



**THE
INDIAN
ASTRONOMICAL EPHEMERIS
FOR THE YEAR
2025**

**POSITIONAL ASTRONOMY CENTRE
INDIA METEOROLOGICAL DEPARTMENT
MINISTRY OF EARTH SCIENCES**

THE
INDIAN
ASTRONOMICAL EPHEMERIS
FOR THE YEAR
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POSITIONAL ASTRONOMY CENTRE
INDIA METEOROLOGICAL DEPARTMENT

Issued under the authority of
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PREFACE

The Indian Astronomical Ephemeris is published annually by the India Meteorological Department (IMD) for providing data to astronomers. The speciality of this publication is that it contains calendric information which caters to the requirement of the country's panchang makers and other users. Thus, it has great civil and cultural significance. This has been mandate given to the Positional Astronomy Centre at Kolkata by the Govt. of India.

The calculations of the Indian Calendar portion, such as tithi, nakshatra, etc. are given in Indian Standard Time (IST) and covers an extended period upto 21st March, 2026 which is the end of the year 1947 Saka Era of the Indian National Calendar. A separate note has also been given to explain the terminology and the basis of different calculations relating to the Indian Calendar.

The epoch of the standard reference system in this publication is J 2000.0 and the argument of the ephemerides is Terrestrial Time (TT). Resolutions of the Indian Astronomical Union (IAU) recommending the changes from time to time including a list of new IAU constants are given in Part VI – Indian Calendar and Explanation.

Our sincere thanks are due to the Nautical Almanac Office, United States Naval Observatory and Her Majesty's Nautical Almanac office, U.K.

The work of preparation and publication of the Indian Astronomical Ephemeris for 2025 has been done under the supervision of Shri Debapriya Roy, Head, Positional Astronomy Centre, India Meteorological Department, Kolkata.

Mausam Bhawan
New Delhi – 110 003
11 August, 2024 A.D.
(20 Sravana, 1946 Saka Era)

Dr. M. Mohapatra
Director General of Meteorology

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PART - I

TIME, SUN, MOON, PLANETS

TIME-SCALE, 2025

Julian date for Standard epoch

1900 January 0, 12 ^h U.T.	=	JD	241	5020.0
B 1950.0	=	1950 Jan. 0.923	=	JD 243 3282.423
B 2025.0	=	2025 Jan. 0.088	=	JD 246 0675.588
J 2025.5	=	2025 July 2.375	=	JD 246 0858.875
J 2000.0	=	2000 Jan. 1.5	=	JD 245 1545.0

Tabulations of Julian date against calendar date for 2025 are given on pages 4 to 12 and for other years are given at Table IX of Part-V on page 359.

The fraction of the year from 2020.5 is tabulated with the Besselian day numbers on pages 244-251.

The lengths of the principal years and mean months at 2025.0 as derived from the Sun's mean motion and mean Orbital elements respectively are:

Length of the year (ephemeris days) :

	d		d	h	m	s
Tropical (equinox to equinox)	365.242190	=	365	05	48	45.2
Sidereal (fixed star to fixed star)	365.256363	=	365	06	09	09.8
Anomalistic (perigee to perigee)	365.259635	=	365	06	13	52.5
Eclipse (node to node)	346.620074	=	346	14	52	54.4

Length of the Month (ephemeris days)

	d		d	h	m	s
Synodic (new moon to new moon)	29.5305888	=	29	12	44	02.9
Tropical (equinox to equinox)	27.3215822	=	27	07	43	04.7
Sidereal (fixed star to fixed star)	27.3216615	=	27	07	43	11.6
Anomalistic (perigee to perigee)	27.5545501	=	27	13	18	33.1
Nodical (node to node)	27.2122207	=	27	05	05	35.9

	h	m	s
Length of the day: Mean Sidereal	23	56	04.09053 of mean Solar time.
Mean Solar	24	03	56.55537 of mean Sidereal time.

CHRONOLOGICAL TABLE

3

CHRONOLOGICAL CYCLES

Golden Number or Lunar Cycle	XII	Solar Cycle	18
Epact	30	Roman Indiction	3
Dominical Letter	E		

CHRONOLOGICAL ERAS

The year 1947 of the Saka Era (Indian National Calendar) begins on March 22, 2025.

The year 1947 of the Saka Era or Saka Shalivahana (Lunisolar, Traditional Calendar) begins on March 30, 2025.

The year 1947 of the Saka Era (Solar, Traditional Calendar) begins on April 14, 2025.

The year 5126 Kali Era begins on April 14, 2025.

The year 2082 of the Vikram Samvat begins on March 30, 2025 (Chaitradi) and October 22, 2025 (Kartikadi) according to different systems of reckoning.

The year 1432 of the Bengali San on April 15, 2025.

The year 1201 of the Kollam Era begins on August 17, 2025.

Jovian year (Barhaspatya Varsa or 60-year cycle of Jupiter) 53 Siddharthin begins on May 11, 2025 (North Indian Usage), and 39 Vivavasu March 30, 2025 (Lunar Chaitradi) or April 14, 2025 (Solar) (South Indian Usage).

Vedanga Jyotisa year 1- Samvatsara of the 5-year cycle (390 th cycle of Paitamaha Siddhanta) begins on January 30, 2025.

The year 2569 of the Buddha Nirvana era begins on May 12, 2025.

The year 2552 of the Mahavira Nirvana Era begins on October 22, 2025.

The year 1447 of the Mohammedan Era begins on June 27, 2025.

The year 1395 of the Yazdejardi Era begins on August 15, 2025 according to the Indian Parsi (Shahenshahi) Calendar.

The year 6738 of the Julian period begins on January 14, 2025.

The year 5786 of the Jewish Era (A.M.) begins on September 23, 2025.

The year 2801 of the Greek Olympiad, being the 1st year of the 4-Year cycle (701 th Olympiad) begins on July, 2025.

The year 2778 of the Foundation of Rome (A.U.C.) begins on January 14, 2025.

The year 2774 of the Nabonassar begins on April 17, 2025.

The year 2337 of the Seleucid era begins in the present-day usage of the Syrians on September 14 or October 14, 2025 according to different sects.

The Gregorian Year 2025 begins on January 1, 2025.

CALENDAR, 2025

Day of Month	Day of Year	Day of Week	Days since J 2025.5	Fraction of Year since Jan. 1.0	Julian Day (at 0h U.T.)	Indian Calendar		Phases of the Moon
						Day of Month	Day of Year	
					2460	1946 Saka Era		
Dec. 27	362	Fri	-187.375	-0.0137	671.5	Pausha 6	282	30-New Moon 22 ^h 27 ^m U.T.
28	363	Sat	186.375	-0.0110	672.5	7	283	
29	364	Sun	185.375	-0.0082	673.5	8	284	
30	365	Mon	184.375	-0.0055	674.5	9	285	
Dec. 31	366	Tue	183.375	-0.0027	675.5	10	286	
Jan. 1	1	Wed	182.375	0.0000	676.5	11	287	6-First Quarter 23 ^h 56 ^m U.T.
2	2	Thu	181.375	0.0027	677.5	12	288	
3	3	Fri	-180.375	0.0055	678.5	13	289	
4	4	Sat	179.375	0.0082	679.5	14	290	
5	5	Sun	178.375	0.0110	680.5	15	291	
6	6	Mon	177.375	0.0137	681.5	16	292	13-Full Moon 22 ^h 27 ^m U.T.
7	7	Tue	176.375	0.0164	682.5	17	293	
8	8	Wed	175.375	0.0192	683.5	18	294	
9	9	Thu	174.375	0.0219	684.5	19	295	
10	10	Fri	-173.375	0.0246	685.5	20	296	
11	11	Sat	172.375	0.0274	686.5	21	297	21-Last Quarter 20 ^h 31 ^m U.T.
12	12	Sun	171.375	0.0301	687.5	22	298	
13	13	Mon	170.375	0.0329	688.5	23	299	
14	14	Tue	169.375	0.0356	689.5	24	300	
15	15	Wed	168.375	0.0383	690.5	25	301	
16	16	Thu	167.375	0.0411	691.5	26	302	29-New Moon 12 ^h 36 ^m U.T.
17	17	Fri	-166.375	0.0438	692.5	27	303	
18	18	Sat	165.375	0.0465	693.5	28	304	
19	19	Sun	164.375	0.0493	694.5	29	305	
20	20	Mon	163.375	0.0520	695.5	30	306	
21	21	Tue	162.375	0.0548	696.5	Magha 1	307	5-First Quarter 8 ^h 02 ^m U.T.
22	22	Wed	161.375	0.0575	697.5	2	308	
23	23	Thu	160.375	0.0602	698.5	3	309	
24	24	Fri	-159.375	0.0630	699.5	4	310	
25	25	Sat	158.375	0.0657	700.5	5	311	
26	26	Sun	157.375	0.0684	701.5	6	312	
27	27	Mon	156.375	0.0712	702.5	7	313	
28	28	Tue	155.375	0.0739	703.5	8	314	
29	29	Wed	154.375	0.0767	704.5	9	315	
30	30	Thu	153.375	0.0794	705.5	10	316	
31	31	Fri	-152.375	0.0821	706.5	11	317	
Feb. 1	32	Sat	151.375	0.0849	707.5	12	318	
2	33	Sun	150.375	0.0876	708.5	13	319	
3	34	Mon	149.375	0.0904	709.5	14	320	
4	35	Tue	148.375	0.0931	710.5	15	321	
5	36	Wed	147.375	0.0958	711.5	16	322	
6	37	Thu	-146.375	0.0986	712.5	17	323	

CALENDAR, 2025

Day of Month	Day of Year	Day of Week	Days since J 2025.5	Fraction of Year since Jan. 1.0	Julian Day (at 0h U.T.)	Indian Calendar		Phases of the Moon
						Day of Month	Day of Year	
Feb.	7	38	Fri	-145.375	0.1013	2460	1946 Saka Era	12-Full Moon 13 ^h 53 ^m U.T.
	8	39	Sat	144.375	0.1040	713.5	Magha 18	
	9	40	Sun	143.375	0.1068	714.5	19	
	10	41	Mon	142.375	0.1095	715.5	20	
	11	42	Tue	141.375	0.1123	716.5	21	
	12	43	Wed	140.375	0.1150	717.5	22	
	13	44	Thu	139.375	0.1177	718.5	23	
						719.5	24	
	14	45	Fri	-138.375	0.1205	720.5	25	
	15	46	Sat	137.375	0.1232	721.5	26	
	16	47	Sun	136.375	0.1259	722.5	27	20-Last Quarter 17 ^h 32 ^m U.T.
	17	48	Mon	135.375	0.1287	723.5	28	
	18	49	Tue	134.375	0.1314	724.5	29	
	19	50	Wed	133.375	0.1342	725.5	30	
	20	51	Thu	132.375	0.1369	726.5	Phalguna 1	
	21	52	Fri	-131.375	0.1396	727.5	2	
	22	53	Sat	130.375	0.1424	728.5	3	
	23	54	Sun	129.375	0.1451	729.5	4	
	24	55	Mon	128.375	0.1478	730.5	5	
Mar.	25	56	Tue	127.375	0.1506	731.5	6	28-New Moon 0 ^h 45 ^m U.T.
	26	57	Wed	126.375	0.1533	732.5	7	
	27	58	Thu	125.375	0.1561	733.5	8	
	28	59	Fri	-124.375	0.1588	734.5	9	
	1	60	Sat	123.375	0.1615	735.5	10	
	2	61	Sun	122.375	0.1643	736.5	11	
	3	62	Mon	121.375	0.1670	737.5	12	
	4	63	Tue	120.375	0.1698	738.5	13	
	5	64	Wed	119.375	0.1725	739.5	14	6-First Quarter 16 ^h 32 ^m U.T.
	6	65	Thu	118.375	0.1752	740.5	15	
	7	66	Fri	-117.375	0.1780	741.5	16	
	8	67	Sat	116.375	0.1807	742.5	17	
	9	68	Sun	115.375	0.1834	743.5	18	
	10	69	Mon	114.375	0.1862	744.5	19	
	11	70	Tue	113.375	0.1889	745.5	20	
	12	71	Wed	112.375	0.1917	746.5	21	
	13	72	Thu	111.375	0.1944	747.5	22	14-Full Moon 6 ^h 55 ^m U.T.
	14	73	Fri	-110.375	0.1971	748.5	23	
	15	74	Sat	109.375	0.1999	749.5	24	
	16	75	Sun	108.375	0.2026	750.5	25	
	17	76	Mon	107.375	0.2053	751.5	26	
	18	77	Tue	106.375	0.2081	752.5	27	
	19	78	Wed	105.375	0.2108	753.5	28	
	20	79	Thu	-104.375	0.2136	754.5	29	

CALENDAR, 2025

Day of Month	Day of Year	Day of Week	Days since J 2025.5	Fraction of Year since Jan. 1.0	Julian Day (at 0h U.T.)	Indian Calendar		Phases of the Moon
						Day of Month	Day of Year	
Mar.	21	80	Fri	-103.375	0.2163	2460	1946 Saka Era	22-Last Quarter 11 ^h 29 ^m U.T.
	22	81	Sat	102.375	0.2190	755.5	Phalguna 30	
	23	82	Sun	101.375	0.2218	756.5	1947, Chaitra 1	
	24	83	Mon	100.375	0.2245	757.5	2	
	25	84	Tue	99.375	0.2272	758.5	3	
	26	85	Wed	98.375	0.2300	759.5	4	
	27	86	Thu	97.375	0.2327	760.5	5	
Apr.	28	87	Fri	-96.375	0.2355	761.5	6	29-New Moon 10 ^h 58 ^m U.T.
	29	88	Sat	95.375	0.2382	762.5	7	
	30	89	Sun	94.375	0.2409	763.5	8	
	31	90	Mon	93.375	0.2437	764.5	9	
	1	91	Tue	92.375	0.2464	765.5	10	
	2	92	Wed	91.375	0.2491	766.5	11	5-First Quarter 2 ^h 15 ^m U.T.
	3	93	Thu	90.375	0.2519	767.5	12	
	4	94	Fri	-89.375	0.2546	768.5	13	
	5	95	Sat	88.375	0.2574	769.5	14	
	6	96	Sun	87.375	0.2601	770.5	15	
	7	97	Mon	86.375	0.2628	771.5	16	13-Full Moon 0 ^h 22 ^m U.T.
	8	98	Tue	85.375	0.2656	772.5	17	
	9	99	Wed	84.375	0.2683	773.5	18	
	10	100	Thu	83.375	0.2711	774.5	19	
	11	101	Fri	-82.375	0.2738	775.5	20	
	12	102	Sat	81.375	0.2765	776.5	21	21-Last Quarter 1 ^h 35 ^m U.T.
	13	103	Sun	80.375	0.2793	777.5	22	
	14	104	Mon	79.375	0.2820	778.5	23	
	15	105	Tue	78.375	0.2847	779.5	24	
	16	106	Wed	77.375	0.2875	780.5	25	
May	17	107	Thu	76.375	0.2902	781.5	26	27-New Moon 19 ^h 31 ^m U.T.
	18	108	Fri	-75.375	0.2930	782.5	27	
	19	109	Sat	74.375	0.2957	783.5	28	
	20	110	Sun	73.375	0.2984	784.5	29	
	21	111	Mon	72.375	0.3012	785.5	30	
	22	112	Tue	71.375	0.3039	786.5	Vaishakha 1	27-New Moon 19 ^h 31 ^m U.T.
	23	113	Wed	70.375	0.3066	787.5	2	
	24	114	Thu	69.375	0.3094	788.5	3	
	25	115	Fri	-68.375	0.3121	789.5	4	
	26	116	Sat	67.375	0.3149	790.5	5	
	27	117	Sun	66.375	0.3176	791.5	6	27-New Moon 19 ^h 31 ^m U.T.
	28	118	Mon	65.375	0.3203	792.5	7	
	29	119	Tue	64.375	0.3231	793.5	8	
	30	120	Wed	63.375	0.3258	794.5	9	
	1	121	Thu	-62.375	0.3285	795.5	10	
May	1	121	Thu	-62.375	0.3285	796.5	11	41

CALENDAR, 2025

Day of Month	Day of Year	Day of Week	Days since J 2025.5	Fraction of Year since Jan. 1.0	Julian Day (at 0h U.T.)	Indian Calendar		Phases of the Moon
						Day of Month	Day of Year	
May	2	122	Fri	-61.375	0.3313	2460	1947 Saka Era	4-First Quarter 13 ^h 52 ^m U.T.
	3	123	Sat	60.375	0.3340	797.5	Vaishakha 12	
	4	124	Sun	59.375	0.3368	798.5	13	
	5	125	Mon	58.375	0.3395	799.5	14	
	6	126	Tue	57.375	0.3422	800.5	15	
	7	127	Wed	56.375	0.3450	801.5	16	
	8	128	Thu	55.375	0.3477	802.5	17	
						803.5	18	
	9	129	Fri	-54.375	0.3505	804.5	19	12-Full Moon 16 ^h 56 ^m U.T.
	10	130	Sat	53.375	0.3532	805.5	20	
	11	131	Sun	52.375	0.3559	806.5	21	
	12	132	Mon	51.375	0.3587	807.5	22	
	13	133	Tue	50.375	0.3614	808.5	23	
	14	134	Wed	49.375	0.3641	809.5	24	
	15	135	Thu	48.375	0.3669	810.5	25	
								20-Last Quarter 11 ^h 59 ^m U.T.
	16	136	Fri	-47.375	0.3696	811.5	26	
	17	137	Sat	46.375	0.3724	812.5	27	
	18	138	Sun	45.375	0.3751	813.5	28	
	19	139	Mon	44.375	0.3778	814.5	29	
	20	140	Tue	43.375	0.3806	815.5	30	
	21	141	Wed	42.375	0.3833	816.5	31	
	22	142	Thu	41.375	0.3860	817.5	Jyaishtha 1	
	23	143	Fri	-40.375	0.3888	818.5	2	27-New Moon 3 ^h 02 ^m U.T.
	24	144	Sat	39.375	0.3915	819.5	3	
	25	145	Sun	38.375	0.3943	820.5	4	
	26	146	Mon	37.375	0.3970	821.5	5	
	27	147	Tue	36.375	0.3997	822.5	6	
	28	148	Wed	35.375	0.4025	823.5	7	
	29	149	Thu	34.375	0.4052	824.5	8	
	30	150	Fri	-33.375	0.4079	825.5	9	3-First Quarter 3 ^h 41 ^m U.T.
	31	151	Sat	32.375	0.4107	826.5	10	
June	1	152	Sun	31.375	0.4134	827.5	11	
	2	153	Mon	30.375	0.4162	828.5	12	
	3	154	Tue	29.375	0.4189	829.5	13	
	4	155	Wed	28.375	0.4216	830.5	14	
	5	156	Thu	27.375	0.4244	831.5	15	
	6	157	Fri	-26.375	0.4271	832.5	16	11-Full Moon 7 ^h 44 ^m U.T.
	7	158	Sat	25.375	0.4299	833.5	17	
	8	159	Sun	24.375	0.4326	834.5	18	
	9	160	Mon	23.375	0.4353	835.5	19	
	10	161	Tue	22.375	0.4381	836.5	20	
	11	162	Wed	21.375	0.4408	837.5	21	
	12	163	Thu	-20.375	0.4435	838.5	22	

CALENDAR, 2025

Day of Month	Day of Year	Day of Week	Days since J 2025.5	Fraction of Year since Jan. 1.0	Julian Day (at 0h U.T.)	Indian Calendar		Phases of the Moon
						Day of Month	Day of Year	
June	13	164	Fri	-19.375	0.4463	2460	1947 Saka Era	18-Last Quarter 19 ^h 19 ^m U.T.
	14	165	Sat	18.375	0.4490	839.5	Jyaishtha 23	
	15	166	Sun	17.375	0.4518	840.5	24	
	16	167	Mon	16.375	0.4545	841.5	25	
	17	168	Tue	15.375	0.4572	842.5	26	
	18	169	Wed	14.375	0.4600	843.5	27	
	19	170	Thu	13.375	0.4627	844.5	28	
						845.5	29	
	20	171	Fri	-12.375	0.4654	846.5	30	
	21	172	Sat	11.375	0.4682	847.5	31	
July	22	173	Sun	10.375	0.4709	848.5	Ashadha 1	25-New Moon 10 ^h 32 ^m U.T.
	23	174	Mon	9.375	0.4737	849.5	2	
	24	175	Tue	8.375	0.4764	850.5	3	
	25	176	Wed	7.375	0.4791	851.5	4	
	26	177	Thu	6.375	0.4819	852.5	5	
	27	178	Fri	-5.375	0.4846	853.5	6	
	28	179	Sat	4.375	0.4873	854.5	7	
	29	180	Sun	3.375	0.4901	855.5	8	
	30	181	Mon	2.375	0.4928	856.5	9	
	1	182	Tue	1.375	0.4956	857.5	10	
	2	183	Wed	-0.375	0.4983	858.5	11	2-First Quarter 19 ^h 30 ^m U.T.
	3	184	Thu	+0.625	0.5010	859.5	12	
	4	185	Fri	+1.625	0.5038	860.5	13	
	5	186	Sat	2.625	0.5065	861.5	14	
	6	187	Sun	3.625	0.5093	862.5	15	
	7	188	Mon	4.625	0.5120	863.5	16	
	8	189	Tue	5.625	0.5147	864.5	17	
	9	190	Wed	6.625	0.5175	865.5	18	
	10	191	Thu	7.625	0.5202	866.5	19	
	11	192	Fri	+8.625	0.5229	867.5	20	10-Full Moon 20 ^h 37 ^m U.T.
	12	193	Sat	9.625	0.5257	868.5	21	
	13	194	Sun	10.625	0.5284	869.5	22	
	14	195	Mon	11.625	0.5312	870.5	23	
	15	196	Tue	12.625	0.5339	871.5	24	
	16	197	Wed	13.625	0.5366	872.5	25	
	17	198	Thu	14.625	0.5394	873.5	26	
	18	199	Fri	+15.625	0.5421	874.5	27	
	19	200	Sat	16.625	0.5448	875.5	28	
	20	201	Sun	17.625	0.5476	876.5	29	
	21	202	Mon	18.625	0.5503	877.5	30	18-Last Quarter 0 ^h 38 ^m U.T.
	22	203	Tue	19.625	0.5531	878.5	31	
	23	204	Wed	20.625	0.5558	879.5	Sravana 1	
	24	205	Thu	+21.625	0.5585	880.5	2	
							124	24-New Moon 19 ^h 11 ^m U.T.
							125	

CALENDAR, 2025

Day of Month	Day of Year	Day of Week	Days since J 2025.5	Fraction of Year since Jan. 1.0	Julian Day (at 0h U.T.)	Indian Calendar		Phases of the Moon		
						Day of Month	Day of Year			
July	25	206	Fri	+22.625	0.5613	2460	1947 Saka Era Sravana	3	126	
	26	207	Sat	23.625	0.5640	881.5		4	127	
	27	208	Sun	24.625	0.5667	882.5		5	128	
	28	209	Mon	25.625	0.5695	883.5		6	129	
	29	210	Tue	26.625	0.5722	884.5		7	130	
	30	211	Wed	27.625	0.5750	885.5		8	131	
	31	212	Thu	28.625	0.5777	886.5		9	132	
Aug.	1	213	Fri	+29.625	0.5804	887.5		10	133	1-First Quarter 12 ^h 41 ^m U.T.
	2	214	Sat	30.625	0.5832	888.5		11	134	
	3	215	Sun	31.625	0.5859	889.5		12	135	
	4	216	Mon	32.625	0.5887	890.5		13	136	
	5	217	Tue	33.625	0.5914	891.5		14	137	
	6	218	Wed	34.625	0.5941	892.5		15	138	
	7	219	Thu	35.625	0.5969	893.5		16	139	
	8	220	Fri	+36.625	0.5996	894.5		17	140	9-Full Moon 7 ^h 55 ^m U.T.
	9	221	Sat	37.625	0.6023	895.5		18	141	
	10	222	Sun	38.625	0.6051	896.5		19	142	
	11	223	Mon	39.625	0.6078	897.5		20	143	
	12	224	Tue	40.625	0.6106	898.5		21	144	
	13	225	Wed	41.625	0.6133	899.5		22	145	
	14	226	Thu	42.625	0.6160	900.5		23	146	
	15	227	Fri	+43.625	0.6188	901.5		24	147	16-Last Quarter 5 ^h 12 ^m U.T.
	16	228	Sat	44.625	0.6215	902.5		25	148	
	17	229	Sun	45.625	0.6242	903.5		26	149	
	18	230	Mon	46.625	0.6270	904.5		27	150	
	19	231	Tue	47.625	0.6297	905.5		28	151	
	20	232	Wed	48.625	0.6325	906.5		29	152	
	21	233	Thu	49.625	0.6352	907.5		30	153	
	22	234	Fri	+50.625	0.6379	908.5		31	154	23-New Moon 6 ^h 06 ^m U.T.
	23	235	Sat	51.625	0.6407	909.5	Bhadra	1	155	
	24	236	Sun	52.625	0.6434	910.5		2	156	
	25	237	Mon	53.625	0.6461	911.5		3	157	
	26	238	Tue	54.625	0.6489	912.5		4	158	
	27	239	Wed	55.625	0.6516	913.5		5	159	
	28	240	Thu	56.625	0.6544	914.5		6	160	
	29	241	Fri	+57.625	0.6571	915.5		7	161	31-First Quarter 6 ^h 25 ^m U.T.
	30	242	Sat	58.625	0.6598	916.5		8	162	
	31	243	Sun	59.625	0.6626	917.5		9	163	
	1	244	Mon	60.625	0.6653	918.5		10	164	
	2	245	Tue	61.625	0.6680	919.5		11	165	
	3	246	Wed	62.625	0.6708	920.5		12	166	
	4	247	Thu	+63.625	0.6735	921.5		13	167	

CALENDAR, 2025

Day of Month	Day of Year	Day of Week	Days since J 2025.5	Fraction of Year since Jan. 1.0	Julian Day (at 0h U.T.)	Indian Calendar		Phases of the Moon
						Day of Month	Day of Year	
Sept.	5	248	Fri	+64.625	0.6763	2460	1947 Saka Era	7-Full Moon 18 ^h 09 ^m U.T.
	6	249	Sat	65.625	0.6790	923.5	Bhadra 14	
	7	250	Sun	66.625	0.6817	924.5	15	
	8	251	Mon	67.625	0.6845	925.5	16	
	9	252	Tue	68.625	0.6872	926.5	17	
	10	253	Wed	69.625	0.6900	927.5	18	
	11	254	Thu	+70.625	0.6927	928.5	19	
						929.5	20	
	12	255	Fri	+71.625	0.6954	930.5	21	14-Last Quarter 10 ^h 33 ^m U.T.
	13	256	Sat	72.625	0.6982	931.5	22	
	14	257	Sun	73.625	0.7009	932.5	23	
	15	258	Mon	74.625	0.7036	933.5	24	
	16	259	Tue	75.625	0.7064	934.5	25	
	17	260	Wed	76.625	0.7091	935.5	26	
	18	261	Thu	77.625	0.7119	936.5	27	
	19	262	Fri	+78.625	0.7146	937.5	28	21-New Moon 19 ^h 54 ^m U.T.
	20	263	Sat	79.625	0.7173	938.5	29	
	21	264	Sun	80.625	0.7201	939.5	30	
	22	265	Mon	81.625	0.7228	940.5	31	
	23	266	Tue	82.625	0.7255	941.5	Asvina 1	
	24	267	Wed	83.625	0.7283	942.5	2	
	25	268	Thu	84.625	0.7310	943.5	3	
	26	269	Fri	+85.625	0.7338	944.5	4	29-First Quarter 23 ^h 54 ^m U.T.
	27	270	Sat	86.625	0.7365	945.5	5	
	28	271	Sun	87.625	0.7392	946.5	6	
	29	272	Mon	88.625	0.7420	947.5	7	
	30	273	Tue	89.625	0.7447	948.5	8	
	Oct. 1	274	Wed	90.625	0.7474	949.5	9	
Oct.	2	275	Thu	91.625	0.7502	950.5	10	7-Full Moon 3 ^h 48 ^m U.T.
	3	276	Fri	+92.625	0.7529	951.5	11	
	4	277	Sat	93.625	0.7557	952.5	12	
	5	278	Sun	94.625	0.7584	953.5	13	
	6	279	Mon	95.625	0.7611	954.5	14	
	7	280	Tue	96.625	0.7639	955.5	15	
	8	281	Wed	97.625	0.7666	956.5	16	13-Last Quarter 18 ^h 13 ^m U.T.
	9	282	Thu	98.625	0.7694	957.5	17	
	10	283	Fri	+99.625	0.7721	958.5	18	
	11	284	Sat	100.625	0.7748	959.5	19	
	12	285	Sun	101.625	0.7776	960.5	20	
	13	286	Mon	102.625	0.7803	961.5	21	
	14	287	Tue	103.625	0.7830	962.5	22	
	15	288	Wed	104.625	0.7858	963.5	23	
	16	289	Thu	105.625	0.7885	964.5	24	

CALENDAR, 2025

Day of Month	Day of Year	Day of Week	Days since J 2025.5	Fraction of Year since Jan. 1.0	Julian Day (at 0h U.T.)	Indian Calendar		Phases of the Moon
						Day of Month	Day of Year	
Oct.	17	290	Fri	+106.625	0.7913	2460	1947 Saka Era	21-New Moon 12 ^h 25 ^m U.T.
	18	291	Sat	107.625	0.7940	965.5	Asvina 25	
	19	292	Sun	108.625	0.7967	966.5	26	
	20	293	Mon	109.625	0.7995	967.5	27	
	21	294	Tue	110.625	0.8022	968.5	28	
	22	295	Wed	111.625	0.8049	969.5	29	
	23	296	Thu	112.625	0.8077	970.5	30	
						971.5	Kartika 1	
	24	297	Fri	+113.625	0.8104	972.5	2	
	25	298	Sat	114.625	0.8132	973.5	3	
	26	299	Sun	115.625	0.8159	974.5	4	29-First Quarter 16 ^h 21 ^m U.T.
	27	300	Mon	116.625	0.8186	975.5	5	
	28	301	Tue	117.625	0.8214	976.5	6	
	29	302	Wed	118.625	0.8241	977.5	7	
	30	303	Thu	119.625	0.8268	978.5	8	
	31	304	Fri	+120.625	0.8296	979.5	9	
Nov.	1	305	Sat	121.625	0.8323	980.5	10	5-Full Moon 13 ^h 19 ^m U.T.
	2	306	Sun	122.625	0.8351	981.5	11	
	3	307	Mon	123.625	0.8378	982.5	12	
	4	308	Tue	124.625	0.8405	983.5	13	
	5	309	Wed	125.625	0.8433	984.5	14	
	6	310	Thu	126.625	0.8460	985.5	15	
	7	311	Fri	+127.625	0.8488	986.5	16	
	8	312	Sat	128.625	0.8515	987.5	17	
	9	313	Sun	129.625	0.8542	988.5	18	12-Last Quarter 5 ^h 28 ^m U.T.
	10	314	Mon	130.625	0.8570	989.5	19	
	11	315	Tue	131.625	0.8597	990.5	20	
	12	316	Wed	132.625	0.8624	991.5	21	
	13	317	Thu	133.625	0.8652	992.5	22	
	14	318	Fri	+134.625	0.8679	993.5	23	
	15	319	Sat	135.625	0.8707	994.5	24	
	16	320	Sun	136.625	0.8734	995.5	25	20-New Moon 6 ^h 47 ^m U.T.
	17	321	Mon	137.625	0.8761	996.5	26	
	18	322	Tue	138.625	0.8789	997.5	27	
	19	323	Wed	139.625	0.8816	998.5	28	
	20	324	Thu	+140.625	0.8843	999.5	29	
	21	325	Fri	+141.625	0.8871	2461	000.5	
	22	326	Sat	142.625	0.8898	001.5	30	
	23	327	Sun	143.625	0.8926	002.5	Agrahayana 1	
	24	328	Mon	144.625	0.8953	003.5	2	
	25	329	Tue	145.625	0.8980	004.5	3	
	26	330	Wed	146.625	0.9008	005.5	4	
	27	331	Thu	+147.625	0.9035	006.5	5	
							250	
							251	

CALENDAR, 2025

Day of Month	Day of Year	Day of Week	Days since J 2025.5	Fraction of Year since Jan. 1.0	Julian Day (at 0h U.T.)	Indian Calendar		Phases of the Moon
						Day of Month	Day of Year	
Nov.	28	332	Fri	+148.625	0.9062	2461	1947 Saka Era	28-First Quarter 6 ^h 59 ^m U.T.
	29	333	Sat	149.625	0.9090	007.5	Agrahayana 7	
	30	334	Sun	150.625	0.9117	008.5	8	
Dec.	1	335	Mon	151.625	0.9145	009.5	9	4-Full Moon 23 ^h 14 ^m U.T.
	2	336	Tue	152.625	0.9172	010.5	10	
	3	337	Wed	153.625	0.9199	011.5	11	
	4	338	Thu	154.625	0.9227	012.5	12	11-Last Quarter 20 ^h 52 ^m U.T.
	5	339	Fri	+155.625	0.9254	013.5	13	
	6	340	Sat	156.625	0.9282	014.5	14	
	7	341	Sun	157.625	0.9309	015.5	15	20-New Moon 1 ^h 43 ^m U.T.
	8	342	Mon	158.625	0.9336	016.5	16	
	9	343	Tue	159.625	0.9364	017.5	17	
	10	344	Wed	160.625	0.9391	018.5	18	27-First Quarter 19 ^h 10 ^m U.T.
	11	345	Thu	161.625	0.9418	019.5	19	
	12	346	Fri	+162.625	0.9446	020.5	20	
	13	347	Sat	163.625	0.9473	021.5	21	27-First Quarter 19 ^h 10 ^m U.T.
	14	348	Sun	164.625	0.9501	022.5	22	
	15	349	Mon	165.625	0.9528	023.5	23	
	16	350	Tue	166.625	0.9555	024.5	24	27-First Quarter 19 ^h 10 ^m U.T.
	17	351	Wed	167.625	0.9583	025.5	25	
	18	352	Thu	168.625	0.9610	026.5	26	
	19	353	Fri	+169.625	0.9637	027.5	27	27-First Quarter 19 ^h 10 ^m U.T.
	20	354	Sat	170.625	0.9665	028.5	28	
	21	355	Sun	171.625	0.9692	029.5	29	
	22	356	Mon	172.625	0.9720	030.5	30	27-First Quarter 19 ^h 10 ^m U.T.
	23	357	Tue	173.625	0.9747	031.5	1	
	24	358	Wed	174.625	0.9774	032.5	2	
	25	359	Thu	175.625	0.9802	033.5	3	27-First Quarter 19 ^h 10 ^m U.T.
	26	360	Fri	+176.625	0.9829	034.5	4	
	27	361	Sat	177.625	0.9856	035.5	5	
	28	362	Sun	178.625	0.9884	036.5	6	27-First Quarter 19 ^h 10 ^m U.T.
	29	363	Mon	179.625	0.9911	037.5	7	
	30	364	Tue	180.625	0.9939	038.5	8	
	31	365	Wed	181.625	0.9966	039.5	9	27-First Quarter 19 ^h 10 ^m U.T.
	32	1	Thu	+182.625	0.9993	040.5	10	
						041.5	11	

The new epoch is the middle of the Julian year, denoted by J 2025.5 (i.e. 2025, July 2.375) where the length of the Julian year is taken to be 365.25 days.

The Fraction of year is reckoned from January 1, 0^h U.T and is based on the tropical year of 365.2422 days. The Julian Day begins at noon. In order to obtain the Julian Day Number completed at noon as given in Table IX, increase the above figure by 0.5.

The Day of year of the Gregorian Calendar is reckoned from January 1, and that of the Indian Calendar from Chaitra 1.

SIDEREAL TIME, 2025

Date	Mean Greenwich Sidereal Time at 0 ^h U.T. (G.H.A. of the Equinox)				Equation of the Equinox- es at 0 ^h U.T.	Greenwich Transit of Mean Equinox (U.T. at 0 ^h G.M.S.T.)			Date	Mean Greenwich Sidereal Time at 0 ^h U.T. (G.H.A. of the Equinox)				Equation of the Equinox- es at 0 ^h U.T.	Greenwich Transit of Mean Equinox (U.T. at 0 ^h G.M.S.T.)		
	h	m	s		s	h	m	s		h	m	s		s	h	m	s
Jan.	0	6	39	39.337	+0.002	17	17	30.227	Feb.	15	9	41	00.884	+0.102	14	16	38.392
	1	6	43	35.893	0.012	17	13	34.318		16	9	44	57.440	0.095	14	12	42.482
	2	6	47	32.448	0.020	17	09	38.408		17	9	48	53.995	0.088	14	08	46.573
	3	6	51	29.003	0.024	17	05	42.499		18	9	52	50.550	0.082	14	04	50.663
	4	6	55	25.559	0.025	17	01	46.589		19	9	56	47.106	0.079	14	00	54.754
	5	6	59	22.114	0.023	16	57	50.680		20	10	00	43.661	0.078	13	56	58.844
	6	7	03	18.670	+0.019	16	53	54.771		21	10	04	40.216	+0.080	13	53	02.935
	7	7	07	15.225	0.015	16	49	58.861		22	10	08	36.772	0.084	13	49	07.025
	8	7	11	11.780	0.014	16	46	02.952		23	10	12	33.327	0.090	13	45	11.116
	9	7	15	08.336	0.016	16	42	07.042		24	10	16	29.883	0.096	13	41	15.206
	10	7	19	04.891	0.023	16	38	11.133		25	10	20	26.438	0.101	13	37	19.297
11	7	23	01.446	0.032	16	34	15.223	26	10	24	22.993	0.103	13	33	23.388		
	12	7	26	58.002	+0.044	16	30	19.314	Mar.	27	10	28	19.549	+0.102	13	29	27.478
	13	7	30	54.557	0.055	16	26	23.404		28	10	32	16.104	0.098	13	25	31.569
	14	7	34	51.112	0.064	16	22	27.495		1	10	36	12.659	0.090	13	21	35.659
	15	7	38	47.668	0.071	16	18	31.585		2	10	40	09.215	0.081	13	17	39.750
	16	7	42	44.223	0.074	16	14	35.676		3	10	44	05.770	0.074	13	13	43.840
	17	7	46	40.779	0.073	16	10	39.766		4	10	48	02.326	0.069	13	09	47.931
	18	7	50	37.334	+0.070	16	06	43.857		5	10	51	58.881	+0.069	13	05	52.021
	19	7	54	33.889	0.066	16	02	47.947		6	10	55	55.436	0.073	13	01	56.112
	20	7	58	30.445	0.061	15	58	52.038		7	10	59	51.992	0.079	12	58	00.202
	21	8	02	27.000	0.057	15	54	56.128		8	11	03	48.547	0.085	12	54	04.293
	22	8	06	23.555	0.055	15	51	00.219		9	11	07	45.102	0.091	12	50	08.383
23	8	10	20.111	0.055	15	47	04.309	10	11	11	41.658	0.094	12	46	12.474		
	24	8	14	16.666	+0.058	15	43	08.400		11	11	15	38.213	+0.094	12	42	16.564
	25	8	18	13.222	0.063	15	39	12.491		12	11	19	34.769	0.091	12	38	20.655
	26	8	22	09.777	0.071	15	35	16.581		13	11	23	31.324	0.084	12	34	24.746
	27	8	26	06.332	0.080	15	31	20.672		14	11	27	27.879	0.076	12	30	28.836
	28	8	30	02.888	0.088	15	27	24.762		15	11	31	24.435	0.067	12	26	32.927
	29	8	33	59.443	0.095	15	23	28.853		16	11	35	20.990	0.058	12	22	37.017
	30	8	37	55.998	+0.099	15	19	32.943		17	11	39	17.545	+0.051	12	18	41.108
	31	8	41	52.554	0.099	15	15	37.034		18	11	43	14.101	0.045	12	14	45.198
	1	8	45	49.109	0.095	15	11	41.124		19	11	47	10.656	0.042	12	10	49.289
	2	8	49	45.664	0.089	15	07	45.215		20	11	51	07.211	0.042	12	06	53.379
	3	8	53	42.220	0.083	15	03	49.305		21	11	55	03.767	0.044	12	02	57.470
4	8	57	38.775	0.079	14	59	53.396	22	11	59	00.322	0.047	11	59	01.560		
	5	9	01	35.331	+0.078	14	55	57.486		23	12	02	56.878	+0.052	11	55	05.651
	6	9	05	31.886	0.081	14	52	01.577		24	12	06	53.433	0.056	11	51	09.741
	7	9	09	28.441	0.087	14	48	05.667		25	12	10	49.988	0.059	11	47	13.832
	8	9	13	24.997	0.095	14	44	09.758		26	12	14	46.544	0.058	11	43	17.922
	9	9	17	21.552	0.104	14	40	13.849		27	12	18	43.099	0.055	11	39	22.013
	10	9	21	18.107	0.111	14	36	17.939		28	12	22	39.654	0.047	11	35	26.103
	11	9	25	14.663	+0.115	14	32	22.030		29	12	26	36.210	+0.038	11	31	30.194
	12	9	29	11.218	0.117	14	28	26.120		30	12	30	32.765	0.029	11	27	34.284
	13	9	33	07.774	0.114	14	24	30.211		31	12	34	29.321	0.023	11	23	38.375
	14	9	37	04.329	0.109	14	20	34.301		1	12	38	25.876	0.022	11	19	42.466
	15	9	41	00.884	+0.102	14	16	38.392		2	12	42	22.431	+0.025	11	15	46.556

N.B.-Apparent Sidereal Time = Mean Sidereal Time + Equation of Equinoxes for the instant

SIDEREAL TIME, 2025

Date	Mean Greenwich Sidereal Time at 0 ^h U.T. (G.H.A. of the Equinox)				Equation of the Equinoxes at 0 ^h U.T.	Greenwich Transit of Mean Equinox (U.T. at 0 ^h G.M.S.T.)			Date	Mean Greenwich Sidereal Time at 0 ^h U.T. (G.H.A. of the Equinox)				Equation of the Equinoxes at 0 ^h U.T.	Greenwich Transit of Mean Equinox (U.T. at 0 ^h G.M.S.T.)		
	h	m	s		s	h	m	s		h	m	s		s	h	m	s
Apr.	1	12	38	25.876	+0.022	11	19	42.466	May	17	15	39	47.423	+0.039	8	18	50.630
	2	12	42	22.431	0.025	11	15	46.556		18	15	43	43.978	0.046	8	14	54.720
	3	12	46	18.987	0.031	11	11	50.647		19	15	47	40.534	0.051	8	10	58.811
	4	12	50	15.542	0.038	11	7	54.737		20	15	51	37.089	0.052	8	7	02.901
	5	12	54	12.097	0.044	11	3	58.828		21	15	55	33.644	0.051	8	3	06.992
	6	12	58	08.653	0.049	11	0	02.918		22	15	59	30.200	0.047	7	59	11.083
	7	13	2	05.208	+0.050	10	56	07.009	23	16	3	26.755	+0.042	7	55	15.173	
	8	13	6	01.763	0.048	10	52	11.099	24	16	7	23.310	0.037	7	51	19.264	
	9	13	9	58.319	0.043	10	48	15.190	25	16	11	19.866	0.036	7	47	23.354	
	10	13	13	54.874	0.035	10	44	19.280	26	16	15	16.421	0.039	7	43	27.445	
	11	13	17	51.430	0.027	10	40	23.371	27	16	19	12.977	0.047	7	39	31.535	
	12	13	21	47.985	0.019	10	36	27.461	28	16	23	09.532	0.058	7	35	35.626	
13	13	25	44.540	+0.011	10	32	31.552	29	16	27	06.087	+0.070	7	31	39.716		
14	13	29	41.096	0.006	10	28	35.642	30	16	31	02.643	0.082	7	27	43.807		
15	13	33	37.651	0.003	10	24	39.733	31	16	34	59.198	0.090	7	23	47.897		
16	13	37	34.206	0.003	10	20	43.823	June	1	16	38	55.753	0.095	7	19	51.988	
17	13	41	30.762	0.006	10	16	47.914		2	16	42	52.309	0.096	7	15	56.078	
18	13	45	27.317	0.010	10	12	52.005		3	16	46	48.864	0.094	7	12	00.169	
19	13	49	23.873	+0.015	10	8	56.095		4	16	50	45.419	+0.090	7	8	04.259	
20	13	53	20.428	0.021	10	5	00.186		5	16	54	41.975	0.086	7	4	08.350	
21	13	57	16.983	0.025	10	1	04.276		6	16	58	38.530	0.082	7	0	12.440	
22	14	1	13.539	0.026	9	57	08.367	7	17	2	35.086	0.080	6	56	16.531		
23	14	5	10.094	0.025	9	53	12.457	8	17	6	31.641	0.080	6	52	20.622		
24	14	9	06.649	0.021	9	49	16.548	9	17	10	28.196	0.082	6	48	24.712		
25	14	13	03.205	+0.014	9	45	20.638	10	17	14	24.752	+0.087	6	44	28.803		
26	14	16	59.760	0.006	9	41	24.729	11	17	18	21.307	0.095	6	40	32.893		
27	14	20	56.315	+0.000	9	37	28.819	12	17	22	17.862	0.104	6	36	36.984		
28	14	24	52.871	-0.001	9	33	32.910	13	17	26	14.418	0.113	6	32	41.074		
29	14	28	49.426	+0.002	9	29	37.000	14	17	30	10.973	0.121	6	28	45.165		
30	14	32	45.982	+0.009	9	25	41.091	15	17	34	07.529	0.128	6	24	49.255		
May	1	14	36	42.537	+0.019	9	21	45.181	16	17	38	04.084	+0.131	6	20	53.346	
	2	14	40	39.092	0.028	9	17	49.272	17	17	42	00.639	0.132	6	16	57.436	
	3	14	44	35.648	0.036	9	13	53.363	18	17	45	57.195	0.130	6	13	01.527	
	4	14	48	32.203	0.041	9	9	57.453	19	17	49	53.750	0.126	6	9	05.617	
	5	14	52	28.758	0.042	9	6	01.544	20	17	53	50.305	0.122	6	5	09.708	
	6	14	56	25.314	0.039	9	2	05.634	21	17	57	46.861	0.120	6	1	13.798	
	7	15	0	21.869	+0.035	8	58	09.725	22	18	1	43.416	+0.122	5	57	17.889	
	8	15	4	18.425	0.029	8	54	13.815	23	18	5	39.971	0.129	5	53	21.980	
	9	15	8	14.980	0.023	8	50	17.906	24	18	9	36.527	0.139	5	49	26.070	
	10	15	12	11.535	0.017	8	46	21.996	25	18	13	33.082	0.152	5	45	30.161	
	11	15	16	08.091	0.014	8	42	26.087	26	18	17	29.638	0.165	5	41	34.251	
	12	15	20	04.646	0.013	8	38	30.177	27	18	21	26.193	0.175	5	37	38.342	
13	15	24	01.201	+0.014	8	34	34.268	28	18	25	22.748	+0.182	5	33	42.432		
14	15	27	57.757	0.018	8	30	38.358	29	18	29	19.304	0.185	5	29	46.523		
15	15	31	54.312	0.024	8	26	42.449	30	18	33	15.859	0.184	5	25	50.613		
16	15	35	50.867	0.032	8	22	46.539	July	1	18	37	12.414	0.181	5	21	54.704	
17	15	39	47.423	+0.039	8	18	50.630		2	18	41	08.970	+0.177	5	17	58.794	

N.B.-Apparent Sidereal Time = Mean Sidereal Time + Equation of Equinoxes for the instant

SIDEREAL TIME, 2025

Date	Mean Greenwich Sidereal Time at 0 ^h U.T. (G.H.A. of the Equinox)				Equation of the Equinoxes at 0 ^h U.T.	Greenwich Transit of Mean Equinox (U.T. at 0 ^h G.M.S.T.)				Date	Mean Greenwich Sidereal Time at 0 ^h U.T. (G.H.A. of the Equinox)				Equation of the Equinoxes at 0 ^h U.T.	Greenwich Transit of Mean Equinox (U.T. at 0 ^h G.M.S.T.)			
	h	m	s		s	h	m	s		h	m	s		s	h	m	s		
July	1	18	37	12.414	+0.181	5	21	54.704	Aug.	16	21	38	33.961	+0.241	2	21	02.868		
	2	18	41	08.970	0.177	5	17	58.794		17	21	42	30.517	0.246	2	17	06.959		
	3	18	45	05.525	0.173	5	14	02.885		18	21	46	27.072	0.253	2	13	11.049		
	4	18	49	02.081	0.171	5	10	06.975		19	21	50	23.627	0.262	2	9	15.140		
	5	18	52	58.636	0.170	5	6	11.066		20	21	54	20.183	0.269	2	5	19.230		
	6	18	56	55.191	0.172	5	2	15.156		21	21	58	16.738	0.275	2	1	23.321		
	7	19	0	51.747	+0.176	4	58	19.247		22	22	2	13.294	+0.276	1	57	27.411		
	8	19	4	48.302	0.183	4	54	23.337		23	22	6	09.849	0.274	1	53	31.502		
	9	19	8	44.857	0.191	4	50	27.428		24	22	10	06.404	0.269	1	49	35.592		
	10	19	12	41.413	0.200	4	46	31.519		25	22	14	02.960	0.261	1	45	39.683		
	11	19	16	37.968	0.209	4	42	35.609		26	22	17	59.515	0.253	1	41	43.773		
	12	19	20	34.523	0.216	4	38	39.700		27	22	21	56.070	0.246	1	37	47.864		
	13	19	24	31.079	+0.219	4	34	43.790	28	22	25	52.626	+0.240	1	33	51.954			
	14	19	28	27.634	0.220	4	30	47.881	29	22	29	49.181	0.236	1	29	56.045			
	15	19	32	24.190	0.217	4	26	51.971	30	22	33	45.737	0.235	1	26	00.136			
	16	19	36	20.745	0.213	4	22	56.062	31	22	37	42.292	0.236	1	22	04.226			
	17	19	40	17.300	0.208	4	19	00.152	1	22	41	38.847	0.239	1	18	08.317			
	18	19	44	13.856	0.205	4	15	04.243	2	22	45	35.403	0.243	1	14	12.407			
	19	19	48	10.411	+0.205	4	11	08.333	3	22	49	31.958	+0.248	1	10	16.498			
	20	19	52	06.966	0.209	4	7	12.424	4	22	53	28.513	0.252	1	6	20.588			
	21	19	56	03.522	0.216	4	3	16.514	5	22	57	25.069	0.254	1	2	24.679			
	22	20	0	00.077	0.227	3	59	20.605	6	23	1	21.624	0.253	0	58	28.769			
	23	20	3	56.633	0.238	3	55	24.695	7	23	5	18.179	0.249	0	54	32.860			
	24	20	7	53.188	0.248	3	51	28.786	8	23	9	14.735	0.241	0	50	36.950			
	25	20	11	49.743	+0.255	3	47	32.876	9	23	13	11.290	+0.232	0	46	41.041			
	26	20	15	46.299	0.258	3	43	36.967	10	23	17	07.846	0.224	0	42	45.131			
	27	20	19	42.854	0.257	3	39	41.057	11	23	21	04.401	0.218	0	38	49.222			
	28	20	23	39.409	0.253	3	35	45.148	12	23	25	00.956	0.216	0	34	53.312			
	29	20	27	35.965	0.248	3	31	49.239	13	23	28	57.512	0.218	0	30	57.403			
	30	20	31	32.520	0.242	3	27	53.329	14	23	32	54.067	0.224	0	27	01.494			
	31	20	35	29.075	+0.237	3	23	57.420	15	23	36	50.622	+0.231	0	23	05.584			
	1	20	39	25.631	0.234	3	20	01.510	16	23	40	47.178	0.237	0	19	09.674			
	2	20	43	22.186	0.233	3	16	05.601	17	23	44	43.733	0.241	0	15	13.765			
	3	20	47	18.742	0.235	3	12	09.691	18	23	48	40.289	0.242	0	11	17.856			
	4	20	51	15.297	0.239	3	8	13.782	19	23	52	36.844	0.240	0	7	21.946			
	5	20	55	11.852	0.245	3	4	17.872	20	23	56	33.399	0.234	0	3	26.037			
Aug.	6	20	59	08.408	+0.252	3	0	21.963	21	0	0	29.955	+0.226	23	55	34.218			
	7	21	3	04.963	0.259	2	56	26.053	22	0	4	26.510	0.217	23	51	38.308			
	8	21	7	01.518	0.264	2	52	30.144	23	0	8	23.065	0.208	23	47	42.399			
	9	21	10	58.074	0.267	2	48	34.234	24	0	12	19.621	0.200	23	43	46.489			
	10	21	14	54.629	0.267	2	44	38.325	25	0	16	16.176	0.195	23	39	50.580			
	11	21	18	51.185	0.263	2	40	42.415	26	0	20	12.732	0.192	23	35	54.670			
	12	21	22	47.740	+0.257	2	36	46.506	27	0	24	09.287	+0.191	23	31	58.761			
	13	21	26	44.295	0.249	2	32	50.597	28	0	28	05.842	0.193	23	28	02.852			
	14	21	30	40.851	0.243	2	28	54.687	29	0	32	02.398	0.196	23	24	06.942			
	15	21	34	37.406	0.240	2	24	58.778	30	0	35	58.953	0.200	23	20	11.033			
	16	21	38	33.961	+0.241	2	21	02.868	Oct. 1	0	39	55.508	+0.204	23	16	15.123			

N.B.-Apparent Sidereal Time = Mean Sidereal Time + Equation of Equinoxes for the instant

SIDEREAL TIME, 2025

Date					Mean	Equation	Greenwich			Date	Mean	Equation	Greenwich				
					Greenwich	of the	Transit of Mean										
					Sidereal Time at	Equinox-	Equinox (U.T. at										
					0 ^h U.T. (G.H.A.	es at 0 ^h	0 ^h G.M.S.T.)										
					of the Equinox)	U.T.											
					h	m	s		h	m	s		h	m	s		
Oct.	1	0	39	55.508	+0.204	23	16	15.123	Nov.	16	3	41	17.055	+0.190	20	15	23.287
	2	0	43	52.064	0.206	23	12	19.214		17	3	45	13.611	0.185	20	11	27.378
	3	0	47	48.619	0.206	23	8	23.304		18	3	49	10.166	0.182	20	7	31.469
	4	0	51	45.174	0.202	23	4	27.395		19	3	53	06.721	0.182	20	3	35.559
	5	0	55	41.730	0.196	23	0	31.485		20	3	57	03.277	0.184	19	59	39.650
	6	0	59	38.285	0.187	22	56	35.576		21	4	0	59.832	0.189	19	55	43.740
	7	1	3	34.841	+0.178	22	52	39.666		22	4	4	56.388	+0.195	19	51	47.831
	8	1	7	31.396	0.171	22	48	43.757		23	4	8	52.943	0.203	19	47	51.921
	9	1	11	27.951	0.168	22	44	47.847		24	4	12	49.498	0.211	19	43	56.012
	10	1	15	24.507	0.170	22	40	51.938		25	4	16	46.054	0.218	19	40	00.102
	11	1	19	21.062	0.176	22	36	56.028		26	4	20	42.609	0.223	19	36	04.193
	12	1	23	17.617	0.184	22	33	00.119		27	4	24	39.164	0.225	19	32	08.283
13	1	27	14.173	+0.191	22	29	04.210	28	4	28	35.720	+0.225	19	28	12.374		
14	1	31	10.728	0.197	22	25	08.300	29	4	32	32.275	0.223	19	24	16.464		
15	1	35	07.284	0.200	22	21	12.391	30	4	36	28.830	0.218	19	20	20.555		
16	1	39	03.839	0.199	22	17	16.481	Dec.	1	4	40	25.386	0.214	19	16	24.645	
17	1	43	00.394	0.194	22	13	20.572		2	4	44	21.941	0.212	19	12	28.736	
18	1	46	56.950	0.188	22	9	24.662		3	4	48	18.497	0.214	19	8	32.827	
19	1	50	53.505	+0.180	22	5	28.753		4	4	52	15.052	+0.221	19	4	36.917	
20	1	54	50.060	0.172	22	1	32.843		5	4	56	11.607	0.233	19	0	41.008	
21	1	58	46.616	0.165	21	57	36.934		6	5	0	08.163	0.247	18	56	45.098	
22	2	2	43.171	0.160	21	53	41.024		7	5	4	04.718	0.261	18	52	49.189	
23	2	6	39.726	0.158	21	49	45.115		8	5	8	01.273	0.271	18	48	53.279	
24	2	10	36.282	0.158	21	45	49.205		9	5	11	57.829	0.278	18	44	57.370	
25	2	14	32.837	+0.160	21	41	53.296		10	5	15	54.384	+0.281	18	41	01.460	
26	2	18	29.393	0.165	21	37	57.386		11	5	19	50.940	0.280	18	37	05.551	
27	2	22	25.948	0.170	21	34	01.477		12	5	23	47.495	0.277	18	33	09.641	
28	2	26	22.503	0.175	21	30	05.567	13	5	27	44.050	0.274	18	29	13.732		
29	2	30	19.059	0.179	21	26	09.658	14	5	31	40.606	0.271	18	25	17.822		
30	2	34	15.614	0.181	21	22	13.749	15	5	35	37.161	0.269	18	21	21.913		
Nov.	31	2	38	12.169	+0.181	21	18	17.839	16	5	39	33.716	+0.270	18	17	26.003	
	1	2	42	08.725	0.177	21	14	21.930	17	5	43	30.272	0.273	18	13	30.094	
	2	2	46	05.280	0.171	21	10	26.020	18	5	47	26.827	0.279	18	9	34.184	
	3	2	50	01.836	0.164	21	6	30.111	19	5	51	23.382	0.287	18	5	38.275	
	4	2	53	58.391	0.158	21	2	34.201	20	5	55	19.938	0.296	18	1	42.366	
	5	2	57	54.946	0.156	20	58	38.292	21	5	59	16.493	0.305	17	57	46.456	
	6	3	1	51.502	+0.158	20	54	42.382	22	6	03	13.049	+0.313	17	53	50.547	
	7	3	5	48.057	0.165	20	50	46.473	23	6	07	09.604	0.320	17	49	54.637	
	8	3	9	44.612	0.175	20	46	50.563	24	6	11	06.159	0.324	17	45	58.728	
	9	3	13	41.168	0.186	20	42	54.654	25	6	15	02.715	0.326	17	42	02.818	
	10	3	17	37.723	0.196	20	38	58.744	26	6	18	59.270	0.325	17	38	06.909	
	11	3	21	34.278	0.202	20	35	02.835	27	6	22	55.825	0.322	17	34	10.999	
	12	3	25	30.834	+0.205	20	31	06.925	28	6	26	52.381	+0.318	17	30	15.090	
	13	3	29	27.389	0.204	20	27	11.016	29	6	30	48.936	0.316	17	26	19.180	
	14	3	33	23.945	0.201	20	23	15.106	30	6	34	45.492	0.317	17	22	23.271	
	15	3	37	20.500	0.195	20	19	19.197	31	6	38	42.047	0.322	17	18	27.361	
	16	3	41	17.055	+0.190	20	15	23.287	32	6	42	38.602	+0.332	17	14	31.452	

N.B.-Apparent Sidereal Time = Mean Sidereal Time + Equation of Equinoxes for the instant

SUN, 2025
MEAN LONGITUDE AND ANOMALY

Date		Horizontal Parallax		Mean Longitude		Mean Anomaly	Date		Horizontal Parallax		Mean Longitude		Mean Anomaly
		"	°	'	"	°			"	°	'	"	°
Jan.	1	8.94	280	54	19.137	357.538	July	10	8.65	108	10	41.932	184.802
	11	8.94	290	45	42.442	7.394		20	8.65	118	02	05.237	194.658
	21	8.94	300	37	05.747	17.250		30	8.66	127	53	28.541	204.514
	31	8.93	310	28	29.052	27.106	Aug.	9	8.67	137	44	51.846	214.370
Feb.	10	8.91	320	19	52.357	36.962		19	8.69	147	36	15.151	224.226
	20	8.89	330	11	15.662	46.818		29	8.71	157	27	38.456	234.082
Mar.	2	8.87	340	02	38.967	56.674	Sept.	8	8.73	167	19	01.761	243.938
	12	8.85	349	54	02.272	66.530		18	8.75	177	10	25.066	253.794
	22	8.83	359	45	25.577	76.386		28	8.78	187	01	48.371	263.650
Apr.	1	8.80	9	36	48.882	86.242	Oct.	8	8.80	196	53	11.676	273.506
	11	8.78	19	28	12.187	96.098		18	8.83	206	44	34.981	283.362
	21	8.75	29	19	35.492	105.954		28	8.85	216	35	58.286	293.218
May	1	8.73	39	10	58.797	115.810	Nov.	7	8.87	226	27	21.591	303.074
	11	8.71	49	02	22.102	125.666		17	8.89	236	18	44.896	312.930
	21	8.69	58	53	45.407	135.522		27	8.91	246	10	08.201	322.786
	31	8.67	68	45	08.712	145.378	Dec.	7	8.93	256	01	31.506	332.642
June	10	8.66	78	36	32.017	155.234		17	8.94	265	52	54.811	342.498
	20	8.65	88	27	55.322	165.090		27	8.94	275	44	18.116	352.354
	30	8.65	98	19	18.627	174.946		37	8.94	285	35	41.421	2.210
July	10	8.65	108	10	41.932	184.802		47	8.94	295	27	04.726	12.066

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date		Geometric Longitude* (Mean Equinox of date)			Latitude (Ecliptic of date)	Apparent Longitude (True equinox of date)			Aberra- tion	Prec. in Long. (J 2025.5 of date)	Nut. in Long.	Nut. in Obliquity	True Obliquity (23° 26')
		°	'	"	"	°	'	"	"	"	"	"	"
Jan.	0	279	47	56.10	-0.68	279	47	35.34	20.84	-25.53	+0.03	+8.47	18.16
	1	280	49	06.68	0.65	280	48	46.08	20.84	25.39	0.20	8.50	18.20
	2	281	50	17.26	0.58	281	49	56.78	20.84	25.25	0.32	8.56	18.26
	3	282	51	27.78	0.47	282	51	07.38	20.84	25.11	0.40	8.63	18.32
	4	283	52	38.11	0.36	283	52	17.72	20.84	24.97	0.41	8.69	18.38
	5	284	53	48.17	0.22	284	53	27.74	20.84	24.83	0.37	8.73	18.43
	6	285	54	57.89	-0.11	285	54	37.40	20.84	-24.69	+0.31	+8.75	18.44
	7	286	56	07.18	+0.04	286	55	46.63	20.84	24.55	0.25	8.74	18.43
	8	287	57	16.03	0.14	287	56	55.46	20.84	24.41	0.23	8.71	18.40
	9	288	58	24.39	0.25	288	58	03.86	20.84	24.27	0.27	8.66	18.35
	10	289	59	32.26	0.36	289	59	11.83	20.84	24.14	0.37	8.62	18.30
	11	291	00	39.60	0.40	291	00	19.33	20.84	24.00	0.53	8.59	18.27
	12	292	01	46.48	+0.43	292	01	26.40	20.84	-23.86	+0.71	+8.58	18.27
	13	293	02	52.89	0.43	293	02	33.00	20.84	23.72	0.90	8.61	18.29
	14	294	03	58.91	0.40	294	03	39.17	20.84	23.58	1.05	8.66	18.34
	15	295	05	04.50	0.32	295	04	44.87	20.84	23.44	1.16	8.72	18.40
	16	296	06	09.72	0.22	296	05	50.14	20.84	23.30	1.20	8.79	18.47
	17	297	07	14.60	+0.11	297	06	55.01	20.83	23.16	1.19	8.85	18.53
	18	298	08	19.13	0.00	298	07	59.48	20.83	-23.02	+1.14	+8.90	18.57
	19	299	09	23.31	-0.14	299	09	03.60	20.83	22.88	1.07	8.93	18.60
	20	300	10	27.14	0.25	300	10	07.36	20.83	22.74	0.99	8.94	18.61
	21	301	11	30.60	0.40	301	11	10.75	20.83	22.60	0.93	8.93	18.60
	22	302	12	33.67	0.50	302	12	13.79	20.82	22.47	0.90	8.91	18.58
	23	303	13	36.34	0.58	303	13	16.46	20.82	22.33	0.90	8.89	18.55
	24	304	14	38.50	-0.68	304	14	18.67	20.82	-22.19	+0.94	+8.86	18.53
	25	305	15	40.15	0.72	305	15	20.41	20.82	22.05	1.03	8.84	18.51
	26	306	16	41.26	0.76	306	16	21.65	20.82	21.91	1.16	8.84	18.50
	27	307	17	41.70	0.72	307	17	22.24	20.81	21.77	1.30	8.85	18.52
	28	308	18	41.42	0.68	308	18	22.10	20.81	21.63	1.45	8.90	18.56
	29	309	19	40.35	0.61	309	19	21.14	20.81	21.49	1.56	8.96	18.62
Feb.	30	310	20	38.39	-0.54	310	20	19.25	20.81	-21.35	+1.62	+9.04	18.70
	31	311	21	35.41	0.43	311	21	16.27	20.80	21.21	1.62	9.11	18.77
	1	312	22	31.34	0.29	312	22	12.14	20.80	21.07	1.56	9.18	18.83
	2	313	23	26.05	-0.14	313	23	06.76	20.80	20.93	1.46	9.21	18.87
	3	314	24	19.46	0.00	314	24	00.07	20.79	20.80	1.36	9.22	18.87
	4	315	25	11.48	+0.11	315	24	52.02	20.79	20.66	1.29	9.20	18.85
	5	316	26	02.07	+0.25	316	25	42.60	20.79	-20.52	+1.27	+9.16	18.81
	6	317	26	51.16	0.32	317	26	31.74	20.78	20.38	1.32	9.12	18.77
	7	318	27	38.76	0.40	318	27	19.44	20.78	20.24	1.42	9.10	18.74
	8	319	28	24.84	0.43	319	28	05.66	20.78	20.10	1.55	9.09	18.74
	9	320	29	09.45	0.43	320	28	50.41	20.77	19.96	1.69	9.11	18.76
	10	321	29	52.53	0.40	321	29	33.61	20.77	19.82	1.81	9.16	18.80
	11	322	30	34.14	+0.32	322	30	15.30	20.77	-19.68	+1.89	+9.22	18.86
	12	323	31	14.32	0.25	323	30	55.51	20.76	19.54	1.90	9.29	18.93
	13	324	31	53.13	+0.14	324	31	34.28	20.76	19.40	1.87	9.36	19.00
	14	325	32	30.54	0.00	325	32	11.62	20.76	19.26	1.79	9.42	19.06
15	326	33	06.61	-0.11	326	32	47.58	20.75	-19.12	+1.67	+9.45	19.09	

*To obtain the geometric longitude referred to the mean equinox of J 2000.0, add -21' 22".421 and subtract precession from J 2025.5.

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Semi Diameter		Ephemeris Transit		
		h	m	s	°	'	"		'	"	h	m	s
Jan.	0	18	42	37.09	-23	04	37.56	0.983 3692	16	15.87	12	03	12.13
	1	18	47	02.21	22	59	53.78	0.983 3532	16	15.89	12	03	40.54
	2	18	51	27.02	22	54	42.46	0.983 3409	16	15.90	12	04	08.61
	3	18	55	51.46	22	49	03.74	0.983 3325	16	15.91	12	04	36.31
	4	19	00	15.50	22	42	57.80	0.983 3281	16	15.92	12	05	03.60
	5	19	04	39.11	22	36	24.81	0.983 3278	16	15.92	12	05	30.44
	6	19	09	02.27	-22	29	24.97	0.983 3320	16	15.91	12	05	56.81
	7	19	13	24.94	22	21	58.51	0.983 3410	16	15.90	12	06	22.68
	8	19	17	47.09	22	14	05.66	0.983 3551	16	15.89	12	06	48.02
	9	19	22	08.72	22	05	46.66	0.983 3746	16	15.87	12	07	12.81
	10	19	26	29.78	21	57	01.78	0.983 3999	16	15.84	12	07	37.03
	11	19	30	50.27	21	47	51.29	0.983 4312	16	15.81	12	08	00.65
	12	19	35	10.15	-21	38	15.46	0.983 4687	16	15.78	12	08	23.67
	13	19	39	29.42	21	28	14.57	0.983 5126	16	15.73	12	08	46.05
	14	19	43	48.05	21	17	48.90	0.983 5629	16	15.68	12	09	07.79
	15	19	48	06.02	21	06	58.71	0.983 6197	16	15.63	12	09	28.88
	16	19	52	23.33	20	55	44.29	0.983 6828	16	15.56	12	09	49.29
	17	19	56	39.95	20	44	05.93	0.983 7521	16	15.49	12	10	09.01
	18	20	00	55.88	-20	32	03.93	0.983 8274	16	15.42	12	10	28.04
	19	20	05	11.11	20	19	38.58	0.983 9085	16	15.34	12	10	46.35
	20	20	09	25.61	20	06	50.20	0.983 9951	16	15.25	12	11	03.94
	21	20	13	39.39	19	53	39.13	0.984 0870	16	15.16	12	11	20.80
	22	20	17	52.43	19	40	05.71	0.984 1840	16	15.07	12	11	36.90
	23	20	22	04.71	19	26	10.29	0.984 2858	16	14.97	12	11	52.25
	24	20	26	16.24	-19	11	53.22	0.984 3921	16	14.86	12	12	06.83
	25	20	30	27.00	18	57	14.88	0.984 5027	16	14.75	12	12	20.64
	26	20	34	36.99	18	42	15.65	0.984 6173	16	14.64	12	12	33.66
	27	20	38	46.18	18	26	55.92	0.984 7356	16	14.52	12	12	45.89
	28	20	42	54.58	18	11	16.09	0.984 8574	16	14.40	12	12	57.32
	29	20	47	02.17	17	55	16.57	0.984 9825	16	14.28	12	13	07.94
	30	20	51	08.95	-17	38	57.78	0.985 1108	16	14.15	12	13	17.74
	31	20	55	14.90	17	22	20.12	0.985 2421	16	14.02	12	13	26.72
Feb.	1	20	59	20.02	17	05	24.01	0.985 3764	16	13.89	12	13	34.87
	2	21	03	24.31	16	48	09.88	0.985 5140	16	13.75	12	13	42.19
	3	21	07	27.77	16	30	38.15	0.985 6548	16	13.61	12	13	48.67
	4	21	11	30.40	16	12	49.24	0.985 7992	16	13.47	12	13	54.33
	5	21	15	32.20	-15	54	43.59	0.985 9475	16	13.32	12	13	59.15
	6	21	19	33.18	15	36	21.63	0.986 0999	16	13.17	12	14	03.15
	7	21	23	33.34	15	17	43.78	0.986 2568	16	13.02	12	14	06.33
	8	21	27	32.69	14	58	50.49	0.986 4183	16	12.86	12	14	08.71
	9	21	31	31.23	14	39	42.16	0.986 5847	16	12.69	12	14	10.28
	10	21	35	28.98	14	20	19.20	0.986 7562	16	12.52	12	14	11.06
	11	21	39	25.94	-14	00	42.02	0.986 9329	16	12.35	12	14	11.07
	12	21	43	22.13	13	40	51.00	0.987 1147	16	12.17	12	14	10.32
	13	21	47	17.56	13	20	46.55	0.987 3018	16	11.99	12	14	08.81
	14	21	51	12.24	13	00	29.03	0.987 4940	16	11.80	12	14	06.57
	15	21	55	06.19	-12	39	58.84	0.987 6911	16	11.60	12	14	03.60

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date		Geometric Longitude* (Mean Equinox of date)			Latitude (Ecliptic of date)	Apparent Longitude (True equinox of date)			Aberra- tion	Prec. in Long. (J 2025.5 of date)	Nut. in Long.	Nut. in Obliquity	True Obliquity (23° 26')
		°	'	"	"	°	'	"	"	"	"	"	"
Feb.	15	326	33	06.61	-0.11	326	32	47.58	20.75	-19.12	+1.67	+9.45	19.09
	16	327	33	41.36	0.25	327	33	22.21	20.75	18.99	1.55	9.47	19.11
	17	328	34	14.81	0.40	328	33	55.55	20.74	18.85	1.44	9.47	19.11
	18	329	34	46.97	0.50	329	34	27.62	20.74	18.71	1.35	9.45	19.09
	19	330	35	17.84	0.61	330	34	58.44	20.73	18.57	1.29	9.43	19.06
	20	331	35	47.40	0.72	331	35	28.00	20.73	18.43	1.28	9.40	19.03
	21	332	36	15.66	-0.79	332	35	56.29	20.72	-18.29	+1.31	+9.37	19.00
	22	333	36	42.66	0.90	333	36	23.36	20.72	18.15	1.37	9.36	18.99
	23	334	37	08.20	1.19	334	36	49.00	20.71	18.01	1.46	9.36	18.99
	24	335	37	31.89	1.12	335	37	12.79	20.71	17.87	1.56	9.39	19.02
Mar.	25	336	37	54.63	0.79	336	37	35.62	20.70	17.73	1.65	9.44	19.07
	26	337	38	15.93	0.65	337	37	56.96	20.70	17.59	1.69	9.51	19.13
	27	338	38	35.67	-0.50	338	38	16.69	20.70	-17.45	+1.67	+9.58	19.21
	28	339	38	53.74	0.36	339	38	34.69	20.69	17.32	1.59	9.65	19.27
	1	340	39	10.06	0.22	340	38	50.89	20.69	17.18	1.47	9.69	19.31
	2	341	39	24.53	-0.04	341	39	05.22	20.68	17.04	1.32	9.70	19.32
	3	342	39	37.07	+0.11	342	39	17.64	20.68	16.90	1.20	9.67	19.29
	4	343	39	47.57	0.22	343	39	28.08	20.67	16.76	1.13	9.63	19.24
	5	344	39	55.99	+0.32	344	39	36.50	20.66	-16.62	+1.13	+9.57	19.19
	6	345	40	02.30	0.40	345	39	42.88	20.66	16.48	1.19	9.53	19.14
	7	346	40	06.41	0.43	346	39	47.09	20.65	16.34	1.29	9.51	19.12
	8	347	40	08.38	0.43	347	39	49.18	20.65	16.20	1.39	9.51	19.12
	9	348	40	08.18	0.40	348	39	49.07	20.64	16.06	1.48	9.54	19.15
	10	349	40	05.82	0.36	349	39	46.76	20.64	15.92	1.54	9.59	19.20
	11	350	40	01.35	+0.29	350	39	42.30	20.63	-15.78	+1.54	+9.64	19.25
	12	351	39	54.78	0.18	351	39	35.68	20.63	15.64	1.48	9.70	19.31
	13	352	39	46.16	+0.04	352	39	26.96	20.62	15.51	1.38	9.75	19.35
	14	353	39	35.56	-0.07	353	39	16.24	20.62	15.37	1.25	9.77	19.38
	15	354	39	23.00	0.22	354	39	03.53	20.61	15.23	1.10	9.78	19.39
	16	355	39	08.48	0.32	355	38	48.88	20.61	15.09	0.95	9.77	19.37
	17	356	38	52.08	-0.47	356	38	32.35	20.60	-14.95	+0.83	+9.74	19.34
	18	357	38	33.84	0.58	357	38	14.03	20.59	14.81	0.74	9.70	19.30
	19	358	38	13.79	0.65	358	37	53.94	20.59	14.67	0.69	9.66	19.26
	20	359	37	51.94	0.72	359	37	32.09	20.58	14.53	0.68	9.62	19.21
	21	0	37	28.32	0.76	0	37	08.51	20.58	14.39	0.71	9.58	19.18
	22	1	37	02.95	0.79	1	36	43.20	20.57	14.25	0.78	9.56	19.16
	23	2	36	35.83	-0.76	2	36	16.16	20.56	-14.11	+0.85	+9.57	19.16
	24	3	36	06.99	0.72	3	35	47.40	20.56	13.97	0.92	9.59	19.18
	25	4	35	36.38	0.65	4	35	16.84	20.55	13.84	0.96	9.63	19.22
	26	5	35	04.02	0.54	5	34	44.47	20.55	13.70	0.95	9.68	19.27
	27	6	34	29.88	0.43	6	34	10.27	20.54	13.56	0.89	9.74	19.32
	28	7	33	53.84	0.29	7	33	34.13	20.53	13.42	0.77	9.77	19.36
	29	8	33	15.94	-0.14	8	32	56.08	20.53	-13.28	+0.62	+9.78	19.36
	30	9	32	36.01	0.00	9	32	16.01	20.52	13.14	0.48	9.75	19.33
	31	10	31	53.98	+0.11	10	31	33.89	20.52	13.00	0.38	9.69	19.27
	1	11	31	09.82	0.22	11	30	49.72	20.51	12.86	0.36	9.62	19.20
	2	12	30	23.40	+0.32	12	30	03.35	20.51	-12.72	+0.40	+9.55	19.13

*To obtain the geometric longitude referred to the mean equinox of J 2000.0, add -21' 22".421 and subtract precession from J 2025.5.

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Semi Diameter		Ephemeris Transit		
		h	m	s	°	'	"		'	"	h	m	s
Feb.	15	21	55	06.19	-12	39	58.84	0.987 6911	16	11.60	12	14	03.60
	16	21	58	59.42	12	19	16.35	0.987 8931	16	11.41	12	13	59.93
	17	22	02	51.96	11	58	21.97	0.988 0997	16	11.20	12	13	55.57
	18	22	06	43.81	11	37	16.08	0.988 3106	16	11.00	12	13	50.53
	19	22	10	35.00	11	15	59.08	0.988 5256	16	10.78	12	13	44.83
	20	22	14	25.53	10	54	31.36	0.988 7444	16	10.57	12	13	38.48
	21	22	18	15.43	-10	32	53.35	0.988 9668	16	10.35	12	13	31.50
	22	22	22	04.71	10	11	05.47	0.989 1924	16	10.13	12	13	23.91
	23	22	25	53.38	9	49	08.32	0.989 4209	16	09.91	12	13	15.70
	24	22	29	41.42	9	27	01.95	0.989 6520	16	09.68	12	13	06.89
Mar.	25	22	33	28.90	9	04	46.55	0.989 8853	16	09.45	12	12	57.53
	26	22	37	15.82	8	42	23.07	0.990 1205	16	09.22	12	12	47.61
	27	22	41	02.19	-8	19	51.84	0.990 3574	16	08.99	12	12	37.15
	28	22	44	48.02	7	57	13.26	0.990 5956	16	08.76	12	12	26.16
	1	22	48	33.31	7	34	27.73	0.990 8350	16	08.52	12	12	14.65
	2	22	52	18.10	7	11	35.68	0.991 0756	16	08.29	12	12	02.63
	3	22	56	02.38	6	48	37.52	0.991 3175	16	08.05	12	11	50.12
	4	22	59	46.19	6	25	33.68	0.991 5606	16	07.81	12	11	37.14
	5	23	03	29.53	-6	02	24.57	0.991 8054	16	07.57	12	11	23.70
	6	23	07	12.43	5	39	10.61	0.992 0520	16	07.33	12	11	09.82
	7	23	10	54.90	5	15	52.20	0.992 3006	16	07.09	12	10	55.52
	8	23	14	36.96	4	52	29.75	0.992 5516	16	06.85	12	10	40.82
	9	23	18	18.62	4	29	03.64	0.992 8052	16	06.60	12	10	25.74
	10	23	21	59.92	4	05	34.23	0.993 0615	16	06.35	12	10	10.30
	11	23	25	40.87	-3	42	01.91	0.993 3208	16	06.10	12	09	54.53
	12	23	29	21.49	3	18	27.03	0.993 5829	16	05.84	12	09	38.44
	13	23	33	01.81	2	54	49.92	0.993 8481	16	05.58	12	09	22.07
	14	23	36	41.84	2	31	10.95	0.994 1163	16	05.32	12	09	05.43
	15	23	40	21.63	2	07	30.44	0.994 3874	16	05.06	12	08	48.55
	16	23	44	01.18	1	43	48.74	0.994 6614	16	04.80	12	08	31.46
	17	23	47	40.53	-1	20	06.18	0.994 9380	16	04.53	12	08	14.16
	18	23	51	19.69	0	56	23.11	0.995 2171	16	04.26	12	07	56.70
	19	23	54	58.70	0	32	39.88	0.995 4985	16	03.98	12	07	39.08
	20	23	58	37.57	0	08	56.82	0.995 7818	16	03.71	12	07	21.34
	21	0	02	16.33	-0	14	45.70	0.996 0670	16	03.43	12	07	03.49
	22	0	05	54.99	+0	38	27.35	0.996 3536	16	03.16	12	06	45.56
	23	0	09	33.58	+1	02	07.75	0.996 6413	16	02.88	12	06	27.57
	24	0	13	12.12	1	25	46.54	0.996 9298	16	02.60	12	06	09.53
	25	0	16	50.62	1	49	23.36	0.997 2187	16	02.32	12	05	51.47
	26	0	20	29.11	2	12	57.83	0.997 5076	16	02.04	12	05	33.41
	27	0	24	07.60	2	36	29.57	0.997 7962	16	01.76	12	05	15.36
	28	0	27	46.11	2	59	58.20	0.998 0841	16	01.49	12	04	57.34
Apr.	29	0	31	24.65	+3	23	23.35	0.998 3710	16	01.21	12	04	39.36
	30	0	35	03.25	3	46	44.62	0.998 6566	16	00.94	12	04	21.45
	31	0	38	41.92	4	10	01.65	0.998 9410	16	00.66	12	04	03.61
	1	0	42	20.67	4	33	14.05	0.999 2241	16	00.39	12	03	45.87
	2	0	45	59.53	+4	56	21.45	0.999 5061	16	00.12	12	03	28.23

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date	Geometric Longitude* (Mean Equinox of date)			Latitude (Ecliptic of date)	Apparent Longitude (True equinox of date)			Aberra- tion	Prec. in Long. (J 2025.5 of date)	Nut. in Long.	Nut. in Obliquity	True Obliquity (23° 26')	
	°	'	"	"	°	'	"	"	"	"	"	"	
Apr.	1	11	31	09.82	+0.22	11	30	49.72	20.51	-12.86	+0.36	+9.62	19.20
	2	12	30	23.40	0.32	12	30	03.35	20.51	12.72	0.40	9.55	19.13
	3	13	29	34.70	0.36	13	29	14.75	20.50	12.58	0.50	9.50	19.08
	4	14	28	43.67	0.36	14	28	23.84	20.49	12.44	0.62	9.47	19.05
	5	15	27	50.35	0.36	15	27	30.64	20.49	12.30	0.73	9.48	19.06
	6	16	26	54.66	0.29	16	26	35.02	20.48	12.16	0.80	9.51	19.08
	7	17	25	56.67	+0.22	17	25	37.06	20.48	-12.03	+0.81	+9.54	19.12
	8	18	24	56.40	+0.11	18	24	36.76	20.47	11.89	0.78	9.58	19.16
	9	19	23	53.91	0.00	19	23	34.19	20.47	11.75	0.69	9.61	19.18
	10	20	22	49.19	-0.11	20	22	29.35	20.46	11.61	0.58	9.63	19.20
	11	21	21	42.36	0.25	21	21	22.39	20.45	11.47	0.44	9.63	19.20
	12	22	20	33.41	0.40	22	20	13.31	20.45	11.33	0.30	9.60	19.17
	13	23	19	22.38	-0.50	23	19	02.17	20.44	-11.19	+0.19	+9.56	19.13
	14	24	18	09.42	0.61	24	17	49.13	20.44	11.05	0.10	9.51	19.07
	15	25	16	54.51	0.72	25	16	34.18	20.43	10.91	0.05	9.45	19.01
	16	26	15	37.72	0.79	26	15	17.39	20.43	10.77	0.05	9.39	18.95
	17	27	14	19.12	0.83	27	13	58.84	20.42	10.63	0.09	9.34	18.90
	18	28	12	58.73	0.86	28	12	38.52	20.41	10.49	0.16	9.30	18.86
	19	29	11	36.63	-0.86	29	11	16.51	20.41	-10.35	+0.25	+9.28	18.84
	20	30	10	12.87	0.83	30	09	52.85	20.40	10.22	0.34	9.28	18.84
	21	31	08	47.44	0.76	31	08	27.49	20.40	10.08	0.40	9.30	18.86
	22	32	07	20.39	0.68	32	07	00.48	20.39	9.94	0.43	9.34	18.89
	23	33	05	51.74	0.58	33	05	31.81	20.39	9.80	0.41	9.37	18.93
	24	34	04	21.52	0.43	34	04	01.52	20.38	9.66	0.34	9.40	18.96
	25	35	02	49.65	-0.29	35	02	29.54	20.37	-9.52	+0.22	+9.41	18.96
	26	36	01	16.17	0.18	36	00	55.94	20.37	9.38	0.10	9.38	18.93
	27	36	59	40.96	-0.04	36	59	20.65	20.36	9.24	+0.01	9.32	18.87
	28	37	58	04.04	+0.07	37	57	43.70	20.36	9.10	-0.02	9.24	18.79
	29	38	56	25.27	0.14	38	56	04.99	20.35	8.96	+0.03	9.16	18.70
	30	39	54	44.60	0.22	39	54	24.44	20.35	8.82	0.15	9.08	18.63
May	1	40	53	02.02	+0.25	40	52	42.02	20.34	-8.68	+0.31	+9.04	18.58
	2	41	51	17.42	0.22	41	50	57.59	20.34	8.55	0.46	9.03	18.57
	3	42	49	30.80	0.18	42	49	11.10	20.33	8.41	0.59	9.04	18.58
	4	43	47	42.18	0.11	43	47	22.56	20.33	8.27	0.66	9.07	18.61
	5	44	45	51.57	+0.04	44	45	31.97	20.32	8.13	0.68	9.10	18.64
	6	45	43	58.99	-0.07	45	43	39.36	20.32	7.99	0.64	9.13	18.67
	7	46	42	04.47	-0.22	46	41	44.77	20.31	-7.85	+0.57	+9.14	18.68
	8	47	40	08.07	0.32	47	39	48.28	20.31	7.71	0.47	9.14	18.67
	9	48	38	09.83	0.47	48	37	49.94	20.30	7.57	0.37	9.11	18.65
	10	49	36	09.82	0.58	49	35	49.85	20.30	7.43	0.28	9.07	18.60
	11	50	34	08.05	0.68	50	33	48.02	20.30	7.29	0.22	9.02	18.55
	12	51	32	04.66	0.79	51	31	44.62	20.29	7.15	0.21	8.95	18.48
	13	52	29	59.71	-0.86	52	29	39.70	20.29	-7.01	+0.23	+8.89	18.42
	14	53	27	53.20	0.90	53	27	33.26	20.28	6.87	0.30	8.83	18.36
	15	54	25	45.30	0.94	54	25	25.46	20.28	6.74	0.40	8.79	18.31
	16	55	23	35.97	0.94	55	23	16.26	20.27	6.60	0.52	8.76	18.29
	17	56	21	25.38	-0.90	56	21	05.80	20.27	-6.46	+0.64	+8.76	18.28

*To obtain the geometric longitude referred to the mean equinox of J 2000.0, add -21' 22".421 and subtract precession from J 2025.5.

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Semi Diameter		Ephemeris Transit		
		h	m	s	°	'	"		'	"	h	m	s
Apr.	1	0	42	20.67	+4	33	14.05	0.999 2241	16	00.39	12	03	45.87
	2	0	45	59.53	4	56	21.45	0.999 5061	16	00.12	12	03	28.23
	3	0	49	38.51	5	19	23.47	0.999 7871	15	59.85	12	03	10.71
	4	0	53	17.62	5	42	19.73	1.000 0674	15	59.58	12	02	53.33
	5	0	56	56.87	6	05	09.87	1.000 3473	15	59.31	12	02	36.11
	6	1	00	36.29	6	27	53.55	1.000 6269	15	59.04	12	02	19.06
	7	1	04	15.89	+6	50	30.43	1.000 9066	15	58.78	12	02	02.21
	8	1	07	55.70	7	13	00.16	1.001 1864	15	58.51	12	01	45.58
	9	1	11	35.72	7	35	22.43	1.001 4665	15	58.24	12	01	29.17
	10	1	15	15.99	7	57	36.92	1.001 7470	15	57.97	12	01	13.03
	11	1	18	56.52	8	19	43.31	1.002 0280	15	57.70	12	00	57.15
	12	1	22	37.33	8	41	41.30	1.002 3095	15	57.43	12	00	41.57
	13	1	26	18.45	+9	03	30.58	1.002 5914	15	57.16	12	00	26.30
	14	1	29	59.89	9	25	10.83	1.002 8736	15	56.89	12	00	11.36
	15	1	33	41.67	9	46	41.76	1.003 1562	15	56.63	11	59	56.77
	16	1	37	23.82	10	08	03.04	1.003 4388	15	56.36	11	59	42.55
	17	1	41	06.34	10	29	14.36	1.003 7215	15	56.09	11	59	28.71
	18	1	44	49.26	10	50	15.40	1.004 0038	15	55.82	11	59	15.27
	19	1	48	32.59	+11	11	05.83	1.004 2856	15	55.55	11	59	02.25
	20	1	52	16.35	11	31	45.34	1.004 5667	15	55.28	11	58	49.67
	21	1	56	00.54	11	52	13.58	1.004 8466	15	55.02	11	58	37.53
	22	1	59	45.19	12	12	30.21	1.005 1250	15	54.75	11	58	25.86
	23	2	03	30.30	12	32	34.90	1.005 4016	15	54.49	11	58	14.66
	24	2	07	15.89	12	52	27.29	1.005 6760	15	54.23	11	58	03.94
	25	2	11	01.97	+13	12	07.04	1.005 9477	15	53.97	11	57	53.71
	26	2	14	48.54	13	31	33.79	1.006 2164	15	53.72	11	57	43.99
	27	2	18	35.62	13	50	47.20	1.006 4818	15	53.46	11	57	34.78
	28	2	22	23.22	14	09	46.93	1.006 7436	15	53.22	11	57	26.08
	29	2	26	11.33	14	28	32.64	1.007 0017	15	52.97	11	57	17.89
	30	2	29	59.97	14	47	03.96	1.007 2563	15	52.73	11	57	10.22
May	1	2	33	49.12	+15	05	20.57	1.007 5072	15	52.49	11	57	03.07
	2	2	37	38.80	15	23	22.12	1.007 7549	15	52.26	11	56	56.45
	3	2	41	29.01	15	41	08.27	1.007 9994	15	52.03	11	56	50.35
	4	2	45	19.74	15	58	38.69	1.008 2411	15	51.80	11	56	44.79
	5	2	49	11.00	16	15	53.09	1.008 4802	15	51.58	11	56	39.77
	6	2	53	02.81	16	32	51.14	1.008 7169	15	51.35	11	56	35.30
	7	2	56	55.16	+16	49	32.56	1.008 9514	15	51.13	11	56	31.37
	8	3	00	48.05	17	05	57.07	1.009 1838	15	50.91	11	56	27.99
	9	3	04	41.51	17	22	04.38	1.009 4143	15	50.69	11	56	25.17
	10	3	08	35.52	17	37	54.21	1.009 6429	15	50.48	11	56	22.92
	11	3	12	30.10	17	53	26.30	1.009 8698	15	50.27	11	56	21.23
	12	3	16	25.25	18	08	40.39	1.010 0949	15	50.05	11	56	20.11
	13	3	20	20.98	+18	23	36.19	1.010 3183	15	49.84	11	56	19.56
	14	3	24	17.27	18	38	13.45	1.010 5399	15	49.64	11	56	19.58
	15	3	28	14.15	18	52	31.91	1.010 7595	15	49.43	11	56	20.18
	16	3	32	11.59	19	06	31.30	1.010 9772	15	49.22	11	56	21.35
	17	3	36	09.61	+19	20	11.35	1.011 1927	15	49.02	11	56	23.09

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date		Geometric Longitude* (Mean Equinox of date)			Latitude (Ecliptic of date)	Apparent Longitude (True equinox of date)			Aberra- tion	Prec. in Long. (J 2025.5 of date)	Nut. in Long.	Nut. in Obliquity	True Obliquity (23° 26')
		°	'	"	"	°	'	"	"	"	"	"	"
May	17	56	21	25.38	-0.90	56	21	05.80	20.27	-6.46	+0.64	+8.76	18.28
	18	57	19	13.54	0.83	57	18	54.07	20.26	6.32	0.75	8.77	18.30
	19	58	17	00.55	0.76	58	16	41.16	20.26	6.18	0.83	8.80	18.32
	20	59	14	46.42	0.65	59	14	27.06	20.26	6.04	0.85	8.84	18.36
	21	60	12	31.26	0.54	60	12	11.88	20.25	5.90	0.83	8.87	18.39
	22	61	10	15.02	0.40	61	09	55.58	20.25	5.76	0.76	8.89	18.40
	23	62	07	57.76	-0.25	62	07	38.24	20.24	-5.62	+0.68	+8.88	18.39
	24	63	05	39.52	0.14	63	05	19.93	20.24	5.48	0.61	8.83	18.35
	25	64	03	20.22	-0.04	64	03	00.61	20.24	5.34	0.58	8.76	18.28
	26	65	00	59.88	+0.07	65	00	40.32	20.23	5.20	0.63	8.68	18.19
	27	65	58	38.37	0.14	65	58	18.95	20.23	5.06	0.76	8.61	18.12
	28	66	56	15.73	0.18	66	55	56.50	20.23	4.93	0.95	8.55	18.06
	29	67	53	51.85	+0.18	67	53	32.82	20.22	-4.79	+1.15	+8.53	18.04
	30	68	51	26.69	0.14	68	51	07.85	20.22	4.65	1.34	8.54	18.05
	31	69	49	00.21	+0.07	69	48	41.51	20.22	4.51	1.47	8.58	18.08
June	1	70	46	32.42	0.00	70	46	13.80	20.21	4.37	1.55	8.62	18.12
	2	71	44	03.33	-0.11	71	43	44.72	20.21	4.23	1.56	8.66	18.16
	3	72	41	32.95	0.22	72	41	14.32	20.21	4.09	1.53	8.68	18.18
	4	73	39	01.30	-0.32	73	38	42.61	20.20	-3.95	+1.47	+8.69	18.19
	5	74	36	28.41	0.47	74	36	09.65	20.20	3.81	1.40	8.68	18.18
	6	75	33	54.35	0.58	75	33	35.53	20.20	3.67	1.34	8.65	18.15
	7	76	31	19.15	0.68	76	31	00.30	20.20	3.53	1.30	8.61	18.11
	8	77	28	42.87	0.76	77	28	24.02	20.19	3.39	1.30	8.56	18.05
	9	78	26	05.62	0.83	78	25	46.81	20.19	3.25	1.34	8.50	18.00
	10	79	23	27.42	-0.90	79	23	08.70	20.19	-3.12	+1.43	+8.46	17.95
	11	80	20	48.35	0.90	80	20	29.76	20.19	2.98	1.55	8.42	17.91
	12	81	18	08.51	0.90	81	17	50.06	20.19	2.84	1.70	8.40	17.89
	13	82	15	28.01	0.86	82	15	09.72	20.18	2.70	1.85	8.40	17.89
	14	83	12	46.84	0.83	83	12	28.69	20.18	2.56	1.98	8.43	17.91
	15	84	10	05.21	0.72	84	09	47.16	20.18	2.42	2.09	8.47	17.95
16	85	07	23.11	-0.61	85	07	05.12	20.18	-2.28	+2.15	+8.52	18.00	
17	86	04	40.63	0.50	86	04	22.66	20.18	2.14	2.15	8.56	18.05	
18	87	01	57.84	0.40	87	01	39.83	20.17	2.00	2.12	8.60	18.08	
19	87	59	14.82	0.25	87	58	56.75	20.17	1.86	2.05	8.60	18.08	
20	88	56	31.59	-0.11	88	56	13.45	20.17	1.72	1.99	8.59	18.06	
21	89	53	48.17	0.00	89	53	30.01	20.17	1.58	1.96	8.54	18.02	
22	90	51	04.59	+0.11	90	50	46.46	20.17	-1.44	+2.00	+8.48	17.95	
23	91	48	20.86	0.18	91	48	02.84	20.17	1.31	2.10	8.42	17.89	
24	92	45	36.89	0.22	92	45	19.04	20.17	1.17	2.28	8.37	17.84	
25	93	42	52.66	0.22	93	42	35.03	20.16	1.03	2.49	8.35	17.82	
26	94	40	08.18	0.18	94	39	50.76	20.16	0.89	2.70	8.36	17.83	
27	95	37	23.35	0.14	95	37	06.10	20.16	0.75	2.87	8.40	17.87	
28	96	34	38.14	+0.07	96	34	21.00	20.16	-0.61	+2.98	+8.46	17.93	
29	97	31	52.53	-0.04	97	31	35.44	20.16	0.47	3.02	8.52	17.99	
30	98	29	06.54	0.14	98	28	49.44	20.16	0.33	3.01	8.57	18.03	
July	1	99	26	20.13	0.25	99	26	02.98	20.16	0.19	2.97	8.60	18.07
	2	100	23	33.30	-0.40	100	23	16.08	20.16	-0.05	+2.90	+8.61	18.08

*To obtain the geometric longitude referred to the mean equinox of J 2000.0, add -21' 22".421 and subtract precession from J 2025.5.

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Semi Diameter		Ephemeris Transit		
		h	m	s	°	'	"		'	"	h	m	s
May	17	3	36	09.61	+19	20	11.35	1.011 1927	15	49.02	11	56	23.09
	18	3	40	08.20	19	33	31.80	1.011 4057	15	48.82	11	56	25.40
	19	3	44	07.36	19	46	32.37	1.011 6161	15	48.63	11	56	28.28
	20	3	48	07.08	19	59	12.80	1.011 8236	15	48.43	11	56	31.72
	21	3	52	07.35	20	11	32.82	1.012 0278	15	48.24	11	56	35.72
	22	3	56	08.18	20	23	32.15	1.012 2283	15	48.05	11	56	40.26
	23	4	00	09.55	+20	35	10.55	1.012 4247	15	47.87	11	56	45.35
	24	4	04	11.46	20	46	27.75	1.012 6167	15	47.69	11	56	50.97
	25	4	08	13.89	20	57	23.50	1.012 8040	15	47.51	11	56	57.10
	26	4	12	16.83	21	07	57.58	1.012 9861	15	47.34	11	57	03.73
June	27	4	16	20.27	21	18	09.75	1.013 1629	15	47.18	11	57	10.85
	28	4	20	24.19	21	27	59.80	1.013 3343	15	47.02	11	57	18.42
	29	4	24	28.55	+21	37	27.49	1.013 5002	15	46.86	11	57	26.44
	30	4	28	33.35	21	46	32.62	1.013 6609	15	46.71	11	57	34.88
	31	4	32	38.56	21	55	14.98	1.013 8165	15	46.57	11	57	43.73
	1	4	36	44.16	22	03	34.36	1.013 9672	15	46.43	11	57	52.96
	2	4	40	50.14	22	11	30.59	1.014 1133	15	46.29	11	58	02.56
	3	4	44	56.47	22	19	03.51	1.014 2550	15	46.16	11	58	12.52
	4	4	49	03.14	+22	26	12.94	1.014 3926	15	46.03	11	58	22.80
	5	4	53	10.14	22	32	58.77	1.014 5262	15	45.90	11	58	33.40
July	6	4	57	17.44	22	39	20.85	1.014 6561	15	45.78	11	58	44.30
	7	5	01	25.04	22	45	19.06	1.014 7825	15	45.67	11	58	55.48
	8	5	05	32.91	22	50	53.30	1.014 9054	15	45.55	11	59	06.93
	9	5	09	41.03	22	56	03.46	1.015 0250	15	45.44	11	59	18.62
	10	5	13	49.40	+23	00	49.44	1.015 1414	15	45.33	11	59	30.54
	11	5	17	57.99	23	05	11.16	1.015 2546	15	45.23	11	59	42.67
	12	5	22	06.77	23	09	08.54	1.015 3647	15	45.12	11	59	54.99
	13	5	26	15.75	23	12	41.49	1.015 4717	15	45.02	12	00	07.48
	14	5	30	24.88	23	15	49.94	1.015 5755	15	44.93	12	00	20.13
	15	5	34	34.15	23	18	33.83	1.015 6759	15	44.83	12	00	32.91
	16	5	38	43.55	+23	20	53.08	1.015 7729	15	44.74	12	00	45.80
	17	5	42	53.05	23	22	47.62	1.015 8661	15	44.66	12	00	58.79
	18	5	47	02.63	23	24	17.42	1.015 9554	15	44.57	12	01	11.86
	19	5	51	12.28	23	25	22.41	1.016 0403	15	44.49	12	01	24.98
	20	5	55	21.96	23	26	02.56	1.016 1206	15	44.42	12	01	38.12
	21	5	59	31.66	23	26	17.86	1.016 1959	15	44.35	12	01	51.27
	22	6	03	41.36	+23	26	08.30	1.016 2658	15	44.29	12	02	04.40
	23	6	07	51.03	23	25	33.89	1.016 3300	15	44.23	12	02	17.48
	24	6	12	00.63	23	24	34.68	1.016 3882	15	44.17	12	02	30.48
	25	6	16	10.15	23	23	10.70	1.016 4402	15	44.12	12	02	43.37
	26	6	20	19.55	23	21	22.00	1.016 4860	15	44.08	12	02	56.13
	27	6	24	28.79	23	19	08.63	1.016 5256	15	44.04	12	03	08.72
	28	6	28	37.85	+23	16	30.65	1.016 5590	15	44.01	12	03	21.12
	29	6	32	46.70	23	13	28.14	1.016 5866	15	43.99	12	03	33.29
	30	6	36	55.31	23	10	01.17	1.016 6084	15	43.97	12	03	45.23
	1	6	41	03.66	23	06	09.85	1.016 6248	15	43.95	12	03	56.90
	2	6	45	11.74	+23	01	54.28	1.016 6359	15	43.94	12	04	08.27

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Date		Geometric Longitude* (Mean Equinox of date)			Latitude (Ecliptic of date)	Apparent Longitude (True equinox of date)			Aberra- tion	Prec. in Long. (J 2025.5 of date)	Nut. in Long.	Nut. in Obliquity	True Obliquity (23° 26')
		°	'	"	"	°	'	"	"	"	"	"	"
July	1	99	26	20.13	-0.25	99	26	02.98	20.16	-0.19	+2.97	+8.60	18.07
	2	100	23	33.30	0.40	100	23	16.08	20.16	-0.05	2.90	8.61	18.08
	3	101	20	46.14	0.50	101	20	28.86	20.16	+0.09	2.84	8.61	18.07
	4	102	17	58.64	0.61	102	17	41.32	20.16	0.23	2.79	8.58	18.04
	5	103	15	10.82	0.68	103	14	53.48	20.16	0.37	2.78	8.55	18.01
	6	104	12	22.81	0.76	104	12	05.51	20.16	0.50	2.81	8.51	17.97
	7	105	09	34.59	-0.83	105	09	17.35	20.16	+0.64	+2.88	+8.47	17.93
	8	106	06	46.21	0.83	106	06	29.09	20.16	0.78	2.99	8.45	17.90
	9	107	03	57.81	0.83	107	03	40.82	20.16	0.92	3.13	8.44	17.90
	10	108	01	09.44	0.79	108	00	52.60	20.16	1.06	3.28	8.45	17.91
	11	108	58	21.18	0.76	108	58	04.48	20.16	1.20	3.42	8.49	17.94
	12	109	55	33.09	0.65	109	55	16.50	20.16	1.34	3.52	8.54	17.99
	13	110	52	45.31	-0.54	110	52	28.78	20.16	+1.48	+3.59	+8.61	18.06
	14	111	49	57.90	0.43	111	49	41.38	20.16	1.62	3.60	8.67	18.12
	15	112	47	10.94	0.29	112	46	54.37	20.16	1.76	3.56	8.72	18.17
	16	113	44	24.55	0.18	113	44	07.91	20.17	1.90	3.48	8.75	18.20
	17	114	41	38.78	-0.04	114	41	22.06	20.17	2.04	3.40	8.75	18.20
	18	115	38	53.70	+0.07	115	38	36.92	20.17	2.18	3.35	8.73	18.17
	19	116	36	09.33	+0.18	116	35	52.55	20.17	+2.31	+3.35	+8.69	18.13
	20	117	33	25.72	0.25	117	33	09.00	20.17	2.45	3.41	8.64	18.08
	21	118	30	42.83	0.32	118	30	26.24	20.17	2.59	3.54	8.60	18.04
	22	119	28	00.73	0.32	119	27	44.32	20.17	2.73	3.71	8.59	18.02
	23	120	25	19.34	0.32	120	25	03.11	20.17	2.87	3.89	8.60	18.04
	24	121	22	38.66	0.25	121	22	22.58	20.18	3.01	4.06	8.65	18.08
	25	122	19	58.60	+0.18	122	19	42.64	20.18	+3.15	+4.17	+8.71	18.15
	26	123	17	19.19	+0.11	123	17	03.26	20.18	3.29	4.21	8.78	18.22
	27	124	14	40.33	-0.04	124	14	24.40	20.18	3.43	4.20	8.85	18.28
	28	125	12	02.07	0.14	125	11	46.07	20.18	3.57	4.14	8.90	18.33
	29	126	09	24.30	0.25	126	09	08.21	20.19	3.71	4.05	8.93	18.36
	30	127	06	47.12	0.40	127	06	30.92	20.19	3.85	3.95	8.94	18.37
Aug.	31	128	04	10.45	-0.50	128	03	54.18	20.19	+3.99	+3.87	+8.93	18.36
	1	129	01	34.34	0.58	129	01	18.01	20.19	4.13	3.82	8.91	18.34
	2	129	58	58.80	0.68	129	58	42.46	20.20	4.26	3.81	8.88	18.31
	3	130	56	23.90	0.72	130	56	07.58	20.20	4.40	3.84	8.85	18.28
	4	131	53	49.61	0.76	131	53	33.36	20.20	4.54	3.90	8.83	18.26
	5	132	51	16.05	0.76	132	50	59.89	20.20	4.68	4.00	8.83	18.25
	6	133	48	43.23	-0.72	133	48	27.18	20.21	+4.82	+4.12	+8.84	18.26
	7	134	46	11.20	0.65	134	45	55.26	20.21	4.96	4.23	8.88	18.30
	8	135	43	40.05	0.58	135	43	24.20	20.21	5.10	4.32	8.94	18.35
	9	136	41	09.85	0.47	136	40	54.05	20.22	5.24	4.37	9.00	18.42
	10	137	38	40.72	0.36	137	38	24.90	20.22	5.38	4.36	9.08	18.49
	11	138	36	12.71	0.22	138	35	56.83	20.22	5.52	4.30	9.14	18.55
	12	139	33	45.94	-0.07	139	33	29.95	20.23	+5.66	+4.19	+9.18	18.59
	13	140	31	20.51	+0.07	140	31	04.40	20.23	5.80	4.08	9.19	18.60
	14	141	28	56.47	0.18	141	28	40.26	20.23	5.94	3.98	9.18	18.59
	15	142	26	33.89	0.29	142	26	17.63	20.24	6.07	3.93	9.14	18.55
16	143	24	12.87	+0.40	143	23	56.62	20.24	+6.21	+3.94	+9.10	18.50	

*To obtain the geometric longitude referred to the mean equinox of J 2000.0, add -21' 22".421 and subtract precession from J 2025.5.

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Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Semi Diameter		Ephemeris Transit		
		h	m	s	°	'	"		'	"	h	m	s
July	1	6	41	03.66	+23	06	09.85	1.016 6248	15	43.95	12	03	56.90
	2	6	45	11.74	23	01	54.28	1.016 6359	15	43.94	12	04	08.27
	3	6	49	19.51	22	57	14.58	1.016 6422	15	43.94	12	04	19.34
	4	6	53	26.97	22	52	10.88	1.016 6437	15	43.93	12	04	30.08
	5	6	57	34.09	22	46	43.33	1.016 6407	15	43.94	12	04	40.46
	6	7	01	40.85	22	40	52.06	1.016 6335	15	43.94	12	04	50.48
	7	7	05	47.24	+22	34	37.25	1.016 6222	15	43.95	12	05	00.12
	8	7	09	53.24	22	27	59.03	1.016 6071	15	43.97	12	05	09.36
	9	7	13	58.84	22	20	57.59	1.016 5883	15	43.99	12	05	18.18
	10	7	18	04.01	22	13	33.10	1.016 5659	15	44.01	12	05	26.57
	11	7	22	08.75	22	05	45.72	1.016 5401	15	44.03	12	05	34.52
	12	7	26	13.04	21	57	35.62	1.016 5109	15	44.06	12	05	42.02
	13	7	30	16.87	+21	49	02.99	1.016 4784	15	44.09	12	05	49.06
	14	7	34	20.23	21	40	07.99	1.016 4423	15	44.12	12	05	55.62
	15	7	38	23.11	21	30	50.79	1.016 4027	15	44.16	12	06	01.70
	16	7	42	25.49	21	21	11.59	1.016 3593	15	44.20	12	06	07.29
	17	7	46	27.38	21	11	10.56	1.016 3119	15	44.24	12	06	12.37
	18	7	50	28.76	21	00	47.91	1.016 2602	15	44.29	12	06	16.93
	19	7	54	29.62	+20	50	03.85	1.016 2038	15	44.34	12	06	20.98
	20	7	58	29.96	20	38	58.62	1.016 1425	15	44.40	12	06	24.49
	21	8	02	29.77	20	27	32.46	1.016 0759	15	44.46	12	06	27.46
	22	8	06	29.03	20	15	45.63	1.016 0036	15	44.53	12	06	29.87
	23	8	10	27.72	20	03	38.40	1.015 9256	15	44.60	12	06	31.71
	24	8	14	25.84	19	51	11.05	1.015 8416	15	44.68	12	06	32.97
	25	8	18	23.37	+19	38	23.84	1.015 7517	15	44.76	12	06	33.63
	26	8	22	20.30	19	25	17.07	1.015 6557	15	44.85	12	06	33.70
	27	8	26	16.62	19	11	50.99	1.015 5539	15	44.95	12	06	33.16
	28	8	30	12.33	18	58	05.91	1.015 4464	15	45.05	12	06	32.00
	29	8	34	07.41	18	44	02.10	1.015 3335	15	45.15	12	06	30.23
	30	8	38	01.88	18	29	39.86	1.015 2153	15	45.26	12	06	27.82
Aug.	31	8	41	55.72	+18	14	59.48	1.015 0921	15	45.38	12	06	24.80
	1	8	45	48.93	18	00	01.27	1.014 9643	15	45.50	12	06	21.15
	2	8	49	41.52	17	44	45.51	1.014 8320	15	45.62	12	06	16.87
	3	8	53	33.49	17	29	12.52	1.014 6955	15	45.75	12	06	11.97
	4	8	57	24.84	17	13	22.59	1.014 5551	15	45.88	12	06	06.45
	5	9	01	15.58	16	57	16.03	1.014 4111	15	46.01	12	06	00.31
	6	9	05	05.70	+16	40	53.14	1.014 2638	15	46.15	12	05	53.56
	7	9	08	55.22	16	24	14.22	1.014 1133	15	46.29	12	05	46.22
	8	9	12	44.13	16	07	19.56	1.013 9599	15	46.43	12	05	38.27
	9	9	16	32.45	15	50	09.45	1.013 8038	15	46.58	12	05	29.74
	10	9	20	20.19	15	32	44.17	1.013 6451	15	46.73	12	05	20.63
	11	9	24	07.35	15	15	03.99	1.013 4839	15	46.88	12	05	10.96
	12	9	27	53.95	+14	57	09.18	1.013 3202	15	47.03	12	05	00.73
	13	9	31	40.00	14	39	00.01	1.013 1538	15	47.19	12	04	49.96
	14	9	35	25.51	14	20	36.76	1.012 9846	15	47.34	12	04	38.67
	15	9	39	10.51	14	01	59.70	1.012 8124	15	47.51	12	04	26.85
	16	9	42	54.99	+13	43	09.13	1.012 6369	15	47.67	12	04	14.53

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Date	Geometric Longitude* (Mean Equinox of date)			Latitude (Ecliptic of date)	Apparent Longitude (True equinox of date)			Aberra- tion	Prec. in Long. (J 2025.5 of date)	Nut. in Long.	Nut. in Obliquity	True Obliquity (23° 26')
	°	'	"	"	°	'	"	"	"	"	"	"
Aug. 16	143	24	12.87	+0.40	143	23	56.62	20.24	+6.21	+3.94	+9.10	18.50
17	144	21	53.44	0.43	144	21	37.26	20.24	6.35	4.01	9.06	18.46
18	145	19	35.59	0.47	145	19	19.52	20.25	6.49	4.14	9.04	18.44
19	146	17	19.30	0.47	146	17	03.37	20.25	6.63	4.28	9.05	18.45
20	147	15	04.65	0.40	147	14	48.84	20.25	6.77	4.40	9.09	18.49
21	148	12	51.51	0.32	148	12	35.78	20.26	6.91	4.49	9.15	18.55
22	149	10	39.91	+0.25	149	10	24.20	20.26	+7.05	+4.52	+9.22	18.61
23	150	08	29.77	+0.14	150	08	14.03	20.27	7.19	4.48	9.28	18.68
24	151	06	21.09	0.00	151	06	05.26	20.27	7.33	4.39	9.34	18.74
25	152	04	13.81	-0.11	152	03	57.85	20.28	7.47	4.27	9.38	18.77
26	153	02	07.94	0.25	153	01	51.85	20.28	7.61	4.14	9.39	18.78
27	154	00	03.40	-0.36	153	59	47.18	20.28	7.75	4.02	9.39	18.78
28	154	58	00.21	-0.47	154	57	43.88	20.29	+7.88	+3.92	+9.36	18.75
29	155	55	58.34	0.54	155	55	41.95	20.29	8.02	3.86	9.33	18.72
30	156	53	57.77	0.61	156	53	41.35	20.30	8.16	3.83	9.30	18.69
31	157	51	58.60	0.65	157	51	42.19	20.30	8.30	3.85	9.27	18.66
Sept. 1	158	50	00.72	0.65	158	49	44.36	20.31	8.44	3.90	9.25	18.64
2	159	48	04.23	0.65	159	47	47.94	20.31	8.58	3.98	9.25	18.64
3	160	46	09.10	-0.58	160	45	52.88	20.32	+8.72	+4.06	+9.28	18.66
4	161	44	15.42	0.50	161	43	59.27	20.32	8.86	4.12	9.32	18.70
5	162	42	23.22	0.40	162	42	07.09	20.33	9.00	4.15	9.37	18.75
6	163	40	32.54	0.29	163	40	16.39	20.33	9.14	4.14	9.44	18.82
7	164	38	43.47	-0.14	164	38	27.24	20.34	9.28	4.06	9.50	18.88
8	165	36	56.10	0.00	165	36	39.74	20.34	9.42	3.94	9.54	18.92
9	166	35	10.48	+0.14	166	34	53.98	20.35	+9.56	+3.79	+9.56	18.93
10	167	33	26.73	0.25	167	33	10.08	20.35	9.70	3.66	9.54	18.91
11	168	31	44.92	0.40	168	31	28.16	20.36	9.83	3.56	9.49	18.87
12	169	30	05.16	0.47	169	29	48.37	20.36	9.97	3.53	9.44	18.81
13	170	28	27.50	0.54	170	28	10.74	20.37	10.11	3.57	9.38	18.75
14	171	26	51.94	0.58	171	26	35.27	20.37	10.25	3.66	9.35	18.71
15	172	25	18.59	+0.58	172	25	02.03	20.38	+10.39	+3.77	+9.34	18.70
16	173	23	47.37	0.54	173	23	30.91	20.38	10.53	3.88	9.36	18.72
17	174	22	18.35	0.47	174	22	01.96	20.39	10.67	3.95	9.40	18.76
18	175	20	51.44	0.40	175	20	35.05	20.39	10.81	3.96	9.45	18.81
19	176	19	26.67	0.29	176	19	10.24	20.40	10.95	3.92	9.50	18.87
20	177	18	03.93	0.14	177	17	47.40	20.41	11.09	3.83	9.55	18.91
21	178	16	43.25	+0.04	178	16	26.58	20.41	+11.23	+3.70	+9.58	18.94
22	179	15	24.53	-0.11	179	15	07.70	20.42	11.37	3.55	9.58	18.94
23	180	14	07.79	0.22	180	13	50.81	20.42	11.51	3.40	9.57	18.93
24	181	12	52.93	0.32	181	12	35.82	20.43	11.65	3.27	9.54	18.89
25	182	11	39.91	0.43	182	11	22.70	20.43	11.78	3.18	9.49	18.85
26	183	10	28.72	-0.50	183	10	11.46	20.44	11.92	3.13	9.44	18.79
27	184	09	19.33	-0.54	184	09	02.05	20.45	+12.06	+3.13	+9.40	18.75
28	185	08	11.73	0.58	185	07	54.48	20.45	12.20	3.15	9.36	18.71
29	186	07	05.88	0.54	186	06	48.67	20.46	12.34	3.21	9.34	18.69
30	187	06	01.74	0.50	187	05	44.59	20.46	12.48	3.27	9.33	18.68
Oct. 1	188	04	59.37	-0.47	188	04	42.28	20.47	+12.62	+3.33	+9.35	18.70

*To obtain the geometric longitude referred to the mean equinox of J 2000.0, add -21' 22".421 and subtract precession from J 2025.5.

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Semi Diameter		Ephemeris Transit		
		h	m	s	°	'	"		'	"	h	m	s
Aug.	16	9	42	54.99	+13	43	09.13	1.012 6369	15	47.67	12	04	14.53
	17	9	46	38.98	13	24	05.37	1.012 4578	15	47.84	12	04	01.71
	18	9	50	22.48	13	04	48.73	1.012 2748	15	48.01	12	03	48.40
	19	9	54	05.50	12	45	19.55	1.012 0876	15	48.18	12	03	34.62
	20	9	57	48.04	12	25	38.16	1.011 8961	15	48.36	12	03	20.37
	21	10	01	30.11	12	05	44.91	1.011 6999	15	48.55	12	03	05.66
	22	10	05	11.73	+11	45	40.14	1.011 4990	15	48.74	12	02	50.49
	23	10	08	52.90	11	25	24.18	1.011 2934	15	48.93	12	02	34.89
	24	10	12	33.62	11	04	57.38	1.011 0832	15	49.13	12	02	18.85
	25	10	16	13.92	10	44	20.07	1.010 8683	15	49.33	12	02	02.39
	26	10	19	53.80	10	23	32.58	1.010 6490	15	49.53	12	01	45.52
	27	10	23	33.27	10	02	35.27	1.010 4255	15	49.74	12	01	28.25
	28	10	27	12.36	+9	41	28.46	1.010 1980	15	49.96	12	01	10.61
	29	10	30	51.07	9	20	12.49	1.009 9668	15	50.17	12	00	52.59
Sept.	30	10	34	29.42	8	58	47.70	1.009 7321	15	50.40	12	00	34.22
	31	10	38	07.43	8	37	14.42	1.009 4943	15	50.62	12	00	15.50
	1	10	41	45.11	8	15	32.99	1.009 2535	15	50.85	11	59	56.47
	2	10	45	22.48	7	53	43.73	1.009 0102	15	51.08	11	59	37.14
	3	10	48	59.56	+7	31	46.98	1.008 7646	15	51.31	11	59	17.51
	4	10	52	36.35	7	09	43.05	1.008 5171	15	51.54	11	58	57.62
	5	10	56	12.88	6	47	32.27	1.008 2679	15	51.78	11	58	37.48
	6	10	59	49.18	6	25	14.93	1.008 0175	15	52.01	11	58	17.11
	7	11	03	25.25	6	02	51.35	1.007 7659	15	52.25	11	57	56.54
	8	11	07	01.13	5	40	21.81	1.007 5135	15	52.49	11	57	35.79
	9	11	10	36.83	+5	17	46.59	1.007 2604	15	52.73	11	57	14.87
	10	11	14	12.38	4	55	05.97	1.007 0065	15	52.97	11	56	53.82
	11	11	17	47.82	4	32	20.22	1.006 7519	15	53.21	11	56	32.65
	12	11	21	23.15	4	09	29.64	1.006 4963	15	53.45	11	56	11.39
	13	11	24	58.41	3	46	34.52	1.006 2396	15	53.69	11	55	50.07
	14	11	28	33.61	3	23	35.21	1.005 9815	15	53.94	11	55	28.69
	15	11	32	08.77	+3	00	32.01	1.005 7218	15	54.19	11	55	07.29
	16	11	35	43.92	2	37	25.30	1.005 4601	15	54.43	11	54	45.87
	17	11	39	19.06	2	14	15.40	1.005 1962	15	54.68	11	54	24.46
	18	11	42	54.21	1	51	02.69	1.004 9299	15	54.94	11	54	03.08
	19	11	46	29.40	1	27	47.51	1.004 6611	15	55.19	11	53	41.74
	20	11	50	04.63	1	04	30.23	1.004 3898	15	55.45	11	53	20.47
	21	11	53	39.93	+0	41	11.20	1.004 1158	15	55.71	11	52	59.27
	22	11	57	15.32	+0	17	50.78	1.003 8393	15	55.97	11	52	38.16
	23	12	00	50.81	-0	05	30.67	1.003 5602	15	56.24	11	52	17.17
	24	12	04	26.42	0	28	52.79	1.003 2788	15	56.51	11	51	56.30
	25	12	08	02.18	0	52	15.22	1.002 9952	15	56.78	11	51	35.59
	26	12	11	38.09	1	15	37.59	1.002 7096	15	57.05	11	51	15.04
	27	12	15	14.18	-1	38	59.55	1.002 4224	15	57.33	11	50	54.67
	28	12	18	50.47	2	02	20.74	1.002 1336	15	57.60	11	50	34.51
	29	12	22	26.97	2	25	40.79	1.001 8436	15	57.88	11	50	14.57
	30	12	26	03.71	2	48	59.35	1.001 5528	15	58.16	11	49	54.87
Oct.	1	12	29	40.69	-3	12	16.05	1.001 2614	15	58.44	11	49	35.43

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date		Geometric Longitude* (Mean Equinox of date)			Latitude (Ecliptic of date)	Apparent Longitude (True equinox of date)			Aberra- tion	Prec. in Long. (J 2025.5 of date)	Nut. in Long.	Nut. in Obliquity	True Obliquity (23° 26')
		°	'	"	"	°	'	"	"	"	"	"	"
Oct.	1	188	04	59.37	-0.47	188	04	42.28	20.47	+12.62	+3.33	+9.35	18.70
	2	189	03	58.75	0.36	189	03	41.69	20.48	12.76	3.37	9.39	18.73
	3	190	02	59.86	0.25	190	02	42.79	20.48	12.90	3.36	9.43	18.77
	4	191	02	02.79	-0.11	191	01	45.66	20.49	13.04	3.31	9.48	18.82
	5	192	01	07.50	0.00	192	00	50.26	20.49	13.18	3.20	9.51	18.85
	6	193	00	14.12	+0.14	192	59	56.72	20.50	13.32	3.06	9.52	18.86
	7	193	59	22.64	+0.29	193	59	05.10	20.51	+13.46	+2.92	+9.50	18.83
	8	194	58	33.19	0.43	194	58	15.53	20.51	13.59	2.80	9.44	18.78
	9	195	57	45.87	0.54	195	57	28.15	20.52	13.73	2.75	9.37	18.70
	10	196	57	00.70	0.61	196	56	43.01	20.52	13.87	2.78	9.29	18.62
	11	197	56	17.81	0.65	197	56	00.20	20.53	14.01	2.87	9.23	18.56
	12	198	55	37.19	0.65	198	55	19.70	20.53	14.15	3.00	9.19	18.52
	13	199	54	58.95	+0.61	199	54	41.58	20.54	+14.29	+3.13	+9.19	18.52
	14	200	54	23.00	0.58	200	54	05.72	20.55	14.43	3.22	9.21	18.54
	15	201	53	49.41	0.47	201	53	32.17	20.55	14.57	3.26	9.24	18.57
	16	202	53	18.11	0.36	202	53	00.85	20.56	14.71	3.25	9.28	18.61
	17	203	52	49.10	0.25	203	52	31.76	20.56	14.85	3.18	9.31	18.64
	18	204	52	22.33	+0.14	204	52	04.87	20.57	14.99	3.07	9.33	18.65
	19	205	51	57.76	0.00	205	51	40.18	20.57	+15.13	+2.94	+9.32	18.65
	20	206	51	35.33	-0.11	206	51	17.60	20.58	15.27	2.81	9.30	18.62
	21	207	51	14.96	0.22	207	50	57.12	20.59	15.41	2.70	9.25	18.57
	22	208	50	56.62	0.32	208	50	38.69	20.59	15.54	2.62	9.19	18.51
	23	209	50	40.25	0.40	209	50	22.27	20.60	15.68	2.58	9.13	18.45
	24	210	50	25.78	0.47	210	50	07.80	20.60	15.82	2.58	9.07	18.39
	25	211	50	13.18	-0.50	211	49	55.24	20.61	+15.96	+2.62	+9.01	18.33
	26	212	50	02.35	0.50	212	49	44.47	20.61	16.10	2.69	8.97	18.29
	27	213	49	53.31	0.47	213	49	35.51	20.62	16.24	2.78	8.95	18.26
	28	214	49	45.96	0.40	214	49	28.24	20.63	16.38	2.86	8.95	18.26
	29	215	49	40.31	0.32	215	49	22.66	20.63	16.52	2.93	8.96	18.27
	30	216	49	36.29	0.22	216	49	18.66	20.64	16.66	2.96	8.99	18.30
Nov.	31	217	49	33.89	-0.11	217	49	16.25	20.64	+16.80	+2.96	+9.02	18.33
	1	218	49	33.09	+0.04	218	49	15.38	20.65	16.94	2.90	9.05	18.35
	2	219	49	33.91	0.18	219	49	16.10	20.65	17.08	2.80	9.06	18.36
	3	220	49	36.33	0.29	220	49	18.41	20.66	17.22	2.69	9.04	18.34
	4	221	49	40.40	0.43	221	49	22.37	20.66	17.36	2.59	8.98	18.29
	5	222	49	46.21	0.54	222	49	28.13	20.67	17.49	2.55	8.91	18.21
	6	223	49	53.74	+0.61	223	49	35.69	20.67	+17.63	+2.58	+8.82	18.12
	7	224	50	03.13	0.65	224	49	45.19	20.68	17.77	2.69	8.73	18.03
	8	225	50	14.42	0.68	225	49	56.64	20.68	17.91	2.86	8.68	17.98
	9	226	50	27.70	0.65	226	50	10.10	20.69	18.05	3.04	8.65	17.95
	10	227	50	42.92	0.61	227	50	25.48	20.69	18.19	3.20	8.66	17.96
	11	228	51	00.21	0.54	228	50	42.86	20.70	18.33	3.31	8.69	17.98
	12	229	51	19.47	+0.43	229	51	02.16	20.70	+18.47	+3.35	+8.72	18.01
	13	230	51	40.73	0.29	230	51	23.40	20.71	18.61	3.34	8.75	18.04
	14	231	52	03.90	0.18	231	51	46.51	20.71	18.75	3.28	8.76	18.05
	15	232	52	29.01	+0.04	232	52	11.53	20.72	18.89	3.19	8.76	18.05
16	233	52	56.00	-0.07	233	52	38.42	20.72	+19.03	+3.10	+8.73	18.02	

*To obtain the geometric longitude referred to the mean equinox of J 2000.0, add -21' 22".421 and subtract precession from J 2025.5.

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Semi Diameter		Ephemeris Transit			
	h	m	s	°	'	"		'	"	h	m	s	
Oct.	1	12	29	40.69	-3	12	16.05	1.001 2614	15	58.44	11	49	35.43
	2	12	33	17.95	3	35	30.54	1.000 9698	15	58.72	11	49	16.28
	3	12	36	55.50	3	58	42.47	1.000 6784	15	58.99	11	48	57.43
	4	12	40	33.35	4	21	51.48	1.000 3875	15	59.27	11	48	38.90
	5	12	44	11.54	4	44	57.23	1.000 0974	15	59.55	11	48	20.72
	6	12	47	50.09	5	07	59.41	0.999 8086	15	59.83	11	48	02.91
	7	12	51	29.02	-5	30	57.69	0.999 5211	16	00.10	11	47	45.49
	8	12	55	08.36	5	53	51.75	0.999 2354	16	00.38	11	47	28.49
	9	12	58	48.13	6	16	41.29	0.998 9513	16	00.65	11	47	11.94
	10	13	02	28.37	6	39	25.99	0.998 6689	16	00.92	11	46	55.85
	11	13	06	09.09	7	02	05.49	0.998 3879	16	01.19	11	46	40.25
	12	13	09	50.30	7	24	39.45	0.998 1083	16	01.46	11	46	25.17
	13	13	13	32.05	-7	47	07.49	0.997 8298	16	01.73	11	46	10.61
	14	13	17	14.32	8	09	29.23	0.997 5520	16	02.00	11	45	56.60
	15	13	20	57.16	8	31	44.26	0.997 2748	16	02.27	11	45	43.16
	16	13	24	40.57	8	53	52.18	0.996 9979	16	02.53	11	45	30.30
	17	13	28	24.56	9	15	52.61	0.996 7212	16	02.80	11	45	18.05
	18	13	32	09.16	9	37	45.12	0.996 4446	16	03.07	11	45	06.40
	19	13	35	54.39	-9	59	29.32	0.996 1679	16	03.34	11	44	55.39
	20	13	39	40.24	10	21	04.81	0.995 8911	16	03.60	11	44	45.02
	21	13	43	26.75	10	42	31.17	0.995 6143	16	03.87	11	44	35.30
	22	13	47	13.92	11	03	47.99	0.995 3375	16	04.14	11	44	26.25
	23	13	51	01.77	11	24	54.87	0.995 0607	16	04.41	11	44	17.88
	24	13	54	50.31	11	45	51.39	0.994 7842	16	04.68	11	44	10.20
	25	13	58	39.55	-12	06	37.15	0.994 5080	16	04.94	11	44	03.23
	26	14	02	29.49	12	27	11.72	0.994 2325	16	05.21	11	43	56.96
	27	14	06	20.16	12	47	34.70	0.993 9578	16	05.48	11	43	51.43
	28	14	10	11.56	13	07	45.67	0.993 6842	16	05.74	11	43	46.62
	29	14	14	03.69	13	27	44.22	0.993 4120	16	06.01	11	43	42.56
	30	14	17	56.57	13	47	29.94	0.993 1415	16	06.27	11	43	39.26
Nov.	31	14	21	50.21	-14	07	02.43	0.992 8730	16	06.53	11	43	36.72
	1	14	25	44.62	14	26	21.27	0.992 6070	16	06.79	11	43	34.95
	2	14	29	39.80	14	45	26.08	0.992 3438	16	07.05	11	43	33.97
	3	14	33	35.78	15	04	16.46	0.992 0838	16	07.30	11	43	33.79
	4	14	37	32.56	15	22	52.05	0.991 8273	16	07.55	11	43	34.41
	5	14	41	30.15	15	41	12.49	0.991 5747	16	07.80	11	43	35.85
	6	14	45	28.57	-15	59	17.42	0.991 3262	16	08.04	11	43	38.13
	7	14	49	27.84	16	17	06.48	0.991 0818	16	08.28	11	43	41.24
	8	14	53	27.95	16	34	39.29	0.990 8416	16	08.52	11	43	45.21
	9	14	57	28.92	16	51	55.47	0.990 6053	16	08.75	11	43	50.03
	10	15	01	30.75	17	08	54.61	0.990 3728	16	08.97	11	43	55.72
	11	15	05	33.44	17	25	36.31	0.990 1439	16	09.20	11	44	02.27
	12	15	09	36.99	-17	42	00.13	0.989 9182	16	09.42	11	44	09.69
	13	15	13	41.41	17	58	05.68	0.989 6955	16	09.64	11	44	17.98
	14	15	17	46.70	18	13	52.55	0.989 4757	16	09.85	11	44	27.14
	15	15	21	52.85	18	29	20.31	0.989 2586	16	10.06	11	44	37.17
16	15	25	59.86	-18	44	28.58	0.989 0439	16	10.28	11	44	48.05	

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date		Geometric Longitude* (Mean Equinox of date)			Latitude (Ecliptic of date)	Apparent Longitude (True equinox of date)			Aberra- tion	Prec. in Long. (J 2025.5 of date)	Nut. in Long.	Nut. in Obliquity	True Obliquity (23° 26')
		°	'	"	"	°	'	"	"	"	"	"	"
Nov.	16	233	52	56.00	-0.07	233	52	38.42	20.72	+19.03	+3.10	+8.73	18.02
	17	234	53	24.77	0.18	234	53	07.12	20.73	19.17	3.03	8.69	17.98
	18	235	53	55.24	0.29	235	53	37.54	20.73	19.31	2.98	8.63	17.92
	19	236	54	27.40	0.36	236	54	09.68	20.74	19.44	2.97	8.57	17.85
	20	237	55	01.17	0.43	237	54	43.49	20.74	19.58	3.01	8.50	17.79
	21	238	55	36.45	0.47	238	55	18.84	20.74	19.72	3.08	8.45	17.73
	22	239	56	13.18	-0.47	239	55	55.67	20.75	+19.86	+3.19	+8.40	17.68
	23	240	56	51.25	0.43	240	56	33.86	20.75	20.00	3.32	8.38	17.66
	24	241	57	30.66	0.40	241	57	13.39	20.76	20.14	3.44	8.37	17.65
	25	242	58	11.27	0.32	242	57	54.11	20.76	20.28	3.56	8.38	17.66
26	243	58	53.05	0.22	243	58	35.98	20.76	20.42	3.64	8.41	17.68	
27	244	59	35.93	-0.11	244	59	18.89	20.77	20.56	3.68	8.44	17.71	
Dec.	28	246	00	19.82	+0.04	246	00	02.77	20.77	+20.70	+3.68	+8.47	17.74
	29	247	01	04.72	0.14	247	00	47.63	20.78	20.84	3.64	8.49	17.76
	30	248	01	50.58	0.29	248	01	33.42	20.78	20.98	3.57	8.48	17.75
	1	249	02	37.38	0.40	249	02	20.15	20.78	21.12	3.50	8.45	17.72
	2	250	03	25.08	0.50	250	03	07.81	20.79	21.26	3.47	8.39	17.66
	3	251	04	13.76	0.61	251	03	56.52	20.79	21.39	3.51	8.31	17.58
	4	252	05	03.40	+0.65	252	04	46.27	20.79	+21.53	+3.62	+8.23	17.50
	5	253	05	54.05	0.68	253	05	37.10	20.80	21.67	3.81	8.17	17.43
	6	254	06	45.77	0.65	254	06	29.05	20.80	21.81	4.04	8.14	17.40
	7	255	07	38.65	0.61	255	07	22.15	20.80	21.95	4.26	8.14	17.40
8	256	08	32.69	0.54	256	08	16.37	20.81	22.09	4.44	8.18	17.43	
9	257	09	27.91	0.43	257	09	11.70	20.81	22.23	4.55	8.22	17.48	
10	258	10	24.32	+0.32	258	10	08.15	20.81	+22.37	+4.59	+8.27	17.52	
11	259	11	21.94	0.18	259	11	05.75	20.81	22.51	4.58	8.30	17.55	
12	260	12	20.74	+0.04	260	12	04.50	20.82	22.65	4.53	8.31	17.57	
13	261	13	20.63	-0.07	261	13	04.33	20.82	22.79	4.47	8.30	17.56	
14	262	14	21.63	0.18	262	14	05.28	20.82	22.93	4.42	8.28	17.53	
15	263	15	23.61	0.29	263	15	07.24	20.82	23.07	4.40	8.24	17.49	
16	264	16	26.57	-0.36	264	16	10.20	20.82	+23.21	+4.41	+8.19	17.44	
17	265	17	30.41	0.43	265	17	14.10	20.83	23.34	4.47	8.14	17.38	
18	266	18	35.05	0.47	266	18	18.83	20.83	23.48	4.56	8.09	17.34	
19	267	19	40.45	0.47	267	19	24.35	20.83	23.62	4.68	8.06	17.30	
20	268	20	46.47	0.43	268	20	30.52	20.83	23.76	4.83	8.04	17.29	
21	269	21	53.06	0.40	269	21	37.26	20.83	23.90	4.98	8.05	17.29	
22	270	23	00.14	-0.32	270	22	44.47	20.83	+24.04	+5.12	+8.07	17.32	
23	271	24	07.56	0.25	271	23	52.01	20.83	24.18	5.23	8.11	17.35	
24	272	25	15.32	-0.11	272	24	59.83	20.84	24.32	5.30	8.16	17.40	
25	273	26	23.26	0.00	273	26	07.80	20.84	24.46	5.33	8.21	17.45	
26	274	27	31.33	+0.14	274	27	15.84	20.84	24.60	5.31	8.25	17.48	
27	275	28	39.49	0.25	275	28	23.95	20.84	24.74	5.26	8.27	17.50	
28	276	29	47.62	+0.40	276	29	32.03	20.84	+24.88	+5.20	+8.26	17.49	
29	277	30	55.70	0.50	277	30	40.07	20.84	25.02	5.16	8.23	17.46	
30	278	32	03.69	0.58	278	31	48.07	20.84	25.16	5.18	8.18	17.41	
31	279	33	11.57	0.61	279	32	56.04	20.84	25.29	5.26	8.12	17.35	
32	280	34	19.38	+0.65	280	34	04.01	20.84	+25.43	+5.42	+8.07	17.29	

*To obtain the geometric longitude referred to the mean equinox of J 2000.0, add -21' 22".421 and subtract precession from J 2025.5.

SUN, 2025
FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Semi Diameter		Ephemeris Transit		
		h	m	s	°	'	"		'	"	h	m	s
Nov.	16	15	25	59.86	-18	44	28.58	0.989 0439	16	10.28	11	44	48.05
	17	15	30	07.73	18	59	16.95	0.988 8316	16	10.48	11	44	59.78
	18	15	34	16.44	19	13	45.03	0.988 6217	16	10.69	11	45	12.35
	19	15	38	25.99	19	27	52.43	0.988 4140	16	10.89	11	45	25.76
	20	15	42	36.38	19	41	38.77	0.988 2087	16	11.10	11	45	39.99
	21	15	46	47.58	19	55	03.68	0.988 0056	16	11.30	11	45	55.03
	22	15	50	59.58	-20	08	06.77	0.987 8049	16	11.49	11	46	10.86
	23	15	55	12.38	20	20	47.69	0.987 6068	16	11.69	11	46	27.48
	24	15	59	25.95	20	33	06.07	0.987 4112	16	11.88	11	46	44.86
	25	16	03	40.27	20	45	01.56	0.987 2186	16	12.07	11	47	02.99
	26	16	07	55.33	20	56	33.82	0.987 0289	16	12.26	11	47	21.85
	27	16	12	11.11	21	07	42.50	0.986 8426	16	12.44	11	47	41.43
	28	16	16	27.59	-21	18	27.30	0.986 6599	16	12.62	11	48	01.70
	29	16	20	44.76	21	28	47.88	0.986 4811	16	12.80	11	48	22.64
Dec.	30	16	25	02.58	21	38	43.95	0.986 3066	16	12.97	11	48	44.24
	1	16	29	21.06	21	48	15.24	0.986 1367	16	13.14	11	49	06.48
	2	16	33	40.16	21	57	21.47	0.985 9719	16	13.30	11	49	29.34
	3	16	37	59.87	22	06	02.39	0.985 8125	16	13.46	11	49	52.79
	4	16	42	20.18	-22	14	17.78	0.985 6588	16	13.61	11	50	16.83
	5	16	46	41.07	22	22	07.42	0.985 5110	16	13.75	11	50	41.43
	6	16	51	02.51	22	29	31.07	0.985 3692	16	13.89	11	51	06.58
	7	16	55	24.48	22	36	28.52	0.985 2333	16	14.03	11	51	32.24
	8	16	59	46.96	22	42	59.52	0.985 1033	16	14.16	11	51	58.41
	9	17	04	09.93	22	49	03.86	0.984 9790	16	14.28	11	52	25.05
	10	17	08	33.35	-22	54	41.32	0.984 8600	16	14.40	11	52	52.15
	11	17	12	57.21	22	59	51.68	0.984 7462	16	14.51	11	53	19.66
	12	17	17	21.46	23	04	34.77	0.984 6372	16	14.62	11	53	47.57
	13	17	21	46.10	23	08	50.40	0.984 5329	16	14.72	11	54	15.83
	14	17	26	11.08	23	12	38.43	0.984 4330	16	14.82	11	54	44.42
	15	17	30	36.37	23	15	58.72	0.984 3373	16	14.91	11	55	13.31
	16	17	35	01.93	-23	18	51.14	0.984 2457	16	15.01	11	55	42.46
	17	17	39	27.74	23	21	15.59	0.984 1580	16	15.09	11	56	11.82
	18	17	43	53.76	23	23	11.98	0.984 0741	16	15.18	11	56	41.38
	19	17	48	19.95	23	24	40.23	0.983 9940	16	15.25	11	57	11.08
	20	17	52	46.27	23	25	40.29	0.983 9176	16	15.33	11	57	40.90
	21	17	57	12.68	23	26	12.12	0.983 8449	16	15.40	11	58	10.79
	22	18	01	39.14	-23	26	15.69	0.983 7759	16	15.47	11	58	40.71
	23	18	06	05.62	23	25	50.98	0.983 7106	16	15.54	11	59	10.63
	24	18	10	32.08	23	24	58.00	0.983 6493	16	15.60	11	59	40.51
	25	18	14	58.47	23	23	36.77	0.983 5920	16	15.65	12	00	10.31
	26	18	19	24.76	23	21	47.33	0.983 5390	16	15.71	12	00	39.99
	27	18	23	50.91	23	19	29.72	0.983 4905	16	15.75	12	01	09.53
	28	18	28	16.90	-23	16	44.01	0.983 4468	16	15.80	12	01	38.87
	29	18	32	42.68	23	13	30.30	0.983 4083	16	15.84	12	02	08.00
	30	18	37	08.23	23	09	48.70	0.983 3751	16	15.87	12	02	36.87
	31	18	41	33.52	23	05	39.32	0.983 3478	16	15.90	12	03	05.47
	32	18	45	58.52	-23	01	02.32	0.983 3267	16	15.92	12	03	33.75

SUN, 2025
EQUATORIAL RECTANGULAR CO-ORDINATES FOR 0^h TERRESTRIAL TIME
MEAN EQUATOR AND EQUINOX OF J 2025.5 AND J 2000.0

Date		X _{2025.5}	X _{2000.0}	Y _{2025.5}	Y _{2000.0}	Z _{2025.5}	Z _{2000.0}
Jan.	0	+0.162 4073	+0.161 4515	-0.890 0035	-0.890 0008	-0.385 3993	-0.385 8068
	1	0.179 6362	0.178 6834	0.887 2123	0.887 2097	0.384 1466	0.384 5968
	2	0.196 8085	0.195 8591	0.884 1438	0.884 1411	0.382 7736	0.383 2663
	3	0.213 9185	0.212 9728	0.880 7988	0.880 7962	0.381 2809	0.381 8160
	4	0.230 9606	0.230 0188	0.877 1789	0.877 1763	0.379 6690	0.380 2463
	5	0.247 9293	0.246 9917	0.873 2852	0.873 2827	0.377 9386	0.378 5579
	6	+0.264 8191	+0.263 8860	-0.869 1195	-0.869 1170	-0.376 0904	-0.376 7515
	7	0.281 6247	0.280 6964	0.864 6834	0.864 6809	0.374 1252	0.374 8279
	8	0.298 3409	0.297 4178	0.859 9787	0.859 9762	0.372 0438	0.372 7880
	9	0.314 9628	0.314 0450	0.855 0071	0.855 0046	0.369 8471	0.370 6324
	10	0.331 4854	0.330 5733	0.849 7706	0.849 7682	0.367 5359	0.368 3621
	11	0.347 9040	0.346 9979	0.844 2710	0.844 2686	0.365 1111	0.365 9779
	12	+0.364 2138	+0.363 3139	-0.838 5103	-0.838 5079	-0.362 5735	-0.363 4807
	13	0.380 4102	0.379 5169	0.832 4902	0.832 4878	0.359 9239	0.360 8712
	14	0.396 4886	0.395 6021	0.826 2126	0.826 2103	0.357 1631	0.358 1503
	15	0.412 4444	0.411 5650	0.819 6795	0.819 6771	0.354 2921	0.355 3187
	16	0.428 2730	0.427 4009	0.812 8926	0.812 8903	0.351 3114	0.352 3772
	17	0.443 9697	0.443 1051	0.805 8539	0.805 8516	0.348 2221	0.349 3267
	18	+0.459 5297	+0.458 6731	-0.798 5653	-0.798 5631	-0.345 0248	-0.346 1680
	19	0.474 9485	0.474 1000	0.791 0290	0.791 0268	0.341 7205	0.342 9018
	20	0.490 2212	0.489 3811	0.783 2470	0.783 2448	0.338 3101	0.339 5292
	21	0.505 3431	0.504 5117	0.775 2214	0.775 2193	0.334 7944	0.336 0510
	22	0.520 3095	0.519 4870	0.766 9547	0.766 9526	0.331 1746	0.332 4682
	23	0.535 1157	0.534 3024	0.758 4493	0.758 4472	0.327 4515	0.328 7817
	24	+0.549 7568	+0.548 9530	-0.749 7075	-0.749 7054	-0.323 6263	-0.324 9928
	25	0.564 2283	0.563 4341	0.740 7320	0.740 7300	0.319 7001	0.321 1024
	26	0.578 5253	0.577 7410	0.731 5255	0.731 5236	0.315 6741	0.317 1117
	27	0.592 6431	0.591 8691	0.722 0909	0.722 0890	0.311 5495	0.313 0220
	28	0.606 5772	0.605 8135	0.712 4311	0.712 4292	0.307 3275	0.308 8345
	29	0.620 3228	0.619 5698	0.702 5492	0.702 5474	0.303 0096	0.304 5506
Feb.	30	+0.633 8754	+0.633 1333	-0.692 4485	-0.692 4467	-0.298 5972	-0.300 1717
	31	0.647 2306	0.646 4996	0.682 1324	0.682 1306	0.294 0917	0.295 6993
	1	0.660 3839	0.659 6643	0.671 6045	0.671 6027	0.289 4949	0.291 1350
	2	0.673 3313	0.672 6232	0.660 8684	0.660 8667	0.284 8083	0.286 4804
	3	0.686 0687	0.685 3724	0.649 9280	0.649 9263	0.280 0336	0.281 7373
	4	0.698 5923	0.697 9081	0.638 7871	0.638 7855	0.275 1727	0.276 9073
	5	+0.710 8986	+0.710 2266	-0.627 4496	-0.627 4480	-0.270 2271	-0.271 9921
	6	0.722 9840	0.722 3244	0.615 9195	0.615 9179	0.265 1987	0.266 9936
	7	0.734 8454	0.734 1984	0.604 2005	0.604 1990	0.260 0891	0.261 9134
	8	0.746 4795	0.745 8454	0.592 2966	0.592 2952	0.254 9001	0.256 7531
	9	0.757 8833	0.757 2621	0.580 2116	0.580 2102	0.249 6334	0.251 5145
	10	0.769 0537	0.768 4458	0.567 9493	0.567 9479	0.244 2905	0.246 1992
	11	+0.779 9878	+0.779 3933	-0.555 5134	-0.555 5121	-0.238 8731	-0.240 8089
	12	0.790 6827	0.790 1018	0.542 9077	0.542 9064	0.233 3828	0.235 3450
	13	0.801 1356	0.800 5684	0.530 1360	0.530 1347	0.227 8212	0.229 8093
	14	0.811 3434	0.810 7902	0.517 2020	0.517 2007	0.222 1900	0.224 2033
	15	+0.821 3034	+0.820 7642	-0.504 1094	-0.504 1083	-0.216 4907	-0.218 5286

SUN, 2025
EQUATORIAL RECTANGULAR CO-ORDINATES FOR 0^h TERRESTRIAL TIME
MEAN EQUATOR AND EQUINOX OF J 2025.5 AND J 2000.0

Date		X _{2025.5}	X _{2000.0}	Y _{2025.5}	Y _{2000.0}	Z _{2025.5}	Z _{2000.0}
Feb.	15	+0.821 3034	+0.820 7642	-0.504 1094	-0.504 1083	-0.216 4907	-0.218 5286
	16	0.831 0126	0.830 4878	0.490 8622	0.490 8611	0.210 7250	0.212 7869
	17	0.840 4683	0.839 9579	0.477 4643	0.477 4632	0.204 8946	0.206 9798
	18	0.849 6677	0.849 1718	0.463 9195	0.463 9184	0.199 0011	0.201 1090
	19	0.858 6078	0.858 1266	0.450 2318	0.450 2308	0.193 0462	0.195 1762
	20	0.867 2860	0.866 8198	0.436 4053	0.436 4044	0.187 0317	0.189 1831
	21	+0.875 6997	+0.875 2484	-0.422 4442	-0.422 4433	-0.180 9594	-0.183 1315
	22	0.883 8461	0.883 4100	0.408 3527	0.408 3518	0.174 8310	0.177 0233
	23	0.891 7225	0.891 3018	0.394 1350	0.394 1342	0.168 6484	0.170 8602
	24	0.899 3266	0.898 9213	0.379 7954	0.379 7947	0.162 4136	0.164 6441
Mar.	25	0.906 6557	0.906 2659	0.365 3385	0.365 3378	0.156 1284	0.158 3770
	26	0.913 7075	0.913 3334	0.350 7688	0.350 7682	0.149 7949	0.152 0608
	27	+0.920 4796	+0.920 1213	-0.336 0911	-0.336 0904	-0.143 4151	-0.145 6977
	28	0.926 9698	0.926 6274	0.321 3100	0.321 3094	0.136 9910	0.139 2897
	1	0.933 1761	0.932 8497	0.306 4305	0.306 4300	0.130 5250	0.132 8389
	2	0.939 0967	0.938 7864	0.291 4576	0.291 4571	0.124 0192	0.126 3477
	3	0.944 7300	0.944 4359	0.276 3963	0.276 3959	0.117 4758	0.119 8182
	4	0.950 0746	0.949 7968	0.261 2518	0.261 2514	0.110 8971	0.113 2527
	5	+0.955 1295	+0.954 8680	-0.246 0289	-0.246 0286	-0.104 2853	-0.106 6533
	6	0.959 8935	0.959 6485	0.230 7326	0.230 7324	0.097 6426	0.100 0223
	7	0.964 3659	0.964 1374	0.215 3678	0.215 3676	0.090 9710	0.093 3617
	8	0.968 5459	0.968 3340	0.199 9393	0.199 9391	0.084 2727	0.086 6737
	9	0.972 4329	0.972 2377	0.184 4518	0.184 4516	0.077 5497	0.079 9602
	10	0.976 0264	0.975 8479	0.168 9098	0.168 9097	0.070 8041	0.073 2234
	11	+0.979 3257	+0.979 1640	-0.153 3180	-0.153 3180	-0.064 0377	-0.066 4650
	12	0.982 3305	0.982 1855	0.137 6810	0.137 6810	0.057 2525	0.059 6872
	13	0.985 0401	0.984 9121	0.122 0032	0.122 0033	0.050 4504	0.052 8918
	14	0.987 4543	0.987 3431	0.106 2892	0.106 2893	0.043 6334	0.046 0807
	15	0.989 5725	0.989 4783	0.090 5433	0.090 5435	0.036 8034	0.039 2558
	16	0.991 3944	0.991 3171	0.074 7702	0.074 7704	0.029 9623	0.032 4191
	17	+0.992 9197	+0.992 8593	-0.058 9743	-0.058 9746	-0.023 1120	-0.025 5725
	18	0.994 1479	0.994 1046	0.043 1601	0.043 1604	0.016 2544	0.018 7179
	19	0.995 0789	0.995 0525	0.027 3321	0.027 3325	0.009 3915	0.011 8572
	20	0.995 7123	0.995 7030	-0.011 4949	-0.011 4954	-0.002 5252	-0.004 9924
	21	0.996 0480	0.996 0557	+0.004 3468	+0.004 3464	+0.004 3424	+0.001 8745
	22	0.996 0859	0.996 1107	0.020 1886	0.020 1881	0.011 2095	0.008 7416
	23	+0.995 8260	+0.995 8677	+0.036 0256	+0.036 0251	+0.018 0740	+0.015 6068
	24	0.995 2681	0.995 3268	0.051 8533	0.051 8527	0.024 9338	0.022 4681
	25	0.994 4123	0.994 4881	0.067 6669	0.067 6662	0.031 7869	0.029 3234
	26	0.993 2589	0.993 3516	0.083 4614	0.083 4607	0.038 6312	0.036 1706
Apr.	27	0.991 8081	0.991 9177	0.099 2322	0.099 2314	0.045 4645	0.043 0076
	28	0.990 0602	0.990 1867	0.114 9741	0.114 9733	0.052 2846	0.049 8322
	29	+0.988 0158	+0.988 1592	+0.130 6821	+0.130 6813	+0.059 0894	+0.056 6421
	30	0.985 6757	0.985 8360	0.146 3513	0.146 3504	0.065 8766	0.063 4352
	31	0.983 0410	0.983 2181	0.161 9765	0.161 9755	0.072 6439	0.070 2091
	1	0.980 1129	0.980 3067	0.177 5527	0.177 5517	0.079 3892	0.076 9618
	2	+0.976 8928	+0.977 1032	+0.193 0751	+0.193 0741	+0.086 1103	+0.083 6909

SUN, 2025
EQUATORIAL RECTANGULAR CO-ORDINATES FOR 0^h TERRESTRIAL TIME
MEAN EQUATOR AND EQUINOX OF J 2025.5 AND J 2000.0

Date		X _{2025.5}	X _{2000.0}	Y _{2025.5}	Y _{2000.0}	Z _{2025.5}	Z _{2000.0}
Apr.	1	+0.980 1129	+0.980 3067	+0.177 5527	+0.177 5517	+0.079 3892	+0.076 9618
	2	0.976 8928	0.977 1032	0.193 0751	0.193 0741	0.086 1103	0.083 6909
	3	0.973 3823	0.973 6093	0.208 5389	0.208 5378	0.092 8050	0.090 3944
	4	0.969 5831	0.969 8267	0.223 9394	0.223 9382	0.099 4715	0.097 0704
	5	0.965 4971	0.965 7572	0.239 2721	0.239 2709	0.106 1077	0.103 7168
	6	0.961 1261	0.961 4026	0.254 5326	0.254 5314	0.112 7117	0.110 3317
	7	+0.956 4720	+0.956 7647	+0.269 7168	+0.269 7155	+0.119 2817	+0.116 9134
	8	0.951 5366	0.951 8456	0.284 8202	0.284 8189	0.125 8160	0.123 4600
	9	0.946 3219	0.946 6470	0.299 8388	0.299 8375	0.132 3127	0.129 9697
	10	0.940 8298	0.941 1709	0.314 7685	0.314 7671	0.138 7702	0.136 4409
	11	0.935 0622	0.935 4192	0.329 6053	0.329 6039	0.145 1866	0.142 8717
	12	0.929 0211	0.929 3939	0.344 3451	0.344 3436	0.151 5604	0.149 2605
	13	+0.922 7084	+0.923 0969	+0.358 9839	+0.358 9824	+0.157 8897	+0.155 6055
	14	0.916 1262	0.916 5303	0.373 5179	0.373 5163	0.164 1730	0.161 9052
	15	0.909 2763	0.909 6960	0.387 9430	0.387 9414	0.170 4085	0.168 1578
	16	0.902 1610	0.902 5960	0.402 2553	0.402 2537	0.176 5946	0.174 3616
	17	0.894 7822	0.895 2324	0.416 4510	0.416 4493	0.182 7296	0.180 5149
	18	0.887 1421	0.887 6074	0.430 5260	0.430 5243	0.188 8118	0.186 6161
	19	+0.879 2428	+0.879 7231	+0.444 4765	+0.444 4747	+0.194 8395	+0.192 6635
	20	0.871 0865	0.871 5816	0.458 2984	0.458 2966	0.200 8110	0.198 6553
	21	0.862 6754	0.863 1852	0.471 9880	0.471 9861	0.206 7247	0.204 5899
	22	0.854 0120	0.854 5363	0.485 5411	0.485 5392	0.212 5787	0.210 4655
	23	0.845 0985	0.845 6372	0.498 9538	0.498 9519	0.218 3714	0.216 2803
	24	0.835 9375	0.836 4904	0.512 2221	0.512 2202	0.224 1009	0.222 0326
	25	+0.826 5316	+0.827 0986	+0.525 3419	+0.525 3400	+0.229 7655	+0.227 7206
	26	0.816 8836	0.817 4645	0.538 3092	0.538 3071	0.235 3634	0.233 3424
	27	0.806 9964	0.807 5911	0.551 1198	0.551 1177	0.240 8927	0.238 8963
	28	0.796 8734	0.797 4816	0.563 7697	0.563 7676	0.246 3517	0.244 3805
	29	0.786 5178	0.787 1394	0.576 2551	0.576 2530	0.251 7387	0.249 7932
	30	0.775 9332	0.776 5680	0.588 5721	0.588 5699	0.257 0520	0.255 1328
May	1	+0.765 1233	+0.765 7711	+0.600 7172	+0.600 7150	+0.262 2900	+0.260 3977
	2	0.754 0919	0.754 7525	0.612 6868	0.612 6846	0.267 4513	0.265 5863
	3	0.742 8427	0.743 5160	0.624 4779	0.624 4756	0.272 5344	0.270 6974
	4	0.731 3796	0.732 0653	0.636 0871	0.636 0848	0.277 5380	0.275 7295
	5	0.719 7062	0.720 4042	0.647 5115	0.647 5092	0.282 4609	0.280 6814
	6	0.707 8265	0.708 5365	0.658 7482	0.658 7458	0.287 3018	0.285 5518
	7	+0.695 7440	+0.696 4658	+0.669 7943	+0.669 7919	+0.292 0595	+0.290 3395
	8	0.683 4626	0.684 1960	0.680 6470	0.680 6446	0.296 7329	0.295 0434
	9	0.670 9859	0.671 7307	0.691 3038	0.691 3013	0.301 3208	0.299 6623
	10	0.658 3176	0.659 0737	0.701 7618	0.701 7593	0.305 8222	0.304 1951
	11	0.645 4615	0.646 2285	0.712 0184	0.712 0160	0.310 2358	0.308 6406
	12	0.632 4211	0.633 1989	0.722 0712	0.722 0687	0.314 5608	0.312 9979
	13	+0.619 2002	+0.619 9886	+0.731 9176	+0.731 9151	+0.318 7958	+0.317 2658
	14	0.605 8025	0.606 6012	0.741 5550	0.741 5525	0.322 9401	0.321 4433
	15	0.592 2317	0.593 0404	0.750 9810	0.750 9785	0.326 9923	0.325 5293
	16	0.578 4914	0.579 3100	0.760 1931	0.760 1905	0.330 9516	0.329 5226
	17	+0.564 5854	+0.565 4136	+0.769 1889	+0.769 1863	+0.334 8169	+0.333 4224

SUN, 2025
EQUATORIAL RECTANGULAR CO-ORDINATES FOR 0^h TERRESTRIAL TIME
MEAN EQUATOR AND EQUINOX OF J 2025.5 AND J 2000.0

Date		X _{2025.5}	X _{2000.0}	Y _{2025.5}	Y _{2000.0}	Z _{2025.5}	Z _{2000.0}
May	17	+0.564 5854	+0.565 4136	+0.769 1889	+0.769 1863	+0.334 8169	+0.333 4224
	18	0.550 5174	0.551 3550	0.777 9659	0.777 9632	0.338 5870	0.337 2275
	19	0.536 2913	0.537 1380	0.786 5216	0.786 5190	0.342 2610	0.340 9367
	20	0.521 9108	0.522 7665	0.794 8536	0.794 8510	0.345 8378	0.344 5492
	21	0.507 3800	0.508 2443	0.802 9595	0.802 9568	0.349 3162	0.348 0636
	22	0.492 7026	0.493 5754	0.810 8368	0.810 8340	0.352 6952	0.351 4791
	23	+0.477 8830	+0.478 7639	+0.818 4829	+0.818 4802	+0.355 9737	+0.354 7944
	24	0.462 9253	0.463 8141	0.825 8956	0.825 8929	0.359 1507	0.358 0084
	25	0.447 8339	0.448 7304	0.833 0724	0.833 0697	0.362 2250	0.361 1201
	26	0.432 6134	0.433 5174	0.840 0111	0.840 0083	0.365 1956	0.364 1285
June	27	0.417 2686	0.418 1796	0.846 7093	0.846 7065	0.368 0615	0.367 0325
	28	0.401 8041	0.402 7221	0.853 1652	0.853 1624	0.370 8219	0.369 8313
	29	+0.386 2251	+0.387 1496	+0.859 3768	+0.859 3740	+0.373 4760	+0.372 5240
	30	0.370 5363	0.371 4673	0.865 3426	0.865 3398	0.376 0231	0.375 1100
	31	0.354 7429	0.355 6799	0.871 0611	0.871 0583	0.378 4626	0.377 5886
	1	0.338 8496	0.339 7924	0.876 5309	0.876 5281	0.380 7939	0.379 9593
	2	0.322 8612	0.323 8097	0.881 7509	0.881 7481	0.383 0166	0.382 2216
	3	0.306 7827	0.307 7364	0.886 7200	0.886 7172	0.385 1302	0.384 3751
	4	+0.290 6186	+0.291 5773	+0.891 4372	+0.891 4343	+0.387 1343	+0.386 4194
	5	0.274 3736	0.275 3371	0.895 9014	0.895 8985	0.389 0287	0.388 3540
	6	0.258 0524	0.259 0203	0.900 1119	0.900 1090	0.390 8128	0.390 1786
	7	0.241 6595	0.242 6317	0.904 0677	0.904 0649	0.392 4865	0.391 8929
	8	0.225 1995	0.226 1756	0.907 7682	0.907 7653	0.394 0494	0.393 4966
	9	0.208 6769	0.209 6566	0.911 2126	0.911 2097	0.395 5012	0.394 9894
	10	+0.192 0961	+0.193 0792	+0.914 4002	+0.914 3973	+0.396 8417	+0.396 3710
	11	0.175 4616	0.176 4478	0.917 3303	0.917 3274	0.398 0706	0.397 6412
	12	0.158 7779	0.159 7669	0.920 0023	0.919 9995	0.399 1877	0.398 7995
	13	0.142 0493	0.143 0409	0.922 4157	0.922 4128	0.400 1926	0.399 8459
	14	0.125 2803	0.126 2741	0.924 5697	0.924 5668	0.401 0852	0.400 7801
	15	0.108 4752	0.109 4710	0.926 4638	0.926 4609	0.401 8651	0.401 6017
	16	+0.091 6386	+0.092 6361	+0.928 0974	+0.928 0945	+0.402 5322	+0.402 3105
	17	0.074 7748	0.075 7737	0.929 4699	0.929 4670	0.403 0861	0.402 9062
	18	0.057 8884	0.058 8885	0.930 5808	0.930 5779	0.403 5266	0.403 3885
	19	0.040 9840	0.041 9849	0.931 4294	0.931 4265	0.403 8534	0.403 7572
	20	0.024 0663	0.025 0678	0.932 0153	0.932 0124	0.404 0662	0.404 0119
	21	+0.007 1401	+0.008 1419	0.932 3379	0.932 3350	0.404 1648	0.404 1525
	22	-0.009 7898	-0.008 7880	+0.932 3969	+0.932 3940	+0.404 1490	+0.404 1786
	23	0.026 7182	0.025 7166	0.932 1919	0.932 1890	0.404 0187	0.404 0902
	24	0.043 6401	0.042 6391	0.931 7227	0.931 7199	0.403 7737	0.403 8872
	25	0.060 5502	0.059 5500	0.930 9895	0.930 9867	0.403 4141	0.403 5695
July	26	0.077 4433	0.076 4442	0.929 9923	0.929 9895	0.402 9400	0.403 1372
	27	-0.094 3142	0.093 3166	0.928 7316	0.928 7288	0.402 3515	0.402 5905
	28	-0.111 1578	-0.110 1619	+0.927 2078	+0.927 2050	+0.401 6489	+0.401 9296
	29	0.127 9690	0.126 9751	0.925 4217	0.925 4190	0.400 8326	0.401 1550
	30	0.144 7429	0.143 7512	0.923 3741	0.923 3714	0.399 9029	0.400 2668
	1	0.161 4745	0.160 4853	0.921 0659	0.921 0631	0.398 8603	0.399 2657
	2	-0.178 1591	-0.177 1727	+0.918 4979	+0.918 4952	+0.397 7053	+0.398 1520

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MEAN EQUATOR AND EQUINOX OF J 2025.5 AND J 2000.0

Date		X _{2025.5}	X _{2000.0}	Y _{2025.5}	Y _{2000.0}	Z _{2025.5}	Z _{2000.0}
July	1	-0.161 4745	-0.160 4853	+0.921 0659	+0.921 0631	+0.398 8603	+0.399 2657
	2	0.178 1591	0.177 1727	0.918 4979	0.918 4952	0.397 7053	0.398 1520
	3	0.194 7920	0.193 8087	0.915 6714	0.915 6686	0.396 4383	0.396 9262
	4	0.211 3685	0.210 3886	0.912 5872	0.912 5845	0.395 0598	0.395 5888
	5	0.227 8842	0.226 9079	0.909 2466	0.909 2439	0.393 5705	0.394 1403
	6	0.244 3345	0.243 3622	0.905 6508	0.905 6481	0.391 9707	0.392 5813
	7	-0.260 7150	-0.259 7469	+0.901 8008	+0.901 7982	+0.390 2611	+0.390 9122
	8	0.277 0214	0.276 0577	0.897 6981	0.897 6954	0.388 4422	0.389 1337
	9	0.293 2493	0.292 2903	0.893 3438	0.893 3412	0.386 5146	0.387 2463
	10	0.309 3945	0.308 4405	0.888 7392	0.888 7366	0.384 4789	0.385 2506
	11	0.325 4527	0.324 5040	0.883 8857	0.883 8831	0.382 3356	0.383 1471
	12	0.341 4198	0.340 4766	0.878 7845	0.878 7819	0.380 0853	0.380 9363
	13	-0.357 2916	-0.356 3542	+0.873 4369	+0.873 4344	+0.377 7286	+0.378 6189
	14	0.373 0639	0.372 1326	0.867 8443	0.867 8418	0.375 2660	0.376 1953
	15	0.388 7326	0.387 8076	0.862 0079	0.862 0054	0.372 6980	0.373 6662
	16	0.404 2934	0.403 3750	0.855 9290	0.855 9266	0.370 0253	0.371 0319
	17	0.419 7420	0.418 8303	0.849 6090	0.849 6066	0.367 2482	0.368 2931
	18	0.435 0739	0.434 1694	0.843 0492	0.843 0468	0.364 3674	0.365 4502
	19	-0.450 2848	-0.449 3877	+0.836 2510	+0.836 2487	+0.361 3835	+0.362 5040
	20	0.465 3701	0.464 4806	0.829 2161	0.829 2138	0.358 2971	0.359 4550
	21	0.480 3253	0.479 4436	0.821 9461	0.821 9438	0.355 1090	0.356 3039
	22	0.495 1456	0.494 2720	0.814 4427	0.814 4405	0.351 8199	0.353 0514
	23	0.509 8264	0.508 9612	0.806 7080	0.806 7058	0.348 4307	0.349 6986
	24	0.524 3632	0.523 5066	0.798 7442	0.798 7419	0.344 9424	0.346 2462
	25	-0.538 7513	-0.537 9035	+0.790 5533	+0.790 5512	+0.341 3559	+0.342 6953
	26	0.552 9864	0.552 1477	0.782 1381	0.782 1359	0.337 6723	0.339 0470
	27	0.567 0640	0.566 2346	0.773 5009	0.773 4988	0.333 8929	0.335 3024
	28	0.580 9800	0.580 1602	0.764 6445	0.764 6425	0.330 0188	0.331 4627
	29	0.594 7302	0.593 9202	0.755 5717	0.755 5696	0.326 0513	0.327 5292
	30	0.608 3108	0.607 5108	0.746 2851	0.746 2831	0.321 9916	0.323 5031
Aug.	31	-0.621 7178	-0.620 9281	+0.736 7877	+0.736 7857	+0.317 8409	+0.319 3856
	1	0.634 9476	0.634 1683	0.727 0823	0.727 0804	0.313 6006	0.315 1780
	2	0.647 9963	0.647 2277	0.717 1718	0.717 1699	0.309 2720	0.310 8817
	3	0.660 8606	0.660 1029	0.707 0593	0.707 0574	0.304 8564	0.306 4979
	4	0.673 5369	0.672 7903	0.696 7475	0.696 7457	0.300 3550	0.302 0278
	5	0.686 0217	0.685 2865	0.686 2396	0.686 2378	0.295 7692	0.297 4729
	6	-0.698 3119	-0.697 5881	+0.675 5385	+0.675 5367	+0.291 1002	+0.292 8344
	7	0.710 4041	0.709 6921	0.664 6471	0.664 6454	0.286 3495	0.288 1135
	8	0.722 2951	0.721 5951	0.653 5686	0.653 5669	0.281 5183	0.283 3117
	9	0.733 9820	0.733 2941	0.642 3058	0.642 3042	0.276 6078	0.278 4301
	10	0.745 4615	0.744 7859	0.630 8617	0.630 8601	0.271 6193	0.273 4700
	11	0.756 7307	0.756 0676	0.619 2392	0.619 2377	0.266 5541	0.268 4326
	12	-0.767 7863	-0.767 1360	+0.607 4413	+0.607 4398	+0.261 4134	+0.263 3193
	13	0.778 6254	0.777 9879	0.595 4708	0.595 4693	0.256 1984	0.258 1311
	14	0.789 2447	0.788 6203	0.583 3307	0.583 3292	0.250 9104	0.252 8693
	15	0.799 6409	0.799 0298	0.571 0239	0.571 0225	0.245 5506	0.247 5351
	16	-0.809 8109	-0.809 2132	+0.558 5536	+0.558 5523	+0.240 1203	+0.242 1300

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MEAN EQUATOR AND EQUINOX OF J 2025.5 AND J 2000.0

Date	X _{2025.5}	X _{2000.0}	Y _{2025.5}	Y _{2000.0}	Z _{2025.5}	Z _{2000.0}
Aug. 16	-0.809 8109	-0.809 2132	+0.558 5536	+0.558 5523	+0.240 1203	+0.242 1300
17	0.819 7512	0.819 1671	0.545 9230	0.545 9217	0.234 6209	0.236 6552
18	0.829 4585	0.828 8882	0.533 1353	0.533 1340	0.229 0539	0.231 1121
19	0.838 9295	0.838 3732	0.520 1940	0.520 1928	0.223 4207	0.225 5023
20	0.848 1611	0.847 6188	0.507 1027	0.507 1016	0.217 7228	0.219 8273
21	0.857 1499	0.856 6219	0.493 8652	0.493 8640	0.211 9621	0.214 0887
22	-0.865 8929	-0.865 3793	+0.480 4852	+0.480 4841	+0.206 1400	+0.208 2882
23	0.874 3872	0.873 8881	0.466 9667	0.466 9657	0.200 2585	0.202 4277
24	0.882 6300	0.882 1456	0.453 3139	0.453 3129	0.194 3193	0.196 5088
25	0.890 6186	0.890 1490	0.439 5308	0.439 5298	0.188 3242	0.190 5334
26	0.898 3505	0.897 8959	0.425 6216	0.425 6207	0.182 2751	0.184 5034
27	0.905 8233	0.905 3838	0.411 5905	0.411 5896	0.176 1738	0.178 4206
28	-0.913 0349	-0.912 6106	+0.397 4417	+0.397 4408	+0.170 0223	+0.172 2868
29	0.919 9830	0.919 5741	0.383 1794	0.383 1786	0.163 8223	0.166 1040
30	0.926 6658	0.926 2724	0.368 8079	0.368 8072	0.157 5758	0.159 8739
31	0.933 0814	0.932 7035	0.354 3315	0.354 3309	0.151 2845	0.153 5985
Sept. 1	0.939 2279	0.938 8657	0.339 7544	0.339 7537	0.144 9504	0.147 2795
2	0.945 1037	0.944 7573	0.325 0807	0.325 0801	0.138 5753	0.140 9189
3	-0.950 7072	-0.950 3767	+0.310 3148	+0.310 3143	+0.132 1610	+0.134 5184
4	0.956 0370	0.955 7225	0.295 4607	0.295 4603	0.125 7094	0.128 0799
5	0.961 0917	0.960 7932	0.280 5228	0.280 5224	0.119 2222	0.121 6051
6	0.965 8699	0.965 5876	0.265 5051	0.265 5047	0.112 7011	0.115 0958
7	0.970 3704	0.970 1043	0.250 4116	0.250 4112	0.106 1481	0.108 5538
8	0.974 5920	0.974 3422	0.235 2464	0.235 2461	0.099 5646	0.101 9808
9	-0.978 5333	-0.978 2998	+0.220 0134	+0.220 0132	+0.092 9525	+0.095 3783
10	0.982 1930	0.981 9761	0.204 7167	0.204 7165	0.086 3134	0.088 7482
11	0.985 5699	0.985 3695	0.189 3602	0.189 3601	0.079 6490	0.082 0921
12	0.988 6626	0.988 4787	0.173 9480	0.173 9479	0.072 9611	0.075 4117
13	0.991 4695	0.991 3022	0.158 4841	0.158 4841	0.066 2512	0.068 7087
14	0.993 9894	0.993 8388	0.142 9728	0.142 9729	0.059 5214	0.061 9851
15	-0.996 2207	-0.996 0869	+0.127 4185	+0.127 4186	+0.052 7734	+0.055 2425
16	0.998 1624	0.998 0453	0.111 8256	0.111 8257	0.046 0093	0.048 4831
17	0.999 8130	0.999 7127	0.096 1987	0.096 1989	0.039 2310	0.041 7088
18	1.001 1716	1.001 0882	0.080 5424	0.080 5426	0.032 4405	0.034 9216
19	1.002 2373	1.002 1707	0.064 8615	0.064 8618	0.025 6400	0.028 1237
20	1.003 0092	1.002 9594	0.049 1609	0.049 1612	0.018 8316	0.021 3171
21	-1.003 4867	-1.003 4538	+0.033 4453	+0.033 4456	+0.012 0174	+0.014 5039
22	1.003 6694	1.003 6534	0.017 7196	0.017 7200	+0.005 1995	0.007 6865
23	1.003 5569	1.003 5579	+0.001 9887	+0.001 9892	-0.001 6198	+0.000 8668
24	1.003 1492	1.003 1670	-0.013 7424	-0.013 7419	0.008 4384	-0.005 9530
25	1.002 4461	1.002 4809	0.029 4690	0.029 4684	0.015 2543	0.012 7707
26	1.001 4479	1.001 4996	0.045 1861	0.045 1855	0.022 0652	0.019 5841
27	-1.000 1548	-1.000 2233	-0.060 8890	-0.060 8884	-0.028 8691	-0.026 3913
28	0.998 5672	0.998 6525	0.076 5729	0.076 5722	0.035 6638	0.033 1901
29	0.996 6855	0.996 7876	0.092 2330	0.092 2322	0.042 4474	0.039 9784
30	0.994 5104	0.994 6293	0.107 8646	0.107 8638	0.049 2178	0.046 7543
Oct. 1	-0.992 0425	-0.992 1782	-0.123 4631	-0.123 4623	-0.055 9730	-0.053 5156

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MEAN EQUATOR AND EQUINOX OF J 2025.5 AND J 2000.0

Date		X _{2025.5}	X _{2000.0}	Y _{2025.5}	Y _{2000.0}	Z _{2025.5}	Z _{2000.0}
Oct.	1	-0.992 0425	-0.992 1782	-0.123 4631	-0.123 4623	-0.055 9730	-0.053 5156
	2	0.989 2827	0.989 4351	0.139 0239	0.139 0231	0.062 7109	0.060 2605
	3	0.986 2319	0.986 4010	0.154 5425	0.154 5416	0.069 4297	0.066 9870
	4	0.982 8911	0.983 0767	0.170 0144	0.170 0134	0.076 1275	0.073 6931
	5	0.979 2612	0.979 4634	0.185 4352	0.185 4342	0.082 8023	0.080 3770
	6	0.975 3433	0.975 5620	0.200 8007	0.200 7997	0.089 4524	0.087 0369
	7	-0.971 1384	-0.971 3736	-0.216 1067	-0.216 1056	-0.096 0761	-0.093 6711
	8	0.966 6476	0.966 8991	0.231 3489	0.231 3477	0.102 6714	0.100 2777
	9	0.961 8718	0.962 1396	0.246 5232	0.246 5220	0.109 2368	0.106 8549
	10	0.956 8118	0.957 0959	0.261 6254	0.261 6241	0.115 7703	0.113 4011
	11	0.951 4686	0.951 7688	0.276 6512	0.276 6499	0.122 2703	0.119 9144
	12	0.945 8431	0.946 1593	0.291 5963	0.291 5950	0.128 7347	0.126 3928
	13	-0.939 9363	-0.940 2684	-0.306 4562	-0.306 4548	-0.135 1616	-0.132 8344
	14	0.933 7492	0.934 0972	0.321 2263	0.321 2249	0.141 5491	0.139 2374
	15	0.927 2831	0.927 6468	0.335 9020	0.335 9006	0.147 8951	0.145 5995
	16	0.920 5393	0.920 9187	0.350 4787	0.350 4772	0.154 1977	0.151 9188
	17	0.913 5195	0.913 9144	0.364 9517	0.364 9502	0.160 4546	0.158 1933
	18	0.906 2252	0.906 6355	0.379 3163	0.379 3147	0.166 6640	0.164 4208
	19	-0.898 6584	-0.899 0840	-0.393 5678	-0.393 5662	-0.172 8236	-0.170 5992
	20	0.890 8210	0.891 2618	0.407 7015	0.407 6999	0.178 9315	0.176 7267
	21	0.882 7153	0.883 1711	0.421 7129	0.421 7112	0.184 9857	0.182 8010
	22	0.874 3435	0.874 8143	0.435 5974	0.435 5957	0.190 9841	0.188 8202
	23	0.865 7082	0.866 1936	0.449 3504	0.449 3487	0.196 9248	0.194 7824
	24	0.856 8117	0.857 3118	0.462 9676	0.462 9658	0.202 8058	0.200 6855
	25	-0.847 6570	-0.848 1715	-0.476 4445	-0.476 4427	-0.208 6252	-0.206 5277
	26	0.838 2467	0.838 7756	0.489 7769	0.489 7750	0.214 3812	0.212 3071
	27	0.828 5838	0.829 1268	0.502 9605	0.502 9586	0.220 0719	0.218 0218
	28	0.818 6714	0.819 2283	0.515 9912	0.515 9893	0.225 6957	0.223 6702
	29	0.808 5124	0.809 0831	0.528 8650	0.528 8630	0.231 2506	0.229 2504
	30	0.798 1101	0.798 6945	0.541 5780	0.541 5759	0.236 7351	0.234 7607
Nov.	31	-0.787 4678	-0.788 0656	-0.554 1262	-0.554 1242	-0.242 1476	-0.240 1996
	1	0.776 5887	0.777 1998	0.566 5061	0.566 5040	0.247 4863	0.245 5654
	2	0.765 4763	0.766 1004	0.578 7139	0.578 7118	0.252 7499	0.250 8566
	3	0.754 1338	0.754 7708	0.590 7462	0.590 7440	0.257 9369	0.256 0717
	4	0.742 5645	0.743 2143	0.602 5996	0.602 5974	0.263 0458	0.261 2094
	5	0.730 7719	0.731 4341	0.614 2708	0.614 2686	0.268 0753	0.266 2682
	6	-0.718 7589	-0.719 4335	-0.625 7565	-0.625 7542	-0.273 0239	-0.271 2466
	7	0.706 5289	0.707 2156	0.637 0534	0.637 0511	0.277 8904	0.276 1435
	8	0.694 0850	0.694 7835	0.648 1581	0.648 1558	0.282 6732	0.280 9572
	9	0.681 4302	0.682 1404	0.659 0673	0.659 0650	0.287 3709	0.285 6863
	10	0.668 5678	0.669 2895	0.669 7775	0.669 7752	0.291 9820	0.290 3293
	11	0.655 5012	0.656 2341	0.680 2852	0.680 2828	0.296 5049	0.294 8847
	12	-0.642 2338	-0.642 9778	-0.690 5867	-0.690 5843	-0.300 9381	-0.299 3508
	13	0.628 7693	0.629 5241	0.700 6786	0.700 6762	0.305 2801	0.303 7262
	14	0.615 1114	0.615 8768	0.710 5574	0.710 5550	0.309 5292	0.308 0092
	15	0.601 2642	0.602 0399	0.720 2196	0.720 2171	0.313 6839	0.312 1983
	16	-0.587 2317	-0.588 0175	-0.729 6618	-0.729 6593	-0.317 7428	-0.316 2920

SUN, 2025
EQUATORIAL RECTANGULAR CO-ORDINATES FOR 0^h TERRESTRIAL TIME
MEAN EQUATOR AND EQUINOX OF J 2025.5 AND J 2000.0

Date	X _{2025.5}	X _{2000.0}	Y _{2025.5}	Y _{2000.0}	Z _{2025.5}	Z _{2000.0}	
Nov.	16	-0.587 2317	-0.588 0175	-0.729 6618	-0.729 6593	-0.317 7428	-0.316 2920
	17	0.573 0180	0.573 8137	0.738 8806	0.738 8781	0.321 7044	0.320 2889
	18	0.558 6276	0.559 4329	0.747 8730	0.747 8704	0.325 5673	0.324 1875
	19	0.544 0648	0.544 8795	0.756 6356	0.756 6330	0.329 3301	0.327 9864
	20	0.529 3342	0.530 1580	0.765 1655	0.765 1629	0.332 9915	0.331 6844
	21	0.514 4405	0.515 2732	0.773 4597	0.773 4571	0.336 5502	0.335 2800
	22	-0.499 3883	-0.500 2296	-0.781 5155	-0.781 5129	-0.340 0050	-0.338 7721
23	0.484 1825	0.485 0322	0.789 3300	0.789 3274	0.343 3547	0.342 1596	
24	0.468 8280	0.469 6857	0.796 9008	0.796 8982	0.346 5982	0.345 4412	
25	0.453 3297	0.454 1953	0.804 2253	0.804 2227	0.349 7345	0.348 6159	
26	0.437 6927	0.438 5657	0.811 3013	0.811 2986	0.352 7626	0.351 6828	
27	0.421 9218	0.422 8022	0.818 1265	0.818 1238	0.355 6816	0.354 6409	
Dec.	28	-0.406 0223	-0.406 9097	-0.824 6988	-0.824 6961	-0.358 4906	-0.357 4893
	29	0.389 9991	0.390 8932	0.831 0164	0.831 0137	0.361 1888	0.360 2273
	30	0.373 8574	0.374 7580	0.837 0774	0.837 0747	0.363 7756	0.362 8540
	1	0.357 6021	0.358 5089	0.842 8803	0.842 8776	0.366 2501	0.365 3689
	2	0.341 2382	0.342 1509	0.848 4234	0.848 4207	0.368 6119	0.367 7713
	3	0.324 7707	0.325 6889	0.853 7054	0.853 7026	0.370 8604	0.370 0606
	4	-0.308 2041	-0.309 1278	-0.858 7248	-0.858 7220	-0.372 9949	-0.372 2362
	5	0.291 5434	0.292 4721	0.863 4802	0.863 4774	0.375 0150	0.374 2976
	6	0.274 7931	0.275 7265	0.867 9703	0.867 9675	0.376 9200	0.376 2442
	7	0.257 9578	0.258 8957	0.872 1936	0.872 1908	0.378 7094	0.378 0752
8	0.241 0423	0.241 9844	0.876 1487	0.876 1459	0.380 3824	0.379 7902	
9	0.224 0513	0.224 9974	0.879 8339	0.879 8311	0.381 9384	0.381 3883	
10	-0.206 9898	-0.207 9395	-0.883 2479	-0.883 2451	-0.383 3767	-0.382 8689	
11	0.189 8628	0.190 8158	0.886 3891	0.886 3863	0.384 6967	0.384 2313	
12	0.172 6754	0.173 6315	0.889 2562	0.889 2534	0.385 8977	0.385 4749	
13	0.155 4330	0.156 3918	0.891 8479	0.891 8451	0.386 9792	0.386 5991	
14	0.138 1408	0.139 1020	0.894 1630	0.894 1602	0.387 9405	0.387 6034	
15	0.120 8043	0.121 7677	0.896 2005	0.896 1977	0.388 7814	0.388 4872	
16	-0.103 4290	-0.104 3942	-0.897 9592	-0.897 9564	-0.389 5012	-0.389 2501	
17	0.086 0205	0.086 9872	0.899 4385	0.899 4357	0.390 0997	0.389 8917	
18	0.068 5844	0.069 5523	0.900 6376	0.900 6348	0.390 5766	0.390 4118	
19	0.051 1263	0.052 0951	0.901 5558	0.901 5531	0.390 9315	0.390 8100	
20	0.033 6519	0.034 6214	0.902 1928	0.902 1901	0.391 1643	0.391 0861	
21	-0.016 1670	-0.017 1368	0.902 5483	0.902 5455	0.391 2749	0.391 2400	
22	+0.001 3227	+0.000 3528	-0.902 6219	-0.902 6192	-0.391 2632	-0.391 2716	
23	0.018 8114	0.017 8418	0.902 4138	0.902 4111	0.391 1292	0.391 1810	
24	0.036 2934	0.035 3244	0.901 9240	0.901 9213	0.390 8731	0.390 9682	
25	0.053 7629	0.052 7948	0.901 1529	0.901 1501	0.390 4950	0.390 6334	
26	0.071 2144	0.070 2475	0.900 1007	0.900 0980	0.389 9951	0.390 1767	
27	0.088 6421	0.087 6767	0.898 7682	0.898 7655	0.389 3738	0.389 5985	
28	+0.106 0406	+0.105 0770	-0.897 1560	-0.897 1533	-0.388 6312	-0.388 8991	
29	0.123 4044	0.122 4429	0.895 2648	0.895 2621	0.387 7680	0.388 0789	
30	0.140 7282	0.139 7690	0.893 0957	0.893 0931	0.386 7845	0.387 1383	
31	0.158 0068	0.157 0503	0.890 6497	0.890 6470	0.385 6812	0.386 0778	
32	+0.175 2350	+0.174 2815	-0.887 9277	-0.887 9251	-0.384 4586	-0.384 8978	

SUN, 2025
EPHEMERIS FOR PHYSICAL OBSERVATIONS
FOR 0^h TERRESTRIAL TIME

Date		Position Angle of Axis P	Heliographic		Date		Position Angle of Axis P	Heliographic	
			Latitude B_0	Longitude L_0				Latitude B_0	Longitude L_0
		°	°	°			°	°	°
Jan.	0	+2.43	-2.91	89.85	Feb.	15	-17.45	-6.83	204.14
	1	1.94	3.03	76.68		16	17.78	6.87	190.97
	2	1.46	3.14	63.51		17	18.10	6.91	177.81
	3	0.97	3.26	50.34		18	18.42	6.95	164.64
	4	+0.49	3.37	37.17		19	18.74	6.99	151.47
	5	0.00	3.49	24.00		20	19.05	7.02	138.30
	6	-0.48	-3.60	10.83		21	-19.35	-7.05	125.13
	7	0.96	3.71	357.66		22	19.65	7.08	111.96
	8	1.44	3.82	344.49		23	19.94	7.11	98.79
	9	1.92	3.93	331.33		24	20.22	7.13	85.62
	10	2.40	4.04	318.16		25	20.50	7.15	72.45
	11	2.88	4.14	304.99		26	20.77	7.17	59.28
	12	-3.35	-4.25	291.82	Mar.	27	-21.04	-7.19	46.11
	13	3.83	4.35	278.65		28	21.30	7.21	32.94
	14	4.30	4.46	265.48		1	21.55	7.22	19.76
	15	4.77	4.56	252.31		2	21.80	7.23	6.59
	16	5.23	4.66	239.15		3	22.04	7.24	353.42
	17	5.69	4.75	225.98		4	22.28	7.25	340.25
	18	-6.16	-4.85	212.81		5	-22.51	-7.25	327.07
	19	6.61	4.95	199.64		6	22.73	7.25	313.90
	20	7.07	5.04	186.48		7	22.94	7.25	300.72
	21	7.52	5.13	173.31		8	23.15	7.25	287.55
	22	7.97	5.22	160.14		9	23.36	7.24	274.37
	23	8.41	5.31	146.98		10	23.55	7.24	261.19
	24	-8.86	-5.40	133.81		11	-23.74	-7.23	248.01
	25	9.29	5.48	120.64		12	23.92	7.22	234.84
	26	9.73	5.56	107.48		13	24.10	7.20	221.66
	27	10.16	5.65	94.31		14	24.27	7.19	208.48
	28	10.58	5.73	81.15		15	24.43	7.17	195.30
	29	11.01	5.80	67.98		16	24.59	7.15	182.12
	30	-11.42	-5.88	54.81		17	-24.74	-7.13	168.93
	31	11.84	5.95	41.65		18	24.88	7.10	155.75
Feb.	1	12.25	6.03	28.48		19	25.01	7.08	142.57
	2	12.65	6.10	15.32		20	25.14	7.05	129.39
	3	13.05	6.17	2.15		21	25.26	7.02	116.20
	4	13.44	6.23	348.98		22	25.38	6.99	103.02
	5	-13.83	-6.30	335.82		23	-25.49	-6.95	89.83
	6	14.22	6.36	322.65		24	25.59	6.91	76.65
	7	14.60	6.42	309.48		25	25.68	6.88	63.46
	8	14.97	6.48	296.32		26	25.77	6.83	50.27
	9	15.34	6.54	283.15		27	25.85	6.79	37.09
	10	15.71	6.59	269.98		28	25.92	6.75	23.90
	11	-16.07	-6.64	256.82		29	-25.99	-6.70	10.71
	12	16.42	6.69	243.65		30	26.05	6.65	357.52
	13	16.77	6.74	230.48		31	26.10	6.60	344.33
	14	17.11	6.79	217.31	Apr.	1	26.14	6.55	331.14
	15	-17.45	-6.83	204.14		2	-26.18	-6.49	317.94

SUN, 2025
EPHEMERIS FOR PHYSICAL OBSERVATIONS
FOR 0^h TERRESTRIAL TIME

Date		Position Angle of Axis <i>P</i>	Heliographic		Date		Position Angle of Axis <i>P</i>	Heliographic	
			Latitude <i>B</i> ₀	Longitude <i>L</i> ₀				Latitude <i>B</i> ₀	Longitude <i>L</i> ₀
		°	°	°			°	°	°
Apr.	1	-26.14	-6.55	331.14	May	17	-20.33	-2.44	83.46
	2	26.18	6.49	317.94		18	20.04	2.33	70.23
	3	26.21	6.44	304.75		19	19.75	2.21	57.00
	4	26.23	6.38	291.56		20	19.44	2.10	43.77
	5	26.25	6.32	278.36		21	19.13	1.98	30.54
	6	26.25	6.25	265.16		22	18.82	1.86	17.32
	7	-26.26	-6.19	251.97		23	-18.49	-1.75	4.09
	8	26.25	6.12	238.77		24	18.17	1.63	350.86
	9	26.24	6.06	225.57		25	17.83	1.51	337.63
	10	26.21	5.99	212.37		26	17.49	1.39	324.40
	11	26.19	5.92	199.17		27	17.15	1.27	311.17
	12	26.15	5.84	185.97		28	16.80	1.15	297.93
	13	-26.11	-5.77	172.77	June	29	-16.44	-1.03	284.70
	14	26.06	5.69	159.57		30	16.08	0.91	271.47
	15	26.00	5.61	146.36		31	15.72	0.79	258.24
	16	25.94	5.54	133.16		1	15.34	0.67	245.00
	17	25.86	5.45	119.95		2	14.97	0.55	231.77
	18	25.78	5.37	106.75		3	14.59	0.43	218.54
	19	-25.70	-5.29	93.54		4	-14.20	-0.31	205.30
	20	25.60	5.20	80.33		5	13.81	0.19	192.07
	21	25.50	5.12	67.13		6	13.42	-0.07	178.83
	22	25.39	5.03	53.92		7	13.02	+0.05	165.60
	23	25.28	4.94	40.71		8	12.62	0.17	152.36
	24	25.15	4.85	27.50		9	12.21	0.30	139.13
	25	-25.02	-4.76	14.29		10	-11.80	+0.42	125.89
	26	24.88	4.66	1.07		11	11.39	0.54	112.66
	27	24.74	4.57	347.86		12	10.97	0.66	99.42
	28	24.58	4.47	334.65		13	10.55	0.78	86.18
	29	24.42	4.37	321.43		14	10.13	0.90	72.95
	30	24.26	4.27	308.22		15	9.70	1.02	59.71
May	1	-24.08	-4.17	295.00		16	-9.27	+1.14	46.47
	2	23.90	4.07	281.79		17	8.84	1.25	33.24
	3	23.71	3.97	268.57		18	8.41	1.37	20.00
	4	23.51	3.87	255.35		19	7.97	1.49	6.76
	5	23.31	3.76	242.13		20	7.53	1.61	353.52
	6	23.10	3.66	228.92		21	7.09	1.73	340.29
	7	-22.88	-3.55	215.70		22	-6.65	+1.84	327.05
	8	22.66	3.44	202.47		23	6.20	1.96	313.82
	9	22.43	3.34	189.25		24	5.75	2.07	300.58
	10	22.19	3.23	176.03		25	5.31	2.19	287.34
	11	21.94	3.12	162.81		26	4.86	2.30	274.11
	12	21.69	3.01	149.58		27	4.41	2.42	260.87
	13	-21.43	-2.90	136.36	July	28	-3.96	+2.53	247.63
	14	21.17	2.78	123.13		29	3.50	2.64	234.40
	15	20.90	2.67	109.91		30	3.05	2.76	221.16
	16	20.62	2.56	96.68		1	2.60	2.87	207.93
	17	-20.33	-2.44	83.46		2	-2.14	+2.98	194.69

SUN, 2025
EPHEMERIS FOR PHYSICAL OBSERVATIONS
FOR 0^h TERRESTRIAL TIME

Date		Position Angle of Axis P	Heliographic		Date		Position Angle of Axis P	Heliographic	
			Latitude B_0	Longitude L_0				Latitude B_0	Longitude L_0
		°	°	°			°	°	°
July	1	-2.60	+2.87	207.93	Aug.	16	+16.38	+6.69	319.41
	2	2.14	2.98	194.69		17	16.71	6.73	306.19
	3	1.69	3.09	181.45		18	17.04	6.78	292.97
	4	1.24	3.20	168.22		19	17.36	6.82	279.76
	5	0.78	3.30	154.98		20	17.68	6.86	266.54
	6	-0.33	3.41	141.75		21	17.99	6.90	253.33
	7	+0.12	+3.52	128.51		22	+18.30	+6.94	240.11
	8	0.57	3.62	115.28		23	18.60	6.97	226.90
	9	1.02	3.72	102.04		24	18.90	7.00	213.68
	10	1.47	3.83	88.81		25	19.19	7.03	200.47
	11	1.92	3.93	75.57		26	19.48	7.06	187.26
	12	2.37	4.03	62.34		27	19.76	7.09	174.05
	13	+2.82	+4.13	49.10	Sept.	28	+20.04	+7.12	160.84
	14	3.26	4.23	35.87		29	20.31	7.14	147.62
	15	3.70	4.33	22.64		30	20.57	7.16	134.41
	16	4.15	4.42	9.40		31	20.83	7.18	121.20
	17	4.59	4.52	356.17		1	21.09	7.19	107.99
	18	5.02	4.61	342.94		2	21.34	7.21	94.78
	19	+5.46	+4.70	329.71		3	+21.58	+7.22	81.58
	20	5.89	4.79	316.48		4	21.82	7.23	68.37
	21	6.32	4.88	303.25		5	22.05	7.24	55.16
	22	6.75	4.97	290.02		6	22.28	7.25	41.95
	23	7.18	5.06	276.79		7	22.50	7.25	28.75
	24	7.60	5.15	263.56		8	22.72	7.25	15.54
	25	+8.02	+5.23	250.33		9	+22.93	+7.25	2.33
	26	8.44	5.31	237.10		10	23.13	7.25	349.13
	27	8.86	5.40	223.87		11	23.33	7.25	335.92
	28	9.27	5.48	210.65		12	23.52	7.24	322.72
	29	9.68	5.55	197.42		13	23.70	7.23	309.51
	30	10.08	5.63	184.19		14	23.88	7.22	296.31
Aug.	31	+10.48	+5.71	170.97		15	+24.06	+7.21	283.11
	1	10.88	5.78	157.74		16	24.22	7.19	269.91
	2	11.28	5.85	144.51		17	24.38	7.18	256.70
	3	11.67	5.92	131.29		18	24.54	7.16	243.50
	4	12.05	5.99	118.07		19	24.69	7.14	230.30
	5	12.44	6.06	104.84		20	24.83	7.11	217.10
	6	+12.82	+6.13	91.62		21	+24.96	+7.09	203.90
	7	13.19	6.19	78.39		22	25.09	7.06	190.70
	8	13.56	6.25	65.17		23	25.22	7.03	177.51
	9	13.93	6.31	51.95		24	25.33	7.00	164.31
	10	14.29	6.37	38.73		25	25.44	6.97	151.11
	11	14.65	6.43	25.51		26	25.54	6.93	137.91
	12	+15.01	+6.48	12.29	Oct.	27	+25.64	+6.89	124.71
	13	15.36	6.54	359.07		28	25.73	6.85	111.52
	14	15.70	6.59	345.85		29	25.81	6.81	98.32
	15	16.04	6.64	332.63		30	25.89	6.77	85.12
	16	+16.38	+6.69	319.41		1	+25.96	+6.72	71.93

SUN, 2025
EPHEMERIS FOR PHYSICAL OBSERVATIONS
FOR 0^h TERRESTRIAL TIME

Date		Position Angle of Axis <i>P</i>	Heliographic		Date		Position Angle of Axis <i>P</i>	Heliographic	
			Latitude <i>B₀</i>	Longitude <i>L₀</i>				Latitude <i>B₀</i>	Longitude <i>L₀</i>
		°	°	°			°	°	°
Oct.	1	+25.96	+6.72	71.93	Nov.	16	+21.05	+2.74	185.24
	2	26.02	6.67	58.73		17	20.77	2.62	172.06
	3	26.07	6.62	45.54		18	20.47	2.50	158.88
	4	26.12	6.57	32.34		19	20.17	2.38	145.70
	5	26.16	6.52	19.15		20	19.86	2.26	132.52
	6	26.19	6.46	5.95		21	19.54	2.14	119.33
	7	+26.22	+6.41	352.76		22	+19.22	+2.01	106.15
	8	26.24	6.35	339.56		23	18.89	1.89	92.97
	9	26.25	6.28	326.37		24	18.55	1.77	79.79
	10	26.26	6.22	313.18		25	18.21	1.64	66.61
	11	26.25	6.16	299.99		26	17.86	1.52	53.43
	12	26.24	6.09	286.79		27	17.50	1.39	40.25
	13	+26.22	+6.02	273.60	Dec.	28	+17.14	+1.27	27.07
	14	26.20	5.95	260.41		29	16.77	1.14	13.89
	15	26.17	5.88	247.22		30	16.39	1.02	0.71
	16	26.13	5.80	234.03		1	16.01	0.89	347.53
	17	26.08	5.73	220.84		2	15.62	0.76	334.35
	18	26.02	5.65	207.65		3	15.23	0.63	321.18
	19	+25.96	+5.57	194.46		4	+14.83	+0.51	308.00
	20	25.89	5.49	181.27		5	14.43	0.38	294.82
	21	25.81	5.40	168.08		6	14.02	0.25	281.64
	22	25.73	5.32	154.89		7	13.60	+0.12	268.46
	23	25.63	5.23	141.70		8	13.18	-0.01	255.29
	24	25.53	5.14	128.51		9	12.75	0.13	242.11
	25	+25.42	+5.05	115.33		10	+12.32	-0.26	228.93
	26	25.31	4.96	102.14		11	11.89	0.39	215.75
	27	25.18	4.87	88.95		12	11.45	0.52	202.58
	28	25.05	4.78	75.76		13	11.01	0.65	189.40
	29	24.91	4.68	62.58		14	10.56	0.77	176.23
	30	24.76	4.58	49.39		15	10.11	0.90	163.05
	31	+24.61	+4.48	36.20		16	+9.66	-1.03	149.88
Nov.	1	24.44	4.38	23.01		17	9.20	1.16	136.70
	2	24.27	4.28	9.83		18	8.74	1.28	123.53
	3	24.09	4.18	356.64		19	8.27	1.41	110.35
	4	23.90	4.08	343.46		20	7.81	1.53	97.18
	5	23.71	3.97	330.27		21	7.34	1.66	84.01
	6	+23.51	+3.86	317.08		22	+6.86	-1.78	70.83
	7	23.30	3.76	303.90		23	6.39	1.91	57.66
	8	23.08	3.65	290.71		24	5.91	2.03	44.49
	9	22.85	3.54	277.53		25	5.44	2.16	31.32
	10	22.62	3.43	264.34		26	4.96	2.28	18.14
	11	22.38	3.31	251.16		27	4.48	2.40	4.97
	12	+22.13	+3.20	237.98		28	+3.99	-2.52	351.80
	13	21.87	3.09	224.79		29	3.51	2.64	338.63
	14	21.60	2.97	211.61		30	3.03	2.76	325.46
	15	21.33	2.85	198.43		31	2.54	2.88	312.29
	16	+21.05	+2.74	185.24		32	+2.06	-3.00	299.12

MOON, 2025**UNIVERSAL TIME****PHASES OF THE MOON**

Lunation	New Moon			First Quarter			Full Moon			Last Quarter		
		d	h	m		d	h	m		d	h	m
1262	Dec.'24	30	22	27	Jan.	6	23	56	Jan.	13	22	27
1263	Jan.'25	29	12	36	Feb.	5	08	02	Feb.	12	13	53
1264	Feb.	28	00	45	Mar.	6	16	32	Mar.	14	06	55
1265	Mar.	29	10	58	Apr.	5	02	15	Apr.	13	00	22
1266	Apr.	27	19	31	May	4	13	52	May	12	16	56
1267	May	27	03	02	June	3	03	41	June	11	07	44
1268	June	25	10	32	July	2	19	30	July	10	20	37
1269	July	24	19	11	Aug.	1	12	41	Aug.	9	07	55
1270	Aug.	23	06	06	Aug.	31	06	25	Sept.	7	18	09
1271	Sept.	21	19	54	Sept.	29	23	54	Oct.	7	03	48
1272	Oct.	21	12	25	Oct.	29	16	21	Nov.	5	13	19
1273	Nov.	20	06	47	Nov.	28	06	59	Dec.'25	4	23	14
1274	Dec.	20	01	43	Dec.	27	19	10	Jan.'26	3	10	03

MOON AT PERIGEE

	d	h		d	h		d	h
Dec.'24	12	13	Apr.	27	16	Sept.	10	12
Jan.'25	8	00	May	26	02	Oct.	8	13
Feb.	2	03	June	23	05	Nov.	5	22
Mar.	1	21	July	20	14	Dec.'25	4	11
Mar.	30	05	Aug.	14	18	Jan.'26	1	22

MOON AT APOGEE

	d	h		d	h		d	h
Dec.'24	24	07	May	11	01	Sept.	26	10
Jan.'25	21	04	June	7	11	Oct.	23	23
Feb.	18	01	July	5	02	Nov.	20	03
Mar.	17	17	Aug.	1	21	Dec.'25	17	06
Apr.	13	23	Aug.	29	16	Jan.'26	13	21

MOON, 2025
MEAN EQUATOR, ORBIT, LONGITUDE AND ELONGATION

Date		Mean Equator			Orbit Perigee			Node			Mean Longitude			Mean Elongation
		<i>i</i>	Δ	Ω'	Γ'			Ω			ζ			D
		°	°	°	°	'	"	°	'	"	°	'	"	°
Jan.	1	20.796	181.312	0.204	380	38	01.9	+1	29	50.6	298	34	51.4	197.667
	11	20.775	180.737	0.253	381	44	52.5	0	58	04.2	70	20	41.7	319.574
	21	20.753	180.161	0.303	382	51	43.0	+0	26	17.9	202	06	32.0	81.481
	31	20.731	179.585	0.353	383	58	33.5	-1	54	31.6	333	52	22.3	203.389
Feb.	10	20.709	179.009	0.404	385	05	24.0	1	22	45.2	105	38	12.5	325.296
	20	20.686	178.433	0.455	386	12	14.5	2	50	58.9	237	24	02.8	87.204
Mar.	2	20.664	177.856	0.506	387	19	05.1	-2	19	12.6	9	09	53.1	209.111
	12	20.642	177.279	0.557	388	25	55.6	3	47	26.2	140	55	43.4	331.019
	22	20.619	176.702	0.609	389	32	46.1	3	15	39.9	272	41	33.6	92.926
Apr.	1	20.597	176.125	0.661	390	39	36.6	4	43	53.6	44	27	23.9	214.833
	11	20.574	175.547	0.713	391	46	27.2	4	12	07.2	176	13	14.2	336.741
	21	20.552	174.969	0.766	392	53	17.7	5	40	20.9	307	59	04.4	98.648
May	1	20.529	174.391	0.819	394	00	08.2	-5	08	34.5	79	44	54.7	220.556
	11	20.506	173.812	0.872	395	06	58.7	6	36	48.2	211	30	45.0	342.463
	21	20.483	173.233	0.925	396	13	49.2	6	05	01.9	343	16	35.3	104.370
	31	20.460	172.654	0.979	397	20	39.8	7	33	15.5	115	02	25.5	226.278
June	10	20.437	172.075	1.033	398	27	30.3	7	01	29.2	246	48	15.8	348.185
	20	20.414	171.495	1.087	399	34	20.8	8	29	42.9	18	34	06.1	110.093
July	30	20.391	170.915	1.142	400	41	11.3	-9	57	56.5	150	19	56.4	232.000
	10	20.367	170.335	1.197	401	48	01.9	9	26	10.2	282	05	46.6	353.907
	20	20.344	169.754	1.252	402	54	52.4	10	54	23.9	53	51	36.9	115.815
	30	20.321	169.174	1.308	404	01	42.9	10	22	37.5	185	37	27.2	237.722
Aug.	9	20.297	168.593	1.364	405	08	33.4	11	50	51.2	317	23	17.4	359.630
	19	20.273	168.011	1.420	406	15	23.9	11	19	04.9	89	09	07.7	121.537
Sept.	29	20.250	167.430	1.476	407	22	14.5	-12	47	18.5	220	54	58.0	243.444
	8	20.226	166.848	1.533	408	29	05.0	12	15	32.2	352	40	48.3	5.352
	18	20.202	166.266	1.590	409	35	55.5	13	43	45.9	124	26	38.5	127.259
	28	20.178	165.683	1.647	410	42	46.0	13	11	59.5	256	12	28.8	249.167
Oct.	8	20.154	165.101	1.705	411	49	36.6	14	40	13.2	27	58	19.1	11.074
	18	20.130	164.518	1.762	412	56	27.1	14	08	26.9	159	44	09.4	132.982
Nov.	28	20.106	163.935	1.821	414	03	17.6	-15	36	40.5	291	29	59.6	254.889
	7	20.081	163.351	1.879	415	10	08.1	15	04	54.2	63	15	49.9	16.796
	17	20.057	162.767	1.938	416	16	58.6	16	33	07.9	195	01	40.2	138.704
	27	20.032	162.183	1.997	417	23	49.2	16	01	21.5	326	47	30.4	260.611
Dec.	7	20.008	161.599	2.056	418	30	39.7	17	29	35.2	98	33	20.7	22.519
	17	19.983	161.014	2.116	419	37	30.2	18	57	48.9	230	19	11.0	144.426
	27	19.959	160.430	2.176	420	44	20.7	-18	26	02.5	2	05	01.3	266.333
	37	19.934	159.844	2.236	421	51	11.3	19	54	16.2	133	50	51.5	28.241
	47	19.909	159.259	2.297	422	58	01.8	-19	22	29.8	265	36	41.8	150.148

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
Jan.	0.0	280	34	19.0	-4	56	02.4	2.5760	15	29.95
	0.5	287	12	29.7	4	48	20.8	2.5636	15	34.46
	1.0	293	54	10.2	4	36	37.0	2.5518	15	38.77
	1.5	300	39	01.1	4	20	55.0	2.5407	15	42.85
	2.0	307	26	41.7	4	01	23.4	2.5305	15	46.65
	2.5	314	16	51.2	3	38	15.2	2.5212	15	50.14
	3.0	321	09	09.8	-3	11	47.8	2.5128	15	53.32
	3.5	328	03	19.0	2	42	22.4	2.5054	15	56.16
	4.0	334	59	03.0	2	10	24.0	2.4988	15	58.68
	4.5	341	56	08.4	1	36	20.7	2.4930	16	00.89
	5.0	348	54	24.8	1	00	42.8	2.4881	16	02.78
	5.5	355	53	44.3	-0	24	03.0	2.4840	16	04.38
	6.0	2	54	01.1	+0	13	05.1	2.4806	16	05.70
	6.5	9	55	10.9	0	50	06.8	2.4780	16	06.73
	7.0	16	57	10.0	1	26	27.3	2.4760	16	07.49
	7.5	23	59	54.2	2	01	32.4	2.4748	16	07.95
	8.0	31	03	18.2	2	34	48.6	2.4744	16	08.11
	8.5	38	07	14.2	3	05	43.9	2.4749	16	07.94
	9.0	45	11	31.1	+3	33	48.7	2.4762	16	07.43
	9.5	52	15	54.3	3	58	35.8	2.4785	16	06.53
	10.0	59	20	05.2	4	19	41.8	2.4818	16	05.23
	10.5	66	23	40.8	4	36	47.0	2.4863	16	03.49
	11.0	73	26	14.8	4	49	36.4	2.4920	16	01.30
	11.5	80	27	17.5	4	58	00.1	2.4989	15	58.65
	12.0	87	26	17.4	+5	01	53.3	2.5070	15	55.53
	12.5	94	22	42.1	5	01	16.6	2.5164	15	51.97
	13.0	101	15	59.8	4	56	15.9	2.5270	15	47.99
	13.5	108	05	40.7	4	47	01.9	2.5386	15	43.63
	14.0	114	51	18.4	4	33	49.6	2.5513	15	38.95
	14.5	121	32	31.0	4	16	57.7	2.5647	15	34.03
	15.0	128	09	01.7	+3	56	47.6	2.5787	15	28.95
	15.5	134	40	40.3	3	33	42.8	2.5932	15	23.79
	16.0	141	07	22.5	3	08	07.8	2.6077	15	18.64
	16.5	147	29	10.8	2	40	27.7	2.6221	15	13.60
	17.0	153	46	13.9	2	11	07.5	2.6360	15	08.76
	17.5	159	58	46.4	1	40	31.2	2.6493	15	04.21
	18.0	166	07	08.6	+1	09	02.2	2.6616	15	00.03
	18.5	172	11	45.4	0	37	02.4	2.6727	14	56.30
	19.0	178	13	06.0	+0	04	52.6	2.6823	14	53.09
	19.5	184	11	43.4	-0	27	07.9	2.6902	14	50.45
	20.0	190	08	13.1	0	58	40.9	2.6963	14	48.44
	20.5	196	03	13.2	1	29	29.0	2.7004	14	47.10
	21.0	201	57	23.5	-1	59	16.0	2.7024	14	46.45
	21.5	207	51	24.5	2	27	45.9	2.7022	14	46.52
	22.0	213	45	57.4	2	54	43.5	2.6998	14	47.30
	22.5	219	41	43.2	3	19	53.5	2.6952	14	48.81
	23.0	225	39	22.2	-3	43	00.9	2.6885	14	51.03

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
Jan.	23.0	225	39	22.2	-3	43	00.9	2.6885	14	51.03
	23.5	231	39	32.9	4	03	50.3	2.6797	14	53.94
	24.0	237	42	52.1	4	22	06.5	2.6691	14	57.49
	24.5	243	49	53.6	4	37	34.2	2.6568	15	01.65
	25.0	250	01	07.4	4	49	58.2	2.6431	15	06.34
	25.5	256	16	59.4	4	59	03.6	2.6281	15	11.50
	26.0	262	37	50.2	-5	04	36.4	2.6123	15	17.03
	26.5	269	03	54.7	5	06	23.6	2.5958	15	22.85
	27.0	275	35	21.2	5	04	14.5	2.5790	15	28.85
	27.5	282	12	11.3	4	58	00.6	2.5623	15	34.90
	28.0	288	54	19.1	4	47	37.0	2.5460	15	40.89
	28.5	295	41	32.2	4	33	02.7	2.5304	15	46.69
	29.0	302	33	30.9	-4	14	21.7	2.5158	15	52.19
	29.5	309	29	49.8	3	51	42.9	2.5024	15	57.27
	30.0	316	29	58.3	3	25	21.3	2.4906	16	01.84
	30.5	323	33	21.9	2	55	37.2	2.4803	16	05.81
	31.0	330	39	23.7	2	22	56.3	2.4719	16	09.11
	31.5	337	47	26.0	1	47	49.3	2.4653	16	11.71
Feb.	1.0	344	56	51.2	-1	10	50.7	2.4605	16	13.60
	1.5	352	07	03.8	0	32	38.1	2.4575	16	14.76
	2.0	359	17	31.1	+0	06	09.4	2.4563	16	15.24
	2.5	6	27	43.6	0	44	51.8	2.4568	16	15.08
	3.0	13	37	16.1	1	22	49.7	2.4586	16	14.33
	3.5	20	45	47.3	1	59	25.5	2.4619	16	13.06
	4.0	27	52	59.9	+2	34	03.7	2.4662	16	11.33
	4.5	34	58	39.9	3	06	11.9	2.4716	16	09.22
	5.0	42	02	36.0	3	35	21.5	2.4778	16	06.80
	5.5	49	04	39.4	4	01	07.4	2.4847	16	04.11
	6.0	56	04	42.5	4	23	09.0	2.4922	16	01.20
	6.5	63	02	38.4	4	41	09.7	2.5002	15	58.12
	7.0	69	58	20.6	+4	54	57.3	2.5087	15	54.90
	7.5	76	51	42.2	5	04	23.9	2.5175	15	51.55
	8.0	83	42	35.6	5	09	25.5	2.5267	15	48.09
	8.5	90	30	52.7	5	10	02.8	2.5362	15	44.53
	9.0	97	16	24.5	5	06	20.1	2.5461	15	40.87
	9.5	103	59	01.8	4	58	25.5	2.5563	15	37.12
	10.0	110	38	34.9	+4	46	30.9	2.5668	15	33.29
	10.5	117	14	54.8	4	30	51.2	2.5776	15	29.38
	11.0	123	47	52.9	4	11	44.2	2.5886	15	25.41
	11.5	130	17	22.1	3	49	30.1	2.5999	15	21.40
	12.0	136	43	17.1	3	24	30.8	2.6113	15	17.37
	12.5	143	05	35.1	2	57	09.8	2.6227	15	13.37
	13.0	149	24	15.8	+2	27	51.2	2.6341	15	09.43
	13.5	155	39	22.1	1	56	59.7	2.6452	15	05.60
	14.0	161	51	00.1	1	24	59.4	2.6560	15	01.93
	14.5	167	59	19.4	0	52	14.5	2.6662	14	58.47
	15.0	174	04	33.2	+0	19	07.8	2.6757	14	55.29

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
Feb.	15.0	174	04	33.2	+0	19	07.8	2.6757	14	55.29
	15.5	180	06	58.0	-0	13	58.6	2.6842	14	52.44
	16.0	186	06	53.7	0	46	43.9	2.6917	14	49.98
	16.5	192	04	43.5	-1	18	48.5	2.6978	14	47.97
	17.0	198	00	53.3	1	49	54.1	2.7024	14	46.45
	17.5	203	55	52.0	2	19	43.6	2.7053	14	45.49
	18.0	209	50	10.8	-2	48	00.7	2.7065	14	45.11
	18.5	215	44	22.8	3	14	30.3	2.7057	14	45.37
	19.0	221	39	03.2	3	38	57.8	2.7029	14	46.29
	19.5	227	34	48.1	4	01	09.1	2.6980	14	47.90
	20.0	233	32	14.8	4	20	50.8	2.6910	14	50.21
	20.5	239	32	00.8	4	37	49.4	2.6819	14	53.22
	21.0	245	34	43.5	-4	51	52.0	2.6708	14	56.92
	21.5	251	40	59.3	5	02	45.5	2.6578	15	01.30
	22.0	257	51	23.2	5	10	17.4	2.6431	15	06.33
	22.5	264	06	27.8	5	14	15.6	2.6268	15	11.94
	23.0	270	26	42.6	5	14	28.8	2.6093	15	18.09
	23.5	276	52	32.8	5	10	47.1	2.5907	15	24.67
	24.0	283	24	18.4	-5	03	02.3	2.5714	15	31.60
	24.5	290	02	13.5	4	51	08.7	2.5518	15	38.75
	25.0	296	46	24.8	4	35	04.0	2.5323	15	45.98
	25.5	303	36	51.6	4	14	50.1	2.5133	15	53.16
	26.0	310	33	24.5	3	50	34.0	2.4951	16	00.10
	26.5	317	35	45.4	3	22	28.3	2.4782	16	06.66
Mar.	27.0	324	43	27.8	-2	50	51.9	2.4629	16	12.66
	27.5	331	55	56.8	2	16	10.3	2.4495	16	17.95
	28.0	339	12	30.4	1	38	55.2	2.4384	16	22.40
	28.5	346	32	20.5	0	59	44.1	2.4298	16	25.89
	1.0	353	54	34.9	-0	19	18.8	2.4238	16	28.35
	1.5	1	18	18.6	+0	21	35.3	2.4204	16	29.73
	2.0	8	42	36.4	+1	02	11.8	2.4196	16	30.04
	2.5	16	06	34.1	1	41	44.3	2.4215	16	29.29
	3.0	23	29	21.0	2	19	28.7	2.4257	16	27.57
	3.5	30	50	10.6	2	54	44.7	2.4321	16	24.96
	4.0	38	08	22.4	3	26	56.4	2.4405	16	21.58
	4.5	45	23	22.0	3	55	33.9	2.4505	16	17.56
	5.0	52	34	41.7	+4	20	13.4	2.4619	16	13.04
	5.5	59	42	00.5	4	40	37.1	2.4744	16	08.13
	6.0	66	45	03.5	4	56	33.1	2.4876	16	02.97
	6.5	73	43	41.7	5	07	55.2	2.5014	15	57.66
	7.0	80	37	51.2	5	14	41.9	2.5155	15	52.30
	7.5	87	27	32.0	5	16	56.3	2.5297	15	46.97
	8.0	94	12	47.9	+5	14	45.2	2.5438	15	41.73
	8.5	100	53	45.0	5	08	18.7	2.5576	15	36.62
	9.0	107	30	31.6	4	57	49.5	2.5712	15	31.69
	9.5	114	03	17.2	4	43	32.9	2.5843	15	26.95
	10.0	120	32	12.2	+4	25	45.9	2.5970	15	22.43

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
Mar.	10.0	120	32	12.2	+4	25	45.9	2.5970	15	22.43
	10.5	126	57	27.3	4	04	47.4	2.6092	15	18.11
	11.0	133	19	13.5	3	40	57.4	2.6209	15	14.02
	11.5	139	37	41.8	3	14	37.1	2.6320	15	10.14
	12.0	145	53	03.0	2	46	08.6	2.6427	15	06.48
	12.5	152	05	28.0	2	15	54.3	2.6527	15	03.04
	13.0	158	15	07.6	+1	44	17.4	2.6623	14	59.81
	13.5	164	22	12.9	1	11	40.7	2.6712	14	56.81
	14.0	170	26	55.4	0	38	27.0	2.6794	14	54.05
	14.5	176	29	27.0	+0	04	58.8	2.6870	14	51.54
	15.0	182	30	00.5	-0	28	22.2	2.6937	14	49.30
	15.5	188	28	49.9	1	01	14.8	2.6996	14	47.37
	16.0	194	26	10.1	-1	33	19.1	2.7045	14	45.76
	16.5	200	22	17.8	2	04	16.0	2.7083	14	44.51
	17.0	206	17	31.0	2	33	47.5	2.7109	14	43.66
	17.5	212	12	09.6	3	01	36.9	2.7122	14	43.25
	18.0	218	06	35.3	3	27	28.4	2.7120	14	43.30
	18.5	224	01	11.6	3	51	07.4	2.7103	14	43.87
	19.0	229	56	23.9	-4	12	20.3	2.7069	14	44.98
	19.5	235	52	39.3	4	30	54.1	2.7017	14	46.68
	20.0	241	50	26.6	4	46	37.1	2.6947	14	48.97
	20.5	247	50	16.2	4	59	17.9	2.6859	14	51.90
	21.0	253	52	39.6	5	08	46.0	2.6752	14	55.47
	21.5	259	58	09.1	5	14	51.5	2.6626	14	59.69
	22.0	266	07	17.4	-5	17	25.2	2.6483	15	04.56
	22.5	272	20	37.1	5	16	18.7	2.6323	15	10.04
	23.0	278	38	40.0	5	11	24.7	2.6149	15	16.12
	23.5	285	01	56.1	5	02	37.5	2.5961	15	22.74
	24.0	291	30	53.1	4	49	52.8	2.5763	15	29.83
	24.5	298	05	54.8	4	33	09.3	2.5558	15	37.29
	25.0	304	47	20.7	-4	12	28.2	2.5349	15	45.01
	25.5	311	35	23.8	3	47	55.0	2.5140	15	52.86
	26.0	318	30	10.5	3	19	39.8	2.4936	16	00.68
	26.5	325	31	38.6	2	47	57.9	2.4740	16	08.29
	27.0	332	39	36.7	2	13	10.9	2.4557	16	15.51
	27.5	339	53	43.2	1	35	46.6	2.4391	16	22.15
	28.0	347	13	26.4	-0	56	19.5	2.4246	16	28.00
	28.5	354	38	04.0	-0	15	29.8	2.4127	16	32.90
	29.0	2	06	44.4	+0	25	57.3	2.4035	16	36.70
	29.5	9	38	27.7	1	07	13.2	2.3973	16	39.26
	30.0	17	12	07.6	1	47	27.8	2.3943	16	40.53
	30.5	24	46	33.6	2	25	51.5	2.3944	16	40.47
Apr.	31.0	32	20	34.2	+3	01	37.8	2.3977	16	39.10
	31.5	39	52	59.2	3	34	05.2	2.4039	16	36.51
	1.0	47	22	42.6	4	02	38.6	2.4129	16	32.79
	1.5	54	48	44.9	4	26	50.5	2.4244	16	28.10
	2.0	62	10	15.2	+4	46	21.7	2.4380	16	22.59

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
Apr.	1.0	47	22	42.6	+4	02	38.6	2.4129	16	32.79
	1.5	54	48	44.9	4	26	50.5	2.4244	16	28.10
	2.0	62	10	15.2	4	46	21.7	2.4380	16	22.59
	2.5	69	26	32.1	5	01	00.8	2.4533	16	16.46
	3.0	76	37	04.4	5	10	44.0	2.4699	16	09.87
	3.5	83	41	31.5	5	15	33.9	2.4876	16	03.00
	4.0	90	39	42.2	+5	15	38.8	2.5058	15	56.00
	4.5	97	31	34.5	5	11	11.2	2.5242	15	49.01
	5.0	104	17	14.0	5	02	27.1	2.5426	15	42.15
	5.5	110	56	52.9	4	49	44.7	2.5607	15	35.51
	6.0	117	30	48.4	4	33	24.1	2.5781	15	29.17
	6.5	123	59	21.6	4	13	46.3	2.5948	15	23.20
	7.0	130	22	56.5	+3	51	12.9	2.6106	15	17.61
	7.5	136	41	58.4	3	26	05.7	2.6254	15	12.45
	8.0	142	56	53.6	2	58	46.7	2.6391	15	07.72
	8.5	149	08	08.5	2	29	37.8	2.6516	15	03.43
	9.0	155	16	08.8	1	59	00.5	2.6630	14	59.57
	9.5	161	21	19.3	1	27	16.6	2.6732	14	56.12
	10.0	167	24	03.8	+0	54	47.2	2.6823	14	53.09
	10.5	173	24	44.4	+0	21	53.4	2.6903	14	50.44
	11.0	179	23	41.8	-0	11	04.1	2.6971	14	48.18
	11.5	185	21	15.4	0	43	45.1	2.7029	14	46.28
	12.0	191	17	43.1	1	15	49.8	2.7076	14	44.73
	12.5	197	13	21.8	1	46	58.8	2.7113	14	43.53
	13.0	203	08	27.1	-2	16	53.8	2.7139	14	42.68
	13.5	209	03	14.3	2	45	16.9	2.7155	14	42.18
	14.0	214	57	58.1	3	11	51.3	2.7159	14	42.03
	14.5	220	52	53.1	3	36	21.2	2.7152	14	42.26
	15.0	226	48	14.3	3	58	31.7	2.7134	14	42.86
	15.5	232	44	17.1	4	18	09.2	2.7103	14	43.87
	16.0	238	41	17.9	-4	35	01.2	2.7059	14	45.31
	16.5	244	39	34.1	4	48	56.4	2.7001	14	47.19
	17.0	250	39	24.4	4	59	44.7	2.6930	14	49.55
	17.5	256	41	09.0	5	07	17.3	2.6844	14	52.40
	18.0	262	45	09.7	5	11	26.5	2.6743	14	55.77
	18.5	268	51	49.8	5	12	05.7	2.6627	14	59.68
	19.0	275	01	34.1	-5	09	09.9	2.6496	15	04.12
	19.5	281	14	48.6	5	02	35.2	2.6350	15	09.11
	20.0	287	32	00.4	4	52	19.3	2.6191	15	14.64
	20.5	293	53	36.7	4	38	21.7	2.6019	15	20.67
	21.0	300	20	04.8	4	20	43.8	2.5837	15	27.19
	21.5	306	51	51.0	3	59	29.7	2.5645	15	34.12
	22.0	313	29	19.7	-3	34	46.1	2.5447	15	41.39
	22.5	320	12	52.2	3	06	43.3	2.5245	15	48.92
	23.0	327	02	45.6	2	35	35.8	2.5043	15	56.57
	23.5	333	59	11.1	2	01	42.3	2.4845	16	04.20
	24.0	341	02	12.7	-1	25	27.0	2.4654	16	11.65

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
Apr.	24.0	341	02	12.7	-1	25	27.0	2.4654	16	11.65
	24.5	348	11	45.8	0	47	19.4	2.4476	16	18.74
	25.0	355	27	35.8	-0	07	54.2	2.4313	16	25.28
	25.5	2	49	16.8	+0	32	08.4	2.4171	16	31.07
	26.0	10	16	11.4	1	12	04.3	2.4053	16	35.93
	26.5	17	47	30.5	1	51	06.2	2.3963	16	39.69
	27.0	25	22	14.0	+2	28	25.6	2.3902	16	42.22
	27.5	32	59	12.8	3	03	15.0	2.3874	16	43.40
	28.0	40	37	10.6	3	34	49.9	2.3879	16	43.21
	28.5	48	14	47.3	4	02	31.3	2.3916	16	41.63
	29.0	55	50	42.4	4	25	47.1	2.3986	16	38.74
	29.5	63	23	38.7	4	44	13.8	2.4085	16	34.62
	30.0	70	52	25.3	+4	57	37.0	2.4211	16	29.44
	30.5	78	16	00.8	5	05	51.1	2.4361	16	23.35
	1.0	85	33	35.0	5	08	58.8	2.4531	16	16.55
	1.5	92	44	30.3	5	07	10.1	2.4716	16	09.23
	2.0	99	48	21.7	5	00	40.7	2.4912	16	01.59
	2.5	106	44	57.0	4	49	50.7	2.5115	15	53.81
	3.0	113	34	15.0	+4	35	03.0	2.5321	15	46.05
	3.5	120	16	24.7	4	16	42.4	2.5526	15	38.46
	4.0	126	51	43.5	3	55	14.3	2.5727	15	31.15
	4.5	133	20	35.4	3	31	04.2	2.5920	15	24.21
	5.0	139	43	29.4	3	04	37.1	2.6103	15	17.73
	5.5	146	00	58.1	2	36	17.2	2.6274	15	11.76
	6.0	152	13	36.5	+2	06	27.5	2.6431	15	06.34
	6.5	158	22	00.3	1	35	30.3	2.6573	15	01.48
	7.0	164	26	45.6	1	03	46.9	2.6700	14	57.20
	7.5	170	28	27.9	+0	31	37.6	2.6811	14	53.50
	8.0	176	27	41.1	-0	00	37.8	2.6905	14	50.36
	8.5	182	24	57.6	0	32	40.5	2.6984	14	47.76
	9.0	188	20	47.7	-1	04	11.9	2.7047	14	45.69
	9.5	194	15	39.2	1	34	54.1	2.7095	14	44.12
	10.0	200	09	57.7	2	04	29.5	2.7129	14	43.02
	10.5	206	04	06.0	2	32	41.1	2.7149	14	42.37
	11.0	211	58	24.7	2	59	12.4	2.7156	14	42.15
	11.5	217	53	11.8	3	23	47.4	2.7150	14	42.31
	12.0	223	48	43.3	-3	46	11.0	2.7134	14	42.86
	12.5	229	45	13.2	4	06	08.9	2.7106	14	43.77
	13.0	235	42	54.0	4	23	27.7	2.7067	14	45.02
	13.5	241	41	56.8	4	37	55.3	2.7019	14	46.62
	14.0	247	42	32.1	4	49	20.7	2.6960	14	48.55
	14.5	253	44	49.9	4	57	34.6	2.6891	14	50.82
	15.0	259	49	00.2	-5	02	29.2	2.6813	14	53.43
	15.5	265	55	13.5	5	03	58.2	2.6724	14	56.39
	16.0	272	03	41.2	5	01	57.3	2.6626	14	59.70
	16.5	278	14	35.9	4	56	23.9	2.6517	15	03.38
	17.0	284	28	11.6	-4	47	17.4	2.6399	15	07.43

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
May	17.0	284	28	11.6	-4	47	17.4	2.6399	15	07.43
	17.5	290	44	43.9	4	34	39.2	2.6271	15	11.86
	18.0	297	04	30.1	4	18	32.6	2.6133	15	16.67
	18.5	303	27	49.0	3	59	03.5	2.5986	15	21.86
	19.0	309	55	00.7	3	36	19.8	2.5830	15	27.40
	19.5	316	26	26.1	3	10	32.1	2.5668	15	33.28
	20.0	323	02	26.4	-2	41	53.8	2.5500	15	39.44
	20.5	329	43	22.1	2	10	41.5	2.5327	15	45.83
	21.0	336	29	31.9	1	37	14.8	2.5153	15	52.37
	21.5	343	21	11.9	1	01	57.4	2.4980	15	58.98
	22.0	350	18	33.6	-0	25	16.5	2.4811	16	05.53
	22.5	357	21	42.5	+0	12	16.7	2.4648	16	11.89
	23.0	4	30	37.0	+0	50	07.4	2.4496	16	17.91
	23.5	11	45	06.2	1	27	37.1	2.4359	16	23.43
	24.0	19	04	49.0	2	04	04.8	2.4239	16	28.30
	24.5	26	29	13.3	2	38	48.1	2.4140	16	32.34
	25.0	33	57	35.5	3	11	04.3	2.4066	16	35.41
	25.5	41	29	00.7	3	40	12.2	2.4018	16	37.38
	26.0	49	02	24.6	+4	05	34.4	2.3999	16	38.16
	26.5	56	36	35.3	4	26	38.7	2.4011	16	37.70
	27.0	64	10	16.1	4	42	59.7	2.4052	16	35.98
	27.5	71	42	09.1	4	54	20.4	2.4123	16	33.04
	28.0	79	10	58.6	5	00	32.6	2.4222	16	28.97
	28.5	86	35	34.9	5	01	36.5	2.4348	16	23.88
	29.0	93	54	56.8	+4	57	40.8	2.4496	16	17.91
	29.5	101	08	14.3	4	49	00.9	2.4664	16	11.25
	30.0	108	14	49.7	4	35	58.1	2.4848	16	04.07
	30.5	115	14	18.1	4	18	57.5	2.5043	15	56.56
	31.0	122	06	27.5	3	58	27.0	2.5246	15	48.89
	31.5	128	51	17.2	3	34	55.5	2.5451	15	41.23
June	1.0	135	28	57.3	+3	08	52.1	2.5655	15	33.73
	1.5	141	59	46.6	2	40	45.3	2.5855	15	26.51
	2.0	148	24	11.2	2	11	02.1	2.6047	15	19.69
	2.5	154	42	42.4	1	40	08.2	2.6228	15	13.34
	3.0	160	55	56.0	1	08	27.4	2.6396	15	07.54
	3.5	167	04	30.3	0	36	22.0	2.6548	15	02.34
	4.0	173	09	04.9	+0	04	12.5	2.6683	14	57.77
	4.5	179	10	20.2	-0	27	41.6	2.6800	14	53.85
	5.0	185	08	56.0	0	59	02.2	2.6898	14	50.58
	5.5	191	05	31.2	1	29	32.3	2.6978	14	47.97
	6.0	197	00	43.0	1	58	55.4	2.7038	14	45.99
	6.5	202	55	06.5	2	26	55.8	2.7079	14	44.63
	7.0	208	49	14.1	-2	53	18.1	2.7103	14	43.86
	7.5	214	43	35.8	3	17	47.7	2.7109	14	43.65
	8.0	220	38	38.4	3	40	10.1	2.7100	14	43.96
	8.5	226	34	45.5	4	00	11.4	2.7076	14	44.75
	9.0	232	32	17.6	-4	17	38.5	2.7038	14	45.99

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
June	9.0	232	32	17.6	-4	17	38.5	2.7038	14	45.99
	9.5	238	31	32.0	4	32	18.9	2.6988	14	47.64
	10.0	244	32	43.1	4	44	01.0	2.6927	14	49.65
	10.5	250	36	02.2	4	52	34.5	2.6856	14	52.00
	11.0	256	41	38.1	4	57	50.7	2.6776	14	54.64
	11.5	262	49	37.5	4	59	42.1	2.6689	14	57.55
	12.0	269	00	05.3	-4	58	03.7	2.6596	15	00.71
	12.5	275	13	05.0	4	52	52.2	2.6497	15	04.08
	13.0	281	28	39.6	4	44	07.0	2.6393	15	07.64
	13.5	287	46	51.8	4	31	49.7	2.6284	15	11.40
	14.0	294	07	44.8	4	16	04.8	2.6171	15	15.33
	14.5	300	31	22.4	3	56	59.3	2.6055	15	19.43
	15.0	306	57	49.9	-3	34	43.1	2.5935	15	23.68
	15.5	313	27	14.0	3	09	28.5	2.5811	15	28.09
	16.0	319	59	43.1	2	41	31.1	2.5685	15	32.64
	16.5	326	35	26.9	2	11	08.6	2.5557	15	37.32
	17.0	333	14	36.6	1	38	41.9	2.5427	15	42.10
	17.5	339	57	24.2	-1	04	34.1	2.5297	15	46.97
	18.0	346	44	01.6	-0	29	11.2	2.5166	15	51.89
	18.5	353	34	40.2	+0	06	58.5	2.5037	15	56.79
	19.0	0	29	29.3	0	43	24.3	2.4911	16	01.63
	19.5	7	28	35.1	1	19	33.3	2.4790	16	06.32
	20.0	14	31	59.4	1	54	51.0	2.4676	16	10.78
	20.5	21	39	38.2	2	28	41.4	2.4572	16	14.90
	21.0	28	51	20.2	+3	00	28.3	2.4480	16	18.58
	21.5	36	06	46.2	3	29	35.6	2.4402	16	21.70
	22.0	43	25	27.9	3	55	28.8	2.4341	16	24.16
	22.5	50	46	48.2	4	17	36.3	2.4299	16	25.85
	23.0	58	10	01.3	4	35	30.4	2.4279	16	26.68
	23.5	65	34	13.6	4	48	49.0	2.4281	16	26.57
	24.0	72	58	26.1	+4	57	16.3	2.4308	16	25.50
	24.5	80	21	36.1	5	00	43.9	2.4358	16	23.45
	25.0	87	42	40.0	4	59	11.1	2.4433	16	20.44
	25.5	95	00	36.3	4	52	44.7	2.4531	16	16.52
	26.0	102	14	28.3	4	41	38.5	2.4651	16	11.78
	26.5	109	23	26.2	4	26	12.6	2.4790	16	06.33
	27.0	116	26	49.3	+4	06	51.7	2.4946	16	00.30
	27.5	123	24	06.9	3	44	04.1	2.5115	15	53.83
	28.0	130	14	58.9	3	18	20.0	2.5294	15	47.08
	28.5	136	59	15.8	2	50	10.8	2.5479	15	40.19
	29.0	143	36	58.2	2	20	07.2	2.5667	15	33.31
	29.5	150	08	15.6	1	48	39.1	2.5854	15	26.57
	30.0	156	33	25.7	+1	16	14.8	2.6036	15	20.10
	30.5	162	52	52.5	0	43	20.4	2.6209	15	13.99
July	1.0	169	07	05.7	+0	10	20.0	2.6372	15	08.35
	1.5	175	16	39.1	-0	22	24.4	2.6521	15	03.24
	2.0	181	22	09.4	-0	54	32.7	2.6655	14	58.73

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
July	1.0	169	07	05.7	+0	10	20.0	2.6372	15	08.35
	1.5	175	16	39.1	-0	22	24.4	2.6521	15	03.24
	2.0	181	22	09.4	0	54	32.7	2.6655	14	58.73
	2.5	187	24	15.5	1	25	46.7	2.6770	14	54.85
	3.0	193	23	37.1	1	55	49.6	2.6867	14	51.64
	3.5	199	20	54.5	2	24	25.9	2.6943	14	49.12
	4.0	205	16	47.4	-2	51	20.9	2.6998	14	47.29
	4.5	211	11	54.6	3	16	21.0	2.7033	14	46.15
	5.0	217	06	53.3	3	39	13.0	2.7047	14	45.68
	5.5	223	02	18.5	3	59	44.2	2.7041	14	45.87
	6.0	228	58	43.1	4	17	42.4	2.7017	14	46.68
	6.5	234	56	36.9	4	32	55.9	2.6975	14	48.07
	7.0	240	56	26.5	-4	45	13.5	2.6916	14	50.00
	7.5	246	58	35.3	4	54	24.8	2.6843	14	52.43
	8.0	253	03	22.8	5	00	20.1	2.6757	14	55.29
	8.5	259	11	04.9	5	02	51.2	2.6660	14	58.53
	9.0	265	21	53.6	5	01	51.3	2.6555	15	02.10
	9.5	271	35	57.3	4	57	15.5	2.6443	15	05.92
	10.0	277	53	20.7	-4	49	01.1	2.6326	15	09.95
	10.5	284	14	05.3	4	37	08.2	2.6206	15	14.11
	11.0	290	38	09.9	4	21	39.6	2.6085	15	18.36
	11.5	297	05	30.9	4	02	41.5	2.5964	15	22.65
	12.0	303	36	03.0	3	40	23.4	2.5844	15	26.92
	12.5	310	09	39.8	3	14	58.2	2.5727	15	31.13
	13.0	316	46	14.5	-2	46	42.5	2.5613	15	35.26
	13.5	323	25	40.3	2	15	56.0	2.5504	15	39.28
	14.0	330	07	51.2	1	43	01.7	2.5399	15	43.15
	14.5	336	52	42.0	1	08	25.2	2.5299	15	46.88
	15.0	343	40	08.7	-0	32	34.9	2.5205	15	50.44
	15.5	350	30	08.4	+0	03	58.9	2.5115	15	53.82
	16.0	357	22	39.1	+0	40	44.5	2.5031	15	57.01
	16.5	4	17	39.6	1	17	08.7	2.4953	16	00.01
	17.0	11	15	08.3	1	52	38.0	2.4881	16	02.79
	17.5	18	15	02.9	2	26	38.7	2.4815	16	05.34
	18.0	25	17	19.5	2	58	37.5	2.4757	16	07.62
	18.5	32	21	51.6	3	28	02.4	2.4706	16	09.61
	19.0	39	28	29.5	+3	54	22.8	2.4664	16	11.26
	19.5	46	36	58.9	4	17	11.0	2.4632	16	12.53
	20.0	53	47	01.1	4	36	02.1	2.4611	16	13.36
	20.5	60	58	12.2	4	50	35.3	2.4602	16	13.70
	21.0	68	10	03.1	5	00	34.5	2.4607	16	13.52
	21.5	75	22	00.3	5	05	48.8	2.4626	16	12.75
	22.0	82	33	26.1	+5	06	13.3	2.4661	16	11.37
	22.5	89	43	40.1	5	01	49.0	2.4712	16	09.37
	23.0	96	52	00.5	4	52	43.3	2.4780	16	06.72
	23.5	103	57	45.9	4	39	09.1	2.4864	16	03.46
	24.0	111	00	16.4	+4	21	25.2	2.4964	15	59.61

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
July	24.0	111	00	16.4	+4	21	25.2	2.4964	15	59.61
	24.5	117	58	55.8	3	59	54.5	2.5078	15	55.22
	25.0	124	53	12.7	3	35	03.9	2.5206	15	50.37
	25.5	131	42	41.3	3	07	22.7	2.5346	15	45.13
	26.0	138	27	02.9	2	37	21.8	2.5495	15	39.62
	26.5	145	06	05.6	2	05	32.5	2.5650	15	33.93
	27.0	151	39	45.0	+1	32	25.7	2.5809	15	28.17
	27.5	158	08	03.6	0	58	31.1	2.5969	15	22.44
	28.0	164	31	10.4	+0	24	16.8	2.6127	15	16.87
	28.5	170	49	20.5	-0	09	51.2	2.6280	15	11.54
Aug.	29.0	177	02	54.6	0	43	29.1	2.6424	15	06.56
	29.5	183	12	17.7	1	16	15.5	2.6558	15	01.99
	30.0	189	17	58.7	-1	47	51.0	2.6678	14	57.93
	30.5	195	20	29.6	2	17	58.1	2.6783	14	54.43
	31.0	201	20	24.9	2	46	21.3	2.6870	14	51.53
	31.5	207	18	20.6	3	12	46.3	2.6937	14	49.29
	1.0	213	14	54.0	3	37	00.2	2.6985	14	47.73
	1.5	219	10	42.9	3	58	51.1	2.7011	14	46.87
	2.0	225	06	24.8	-4	18	07.7	2.7016	14	46.72
	2.5	231	02	36.9	4	34	39.4	2.6999	14	47.27
	3.0	236	59	55.2	4	48	16.3	2.6961	14	48.51
	3.5	242	58	54.2	4	58	48.9	2.6903	14	50.42
	4.0	249	00	06.0	5	06	08.0	2.6827	14	52.96
	4.5	255	04	00.7	5	10	05.4	2.6733	14	56.10
	5.0	261	11	04.8	-5	10	33.7	2.6623	14	59.78
	5.5	267	21	41.6	5	07	26.7	2.6501	15	03.94
	6.0	273	36	10.5	5	00	39.7	2.6368	15	08.50
	6.5	279	54	46.4	4	50	10.0	2.6227	15	13.40
	7.0	286	17	40.0	4	35	57.3	2.6080	15	18.53
	7.5	292	44	57.1	4	18	04.4	2.5931	15	23.82
	8.0	299	16	38.7	-3	56	37.3	2.5782	15	29.16
	8.5	305	52	41.4	3	31	46.1	2.5635	15	34.46
	9.0	312	32	57.1	3	03	44.8	2.5494	15	39.63
	9.5	319	17	14.1	2	32	51.7	2.5361	15	44.57
	10.0	326	05	16.8	1	59	29.4	2.5237	15	49.21
	10.5	332	56	47.2	1	24	04.7	2.5124	15	53.48
	11.0	339	51	25.0	-0	47	07.9	2.5023	15	57.32
	11.5	346	48	48.6	-0	09	12.4	2.4936	16	00.68
	12.0	353	48	35.8	+0	29	06.2	2.4862	16	03.55
	12.5	0	50	24.1	1	07	10.8	2.4801	16	05.90
	13.0	7	53	51.7	1	44	23.8	2.4754	16	07.74
	13.5	14	58	37.6	2	20	08.2	2.4719	16	09.09
	14.0	22	04	21.7	+2	53	48.4	2.4697	16	09.95
	14.5	29	10	45.2	3	24	51.0	2.4687	16	10.37
	15.0	36	17	30.0	3	52	45.3	2.4687	16	10.37
	15.5	43	24	19.2	4	17	04.5	2.4696	16	09.99
	16.0	50	30	56.1	+4	37	25.5	2.4715	16	09.25

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
Aug.	16.0	50	30	56.1	+4	37	25.5	2.4715	16	09.25
	16.5	57	37	04.6	4	53	29.9	2.4743	16	08.17
	17.0	64	42	28.2	5	05	03.7	2.4778	16	06.78
	17.5	71	46	50.3	5	11	57.8	2.4822	16	05.09
	18.0	78	49	53.8	5	14	08.1	2.4873	16	03.10
	18.5	85	51	21.0	5	11	35.3	2.4932	16	00.82
	19.0	92	50	53.7	+5	04	25.2	2.4999	15	58.26
	19.5	99	48	13.4	4	52	48.0	2.5073	15	55.41
	20.0	106	43	01.5	4	36	58.4	2.5156	15	52.27
	20.5	113	34	59.9	4	17	15.1	2.5247	15	48.85
	21.0	120	23	51.3	3	54	00.3	2.5345	15	45.16
	21.5	127	09	19.7	3	27	38.9	2.5451	15	41.22
	22.0	133	51	10.9	+2	58	38.3	2.5564	15	37.06
	22.5	140	29	13.4	2	27	27.3	2.5684	15	32.71
	23.0	147	03	18.4	1	54	35.5	2.5808	15	28.21
	23.5	153	33	20.2	1	20	32.5	2.5936	15	23.63
	24.0	159	59	16.8	0	45	47.4	2.6066	15	19.02
	24.5	166	21	09.8	+0	10	48.4	2.6197	15	14.44
	25.0	172	39	04.7	-0	23	58.0	2.6325	15	09.98
	25.5	178	53	10.8	0	58	07.1	2.6450	15	05.69
	26.0	185	03	40.9	1	31	16.3	2.6568	15	01.65
	26.5	191	10	51.6	2	03	04.9	2.6678	14	57.93
	27.0	197	15	02.7	2	33	14.6	2.6777	14	54.61
	27.5	203	16	37.1	3	01	29.0	2.6863	14	51.74
	28.0	209	16	00.6	-3	27	33.4	2.6935	14	49.38
	28.5	215	13	41.4	3	51	15.0	2.6989	14	47.59
	29.0	221	10	09.6	4	12	22.2	2.7025	14	46.41
	29.5	227	05	57.5	4	30	44.8	2.7041	14	45.87
	30.0	233	01	38.5	4	46	13.4	2.7037	14	46.01
	30.5	238	57	47.0	4	58	39.7	2.7012	14	46.85
Sept.	31.0	244	54	58.2	-5	07	55.9	2.6965	14	48.39
	31.5	250	53	47.3	5	13	54.9	2.6897	14	50.63
	1.0	256	54	49.1	5	16	30.2	2.6808	14	53.57
	1.5	262	58	37.7	5	15	36.2	2.6700	14	57.18
	2.0	269	05	45.8	5	11	07.9	2.6575	15	01.44
	2.5	275	16	44.1	5	03	01.6	2.6433	15	06.28
	3.0	281	32	00.4	-4	51	15.0	2.6277	15	11.65
	3.5	287	51	59.6	4	35	47.8	2.6110	15	17.47
	4.0	294	17	02.1	4	16	42.1	2.5935	15	23.65
	4.5	300	47	24.0	3	54	02.8	2.5756	15	30.09
	5.0	307	23	15.6	3	27	58.6	2.5575	15	36.66
	5.5	314	04	41.5	2	58	42.2	2.5397	15	43.25
	6.0	320	51	39.8	-2	26	30.7	2.5224	15	49.71
	6.5	327	44	01.7	1	51	46.5	2.5060	15	55.91
	7.0	334	41	31.6	1	14	56.6	2.4909	16	01.70
	7.5	341	43	47.3	-0	36	33.0	2.4774	16	06.96
	8.0	348	50	20.0	+0	02	48.3	2.4656	16	11.57

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
Sept.	8.0	348	50	20.0	+0	02	48.3	2.4656	16	11.57
	8.5	356	00	35.6	0	42	27.5	2.4558	16	15.44
	9.0	3	13	55.0	1	21	42.8	2.4482	16	18.49
	9.5	10	29	35.9	1	59	51.4	2.4427	16	20.68
	10.0	17	46	53.6	2	36	10.8	2.4395	16	21.99
	10.5	25	05	02.8	3	10	01.0	2.4384	16	22.42
	11.0	32	23	18.8	+3	40	45.1	2.4394	16	22.03
	11.5	39	40	58.9	4	07	50.8	2.4423	16	20.86
	12.0	46	57	23.3	4	30	51.4	2.4469	16	19.00
	12.5	54	11	56.6	4	49	26.2	2.4531	16	16.54
	13.0	61	24	07.7	5	03	20.5	2.4606	16	13.56
	13.5	68	33	30.9	5	12	25.9	2.4692	16	10.17
	14.0	75	39	45.1	+5	16	39.9	2.4787	16	06.45
	14.5	82	42	34.4	5	16	05.2	2.4889	16	02.49
	15.0	89	41	47.6	5	10	49.4	2.4996	15	58.35
	15.5	96	37	17.2	5	01	04.5	2.5107	15	54.11
	16.0	103	28	59.4	4	47	05.8	2.5221	15	49.80
	16.5	110	16	53.2	4	29	12.1	2.5337	15	45.47
	17.0	117	00	59.8	+4	07	44.3	2.5453	15	41.14
	17.5	123	41	22.1	3	43	05.6	2.5570	15	36.84
	18.0	130	18	04.3	3	15	40.8	2.5687	15	32.58
	18.5	136	51	11.2	2	45	55.9	2.5804	15	28.37
	19.0	143	20	48.3	2	14	17.5	2.5920	15	24.21
	19.5	149	47	01.5	1	41	12.7	2.6035	15	20.13
	20.0	156	09	56.8	+1	07	08.6	2.6148	15	16.12
	20.5	162	29	40.6	+0	32	32.0	2.6261	15	12.21
	21.0	168	46	19.8	-0	02	11.1	2.6370	15	08.41
	21.5	175	00	01.5	0	36	35.6	2.6477	15	04.75
	22.0	181	10	53.9	1	10	17.8	2.6580	15	01.25
	22.5	187	19	06.0	1	42	55.4	2.6678	14	57.95
	23.0	193	24	48.0	-2	14	07.8	2.6769	14	54.88
	23.5	199	28	11.4	2	43	36.4	2.6853	14	52.08
	24.0	205	29	29.6	3	11	04.2	2.6928	14	49.61
	24.5	211	28	57.7	3	36	16.1	2.6992	14	47.50
	25.0	217	26	52.8	3	58	59.0	2.7043	14	45.81
	25.5	223	23	33.9	4	19	01.4	2.7081	14	44.58
	26.0	229	19	22.5	-4	36	13.1	2.7103	14	43.85
	26.5	235	14	42.0	4	50	25.8	2.7109	14	43.67
	27.0	241	09	58.0	5	01	32.1	2.7096	14	44.08
	27.5	247	05	38.2	5	09	25.9	2.7065	14	45.10
	28.0	253	02	12.0	5	14	01.9	2.7014	14	46.78
	28.5	259	00	10.7	5	15	16.0	2.6942	14	49.13
	29.0	265	00	06.7	-5	13	04.6	2.6851	14	52.16
	29.5	271	02	33.7	5	07	25.3	2.6739	14	55.88
	30.0	277	08	05.8	4	58	16.5	2.6609	15	00.28
	30.5	283	17	17.2	4	45	37.6	2.6460	15	05.33
Oct.	1.0	289	30	41.8	-4	29	29.8	2.6295	15	11.00

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
Oct.	1.0	289	30	41.8	-4	29	29.8	2.6295	15	11.00
	1.5	295	48	51.9	4	09	55.6	2.6117	15	17.24
	2.0	302	12	17.9	3	46	59.9	2.5926	15	23.98
	2.5	308	41	27.1	3	20	50.5	2.5727	15	31.12
	3.0	315	16	42.4	2	51	38.2	2.5524	15	38.56
	3.5	321	58	21.6	2	19	37.9	2.5318	15	46.16
	4.0	328	46	36.1	-1	45	08.8	2.5116	15	53.79
	4.5	335	41	29.4	1	08	35.0	2.4921	16	01.26
	5.0	342	42	56.1	-0	30	25.9	2.4736	16	08.42
	5.5	349	50	41.6	+0	08	44.4	2.4567	16	15.08
	6.0	357	04	20.4	0	48	16.8	2.4418	16	21.06
	6.5	4	23	17.1	1	27	28.8	2.4290	16	26.20
	7.0	11	46	46.1	+2	05	35.1	2.4189	16	30.36
	7.5	19	13	52.8	2	41	49.8	2.4114	16	33.41
	8.0	26	43	35.3	3	15	28.0	2.4069	16	35.29
	8.5	34	14	46.6	3	45	48.0	2.4052	16	35.96
	9.0	41	46	17.2	4	12	13.1	2.4065	16	35.43
	9.5	49	16	57.7	4	34	12.9	2.4106	16	33.76
	10.0	56	45	42.0	+4	51	25.1	2.4172	16	31.03
	10.5	64	11	29.8	5	03	35.1	2.4262	16	27.37
	11.0	71	33	28.1	5	10	36.8	2.4372	16	22.91
	11.5	78	50	53.6	5	12	31.7	2.4499	16	17.81
	12.0	86	03	12.7	5	09	27.9	2.4640	16	12.22
	12.5	93	10	02.2	5	01	39.4	2.4791	16	06.30
	13.0	100	11	08.5	+4	49	24.4	2.4949	16	00.17
	13.5	107	06	26.8	4	33	04.9	2.5111	15	53.97
	14.0	113	56	00.4	4	13	04.9	2.5275	15	47.80
	14.5	120	39	58.7	3	49	50.0	2.5437	15	41.75
	15.0	127	18	36.3	3	23	46.5	2.5596	15	35.89
	15.5	133	52	11.3	2	55	21.1	2.5751	15	30.26
	16.0	140	21	04.7	+2	25	00.2	2.5900	15	24.92
	16.5	146	45	38.4	1	53	09.9	2.6042	15	19.87
	17.0	153	06	15.0	1	20	15.7	2.6177	15	15.14
	17.5	159	23	16.9	0	46	42.6	2.6303	15	10.73
	18.0	165	37	05.6	+0	12	54.7	2.6422	15	06.63
	18.5	171	48	01.2	-0	20	45.0	2.6533	15	02.85
	19.0	177	56	22.5	-0	53	54.0	2.6635	14	59.38
	19.5	184	02	26.8	1	26	11.1	2.6730	14	56.21
	20.0	190	06	29.7	1	57	16.2	2.6816	14	53.33
	20.5	196	08	45.3	2	26	50.4	2.6893	14	50.75
	21.0	202	09	26.8	2	54	36.1	2.6963	14	48.46
	21.5	208	08	46.2	3	20	17.2	2.7023	14	46.48
	22.0	214	06	55.1	-3	43	39.1	2.7074	14	44.82
	22.5	220	04	05.0	4	04	28.9	2.7114	14	43.49
	23.0	226	00	27.5	4	22	35.1	2.7145	14	42.51
	23.5	231	56	14.9	4	37	47.9	2.7163	14	41.90
	24.0	237	51	40.8	-4	49	59.4	2.7169	14	41.71

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
Oct.	24.0	237	51	40.8	-4	49	59.4	2.7169	14	41.71
	24.5	243	46	59.9	4	59	02.9	2.7162	14	41.95
	25.0	249	42	28.8	5	04	53.4	2.7140	14	42.66
	25.5	255	38	26.2	5	07	27.2	2.7103	14	43.87
	26.0	261	35	12.7	5	06	41.9	2.7049	14	45.62
	26.5	267	33	11.5	5	02	36.6	2.6979	14	47.93
	27.0	273	32	47.9	-4	55	11.2	2.6891	14	50.82
	27.5	279	34	29.7	4	44	27.2	2.6786	14	54.33
	28.0	285	38	46.7	4	30	26.9	2.6663	14	58.45
	28.5	291	46	10.6	4	13	14.1	2.6522	15	03.21
Nov.	29.0	297	57	14.3	3	52	54.2	2.6366	15	08.58
	29.5	304	12	31.9	3	29	33.8	2.6194	15	14.54
	30.0	310	32	37.7	-3	03	22.0	2.6008	15	21.06
	30.5	316	58	05.0	2	34	30.0	2.5811	15	28.09
	31.0	323	29	25.6	2	03	11.8	2.5606	15	35.54
	31.5	330	07	08.3	1	29	44.8	2.5395	15	43.32
	1.0	336	51	37.3	0	54	30.1	2.5181	15	51.31
	1.5	343	43	10.7	-0	17	53.1	2.4970	15	59.35
	2.0	350	41	58.7	+0	19	36.5	2.4765	16	07.29
	2.5	357	48	01.9	0	57	24.5	2.4571	16	14.93
	3.0	5	01	09.6	1	34	52.5	2.4393	16	22.08
	3.5	12	20	58.5	2	11	18.7	2.4233	16	28.53
	4.0	19	46	51.8	2	45	59.0	2.4098	16	34.09
	4.5	27	17	59.2	3	18	08.4	2.3990	16	38.57
	5.0	34	53	17.7	+3	47	03.7	2.3911	16	41.83
	5.5	42	31	33.1	4	12	04.8	2.3866	16	43.76
	6.0	50	11	23.5	4	32	37.5	2.3853	16	44.29
	6.5	57	51	21.9	4	48	15.1	2.3874	16	43.41
	7.0	65	30	01.2	4	58	39.7	2.3927	16	41.16
	7.5	73	05	57.6	5	03	43.1	2.4012	16	37.65
	8.0	80	37	54.9	+5	03	26.5	2.4124	16	33.01
	8.5	88	04	47.3	4	57	59.7	2.4261	16	27.41
	9.0	95	25	41.7	4	47	40.2	2.4419	16	21.02
	9.5	102	39	58.8	4	32	51.3	2.4593	16	14.06
	10.0	109	47	13.4	4	14	00.2	2.4780	16	06.71
	10.5	116	47	13.3	3	51	37.2	2.4975	15	59.16
	11.0	123	39	58.4	+3	26	13.3	2.5175	15	51.56
	11.5	130	25	38.7	2	58	19.8	2.5375	15	44.06
	12.0	137	04	32.6	2	28	27.1	2.5572	15	36.79
	12.5	143	37	04.9	1	57	04.6	2.5763	15	29.83
	13.0	150	03	44.9	1	24	39.7	2.5946	15	23.27
	13.5	156	25	05.0	0	51	38.3	2.6119	15	17.16
	14.0	162	41	39.2	+0	18	24.7	2.6280	15	11.53
	14.5	168	54	01.8	-0	14	38.8	2.6429	15	06.41
	15.0	175	02	46.3	0	47	10.9	2.6564	15	01.81
	15.5	181	08	25.3	1	18	52.0	2.6685	14	57.71
	16.0	187	11	29.2	-1	49	23.8	2.6792	14	54.12

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
Nov.	16.0	187	11	29.2	-1	49	23.8	2.6792	14	54.12
	16.5	193	12	26.0	2	18	28.8	2.6885	14	51.02
	17.0	199	11	41.4	2	45	50.9	2.6965	14	48.38
	17.5	205	09	38.3	3	11	14.8	2.7032	14	46.19
	18.0	211	06	36.8	3	34	26.6	2.7086	14	44.41
	18.5	217	02	54.5	3	55	13.3	2.7128	14	43.05
	19.0	222	58	46.7	-4	13	23.2	2.7158	14	42.06
	19.5	228	54	26.7	4	28	45.9	2.7177	14	41.44
	20.0	234	50	06.0	4	41	12.3	2.7185	14	41.18
	20.5	240	45	54.9	4	50	35.1	2.7182	14	41.28
	21.0	246	42	03.1	4	56	48.3	2.7169	14	41.72
	21.5	252	38	39.9	4	59	47.5	2.7144	14	42.52
	22.0	258	35	55.1	-4	59	30.3	2.7109	14	43.68
	22.5	264	33	59.3	4	55	55.6	2.7061	14	45.22
	23.0	270	33	04.4	4	49	04.3	2.7003	14	47.15
	23.5	276	33	24.0	4	38	58.7	2.6931	14	49.49
	24.0	282	35	14.0	4	25	42.7	2.6848	14	52.27
	24.5	288	38	52.4	4	09	22.1	2.6751	14	55.50
	25.0	294	44	40.0	-3	50	03.9	2.6641	14	59.20
	25.5	300	52	59.9	3	27	56.9	2.6517	15	03.39
	26.0	307	04	18.0	3	03	11.4	2.6380	15	08.08
	26.5	313	19	02.1	2	35	59.4	2.6230	15	13.26
	27.0	319	37	42.1	2	06	34.9	2.6068	15	18.94
	27.5	326	00	49.0	1	35	13.9	2.5896	15	25.07
	28.0	332	28	54.2	-1	02	14.7	2.5713	15	31.64
	28.5	339	02	28.3	-0	27	58.1	2.5523	15	38.58
	29.0	345	42	00.3	+0	07	12.1	2.5328	15	45.81
	29.5	352	27	55.6	0	42	49.2	2.5130	15	53.24
	30.0	359	20	34.4	1	18	23.2	2.4934	16	00.75
	30.5	6	20	10.0	1	53	21.1	2.4743	16	08.18
Dec.	1.0	13	26	46.4	+2	27	06.9	2.4560	16	15.38
	1.5	20	40	17.0	2	59	02.5	2.4390	16	22.17
	2.0	28	00	22.1	3	28	28.3	2.4238	16	28.35
	2.5	35	26	28.7	3	54	44.9	2.4107	16	33.72
	3.0	42	57	49.2	4	17	14.9	2.4000	16	38.12
	3.5	50	33	22.3	4	35	24.2	2.3923	16	41.36
	4.0	58	11	54.6	+4	48	44.8	2.3876	16	43.33
	4.5	65	52	03.2	4	56	55.8	2.3862	16	43.93
	5.0	73	32	19.3	4	59	45.5	2.3881	16	43.12
	5.5	81	11	12.8	4	57	11.8	2.3933	16	40.93
	6.0	88	47	16.1	4	49	22.0	2.4017	16	37.42
	6.5	96	19	08.9	4	36	32.7	2.4131	16	32.71
	7.0	103	45	41.3	+4	19	07.9	2.4272	16	26.95
	7.5	111	05	56.6	3	57	37.7	2.4436	16	20.34
	8.0	118	19	12.5	3	32	35.9	2.4619	16	13.06
	8.5	125	25	01.4	3	04	38.6	2.4816	16	05.32
	9.0	132	23	10.1	+2	34	22.1	2.5023	15	57.32

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Longitude			Apparent Latitude			True Geocentric Distance (A. U.)	Semi Diameter	
		°	'	"	°	'	"	(X 10 ⁻³)	'	"
Dec.	9.0	132	23	10.1	+2	34	22.1	2.5023	15	57.32
	9.5	139	13	38.0	2	02	22.1	2.5236	15	49.24
	10.0	145	56	35.9	1	29	12.1	2.5450	15	41.25
	10.5	152	32	23.8	0	55	23.3	2.5662	15	33.50
	11.0	159	01	28.8	+0	21	24.0	2.5867	15	26.10
	11.5	165	24	23.5	-0	12	20.1	2.6062	15	19.16
	12.0	171	41	44.1	-0	45	26.0	2.6246	15	12.74
	12.5	177	54	09.2	1	17	33.4	2.6415	15	06.89
	13.0	184	02	18.0	1	48	23.9	2.6568	15	01.67
	13.5	190	06	49.9	2	17	41.0	2.6704	14	57.07
	14.0	196	08	22.9	2	45	09.7	2.6822	14	53.12
	14.5	202	07	33.8	3	10	36.7	2.6922	14	49.81
	15.0	208	04	56.9	-3	33	49.2	2.7004	14	47.11
	15.5	214	01	04.1	3	54	36.1	2.7068	14	45.02
	16.0	219	56	24.3	4	12	46.7	2.7114	14	43.50
	16.5	225	51	23.5	4	28	11.4	2.7144	14	42.51
	17.0	231	46	24.6	4	40	41.8	2.7159	14	42.03
	17.5	237	41	47.3	4	50	10.2	2.7159	14	42.03
	18.0	243	37	48.6	-4	56	30.4	2.7146	14	42.45
	18.5	249	34	42.7	4	59	37.3	2.7121	14	43.28
	19.0	255	32	41.3	4	59	27.4	2.7084	14	44.48
	19.5	261	31	54.0	4	55	58.8	2.7037	14	46.01
	20.0	267	32	29.2	4	49	11.4	2.6981	14	47.87
	20.5	273	34	33.9	4	39	07.1	2.6916	14	50.02
	21.0	279	38	14.8	-4	25	49.7	2.6842	14	52.45
	21.5	285	43	38.4	4	09	25.2	2.6761	14	55.15
	22.0	291	50	52.2	3	50	01.4	2.6673	14	58.12
	22.5	298	00	04.4	3	27	48.6	2.6577	15	01.36
	23.0	304	11	24.9	3	02	58.8	2.6474	15	04.87
	23.5	310	25	05.8	2	35	46.0	2.6363	15	08.65
	24.0	316	41	20.8	-2	06	26.4	2.6246	15	12.72
	24.5	323	00	26.1	1	35	17.8	2.6121	15	17.07
	25.0	329	22	40.1	1	02	40.0	2.5990	15	21.72
	25.5	335	48	23.0	-0	28	54.5	2.5852	15	26.64
	26.0	342	17	56.3	+0	05	35.5	2.5707	15	31.84
	26.5	348	51	42.4	0	40	24.9	2.5558	15	37.30
	27.0	355	30	03.7	+1	15	06.7	2.5404	15	42.97
	27.5	2	13	21.1	1	49	12.4	2.5248	15	48.81
	28.0	9	01	53.3	2	22	11.8	2.5091	15	54.75
	28.5	15	55	54.8	2	53	33.3	2.4935	16	00.71
	29.0	22	55	34.7	3	22	44.5	2.4783	16	06.59
	29.5	30	00	54.5	3	49	12.3	2.4639	16	12.26
		37	11	47.2	4	12	24.0	2.4504	16	17.60
	30.0									
	30.5	44	27	55.5	+4	31	48.6	2.4383	16	22.45
	31.0	51	48	51.1	4	46	57.6	2.4279	16	26.67
	31.5	59	13	54.0	4	57	26.5	2.4195	16	30.11
	32.0	66	42	13.1	+5	02	56.5	2.4133	16	32.63

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
Jan.	0.0	18	47	45.76	-27	56	06.87	56	54.06
	0.5	19	17	21.29	27	05	46.58	57	10.61
	1.0	19	46	40.48	25	51	45.94	57	26.46
	1.5	20	15	32.60	24	15	13.02	57	41.43
	2.0	20	43	49.97	22	17	45.67	57	55.38
	2.5	21	11	28.25	20	01	24.47	58	08.20
	3.0	21	38	26.37	-17	28	25.51	58	19.85
	3.5	22	04	46.22	14	41	13.82	58	30.30
	4.0	22	30	32.09	11	42	18.38	58	39.56
	4.5	22	55	50.15	8	34	08.64	58	47.65
	5.0	23	20	48.00	5	19	12.82	58	54.61
	5.5	23	45	34.19	-1	59	57.43	59	00.50
	6.0	0	10	17.92	+1	21	12.02	59	05.32
	6.5	0	35	08.74	4	41	49.63	59	09.12
	7.0	1	00	16.27	7	59	27.26	59	11.89
	7.5	1	25	49.89	11	11	32.70	59	13.59
	8.0	1	51	58.40	14	15	28.17	59	14.17
	8.5	2	18	49.48	17	08	29.68	59	13.56
	9.0	2	46	29.12	+19	47	47.92	59	11.67
	9.5	3	15	00.81	22	10	30.99	59	08.39
	10.0	3	44	24.77	24	13	49.79	59	03.60
	10.5	4	14	37.24	25	55	06.00	58	57.23
	11.0	4	45	30.04	27	12	02.38	58	49.19
	11.5	5	16	50.72	28	02	54.01	58	39.45
	12.0	5	48	23.38	+28	26	38.64	58	28.00
	12.5	6	19	50.14	28	23	03.67	58	14.92
	13.0	6	50	53.12	27	52	48.00	58	00.29
	13.5	7	21	16.28	26	57	17.99	57	44.29
	14.0	7	50	46.92	25	38	38.60	57	27.13
	14.5	8	19	16.50	23	59	21.50	57	09.06
	15.0	8	46	40.73	+22	02	12.69	56	50.39
	15.5	9	12	59.12	19	50	01.54	56	31.44
	16.0	9	38	14.31	17	25	32.27	56	12.53
	16.5	10	02	31.23	14	51	18.31	55	54.03
	17.0	10	25	56.39	12	09	39.24	55	36.26
	17.5	10	48	37.26	9	22	39.76	55	19.55
	18.0	11	10	41.87	+6	32	10.18	55	04.21
	18.5	11	32	18.48	3	39	47.87	54	50.52
	19.0	11	53	35.42	+0	46	59.35	54	38.73
	19.5	12	14	40.97	-2	04	57.28	54	29.06
	20.0	12	35	43.33	4	54	49.84	54	21.68
	20.5	12	56	50.59	7	41	29.36	54	16.74
	21.0	13	18	10.70	-10	23	47.58	54	14.35
	21.5	13	39	51.43	13	00	34.40	54	14.59
	22.0	14	02	00.31	15	30	35.52	54	17.49
	22.5	14	24	44.47	17	52	30.42	54	23.04
	23.0	14	48	10.42	-20	04	50.60	54	31.19

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
Jan.	23.0	14	48	10.42	-20	04	50.60	54	31.19
	23.5	15	12	23.78	22	05	58.63	54	41.85
	24.0	15	37	28.83	23	54	08.01	54	54.90
	24.5	16	03	28.02	25	27	24.40	55	10.14
	25.0	16	30	21.49	26	43	48.46	55	27.37
	25.5	16	58	06.58	27	41	20.58	55	46.31
	26.0	17	26	37.54	-28	18	07.40	56	06.64
	26.5	17	55	45.62	28	32	29.77	56	28.01
	27.0	18	25	19.47	28	23	11.14	56	50.01
	27.5	18	55	06.05	27	49	25.20	57	12.23
	28.0	19	24	51.88	26	51	01.38	57	34.22
	28.5	19	54	24.31	25	28	27.24	57	55.53
	29.0	20	23	32.74	-23	42	47.53	58	15.72
	29.5	20	52	09.42	21	35	40.22	58	34.39
	30.0	21	20	09.83	19	09	10.64	58	51.16
	30.5	21	47	32.70	16	25	44.72	59	05.72
	31.0	22	14	19.63	13	28	02.40	59	17.86
	31.5	22	40	34.69	10	18	52.01	59	27.41
Feb.	1.0	23	06	23.78	-7	01	05.68	59	34.32
	1.5	23	31	54.23	3	37	36.19	59	38.60
	2.0	23	57	14.30	-0	11	14.96	59	40.36
	2.5	0	22	32.78	+3	15	08.94	59	39.76
	3.0	0	47	58.71	6	38	48.93	59	37.00
	3.5	1	13	41.03	9	57	00.62	59	32.33
	4.0	1	39	48.18	+13	07	01.22	59	26.00
	4.5	2	06	27.76	16	06	09.22	59	18.26
	5.0	2	33	45.95	18	51	44.64	59	09.35
	5.5	3	01	46.96	21	21	10.46	58	59.47
	6.0	3	30	32.34	23	31	55.55	58	48.81
	6.5	4	00	00.40	25	21	39.46	58	37.50
	7.0	4	30	05.82	+26	48	19.00	58	25.66
	7.5	5	00	39.51	27	50	15.87	58	13.37
	8.0	5	31	29.15	28	26	24.44	58	00.66
	8.5	6	02	20.11	28	36	17.81	57	47.59
	9.0	6	32	56.91	28	20	10.99	57	34.16
	9.5	7	03	04.78	27	39	00.02	57	20.39
	10.0	7	32	31.08	+26	34	17.17	57	06.31
	10.5	8	01	06.27	25	08	03.21	56	51.96
	11.0	8	28	44.38	23	22	38.22	56	37.38
	11.5	8	55	22.87	21	20	32.51	56	22.66
	12.0	9	21	02.31	19	04	18.78	56	07.89
	12.5	9	45	45.69	16	36	26.09	55	53.19
	13.0	10	09	37.82	+13	59	15.82	55	38.73
	13.5	10	32	44.78	11	14	59.36	55	24.66
	14.0	10	55	13.41	8	25	37.18	55	11.19
	14.5	11	17	11.02	5	32	58.93	54	58.50
	15.0	11	38	45.13	+2	38	44.31	54	46.82

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
Feb.	15.0	11	38	45.13	+2	38	44.31	54	46.82
	15.5	12	00	03.33	-0	15	35.67	54	36.35
	16.0	12	21	13.19	3	08	37.03	54	27.32
	16.5	12	42	22.20	5	59	01.03	54	19.92
	17.0	13	03	37.75	8	45	32.25	54	14.36
	17.5	13	25	07.10	11	26	56.65	54	10.82
	18.0	13	46	57.29	-14	01	59.58	54	09.45
	18.5	14	09	15.09	16	29	24.00	54	10.40
	19.0	14	32	06.86	18	47	48.79	54	13.78
	19.5	14	55	38.28	20	55	47.43	54	19.68
	20.0	15	19	54.16	22	51	47.24	54	28.14
	20.5	15	44	58.00	24	34	09.35	54	39.19
	21.0	16	10	51.62	-26	01	09.78	54	52.80
	21.5	16	37	34.76	27	11	01.71	55	08.89
	22.0	17	05	04.71	28	01	59.31	55	27.33
	22.5	17	33	16.16	28	32	22.87	55	47.95
	23.0	18	02	01.27	28	40	45.01	56	10.51
	23.5	18	31	10.15	28	25	57.27	56	34.69
	24.0	19	00	31.59	-27	47	16.22	57	00.12
	24.5	19	29	54.09	26	44	28.09	57	26.37
	25.0	19	59	06.92	25	17	51.45	57	52.94
	25.5	20	28	01.12	23	28	17.49	58	19.27
	26.0	20	56	30.18	21	17	08.25	58	44.77
	26.5	21	24	30.35	18	46	13.40	59	08.84
	27.0	21	52	00.75	-15	57	46.18	59	30.88
	27.5	22	19	03.05	12	54	19.12	59	50.31
	28.0	22	45	41.16	9	38	40.02	60	06.64
	28.5	23	12	00.74	6	13	48.23	60	19.47
Mar.	1.0	23	38	08.75	-2	42	51.41	60	28.49
	1.5	0	04	13.06	+0	50	57.30	60	33.57
	2.0	0	30	21.99	+4	24	21.81	60	34.67
	2.5	0	56	43.97	7	54	05.33	60	31.94
	3.0	1	23	27.10	11	16	52.40	60	25.61
	3.5	1	50	38.72	14	29	30.96	60	16.03
	4.0	2	18	24.84	17	28	54.69	60	03.63
	4.5	2	46	49.57	20	12	05.81	59	48.88
	5.0	3	15	54.48	+22	36	18.80	59	32.26
	5.5	3	45	38.01	24	39	05.23	59	14.25
	6.0	4	15	55.13	26	18	19.50	58	55.30
	6.5	4	46	37.26	27	32	25.15	58	35.81
	7.0	5	17	32.71	28	20	20.70	58	16.13
	7.5	5	48	27.64	28	41	43.83	57	56.56
	8.0	6	19	07.36	+28	36	52.72	57	37.31
	8.5	6	49	17.84	28	06	43.98	57	18.56
	9.0	7	18	47.03	27	12	47.34	57	00.46
	9.5	7	47	25.78	25	56	57.98	56	43.06
	10.0	8	15	08.27	+24	21	28.06	56	26.44

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
Mar.	10.0	8	15	08.27	+24	21	28.06	56	26.44
	10.5	8	41	51.98	22	28	38.53	56	10.61
	11.0	9	07	37.33	20	20	52.31	55	55.57
	11.5	9	32	27.07	18	00	29.26	55	41.34
	12.0	9	56	25.73	15	29	42.89	55	27.90
	12.5	10	19	39.07	12	50	38.63	55	15.25
	13.0	10	42	13.61	+10	05	13.26	55	03.41
	13.5	11	04	16.33	7	15	15.11	54	52.40
	14.0	11	25	54.40	4	22	24.86	54	42.25
	14.5	11	47	15.05	+1	28	16.57	54	33.04
	15.0	12	08	25.47	-1	25	41.10	54	24.83
	15.5	12	29	32.72	4	18	03.56	54	17.72
	16.0	12	50	43.75	-7	07	29.03	54	11.81
	16.5	13	12	05.33	9	52	37.15	54	07.23
	17.0	13	33	43.99	12	32	07.79	54	04.11
	17.5	13	55	45.95	15	04	39.78	54	02.59
	18.0	14	18	17.05	17	28	49.94	54	02.80
	18.5	14	41	22.51	19	43	12.18	54	04.88
	19.0	15	05	06.79	-21	46	17.10	54	08.97
	19.5	15	29	33.24	23	36	32.05	54	15.18
	20.0	15	54	43.85	25	12	21.80	54	23.62
	20.5	16	20	38.92	26	32	10.20	54	34.37
	21.0	16	47	16.75	27	34	22.70	54	47.48
	21.5	17	14	33.54	28	17	29.74	55	02.98
	22.0	17	42	23.38	-28	40	11.02	55	20.83
	22.5	18	10	38.53	28	41	19.92	55	40.98
	23.0	18	39	09.95	28	20	07.87	56	03.30
	23.5	19	07	48.04	27	36	07.87	56	27.60
	24.0	19	36	23.51	26	29	16.85	56	53.61
	24.5	20	04	48.15	24	59	56.54	57	21.00
	25.0	20	32	55.57	-23	08	53.15	57	49.36
	25.5	21	00	41.60	20	57	16.03	58	18.18
	26.0	21	28	04.48	18	26	35.94	58	46.89
	26.5	21	55	04.85	15	38	43.27	59	14.84
	27.0	22	21	45.49	12	35	46.57	59	41.35
	27.5	22	48	11.03	9	20	11.38	60	05.71
	28.0	23	14	27.63	-5	54	39.38	60	27.21
	28.5	23	40	42.56	-2	22	07.48	60	45.20
	29.0	0	07	03.88	+1	14	13.20	60	59.13
	29.5	0	33	40.03	4	50	58.98	61	08.55
	30.0	1	00	39.44	8	24	35.91	61	13.20
	30.5	1	28	10.01	11	51	22.92	61	12.98
Apr.	31.0	1	56	18.54	+15	07	36.12	61	07.97
	31.5	2	25	10.05	18	09	34.15	60	58.43
	1.0	2	54	46.97	20	53	44.91	60	44.79
	1.5	3	25	08.40	23	16	53.48	60	27.56
	2.0	3	56	09.51	+25	16	11.13	60	07.35

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
Apr.	1.0	2	54	46.97	+20	53	44.91	60	44.79
	1.5	3	25	08.40	23	16	53.48	60	27.56
	2.0	3	56	09.51	25	16	11.13	60	07.35
	2.5	4	27	41.29	26	49	24.54	59	44.83
	3.0	4	59	30.97	27	55	04.07	59	20.64
	3.5	5	31	22.92	28	32	29.50	58	55.41
	4.0	6	03	00.29	+28	41	51.63	58	29.70
	4.5	6	34	06.75	28	24	09.14	58	04.04
	5.0	7	04	28.18	27	41	01.03	57	38.85
	5.5	7	33	53.90	26	34	36.03	57	14.48
	6.0	8	02	17.11	25	07	21.12	56	51.22
	6.5	8	29	34.93	23	21	50.92	56	29.27
	7.0	8	55	47.87	+21	20	39.27	56	08.77
	7.5	9	20	59.09	19	06	13.35	55	49.82
	8.0	9	45	13.75	16	40	50.35	55	32.46
	8.5	10	08	38.25	14	06	36.20	55	16.70
	9.0	10	31	19.82	11	25	25.66	55	02.51
	9.5	10	53	26.01	8	39	03.44	54	49.88
	10.0	11	15	04.55	+5	49	05.74	54	38.73
	10.5	11	36	23.09	2	57	02.09	54	29.02
	11.0	11	57	29.16	+0	04	17.09	54	20.70
	11.5	12	18	30.10	-2	47	47.78	54	13.72
	12.0	12	39	33.03	5	37	52.61	54	08.04
	12.5	13	00	44.81	8	24	37.63	54	03.65
	13.0	13	22	12.00	-11	06	42.02	54	00.52
	13.5	13	44	00.83	13	42	42.86	53	58.68
	14.0	14	06	17.04	16	11	14.43	53	58.14
	14.5	14	29	05.75	18	30	47.81	53	58.96
	15.0	14	52	31.27	20	39	50.83	54	01.19
	15.5	15	16	36.82	22	36	48.66	54	04.89
	16.0	15	41	24.29	-24	20	04.92	54	10.16
	16.5	16	06	53.90	25	48	03.67	54	17.08
	17.0	16	33	03.99	26	59	12.04	54	25.73
	17.5	16	59	50.86	27	52	03.64	54	36.21
	18.0	17	27	08.86	28	25	22.36	54	48.58
	18.5	17	54	50.59	28	38	06.26	55	02.91
	19.0	18	22	47.46	-28	29	31.06	55	19.23
	19.5	18	50	50.31	27	59	12.55	55	37.55
	20.0	19	18	50.26	27	07	07.92	55	57.84
	20.5	19	46	39.44	25	53	35.51	56	20.00
	21.0	20	14	11.62	24	19	13.55	56	43.92
	21.5	20	41	22.68	22	24	58.06	57	09.37
	22.0	21	08	10.76	-20	12	00.61	57	36.08
	22.5	21	34	36.29	17	41	46.37	58	03.70
	23.0	22	00	41.78	14	55	52.89	58	31.79
	23.5	22	26	31.61	11	56	09.68	58	59.81
	24.0	22	52	11.72	-8	44	38.70	59	27.17

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
Apr.	24.0	22	52	11.72	-8	44	38.70	59	27.17
	24.5	23	17	49.29	5	23	35.51	59	53.20
	25.0	23	43	32.51	-1	55	30.76	60	17.21
	25.5	0	09	30.22	+1	36	48.26	60	38.48
	26.0	0	35	51.63	5	10	16.61	60	56.33
	26.5	1	02	45.90	8	41	31.52	61	10.13
	27.0	1	30	21.64	+12	06	53.71	61	19.39
	27.5	1	58	46.27	15	22	30.66	61	23.75
	28.0	2	28	05.10	18	24	22.31	61	23.04
	28.5	2	58	20.43	21	08	29.52	61	17.26
	29.0	3	29	30.47	23	31	05.42	61	06.63
	29.5	4	01	28.57	25	28	49.03	60	51.53
	30.0	4	34	02.97	+26	58	59.84	60	32.48
	30.5	5	06	57.25	27	59	50.96	60	10.12
May	1.0	5	39	51.81	28	30	38.17	59	45.15
	1.5	6	12	26.05	28	31	42.19	59	18.29
	2.0	6	44	20.68	28	04	23.58	58	50.25
	2.5	7	15	19.85	27	10	51.02	58	21.68
	3.0	7	45	12.37	+25	53	45.84	57	53.19
	3.5	8	13	52.07	24	16	06.15	57	25.31
	4.0	8	41	17.40	22	20	53.07	56	58.46
	4.5	9	07	30.61	20	11	00.63	56	33.00
	5.0	9	32	36.71	17	49	09.59	56	09.21
	5.5	9	56	42.58	15	17	44.54	55	47.29
	6.0	10	19	56.21	+12	38	53.60	55	27.38
	6.5	10	42	26.10	9	54	29.67	55	09.55
	7.0	11	04	20.93	7	06	12.64	54	53.84
	7.5	11	25	49.32	4	15	32.03	54	40.24
	8.0	11	46	59.66	+1	23	49.66	54	28.70
	8.5	12	08	00.08	-1	27	37.69	54	19.18
	9.0	12	28	58.43	-4	17	35.92	54	11.58
	9.5	12	50	02.24	7	04	51.44	54	05.81
	10.0	13	11	18.68	9	48	09.28	54	01.78
	10.5	13	32	54.55	12	26	11.60	53	59.39
	11.0	13	54	56.16	14	57	36.49	53	58.55
	11.5	14	17	29.21	17	20	57.24	53	59.17
	12.0	14	40	38.56	-19	34	42.15	54	01.17
	12.5	15	04	28.03	21	37	14.96	54	04.51
	13.0	15	29	00.02	23	26	56.15	54	09.12
	13.5	15	54	15.25	25	02	05.05	54	14.97
	14.0	16	20	12.46	26	21	03.00	54	22.07
	14.5	16	46	48.18	27	22	17.27	54	30.40
	15.0	17	13	56.77	-28	04	25.62	54	39.98
	15.5	17	41	30.61	28	26	20.94	54	50.83
	16.0	18	09	20.59	28	27	15.42	55	03.00
	16.5	18	37	16.82	28	06	43.52	55	16.51
	17.0	19	05	09.51	-27	24	43.31	55	31.38

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
May	17.0	19	05	09.51	-27	24	43.31	55	31.38
	17.5	19	32	49.80	26	21	36.04	55	47.66
	18.0	20	00	10.47	24	58	04.00	56	05.32
	18.5	20	27	06.49	23	15	07.33	56	24.36
	19.0	20	53	35.23	21	14	00.36	56	44.71
	19.5	21	19	36.47	18	56	08.22	57	06.28
	20.0	21	45	12.20	-16	23	04.10	57	28.90
	20.5	22	10	26.41	13	36	27.64	57	52.36
	21.0	22	35	24.73	10	38	04.48	58	16.40
	21.5	23	00	14.16	7	29	46.89	58	40.64
	22.0	23	25	02.77	4	13	35.29	59	04.69
	22.5	23	49	59.49	-0	51	40.57	59	28.04
	23.0	0	15	13.86	+2	33	33.32	59	50.15
	23.5	0	40	55.74	5	59	26.74	60	10.43
	24.0	1	07	15.02	9	23	02.21	60	28.29
	24.5	1	34	21.12	12	41	03.38	60	43.12
	25.0	2	02	22.35	15	49	55.75	60	54.39
	25.5	2	31	25.03	18	45	49.98	61	01.64
	26.0	3	01	32.38	+21	24	48.74	61	04.51
	26.5	3	32	43.37	23	42	57.42	61	02.81
	27.0	4	04	51.70	25	36	38.84	60	56.50
	27.5	4	37	45.24	27	02	50.60	60	45.72
	28.0	5	11	06.42	27	59	22.50	60	30.76
	28.5	5	44	33.70	28	25	10.26	60	12.06
	29.0	6	17	43.99	+28	20	21.93	59	50.17
	29.5	6	50	15.43	27	46	14.93	59	25.71
	30.0	7	21	49.87	26	45	04.31	58	59.35
	30.5	7	52	14.43	25	19	45.33	58	31.77
	31.0	8	21	21.99	23	33	34.59	58	03.61
	31.5	8	49	10.65	21	29	53.29	57	35.49
June	1.0	9	15	42.82	+19	11	54.60	57	07.94
	1.5	9	41	04.00	16	42	35.88	56	41.44
	2.0	10	05	21.72	14	04	34.97	56	16.38
	2.5	10	28	44.67	11	20	09.56	55	53.08
	3.0	10	51	22.07	8	31	18.68	55	31.79
	3.5	11	13	23.27	5	39	45.24	55	12.70
	4.0	11	34	57.48	+2	46	59.18	54	55.92
	4.5	11	56	13.68	-0	05	39.26	54	41.52
	5.0	12	17	20.52	2	56	56.42	54	29.53
	5.5	12	38	26.33	5	45	42.20	54	19.93
	6.0	12	59	39.07	8	30	47.49	54	12.67
	6.5	13	21	06.32	11	11	01.72	54	07.68
	7.0	13	42	55.25	-13	45	10.99	54	04.85
	7.5	14	05	12.44	16	11	56.43	54	04.07
	8.0	14	28	03.79	18	29	53.24	54	05.21
	8.5	14	51	34.23	20	37	30.31	54	08.12
	9.0	15	15	47.41	-22	33	10.73	54	12.68

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
June	9.0	15	15	47.41	-22	33	10.73	54	12.68
	9.5	15	40	45.41	24	15	13.29	54	18.72
	10.0	16	06	28.29	25	41	55.18	54	26.12
	10.5	16	32	53.86	26	51	35.87	54	34.73
	11.0	16	59	57.47	27	42	42.09	54	44.44
	11.5	17	27	32.06	28	13	53.33	54	55.12
	12.0	17	55	28.58	-28	24	07.47	55	06.69
	12.5	18	23	36.57	28	12	45.48	55	19.07
	13.0	18	51	45.07	27	39	34.46	55	32.17
	13.5	19	19	43.64	26	44	48.57	55	45.96
	14.0	19	47	23.19	25	29	07.72	56	00.39
	14.5	20	14	36.78	23	53	34.26	56	15.42
	15.0	20	41	19.95	-21	59	28.67	56	31.05
	15.5	21	07	30.87	19	48	24.76	56	47.23
	16.0	21	33	10.23	17	22	05.35	57	03.93
	16.5	21	58	20.92	14	42	18.85	57	21.11
	17.0	22	23	07.74	11	50	57.03	57	38.69
	17.5	22	47	37.00	8	49	54.09	57	56.57
	18.0	23	11	56.21	-5	41	06.76	58	14.61
	18.5	23	36	13.87	-2	26	35.60	58	32.62
	19.0	0	00	39.16	+0	51	33.16	58	50.38
	19.5	0	25	21.77	4	11	05.06	59	07.60
	20.0	0	50	31.67	7	29	34.79	59	23.96
	20.5	1	16	18.83	10	44	23.64	59	39.10
	21.0	1	42	52.72	+13	52	37.62	59	52.61
	21.5	2	10	21.82	16	51	06.89	60	04.08
	22.0	2	38	52.70	19	36	27.34	60	13.10
	22.5	3	08	29.08	22	05	05.15	60	19.30
	23.0	3	39	10.63	24	13	25.17	60	22.34
	23.5	4	10	51.95	25	58	03.46	60	21.97
	24.0	4	43	21.98	+27	16	03.09	60	18.04
	24.5	5	16	24.17	28	05	11.38	60	10.50
	25.0	5	49	37.80	28	24	14.76	59	59.44
	25.5	6	22	40.15	28	13	07.88	59	45.05
	26.0	6	55	09.24	27	32	53.89	59	27.65
	26.5	7	26	46.37	26	25	35.92	59	07.64
	27.0	7	57	17.79	+24	54	01.85	58	45.50
	27.5	8	26	35.34	23	01	26.32	58	21.76
	28.0	8	54	36.22	20	51	13.59	57	56.97
	28.5	9	21	22.00	18	26	43.88	57	31.68
	29.0	9	46	57.56	15	51	04.07	57	06.41
	29.5	10	11	30.01	13	07	02.57	56	41.67
July	30.0	10	35	07.74	+10	17	07.56	56	17.90
	30.5	10	57	59.83	7	23	27.59	55	55.48
	1.0	11	20	15.57	4	27	53.59	55	34.76
	1.5	11	42	04.19	+1	32	01.75	55	16.00
	2.0	12	03	34.74	-1	22	43.32	54	59.42

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
July	1.0	11	20	15.57	+4	27	53.59	55	34.76
	1.5	11	42	04.19	+1	32	01.75	55	16.00
	2.0	12	03	34.74	-1	22	43.32	54	59.42
	2.5	12	24	55.96	4	15	05.36	54	45.19
	3.0	12	46	16.31	7	03	53.35	54	33.41
	3.5	13	07	43.88	9	47	58.61	54	24.15
	4.0	13	29	26.43	-12	26	12.17	54	17.44
	4.5	13	51	31.24	14	57	22.51	54	13.25
	5.0	14	14	05.04	17	20	13.69	54	11.54
	5.5	14	37	13.82	19	33	24.02	54	12.23
	6.0	15	01	02.56	21	35	25.40	54	15.19
	6.5	15	25	34.89	23	24	43.67	54	20.30
	7.0	15	50	52.77	-24	59	39.87	54	27.40
	7.5	16	16	56.04	26	18	33.01	54	36.30
	8.0	16	43	42.15	27	19	44.03	54	46.81
	8.5	17	11	06.01	28	01	41.03	54	58.72
	9.0	17	39	00.04	28	23	05.28	55	11.80
	9.5	18	07	14.65	28	22	57.21	55	25.84
	10.0	18	35	38.91	-28	00	41.62	55	40.62
	10.5	19	04	01.53	27	16	11.13	55	55.92
	11.0	19	32	11.87	26	09	47.35	56	11.52
	11.5	20	00	00.89	24	42	19.59	56	27.25
	12.0	20	27	21.79	22	55	01.64	56	42.93
	12.5	20	54	10.41	20	49	27.12	56	58.41
	13.0	21	20	25.30	-18	27	24.52	57	13.57
	13.5	21	46	07.51	15	50	52.43	57	28.31
	14.0	22	11	20.27	13	01	55.66	57	42.54
	14.5	22	36	08.64	10	02	42.45	57	56.22
	15.0	23	00	39.13	6	55	22.81	58	09.28
	15.5	23	24	59.34	-3	42	08.02	58	21.70
	16.0	23	49	17.71	-0	25	10.95	58	33.43
	16.5	0	13	43.28	+2	53	12.77	58	44.43
	17.0	0	38	25.45	6	10	43.07	58	54.65
	17.5	1	03	33.74	9	24	53.62	59	04.00
	18.0	1	29	17.48	12	33	09.87	59	12.39
	18.5	1	55	45.41	15	32	47.76	59	19.68
	19.0	2	23	05.06	+18	20	53.38	59	25.74
	19.5	2	51	22.05	20	54	24.34	59	30.39
	20.0	3	20	39.14	23	10	13.69	59	33.44
	20.5	3	50	55.30	25	05	16.79	59	34.71
	21.0	4	22	04.89	26	36	41.58	59	34.02
	21.5	4	53	57.29	27	42	01.32	59	31.21
	22.0	5	26	17.23	+28	19	28.35	59	26.15
	22.5	5	58	45.97	28	28	05.99	59	18.78
	23.0	6	31	03.28	28	07	55.77	59	09.08
	23.5	7	02	49.71	27	19	57.94	58	57.09
	24.0	7	33	48.70	+26	06	04.96	58	42.95

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
July	24.0	7	33	48.70	+26	06	04.96	58	42.95
	24.5	8	03	47.97	24	28	49.64	58	26.84
	25.0	8	32	40.14	22	31	10.73	58	09.03
	25.5	9	00	22.48	20	16	18.69	57	49.82
	26.0	9	26	56.20	17	47	23.86	57	29.57
	26.5	9	52	25.51	15	07	27.84	57	08.67
	27.0	10	16	56.71	+12	19	18.12	56	47.52
	27.5	10	40	37.40	9	25	25.56	56	26.51
	28.0	11	03	35.91	6	28	03.96	56	06.04
	28.5	11	26	00.85	3	29	11.04	55	46.48
	29.0	11	48	00.89	+0	30	30.41	55	28.18
	29.5	12	09	44.56	-2	26	26.05	55	11.43
	30.0	12	31	20.18	-5	20	15.53	54	56.51
	30.5	12	52	55.84	8	09	41.57	54	43.64
Aug.	31.0	13	14	39.29	10	53	31.41	54	33.02
	31.5	13	36	37.94	13	30	33.59	54	24.80
	1.0	13	58	58.79	15	59	35.65	54	19.07
	1.5	14	21	48.26	18	19	22.33	54	15.90
	2.0	14	45	12.00	-20	28	34.13	54	15.34
	2.5	15	09	14.69	22	25	46.58	54	17.35
	3.0	15	33	59.66	24	09	30.29	54	21.91
	3.5	15	59	28.59	25	38	12.07	54	28.92
	4.0	16	25	41.13	26	50	17.23	54	38.26
	4.5	16	52	34.63	27	44	13.17	54	49.79
	5.0	17	20	04.03	-28	18	34.06	55	03.29
	5.5	17	48	02.02	28	32	06.34	55	18.56
	6.0	18	16	19.41	28	23	54.26	55	35.32
	6.5	18	44	45.86	27	53	24.85	55	53.29
	7.0	19	13	10.74	27	00	31.39	56	12.14
	7.5	19	41	24.16	25	45	35.02	56	31.55
	8.0	20	09	17.74	-24	09	24.16	56	51.16
	8.5	20	36	45.29	22	13	12.24	57	10.62
	9.0	21	03	43.09	19	58	34.12	57	29.60
	9.5	21	30	10.02	17	27	21.97	57	47.75
	10.0	21	56	07.29	14	41	41.24	58	04.79
	10.5	22	21	38.24	11	43	47.05	58	20.46
	11.0	22	46	47.91	-8	36	01.34	58	34.55
	11.5	23	11	42.69	5	20	50.84	58	46.91
	12.0	23	36	30.02	-2	00	45.72	58	57.43
	12.5	0	01	18.07	+1	21	41.01	59	06.06
	13.0	0	26	15.48	4	43	53.58	59	12.83
	13.5	0	51	31.07	8	03	13.18	59	17.76
	14.0	1	17	13.59	+11	16	57.51	59	20.94
	14.5	1	43	31.29	14	22	20.39	59	22.48
	15.0	2	10	31.48	17	16	31.95	59	22.48
	15.5	2	38	19.89	19	56	39.71	59	21.07
	16.0	3	06	59.98	+22	19	51.22	59	18.34

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
Aug.	16.0	3	06	59.98	+22	19	51.22	59	18.34
	16.5	3	36	32.13	24	23	18.69	59	14.39
	17.0	4	06	52.98	26	04	25.90	59	09.28
	17.5	4	37	54.92	27	20	57.09	59	03.07
	18.0	5	09	26.28	28	11	07.04	58	55.78
	18.5	5	41	11.93	28	33	50.44	58	47.42
	19.0	6	12	54.74	+28	28	48.77	58	38.01
	19.5	6	44	17.32	27	56	32.79	58	27.53
	20.0	7	15	03.87	26	58	19.87	58	16.01
	20.5	7	45	01.68	25	36	06.76	58	03.46
	21.0	8	14	01.91	23	52	19.35	57	49.91
	21.5	8	41	59.88	21	49	41.53	57	35.45
	22.0	9	08	54.63	+19	31	04.89	57	20.17
	22.5	9	34	48.32	16	59	20.33	57	04.19
	23.0	9	59	45.43	14	17	12.18	56	47.69
	23.5	10	23	52.06	11	27	14.37	56	30.87
	24.0	10	47	15.31	8	31	48.65	56	13.93
	24.5	11	10	02.84	5	33	04.08	55	57.13
	25.0	11	32	22.54	+2	32	57.61	55	40.73
	25.5	11	54	22.31	-0	26	44.83	55	24.98
	26.0	12	16	09.97	3	24	26.70	55	10.16
	26.5	12	37	53.12	6	18	39.09	54	56.52
	27.0	12	59	39.11	9	07	58.83	54	44.32
	27.5	13	21	35.02	11	51	06.58	54	33.78
	28.0	13	43	47.51	-14	26	45.02	54	25.13
	28.5	14	06	22.83	16	53	37.18	54	18.55
	29.0	14	29	26.57	19	10	25.04	54	14.20
	29.5	14	53	03.57	21	15	48.51	54	12.24
	30.0	15	17	17.60	23	08	24.98	54	12.75
	30.5	15	42	11.13	24	46	49.53	54	15.81
Sept.	31.0	16	07	45.03	-26	09	36.04	54	21.46
	31.5	16	33	58.30	27	15	19.17	54	29.71
	1.0	17	00	47.89	28	02	37.37	54	40.50
	1.5	17	28	08.72	28	30	16.68	54	53.77
	2.0	17	55	53.86	28	37	14.95	55	09.38
	2.5	18	23	54.98	28	22	46.06	55	27.15
	3.0	18	52	02.97	-27	46	23.58	55	46.87
	3.5	19	20	08.76	26	48	03.35	56	08.24
	4.0	19	48	04.07	25	28	04.66	56	30.94
	4.5	20	15	42.12	23	47	10.09	56	54.57
	5.0	20	42	58.11	21	46	24.21	57	18.72
	5.5	21	09	49.45	19	27	11.53	57	42.90
	6.0	21	36	15.81	-16	51	14.23	58	06.62
	6.5	22	02	18.97	14	00	29.87	58	29.36
	7.0	22	28	02.56	10	57	09.44	58	50.63
	7.5	22	53	31.78	7	43	35.77	59	09.95
	8.0	23	18	53.06	-4	22	22.21	59	26.89

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
Sept.	8.0	23	18	53.06	-4	22	22.21	59	26.89
	8.5	23	44	13.74	-0	56	11.51	59	41.10
	9.0	0	09	41.83	+2	32	05.09	59	52.30
	9.5	0	35	25.66	5	59	28.97	60	00.33
	10.0	1	01	33.58	9	22	55.22	60	05.12
	10.5	1	28	13.54	12	39	14.15	60	06.73
	11.0	1	55	32.62	+15	45	13.26	60	05.28
	11.5	2	23	36.42	18	37	40.03	60	01.00
	12.0	2	52	28.35	21	13	25.83	59	54.17
	12.5	3	22	08.90	23	29	31.36	59	45.12
	13.0	3	52	34.96	25	23	13.63	59	34.19
	13.5	4	23	39.40	26	52	14.25	59	21.74
	14.0	4	55	11.18	+27	54	48.19	59	08.09
	14.5	5	26	55.95	28	29	51.58	58	53.54
	15.0	5	58	37.38	28	37	06.80	58	38.36
	15.5	6	29	58.82	28	17	03.59	58	22.77
	16.0	7	00	45.03	27	30	55.48	58	06.95
	16.5	7	30	43.62	26	20	32.40	57	51.04
	17.0	7	59	45.87	+24	48	10.86	57	35.16
	17.5	8	27	46.99	22	56	23.58	57	19.36
	18.0	8	54	45.80	20	47	50.23	57	03.71
	18.5	9	20	44.14	18	25	10.02	56	48.25
	19.0	9	45	46.18	15	50	56.72	56	33.00
	19.5	10	09	57.67	13	07	35.61	56	18.01
	20.0	10	33	25.39	+10	17	22.14	56	03.30
	20.5	10	56	16.72	7	22	21.75	55	48.94
	21.0	11	18	39.25	4	24	30.46	55	35.00
	21.5	11	40	40.62	+1	25	35.82	55	21.54
	22.0	12	02	28.34	-1	32	41.76	55	08.69
	22.5	12	24	09.75	4	28	47.80	54	56.56
	23.0	12	45	51.90	-7	21	12.38	54	45.29
	23.5	13	07	41.53	10	08	28.89	54	35.04
	24.0	13	29	45.00	12	49	12.87	54	25.96
	24.5	13	52	08.20	15	22	00.99	54	18.22
	25.0	14	14	56.44	17	45	30.21	54	12.00
	25.5	14	38	14.28	19	58	17.25	54	07.47
	26.0	15	02	05.36	-21	58	58.41	54	04.80
	26.5	15	26	32.12	23	46	09.90	54	04.14
	27.0	15	51	35.62	25	18	28.71	54	05.64
	27.5	16	17	15.30	26	34	34.22	54	09.41
	28.0	16	43	28.83	27	33	10.34	54	15.58
	28.5	17	10	12.13	28	13	08.26	54	24.20
	29.0	17	37	19.45	-28	33	29.45	54	35.33
	29.5	18	04	43.78	28	33	28.61	54	48.99
	30.0	18	32	17.29	28	12	36.25	55	05.13
	30.5	18	59	52.03	27	30	40.39	55	23.68
Oct.	1.0	19	27	20.54	-26	27	47.42	55	44.50

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
Oct.	1.0	19	27	20.54	-26	27	47.42	55	44.50
	1.5	19	54	36.50	25	04	21.95	56	07.41
	2.0	20	21	35.20	23	21	05.88	56	32.14
	2.5	20	48	13.83	21	18	57.18	56	58.36
	3.0	21	14	31.58	18	59	08.52	57	25.67
	3.5	21	40	29.61	16	23	06.31	57	53.59
	4.0	22	06	10.91	-13	32	30.12	58	21.58
	4.5	22	31	40.03	10	29	12.77	58	49.04
	5.0	22	57	02.87	7	15	20.81	59	15.32
	5.5	23	22	26.43	3	53	15.24	59	39.77
	6.0	23	47	58.51	-0	25	32.34	60	01.73
	6.5	0	13	47.51	+3	04	55.91	60	20.60
	7.0	0	40	02.04	+6	35	01.88	60	35.85
	7.5	1	06	50.59	10	01	23.38	60	47.07
	8.0	1	34	21.01	13	20	25.87	60	53.96
	8.5	2	02	39.86	16	28	26.32	60	56.43
	9.0	2	31	51.63	19	21	38.85	60	54.49
	9.5	3	01	57.82	21	56	22.54	60	48.35
	10.0	3	32	56.04	+24	09	11.35	60	38.33
	10.5	4	04	39.43	25	57	05.70	60	24.89
	11.0	4	36	56.43	27	17	44.59	60	08.52
	11.5	5	09	31.40	28	09	36.36	59	49.79
	12.0	5	42	06.01	28	32	05.83	59	29.28
	12.5	6	14	21.17	28	25	35.89	59	07.52
	13.0	6	45	59.16	+27	51	22.88	58	45.03
	13.5	7	16	45.45	26	51	26.62	58	22.26
	14.0	7	46	29.79	25	28	17.33	57	59.61
	14.5	8	15	06.48	23	44	42.10	57	37.39
	15.0	8	42	34.08	21	43	33.08	57	15.86
	15.5	9	08	54.63	19	27	38.58	56	55.22
	16.0	9	34	12.78	+16	59	37.43	56	35.59
	16.5	9	58	34.95	14	21	56.14	56	17.06
	17.0	10	22	08.63	11	36	48.16	55	59.69
	17.5	10	45	01.84	8	46	14.66	55	43.49
	18.0	11	07	22.82	5	52	05.98	55	28.46
	18.5	11	29	19.74	+2	56	03.67	55	14.58
	19.0	11	51	00.57	-0	00	17.62	55	01.82
	19.5	12	12	33.00	2	55	28.12	54	50.17
	20.0	12	34	04.39	5	48	01.23	54	39.61
	20.5	12	55	41.73	8	36	32.07	54	30.13
	21.0	13	17	31.57	11	19	36.19	54	21.75
	21.5	13	39	39.92	13	55	48.72	54	14.48
	22.0	14	02	12.22	-16	23	43.73	54	08.37
	22.5	14	25	13.10	18	41	54.12	54	03.47
	23.0	14	48	46.24	20	48	51.82	53	59.88
	23.5	15	12	54.14	22	43	08.60	53	57.67
	24.0	15	37	37.87	-24	23	17.46	53	56.95

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
Oct.	24.0	15	37	37.87	-24	23	17.46	53	56.95
	24.5	16	02	56.91	25	47	54.60	53	57.83
	25.0	16	28	48.96	26	55	41.89	54	00.44
	25.5	16	55	09.94	27	45	29.81	54	04.89
	26.0	17	21	54.15	28	16	20.42	54	11.30
	26.5	17	48	54.58	28	27	30.10	54	19.77
	27.0	18	16	03.43	-28	18	31.64	54	30.41
	27.5	18	43	12.73	27	49	15.37	54	43.28
	28.0	19	10	14.99	26	59	49.17	54	58.43
	28.5	19	37	03.82	25	50	37.39	55	15.88
	29.0	20	03	34.41	24	22	19.08	55	35.59
	29.5	20	29	43.79	22	35	45.76	55	57.49
	30.0	20	55	31.01	-20	31	59.28	56	21.44
	30.5	21	20	57.03	18	12	10.21	56	47.24
Nov.	31.0	21	46	04.65	15	37	36.94	57	14.60
	31.5	22	10	58.24	12	49	45.62	57	43.16
	1.0	22	35	43.59	9	50	11.16	58	12.48
	1.5	23	00	27.65	6	40	38.83	58	42.01
	2.0	23	25	18.35	-3	23	06.67	59	11.15
	2.5	23	50	24.37	+0	00	11.85	59	39.20
	3.0	0	15	54.97	3	26	45.17	60	05.45
	3.5	0	41	59.69	6	53	41.31	60	29.14
	4.0	1	08	47.96	10	17	46.58	60	49.55
	4.5	1	36	28.55	13	35	25.87	61	06.02
	5.0	2	05	08.83	+16	42	45.30	61	17.99
	5.5	2	34	53.75	19	35	37.97	61	25.06
	6.0	3	05	44.70	22	09	53.45	61	26.99
	6.5	3	37	38.31	24	21	31.38	61	23.76
	7.0	4	10	25.57	26	06	58.21	61	15.53
	7.5	4	43	51.65	27	23	25.50	61	02.64
	8.0	5	17	36.75	+28	09	06.24	60	45.60
	8.5	5	51	18.09	28	23	25.49	60	25.02
	9.0	6	24	32.54	28	07	02.24	60	01.59
	9.5	6	56	59.49	27	21	41.71	59	36.03
	10.0	7	28	22.92	26	10	00.08	59	09.05
	10.5	7	58	32.51	24	35	05.58	58	41.31
	11.0	8	27	23.59	+22	40	20.03	58	13.41
	11.5	8	54	56.44	20	29	03.90	57	45.89
	12.0	9	21	15.09	18	04	26.03	57	19.18
	12.5	9	46	26.16	15	29	17.97	56	53.64
	13.0	10	10	37.86	12	46	11.98	56	29.55
	13.5	10	33	59.21	9	57	21.61	56	07.11
	14.0	10	56	39.54	+7	04	43.75	55	46.45
	14.5	11	18	48.11	4	10	01.48	55	27.65
	15.0	11	40	33.91	+1	14	47.19	55	10.74
	15.5	12	02	05.61	-1	39	34.44	54	55.71
	16.0	12	23	31.43	-4	31	43.65	54	42.52

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
Nov.	16.0	12	23	31.43	-4	31	43.65	54	42.52
	16.5	12	44	59.18	7	20	23.12	54	31.12
	17.0	13	06	36.16	10	04	15.92	54	21.44
	17.5	13	28	29.16	12	42	03.90	54	13.38
	18.0	13	50	44.32	15	12	26.48	54	06.88
	18.5	14	13	27.02	17	33	59.98	54	01.85
	19.0	14	36	41.69	-19	45	17.62	53	58.24
	19.5	15	00	31.58	21	44	50.12	53	55.97
	20.0	15	24	58.48	23	31	07.10	53	55.02
	20.5	15	50	02.48	25	02	39.30	53	55.36
	21.0	16	15	41.80	26	18	01.61	53	56.99
	21.5	16	41	52.62	27	15	56.56	53	59.92
	22.0	17	08	29.27	-27	55	18.27	54	04.18
	22.5	17	35	24.43	28	15	16.10	54	09.83
	23.0	18	02	29.66	28	15	17.64	54	16.92
	23.5	18	29	36.09	27	55	10.52	54	25.53
	24.0	18	56	35.14	27	15	02.75	54	35.73
	24.5	19	23	19.24	26	15	21.50	54	47.59
	25.0	19	49	42.38	-24	56	50.73	55	01.18
	25.5	20	15	40.55	23	20	27.95	55	16.57
	26.0	20	41	11.81	21	27	20.85	55	33.77
	26.5	21	06	16.39	19	18	44.19	55	52.80
	27.0	21	30	56.42	16	55	57.52	56	13.62
	27.5	21	55	15.79	14	20	23.72	56	36.16
	28.0	22	19	19.87	-11	33	28.72	57	00.27
	28.5	22	43	15.29	8	36	42.14	57	25.74
	29.0	23	07	09.71	5	31	39.04	57	52.30
	29.5	23	31	11.71	-2	20	02.28	58	19.58
	30.0	23	55	30.59	+0	56	14.29	58	47.13
	30.5	0	20	16.21	4	15	02.39	59	14.43
Dec.	1.0	0	45	38.80	+7	33	55.68	59	40.88
	1.5	1	11	48.63	10	50	06.59	60	05.79
	2.0	1	38	55.51	14	00	24.17	60	28.48
	2.5	2	07	08.08	17	01	13.79	60	48.22
	3.0	2	36	32.75	19	48	40.04	61	04.35
	3.5	3	07	12.48	22	18	33.66	61	16.26
	4.0	3	39	05.30	+24	26	43.86	61	23.48
	4.5	4	12	03.14	26	09	15.81	61	25.68
	5.0	4	45	51.27	27	22	51.96	61	22.73
	5.5	5	20	08.84	28	05	13.75	61	14.68
	6.0	5	54	30.88	28	15	18.62	61	01.80
	6.5	6	28	31.31	27	53	27.50	60	44.50
	7.0	7	01	46.24	+27	01	20.37	60	23.36
	7.5	7	33	56.71	25	41	41.06	59	59.06
	8.0	8	04	50.16	23	57	55.67	59	32.33
	8.5	8	34	20.57	21	53	50.21	59	03.92
	9.0	9	02	27.63	+19	33	11.44	58	34.54

MOON, 2025
FOR 0^h AND 12^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			Horizontal Parallax	
		h	m	s	°	'	"	'	"
Dec.	9.0	9	02	27.63	+19	33	11.44	58	34.54
	9.5	9	29	15.41	16	59	33.38	58	04.89
	10.0	9	54	50.95	14	16	09.44	57	35.57
	10.5	10	19	23.09	11	25	49.32	57	07.11
	11.0	10	43	01.58	8	30	59.19	56	39.95
	11.5	11	05	56.46	5	33	44.03	56	14.44
	12.0	11	28	17.65	+2	35	50.94	55	50.86
	12.5	11	50	14.80	-0	21	07.12	55	29.41
	13.0	12	11	57.11	3	15	47.58	55	10.22
	13.5	12	33	33.32	6	06	54.82	54	53.36
	14.0	12	55	11.68	8	53	17.01	54	38.86
	14.5	13	16	59.91	11	33	43.50	54	26.68
	15.0	13	39	05.10	-14	07	02.56	54	16.79
	15.5	14	01	33.68	16	31	59.78	54	09.10
	16.0	14	24	31.22	18	47	16.96	54	03.51
	16.5	14	48	02.20	20	51	31.87	53	59.90
	17.0	15	12	09.82	22	43	18.68	53	58.14
	17.5	15	36	55.62	24	21	09.46	53	58.11
	18.0	16	02	19.27	-25	43	36.70	53	59.68
	18.5	16	28	18.35	26	49	16.66	54	02.72
	19.0	16	54	48.28	27	36	53.65	54	07.11
	19.5	17	21	42.44	28	05	24.58	54	12.75
	20.0	17	48	52.58	28	14	03.27	54	19.55
	20.5	18	16	09.37	28	02	23.96	54	27.44
	21.0	18	43	23.26	-27	30	23.31	54	36.37
	21.5	19	10	25.19	26	38	20.68	54	46.30
	22.0	19	37	07.42	25	26	56.61	54	57.21
	22.5	20	03	24.03	23	57	09.83	55	09.10
	23.0	20	29	11.29	22	10	13.45	55	21.98
	23.5	20	54	27.72	20	07	30.94	55	35.88
	24.0	21	19	14.02	-17	50	32.41	55	50.81
	24.5	21	43	32.83	15	20	51.66	56	06.79
	25.0	22	07	28.46	12	40	04.29	56	23.84
	25.5	22	31	06.65	9	49	46.76	56	41.93
	26.0	22	54	34.26	6	51	36.51	57	01.02
	26.5	23	17	59.11	-3	47	13.02	57	21.04
	27.0	23	41	29.82	-0	38	19.65	57	41.87
	27.5	0	05	15.65	+2	33	13.88	58	03.31
	28.0	0	29	26.36	5	45	28.43	58	25.12
	28.5	0	54	12.04	8	56	12.25	58	47.01
	29.0	1	19	42.86	12	02	57.68	59	08.59
	29.5	1	46	08.61	15	02	58.50	59	29.42
	30.0	2	13	38.08	+17	53	08.54	59	49.02
	30.5	2	42	18.17	20	30	02.42	60	06.83
	31.0	3	12	12.74	22	49	59.75	60	22.33
	31.5	3	43	21.30	24	49	13.83	60	34.95
	32.0	4	15	37.73	+26	24	05.49	60	44.21

MOON, 2025
AT EPHEMERIS TRANSIT

Date	Age (at 0 ^h)	Ephemeris Transit			Geocentric Declination		Date	Age (at 0 ^h)	Ephemeris Transit			Geocentric Declination	
	d	d	h	m	°	'		d	d	h	m	°	'
Jan. 0	0.06 L	31	00	08.4	-27	55.6	Jan. 23	23.06 U	23	06	50.5	-16	52.8
0	U	31	12	37.1	27	02.4	23	L	23	19	14.0	23	13.0
1	1.06 L	1	01	05.5	25	43.7	24	24.06 U	24	07	38.5	21	23.6
1	U	1	13	33.4	24	01.0	24	L	24	20	03.9	26	20.8
2	2.06 L	2	02	00.6	21	56.0	25	25.06 U	25	08	30.4	25	02.0
2	U	2	14	27.1	19	31.2	25	L	25	20	57.7	28	10.9
3	3.06 L	3	02	52.9	-16	49.2	26	26.06 U	26	09	25.7	-27	30.7
3	U	3	15	18.0	13	52.8	26	L	26	21	54.3	28	26.5
4	4.06 L	4	03	42.4	10	44.7	27	27.06 U	27	10	23.2	28	31.9
4	U	4	16	06.4	07	27.7	27	L	27	22	52.1	26	57.5
5	5.06 L	5	04	30.1	04	04.5	28	28.06 U	28	11	20.8	27	51.8
5	U	5	16	53.6	-00	37.7	28	L	28	23	49.1	23	44.4
6	6.06 L	6	05	17.2	+02	50.1	29	29.06 U	29	12	16.8	-25	26.1
6	U	6	17	40.9	06	16.3	30	0.48 L	30	00	43.8	18	59.4
7	7.06 L	7	06	05.0	09	38.0	30	U	30	13	10.1	21	22.0
7	U	7	18	29.7	12	52.6	31	1.48 L	31	01	35.8	13	03.2
8	8.06 L	8	06	55.1	15	57.0	31	U	31	14	00.8	15	56.6
8	U	8	19	21.4	18	48.2	Feb. 1	2.48 L	1	02	25.4	06	20.0
9	9.06 L	9	07	48.6	+21	23.0	1	U	1	14	49.7	-09	32.6
9	U	9	20	16.8	23	38.0	2	3.48 L	2	03	13.9	00	44.8
10	10.06 L	10	08	46.0	25	30.2	2	U	2	15	38.0	-02	35.0
10	U	10	21	15.9	26	56.8	3	4.48 L	3	04	02.3	+07	46.6
11	11.06 L	11	09	46.4	27	55.5	3	U	3	16	27.0	04	31.5
11	U	11	22	17.2	28	24.9	4	5.48 L	4	04	52.2	14	21.5
12	12.06 L	12	10	48.0	+28	24.6	4	U	4	17	18.1	+11	22.4
12	U	12	23	18.3	27	55.2	5	6.48 L	5	05	44.7	20	05.7
13	13.06 L	13	11	47.9	26	58.4	5	U	5	18	12.0	17	33.9
14	14.06 U	14	00	16.6	27	51.7	6	7.48 L	6	06	40.3	24	35.8
14	L	14	12	44.1	23	52.6	6	U	6	19	09.2	22	41.7
15	15.06 U	15	01	10.4	25	29.7	7	8.48 L	7	07	38.8	27	30.8
15	L	15	13	35.4	+19	31.3	7	U	7	20	08.8	+26	23.2
16	16.06 U	16	01	59.3	21	41.1	8	9.48 L	8	08	38.9	28	36.2
16	L	16	14	22.2	14	19.6	8	U	8	21	08.8	28	20.2
17	17.06 U	17	02	44.1	16	50.9	9	10.48 L	9	09	38.2	27	49.0
17	L	17	15	05.2	08	38.8	9	U	9	22	07.0	28	24.4
18	18.06 U	18	03	25.8	11	22.1	10	11.48 L	10	10	34.7	25	19.2
18	L	18	15	45.9	+02	45.3	10	U	10	23	01.5	+26	40.3
19	19.06 U	19	04	05.6	+05	33.2	11	12.48 L	11	11	27.1	21	26.3
19	L	19	16	25.2	-03	08.1	11	U	11	23	51.6	23	23.8
20	20.06 U	20	04	44.8	00	21.5	12	13.48 L	12	12	15.1	16	33.0
20	L	20	17	04.6	08	51.0	13	14.48 U	13	00	37.7	18	56.6
21	21.06 U	21	05	24.6	06	10.7	13	L	13	12	59.4	11	00.9
21	L	21	17	45.1	-14	13.7	14	15.48 U	14	01	20.5	+13	40.9
22	22.06 U	22	06	06.2	11	44.6	14	L	14	13	41.0	05	08.3
22	L	22	18	27.9	19	05.3	15	16.48 U	15	02	01.1	+07	56.5
23	23.06 U	23	06	50.5	-16	52.8	15	L	15	14	20.9	-00	49.9

MOON, 2025
AT EPHEMERIS TRANSIT

Date	Age (at 0 ^h)	Ephemeris Transit			Geocentric Declination		Date	Age (at 0 ^h)	Ephemeris Transit			Geocentric Declination	
	d	d	h	m	°	'		d	d	h	m	°	'
Feb. 15	L	15	14	20.9	-00	49.9	Mar. 10	U	10	21	47.7	+24	40.2
16	17.48 U	16	02	40.6	01	59.5	11	10.97 L	11	10	11.5	18	22.1
16	L	16	15	00.3	06	41.4	11	U	11	22	34.3	20	36.6
17	18.48 U	17	03	20.2	03	56.6	12	11.97 L	12	10	56.3	13	04.7
17	L	17	15	40.3	12	15.4	12	U	12	23	17.5	15	38.6
18	19.48 U	18	04	00.9	09	40.5	13	12.97 L	13	11	38.2	07	20.1
18	L	18	16	22.0	-17	21.1	13	U	13	23	58.4	+10	05.3
19	20.48 U	19	04	43.8	15	01.3	14	13.97 L	14	12	18.3	01	23.5
19	L	19	17	06.3	21	46.9	15	U	15	00	38.1	+04	12.9
20	21.48 U	20	05	29.7	19	48.0	15	14.97 L	15	12	57.7	-04	32.1
20	L	20	17	54.0	25	19.1	16	U	16	01	17.5	01	44.6
21	22.48 U	21	06	19.2	23	47.7	16	15.97 L	16	13	37.5	10	14.9
21	L	21	18	45.3	-27	42.2	17	U	17	01	57.7	-07	35.1
22	23.48 U	22	07	12.1	26	45.4	17	16.97 L	17	14	18.5	15	33.3
22	L	22	19	39.7	28	40.3	18	U	18	02	39.7	13	06.9
23	24.48 U	23	08	07.8	28	24.9	18	17.97 L	18	15	01.7	20	15.6
23	L	23	20	36.2	28	00.6	19	U	19	03	24.3	18	08.2
24	25.48 U	24	09	04.7	28	31.7	19	18.97 L	19	15	47.7	24	08.6
24	L	24	21	33.1	-25	37.3	20	U	20	04	12.0	-22	26.6
25	26.48 U	25	10	01.2	26	56.4	20	19.97 L	20	16	37.0	26	58.4
25	L	25	22	28.8	21	34.7	21	U	21	05	02.8	25	48.1
26	27.48 U	26	10	55.9	23	38.8	21	20.97 L	21	17	29.3	28	30.5
26	L	26	23	22.4	16	06.7	22	U	22	05	56.4	27	58.2
27	28.48 U	27	11	48.4	18	48.6	22	21.97 L	22	18	23.8	28	32.8
28	29.48 L	28	00	14.0	-09	34.4	23	U	23	06	51.4	-28	43.5
28	U	28	12	39.2	12	43.7	23	22.97 L	23	19	19.1	26	57.9
Mar. 1	0.97 L	1	01	04.2	02	23.5	24	U	24	07	46.7	27	54.1
1	U	1	13	29.1	-05	47.6	24	23.97 L	24	20	13.9	23	45.8
2	1.97 L	2	01	54.2	+04	58.3	25	U	25	08	40.8	25	26.7
2	U	2	14	19.5	01	32.8	25	24.97 L	25	21	07.3	19	04.1
3	2.97 L	3	02	45.2	+12	02.4	26	U	26	09	33.3	-21	25.5
3	U	3	15	11.5	08	49.2	26	25.97 L	26	21	59.0	13	07.2
4	3.97 L	4	03	38.4	18	20.5	27	U	27	10	24.3	16	01.7
4	U	4	16	06.1	15	32.8	27	26.97 L	27	22	49.5	06	14.8
5	4.97 L	5	04	34.5	23	26.0	28	U	28	11	14.7	09	32.5
5	U	5	17	03.6	21	15.6	28	27.97 L	28	23	39.9	01	08.5
6	5.97 L	6	05	33.3	+26	55.9	29	U	29	12	05.4	-02	20.2
6	U	6	18	03.3	25	32.4	30	0.54 L	30	00	31.3	+08	34.1
7	6.97 L	7	06	33.5	28	35.4	30	U	30	12	57.8	05	08.7
7	U	7	19	03.5	28	03.9	31	1.54 L	31	01	25.1	15	30.2
8	7.97 L	8	07	33.1	28	20.8	31	U	31	13	53.1	12	23.3
8	U	8	20	02.0	28	41.3	Apr. 1	2.54 L	1	02	22.0	21	24.0
9	8.97 L	9	08	30.0	+26	21.1	1	U	1	14	51.6	+18	50.7
9	U	9	20	57.0	27	28.6	2	3.54 L	2	03	22.1	25	45.2
10	9.97 L	10	09	22.9	22	54.5	2	U	2	15	52.9	23	58.4
10	U	10	21	47.7	+24	40.2	3	4.54 L	3	04	24.1	+28	12.2

MOON, 2025
AT EPHEMERIS TRANSIT

Date	Age (at 0 ^h)	Ephemeris Transit			Geocentric Declination		Date	Age (at 0 ^h)	Ephemeris Transit			Geocentric Declination	
	d	d	h	m	°	'		d	d	h	m	°	'
Apr. 1	2.54 L	1	02	22.0	+21	24.0	Apr. 24	25.54 U	24	09	01.0	-12	41.7
1	U	1	14	51.6	18	50.7	24	L	24	21	25.5	02	40.3
2	3.54 L	2	03	22.1	25	45.2	25	26.54 U	25	09	50.2	-06	00.1
2	U	2	15	52.9	23	58.4	25	L	25	22	15.4	+04	39.7
3	4.54 L	3	04	24.1	28	12.2	26	27.54 U	26	10	41.2	01	13.8
3	U	3	16	55.2	27	19.8	26	L	26	23	07.7	11	52.6
4	5.54 L	4	05	25.9	+28	37.1	27	28.54 U	27	11	35.0	+08	34.6
4	U	4	17	56.0	28	40.6	28	0.19 L	28	00	03.5	18	25.5
5	6.54 L	5	06	25.0	27	08.2	28	U	28	12	32.9	15	31.4
5	U	5	18	53.0	28	02.4	29	1.19 L	29	01	03.4	23	42.7
6	7.54 L	6	07	19.7	24	04.8	29	U	29	13	34.7	21	28.7
6	U	6	19	45.3	25	40.3	30	2.19 L	30	02	06.7	27	12.0
7	8.54 L	7	08	09.6	+19	50.3	30	U	30	14	39.0	+25	51.3
7	U	7	20	32.9	21	56.8	31	3.19 L	31	03	11.2	28	33.8
8	9.54 L	8	08	55.3	14	46.6	May 1	U	1	15	43.0	28	12.6
8	U	8	21	16.8	17	14.4	2	4.19 L	2	04	13.9	27	48.3
9	10.54 L	9	09	37.6	09	12.0	2	U	2	16	43.8	28	24.2
9	U	9	21	57.9	11	52.9	3	5.19 L	3	05	12.3	25	13.6
10	11.54 L	10	10	17.8	+03	21.2	3	U	3	17	39.5	+26	37.2
10	U	10	22	37.5	+06	08.4	4	6.19 L	4	06	05.2	21	16.5
11	12.54 L	11	10	57.1	-02	33.1	4	U	4	18	29.7	23	15.6
11	U	11	23	16.6	00	14.4	5	7.19 L	5	06	53.0	16	23.1
12	13.54 L	12	11	36.4	08	19.5	5	U	5	19	15.3	18	46.3
12	U	12	23	56.4	05	37.3	6	8.19 L	6	07	36.7	10	54.9
13	14.54 L	13	12	16.8	-13	46.5	6	U	6	19	57.4	+13	32.9
14	15.54 U	14	00	37.7	11	15.3	7	9.19 L	7	08	17.6	05	08.1
14	L	14	12	59.2	18	42.1	7	U	7	20	37.4	+07	53.6
15	16.54 U	15	01	21.4	16	27.7	8	10.19 L	8	08	57.0	-00	44.4
15	L	15	13	44.3	22	52.8	8	U	8	21	16.5	02	02.6
16	17.54 U	16	02	08.0	21	01.8	9	11.19 L	9	09	36.1	06	32.0
16	L	16	14	32.5	-26	04.7	9	U	9	21	55.8	-03	48.7
17	18.54 U	17	02	57.7	24	43.4	10	12.19 L	10	10	15.9	12	04.0
17	L	17	15	23.5	28	03.5	10	U	10	22	36.5	09	29.7
18	19.54 U	18	03	49.9	27	18.2	11	13.19 L	11	10	57.6	17	09.1
18	L	18	16	16.7	28	37.5	11	U	11	23	19.4	14	49.5
19	20.54 U	19	04	43.7	28	32.9	12	14.19 L	12	11	41.9	21	34.5
19	L	19	17	10.7	-27	39.3	13	15.19 U	13	00	05.2	-19	35.8
20	21.54 U	20	05	37.7	28	18.0	13	L	13	12	29.3	25	05.7
20	L	20	18	04.3	25	08.2	14	16.19 U	14	00	54.1	23	34.8
21	22.54 U	21	06	30.7	26	29.7	14	L	14	13	19.7	27	28.0
21	L	21	18	56.6	21	10.0	15	17.19 U	15	01	45.8	26	31.3
22	23.54 U	22	07	22.1	23	11.2	15	L	15	14	12.4	28	28.1
22	L	22	19	47.1	-15	55.5	16	18.19 U	16	02	39.3	-28	11.1
23	24.54 U	23	08	11.9	18	30.9	16	L	16	15	06.2	27	57.9
23	L	23	20	36.5	09	39.5	17	19.19 U	17	03	33.0	28	23.4
24	25.54 U	24	09	01.0	-12	41.7	17	L	17	15	59.6	-25	55.9

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	d		d	h	m	°	'		d		d	h	m	°	'
May	17	19.19 U	17	03	33.0	-28	23.4	June	9	12.87 L	9	10	25.3	-24	02.8
	17	L	17	15	59.6	25	55.9		9	U	9	22	49.8	22	22.7
	18	20.19 U	18	04	25.7	27	03.8		10	13.87 L	10	11	15.0	26	47.8
	18	L	18	16	51.4	22	28.0		10	U	10	23	41.0	25	40.0
	19	21.19 U	19	05	16.6	24	15.0		11	14.87 L	11	12	07.5	28	14.1
	19	L	19	17	41.2	17	45.1		12	15.87 U	12	00	34.5	27	44.7
	20	22.19 U	20	06	05.5	-20	05.8		12	L	12	13	01.6	-28	10.7
	20	L	20	18	29.4	12	01.0		13	16.87 U	13	01	28.8	28	23.9
	21	23.19 U	21	06	53.1	14	48.7		13	L	13	13	55.7	26	33.9
	21	L	21	19	16.6	05	31.3		14	17.87 U	14	02	22.3	27	30.4
	22	24.19 U	22	07	40.3	08	38.4		14	L	14	14	48.3	23	28.3
	22	L	22	20	04.2	01	26.5		15	18.87 U	15	03	13.8	25	05.2
	23	25.19 U	23	08	28.6	-01	51.1		15	L	15	15	38.7	-19	05.3
	23	L	23	20	53.6	+08	31.1		16	19.87 U	16	04	03.0	21	16.8
	24	26.19 U	24	09	19.4	05	14.0		16	L	16	16	26.9	13	39.8
	24	L	24	21	46.3	15	16.0		17	20.87 U	17	04	50.3	16	18.9
	25	27.19 U	25	10	14.2	12	12.8		17	L	17	17	13.4	07	28.2
	25	L	25	22	43.3	21	09.0		18	21.87 U	18	05	36.5	10	27.1
	26	28.19 U	26	11	13.6	+18	35.2		18	L	18	17	59.6	-00	47.6
	26	L	26	23	45.0	25	34.7		19	22.87 U	19	06	22.9	-03	57.9
	27	29.19 U	27	12	17.2	23	46.1		19	L	19	18	46.6	+06	03.8
	28	0.87 L	28	00	50.0	28	02.2		20	23.87 U	20	07	11.0	02	51.3
	28	U	28	13	22.9	27	10.9		20	L	20	19	36.1	12	44.9
	29	1.87 L	29	01	55.4	28	16.8		21	24.87 U	21	08	02.2	09	41.0
	29	U	29	14	27.2	+28	26.7		21	L	21	20	29.4	+18	49.9
	30	2.87 L	30	02	57.8	26	26.0		22	25.87 U	22	08	57.8	16	07.3
	30	U	30	15	27.1	27	31.3		22	L	22	21	27.4	23	48.3
	31	3.87 L	31	03	54.9	22	54.8		23	26.87 U	23	09	58.1	21	41.4
	31	U	31	16	21.3	24	43.4		23	L	23	22	29.9	27	07.9
June	1	4.87 L	1	04	46.3	18	13.5		24	27.87 U	24	11	02.2	25	50.7
	1	U	1	17	10.0	+20	31.9		24	L	24	23	34.9	+28	24.1
	2	5.87 L	2	05	32.6	12	49.0		25	28.87 U	25	12	07.3	28	05.5
	2	U	2	17	54.2	15	25.5		26	0.56 L	26	00	39.1	27	29.8
	3	6.87 L	3	06	15.2	07	01.9		26	U	26	13	10.0	28	10.5
	3	U	3	18	35.5	09	47.5		27	1.56 L	27	01	39.6	24	39.5
	4	7.87 L	4	06	55.5	01	07.0		27	U	27	14	07.9	26	11.0
	4	U	4	19	15.2	+03	55.1		28	2.56 L	28	02	34.7	+20	21.1
	5	8.87 L	5	07	34.8	-04	44.2		28	U	28	15	00.1	22	30.3
	5	U	5	19	54.5	01	59.1		29	3.56 L	29	03	24.2	15	05.0
	6	9.87 L	6	08	14.4	10	21.7		29	U	29	15	47.2	17	38.4
	6	U	6	20	34.7	07	44.4		30	4.56 L	30	04	09.3	09	17.0
	7	10.87 L	7	08	55.5	15	35.4		30	U	30	16	30.5	12	03.5
	7	U	7	21	16.8	-13	11.1	July	1	5.56 L	1	04	51.2	+03	16.4
	8	11.87 L	8	09	38.9	20	13.6		1	U	1	17	11.5	+06	07.3
	8	U	8	22	01.7	18	08.1		2	6.56 L	2	05	31.5	-02	42.7
	9	12.87 L	9	10	25.3	24	02.8		2	U	2	17	51.4	-00	06.2

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		d	d	h	m	°	'			d	d	h	m	°	'	
July	1	5.56 L	1	04	51.2	+03	16.4	July	24	28.56 U	24	11	53.7	+27	20.5	
	1	U	1	17	11.5	+06	07.3		25	0.20 L	25	00	21.6	22	27.2	
	2	6.56 L	2	05	31.5	-02	42.7		25	U	25	12	48.3	24	21.4	
	2	U	2	17	51.4	00	06.2		26	1.20 L	26	01	13.7	17	31.2	
	3	7.56 L	3	06	11.3	08	29.5		26	U	26	13	37.9	19	56.6	
	3	U	3	18	31.4	05	47.7		27	2.20 L	27	02	01.0	11	50.1	
	4	8.56 L	4	06	51.9	-13	53.9		27	U	27	14	23.3	+14	34.3	
	4	U	4	19	12.9	11	24.2		28	3.20 L	28	02	44.8	05	46.9	
	5	9.56 L	5	07	34.5	18	45.7		28	U	28	15	05.7	+08	39.6	
	5	U	5	19	56.7	16	33.2		29	4.20 L	29	03	26.2	-00	20.7	
	6	10.56 L	6	08	19.8	22	52.9		29	U	29	15	46.5	02	32.6	
	6	U	6	20	43.6	21	03.5		30	5.20 L	30	04	06.6	06	19.1	
	7	11.56 L	7	09	08.4	-26	01.4		30	U	30	16	26.8	-03	31.6	
	7	U	7	21	33.8	24	41.8		31	6.20 L	31	04	47.2	11	57.3	
	8	12.56 L	8	10	00.1	27	56.1		31	U	31	17	07.9	09	20.8	
	8	U	8	22	26.9	27	13.0		Aug.	1	7.20 L	1	05	29.1	17	05.0
	9	13.56 L	9	10	54.1	28	23.8			1	U	1	17	50.9	14	44.5
	9	U	9	23	21.6	28	22.5	2		8.20 L	2	06	13.3	21	31.1	
	10	14.56 L	10	11	49.0	-27	16.9	2		U	2	18	36.4	-19	32.1	
	11	15.56 U	11	00	16.2	27	59.9	3		9.20 L	3	07	00.4	25	03.4	
	11	L	11	12	43.0	24	36.3	3		U	3	19	25.1	23	31.8	
	12	16.56 U	12	01	09.2	26	02.1	4		10.20 L	4	07	50.7	27	27.8	
	12	L	12	13	34.9	20	31.4	4		U	4	20	16.9	26	29.9	
	13	17.56 U	13	01	59.9	22	35.1	5		11.20 L	5	08	43.8	28	30.5	
	13	L	13	14	24.4	-15	17.7	5		U	5	21	11.0	-28	12.4	
	14	18.56 U	14	02	48.3	17	51.8	6		12.20 L	6	09	38.5	28	01.1	
	14	L	14	15	11.8	09	13.2	6		U	6	22	05.9	28	26.6	
	15	19.56 U	15	03	35.0	12	09.1	7		13.20 L	7	10	33.2	25	55.6	
	15	L	15	15	58.1	02	37.0	7		U	7	23	00.2	27	05.7	
	16	20.56 U	16	04	21.1	-05	45.5	8		14.20 L	8	11	26.6	22	18.8	
	16	L	16	16	44.4	+04	11.8	8		U	8	23	52.5	-24	10.3	
	17	21.56 U	17	05	08.1	01	00.0	9		15.20 L	9	12	17.9	17	23.2	
	17	L	17	17	32.3	10	53.0	10		16.20 U	10	00	42.7	19	49.8	
	18	22.56 U	18	05	57.2	07	48.0	10		L	10	13	07.0	11	26.4	
	18	L	18	18	23.0	17	04.1	11		17.20 U	11	01	30.9	14	19.6	
	19	23.56 U	19	06	49.8	14	17.0	11		L	11	13	54.6	04	48.9	
	19	L	19	19	17.8	+22	19.5	12		18.20 U	12	02	18.1	-07	58.7	
	20	24.56 U	20	07	46.8	20	02.5	12		L	12	14	41.7	02	07.6	
	20	L	20	20	16.9	26	11.2	13		19.20 U	13	03	05.6	-01	08.4	
	21	25.56 U	21	08	47.9	24	36.9	13		L	13	15	29.7	+09	00.7	
	21	L	21	21	19.4	28	13.6	14		20.20 U	14	03	54.5	05	49.6	
	22	26.56 U	22	09	51.2	27	32.4	14		L	14	16	19.9	15	27.0	
	22	L	22	22	22.9	+28	12.2	15		21.20 U	15	04	46.1	+12	32.1	
	23	27.56 U	23	10	54.1	28	28.5	15		L	15	17	13.3	21	01.4	
	23	L	23	23	24.4	26	10.2	16		22.20 U	16	05	41.4	18	34.7	
	24	28.56 U	24	11	53.7	+27	20.5	16		L	16	18	10.6	+25	18.4	

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	d	d	h	m	°	'		d	d	h	m	°	'
Aug. 16	L	16	18	10.6	+25	18.4	Sept. 9	16.75 U	9	00	58.5	-04	05.4
17	23.20 U	17	06	40.5	23	31.3	9	L	9	13	23.1	+06	23.6
17	L	17	19	11.1	27	54.3	10	17.75 U	10	01	48.2	03	03.7
18	24.20 U	18	07	42.0	26	56.6	10	L	10	14	13.9	13	15.0
18	L	18	20	13.1	28	33.3	11	18.75 U	11	02	40.3	10	07.7
19	25.20 U	19	08	43.9	28	30.4	11	L	11	15	07.6	19	20.2
19	L	19	21	14.1	+27	13.9	12	19.75 U	12	03	35.7	+16	38.7
20	26.20 U	20	09	43.4	28	04.7	12	L	12	16	04.8	24	11.0
20	L	20	22	11.7	24	09.0	13	20.75 U	13	04	34.7	22	08.0
21	27.20 U	21	10	38.9	25	46.4	13	L	13	17	05.2	27	22.1
21	L	21	23	04.8	19	42.0	14	21.75 U	14	05	36.2	26	08.1
22	28.20 U	22	11	29.7	21	55.0	14	L	14	18	07.2	28	37.0
22	L	22	23	53.5	+14	18.4	15	22.75 U	15	06	38.0	+28	17.7
23	29.20 U	23	12	16.3	16	55.5	15	L	15	19	08.3	27	52.6
24	0.75 L	24	00	38.4	08	22.1	16	23.75 U	16	07	37.8	28	27.4
24	U	24	12	59.8	11	12.6	16	L	16	20	06.3	25	20.3
25	1.75 L	25	01	20.7	02	12.5	17	24.75 U	17	08	33.7	26	43.0
25	U	25	13	41.2	+05	07.5	17	L	17	20	59.9	21	21.2
26	2.75 L	26	02	01.6	-03	54.5	18	25.75 U	18	09	25.1	+23	21.8
26	U	26	14	21.9	01	02.3	18	L	18	21	49.1	16	19.5
27	3.75 L	27	02	42.3	09	45.6	19	26.75 U	19	10	12.2	18	47.1
27	U	27	15	02.9	07	02.5	19	L	19	22	34.4	10	37.6
28	4.75 L	28	03	23.8	15	09.5	20	27.75 U	20	10	56.0	13	22.1
28	U	28	15	45.2	12	40.9	20	L	20	23	17.0	04	34.9
29	5.75 L	29	04	07.1	-19	55.0	21	28.75 U	21	11	37.7	+07	27.5
29	U	29	16	29.6	17	46.3	21	L	21	23	58.1	-01	32.5
30	6.75 L	30	04	52.9	23	50.4	22	0.17 U	22	12	18.3	01	20.7
30	U	30	17	16.8	22	07.2	23	1.17 L	23	00	38.6	07	30.6
31	7.75 L	31	05	41.5	26	43.1	23	U	23	12	59.1	04	43.4
31	U	31	18	06.9	25	31.2	24	2.17 L	24	01	19.8	13	06.8
Sept. 1	8.75 L	1	06	33.0	-28	20.3	24	U	24	13	40.8	-10	31.7
1	U	1	18	59.5	27	45.3	25	3.17 L	25	02	02.3	18	09.1
2	9.75 L	2	07	26.4	28	30.8	25	U	25	14	24.4	15	51.8
2	U	2	19	53.6	28	37.2	26	4.17 L	26	02	47.1	22	25.3
3	10.75 L	3	08	20.7	27	08.0	26	U	26	15	10.5	20	31.7
3	U	3	20	47.7	27	58.2	27	5.17 L	27	03	34.5	25	43.0
4	11.75 L	4	09	14.4	-24	12.0	27	U	27	15	59.2	-24	18.7
4	U	4	21	40.7	25	45.1	28	6.17 L	28	04	24.5	27	50.1
5	12.75 L	5	10	06.6	19	50.1	28	U	28	16	50.2	27	00.5
5	U	5	22	32.0	22	02.0	29	7.17 L	29	05	16.4	28	36.0
6	13.75 L	6	10	56.9	14	15.7	29	U	29	17	42.9	28	25.3
6	U	6	23	21.5	16	59.7	30	8.17 L	30	06	09.4	27	53.6
7	14.75 L	7	11	45.8	-07	47.2	30	U	30	18	36.0	-28	24.6
8	15.75 U	8	00	10.0	10	54.2	Oct. 1	9.17 L	1	07	02.3	25	41.2
8	L	8	12	34.2	00	46.0	1	U	1	19	28.3	26	53.8
9	16.75 U	9	00	58.5	-04	05.4	2	10.17 L	2	07	54.0	-22	02.5

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	d	d	h	m	°	'		d	d	h	m	°	'
Oct. 1	U	1	19	28.3	-26	53.8	Oct. 24	U	24	13	54.2	-23	00.2
2	10.17 L	2	07	54.0	22	02.5	25	3.48 L	25	02	19.0	27	06.8
2	10.17 L	2	07	54.0	22	02.5	25	U	25	14	44.3	26	05.0
2	U	2	20	19.3	23	54.6	25	U	25	14	44.3	26	05.0
3	11.17 L	3	08	44.2	17	06.8	26	4.48 L	26	03	10.0	28	21.2
3	U	3	21	08.9	19	33.7	26	U	26	15	36.0	27	56.8
4	12.17 L	4	09	33.2	-11	07.2	27	5.48 L	27	04	02.1	-28	10.9
4	U	4	21	57.4	14	02.2	27	U	27	16	28.1	28	26.5
5	13.17 L	5	10	21.6	04	20.9	28	6.48 L	28	04	54.0	26	33.8
5	U	5	22	46.0	07	35.4	28	U	28	17	19.7	27	29.7
6	14.17 L	6	11	10.6	02	50.8	29	7.48 L	29	05	44.9	23	33.3
6	U	6	23	35.7	-00	32.3	29	U	29	18	09.7	25	07.5
7	15.17 L	7	12	01.4	+10	02.1	30	8.48 L	30	06	34.2	-19	17.1
8	16.17 U	8	00	27.9	06	43.5	30	U	30	18	58.3	21	25.7
8	L	8	12	55.3	16	42.6	31	9.48 L	31	07	22.0	13	55.7
9	17.17 U	9	01	23.7	13	43.2	31	U	31	19	45.6	16	33.6
9	L	9	13	53.1	22	18.9	Nov. 1	10.48 L	1	08	09.1	07	42.1
10	18.17 U	10	02	23.4	19	54.3	1	U	1	20	32.7	10	42.7
10	L	10	14	54.6	+26	19.3	2	11.48 L	2	08	56.5	-00	51.7
11	19.17 U	11	03	26.3	24	42.9	2	U	2	21	20.7	-04	07.0
11	L	11	15	58.3	28	20.3	3	12.48 L	3	09	45.5	+06	15.5
12	20.17 U	12	04	30.2	27	40.7	3	U	3	22	11.1	02	55.8
12	L	12	17	01.5	28	14.5	4	13.48 L	4	10	37.6	13	13.6
13	21.17 U	13	05	32.1	28	32.7	4	U	4	23	05.2	10	02.8
13	L	13	18	01.6	+26	12.3	5	14.48 L	5	11	34.1	+19	29.9
14	22.17 U	14	06	29.9	27	21.9	6	15.48 U	6	00	04.1	16	44.1
14	L	14	18	56.9	22	36.3	6	L	6	12	35.4	24	27.4
15	23.17 U	15	07	22.6	24	26.7	7	16.48 U	7	01	07.6	22	23.5
15	L	15	19	47.1	17	52.6	7	L	7	13	40.6	27	31.7
16	24.17 U	16	08	10.6	20	12.2	8	17.48 U	8	02	13.8	26	23.6
16	L	16	20	33.1	+12	24.6	8	L	8	14	46.9	+28	22.3
17	25.17 U	17	08	54.8	15	03.0	9	18.48 U	9	03	19.4	28	16.2
17	L	17	21	15.9	06	31.7	9	L	9	15	50.8	27	01.4
18	26.17 U	18	09	36.5	09	20.3	10	19.48 U	10	04	21.1	27	53.8
18	L	18	21	56.9	00	29.5	10	L	10	16	49.9	23	51.0
19	27.17 U	19	10	17.0	+03	21.0	11	20.48 U	11	05	17.3	25	30.7
19	L	19	22	37.1	-05	28.6	11	L	11	17	43.2	+19	21.4
20	28.17 U	20	10	57.3	02	40.6	12	21.48 U	12	06	07.8	21	34.9
20	L	20	23	17.7	11	10.5	12	L	12	18	31.2	14	01.2
21	29.17 U	21	11	38.4	08	31.8	13	22.48 U	13	06	53.6	16	36.2
21	L	21	23	59.6	16	23.9	13	L	13	19	15.2	08	13.0
22	0.48 U	22	12	21.2	14	00.6	14	23.48 U	14	07	36.2	10	59.5
23	1.48 L	23	00	43.5	-20	56.3	14	L	14	19	56.7	+02	13.7
23	U	23	13	06.4	18	54.3	15	24.48 U	15	08	16.8	+05	04.0
24	2.48 L	24	01	30.0	24	34.9	15	L	15	20	36.8	-03	43.8
24	U	24	13	54.2	-23	00.2	16	25.48 U	16	08	56.8	-00	55.7

MOON, 2025
AT EPHEMERIS TRANSIT

Date	Age (at 0 ^h)	Ephemeris Transit			Geocentric Declination		Date	Age (at 0 ^h)	Ephemeris Transit			Geocentric Declination	
	d	d	h	m	°	'		d	d	h	m	°	'
Nov. 16	25.48 U	16	08	56.8	-00	55.7	Dec. 9	L	9	16	24.2	+16	00.3
16	L	16	21	17.0	09	27.9	10	19.72 U	10	04	48.2	18	32.8
17	26.48 U	17	09	37.4	06	47.6	10	L	10	17	11.0	10	10.4
17	L	17	21	58.2	14	47.8	11	20.72 U	11	05	33.0	12	57.8
18	27.48 U	18	10	19.5	12	20.7	11	L	11	17	54.3	04	05.9
18	L	18	22	41.3	-19	31.7	12	21.72 U	12	06	15.0	+06	58.5
19	28.48 U	19	11	03.8	-17	23.5	12	L	12	18	35.4	-01	57.7
19	L	19	23	26.9	23	26.7	13	22.72 U	13	06	55.6	00	53.2
20	29.48 U	20	11	50.8	21	43.6	13	L	13	19	15.8	07	48.6
21	0.72 L	21	00	15.2	26	19.6	14	23.72 U	14	07	36.1	05	05.0
21	U	21	12	40.3	25	07.4	14	L	14	19	56.7	13	16.4
22	1.72 L	22	01	05.8	27	58.0	15	24.72 U	15	08	17.7	10	45.2
22	U	22	13	31.7	-27	22.1	15	L	15	20	39.1	-18	10.8
23	2.72 L	23	01	57.7	28	13.4	16	25.72 U	16	09	01.2	15	57.1
23	U	23	14	23.7	28	16.9	16	L	16	21	23.9	22	20.4
24	3.72 L	24	02	49.6	27	02.6	17	26.72 U	17	09	47.3	20	29.7
24	U	24	15	15.2	27	46.2	17	L	17	22	11.4	25	32.3
25	4.72 L	25	03	40.3	24	29.1	18	27.72 U	18	10	36.1	24	10.7
25	U	25	16	05.0	-25	50.6	18	L	18	23	01.4	-27	33.8
26	5.72 L	26	04	29.2	20	40.8	19	28.72 U	19	11	27.2	26	46.7
26	U	26	16	52.9	22	36.2	19	L	19	23	53.3	28	14.1
27	6.72 L	27	05	16.2	15	48.9	20	29.72 U	20	12	19.5	28	05.9
27	U	27	17	39.1	18	12.9	21	0.93 L	21	00	45.7	27	27.6
28	7.72 L	28	06	01.9	10	05.5	21	U	21	13	11.6	28	00.1
28	U	28	18	24.5	-12	52.3	22	1.93 L	22	01	37.2	-25	15.7
29	8.72 L	29	06	47.2	03	43.6	22	U	22	14	02.3	26	27.5
29	U	29	19	10.1	06	46.7	23	2.93 L	23	02	26.8	21	46.2
30	9.72 L	30	07	33.4	03	01.6	23	U	23	14	50.8	23	33.1
30	U	30	19	57.4	-00	10.0	24	3.93 L	24	03	14.2	17	11.1
Dec. 1	10.72 L	1	08	22.1	+09	51.5	24	U	24	15	37.2	19	27.4
1	U	1	20	47.8	+06	41.3	25	4.93 L	25	03	59.7	-11	44.1
2	11.72 L	2	09	14.8	16	21.0	25	U	25	16	22.0	14	23.3
2	U	2	21	43.0	13	25.1	26	5.93 L	26	04	44.1	05	39.2
3	12.72 L	3	10	12.7	21	57.6	26	U	26	17	06.3	08	34.6
3	U	3	22	43.7	19	31.9	27	6.93 L	27	05	28.6	00	49.2
4	13.72 L	4	11	16.0	26	03.8	27	U	27	17	51.2	-02	15.2
4	U	4	23	49.2	+24	25.2	28	7.93 L	28	06	14.4	+07	25.3
5	14.72 L	5	12	23.1	28	06.0	28	U	28	18	38.4	04	20.0
6	15.72 U	6	00	57.0	27	27.5	29	8.93 L	29	07	03.3	13	50.1
6	L	6	13	30.4	27	48.5	29	U	29	19	29.3	10	53.7
7	16.72 U	7	02	02.9	28	13.8	30	9.93 L	30	07	56.5	19	38.9
7	L	7	14	34.2	25	21.3	30	U	30	20	25.1	17	03.9
8	17.72 U	8	03	04.0	+26	43.4	31	10.93 L	31	08	55.2	+24	20.9
8	L	8	15	32.2	21	13.8	31	U	31	21	26.5	22	22.0
9	18.72 U	9	03	58.9	23	18.7	32	11.93 L	1	09	59.0	27	22.1
9	L	9	16	24.2	+16	00.3	32	U	1	22	32.2	+26	14.1

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Date 0 ^h TT	The Earth's Selenographic		The Sun's Selenographic		Position Angle of		Fraction Illuminated	
	Long.	Lat.	Colong.	Lat.	Axis	Bright		
						Limb		
	°	°	°	°	°	°		
Jan.	0	-4.812	+6.493	275.61	-1.55	355	346	0.002
	1	4.628	6.072	287.80	1.54	350	279	0.015
	2	4.243	5.307	299.99	1.53	346	263	0.050
	3	3.709	4.229	312.17	1.52	342	255	0.109
	4	3.068	2.894	324.35	1.50	340	250	0.187
	5	2.351	+1.379	336.52	1.49	338	247	0.282
	6	-1.570	-0.227	348.69	-1.48	338	247	0.389
	7	-0.729	1.824	0.85	1.47	339	247	0.501
	8	+0.171	3.314	13.00	1.46	341	250	0.614
	9	1.122	4.603	25.15	1.45	344	254	0.722
	10	2.098	5.607	37.29	1.44	348	261	0.817
	11	3.050	6.265	49.42	1.43	353	269	0.895
	12	+3.910	-6.539	61.55	-1.42	359	280	0.953
	13	4.599	6.423	73.68	1.41	5	297	0.988
	14	5.041	5.940	85.80	1.40	10	21	0.998
	15	5.176	5.139	97.93	1.39	14	89	0.986
	16	4.972	4.085	110.06	1.38	18	102	0.953
	17	4.428	2.850	122.19	1.37	20	108	0.901
	18	+3.573	-1.503	134.32	-1.36	21	112	0.835
	19	2.462	-0.111	146.46	1.35	22	113	0.758
	20	+1.171	+1.269	158.61	1.34	22	114	0.672
	21	-0.215	2.586	170.76	1.33	21	112	0.581
	22	1.602	3.794	182.92	1.32	19	110	0.488
	23	2.895	4.847	195.08	1.31	16	106	0.394
	24	-4.007	+5.703	207.26	-1.30	13	102	0.303
	25	4.859	6.315	219.43	1.29	8	95	0.217
	26	5.393	6.642	231.61	1.27	3	88	0.140
	27	5.576	6.643	243.80	1.26	358	79	0.077
	28	5.403	6.291	255.99	1.24	352	68	0.030
	29	4.903	5.577	268.18	1.22	347	45	0.005
Feb.	30	-4.132	+4.521	280.37	-1.20	343	281	0.004
	31	3.163	3.174	292.57	1.18	340	256	0.029
	1	2.076	+1.616	304.76	1.16	339	249	0.079
	2	-0.945	-0.050	316.94	1.13	338	246	0.153
	3	+0.170	1.711	329.12	1.10	339	246	0.245
	4	1.228	3.257	341.30	1.08	340	248	0.351
	5	+2.201	-4.591	353.47	-1.05	343	252	0.463
	6	3.067	5.635	5.63	1.03	347	257	0.576
	7	3.808	6.333	17.78	1.00	352	263	0.684
	8	4.405	6.656	29.93	0.98	357	271	0.781
	9	4.829	6.598	42.08	0.95	3	279	0.864
	10	5.054	6.177	54.22	0.92	8	287	0.928
	11	+5.052	-5.432	66.35	-0.90	13	296	0.972
	12	4.803	4.416	78.49	0.87	17	314	0.996
	13	4.297	3.196	90.63	0.85	19	84	0.998
14	3.541	1.840	102.76	0.83	21	108	0.980	
15	+2.557	-0.419	114.90	-0.80	22	113	0.944	

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	Long.	Lat.	Colong.	Lat.	Axis	Bright Limb	
	°	°	°	°	°	°	
Feb. 15	+2.557	-0.419	114.90	-0.80	22	113	0.944
16	1.384	+1.003	127.04	0.78	22	114	0.891
17	+0.077	2.368	139.19	0.76	21	114	0.826
18	-1.301	3.626	151.34	0.74	19	112	0.749
19	2.673	4.731	163.50	0.73	17	110	0.663
20	3.959	5.641	175.66	0.71	14	105	0.571
21	-5.077	+6.318	187.83	-0.69	10	100	0.475
22	5.948	6.723	200.01	0.67	5	94	0.379
23	6.501	6.820	212.19	0.65	360	87	0.284
24	6.683	6.580	224.38	0.63	354	80	0.196
25	6.463	5.982	236.57	0.61	349	73	0.118
26	5.843	5.027	248.77	0.59	345	66	0.056
27	-4.857	+3.744	260.97	-0.56	342	59	0.015
28	3.574	2.196	273.18	0.53	339	353	0.000
Mar. 1	2.085	+0.482	285.38	0.50	338	248	0.013
2	-0.501	-1.274	297.59	0.47	338	245	0.055
3	+1.069	2.941	309.79	0.44	340	245	0.123
4	2.528	4.398	321.98	0.41	342	248	0.211
5	+3.794	-5.551	334.17	-0.37	346	253	0.314
6	4.814	6.339	346.36	0.34	350	259	0.424
7	5.552	6.735	358.54	0.31	356	266	0.536
8	5.997	6.740	10.71	0.27	2	273	0.643
9	6.150	6.378	22.87	0.24	7	280	0.741
10	6.023	5.689	35.04	0.20	12	287	0.827
11	+5.637	-4.725	47.19	-0.17	16	292	0.897
12	5.015	3.545	59.35	0.13	19	296	0.950
13	4.183	2.214	71.50	0.10	21	299	0.984
14	3.171	-0.797	83.65	0.07	22	304	0.999
15	2.011	+0.642	95.80	0.04	22	117	0.995
16	+0.738	2.040	107.95	-0.01	21	117	0.973
17	-0.608	+3.343	120.11	+0.01	20	116	0.934
18	1.980	4.500	132.27	0.03	18	113	0.880
19	3.326	5.468	144.43	0.06	15	109	0.813
20	4.587	6.207	156.60	0.08	11	104	0.733
21	5.701	6.685	168.78	0.10	7	99	0.645
22	6.601	6.872	180.96	0.11	2	92	0.549
23	-7.220	+6.742	193.14	+0.13	356	86	0.449
24	7.496	6.276	205.34	0.15	351	79	0.348
25	7.380	5.468	217.54	0.17	347	73	0.250
26	6.841	4.329	229.74	0.19	343	69	0.161
27	5.877	2.896	241.95	0.21	340	65	0.086
28	4.522	+1.240	254.17	0.24	339	65	0.031
29	-2.850	-0.531	266.39	+0.27	338	70	0.003
30	-0.973	2.285	278.61	0.30	339	234	0.005
31	+0.969	3.881	290.83	0.33	341	242	0.037
Apr. 1	2.826	5.194	303.05	0.36	344	248	0.096
2	+4.461	-6.134	315.26	+0.39	349	254	0.178

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	Long.	Lat.	Colong.	Lat.	Axis	Bright Limb		
		°	°	°	°	°	°	
Apr.	1	+2.826	-5.194	303.05	+0.36	344	248	0.096
	2	4.461	6.134	315.26	0.39	349	254	0.178
	3	5.766	6.656	327.47	0.42	354	261	0.276
	4	6.673	6.757	339.67	0.46	0	269	0.382
	5	7.159	6.468	351.87	0.49	6	276	0.491
	6	7.233	5.836	4.06	0.53	11	283	0.597
	7	+6.935	-4.921	16.25	+0.56	15	288	0.696
	8	6.318	3.786	28.43	0.60	18	291	0.784
	9	5.442	2.495	40.60	0.63	20	294	0.859
	10	4.367	-1.108	52.78	0.67	21	294	0.920
	11	3.150	+0.312	64.95	0.70	22	293	0.964
	12	1.841	1.709	77.12	0.73	22	287	0.991
	13	+0.484	+3.024	89.29	+0.75	20	206	1.000
	14	-0.883	4.208	101.45	0.78	19	126	0.991
	15	2.224	5.213	113.63	0.80	16	117	0.964
	16	3.505	5.997	125.80	0.82	12	110	0.921
	17	4.689	6.527	137.98	0.83	8	104	0.862
	18	5.739	6.774	150.16	0.85	3	97	0.790
	19	-6.608	+6.718	162.34	+0.86	358	90	0.705
	20	7.247	6.347	174.53	0.87	353	83	0.610
	21	7.602	5.657	186.73	0.88	348	77	0.508
	22	7.618	4.657	198.94	0.89	344	72	0.403
	23	7.248	3.372	211.15	0.91	341	69	0.298
	24	6.460	1.853	223.37	0.92	339	67	0.200
	25	-5.250	+0.175	235.59	+0.94	338	66	0.115
	26	3.655	-1.553	247.82	0.95	338	69	0.050
	27	-1.759	3.201	260.06	0.97	340	80	0.011
	28	+0.304	4.633	272.29	0.99	343	198	0.002
	29	2.365	5.730	284.53	1.02	347	242	0.023
	30	4.248	6.411	296.76	1.04	352	253	0.073
May	1	+5.798	-6.648	308.99	+1.07	358	263	0.147
	2	6.907	6.459	321.22	1.09	4	271	0.237
	3	7.524	5.895	333.44	1.12	9	279	0.337
	4	7.652	5.024	345.66	1.15	14	284	0.441
	5	7.335	3.921	357.87	1.18	17	289	0.545
	6	6.643	2.656	10.07	1.21	20	292	0.643
	7	+5.657	-1.296	22.27	+1.24	21	293	0.734
	8	4.462	+0.101	34.46	1.26	22	293	0.814
	9	3.138	1.478	46.65	1.29	22	292	0.882
	10	1.755	2.784	58.84	1.31	21	289	0.936
	11	+0.369	3.968	71.03	1.33	19	282	0.973
	12	-0.973	4.984	83.21	1.35	17	262	0.994
	13	-2.237	+5.789	95.39	+1.36	13	158	0.998
	14	3.398	6.346	107.57	1.38	9	118	0.983
	15	4.437	6.626	119.76	1.38	4	105	0.950
	16	5.335	6.608	131.95	1.39	359	96	0.900
	17	-6.073	+6.283	144.14	+1.39	354	88	0.833

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EPHEMERIS FOR PHYSICAL OBSERVATIONS
FOR 0^h TERRESTRIAL TIME

Date 0 ^h TT	The Earth's Selenographic		The Sun's Selenographic		Position Angle of		Fraction Illuminated	
	Long.	Lat.	Colong.	Lat.	Axis	Bright		
						Limb		
	°	°	°	°	°	°		
May	17	-6.073	+6.283	144.14	+1.39	354	88	0.833
	18	6.623	5.652	156.34	1.39	349	81	0.752
	19	6.950	4.728	168.54	1.39	345	75	0.658
	20	7.010	3.541	180.75	1.39	342	71	0.555
	21	6.758	2.133	192.96	1.39	340	68	0.446
	22	6.151	+0.567	205.18	1.39	338	67	0.337
	23	-5.163	-1.071	217.41	+1.39	338	67	0.233
	24	3.800	2.678	229.65	1.39	339	70	0.141
June	25	2.112	4.132	241.89	1.40	341	75	0.068
	26	-0.204	5.315	254.13	1.40	345	88	0.021
	27	+1.776	6.125	266.38	1.41	349	148	0.002
	28	3.650	6.502	278.62	1.42	355	243	0.013
	29	+5.247	-6.435	290.87	+1.44	1	262	0.053
	30	6.435	5.956	303.11	1.45	7	272	0.115
	31	7.137	5.135	315.35	1.47	12	280	0.196
	1	7.336	4.052	327.59	1.48	16	286	0.288
	2	7.064	2.790	339.82	1.50	19	290	0.386
	3	6.390	1.427	352.04	1.52	21	292	0.486
	4	+5.400	-0.029	4.26	+1.53	22	293	0.584
	5	4.189	+1.348	16.47	1.55	22	293	0.677
	6	2.848	2.651	28.68	1.57	21	291	0.762
	7	1.463	3.834	40.88	1.58	20	288	0.837
	8	+0.105	4.855	53.08	1.59	17	284	0.900
	9	-1.169	5.671	65.28	1.60	14	276	0.949
	10	-2.318	+6.245	77.47	+1.60	10	264	0.982
	11	3.316	6.547	89.66	1.60	6	222	0.997
	12	4.152	6.551	101.85	1.60	1	123	0.994
	13	4.822	6.247	114.04	1.59	355	98	0.971
	14	5.325	5.635	126.24	1.58	350	87	0.928
	15	5.658	4.734	138.44	1.57	346	79	0.867
	16	-5.809	+3.575	150.64	+1.56	343	73	0.788
	17	5.759	2.207	162.84	1.54	340	69	0.695
	18	5.477	+0.693	175.06	1.53	339	67	0.591
	19	4.931	-0.888	187.28	1.51	338	67	0.479
	20	4.097	2.445	199.50	1.50	339	68	0.367
	21	2.969	3.876	211.74	1.48	340	71	0.259
	22	-1.577	-5.077	223.98	+1.47	343	76	0.163
	23	+0.009	5.953	236.22	1.46	347	84	0.085
	24	1.674	6.431	248.47	1.46	353	96	0.031
	25	3.276	6.476	260.72	1.45	359	129	0.005
	26	4.666	6.097	272.98	1.45	5	244	0.006
	27	5.719	5.342	285.23	1.45	10	271	0.034
28	+6.350	-4.288	297.48	+1.45	15	281	0.085	
29	6.528	3.022	309.72	1.45	18	287	0.154	
30	6.267	1.634	321.97	1.46	20	291	0.237	
July	1	5.619	-0.200	334.20	1.46	22	293	0.328
	2	+4.660	+1.211	346.43	+1.47	22	294	0.423

MOON, 2025
EPHEMERIS FOR PHYSICAL OBSERVATIONS
FOR 0^h TERRESTRIAL TIME

Date 0 ^h TT	The Earth's Selenographic		The Sun's Selenographic		Position Angle of		Fraction Illuminated	
	Long.	Lat.	Colong.	Lat.	Axis	Bright Limb		
		°	°	°	°	°		
July	1	+5.619	-0.200	334.20	+1.46	22	293	0.328
	2	4.660	+1.211	346.43	1.47	22	294	0.423
	3	3.480	2.545	358.66	1.47	22	293	0.519
	4	2.171	3.755	10.88	1.47	20	291	0.613
	5	+0.823	4.800	23.09	1.48	18	288	0.703
	6	-0.483	5.643	35.30	1.48	15	283	0.785
	7	-1.678	+6.247	47.51	+1.47	12	277	0.858
	8	2.710	6.582	59.71	1.47	7	270	0.918
	9	3.544	6.621	71.90	1.46	2	260	0.963
	10	4.165	6.347	84.10	1.45	357	241	0.991
	11	4.570	5.758	96.29	1.43	352	150	0.998
	12	4.771	4.866	108.48	1.41	347	91	0.985
	13	-4.782	+3.703	120.68	+1.38	343	78	0.950
	14	4.619	2.323	132.87	1.36	341	71	0.893
	15	4.289	+0.796	145.07	1.33	339	68	0.816
	16	3.793	-0.796	157.28	1.30	338	66	0.723
	17	3.126	2.359	169.49	1.27	338	66	0.617
	18	2.287	3.796	181.71	1.24	340	68	0.504
	19	-1.280	-5.012	193.93	+1.22	342	72	0.390
	20	-0.131	5.925	206.17	1.19	346	77	0.281
	21	+1.108	6.467	218.40	1.17	351	85	0.183
	22	2.362	6.598	230.65	1.15	357	93	0.102
	23	3.533	6.313	242.89	1.13	3	104	0.044
	24	4.522	5.641	255.14	1.11	8	122	0.010
	25	+5.238	-4.642	267.39	+1.10	13	230	0.001
	26	5.617	3.396	279.65	1.08	17	279	0.018
	27	5.629	1.992	291.90	1.07	20	288	0.057
	28	5.277	-0.517	304.14	1.06	21	292	0.114
	29	4.595	+0.950	316.38	1.05	22	294	0.185
	30	3.639	2.345	328.62	1.05	22	294	0.268
Aug.	31	+2.482	+3.615	340.85	+1.04	21	293	0.357
	1	+1.205	4.717	353.08	1.03	19	291	0.451
	2	-0.109	5.613	5.30	1.03	17	287	0.546
	3	1.376	6.272	17.51	1.02	13	282	0.639
	4	2.522	6.666	29.72	1.01	9	277	0.728
	5	3.482	6.769	41.92	0.99	4	270	0.810
	6	-4.207	+6.561	54.12	+0.98	359	262	0.881
	7	4.665	6.033	66.32	0.96	353	254	0.938
	8	4.844	5.187	78.50	0.93	349	245	0.979
	9	4.749	4.049	90.69	0.91	345	217	0.998
	10	4.405	2.663	102.88	0.87	341	83	0.994
	11	3.843	+1.102	115.07	0.84	339	70	0.966
	12	-3.104	-0.543	127.25	+0.80	338	66	0.914
	13	2.228	2.171	139.45	0.77	338	65	0.839
	14	1.252	3.673	151.64	0.73	339	66	0.746
	15	-0.215	4.951	163.85	0.69	341	69	0.640
16	+0.846	-5.923	176.06	+0.66	345	74	0.526	

MOON, 2025
EPHEMERIS FOR PHYSICAL OBSERVATIONS
FOR 0^h TERRESTRIAL TIME

Date 0 ^h TT	The Earth's Selenographic		The Sun's Selenographic		Position Angle of		Fraction Illuminated
	Long.	Lat.	Colong.	Lat.	Axis	Bright Limb	
	°	°	°	°	°	°	
Aug. 16	+0.846	-5.923	176.06	+0.66	345	74	0.526
17	1.892	6.526	188.27	0.62	349	80	0.412
18	2.879	6.729	200.49	0.59	355	87	0.302
19	3.758	6.524	212.72	0.55	1	95	0.204
20	4.481	5.936	224.96	0.53	7	103	0.122
21	4.999	5.011	237.20	0.50	12	110	0.059
22	+5.274	-3.819	249.44	+0.47	16	118	0.019
23	5.279	2.439	261.68	0.45	19	142	0.001
24	5.004	-0.957	273.92	0.43	21	287	0.006
25	4.456	+0.547	286.16	0.41	22	294	0.032
26	3.656	1.998	298.40	0.39	22	296	0.077
27	2.644	3.336	310.64	0.37	21	295	0.137
28	+1.471	+4.509	322.87	+0.36	20	293	0.210
29	+0.198	5.478	335.10	0.35	18	290	0.292
30	-1.106	6.211	347.32	0.33	14	286	0.382
31	2.368	6.681	359.53	0.32	10	281	0.476
Sept. 1	3.515	6.868	11.74	0.30	6	275	0.571
2	4.475	6.754	23.94	0.29	1	269	0.666
3	-5.185	+6.326	36.13	+0.27	355	262	0.756
4	5.592	5.581	48.32	0.25	350	256	0.838
5	5.660	4.531	60.51	0.22	346	250	0.908
6	5.376	3.206	72.69	0.19	343	245	0.961
7	4.750	+1.665	84.86	0.16	340	241	0.992
8	3.817	-0.009	97.04	0.12	338	66	0.999
9	-2.638	-1.708	109.21	+0.09	338	62	0.979
10	-1.293	3.312	121.38	0.05	339	63	0.932
11	+0.128	4.703	133.56	+0.01	341	66	0.860
12	1.529	5.783	145.74	-0.03	344	70	0.769
13	2.827	6.482	157.93	0.07	348	76	0.664
14	3.950	6.768	170.13	0.11	354	83	0.551
15	+4.848	-6.639	182.33	-0.15	360	91	0.438
16	5.489	6.124	194.53	0.18	5	98	0.330
17	5.863	5.272	206.75	0.22	11	104	0.232
18	5.971	4.147	218.97	0.25	15	109	0.148
19	5.823	2.822	231.19	0.28	18	113	0.081
20	5.436	-1.374	243.42	0.31	20	115	0.034
21	+4.831	+0.120	255.64	-0.34	21	113	0.007
22	4.029	1.587	267.87	0.36	22	325	0.000
23	3.057	2.962	280.10	0.38	22	302	0.014
24	1.942	4.187	292.33	0.40	20	299	0.045
25	+0.719	5.218	304.55	0.42	18	295	0.093
26	-0.571	6.018	316.77	0.44	15	291	0.155
27	-1.882	+6.561	328.99	-0.45	12	286	0.230
28	3.157	6.825	341.20	0.46	7	280	0.314
29	4.336	6.799	353.40	0.48	2	273	0.405
30	5.349	6.474	5.60	0.49	357	267	0.502
Oct. 1	-6.127	+5.846	17.79	-0.51	352	261	0.600

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		Long.	Lat.	Colong.	Lat.	Axis	Bright Limb	
		°	°	°	°	°	°	
Oct.	1	-6.127	+5.846	17.79	-0.51	352	261	0.600
	2	6.602	4.923	29.97	0.53	348	255	0.697
	3	6.712	3.723	42.15	0.55	344	251	0.789
	4	6.414	2.285	54.32	0.57	341	248	0.870
	5	5.686	+0.671	66.48	0.60	339	247	0.936
	6	4.545	-1.027	78.64	0.63	338	249	0.981
	7	-3.047	-2.692	90.80	-0.66	338	290	0.999
	8	-1.293	4.196	102.95	0.69	340	53	0.989
	9	+0.579	5.416	115.11	0.72	343	63	0.949
	10	2.418	6.255	127.27	0.76	347	70	0.883
	11	4.075	6.661	139.43	0.79	352	78	0.796
	12	5.436	6.626	151.60	0.83	358	86	0.695
	13	+6.426	-6.182	163.78	-0.86	4	94	0.585
	14	7.016	5.387	175.96	0.89	9	101	0.475
	15	7.218	4.313	188.15	0.92	14	106	0.368
	16	7.069	3.036	200.34	0.95	17	110	0.271
	17	6.618	1.633	212.54	0.98	20	112	0.185
	18	5.921	-0.175	224.75	1.01	21	113	0.113
	19	+5.031	+1.269	236.96	-1.03	22	112	0.059
	20	3.995	2.638	249.17	1.06	22	107	0.022
	21	2.849	3.875	261.38	1.08	21	85	0.003
	22	1.625	4.932	273.59	1.09	19	325	0.003
	23	+0.349	5.769	285.80	1.11	16	302	0.021
	24	-0.954	6.356	298.01	1.12	13	293	0.056
	25	-2.256	+6.671	310.22	-1.13	9	285	0.107
	26	3.522	6.702	322.42	1.14	4	278	0.172
	27	4.709	6.444	334.62	1.15	359	271	0.250
	28	5.764	5.898	346.81	1.15	354	265	0.337
	29	6.622	5.076	358.99	1.16	349	259	0.433
	30	7.213	3.995	11.17	1.17	345	254	0.534
Nov.	31	-7.461	+2.685	23.34	-1.18	342	250	0.636
	1	7.298	+1.192	35.50	1.19	340	248	0.736
	2	6.673	-0.416	47.66	1.21	338	247	0.828
	3	5.564	2.047	59.81	1.22	338	249	0.906
	4	4.002	3.586	71.95	1.24	339	254	0.963
	5	-2.076	4.906	84.09	1.26	341	275	0.994
	6	+0.067	-5.889	96.23	-1.28	345	39	0.995
	7	2.235	6.445	108.37	1.30	350	66	0.966
	8	4.232	6.539	120.51	1.32	356	79	0.909
	9	5.890	6.187	132.66	1.34	2	88	0.830
	10	7.095	5.445	144.81	1.36	8	96	0.735
	11	7.803	4.399	156.96	1.38	13	103	0.632
	12	+8.024	-3.138	169.13	-1.40	16	108	0.525
	13	7.808	1.748	181.30	1.42	19	111	0.421
	14	7.230	-0.306	193.47	1.44	21	113	0.323
	15	6.372	+1.120	205.66	1.46	22	113	0.235
16	+5.311	+2.471	217.84	-1.48	22	112	0.158	

MOON, 2025
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	Long.	Lat.	Colong.	Lat.	Axis	Bright Limb	
	°	°	°	°	°	°	
Nov. 16	+5.311	+2.471	217.84	-1.48	22	112	0.158
17	4.119	3.697	230.03	1.49	21	109	0.095
18	2.850	4.751	242.23	1.51	20	103	0.047
19	1.550	5.596	254.43	1.52	17	91	0.016
20	+0.247	6.198	266.62	1.52	14	48	0.002
21	-1.037	6.534	278.82	1.53	10	312	0.006
22	-2.285	+6.588	291.02	-1.53	5	290	0.028
23	3.480	6.357	303.21	1.53	0	278	0.067
24	4.599	5.843	315.40	1.53	355	270	0.122
25	5.607	5.063	327.59	1.53	350	262	0.192
26	6.459	4.039	339.77	1.52	346	257	0.275
27	7.095	2.804	351.94	1.52	343	252	0.369
28	-7.447	+1.401	4.11	-1.51	340	249	0.471
29	7.440	-0.111	16.27	1.51	339	247	0.577
30	7.008	1.662	28.42	1.50	338	247	0.683
Dec. 1	6.108	3.159	40.57	1.50	338	249	0.783
2	4.735	4.495	52.71	1.50	340	253	0.871
3	2.944	5.559	64.84	1.50	343	260	0.940
4	-0.857	-6.245	76.97	-1.50	347	275	0.984
5	+1.348	6.485	89.10	1.50	353	358	0.998
6	3.460	6.258	101.22	1.50	359	72	0.982
7	5.286	5.598	113.35	1.50	5	88	0.938
8	6.679	4.583	125.48	1.51	11	98	0.870
9	7.560	3.313	137.62	1.51	15	105	0.786
10	+7.916	-1.894	149.76	-1.51	18	109	0.690
11	7.788	-0.417	161.91	1.52	21	112	0.589
12	7.247	+1.039	174.07	1.52	22	113	0.488
13	6.384	2.411	186.23	1.53	22	113	0.390
14	5.288	3.649	198.40	1.54	21	112	0.299
15	4.047	4.711	210.57	1.54	20	109	0.216
16	+2.733	+5.563	222.75	-1.54	18	104	0.144
17	1.407	6.174	234.93	1.54	15	98	0.085
18	+0.114	6.523	247.12	1.54	11	90	0.041
19	-1.118	6.591	259.31	1.54	6	74	0.012
20	2.268	6.371	271.50	1.53	1	11	0.002
21	3.326	5.865	283.69	1.52	356	289	0.010
22	-4.280	+5.089	295.88	-1.51	352	270	0.036
23	5.116	4.068	308.06	1.50	347	261	0.081
24	5.810	2.840	320.24	1.48	344	254	0.143
25	6.325	+1.454	332.42	1.46	341	250	0.221
26	6.615	-0.030	344.59	1.44	339	248	0.313
27	6.624	-1.543	356.75	1.42	338	246	0.415
28	-6.298	-3.004	8.91	-1.40	338	247	0.523
29	5.594	4.326	21.06	1.38	339	249	0.634
30	4.495	5.413	33.20	1.36	341	253	0.740
31	3.030	6.174	45.34	1.34	345	259	0.836
32	-1.280	-6.531	57.47	-1.32	350	267	0.914

MERCURY, 2025
HELIOCENTRIC POSITIONS FOR 0^h TERRESTRIAL TIME
MEAN EQUINOX AND ECLIPTIC OF DATE

Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector		Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector	
	°	'	"		°	'	"					°	'	"		°	'	"			
Jan.	0	199	35	29.0	+3	24	47.5		0.415 4489	Feb.	15	342	27	58.8	-6	24	47.1		0.378 2384		
	1	203	00	47.3	3	02	27.2		0.420 3046		16	346	44	46.0	6	11	08.0		0.372 4403		
	2	206	21	21.5	2	39	59.2		0.424 9629		17	351	09	26.2	5	54	54.0		0.366 6328		
	3	209	37	33.2	2	17	28.3		0.429 4122		18	355	42	19.4	5	35	57.5		0.360 8501		
	4	212	49	43.2	1	54	58.3		0.433 6422		19	0	23	43.6	5	14	12.2		0.355 1298		
	5	215	58	11.3	1	32	32.8		0.437 6441		20	5	13	54.4	4	49	32.9		0.349 5129		
	6	219	03	16.6	+1	10	14.7		0.441 4098		21	10	13	03.7	-4	21	57.2		0.344 0433		
	7	222	05	17.0	0	48	06.6		0.444 9324		22	15	21	18.9	3	51	25.0		0.338 7678		
	8	225	04	29.9	0	26	10.7		0.448 2058		23	20	38	42.0	3	17	60.0		0.333 7358		
	9	228	01	11.9	+0	04	28.9		0.451 2247		24	26	05	08.3	2	41	50.2		0.328 9983		
	10	230	55	38.7	-0	16	56.9		0.453 9843		25	31	40	25.5	2	03	08.6		0.324 6076		
	11	233	48	05.6	0	38	05.4		0.456 4806		26	37	24	12.1	1	22	13.5		0.320 6158		
	12	236	38	47.3	-0	58	55.2		0.458 7103		27	43	15	57.2	-0	39	29.2		0.317 0737		
	13	239	27	57.9	1	19	25.0		0.460 6702		28	49	14	59.4	+0	04	34.4		0.314 0293		
	14	242	15	51.2	1	39	33.8		0.462 3579		Mar.	1	55	20	26.5	0	49	21.8		0.311 5262	
	15	245	02	40.5	1	59	20.3		0.463 7714			2	61	31	16.0	1	34	13.4		0.309 6019	
	16	247	48	38.8	2	18	43.7		0.464 9089			3	67	46	15.6	2	18	26.4		0.308 2865	
17	250	33	58.8	2	37	42.8		0.465 7690	4	74		04	04.9	3	01	17.0		0.307 6008			
18	253	18	53.2	-2	56	16.6		0.466 3509	5	80		23	17.3	+3	42	02.0		0.307 5561			
19	256	03	34.2	3	14	24.0		0.466 6538	6	86	42	22.4	4	20	01.4		0.308 1531				
20	258	48	14.1	3	32	04.1		0.466 6775	7	92	59	49.2	4	54	39.9		0.309 3820				
21	261	33	05.1	3	49	15.4		0.466 4218	8	99	14	08.9	5	25	28.8		0.311 2232				
22	264	18	19.4	4	05	56.9		0.465 8871	9	105	23	57.8	5	52	07.1		0.313 6479				
23	267	04	09.3	4	22	07.2		0.465 0739	10	111	27	59.8	6	14	21.4		0.316 6195				
24	269	50	47.0	-4	37	44.8		0.463 9833	11	117	25	08.5	+6	32	06.4		0.320 0952				
25	272	38	25.1	4	52	48.0		0.462 6164	12	123	14	28.2	6	45	23.9		0.324 0275				
26	275	27	16.3	5	07	15.1		0.460 9749	13	128	55	15.1	6	54	21.9		0.328 3659				
27	278	17	33.5	5	21	04.1		0.459 0609	14	134	26	56.7	6	59	13.1		0.333 0583				
28	281	09	29.9	5	34	12.9		0.456 8767	15	139	49	11.4	7	00	14.2		0.338 0525				
29	284	03	19.1	5	46	39.1		0.454 4252	16	145	01	48.0	6	57	44.0		0.343 2971				
30	286	59	15.1	-5	58	20.1		0.451 7099	17	150	04	43.9	+6	52	02.7		0.348 7426				
Feb.	31	289	57	32.3	6	09	13.0		0.448 7346	18	154	58	04.0	6	43	30.8		0.354 3418			
	1	292	58	25.7	6	19	14.6		0.445 5039	19	159	41	59.6	6	32	28.7		0.360 0502			
	2	296	02	10.6	6	28	21.4		0.442 0231	20	164	16	46.8	6	19	15.7		0.365 8265			
	3	299	09	03.3	6	36	29.4		0.438 2980	21	168	42	45.3	6	04	10.0		0.371 6328			
	4	302	19	20.2	6	43	34.6		0.434 3356	22	173	00	17.5	5	47	28.4		0.377 4342			
	5	305	33	18.8	-6	49	32.1		0.430 1435	23	177	09	47.8	+5	29	26.2		0.383 1989			
	6	308	51	17.1	6	54	17.1		0.425 7307	24	181	11	41.6	5	10	17.1		0.388 8982			
	7	312	13	33.9	6	57	43.8		0.421 1070	25	185	06	24.6	4	50	13.1		0.394 5064			
	8	315	40	28.5	6	59	46.4		0.416 2838	26	188	54	23.0	4	29	25.3		0.400 0002			
	9	319	12	21.2	7	00	18.3		0.411 2739	27	192	36	02.1	4	08	02.8		0.405 3589			
10	322	49	32.7	6	59	12.6		0.406 0917	28	196	11	47.3	3	46	14.2		0.410 5639				
11	326	32	24.6	-6	56	21.9		0.400 7534	29	199	42	02.8	+3	24	06.4		0.415 5988				
12	330	21	18.7	6	51	38.3		0.395 2773	30	203	07	12.2	3	01	45.8		0.420 4488				
13	334	16	37.5	6	44	53.7		0.389 6837	31	206	27	38.1	2	39	17.6		0.425 1010				
14	338	18	43.4	6	35	59.4		0.383 9956	Apr.	1	209	43	42.1	2	16	46.6		0.429 5439			
15	342	27	58.8	-6	24	47.1		0.378 2384		2	212	55	45.1	+1	54	16.7		0.433 7673			

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Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector	Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector
	°	'	"		°	'	"				°	'	"		°	'	"		
Apr.	1	209	43	42.1	+2	16	46.6	0.429 5439	May	17	355	50	56.4	-5	35	20.4	0.360 6727		
	2	212	55	45.1	1	54	16.7	0.433 7673		18	0	32	36.6	5	13	29.7	0.354 9546		
	3	216	04	06.8	1	31	51.4	0.437 7622		19	5	23	03.8	4	48	45.2	0.349 3412		
	4	219	09	06.2	1	09	33.6	0.441 5208		20	10	22	29.8	4	21	04.0	0.343 8764		
	5	222	11	01.3	0	47	25.8	0.445 0360		21	15	31	02.0	3	50	26.4	0.338 6072		
	6	225	10	09.4	0	25	30.3	0.448 3019		22	20	48	42.1	3	16	56.2	0.333 5829		
	7	228	06	46.9	+0	03	49.1	0.451 3131		23	26	15	25.2	-2	40	41.6	0.328 8549		
	8	231	01	09.8	-0	17	36.3	0.454 0649		24	31	50	58.7	2	01	55.5	0.324 4752		
	9	233	53	33.3	0	38	44.3	0.456 5533		25	37	35	01.0	1	20	56.6	0.320 4960		
	10	236	44	11.9	0	59	33.4	0.458 7749		26	43	27	00.6	-0	38	09.3	0.316 9681		
	11	239	33	19.9	1	20	02.6	0.460 7268		27	49	26	16.0	+0	05	56.2	0.313 9394		
	12	242	21	11.0	1	40	10.7	0.462 4063		28	55	31	54.6	0	50	44.5	0.311 4532		
13	245	07	58.5	-1	59	56.5	0.463 8116	29	61	42	53.6	+1	35	35.6	0.309 5470				
14	247	53	55.3	2	19	19.2	0.464 9407	30	67	58	00.3	2	19	46.9	0.308 2504				
15	250	39	14.3	2	38	17.5	0.465 7926	31	74	15	54.2	3	02	34.3	0.307 5841				
16	253	24	08.0	2	56	50.5	0.466 3661	June	1	80	35	08.5	3	43	14.9	0.307 5591			
17	256	08	48.6	3	14	57.1	0.466 6606		2	86	54	12.7	4	21	08.6	0.308 1756			
18	258	53	28.6	3	32	36.3	0.466 6758		3	93	11	35.9	4	55	40.5	0.309 4238			
19	261	38	20.0	-3	49	46.8	0.466 4117	4	99	25	49.2	+5	26	22.1	0.311 2835				
20	264	23	35.1	4	06	27.3	0.465 8686	5	105	35	29.2	5	52	52.4	0.313 7258				
21	267	09	26.1	4	22	36.6	0.465 0470	6	111	39	20.2	6	14	58.5	0.316 7137				
22	269	56	05.4	4	38	13.1	0.463 9480	7	117	36	15.8	6	32	35.2	0.320 2044				
23	272	43	45.4	4	53	15.2	0.462 5727	8	123	25	21.0	6	45	44.5	0.324 1503				
24	275	32	38.8	5	07	41.2	0.460 9229	9	129	05	52.0	6	54	34.6	0.328 5006				
25	278	22	58.7	-5	21	29.0	0.459 0006	10	134	37	16.8	+6	59	18.5	0.333 2034				
26	281	14	58.2	5	34	36.5	0.456 8082	11	139	59	14.3	7	00	12.7	0.338 2065				
27	284	08	50.9	5	47	01.4	0.454 3487	12	145	11	33.3	6	57	36.2	0.343 4584				
28	287	04	50.8	5	58	40.9	0.451 6253	13	150	14	11.6	6	51	49.2	0.348 9098				
29	290	03	12.4	6	09	32.3	0.448 6421	14	155	07	14.4	6	43	12.4	0.354 5133				
30	293	04	10.6	6	19	32.2	0.445 4037	15	159	50	53.1	6	32	05.8	0.360 2248				
May	1	296	08	00.9	-6	28	37.2	0.441 9152	16	164	25	23.7	+6	18	49.0	0.366 0030			
	2	299	14	59.3	6	36	43.4	0.438 1827	17	168	51	06.3	6	03	40.1	0.371 8100			
	3	302	25	22.6	6	43	46.6	0.434 2131	18	173	08	23.4	5	46	55.8	0.377 6110			
	4	305	39	28.1	6	49	42.0	0.430 0140	19	177	17	39.3	5	28	51.3	0.383 3744			
	5	308	57	33.9	6	54	24.7	0.425 5944	20	181	19	19.4	5	09	40.2	0.389 0717			
	6	312	19	58.7	6	57	48.9	0.420 9643	21	185	13	49.5	4	49	34.7	0.394 6770			
	7	315	47	01.9	-6	59	48.8	0.416 1350	22	189	01	35.7	+4	28	45.6	0.400 1672			
	8	319	19	03.9	7	00	17.9	0.411 1194	23	192	43	03.6	4	07	22.3	0.405 5216			
	9	322	56	25.4	6	59	09.1	0.405 9320	24	196	18	38.1	3	45	32.8	0.410 7218			
	10	326	39	27.9	6	56	15.1	0.400 5890	25	199	48	43.8	3	23	24.6	0.415 7514			
	11	330	28	33.3	6	51	27.9	0.395 1086	26	203	13	44.0	3	01	03.6	0.420 5957			
	12	334	24	04.1	6	44	39.4	0.389 5115	27	206	34	01.4	2	38	35.3	0.425 2417			
13	338	26	22.7	-6	35	41.1	0.383 8206	28	209	49	57.6	+2	16	04.3	0.429 6781				
14	342	35	51.5	6	24	24.4	0.378 0614	29	213	01	53.4	1	53	34.5	0.433 8947				
15	346	52	52.8	6	10	40.7	0.372 2622	30	216	10	08.5	1	31	09.4	0.437 8825				
16	351	17	47.8	5	54	21.9	0.366 4545	July	1	219	15	01.8	1	08	51.8	0.441 6338			
17	355	50	56.4	-5	35	20.4	0.360 6727		2	222	16	51.4	+0	46	44.4	0.445 1415			

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Date	Heliocentric Longitude			Heliocentric Latitude			Radius Vector		Date	Heliocentric Longitude			Heliocentric Latitude			Radius Vector	
	°	'	"	°	'	"				°	'	"	°	'	"		
July	1	219	15	01.8	+1	08	51.8	0.441 6338	Aug.	16	10	32	09.8	-4	20	09.3	0.343 7096
	2	222	16	51.4	0	46	44.4	0.445 1415		17	15	40	59.0	3	49	26.2	0.338 4472
	3	225	15	54.5	0	24	49.3	0.448 3996		18	20	58	56.0	3	15	50.8	0.333 4314
	4	228	12	27.5	+0	03	08.5	0.451 4028		19	26	25	55.9	2	39	31.2	0.328 7134
	5	231	06	46.5	-0	18	16.3	0.454 1466		20	32	01	45.5	2	00	40.6	0.324 3454
	6	233	59	06.4	0	39	23.7	0.456 6268		21	37	46	03.1	1	19	38.0	0.320 3796
	7	236	49	41.9	-1	00	12.3	0.458 8401	22	43	38	17.0	-0	36	47.8	0.316 8665	
	8	239	38	47.3	1	20	40.8	0.460 7835	23	49	37	45.0	+0	07	19.6	0.313 8540	
	9	242	26	36.1	1	40	48.2	0.462 4546	24	55	43	34.6	0	52	08.6	0.311 3854	
	10	245	13	21.8	2	00	33.3	0.463 8513	25	61	54	42.3	1	36	59.1	0.309 4977	
	11	247	59	17.3	2	19	55.2	0.464 9719	26	68	09	55.5	2	21	08.4	0.308 2204	
	12	250	44	35.3	2	38	52.7	0.465 8151	27	74	27	53.2	3	03	52.5	0.307 5739	
13	253	29	28.3	-2	57	24.9	0.466 3799	28	80	47	08.5	+3	44	28.5	0.307 5689		
14	256	14	08.7	3	15	30.7	0.466 6657	29	87	06	10.9	4	22	16.5	0.308 2053		
15	258	58	48.8	3	33	09.0	0.466 6722	30	93	23	29.4	4	56	41.6	0.309 4728		
16	261	43	40.7	3	50	18.5	0.466 3994	31	99	37	35.5	5	27	15.5	0.311 3511		
17	264	28	56.7	4	06	58.1	0.465 8476	Sept.	1	105	47	05.7	5	53	37.7	0.313 8109	
18	267	14	49.0	4	23	06.4	0.465 0174		2	111	50	44.6	6	15	35.4	0.316 8152	
19	270	01	30.0	-4	38	41.8	0.463 9097		3	117	47	26.4	+6	33	03.8	0.320 3208	
20	272	49	12.0	4	53	42.8	0.462 5259		4	123	36	16.2	6	46	04.9	0.324 2799	
21	275	38	08.0	5	08	07.7	0.460 8675		5	129	16	30.6	6	54	47.1	0.328 6420	
22	278	28	30.7	5	21	54.2	0.458 9367		6	134	47	38.0	6	59	23.5	0.333 3549	
23	281	20	33.5	5	35	00.5	0.456 7360	7	140	09	17.6	7	00	10.8	0.338 3664		
24	284	14	30.0	5	47	23.9	0.454 2681	8	145	21	18.6	6	57	28.1	0.343 6253		
25	287	10	34.1	-5	59	02.1	0.451 5366	9	150	23	38.8	+6	51	35.5	0.349 0820		
26	290	09	00.3	6	09	51.8	0.448 5454	10	155	16	23.9	6	42	53.7	0.354 6895		
27	293	10	03.6	6	19	50.1	0.445 2991	11	159	59	45.2	6	31	42.8	0.360 4036		
28	296	13	59.5	6	28	53.3	0.441 8029	12	164	33	59.2	6	18	22.2	0.366 1833		
29	299	21	04.0	6	36	57.6	0.438 0629	13	168	59	25.7	6	03	10.1	0.371 9906		
30	302	31	34.0	6	43	58.7	0.434 0860	14	173	16	27.4	5	46	23.1	0.377 7908		
Aug.	31	305	45	46.7	-6	49	52.0	0.429 8799	15	177	25	28.8	+5	28	16.2	0.383 5526	
	1	309	04	00.2	6	54	32.2	0.425 4536	16	181	26	55.1	5	09	03.3	0.389 2473	
	2	312	26	33.4	6	57	53.9	0.420 8171	17	185	21	12.3	4	48	56.3	0.394 8493	
	3	315	53	45.6	6	59	51.1	0.415 9819	18	189	08	46.4	4	28	06.0	0.400 3356	
	4	319	25	57.2	7	00	17.2	0.410 9607	19	192	50	02.9	4	06	41.7	0.405 6854	
	5	323	03	29.0	6	59	05.3	0.405 7682	20	196	25	26.9	3	44	51.6	0.410 8806	
	6	326	46	42.4	-6	56	07.8	0.400 4206	21	199	55	22.7	+3	22	42.8	0.415 9045	
	7	330	35	59.5	6	51	17.0	0.394 9363	22	203	20	13.8	3	00	21.6	0.420 7428	
	8	334	31	42.6	6	44	24.6	0.389 3359	23	206	40	22.8	2	37	53.1	0.425 3824	
	9	338	34	14.2	6	35	22.1	0.383 6425	24	209	56	11.2	2	15	22.1	0.429 8121	
	10	342	43	56.8	6	24	00.9	0.377 8816	25	213	07	59.9	1	52	52.3	0.434 0217	
	11	347	01	12.5	6	10	12.5	0.372 0817	26	216	16	08.5	1	30	27.4	0.438 0022	
12	351	26	22.5	-5	53	48.7	0.366 2743	27	219	20	55.9	+1	08	10.1	0.441 7460		
13	355	59	46.7	5	34	42.0	0.360 4939	28	222	22	40.0	0	46	03.1	0.445 2460		
14	0	41	43.1	5	12	46.0	0.354 7785	29	225	21	38.2	0	24	08.4	0.448 4962		
15	5	32	26.9	4	47	56.0	0.349 1690	30	228	18	06.9	+0	02	28.1	0.451 4914		
16	10	32	09.8	-4	20	09.3	0.343 7096	Oct.	1	231	12	21.9	-0	18	56.3	0.454 2270	

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Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector		Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector	
		°	'	"		°	'	"				°	'	"		°	'	"			
Oct.	1	231	12	21.9	-0	18	56.3	0.454	2270	Nov.	16	32	12	34.1	-1	59	25.5	0.324	2165		
	2	234	04	38.4	0	40	03.1	0.456	6990		17	37	57	06.9	1	18	19.1	0.320	2641		
	3	236	55	11.0	1	00	51.1	0.458	9039		18	43	49	34.9	-0	35	26.1	0.316	7660		
	4	239	44	13.8	1	21	19.0	0.460	8389		19	49	49	15.6	+0	08	43.2	0.313	7699		
	5	242	32	00.6	1	41	25.7	0.462	5014		20	55	55	15.9	0	53	32.8	0.311	3189		
	6	245	18	44.5	2	01	10.1	0.463	8895		21	62	06	32.2	1	38	22.7	0.309	4499		
	7	248	04	38.6	-2	20	31.2	0.465	0015		22	68	21	51.6	+2	22	29.9	0.308	1921		
	8	250	49	55.7	2	39	28.0	0.465	8360		23	74	39	52.9	3	05	10.7	0.307	5655		
	9	253	34	48.2	2	57	59.3	0.466	3922		24	80	59	09.0	3	45	41.9	0.307	5805		
	10	256	19	28.4	3	16	04.3	0.466	6693		25	87	18	09.4	4	23	24.1	0.308	2368		
	11	259	04	08.8	3	33	41.7	0.466	6671		26	93	35	23.0	4	57	42.3	0.309	5236		
	12	261	49	01.3	3	50	50.3	0.466	3856		27	99	49	21.5	5	28	08.7	0.311	4205		
13	264	34	18.3	-4	07	28.9	0.465	8251	28	105	58	41.7	+5	54	22.8	0.313	8978				
14	267	20	11.9	4	23	36.2	0.464	9862	29	112	02	08.4	6	16	12.2	0.316	9182				
15	270	06	54.6	4	39	10.6	0.463	8700	30	117	58	36.1	6	33	32.1	0.320	4386				
16	272	54	38.9	4	54	10.5	0.462	4776	Dec.	1	123	47	10.3	6	46	25.0	0.324	4110			
17	275	43	37.4	5	08	34.2	0.460	8107		2	129	27	08.0	6	54	59.3	0.328	7847			
18	278	34	03.1	5	22	19.5	0.458	8715		3	134	57	57.9	6	59	28.4	0.333	5076			
19	281	26	09.2	-5	35	24.4	0.456	6624	4	140	19	19.5	+7	00	08.9	0.338	5274				
20	284	20	09.5	5	47	46.5	0.454	1863	5	145	31	02.3	6	57	19.9	0.343	7931				
21	287	16	17.8	5	59	23.1	0.451	4467	6	150	33	04.6	6	51	21.7	0.349	2551				
22	290	14	48.8	6	10	11.4	0.448	4475	7	155	25	31.8	6	42	35.0	0.354	8664				
23	293	15	57.2	6	20	08.0	0.445	1933	8	160	08	35.8	6	31	19.8	0.360	5831				
24	296	19	58.8	6	29	09.4	0.441	6895	9	164	42	33.0	6	17	55.5	0.366	3640				
25	299	27	09.5	-6	37	11.8	0.437	9420	10	169	07	43.5	+6	02	40.2	0.372	1715				
26	302	37	46.2	6	44	10.8	0.433	9578	11	173	24	29.9	5	45	50.4	0.377	9709				
27	305	52	06.1	6	50	01.9	0.429	7448	12	177	33	16.7	5	27	41.3	0.383	7309				
28	309	10	27.5	6	54	39.8	0.425	3118	13	181	34	29.3	5	08	26.5	0.389	4230				
29	312	33	09.1	6	57	58.9	0.420	6690	14	185	28	33.7	4	48	18.0	0.395	0216				
30	316	00	30.4	6	59	53.3	0.415	8278	15	189	15	55.6	4	27	26.5	0.400	5039				
Nov.	31	319	32	51.6	-7	00	16.5	0.410	8011	16	192	57	00.8	+4	06	01.3	0.405	8491			
	1	323	10	33.8	6	59	01.3	0.405	6035	17	196	32	14.3	3	44	10.5	0.411	0390			
	2	326	53	58.2	6	56	00.4	0.400	2515	18	200	02	00.3	3	22	01.3	0.416	0573			
	3	330	43	27.0	6	51	06.0	0.394	7633	19	203	26	42.4	2	59	39.7	0.420	8895			
	4	334	39	22.5	6	44	09.6	0.389	1598	20	206	46	43.0	2	37	11.1	0.425	5228			
	5	338	42	07.3	6	35	02.9	0.383	4639	21	210	02	23.7	2	14	40.0	0.429	9457			
	6	342	52	03.7	-6	23	37.2	0.377	7014	22	213	14	05.3	+1	52	10.4	0.434	1482			
	7	347	09	33.8	6	09	44.1	0.371	9008	23	216	22	07.4	1	29	45.6	0.438	1214			
	8	351	34	58.9	5	53	15.3	0.366	0938	24	219	26	48.9	1	07	28.6	0.441	8576			
	9	356	08	38.8	5	34	03.4	0.360	3150	25	222	28	27.7	0	45	21.9	0.445	3499			
	10	0	50	51.4	5	12	02.0	0.354	6023	26	225	27	21.1	0	23	27.6	0.448	5922			
	11	5	41	51.8	4	47	06.5	0.348	9969	27	228	23	45.4	+0	01	47.8	0.451	5794			
12	10	41	51.6	-4	19	14.3	0.343	5430	28	231	17	56.6	-0	19	36.0	0.454	3068				
13	15	50	57.8	3	48	25.8	0.338	2877	29	234	10	09.7	0	40	42.3	0.456	7705				
14	21	09	11.8	3	14	45.0	0.333	2805	30	237	00	39.3	1	01	29.6	0.458	9670				
15	26	36	28.3	2	38	20.5	0.328	5727	31	239	49	39.7	1	21	56.9	0.460	8935				
16	32	12	34.1	-1	59	25.5	0.324	2165	32	242	37	24.3	-1	42	02.9	0.462	5476				

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		°	'	"	°	'	"			°	'	"	°	'	"
Jan.	0	258	35	45.7	+1	15	15.4	Feb.	15	330	54	23.1	-1	47	20.3
	1	259	52	08.2	1	06	49.0		16	332	44	43.0	1	42	43.4
	2	261	10	04.4	0	58	23.9		17	334	35	31.6	1	37	31.2
	3	262	29	24.2	0	50	01.4		18	336	26	43.1	1	31	42.5
	4	263	49	59.3	0	41	42.7		19	338	18	10.0	1	25	16.7
	5	265	11	42.4	0	33	28.9		20	340	09	43.5	1	18	12.9
	6	266	34	27.1	+0	25	20.8		21	342	01	12.9	-1	10	30.7
	7	267	58	08.2	0	17	19.4		22	343	52	25.4	1	02	09.5
	8	269	22	41.3	0	09	25.4		23	345	43	06.4	0	53	09.5
	9	270	48	02.5	+0	01	39.5		24	347	32	58.3	0	43	30.8
	10	272	14	08.6	-0	05	57.7		25	349	21	41.6	0	33	14.1
	11	273	40	57.0	0	13	25.7		26	351	08	53.6	0	22	20.5
	12	275	08	25.4	-0	20	43.7	Mar.	27	352	54	09.6	-0	10	51.5
	13	276	36	32.2	0	27	51.4		28	354	37	01.8	+0	01	10.5
	14	278	05	15.8	0	34	48.2		1	356	17	00.5	0	13	42.9
	15	279	34	35.1	0	41	33.6		2	357	53	33.7	0	26	42.0
	16	281	04	29.4	0	48	07.1		3	359	26	08.0	0	40	03.7
	17	282	34	58.0	0	54	28.2		4	0	54	08.9	0	53	43.1
	18	284	06	00.7	-1	00	36.5		5	2	17	01.6	+1	07	34.6
	19	285	37	37.2	1	06	31.6		6	3	34	11.6	1	21	32.1
	20	287	09	47.6	1	12	12.9		7	4	45	05.3	1	35	28.6
	21	288	42	32.1	1	17	39.9		8	5	49	11.2	1	49	16.8
	22	290	15	51.0	1	22	52.2		9	6	46	00.2	2	02	48.8
	23	291	49	44.7	1	27	49.3		10	7	35	06.3	2	15	56.2
	24	293	24	13.6	-1	32	30.6		11	8	16	07.7	+2	28	30.4
	25	294	59	18.4	1	36	55.7		12	8	48	47.0	2	40	22.4
	26	296	34	59.8	1	41	03.9		13	9	12	51.9	2	51	22.9
	27	298	11	18.5	1	44	54.8		14	9	28	16.1	3	01	22.7
	28	299	48	15.2	1	48	27.8		15	9	34	59.7	3	10	12.5
	29	301	25	50.7	1	51	42.2		16	9	33	09.6	3	17	43.4
	30	303	04	05.8	-1	54	37.4		17	9	23	00.8	+3	23	46.7
	31	304	43	01.3	1	57	12.8		18	9	04	56.0	3	28	14.7
Feb.	1	306	22	38.2	1	59	27.6		19	8	39	26.3	3	31	00.5
	2	308	02	57.3	2	01	21.3		20	8	07	11.0	3	31	58.9
	3	309	43	59.4	2	02	52.9		21	7	28	57.4	3	31	06.3
	4	311	25	45.2	2	04	01.8		22	6	45	39.9	3	28	20.9
	5	313	08	15.6	-2	04	47.1		23	5	58	18.8	+3	23	43.5
	6	314	51	31.0	2	05	07.9		24	5	07	58.5	3	17	17.0
	7	316	35	32.0	2	05	03.5		25	4	15	46.0	3	09	06.7
	8	318	20	18.7	2	04	32.9		26	3	22	48.5	2	59	20.0
	9	320	05	51.2	2	03	35.0		27	2	30	11.6	2	48	06.3
	10	321	52	09.2	2	02	09.0		28	1	38	57.0	2	35	36.3
	11	323	39	12.1	-2	00	13.8	Apr.	29	0	50	01.1	+2	22	01.8
	12	325	26	58.7	1	57	48.4		30	0	04	13.8	2	07	34.9
	13	327	15	27.7	1	54	51.7		31	359	22	17.5	1	52	27.8
	14	329	04	36.8	1	51	22.7		1	358	44	47.0	1	36	52.6
	15	330	54	23.1	-1	47	20.3		2	358	12	09.2	+1	21	00.3

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		°	'	"	°	'	"			°	'	"	°	'	"
Apr.	1	358	44	47.0	+1	36	52.6	May	17	41	36	27.0	-1	38	21.4
	2	358	12	09.2	1	21	00.3		18	43	31	12.0	1	29	36.6
	3	357	44	44.1	1	05	01.1		19	45	27	53.9	1	20	29.3
	4	357	22	44.6	0	49	04.3		20	47	26	30.8	1	11	01.4
	5	357	06	18.3	0	33	17.7		21	49	26	59.9	1	01	14.9
	6	356	55	27.4	0	17	48.3		22	51	29	17.4	0	51	12.2
	7	356	50	10.1	+0	02	41.6		23	53	33	18.5	-0	40	56.0
	8	356	50	21.4	-0	11	57.4		24	55	38	57.1	0	30	29.2
	9	356	55	53.5	0	26	05.1		25	57	46	05.5	0	19	55.2
	10	357	06	37.1	0	39	38.5		26	59	54	34.5	-0	09	17.5
	11	357	22	21.2	0	52	35.3		27	62	04	13.5	+0	01	20.2
	12	357	42	54.2	1	04	53.9		28	64	14	50.1	0	11	53.6
	13	358	08	04.0	-1	16	32.9	June	29	66	26	10.7	+0	22	18.7
	14	358	37	38.4	1	27	31.7		30	68	38	00.3	0	32	31.2
	15	359	11	25.1	1	37	49.6		31	70	50	03.4	0	42	26.4
	16	359	49	12.4	1	47	26.6		1	73	02	03.1	0	52	00.4
	17	0	30	48.7	1	56	22.5		2	75	13	43.2	1	01	09.1
	18	1	16	03.1	2	04	37.6		3	77	24	47.2	1	09	48.7
	19	2	04	45.2	-2	12	11.9		4	79	34	59.4	+1	17	55.7
	20	2	56	45.4	2	19	06.0		5	81	44	04.8	1	25	27.1
	21	3	51	54.6	2	25	20.1		6	83	51	49.9	1	32	20.1
	22	4	50	04.1	2	30	54.7		7	85	58	02.3	1	38	32.6
	23	5	51	06.4	2	35	50.2		8	88	02	31.3	1	44	02.9
	24	6	54	54.1	2	40	07.2		9	90	05	07.4	1	48	49.5
	25	8	01	20.8	-2	43	46.0		10	92	05	43.1	+1	52	51.6
	26	9	10	20.4	2	46	47.2		11	94	04	11.7	1	56	08.5
	27	10	21	47.7	2	49	11.2		12	96	00	28.1	1	58	40.0
	28	11	35	37.8	2	50	58.4		13	97	54	28.3	2	00	26.1
	29	12	51	46.3	2	52	09.4		14	99	46	09.2	2	01	26.9
	30	14	10	09.6	2	52	44.5		15	101	35	28.2	2	01	42.8
May	1	15	30	44.1	-2	52	44.1		16	103	22	23.8	+2	01	14.4
	2	16	53	27.0	2	52	08.6		17	105	06	54.4	2	00	02.3
	3	18	18	15.9	2	50	58.5		18	106	48	59.1	1	58	07.1
	4	19	45	08.8	2	49	14.1		19	108	28	37.2	1	55	29.8
	5	21	14	03.9	2	46	55.9		20	110	05	47.8	1	52	11.0
	6	22	45	00.1	2	44	04.2		21	111	40	30.1	1	48	11.7
	7	24	17	56.3	-2	40	39.5		22	113	12	43.4	+1	43	32.7
	8	25	52	52.0	2	36	42.2		23	114	42	26.6	1	38	14.9
	9	27	29	46.6	2	32	12.9		24	116	09	38.3	1	32	19.2
	10	29	08	40.1	2	27	12.0		25	117	34	16.8	1	25	46.6
	11	30	49	32.3	2	21	40.1		26	118	56	20.3	1	18	37.8
	12	32	32	23.5	2	15	37.9		27	120	15	46.3	1	10	53.9
	13	34	17	13.7	-2	09	06.1	July	28	121	32	32.1	+1	02	35.8
	14	36	04	03.2	2	02	05.6		29	122	46	34.7	0	53	44.4
	15	37	52	52.0	1	54	37.2		30	123	57	50.4	0	44	20.8
	16	39	43	40.0	1	46	42.1		1	125	06	15.4	0	34	25.9
	17	41	36	27.0	-1	38	21.4		2	126	11	45.1	+0	24	00.7

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		°	'	"	°	'	"			°	'	"	°	'	"
July	1	125	06	15.4	+0	34	25.9	Aug.	16	125	32	24.3	-1	49	07.1
	2	126	11	45.1	0	24	00.7		17	126	09	16.4	1	32	01.7
	3	127	14	14.7	0	13	06.5		18	126	53	12.5	1	15	09.7
	4	128	13	38.7	+0	01	44.4		19	127	44	04.6	0	58	37.7
	5	129	09	51.3	-0	10	04.3		20	128	41	42.1	0	42	32.0
	6	130	02	46.2	0	22	18.2		21	129	45	51.4	0	26	58.3
	7	130	52	16.5	-0	34	55.8		22	130	56	16.9	-0	12	01.7
	8	131	38	14.9	0	47	55.4		23	132	12	40.3	+0	02	12.9
	9	132	20	33.8	1	01	15.0		24	133	34	41.1	0	15	41.4
	10	132	59	05.1	1	14	52.6		25	135	01	56.6	0	28	20.1
	11	133	33	40.7	1	28	45.8		26	136	34	02.3	0	40	05.9
	12	134	04	12.1	1	42	51.8		27	138	10	32.2	0	50	56.1
	13	134	30	30.9	-1	57	07.7	Sept.	28	139	50	58.8	+1	00	49.1
	14	134	52	28.8	2	11	29.9		29	141	34	54.3	1	09	43.4
	15	135	09	58.0	2	25	54.7		30	143	21	50.4	1	17	38.6
	16	135	22	51.1	2	40	17.6		31	145	11	19.4	1	24	34.7
	17	135	31	01.8	2	54	33.8		1	147	02	54.5	1	30	32.3
	18	135	34	24.9	3	08	37.8		2	148	56	09.9	1	35	32.5
	19	135	32	56.9	-3	22	23.6		3	150	50	42.0	+1	39	36.9
	20	135	26	36.1	3	35	44.6		4	152	46	08.8	1	42	47.5
	21	135	15	23.5	3	48	33.5		5	154	42	10.6	1	45	06.6
	22	134	59	23.2	4	00	42.7		6	156	38	29.9	1	46	36.7
	23	134	38	42.6	4	12	04.0		7	158	34	51.3	1	47	20.4
	24	134	13	33.2	4	22	29.0		8	160	31	01.9	1	47	20.4
	25	133	44	11.0	-4	31	49.0		9	162	26	50.3	+1	46	39.5
	26	133	10	56.8	4	39	55.6		10	164	22	07.4	1	45	20.4
	27	132	34	16.4	4	46	40.4		11	166	16	45.5	1	43	25.7
	28	131	54	40.9	4	51	56.0		12	168	10	38.5	1	40	58.1
	29	131	12	45.8	4	55	35.6		13	170	03	41.5	1	38	00.0
	30	130	29	11.4	4	57	33.7		14	171	55	50.6	1	34	33.7
Aug.	31	129	44	41.7	-4	57	46.3		15	173	47	03.0	+1	30	41.6
	1	129	00	03.5	4	56	11.0		16	175	37	16.5	1	26	25.8
	2	128	16	05.4	4	52	47.4		17	177	26	29.7	1	21	48.4
	3	127	33	36.7	4	47	36.7		18	179	14	41.8	1	16	51.1
	4	126	53	26.1	4	40	42.2		19	181	01	52.3	1	11	35.8
	5	126	16	20.8	4	32	08.8		20	182	48	01.2	1	06	04.1
	6	125	43	05.0	-4	22	03.0		21	184	33	08.9	+1	00	17.7
	7	125	14	19.5	4	10	32.5		22	186	17	15.8	0	54	18.0
	8	124	50	40.6	3	57	45.9		23	188	00	22.7	0	48	06.4
	9	124	32	40.3	3	43	52.7		24	189	42	30.3	0	41	44.1
	10	124	20	45.5	3	29	02.5		25	191	23	39.7	0	35	12.5
	11	124	15	18.0	3	13	25.4		26	193	03	51.7	0	28	32.6
	12	124	16	35.3	-2	57	11.1	Oct.	27	194	43	07.5	+0	21	45.5
	13	124	24	49.9	2	40	29.1		28	196	21	27.9	0	14	52.4
	14	124	40	10.5	2	23	28.8		29	197	58	54.1	0	07	54.1
	15	125	02	41.6	2	06	18.7		30	199	35	26.9	+0	00	51.7
	16	125	32	24.3	-1	49	07.1		1	201	11	07.3	-0	06	14.1

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		°	'	"	°	'	"			°	'	"	°	'	"
Oct.	1	201	11	07.3	-0	06	14.1	Nov.	16	243	45	17.3	-0	55	30.7
	2	202	45	56.2	0	13	22.3		17	242	40	40.6	0	36	29.3
	3	204	19	54.1	0	20	32.0		18	241	28	40.5	-0	16	32.5
	4	205	53	02.0	0	27	42.5		19	240	11	09.5	+0	03	56.7
	5	207	25	20.3	0	34	53.1		20	238	50	25.6	0	24	31.4
	6	208	56	49.5	0	42	02.8		21	237	29	04.9	0	44	42.8
	7	210	27	30.0	-0	49	10.9		22	236	09	49.9	+1	04	01.8
	8	211	57	22.0	0	56	16.8		23	234	55	18.1	1	22	02.4
	9	213	26	25.7	1	03	19.6		24	233	47	50.2	1	38	23.0
	10	214	54	40.8	1	10	18.5		25	232	49	20.9	1	52	47.7
	11	216	22	07.0	1	17	12.9		26	232	01	14.1	2	05	07.4
	12	217	48	43.6	1	24	01.9		27	231	24	21.6	2	15	18.6
	13	219	14	29.7	-1	30	44.6	Dec.	28	230	59	05.2	+2	23	23.0
	14	220	39	24.0	1	37	20.3		29	230	45	21.5	2	29	26.2
	15	222	03	25.1	1	43	48.2		30	230	42	47.1	2	33	36.4
	16	223	26	31.1	1	50	07.2		1	230	50	44.3	2	36	03.5
	17	224	48	39.5	1	56	16.5		2	231	08	26.8	2	36	57.8
	18	226	09	47.7	2	02	15.0		3	231	35	03.3	2	36	29.8
	19	227	29	52.3	-2	08	01.7		4	232	09	41.3	+2	34	49.6
	20	228	48	49.5	2	13	35.4		5	232	51	29.1	2	32	06.6
	21	230	06	34.9	2	18	54.9		6	233	39	37.8	2	28	29.4
	22	231	23	03.1	2	23	58.8		7	234	33	21.8	2	24	05.6
	23	232	38	08.0	2	28	45.8		8	235	31	59.6	2	19	02.3
	24	233	51	42.7	2	33	14.3		9	236	34	53.9	2	13	25.5
	25	235	03	39.1	-2	37	22.6		10	237	41	31.6	+2	07	20.4
	26	236	13	47.9	2	41	08.8		11	238	51	23.4	2	00	51.9
	27	237	21	58.5	2	44	30.9		12	240	04	03.6	1	54	03.9
	28	238	27	58.8	2	47	26.6		13	241	19	10.0	1	47	00.1
	29	239	31	35.1	2	49	53.4		14	242	36	23.1	1	39	43.6
	30	240	32	31.6	2	51	48.5		15	243	55	26.3	1	32	17.0
Nov.	31	241	30	30.5	-2	53	09.0		16	245	16	04.9	+1	24	42.9
	1	242	25	11.8	2	53	51.4		17	246	38	06.7	1	17	03.2
	2	243	16	12.8	2	53	52.1		18	248	01	20.9	1	09	19.7
	3	244	03	08.2	2	53	06.8		19	249	25	38.5	1	01	34.2
	4	244	45	29.8	2	51	31.2		20	250	50	51.7	0	53	48.1
	5	245	22	46.4	2	49	00.3		21	252	16	53.9	0	46	02.6
	6	245	54	23.6	-2	45	28.7		22	253	43	39.4	+0	38	18.9
	7	246	19	44.7	2	40	50.8		23	255	11	03.7	0	30	38.0
	8	246	38	10.3	2	35	00.8		24	256	39	02.7	0	23	00.9
	9	246	48	59.5	2	27	52.5		25	258	07	33.2	0	15	28.4
	10	246	51	31.5	2	19	20.0		26	259	36	32.5	0	08	01.2
	11	246	45	07.1	2	09	18.1		27	261	05	58.5	+0	00	40.1
	12	246	29	12.0	-1	57	42.4		28	262	35	49.5	-0	06	34.2
	13	246	03	19.9	1	44	30.1		29	264	06	04.1	0	13	41.2
	14	245	27	17.0	1	29	41.2		30	265	36	41.4	0	20	40.2
	15	244	41	07.3	1	13	18.9		31	267	07	40.6	0	27	30.6
	16	243	45	17.3	-0	55	30.7		32	268	39	01.5	-0	34	11.9

MERCURY, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
		h	m	s	°	'	"		"	"	h	m	s
Jan.	0	17	10	51.89	-21	41	56.9	1.130 634	7.78	2.97	10	31	50
	1	17	16	16.93	21	56	28.4	1.148 042	7.66	2.93	10	33	22
	2	17	21	49.83	22	10	22.9	1.164 833	7.55	2.88	10	35	02
	3	17	27	29.87	22	23	35.3	1.181 009	7.45	2.85	10	36	49
	4	17	33	16.43	22	36	01.2	1.196 576	7.35	2.81	10	38	42
	5	17	39	08.94	22	47	36.7	1.211 538	7.26	2.77	10	40	40
	6	17	45	06.92	-22	58	18.3	1.225 904	7.17	2.74	10	42	44
	7	17	51	09.91	23	08	02.9	1.239 681	7.09	2.71	10	44	53
	8	17	57	17.52	23	16	47.7	1.252 878	7.02	2.68	10	47	06
	9	18	03	29.40	23	24	30.1	1.265 504	6.95	2.66	10	49	23
	10	18	09	45.21	23	31	07.9	1.277 568	6.88	2.63	10	51	45
	11	18	16	04.66	23	36	39.0	1.289 078	6.82	2.61	10	54	09
	12	18	22	27.48	-23	41	01.6	1.300 042	6.76	2.58	10	56	37
	13	18	28	53.42	23	44	13.8	1.310 468	6.71	2.56	10	59	08
	14	18	35	22.25	23	46	14.0	1.320 364	6.66	2.54	11	01	42
	15	18	41	53.76	23	47	00.9	1.329 736	6.61	2.53	11	04	18
	16	18	48	27.75	23	46	33.1	1.338 590	6.57	2.51	11	06	57
	17	18	55	04.04	23	44	49.2	1.346 931	6.53	2.49	11	09	38
	18	19	01	42.46	-23	41	48.1	1.354 765	6.49	2.48	11	12	21
	19	19	08	22.84	23	37	28.8	1.362 095	6.46	2.47	11	15	06
	20	19	15	05.05	23	31	50.2	1.368 924	6.42	2.45	11	17	53
	21	19	21	48.95	23	24	51.4	1.375 254	6.39	2.44	11	20	42
	22	19	28	34.39	23	16	31.5	1.381 086	6.37	2.43	11	23	31
	23	19	35	21.25	23	06	49.7	1.386 421	6.34	2.42	11	26	23
	24	19	42	09.42	-22	55	45.3	1.391 258	6.32	2.42	11	29	15
	25	19	48	58.79	22	43	17.5	1.395 595	6.30	2.41	11	32	09
	26	19	55	49.25	22	29	25.7	1.399 429	6.28	2.40	11	35	04
	27	20	02	40.71	22	14	09.3	1.402 757	6.27	2.40	11	37	59
	28	20	09	33.06	21	57	27.8	1.405 573	6.26	2.39	11	40	56
	29	20	16	26.22	21	39	20.6	1.407 871	6.25	2.39	11	43	53
30	20	23	20.11	-21	19	47.3	1.409 642	6.24	2.38	11	46	51	
Feb.	31	20	30	14.64	20	58	47.4	1.410 879	6.23	2.38	11	49	50
	1	20	37	09.76	20	36	20.6	1.411 569	6.23	2.38	11	52	49
	2	20	44	05.38	20	12	26.5	1.411 702	6.23	2.38	11	55	49
	3	20	51	01.45	19	47	04.9	1.411 262	6.23	2.38	11	58	49
	4	20	57	57.90	19	20	15.6	1.410 236	6.24	2.38	12	01	49
	5	21	04	54.69	-18	51	58.3	1.408 605	6.24	2.39	12	04	50
	6	21	11	51.75	18	22	13.2	1.406 350	6.25	2.39	12	07	51
	7	21	18	49.02	17	51	00.2	1.403 450	6.27	2.39	12	10	52
	8	21	25	46.44	17	18	19.4	1.399 881	6.28	2.40	12	13	54
	9	21	32	43.93	16	44	11.3	1.395 618	6.30	2.41	12	16	55
	10	21	39	41.42	16	08	36.2	1.390 633	6.32	2.42	12	19	56
	11	21	46	38.82	-15	31	34.6	1.384 896	6.35	2.43	12	22	57
	12	21	53	36.01	14	53	07.6	1.378 374	6.38	2.44	12	25	58
	13	22	00	32.88	14	13	16.2	1.371 033	6.41	2.45	12	28	59
	14	22	07	29.27	13	32	01.9	1.362 836	6.45	2.47	12	31	59
	15	22	14	24.99	-12	49	26.4	1.353 747	6.50	2.48	12	34	58

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RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Feb.	15	22	14	24.99	-12	49	26.4	1.353 747	6.50	2.48	12	34	58
	16	22	21	19.84	12	05	32.1	1.343 724	6.54	2.50	12	37	56
	17	22	28	13.53	11	20	21.8	1.332 729	6.60	2.52	12	40	53
	18	22	35	05.74	10	33	58.8	1.320 721	6.66	2.54	12	43	48
	19	22	41	56.08	9	46	27.4	1.307 662	6.73	2.57	12	46	41
	20	22	48	44.08	8	57	52.6	1.293 514	6.80	2.60	12	49	31
	21	22	55	29.18	-8	08	20.2	1.278 245	6.88	2.63	12	52	18
	22	23	02	10.71	7	17	57.4	1.261 825	6.97	2.66	12	55	01
	23	23	08	47.89	6	26	52.3	1.244 233	7.07	2.70	12	57	39
	24	23	15	19.83	5	35	14.4	1.225 459	7.18	2.74	13	00	12
Mar.	25	23	21	45.49	4	43	14.5	1.205 500	7.30	2.79	13	02	37
	26	23	28	03.69	3	51	05.1	1.184 372	7.43	2.84	13	04	54
	27	23	34	13.12	-2	58	59.7	1.162 105	7.57	2.89	13	07	02
	28	23	40	12.30	2	07	13.7	1.138 746	7.72	2.95	13	08	58
	1	23	45	59.66	-1	16	03.6	1.114 366	7.89	3.02	13	10	42
	2	23	51	33.49	-0	25	47.1	1.089 054	8.08	3.09	13	12	11
	3	23	56	51.97	+0	23	17.1	1.062 922	8.27	3.16	13	13	24
	4	0	01	53.25	1	10	49.4	1.036 102	8.49	3.24	13	14	18
	5	0	06	35.42	+1	56	30.0	1.008 744	8.72	3.33	13	14	53
	6	0	10	56.59	2	39	58.7	0.981 015	8.96	3.43	13	15	05
	7	0	14	54.93	3	20	55.6	0.953 094	9.23	3.53	13	14	53
	8	0	18	28.68	3	59	01.5	0.925 169	9.51	3.63	13	14	16
	9	0	21	36.26	4	33	57.7	0.897 431	9.80	3.74	13	13	12
	10	0	24	16.26	5	05	26.8	0.870 071	10.11	3.86	13	11	40
	11	0	26	27.51	+5	33	12.5	0.843 279	10.43	3.98	13	09	39
	12	0	28	09.11	5	57	00.3	0.817 234	10.76	4.11	13	07	08
	13	0	29	20.50	6	16	37.3	0.792 108	11.10	4.24	13	04	06
	14	0	30	01.50	6	31	52.9	0.768 061	11.45	4.37	13	00	35
	15	0	30	12.30	6	42	38.8	0.745 239	11.80	4.51	12	56	34
	16	0	29	53.57	6	48	49.6	0.723 773	12.15	4.64	12	52	04
	17	0	29	06.44	+6	50	23.2	0.703 779	12.50	4.77	12	47	07
	18	0	27	52.55	6	47	21.1	0.685 356	12.83	4.90	12	41	44
	19	0	26	14.01	6	39	49.2	0.668 587	13.15	5.03	12	35	59
	20	0	24	13.44	6	27	57.7	0.653 536	13.46	5.14	12	29	53
	21	0	21	53.88	6	12	01.6	0.640 251	13.74	5.25	12	23	30
	22	0	19	18.74	5	52	20.9	0.628 759	13.99	5.34	12	16	53
	23	0	16	31.76	+5	29	19.6	0.619 071	14.21	5.43	12	10	07
	24	0	13	36.82	5	03	26.2	0.611 179	14.39	5.50	12	03	15
	25	0	10	37.90	4	35	12.1	0.605 058	14.53	5.55	11	56	21
	26	0	07	38.90	4	05	11.0	0.600 667	14.64	5.59	11	49	29
	27	0	04	43.58	3	33	57.8	0.597 950	14.71	5.62	11	42	42
	28	0	01	55.39	3	02	07.0	0.596 838	14.73	5.63	5	42	45
	29	23	59	17.45	+2	30	12.0	0.597 253	14.72	5.63	17	28	58
	30	23	56	52.45	1	58	43.9	0.599 109	14.68	5.61	11	23	24
	31	23	54	42.65	1	28	11.1	0.602 312	14.60	5.58	11	17	27
	1	23	52	49.84	0	58	58.2	0.606 768	14.49	5.54	11	11	47
	2	23	51	15.36	+0	31	26.1	0.612 382	14.36	5.49	11	06	26

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RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Apr.	1	23	52	49.84	+0	58	58.2	0.606 768	14.49	5.54	11	11	47
	2	23	51	15.36	0	31	26.1	0.612 382	14.36	5.49	11	06	26
	3	23	50	00.17	+0	05	52.2	0.619 059	14.21	5.43	11	01	25
	4	23	49	04.81	-0	17	30.1	0.626 706	14.03	5.36	10	56	43
	5	23	48	29.54	0	38	30.7	0.635 235	13.84	5.29	10	52	21
	6	23	48	14.34	0	57	02.2	0.644 562	13.64	5.21	10	48	19
	7	23	48	18.93	-1	13	00.2	0.654 609	13.43	5.13	10	44	36
	8	23	48	42.91	1	26	22.5	0.665 302	13.22	5.05	10	41	13
	9	23	49	25.70	1	37	08.5	0.676 575	13.00	4.97	10	38	07
	10	23	50	26.65	1	45	19.1	0.688 365	12.78	4.88	10	35	20
	11	23	51	45.02	1	50	56.7	0.700 617	12.55	4.80	10	32	49
	12	23	53	20.06	1	54	04.1	0.713 281	12.33	4.71	10	30	35
	13	23	55	10.99	-1	54	45.1	0.726 311	12.11	4.63	10	28	36
	14	23	57	17.03	1	53	03.8	0.739 667	11.89	4.54	10	26	52
	15	23	59	37.40	1	49	04.6	0.753 311	11.67	4.46	10	25	22
	16	0	02	11.39	1	42	52.1	0.767 212	11.46	4.38	10	24	05
	17	0	04	58.27	1	34	31.0	0.781 341	11.26	4.30	10	23	01
	18	0	07	57.38	1	24	05.9	0.795 672	11.05	4.22	10	22	09
	19	0	11	08.10	-1	11	41.5	0.810 182	10.85	4.15	10	21	28
	20	0	14	29.83	0	57	22.2	0.824 852	10.66	4.07	10	20	58
	21	0	18	02.05	0	41	12.7	0.839 661	10.47	4.00	10	20	38
	22	0	21	44.27	0	23	17.0	0.854 596	10.29	3.93	10	20	27
	23	0	25	36.04	-0	03	39.5	0.869 640	10.11	3.86	10	20	27
	24	0	29	36.96	+0	17	36.0	0.884 781	9.94	3.80	10	20	35
	25	0	33	46.69	+0	40	25.5	0.900 006	9.77	3.73	10	20	52
	26	0	38	04.91	1	04	45.4	0.915 303	9.61	3.67	10	21	17
	27	0	42	31.36	1	30	31.9	0.930 663	9.45	3.61	10	21	50
	28	0	47	05.81	1	57	41.7	0.946 074	9.30	3.55	10	22	32
	29	0	51	48.09	2	26	11.3	0.961 527	9.15	3.49	10	23	21
	30	0	56	38.05	2	55	57.6	0.977 011	9.00	3.44	10	24	18
May	1	1	01	35.57	+3	26	57.3	0.992 516	8.86	3.39	10	25	22
	2	1	06	40.59	3	59	07.3	1.008 030	8.72	3.33	10	26	34
	3	1	11	53.07	4	32	24.5	1.023 541	8.59	3.28	10	27	53
	4	1	17	13.02	5	06	45.9	1.039 036	8.46	3.23	10	29	20
	5	1	22	40.46	5	42	08.4	1.054 501	8.34	3.19	10	30	54
	6	1	28	15.47	6	18	28.9	1.069 918	8.22	3.14	10	32	36
	7	1	33	58.15	+6	55	44.3	1.085 268	8.10	3.10	10	34	26
	8	1	39	48.62	7	33	51.4	1.100 531	7.99	3.05	10	36	23
	9	1	45	47.04	8	12	46.8	1.115 683	7.88	3.01	10	38	29
	10	1	51	53.60	8	52	27.1	1.130 696	7.78	2.97	10	40	43
	11	1	58	08.49	9	32	48.6	1.145 541	7.68	2.93	10	43	05
	12	2	04	31.95	10	13	47.2	1.160 182	7.58	2.90	10	45	36
	13	2	11	04.21	+10	55	18.9	1.174 581	7.49	2.86	10	48	16
	14	2	17	45.53	11	37	19.0	1.188 695	7.40	2.83	10	51	05
	15	2	24	36.16	12	19	42.5	1.202 475	7.31	2.79	10	54	04
	16	2	31	36.38	13	02	24.1	1.215 868	7.23	2.76	10	57	13
	17	2	38	46.43	+13	45	17.8	1.228 813	7.16	2.73	11	00	31

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RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
May	17	2	38	46.43	+13	45	17.8	1.228 813	7.16	2.73	11	00	31
	18	2	46	06.55	14	28	17.0	1.241 247	7.08	2.71	11	04	00
	19	2	53	36.94	15	11	14.7	1.253 100	7.02	2.68	11	07	39
	20	3	01	17.79	15	54	02.9	1.264 294	6.96	2.66	11	11	29
	21	3	09	09.18	16	36	33.2	1.274 749	6.90	2.64	11	15	29
	22	3	17	11.18	17	18	36.2	1.284 382	6.85	2.62	11	19	40
	23	3	25	23.72	+18	00	01.9	1.293 104	6.80	2.60	11	24	02
	24	3	33	46.64	18	40	39.5	1.300 827	6.76	2.58	11	28	34
June	25	3	42	19.66	19	20	17.7	1.307 463	6.73	2.57	11	33	16
	26	3	51	02.35	19	58	44.8	1.312 930	6.70	2.56	11	38	08
	27	3	59	54.12	20	35	48.4	1.317 148	6.68	2.55	11	43	08
	28	4	08	54.22	21	11	16.4	1.320 049	6.66	2.55	11	48	17
	29	4	18	01.73	+21	44	56.6	1.321 576	6.65	2.54	11	53	32
	30	4	27	15.58	22	16	37.4	1.321 687	6.65	2.54	11	58	53
	31	4	36	34.57	22	46	07.6	1.320 358	6.66	2.54	12	04	19
	1	4	45	57.34	23	13	17.5	1.317 580	6.67	2.55	12	09	48
	2	4	55	22.49	23	37	58.6	1.313 366	6.70	2.56	12	15	18
	3	5	04	48.53	24	00	03.8	1.307 746	6.72	2.57	12	20	49
	4	5	14	13.98	+24	19	27.9	1.300 769	6.76	2.58	12	26	18
	5	5	23	37.35	24	36	07.3	1.292 499	6.80	2.60	12	31	45
	6	5	32	57.20	24	50	00.2	1.283 010	6.85	2.62	12	37	07
	7	5	42	12.19	25	01	06.6	1.272 390	6.91	2.64	12	42	23
	8	5	51	21.05	25	09	28.0	1.260 732	6.98	2.67	12	47	33
	9	6	00	22.65	25	15	07.4	1.248 133	7.05	2.69	12	52	35
	10	6	09	15.96	+25	18	08.9	1.234 691	7.12	2.72	12	57	28
	11	6	18	00.09	25	18	37.6	1.220 502	7.21	2.75	13	02	11
12	6	26	34.26	25	16	39.6	1.205 661	7.29	2.79	13	06	44	
13	6	34	57.81	25	12	21.3	1.190 257	7.39	2.82	13	11	05	
14	6	43	10.20	25	05	49.9	1.174 374	7.49	2.86	13	15	16	
15	6	51	10.98	24	57	12.6	1.158 090	7.59	2.90	13	19	14	
16	6	58	59.77	+24	46	36.8	1.141 475	7.70	2.94	13	23	00	
17	7	06	36.29	24	34	10.2	1.124 597	7.82	2.99	13	26	33	
18	7	14	00.31	24	20	00.3	1.107 512	7.94	3.03	13	29	54	
19	7	21	11.64	24	04	14.5	1.090 274	8.07	3.08	13	33	02	
20	7	28	10.17	23	47	00.3	1.072 929	8.20	3.13	13	35	57	
21	7	34	55.78	23	28	24.7	1.055 521	8.33	3.18	13	38	39	
22	7	41	28.38	+23	08	35.1	1.038 086	8.47	3.24	13	41	08	
23	7	47	47.91	22	47	38.2	1.020 658	8.62	3.29	13	43	24	
24	7	53	54.31	22	25	40.9	1.003 265	8.77	3.35	13	45	26	
25	7	59	47.52	22	02	49.8	0.985 934	8.92	3.41	13	47	15	
26	8	05	27.46	21	39	11.5	0.968 690	9.08	3.47	13	48	51	
27	8	10	54.05	21	14	52.2	0.951 552	9.24	3.53	13	50	14	
28	8	16	07.22	+20	49	58.3	0.934 541	9.41	3.60	13	51	23	
29	8	21	06.86	20	24	36.0	0.917 675	9.58	3.66	13	52	18	
30	8	25	52.85	19	58	51.3	0.900 970	9.76	3.73	13	52	59	
July	1	8	30	25.06	19	32	50.2	0.884 443	9.94	3.80	13	53	27
	2	8	34	43.32	+19	06	38.9	0.868 109	10.13	3.87	13	53	40

MERCURY, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
July	1	8	30	25.06	+19	32	50.2	0.884 443	9.94	3.80	13	53	27
	2	8	34	43.32	19	06	38.9	0.868 109	10.13	3.87	13	53	40
	3	8	38	47.46	18	40	23.2	0.851 984	10.32	3.94	13	53	40
	4	8	42	37.25	18	14	09.4	0.836 083	10.52	4.02	13	53	25
	5	8	46	12.47	17	48	03.4	0.820 421	10.72	4.10	13	52	55
	6	8	49	32.85	17	22	11.3	0.805 015	10.92	4.17	13	52	10
	7	8	52	38.10	+16	56	39.6	0.789 883	11.13	4.25	13	51	10
	8	8	55	27.91	16	31	34.4	0.775 043	11.35	4.34	13	49	54
	9	8	58	01.94	16	07	02.2	0.760 514	11.56	4.42	13	48	22
	10	9	00	19.83	15	43	09.6	0.746 319	11.78	4.50	13	46	34
	11	9	02	21.22	15	20	03.4	0.732 482	12.01	4.59	13	44	30
	12	9	04	05.73	14	57	50.2	0.719 027	12.23	4.67	13	42	08
	13	9	05	33.00	+14	36	37.2	0.705 984	12.46	4.76	13	39	29
	14	9	06	42.66	14	16	31.3	0.693 383	12.68	4.85	13	36	32
	15	9	07	34.38	13	57	39.6	0.681 258	12.91	4.93	13	33	18
	16	9	08	07.87	13	40	09.3	0.669 646	13.13	5.02	13	29	45
	17	9	08	22.90	13	24	07.4	0.658 587	13.35	5.10	13	25	54
	18	9	08	19.32	13	09	40.9	0.648 123	13.57	5.18	13	21	44
	19	9	07	57.09	+12	56	56.6	0.638 303	13.78	5.26	13	17	15
	20	9	07	16.28	12	46	00.9	0.629 175	13.98	5.34	13	12	29
	21	9	06	17.15	12	36	59.6	0.620 793	14.17	5.41	13	07	24
	22	9	05	00.12	12	29	58.2	0.613 213	14.34	5.48	13	02	03
	23	9	03	25.83	12	25	00.8	0.606 493	14.50	5.54	12	56	24
	24	9	01	35.20	12	22	11.0	0.600 694	14.64	5.59	12	50	30
	25	8	59	29.38	+12	21	30.6	0.595 879	14.76	5.64	12	44	22
	26	8	57	09.84	12	23	00.4	0.592 111	14.85	5.67	12	38	01
	27	8	54	38.35	12	26	39.1	0.589 451	14.92	5.70	12	31	29
	28	8	51	56.99	12	32	24.0	0.587 962	14.96	5.71	12	24	49
	29	8	49	08.13	12	40	10.2	0.587 700	14.96	5.72	12	18	02
	30	8	46	14.39	12	49	51.1	0.588 722	14.94	5.71	12	11	13
Aug.	31	8	43	18.64	+13	01	18.4	0.591 076	14.88	5.68	12	04	23
	1	8	40	23.91	13	14	21.7	0.594 806	14.78	5.65	11	57	35
	2	8	37	33.34	13	28	49.5	0.599 948	14.66	5.60	11	50	53
	3	8	34	50.09	13	44	28.8	0.606 530	14.50	5.54	11	44	20
	4	8	32	17.32	14	01	05.8	0.614 572	14.31	5.47	11	37	58
	5	8	29	58.07	14	18	25.9	0.624 083	14.09	5.38	11	31	51
	6	8	27	55.20	+14	36	14.2	0.635 065	13.85	5.29	11	26	02
	7	8	26	11.37	14	54	15.6	0.647 509	13.58	5.19	11	20	33
	8	8	24	48.96	15	12	15.2	0.661 398	13.30	5.08	11	15	26
	9	8	23	50.05	15	29	58.2	0.676 704	13.00	4.97	11	10	43
	10	8	23	16.42	15	47	10.5	0.693 391	12.68	4.85	11	06	26
	11	8	23	09.53	16	03	38.0	0.711 416	12.36	4.72	11	02	36
	12	8	23	30.51	+16	19	07.5	0.730 722	12.03	4.60	10	59	14
	13	8	24	20.19	16	33	26.1	0.751 247	11.71	4.47	10	56	20
	14	8	25	39.11	16	46	21.2	0.772 919	11.38	4.35	10	53	56
	15	8	27	27.51	16	57	41.1	0.795 656	11.05	4.22	10	52	02
16	8	29	45.39	+17	07	14.2	0.819 366	10.73	4.10	10	50	36	

MERCURY, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Aug.	16	8	29	45.39	+17	07	14.2	0.819 366	10.73	4.10	10	50	36
	17	8	32	32.47	17	14	49.5	0.843 946	10.42	3.98	10	49	40
	18	8	35	48.25	17	20	16.5	0.869 285	10.12	3.87	10	49	12
	19	8	39	32.00	17	23	25.4	0.895 258	9.82	3.75	10	49	11
	20	8	43	42.74	17	24	07.1	0.921 734	9.54	3.65	10	49	37
	21	8	48	19.32	17	22	13.2	0.948 567	9.27	3.54	10	50	29
	22	8	53	20.37	+17	17	36.6	0.975 608	9.01	3.44	10	51	44
	23	8	58	44.32	17	10	11.4	1.002 697	8.77	3.35	10	53	21
	24	9	04	29.43	16	59	53.1	1.029 671	8.54	3.26	10	55	19
	25	9	10	33.82	16	46	39.1	1.056 367	8.32	3.18	10	57	35
	26	9	16	55.49	16	30	28.3	1.082 621	8.12	3.10	11	00	08
	27	9	23	32.32	16	11	22.0	1.108 280	7.93	3.03	11	02	54
	28	9	30	22.18	+15	49	23.0	1.133 196	7.76	2.97	11	05	53
	29	9	37	22.92	15	24	36.4	1.157 237	7.60	2.90	11	09	02
Sept.	30	9	44	32.42	14	57	08.9	1.180 287	7.45	2.85	11	12	19
	31	9	51	48.66	14	27	08.7	1.202 248	7.31	2.79	11	15	42
	1	9	59	09.74	13	54	45.3	1.223 043	7.19	2.75	11	19	08
	2	10	06	33.91	13	20	09.4	1.242 615	7.08	2.70	11	22	37
	3	10	13	59.59	+12	43	32.0	1.260 925	6.97	2.66	11	26	07
	4	10	21	25.39	12	05	04.7	1.277 954	6.88	2.63	11	29	37
	5	10	28	50.11	11	24	59.1	1.293 699	6.80	2.60	11	33	04
	6	10	36	12.76	10	43	26.6	1.308 172	6.72	2.57	11	36	30
	7	10	43	32.50	10	00	38.3	1.321 395	6.66	2.54	11	39	52
	8	10	50	48.68	9	16	44.6	1.333 398	6.60	2.52	11	43	10
	9	10	58	00.79	+8	31	55.4	1.344 223	6.54	2.50	11	46	24
	10	11	05	08.46	7	46	20.0	1.353 910	6.50	2.48	11	49	33
	11	11	12	11.43	7	00	06.9	1.362 508	6.45	2.47	11	52	37
	12	11	19	09.55	6	13	23.8	1.370 063	6.42	2.45	11	55	37
13	11	26	02.74	5	26	17.9	1.376 625	6.39	2.44	11	58	32	
14	11	32	50.99	4	38	55.6	1.382 240	6.36	2.43	12	01	21	
15	11	39	34.34	+3	51	22.8	1.386 955	6.34	2.42	12	04	06	
16	11	46	12.88	3	03	44.8	1.390 813	6.32	2.42	12	06	46	
17	11	52	46.73	2	16	06.4	1.393 858	6.31	2.41	12	09	21	
18	11	59	16.03	1	28	31.8	1.396 129	6.30	2.41	12	11	52	
19	12	05	40.97	+0	41	04.9	1.397 661	6.29	2.40	12	14	18	
20	12	12	01.71	-0	06	10.8	1.398 491	6.29	2.40	12	16	41	
21	12	18	18.46	-0	53	12.2	1.398 649	6.29	2.40	12	18	59	
22	12	24	31.41	1	39	56.4	1.398 163	6.29	2.40	12	21	14	
23	12	30	40.75	2	26	20.8	1.397 062	6.29	2.41	12	23	25	
24	12	36	46.69	3	12	23.2	1.395 368	6.30	2.41	12	25	33	
25	12	42	49.43	3	58	01.3	1.393 103	6.31	2.41	12	27	38	
26	12	48	49.15	4	43	13.2	1.390 287	6.33	2.42	12	29	39	
27	12	54	46.03	-5	27	57.1	1.386 938	6.34	2.42	12	31	39	
28	13	00	40.26	6	12	11.3	1.383 069	6.36	2.43	12	33	35	
29	13	06	32.01	6	55	54.1	1.378 696	6.38	2.44	12	35	29	
30	13	12	21.42	7	39	04.1	1.373 831	6.40	2.45	12	37	21	
Oct.	1	13	18	08.65	-8	21	39.8	1.368 482	6.43	2.46	12	39	11

MERCURY, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
Oct.	1	13	18	08.65	-8	21	39.8	1.368 482	6.43	2.46	12	39	11
	2	13	23	53.84	9	03	39.9	1.362 660	6.45	2.47	12	40	58
	3	13	29	37.12	9	45	03.0	1.356 372	6.48	2.48	12	42	44
	4	13	35	18.59	10	25	47.9	1.349 624	6.52	2.49	12	44	28
	5	13	40	58.37	11	05	53.2	1.342 421	6.55	2.50	12	46	11
	6	13	46	36.54	11	45	17.8	1.334 767	6.59	2.52	12	47	52
	7	13	52	13.19	-12	24	00.3	1.326 666	6.63	2.53	12	49	31
	8	13	57	48.38	13	01	59.7	1.318 117	6.67	2.55	12	51	09
	9	14	03	22.14	13	39	14.6	1.309 124	6.72	2.57	12	52	46
	10	14	08	54.52	14	15	43.9	1.299 685	6.77	2.59	12	54	21
	11	14	14	25.52	14	51	26.1	1.289 801	6.82	2.61	12	55	55
	12	14	19	55.11	15	26	20.0	1.279 468	6.87	2.63	12	57	27
	13	14	25	23.26	-16	00	24.2	1.268 686	6.93	2.65	12	58	58
	14	14	30	49.89	16	33	37.1	1.257 452	6.99	2.67	13	00	27
	15	14	36	14.92	17	05	57.4	1.245 762	7.06	2.70	13	01	55
	16	14	41	38.21	17	37	23.3	1.233 613	7.13	2.72	13	03	21
	17	14	46	59.61	18	07	53.3	1.221 002	7.20	2.75	13	04	45
	18	14	52	18.90	18	37	25.6	1.207 925	7.28	2.78	13	06	06
	19	14	57	35.85	-19	05	58.4	1.194 379	7.36	2.81	13	07	25
	20	15	02	50.17	19	33	29.7	1.180 360	7.45	2.85	13	08	41
	21	15	08	01.50	19	59	57.6	1.165 865	7.54	2.88	13	09	54
	22	15	13	09.46	20	25	19.9	1.150 893	7.64	2.92	13	11	04
	23	15	18	13.55	20	49	34.2	1.135 442	7.75	2.96	13	12	09
	24	15	23	13.24	21	12	38.3	1.119 512	7.86	3.00	13	13	10
	25	15	28	07.90	-21	34	29.5	1.103 104	7.97	3.05	13	14	05
	26	15	32	56.80	21	55	04.9	1.086 221	8.10	3.09	13	14	53
	27	15	37	39.10	22	14	21.7	1.068 871	8.23	3.14	13	15	35
	28	15	42	13.88	22	32	16.6	1.051 061	8.37	3.20	13	16	09
	29	15	46	40.05	22	48	46.1	1.032 803	8.51	3.25	13	16	33
	30	15	50	56.39	23	03	46.4	1.014 116	8.67	3.31	13	16	47
Nov.	31	15	55	01.54	-23	17	13.4	0.995 021	8.84	3.38	13	16	49
	1	15	58	53.95	23	29	02.4	0.975 548	9.01	3.44	13	16	37
	2	16	02	31.89	23	39	08.6	0.955 734	9.20	3.52	13	16	09
	3	16	05	53.44	23	47	26.2	0.935 625	9.40	3.59	13	15	24
	4	16	08	56.48	23	53	49.1	0.915 279	9.61	3.67	13	14	20
	5	16	11	38.66	23	58	10.4	0.894 768	9.83	3.76	13	12	53
	6	16	13	57.47	-24	00	22.4	0.874 176	10.06	3.84	13	11	01
	7	16	15	50.19	24	00	16.7	0.853 610	10.30	3.94	13	08	42
	8	16	17	13.98	23	57	43.7	0.833 192	10.55	4.03	13	05	53
	9	16	18	05.95	23	52	33.3	0.813 071	10.82	4.13	13	02	30
	10	16	18	23.24	23	44	34.4	0.793 418	11.08	4.23	12	58	31
	11	16	18	03.19	23	33	35.7	0.774 433	11.36	4.34	12	53	55
	12	16	17	03.57	-23	19	26.1	0.756 344	11.63	4.44	12	48	38
	13	16	15	22.78	23	01	55.9	0.739 404	11.89	4.54	12	42	40
	14	16	13	00.24	22	40	57.8	0.723 893	12.15	4.64	12	36	01
	15	16	09	56.64	22	16	29.4	0.710 106	12.38	4.73	12	28	42
16	16	06	14.31	-21	48	34.9	0.698 349	12.59	4.81	12	20	48	

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RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Nov.	16	16	06	14.31	-21	48	34.9	0.698 349	12.59	4.81	12	20	48
	17	16	01	57.44	21	17	27.8	0.688 924	12.77	4.88	12	12	22
	18	15	57	12.19	20	43	33.1	0.682 110	12.89	4.93	12	03	32
	19	15	52	06.56	20	07	28.4	0.678 148	12.97	4.95	11	54	27
	20	15	46	50.08	19	30	03.3	0.677 220	12.99	4.96	11	45	16
	21	15	41	33.18	18	52	18.0	0.679 434	12.94	4.95	11	36	09
	22	15	36	26.47	-18	15	18.3	0.684 810	12.84	4.91	11	27	18
	23	15	31	39.96	17	40	10.6	0.693 281	12.68	4.85	11	18	50
	24	15	27	22.35	17	07	56.6	0.704 694	12.48	4.77	11	10	55
	25	15	23	40.58	16	39	27.8	0.718 823	12.23	4.67	11	03	37
Dec.	26	15	20	39.55	16	15	22.4	0.735 383	11.96	4.57	10	57	01
	27	15	18	22.15	15	56	04.6	0.754 056	11.66	4.46	10	51	09
	28	15	16	49.45	-15	41	44.3	0.774 504	11.35	4.34	10	46	00
	29	15	16	01.01	15	32	19.1	0.796 386	11.04	4.22	10	41	35
	30	15	15	55.22	15	27	37.2	0.819 378	10.73	4.10	10	37	52
	1	15	16	29.71	15	27	19.7	0.843 175	10.43	3.98	10	34	47
	2	15	17	41.59	15	31	02.9	0.867 503	10.14	3.87	10	32	18
	3	15	19	27.74	15	38	21.1	0.892 119	9.86	3.77	10	30	22
	4	15	21	44.98	-15	48	47.5	0.916 814	9.59	3.66	10	28	55
	5	15	24	30.23	16	01	55.9	0.941 410	9.34	3.57	10	27	55
	6	15	27	40.56	16	17	21.3	0.965 759	9.11	3.48	10	27	19
	7	15	31	13.28	16	34	40.2	0.989 739	8.89	3.39	10	27	04
	8	15	35	05.91	16	53	31.2	1.013 252	8.68	3.32	10	27	08
	9	15	39	16.25	17	13	35.0	1.036 223	8.49	3.24	10	27	29
	10	15	43	42.34	-17	34	34.2	1.058 591	8.31	3.17	10	28	05
	11	15	48	22.45	17	56	13.3	1.080 312	8.14	3.11	10	28	54
	12	15	53	15.05	18	18	18.6	1.101 353	7.98	3.05	10	29	56
	13	15	58	18.81	18	40	38.0	1.121 693	7.84	3.00	10	31	07
	14	16	03	32.56	19	03	00.9	1.141 318	7.71	2.94	10	32	29
	15	16	08	55.30	19	25	17.8	1.160 221	7.58	2.90	10	33	59
16	16	14	26.13	-19	47	20.6	1.178 399	7.46	2.85	10	35	36	
17	16	20	04.29	20	09	01.9	1.195 855	7.35	2.81	10	37	21	
18	16	25	49.11	20	30	15.4	1.212 595	7.25	2.77	10	39	12	
19	16	31	40.01	20	50	55.3	1.228 626	7.16	2.73	10	41	09	
20	16	37	36.46	21	10	56.6	1.243 958	7.07	2.70	10	43	12	
21	16	43	38.02	21	30	14.9	1.258 601	6.99	2.67	10	45	19	
22	16	49	44.30	-21	48	46.1	1.272 568	6.91	2.64	10	47	31	
23	16	55	54.95	22	06	26.6	1.285 870	6.84	2.61	10	49	47	
24	17	02	09.65	22	23	13.3	1.298 520	6.77	2.59	10	52	07	
25	17	08	28.14	22	39	03.1	1.310 531	6.71	2.56	10	54	31	
26	17	14	50.16	22	53	53.5	1.321 913	6.65	2.54	10	56	58	
27	17	21	15.49	23	07	42.0	1.332 679	6.60	2.52	10	59	29	
28	17	27	43.94	-23	20	26.3	1.342 841	6.55	2.50	11	02	02	
29	17	34	15.32	23	32	04.6	1.352 408	6.50	2.48	11	04	39	
30	17	40	49.47	23	42	34.8	1.361 391	6.46	2.47	11	07	18	
31	17	47	26.23	23	51	55.2	1.369 800	6.42	2.45	11	10	00	
32	17	54	05.45	-24	00	04.3	1.377 642	6.38	2.44	11	12	44	

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Date	Heliocentric Longitude				Heliocentric Latitude			Radius Vector		Date	Heliocentric Longitude				Heliocentric Latitude			Radius Vector	
		°	'	"	°	'	"					°	'	"	°	'	"		
Jan.	1	51	27	49.2	-1	27	35.5	0.722 5065	Apr.	3	200	20	54.4	+2	50	01.7	0.721 5060		
	3	54	40	21.6	1	17	09.1	0.722 2385		5	203	34	11.1	2	43	27.6	0.721 7630		
	5	57	53	00.8	1	06	27.7	0.721 9739		7	206	47	17.3	2	36	22.8	0.722 0248		
	7	61	05	47.1	0	55	33.4	0.721 7135		9	210	00	12.7	2	28	48.8	0.722 2908		
	9	64	18	40.5	0	44	28.1	0.721 4580		11	213	12	57.4	2	20	47.2	0.722 5599		
	11	67	31	41.0	0	33	13.9	0.721 2084		13	216	25	31.1	2	12	19.4	0.722 8314		
	13	70	44	48.7	0	21	53.0	0.720 9653		15	219	37	53.8	+2	03	27.2	0.723 1044		
	15	73	58	03.6	-0	10	27.4	0.720 7297		17	222	50	05.7	1	54	12.2	0.723 3781		
	17	77	11	25.7	+0	01	00.5	0.720 5021		19	226	02	06.7	1	44	36.3	0.723 6516		
	19	80	24	55.1	0	12	28.7	0.720 2834		21	229	13	57.0	1	34	41.3	0.723 9239		
Feb.	21	83	38	31.6	0	23	55.0	0.720 0743	23	232	25	36.9	1	24	29.0	0.724 1944			
	23	86	52	15.3	0	35	17.0	0.719 8755	25	235	37	06.5	1	14	01.5	0.724 4621			
	25	90	06	06.0	+0	46	32.7	0.719 6875	27	238	48	26.1	+1	03	20.7	0.724 7262			
	27	93	20	03.5	0	57	39.9	0.719 5109	29	241	59	36.2	0	52	28.6	0.724 9859			
	29	96	34	07.9	1	08	36.3	0.719 3465	May	1	245	10	36.9	0	41	27.3		0.725 2404	
	31	99	48	18.9	1	19	19.9	0.719 1946		3	248	21	28.9	0	30	18.7		0.725 4889	
	2	103	02	36.2	1	29	48.6	0.719 0557	5	251	32	12.4	0	19	05.0	0.725 7306			
	4	106	16	59.7	1	40	00.4	0.718 9304	7	254	42	48.0	+0	07	48.2	0.725 9648			
	6	109	31	29.0	+1	49	53.1	0.718 8190	9	257	53	16.3	-0	03	29.6	0.726 1908			
	8	112	46	03.7	1	59	24.9	0.718 7220	11	261	03	37.5	0	14	46.4	0.726 4079			
Mar.	10	116	00	43.6	2	08	34.0	0.718 6395	13	264	13	52.5	0	25	60.0	0.726 6154			
	12	119	15	28.2	2	17	18.3	0.718 5719	15	267	24	01.6	0	37	08.5	0.726 8126			
	14	122	30	17.1	2	25	36.4	0.718 5193	17	270	34	05.5	0	48	09.8	0.726 9991			
	16	125	45	09.8	2	33	26.5	0.718 4821	19	273	44	04.8	0	59	02.0	0.727 1741			
	18	129	00	05.7	+2	40	47.2	0.718 4602	21	276	53	60.0	-1	09	43.0	0.727 3373			
	20	132	15	04.4	2	47	36.8	0.718 4538	23	280	03	51.6	1	20	11.1	0.727 4880			
	22	135	30	05.2	2	53	54.2	0.718 4628	25	283	13	40.4	1	30	24.2	0.727 6259			
	24	138	45	07.5	2	59	38.0	0.718 4874	27	286	23	26.8	1	40	20.6	0.727 7505			
	26	142	00	10.7	3	04	47.2	0.718 5272	29	289	33	11.4	1	49	58.5	0.727 8614			
	28	145	15	14.2	3	09	20.7	0.718 5824	31	292	42	54.7	1	59	16.1	0.727 9583			
	2	148	30	17.2	+3	13	17.7	0.718 6526	June	2	295	52	37.4	-2	08	11.8	0.728 0409		
	4	151	45	19.0	3	16	37.4	0.718 7376		4	299	02	19.8	2	16	44.0	0.728 1090		
	6	155	00	19.1	3	19	19.2	0.718 8372		6	302	12	02.5	2	24	51.2	0.728 1624		
	8	158	15	16.6	3	21	22.6	0.718 9511		8	305	21	46.0	2	32	31.9	0.728 2008		
	10	161	30	10.9	3	22	47.1	0.719 0789		10	308	31	30.7	2	39	44.7	0.728 2242		
	12	164	45	01.2	3	23	32.7	0.719 2201		12	311	41	17.1	2	46	28.4	0.728 2325		
	14	167	59	46.9	+3	23	39.1	0.719 3744		14	314	51	05.4	-2	52	41.6	0.728 2257		
	16	171	14	27.3	3	23	06.5	0.719 5411		16	318	00	56.3	2	58	23.4	0.728 2038		
	18	174	29	01.8	3	21	54.9	0.719 7199		18	321	10	49.9	3	03	32.6	0.728 1668		
	20	177	43	29.7	3	20	04.6	0.719 9101		20	324	20	46.6	3	08	08.3	0.728 1149		
Apr.	22	180	57	50.4	3	17	36.2	0.720 1111	22	327	30	46.8	3	12	09.6	0.728 0482			
	24	184	12	03.3	3	14	30.0	0.720 3223	24	330	40	50.6	3	15	35.9	0.727 9670			
	26	187	26	07.9	+3	10	46.9	0.720 5430	26	333	50	58.5	-3	18	26.3	0.727 8713			
	28	190	40	03.8	3	06	27.5	0.720 7724	28	337	01	10.4	3	20	40.5	0.727 7617			
	30	193	53	50.4	3	01	32.8	0.721 0099	30	340	11	26.8	3	22	17.9	0.727 6383			
	1	197	07	27.4	2	56	03.8	0.721 2547	July	2	343	21	47.8	3	23	18.3		0.727 5016	
	3	200	20	54.4	+2	50	01.7	0.721 5060		4	346	32	13.6	-3	23	41.4		0.727 3519	

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Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector	Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector
	°	'	"		°	'	"				°	'	"		°	'	"		
July	2	343	21	47.8	-3	23	18.3		0.727 5016	Oct.	2	131	07	17.6	+2	45	17.8		0.718 4232
	4	346	32	13.6	3	23	41.4		0.727 3519		4	134	22	18.7	2	51	46.6		0.718 4281
	6	349	42	44.3	3	23	27.0		0.727 1897		6	137	37	21.5	2	57	42.3		0.718 4486
	8	352	53	20.0	3	22	35.3		0.727 0156		8	140	52	25.4	3	03	03.7		0.718 4845
	10	356	04	01.0	3	21	06.2		0.726 8299		10	144	07	29.6	3	07	49.7		0.718 5357
	12	359	14	47.3	3	19	00.0		0.726 6334		12	147	22	33.6	3	11	59.6		0.718 6022
	14	2	25	39.0	-3	16	17.0		0.726 4265		14	150	37	36.6	+3	15	32.4		0.718 6836
	16	5	36	36.3	3	12	57.7		0.726 2099		16	153	52	38.1	3	18	27.4		0.718 7798
	18	8	47	39.1	3	09	02.7		0.725 9844		18	157	07	37.1	3	20	44.2		0.718 8903
	20	11	58	47.7	3	04	32.5		0.725 7504		20	160	22	33.1	3	22	22.3		0.719 0149
	22	15	10	02.1	2	59	27.9		0.725 5089		22	163	37	25.4	3	23	21.5		0.719 1531
	24	18	21	22.3	2	53	49.8		0.725 2605		24	166	52	13.2	3	23	41.6		0.719 3045
Aug.	26	21	32	48.5	-2	47	39.3		0.725 0060	26	170	06	55.9	+3	23	22.5		0.719 4685	
	28	24	44	20.8	2	40	57.3		0.724 7461	28	173	21	32.8	3	22	24.4		0.719 6447	
	30	27	55	59.3	2	33	45.0		0.724 4817	30	176	36	03.3	3	20	47.6		0.719 8325	
	1	31	07	44.0	2	26	03.8		0.724 2136	Nov.	1	179	50	26.8	3	18	32.4		0.720 0313
	3	34	19	34.9	2	17	55.0		0.723 9426		3	183	04	42.6	3	15	39.3		0.720 2404
	5	37	31	32.3	2	09	20.1		0.723 6696		5	186	18	50.2	3	12	09.0		0.720 4592
	7	40	43	36.2	-2	00	20.6		0.723 3954		7	189	32	49.3	+3	08	02.2		0.720 6870
	9	43	55	46.7	1	50	58.2		0.723 1209		9	192	46	39.2	3	03	19.7		0.720 9230
	11	47	08	03.9	1	41	14.5		0.722 8469	11	196	00	19.5	2	58	02.5		0.721 1665	
	13	50	20	27.8	1	31	11.4		0.722 5744	13	199	13	50.0	2	52	11.8		0.721 4167	
	15	53	32	58.6	1	20	50.7		0.722 3041	15	202	27	10.2	2	45	48.6		0.721 6728	
	17	56	45	36.3	-1	10	14.3		0.722 0369	17	205	40	20.0	2	38	54.4		0.721 9341	
19	59	58	21.1	-0	59	24.2		0.721 7736	19	208	53	19.1	+2	31	30.5		0.722 1996		
21	63	11	13.0	0	48	22.4		0.721 5152	21	212	06	07.3	2	23	38.4		0.722 4685		
23	66	24	12.0	0	37	11.1		0.721 2623	23	215	18	44.7	2	15	19.5		0.722 7401		
25	69	37	18.3	0	25	52.2		0.721 0159	25	218	31	11.0	2	06	35.6		0.723 0133		
27	72	50	31.8	0	14	27.9		0.720 7767	27	221	43	26.4	1	57	28.4		0.723 2875		
29	76	03	52.5	-0	03	00.5		0.720 5454	29	224	55	31.0	1	47	59.6		0.723 5617		
Sept.	31	79	17	20.5	+0	08	27.9		0.720 3229	Dec.	1	228	07	24.8	+1	38	11.0		0.723 8351
	2	82	30	55.6	0	19	55.2		0.720 1098		3	231	19	08.0	1	28	04.6		0.724 1068
	4	85	44	38.0	0	31	19.0		0.719 9068		5	234	30	40.9	1	17	42.2		0.724 3760
	6	88	58	27.4	0	42	37.3		0.719 7146		7	237	42	03.7	1	07	05.8		0.724 6418
	8	92	12	23.8	0	53	47.8		0.719 5338		9	240	53	16.8	0	56	17.5		0.724 9035
	10	95	26	27.1	1	04	48.3		0.719 3649		11	244	04	20.5	0	45	19.1		0.725 1601
	12	98	40	37.0	+1	15	36.7		0.719 2086		13	247	15	15.2	+0	34	12.9		0.725 4110
	14	101	54	53.3	1	26	10.9		0.719 0653		15	250	26	01.3	0	23	00.7		0.725 6554
	16	105	09	15.9	1	36	28.9		0.718 9354		17	253	36	39.4	0	11	44.8		0.725 8924
	18	108	23	44.4	1	46	28.5		0.718 8195		19	256	47	09.8	+0	00	27.1		0.726 1215
	20	111	38	18.5	1	56	07.9		0.718 7179		21	259	57	33.2	-0	10	50.2		0.726 3418
	22	114	52	57.8	2	05	25.2		0.718 6309		23	263	07	50.0	0	22	05.1		0.726 5528
Oct.	24	118	07	41.9	+2	14	18.4		0.718 5588	25	266	18	00.8	-0	33	15.6		0.726 7537	
	26	121	22	30.5	2	22	46.0		0.718 5018	27	269	28	06.2	0	44	19.7		0.726 9440	
	28	124	37	23.0	2	30	46.0		0.718 4601	29	272	38	06.8	0	55	15.2		0.727 1231	
	30	127	52	18.9	2	38	17.2		0.718 4339	31	275	48	03.0	1	06	00.4		0.727 2904	
	2	131	07	17.6	+2	45	17.8		0.718 4232	33	278	57	55.6	-1	16	33.2		0.727 4455	

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Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Jan.	0	326	38	06.8	-1	28	23.6	Feb.	15	6	44	20.8	+4	12	43.7
	1	327	42	40.5	1	24	19.2		16	7	14	01.7	4	23	18.0
	2	328	46	56.7	1	20	06.0		17	7	42	04.4	4	33	56.9
	3	329	50	54.6	1	15	43.9		18	8	08	25.3	4	44	39.7
	4	330	54	33.5	1	11	13.0		19	8	33	00.8	4	55	25.8
	5	331	57	52.7	1	06	33.1		20	8	55	47.2	5	06	14.3
	6	333	00	51.3	-1	01	44.3		21	9	16	41.0	+5	17	04.5
	7	334	03	28.7	0	56	46.5		22	9	35	38.3	5	27	55.3
	8	335	05	44.0	0	51	39.7		23	9	52	35.5	5	38	45.8
	9	336	07	36.4	0	46	24.0		24	10	07	28.8	5	49	34.7
	10	337	09	05.0	0	40	59.2		25	10	20	14.6	6	00	20.8
	11	338	10	08.9	0	35	25.4		26	10	30	49.2	6	11	02.7
	12	339	10	47.3	-0	29	42.6	Mar.	27	10	39	09.1	+6	21	38.9
	13	340	10	59.1	0	23	50.7		28	10	45	11.1	6	32	07.6
	14	341	10	43.5	0	17	49.7		1	10	48	51.9	6	42	27.1
	15	342	09	59.4	0	11	39.7		2	10	50	08.6	6	52	35.2
	16	343	08	46.0	0	05	20.6		3	10	48	58.7	7	02	30.0
	17	344	07	02.3	-0	01	07.7		4	10	45	20.1	7	12	08.9
	18	345	04	47.2	+0	07	45.1		5	10	39	11.1	+7	21	29.6
	19	346	01	59.6	0	14	31.6		6	10	30	30.9	7	30	29.4
	20	346	58	38.5	0	21	27.3		7	10	19	19.2	7	39	05.6
	21	347	54	42.7	0	28	32.0		8	10	05	36.7	7	47	15.2
	22	348	50	11.0	0	35	46.0		9	9	49	24.9	7	54	55.3
	23	349	45	02.0	0	43	09.0		10	9	30	46.4	8	02	02.9
	24	350	39	14.5	+0	50	41.2		11	9	09	45.0	+8	08	34.8
	25	351	32	47.0	0	58	22.5		12	8	46	25.4	8	14	28.1
	26	352	25	38.0	1	06	12.9		13	8	20	53.9	8	19	39.7
	27	353	17	45.8	1	14	12.4		14	7	53	17.8	8	24	06.7
	28	354	09	08.9	1	22	20.9		15	7	23	45.5	8	27	46.4
	29	354	59	45.4	1	30	38.4		16	6	52	26.9	8	30	36.4
	30	355	49	33.4	+1	39	04.9		17	6	19	32.9	+8	32	34.4
	31	356	38	30.9	1	47	40.2		18	5	45	15.4	8	33	38.4
Feb.	1	357	26	35.8	1	56	24.3		19	5	09	47.4	8	33	47.1
	2	358	13	45.9	2	05	17.2		20	4	33	22.7	8	32	59.2
	3	358	59	59.0	2	14	18.7		21	3	56	15.6	8	31	14.1
	4	359	45	12.6	2	23	28.6		22	3	18	41.2	8	28	31.8
	5	0	29	24.3	+2	32	46.9		23	2	40	54.6	+8	24	52.4
	6	1	12	31.4	2	42	13.5		24	2	03	11.1	8	20	17.0
	7	1	54	31.3	2	51	48.0		25	1	25	46.0	8	14	46.7
	8	2	35	21.1	3	01	30.4		26	0	48	54.1	8	08	23.4
	9	3	14	58.1	3	11	20.3		27	0	12	49.8	8	01	09.2
	10	3	53	19.3	3	21	17.7		28	359	37	46.5	7	53	06.7
	11	4	30	21.7	+3	31	22.1	Apr.	29	359	03	57.3	+7	44	18.9
	12	5	06	02.2	3	41	33.3		30	358	31	34.0	7	34	48.7
	13	5	40	17.7	3	51	50.9		31	358	00	47.3	7	24	39.6
	14	6	13	05.0	4	02	14.5		1	357	31	47.2	7	13	55.1
	15	6	44	20.8	+4	12	43.7		2	357	04	42.2	+7	02	38.6

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GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Apr.	1	357	31	47.2	+7	13	55.1	May	17	11	26	52.1	-1	00	28.6
	2	357	04	42.2	7	02	38.6		18	12	16	40.8	1	06	25.7
	3	356	39	40.1	6	50	53.8		19	13	07	10.9	1	12	10.2
	4	356	16	47.3	6	38	44.3		20	13	58	20.8	1	17	42.1
	5	355	56	09.4	6	26	13.7		21	14	50	08.9	1	23	01.7
	6	355	37	50.6	6	13	25.4		22	15	42	33.7	1	28	09.2
	7	355	21	54.4	+6	00	22.7		23	16	35	34.0	-1	33	04.8
	8	355	08	23.3	5	47	08.7		24	17	29	08.2	1	37	48.6
	9	354	57	18.8	5	33	46.6		25	18	23	15.0	1	42	20.8
	10	354	48	41.5	5	20	19.1		26	19	17	53.2	1	46	41.7
	11	354	42	31.6	5	06	48.8		27	20	13	01.6	1	50	51.4
	12	354	38	48.1	4	53	18.1		28	21	08	38.9	1	54	49.9
	13	354	37	29.8	+4	39	49.1	June	29	22	04	44.0	-1	58	37.6
	14	354	38	34.7	4	26	23.8		30	23	01	15.9	2	02	14.6
	15	354	42	00.7	4	13	04.0		31	23	58	13.6	2	05	41.0
	16	354	47	44.7	3	59	51.3		1	24	55	36.3	2	08	56.9
	17	354	55	44.0	3	46	46.9		2	25	53	23.0	2	12	02.5
	18	355	05	55.0	3	33	52.2		3	26	51	33.1	2	14	57.9
	19	355	18	14.2	+3	21	08.2		4	27	50	05.9	-2	17	43.3
	20	355	32	37.9	3	08	35.8		5	28	49	00.6	2	20	18.9
	21	355	49	02.3	2	56	15.6		6	29	48	16.6	2	22	44.6
	22	356	07	23.5	2	44	08.5		7	30	47	53.4	2	25	00.8
	23	356	27	37.4	2	32	14.9		8	31	47	50.3	2	27	07.4
	24	356	49	40.2	2	20	35.2		9	32	48	06.8	2	29	04.7
	25	357	13	27.7	+2	09	09.7		10	33	48	42.2	-2	30	52.9
	26	357	38	56.2	1	57	58.8		11	34	49	36.1	2	32	32.0
	27	358	06	01.8	1	47	02.5		12	35	50	47.9	2	34	02.1
	28	358	34	40.7	1	36	21.1		13	36	52	17.2	2	35	23.5
	29	359	04	49.3	1	25	54.6		14	37	54	03.4	2	36	36.3
	30	359	36	24.0	1	15	43.0		15	38	56	05.9	2	37	40.6
May	1	0	09	21.4	+1	05	46.4		16	39	58	24.4	-2	38	36.5
	2	0	43	38.4	0	56	04.7		17	41	00	58.4	2	39	24.3
	3	1	19	11.8	0	46	37.9		18	42	03	47.3	2	40	04.0
	4	1	55	58.7	0	37	26.0		19	43	06	50.9	2	40	35.9
	5	2	33	56.3	0	28	28.9		20	44	10	08.5	2	41	00.0
	6	3	13	01.9	0	19	46.4		21	45	13	39.9	2	41	16.5
	7	3	53	13.1	+0	11	18.5		22	46	17	24.6	-2	41	25.5
	8	4	34	27.3	+0	03	05.1		23	47	21	22.1	2	41	27.3
	9	5	16	42.2	-0	04	54.0		24	48	25	32.1	2	41	21.8
	10	5	59	55.5	0	12	38.9		25	49	29	54.0	2	41	09.4
	11	6	44	05.1	0	20	09.7		26	50	34	27.6	2	40	50.0
	12	7	29	08.9	0	27	26.6		27	51	39	12.3	2	40	23.9
	13	8	15	04.8	-0	34	29.8	July	28	52	44	07.8	-2	39	51.1
	14	9	01	51.0	0	41	19.4		29	53	49	13.9	2	39	11.8
	15	9	49	25.4	0	47	55.7		30	54	54	30.3	2	38	26.1
	16	10	37	46.4	0	54	18.7		1	55	59	56.8	2	37	34.1
	17	11	26	52.1	-1	00	28.6		2	57	05	33.2	-2	36	36.0

VENUS, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
July	1	55	59	56.8	-2	37	34.1	Aug.	16	108	30	07.0	-0	43	16.5
	2	57	05	33.2	2	36	36.0		17	109	40	59.1	0	40	01.0
	3	58	11	19.3	2	35	31.8		18	110	51	56.5	0	36	45.5
	4	59	17	14.9	2	34	21.7		19	112	02	58.9	0	33	30.4
	5	60	23	19.9	2	33	05.9		20	113	14	06.2	0	30	15.6
	6	61	29	34.2	2	31	44.4		21	114	25	18.3	0	27	01.3
	7	62	35	57.5	-2	30	17.4		22	115	36	35.1	-0	23	47.7
	8	63	42	29.8	2	28	45.1		23	116	47	56.6	0	20	34.8
	9	64	49	10.9	2	27	07.5		24	117	59	22.5	0	17	22.7
	10	65	56	00.6	2	25	24.7		25	119	10	52.9	0	14	11.6
	11	67	02	58.7	2	23	37.1		26	120	22	27.7	0	11	01.6
	12	68	10	05.3	2	21	44.5		27	121	34	06.9	0	07	52.7
	13	69	17	20.0	-2	19	47.3	Sept.	28	122	45	50.5	-0	04	45.1
	14	70	24	42.9	2	17	45.6		29	123	57	38.3	-0	01	38.9
	15	71	32	13.7	2	15	39.5		30	125	09	30.5	+0	01	25.8
	16	72	39	52.3	2	13	29.0		31	126	21	26.9	0	04	28.9
	17	73	47	38.7	2	11	14.5		1	127	33	27.6	0	07	30.2
	18	74	55	32.7	2	08	56.1		2	128	45	32.4	0	10	29.8
	19	76	03	34.1	-2	06	33.7		3	129	57	41.4	+0	13	27.4
	20	77	11	42.8	2	04	07.8		4	131	09	54.5	0	16	23.0
	21	78	19	58.7	2	01	38.2		5	132	22	11.7	0	19	16.5
	22	79	28	21.5	1	59	05.3		6	133	34	32.9	0	22	07.8
	23	80	36	51.1	1	56	29.1		7	134	46	58.3	0	24	56.7
	24	81	45	27.2	1	53	49.8		8	135	59	27.7	0	27	43.2
	25	82	54	09.6	-1	51	07.4		9	137	12	01.2	+0	30	27.1
	26	84	02	58.3	1	48	22.2		10	138	24	38.9	0	33	08.4
	27	85	11	53.0	1	45	34.2		11	139	37	20.7	0	35	47.0
	28	86	20	53.7	1	42	43.6		12	140	50	06.7	0	38	22.8
	29	87	30	00.4	1	39	50.5		13	142	02	56.8	0	40	55.7
	30	88	39	12.9	1	36	55.1		14	143	15	50.9	0	43	25.6
	31	89	48	31.3	-1	33	57.4		15	144	28	49.0	+0	45	52.4
	1	90	57	55.4	1	30	57.6		16	145	41	51.0	0	48	16.1
	2	92	07	25.3	1	27	55.8		17	146	54	56.7	0	50	36.6
	3	93	17	00.9	1	24	52.1		18	148	08	06.1	0	52	53.8
	4	94	26	42.2	1	21	46.7		19	149	21	19.1	0	55	07.6
	5	95	36	29.0	1	18	39.8		20	150	34	35.5	0	57	18.0
Aug.	6	96	46	21.5	-1	15	31.3		21	151	47	55.3	+0	59	25.0
	7	97	56	19.5	1	12	21.6		22	153	01	18.5	1	01	28.4
	8	99	06	23.0	1	09	10.6		23	154	14	45.0	1	03	28.2
	9	100	16	32.0	1	05	58.7		24	155	28	14.7	1	05	24.3
	10	101	26	46.4	1	02	45.7		25	156	41	47.6	1	07	16.7
	11	102	37	06.3	0	59	32.0		26	157	55	23.6	1	09	05.4
	12	103	47	31.6	-0	56	17.7		27	159	09	02.7	+1	10	50.3
	13	104	58	02.4	0	53	02.8		28	160	22	44.9	1	12	31.3
	14	106	08	38.5	0	49	47.6		29	161	36	29.9	1	14	08.4
	15	107	19	20.1	0	46	32.1		30	162	50	17.9	1	15	41.6
	16	108	30	07.0	-0	43	16.5		1	164	04	08.6	+1	17	10.7
								Oct.							

VENUS, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Oct.	1	164	04	08.6	+1	17	10.7	Nov.	16	221	21	04.8	+1	10	51.8
	2	165	18	02.2	1	18	35.9		17	222	36	23.0	1	09	15.1
	3	166	31	58.5	1	19	56.9		18	223	51	42.2	1	07	35.6
	4	167	45	57.5	1	21	13.9		19	225	07	02.2	1	05	53.2
	5	168	59	59.1	1	22	26.7		20	226	22	23.1	1	04	08.1
	6	170	14	03.5	1	23	35.3		21	227	37	44.7	1	02	20.4
	7	171	28	10.5	+1	24	39.7		22	228	53	07.0	+1	00	30.1
	8	172	42	20.4	1	25	39.9		23	230	08	29.8	0	58	37.3
	9	173	56	33.0	1	26	35.8		24	231	23	53.3	0	56	42.1
	10	175	10	48.3	1	27	27.4		25	232	39	17.2	0	54	44.7
	11	176	25	06.5	1	28	14.7		26	233	54	41.5	0	52	45.0
	12	177	39	27.3	1	28	57.7		27	235	10	06.2	0	50	43.2
	13	178	53	50.6	+1	29	36.4		28	236	25	31.2	+0	48	39.3
	14	180	08	16.5	1	30	10.8		29	237	40	56.5	0	46	33.5
	15	181	22	44.8	1	30	40.9		30	238	56	22.1	0	44	25.8
	16	182	37	15.5	1	31	06.6	Dec.	1	240	11	47.9	0	42	16.3
	17	183	51	48.3	1	31	28.0		2	241	27	14.1	0	40	05.1
	18	185	06	23.4	1	31	45.2		3	242	42	40.7	0	37	52.4
	19	186	21	00.6	+1	31	58.0		4	243	58	07.7	+0	35	38.1
	20	187	35	39.9	1	32	06.6		5	245	13	35.0	0	33	22.5
	21	188	50	21.2	1	32	10.9		6	246	29	02.8	0	31	05.5
	22	190	05	04.4	1	32	11.0		7	247	44	31.0	0	28	47.3
	23	191	19	49.5	1	32	06.8		8	248	59	59.5	0	26	28.0
	24	192	34	36.4	1	31	58.5		9	250	15	28.3	0	24	07.7
	25	193	49	25.0	+1	31	46.0		10	251	30	57.5	+0	21	46.5
	26	195	04	15.3	1	31	29.4		11	252	46	27.1	0	19	24.5
	27	196	19	07.2	1	31	08.6		12	254	01	56.9	0	17	01.9
	28	197	34	00.5	1	30	43.8		13	255	17	27.2	0	14	38.6
	29	198	48	55.4	1	30	14.9		14	256	32	57.7	0	12	14.9
	30	200	03	51.6	1	29	42.0		15	257	48	28.5	0	09	50.8
Nov.	31	201	18	49.1	+1	29	05.1		16	259	03	59.7	+0	07	26.4
	1	202	33	47.9	1	28	24.3		17	260	19	31.1	0	05	01.9
	2	203	48	48.0	1	27	39.6		18	261	35	02.7	0	02	37.3
	3	205	03	49.4	1	26	51.0		19	262	50	34.4	+0	00	12.7
	4	206	18	52.1	1	25	58.5		20	264	06	06.3	-0	02	11.7
	5	207	33	56.1	1	25	02.4		21	265	21	38.2	0	04	35.9
	6	208	49	01.5	+1	24	02.4		22	266	37	10.1	-0	06	59.7
	7	210	04	08.3	1	22	58.8		23	267	52	42.0	0	09	23.1
	8	211	19	16.5	1	21	51.6		24	269	08	13.7	0	11	46.0
	9	212	34	26.0	1	20	40.9		25	270	23	45.2	0	14	08.2
	10	213	49	36.7	1	19	26.6		26	271	39	16.5	0	16	29.7
	11	215	04	48.6	1	18	09.0		27	272	54	47.6	0	18	50.4
	12	216	20	01.7	+1	16	47.9		28	274	10	18.4	-0	21	10.1
	13	217	35	15.9	1	15	23.6		29	275	25	49.1	0	23	28.9
	14	218	50	31.2	1	13	56.1		30	276	41	19.5	0	25	46.5
	15	220	05	47.5	1	12	25.5		31	277	56	49.7	0	28	03.0
	16	221	21	04.8	+1	10	51.8		32	279	12	19.7	-0	30	18.2

VENUS, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
Jan.	0	21	57	30.74	-14	01	14.5	0.758 183	11.60	11.00	15	17	56
	1	22	01	34.57	13	35	12.3	0.750 818	11.71	11.11	15	18	02
	2	22	05	36.22	13	08	54.7	0.743 445	11.83	11.22	15	18	06
	3	22	09	35.69	12	42	22.7	0.736 064	11.95	11.33	15	18	07
	4	22	13	32.94	12	15	37.2	0.728 677	12.07	11.45	15	18	07
	5	22	17	27.96	11	48	39.0	0.721 282	12.19	11.56	15	18	04
	6	22	21	20.74	-11	21	29.0	0.713 882	12.32	11.68	15	17	58
	7	22	25	11.25	10	54	08.2	0.706 476	12.45	11.81	15	17	51
	8	22	28	59.48	10	26	37.3	0.699 065	12.58	11.93	15	17	41
	9	22	32	45.40	9	58	57.3	0.691 651	12.71	12.06	15	17	29
	10	22	36	29.00	9	31	09.1	0.684 234	12.85	12.19	15	17	15
	11	22	40	10.24	9	03	13.6	0.676 816	12.99	12.32	15	16	58
	12	22	43	49.11	-8	35	11.6	0.669 397	13.14	12.46	15	16	39
	13	22	47	25.58	8	07	04.0	0.661 979	13.28	12.60	15	16	17
	14	22	50	59.62	7	38	51.8	0.654 562	13.44	12.74	15	15	53
	15	22	54	31.20	7	10	35.6	0.647 149	13.59	12.89	15	15	26
	16	22	58	00.29	6	42	16.5	0.639 739	13.75	13.04	15	14	57
	17	23	01	26.87	6	13	55.2	0.632 333	13.91	13.19	15	14	26
	18	23	04	50.90	-5	45	32.5	0.624 934	14.07	13.35	15	13	52
	19	23	08	12.35	5	17	09.4	0.617 542	14.24	13.51	15	13	15
	20	23	11	31.18	4	48	46.6	0.610 157	14.41	13.67	15	12	35
	21	23	14	47.33	4	20	25.1	0.602 782	14.59	13.84	15	11	53
	22	23	18	00.78	3	52	05.7	0.595 416	14.77	14.01	15	11	09
	23	23	21	11.46	3	23	49.2	0.588 061	14.95	14.18	15	10	21
	24	23	24	19.32	-2	55	36.6	0.580 718	15.14	14.36	15	09	30
	25	23	27	24.30	2	27	28.9	0.573 389	15.34	14.55	15	08	37
	26	23	30	26.33	1	59	26.9	0.566 074	15.54	14.73	15	07	41
	27	23	33	25.33	1	31	31.5	0.558 774	15.74	14.93	15	06	41
	28	23	36	21.23	1	03	43.9	0.551 491	15.95	15.12	15	05	39
	29	23	39	13.93	0	36	04.9	0.544 226	16.16	15.32	15	04	33
30	23	42	03.35	-0	08	35.7	0.536 981	16.38	15.53	15	03	24	
31	23	44	49.38	+0	18	42.7	0.529 756	16.60	15.74	15	02	11	
Feb.	1	23	47	31.92	0	45	49.1	0.522 555	16.83	15.96	15	00	55
	2	23	50	10.84	1	12	42.4	0.515 377	17.06	16.18	14	59	35
	3	23	52	46.02	1	39	21.5	0.508 226	17.30	16.41	14	58	11
	4	23	55	17.35	2	05	45.0	0.501 103	17.55	16.64	14	56	43
	5	23	57	44.66	+2	31	51.8	0.494 012	17.80	16.88	14	55	12
	6	0	00	07.84	2	57	40.5	0.486 954	18.06	17.13	14	53	36
	7	0	02	26.71	3	23	09.9	0.479 932	18.32	17.38	14	51	56
	8	0	04	41.13	3	48	18.4	0.472 950	18.59	17.63	14	50	11
	9	0	06	50.93	4	13	04.8	0.466 011	18.87	17.90	14	48	21
	10	0	08	55.95	4	37	27.5	0.459 117	19.15	18.17	14	46	27
	11	0	10	56.00	+5	01	25.1	0.452 273	19.44	18.44	14	44	27
	12	0	12	50.91	5	24	56.0	0.445 482	19.74	18.72	14	42	23
	13	0	14	40.49	5	47	58.8	0.438 747	20.04	19.01	14	40	12
	14	0	16	24.56	6	10	31.7	0.432 072	20.35	19.30	14	37	57
	15	0	18	02.93	+6	32	33.0	0.425 462	20.67	19.60	14	35	35

VENUS, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"		h	m	s
Feb.	15	0	18	02.93	+6	32	33.0	0.425 462	20.67	19.60	14	35	35
	16	0	19	35.39	6	54	01.1	0.418 921	20.99	19.91	14	33	08
	17	0	21	01.75	7	14	54.0	0.412 452	21.32	20.22	14	30	34
	18	0	22	21.79	7	35	09.9	0.406 061	21.66	20.54	14	27	54
	19	0	23	35.31	7	54	46.8	0.399 752	22.00	20.86	14	25	07
	20	0	24	42.09	8	13	42.5	0.393 529	22.35	21.19	14	22	13
	21	0	25	41.92	+8	31	54.9	0.387 398	22.70	21.53	14	19	13
	22	0	26	34.59	8	49	21.7	0.381 365	23.06	21.87	14	16	05
	23	0	27	19.88	9	06	00.6	0.375 434	23.42	22.21	14	12	50
	24	0	27	57.59	9	21	49.0	0.369 611	23.79	22.56	14	09	27
	25	0	28	27.51	9	36	44.3	0.363 903	24.17	22.92	14	05	56
	26	0	28	49.46	9	50	44.0	0.358 314	24.54	23.28	14	02	17
	27	0	29	03.23	+10	03	45.2	0.352 853	24.92	23.64	13	58	30
	28	0	29	08.68	10	15	45.0	0.347 526	25.31	24.00	13	54	35
	1	0	29	05.65	10	26	40.6	0.342 339	25.69	24.36	13	50	31
	2	0	28	54.00	10	36	29.0	0.337 300	26.07	24.73	13	46	18
	3	0	28	33.64	10	45	07.1	0.332 417	26.46	25.09	13	41	57
	4	0	28	04.50	10	52	32.0	0.327 698	26.84	25.45	13	37	27
	5	0	27	26.55	+10	58	40.6	0.323 152	27.21	25.81	13	32	49
	6	0	26	39.81	11	03	30.3	0.318 787	27.59	26.16	13	28	02
	7	0	25	44.35	11	06	58.2	0.314 612	27.95	26.51	13	23	06
	8	0	24	40.30	11	09	02.0	0.310 637	28.31	26.85	13	18	02
	9	0	23	27.84	11	09	39.4	0.306 870	28.66	27.18	13	12	49
	10	0	22	07.23	11	08	48.6	0.303 321	28.99	27.50	13	07	29
	11	0	20	38.81	+11	06	28.3	0.299 999	29.31	27.80	13	02	01
	12	0	19	02.97	11	02	37.4	0.296 913	29.62	28.09	12	56	26
	13	0	17	20.19	10	57	15.6	0.294 071	29.90	28.36	12	50	45
	14	0	15	31.01	10	50	23.2	0.291 482	30.17	28.61	12	44	57
	15	0	13	36.06	10	42	00.9	0.289 153	30.41	28.84	12	39	04
	16	0	11	36.01	10	32	10.5	0.287 092	30.63	29.05	12	33	07
	17	0	09	31.61	+10	20	54.1	0.285 305	30.82	29.23	12	27	05
	18	0	07	23.65	10	08	15.0	0.283 799	30.99	29.39	12	21	01
	19	0	05	12.98	9	54	16.7	0.282 578	31.12	29.51	12	14	54
	20	0	03	00.48	9	39	04.0	0.281 646	31.22	29.61	12	08	46
	21	0	00	47.03	9	22	42.0	0.281 008	31.30	29.68	6	08	54
	22	23	58	33.56	9	05	16.6	0.280 665	31.33	29.72	17	56	29
	23	23	56	20.98	+8	46	54.3	0.280 619	31.34	29.72	11	50	23
	24	23	54	10.19	8	27	41.9	0.280 870	31.31	29.69	11	44	18
	25	23	52	02.07	8	07	46.8	0.281 418	31.25	29.64	11	38	17
	26	23	49	57.46	7	47	16.6	0.282 261	31.16	29.55	11	32	19
	27	23	47	57.16	7	26	19.0	0.283 397	31.03	29.43	11	26	26
	28	23	46	01.92	7	05	01.8	0.284 822	30.88	29.28	11	20	38
	29	23	44	12.42	+6	43	32.7	0.286 532	30.69	29.11	11	14	56
	30	23	42	29.30	6	21	59.3	0.288 523	30.48	28.91	11	09	21
	31	23	40	53.11	6	00	28.8	0.290 789	30.24	28.68	11	03	53
	1	23	39	24.33	5	39	08.4	0.293 324	29.98	28.43	10	58	32
	2	23	38	03.41	+5	18	04.6	0.296 122	29.70	28.16	10	53	20

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Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Apr.	1	23	39	24.33	+5	39	08.4	0.293 324	29.98	28.43	10	58	32
	2	23	38	03.41	5	18	04.6	0.296 122	29.70	28.16	10	53	20
	3	23	36	50.70	4	57	23.7	0.299 177	29.39	27.88	10	48	15
	4	23	35	46.49	4	37	11.5	0.302 480	29.07	27.57	10	43	19
	5	23	34	51.02	4	17	33.3	0.306 025	28.74	27.25	10	38	32
	6	23	34	04.47	3	58	34.0	0.309 804	28.39	26.92	10	33	54
	7	23	33	26.97	+3	40	17.9	0.313 809	28.02	26.58	10	29	25
	8	23	32	58.57	3	22	48.8	0.318 032	27.65	26.22	10	25	05
	9	23	32	39.30	3	06	10.2	0.322 464	27.27	25.86	10	20	53
	10	23	32	29.13	2	50	24.6	0.327 096	26.89	25.50	10	16	51
	11	23	32	28.00	2	35	34.7	0.331 922	26.49	25.13	10	12	58
	12	23	32	35.81	2	21	42.1	0.336 932	26.10	24.75	10	09	14
	13	23	32	52.42	+2	08	48.4	0.342 117	25.71	24.38	10	05	38
	14	23	33	17.68	1	56	54.8	0.347 471	25.31	24.00	10	02	11
	15	23	33	51.39	1	46	01.8	0.352 984	24.91	23.63	9	58	52
	16	23	34	33.36	1	36	10.0	0.358 650	24.52	23.25	9	55	41
	17	23	35	23.36	1	27	19.3	0.364 460	24.13	22.88	9	52	38
	18	23	36	21.17	1	19	29.8	0.370 408	23.74	22.52	9	49	43
	19	23	37	26.54	+1	12	40.9	0.376 486	23.36	22.15	9	46	55
	20	23	38	39.23	1	06	52.2	0.382 687	22.98	21.79	9	44	14
	21	23	39	58.97	1	02	02.7	0.389 004	22.61	21.44	9	41	41
	22	23	41	25.52	0	58	11.8	0.395 432	22.24	21.09	9	39	13
	23	23	42	58.62	0	55	18.2	0.401 964	21.88	20.75	9	36	53
	24	23	44	38.02	0	53	20.8	0.408 595	21.52	20.41	9	34	38
	25	23	46	23.46	+0	52	18.5	0.415 319	21.17	20.08	9	32	30
	26	23	48	14.69	0	52	09.8	0.422 130	20.83	19.76	9	30	27
	27	23	50	11.48	0	52	53.6	0.429 025	20.50	19.44	9	28	29
	28	23	52	13.60	0	54	28.2	0.435 999	20.17	19.13	9	26	37
	29	23	54	20.81	0	56	52.5	0.443 047	19.85	18.82	9	24	50
	30	23	56	32.91	1	00	04.9	0.450 166	19.54	18.53	9	23	07
May	1	23	58	49.68	+1	04	04.0	0.457 352	19.23	18.24	9	21	29
	2	0	01	10.92	1	08	48.5	0.464 602	18.93	17.95	9	19	56
	3	0	03	36.46	1	14	17.1	0.471 912	18.64	17.67	9	18	27
	4	0	06	06.11	1	20	28.3	0.479 280	18.35	17.40	9	17	01
	5	0	08	39.71	1	27	20.9	0.486 703	18.07	17.14	9	15	40
	6	0	11	17.10	1	34	53.6	0.494 177	17.80	16.88	9	14	22
	7	0	13	58.14	+1	43	05.1	0.501 700	17.53	16.62	9	13	08
	8	0	16	42.67	1	51	54.2	0.509 269	17.27	16.38	9	11	58
	9	0	19	30.58	2	01	19.5	0.516 881	17.01	16.14	9	10	50
	10	0	22	21.71	2	11	19.9	0.524 534	16.77	15.90	9	09	46
	11	0	25	15.97	2	21	54.0	0.532 225	16.52	15.67	9	08	45
	12	0	28	13.23	2	33	00.8	0.539 951	16.29	15.45	9	07	47
	13	0	31	13.37	+2	44	38.9	0.547 711	16.06	15.23	9	06	51
	14	0	34	16.31	2	56	47.1	0.555 502	15.83	15.01	9	05	59
	15	0	37	21.93	3	09	24.3	0.563 322	15.61	14.81	9	05	09
	16	0	40	30.14	3	22	29.3	0.571 167	15.40	14.60	9	04	22
	17	0	43	40.85	+3	36	00.7	0.579 038	15.19	14.40	9	03	37

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Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
May	17	0	43	40.85	+3	36	00.7	0.579 038	15.19	14.40	9	03	37
	18	0	46	53.97	3	49	57.6	0.586 930	14.98	14.21	9	02	54
	19	0	50	09.43	4	04	18.6	0.594 842	14.78	14.02	9	02	14
	20	0	53	27.14	4	19	02.7	0.602 772	14.59	13.84	9	01	36
	21	0	56	47.03	4	34	08.6	0.610 719	14.40	13.66	9	01	00
	22	1	00	09.04	4	49	35.2	0.618 680	14.21	13.48	9	00	26
	23	1	03	33.10	+5	05	21.4	0.626 654	14.03	13.31	8	59	55
	24	1	06	59.14	5	21	26.1	0.634 638	13.86	13.14	8	59	25
June	25	1	10	27.12	5	37	48.1	0.642 632	13.68	12.98	8	58	57
	26	1	13	56.97	5	54	26.4	0.650 635	13.52	12.82	8	58	31
	27	1	17	28.64	6	11	19.8	0.658 644	13.35	12.66	8	58	07
	28	1	21	02.10	6	28	27.4	0.666 660	13.19	12.51	8	57	44
	29	1	24	37.28	+6	45	48.1	0.674 680	13.03	12.36	8	57	24
	30	1	28	14.15	7	03	20.9	0.682 705	12.88	12.22	8	57	05
	31	1	31	52.69	7	21	04.8	0.690 734	12.73	12.07	8	56	47
	1	1	35	32.85	7	38	58.9	0.698 766	12.59	11.94	8	56	31
	2	1	39	14.62	7	57	02.2	0.706 799	12.44	11.80	8	56	17
	3	1	42	57.97	8	15	13.9	0.714 834	12.30	11.67	8	56	05
	4	1	46	42.89	+8	33	33.0	0.722 869	12.17	11.54	8	55	54
	5	1	50	29.37	8	51	58.6	0.730 903	12.03	11.41	8	55	44
	6	1	54	17.38	9	10	29.8	0.738 937	11.90	11.29	8	55	36
	7	1	58	06.93	9	29	05.9	0.746 968	11.77	11.17	8	55	30
	8	2	01	57.99	9	47	45.9	0.754 995	11.65	11.05	8	55	25
	9	2	05	50.57	10	06	28.9	0.763 019	11.53	10.93	8	55	21
July	10	2	09	44.65	+10	25	14.1	0.771 038	11.41	10.82	8	55	19
	11	2	13	40.22	10	44	00.6	0.779 051	11.29	10.71	8	55	19
	12	2	17	37.29	11	02	47.5	0.787 057	11.17	10.60	8	55	20
	13	2	21	35.84	11	21	34.1	0.795 055	11.06	10.49	8	55	23
	14	2	25	35.87	11	40	19.3	0.803 045	10.95	10.39	8	55	27
	15	2	29	37.37	11	59	02.5	0.811 024	10.84	10.28	8	55	32
	16	2	33	40.34	+12	17	42.6	0.818 993	10.74	10.18	8	55	39
	17	2	37	44.78	12	36	18.8	0.826 950	10.63	10.09	8	55	47
	18	2	41	50.67	12	54	50.2	0.834 894	10.53	9.99	8	55	57
	19	2	45	58.02	13	13	16.0	0.842 824	10.43	9.90	8	56	09
	20	2	50	06.82	13	31	35.4	0.850 739	10.34	9.80	8	56	21
	21	2	54	17.07	13	49	47.4	0.858 639	10.24	9.71	8	56	36
	22	2	58	28.76	+14	07	51.2	0.866 522	10.15	9.62	8	56	51
	23	3	02	41.88	14	25	46.1	0.874 388	10.06	9.54	8	57	08
	24	3	06	56.43	14	43	31.1	0.882 236	9.97	9.45	8	57	27
	25	3	11	12.40	15	01	05.4	0.890 065	9.88	9.37	8	57	47
26	3	15	29.77	15	18	28.3	0.897 876	9.79	9.29	8	58	08	
27	3	19	48.53	15	35	38.8	0.905 668	9.71	9.21	8	58	31	
28	3	24	08.69	+15	52	36.3	0.913 440	9.63	9.13	8	58	55	
29	3	28	30.23	16	09	19.9	0.921 193	9.55	9.05	8	59	21	
30	3	32	53.15	16	25	48.8	0.928 926	9.47	8.98	8	59	48	
1	3	37	17.45	16	42	02.4	0.936 639	9.39	8.90	9	00	16	
2	3	41	43.13	+16	57	59.8	0.944 331	9.31	8.83	9	00	45	

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	h	m	s	°	'	"		"	"	h	m	s	
July	1	3	37	17.45	+16	42	02.4	0.936 639	9.39	8.90	9	00	16
	2	3	41	43.13	16	57	59.8	0.944 331	9.31	8.83	9	00	45
	3	3	46	10.18	17	13	40.4	0.952 003	9.24	8.76	9	01	16
	4	3	50	38.60	17	29	03.4	0.959 653	9.16	8.69	9	01	49
	5	3	55	08.38	17	44	08.1	0.967 282	9.09	8.62	9	02	23
	6	3	59	39.53	17	58	53.7	0.974 889	9.02	8.55	9	02	58
	7	4	04	12.02	+18	13	19.6	0.982 473	8.95	8.49	9	03	34
	8	4	08	45.86	18	27	25.0	0.990 035	8.88	8.42	9	04	12
	9	4	13	21.03	18	41	09.3	0.997 573	8.82	8.36	9	04	51
	10	4	17	57.53	18	54	31.8	1.005 088	8.75	8.30	9	05	32
	11	4	22	35.34	19	07	31.7	1.012 577	8.68	8.24	9	06	13
	12	4	27	14.43	19	20	08.4	1.020 042	8.62	8.18	9	06	56
	13	4	31	54.81	+19	32	21.1	1.027 481	8.56	8.12	9	07	41
	14	4	36	36.45	19	44	09.3	1.034 894	8.50	8.06	9	08	26
	15	4	41	19.33	19	55	32.2	1.042 280	8.44	8.00	9	09	13
	16	4	46	03.43	20	06	29.2	1.049 637	8.38	7.95	9	10	01
	17	4	50	48.74	20	16	59.6	1.056 967	8.32	7.89	9	10	50
	18	4	55	35.21	20	27	02.8	1.064 266	8.26	7.84	9	11	41
	19	5	00	22.84	+20	36	38.2	1.071 536	8.21	7.78	9	12	32
	20	5	05	11.58	20	45	45.2	1.078 775	8.15	7.73	9	13	25
	21	5	10	01.40	20	54	23.3	1.085 983	8.10	7.68	9	14	19
	22	5	14	52.27	21	02	31.9	1.093 158	8.04	7.63	9	15	13
	23	5	19	44.15	21	10	10.4	1.100 302	7.99	7.58	9	16	09
	24	5	24	37.00	21	17	18.5	1.107 413	7.94	7.53	9	17	06
	25	5	29	30.76	+21	23	55.4	1.114 491	7.89	7.48	9	18	03
	26	5	34	25.42	21	30	00.9	1.121 537	7.84	7.44	9	19	02
	27	5	39	20.91	21	35	34.4	1.128 549	7.79	7.39	9	20	01
	28	5	44	17.21	21	40	35.5	1.135 529	7.74	7.34	9	21	01
	29	5	49	14.28	21	45	03.8	1.142 475	7.70	7.30	9	22	02
	30	5	54	12.07	21	48	58.9	1.149 387	7.65	7.26	9	23	04
Aug.	31	5	59	10.54	+21	52	20.5	1.156 266	7.61	7.21	9	24	06
	1	6	04	09.66	21	55	08.2	1.163 112	7.56	7.17	9	25	09
	2	6	09	09.39	21	57	21.8	1.169 924	7.52	7.13	9	26	12
	3	6	14	09.67	21	59	00.9	1.176 702	7.47	7.09	9	27	16
	4	6	19	10.47	22	00	05.4	1.183 446	7.43	7.05	9	28	21
	5	6	24	11.74	22	00	34.9	1.190 156	7.39	7.01	9	29	26
	6	6	29	13.43	+22	00	29.2	1.196 831	7.35	6.97	9	30	31
	7	6	34	15.51	21	59	48.2	1.203 471	7.31	6.93	9	31	37
	8	6	39	17.92	21	58	31.6	1.210 076	7.27	6.89	9	32	43
	9	6	44	20.62	21	56	39.4	1.216 646	7.23	6.85	9	33	49
	10	6	49	23.56	21	54	11.3	1.223 180	7.19	6.82	9	34	55
	11	6	54	26.71	21	51	07.3	1.229 678	7.15	6.78	9	36	02
	12	6	59	30.00	+21	47	27.2	1.236 139	7.11	6.75	9	37	09
	13	7	04	33.41	21	43	11.1	1.242 563	7.08	6.71	9	38	16
	14	7	09	36.88	21	38	18.8	1.248 948	7.04	6.68	9	39	23
	15	7	14	40.37	21	32	50.4	1.255 295	7.01	6.64	9	40	30
16	7	19	43.84	+21	26	45.9	1.261 603	6.97	6.61	9	41	37	

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RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
Aug.	16	7	19	43.84	+21	26	45.9	1.261 603	6.97	6.61	9	41	37
	17	7	24	47.24	21	20	05.4	1.267 872	6.94	6.58	9	42	44
	18	7	29	50.52	21	12	49.0	1.274 099	6.90	6.55	9	43	50
	19	7	34	53.63	21	04	56.8	1.280 287	6.87	6.51	9	44	57
	20	7	39	56.53	20	56	29.0	1.286 433	6.84	6.48	9	46	03
	21	7	44	59.16	20	47	25.8	1.292 537	6.80	6.45	9	47	09
	22	7	50	01.48	+20	37	47.3	1.298 600	6.77	6.42	9	48	15
	23	7	55	03.46	20	27	33.8	1.304 622	6.74	6.39	9	49	20
	24	8	00	05.04	20	16	45.6	1.310 601	6.71	6.36	9	50	25
	25	8	05	06.21	20	05	22.8	1.316 538	6.68	6.33	9	51	30
	26	8	10	06.91	19	53	25.8	1.322 434	6.65	6.31	9	52	34
	27	8	15	07.12	19	40	54.9	1.328 288	6.62	6.28	9	53	37
	28	8	20	06.81	+19	27	50.5	1.334 099	6.59	6.25	9	54	40
	29	8	25	05.96	19	14	12.8	1.339 869	6.56	6.22	9	55	42
Sept.	30	8	30	04.53	19	00	02.4	1.345 597	6.54	6.20	9	56	44
	31	8	35	02.50	18	45	19.5	1.351 283	6.51	6.17	9	57	46
	1	8	39	59.85	18	30	04.6	1.356 927	6.48	6.15	9	58	46
	2	8	44	56.55	18	14	18.2	1.362 529	6.45	6.12	9	59	46
	3	8	49	52.60	+17	58	00.6	1.368 090	6.43	6.10	10	00	45
	4	8	54	47.97	17	41	12.3	1.373 609	6.40	6.07	10	01	44
	5	8	59	42.64	17	23	53.8	1.379 085	6.38	6.05	10	02	42
	6	9	04	36.61	17	06	05.6	1.384 520	6.35	6.02	10	03	39
	7	9	09	29.87	16	47	48.1	1.389 912	6.33	6.00	10	04	35
	8	9	14	22.40	16	29	01.9	1.395 263	6.30	5.98	10	05	31
	9	9	19	14.21	+16	09	47.3	1.400 570	6.28	5.95	10	06	26
	10	9	24	05.29	15	50	05.0	1.405 835	6.26	5.93	10	07	20
	11	9	28	55.65	15	29	55.5	1.411 056	6.23	5.91	10	08	14
	12	9	33	45.28	15	09	19.3	1.416 233	6.21	5.89	10	09	07
13	9	38	34.19	14	48	17.0	1.421 366	6.19	5.87	10	09	59	
14	9	43	22.37	14	26	49.3	1.426 454	6.17	5.85	10	10	50	
15	9	48	09.83	+14	04	56.6	1.431 497	6.14	5.83	10	11	41	
16	9	52	56.56	13	42	39.7	1.436 494	6.12	5.81	10	12	31	
17	9	57	42.57	13	19	59.1	1.441 445	6.10	5.79	10	13	20	
18	10	02	27.87	12	56	55.6	1.446 350	6.08	5.77	10	14	08	
19	10	07	12.46	12	33	29.7	1.451 208	6.06	5.75	10	14	56	
20	10	11	56.35	12	09	42.2	1.456 020	6.04	5.73	10	15	43	
21	10	16	39.55	+11	45	33.6	1.460 785	6.02	5.71	10	16	29	
22	10	21	22.08	11	21	04.6	1.465 503	6.00	5.69	10	17	15	
23	10	26	03.95	10	56	15.9	1.470 175	5.98	5.67	10	18	00	
24	10	30	45.18	10	31	08.1	1.474 800	5.96	5.66	10	18	45	
25	10	35	25.80	10	05	42.0	1.479 379	5.94	5.64	10	19	28	
26	10	40	05.81	9	39	58.2	1.483 911	5.93	5.62	10	20	12	
27	10	44	45.25	+9	13	57.4	1.488 397	5.91	5.60	10	20	54	
28	10	49	24.12	8	47	40.3	1.492 837	5.89	5.59	10	21	36	
29	10	54	02.47	8	21	07.5	1.497 230	5.87	5.57	10	22	18	
30	10	58	40.31	7	54	19.8	1.501 578	5.86	5.55	10	22	59	
Oct.	1	11	03	17.67	+7	27	17.8	1.505 881	5.84	5.54	10	23	40

VENUS, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
		h	m	s	°	'	"		"		h	m	s
Oct.	1	11	03	17.67	+7	27	17.8	1.505 881	5.84	5.54	10	23	40
	2	11	07	54.57	7	00	02.3	1.510 138	5.82	5.52	10	24	20
	3	11	12	31.04	6	32	33.9	1.514 350	5.81	5.51	10	25	00
	4	11	17	07.12	6	04	53.3	1.518 516	5.79	5.49	10	25	39
	5	11	21	42.84	5	37	01.2	1.522 638	5.78	5.48	10	26	18
	6	11	26	18.23	5	08	58.3	1.526 715	5.76	5.46	10	26	57
	7	11	30	53.32	+4	40	45.2	1.530 747	5.75	5.45	10	27	35
	8	11	35	28.16	4	12	22.6	1.534 734	5.73	5.43	10	28	13
	9	11	40	02.78	3	43	51.2	1.538 676	5.72	5.42	10	28	51
	10	11	44	37.22	3	15	11.7	1.542 572	5.70	5.41	10	29	29
	11	11	49	11.52	2	46	24.8	1.546 423	5.69	5.39	10	30	07
	12	11	53	45.70	2	17	31.2	1.550 228	5.67	5.38	10	30	45
	13	11	58	19.81	+1	48	31.6	1.553 987	5.66	5.37	10	31	22
	14	12	02	53.88	1	19	26.8	1.557 698	5.65	5.35	10	32	00
	15	12	07	27.93	0	50	17.5	1.561 363	5.63	5.34	10	32	37
	16	12	12	02.01	+0	21	04.5	1.564 981	5.62	5.33	10	33	15
	17	12	16	36.16	-0	08	11.5	1.568 551	5.61	5.32	10	33	52
	18	12	21	10.40	0	37	29.7	1.572 074	5.59	5.31	10	34	30
	19	12	25	44.77	-1	06	49.5	1.575 550	5.58	5.29	10	35	08
	20	12	30	19.32	1	36	09.9	1.578 978	5.57	5.28	10	35	46
	21	12	34	54.08	2	05	30.4	1.582 358	5.56	5.27	10	36	24
	22	12	39	29.09	2	34	50.1	1.585 692	5.55	5.26	10	37	03
	23	12	44	04.38	3	04	08.3	1.588 978	5.53	5.25	10	37	42
	24	12	48	40.00	3	33	24.3	1.592 217	5.52	5.24	10	38	21
	25	12	53	15.97	-4	02	37.2	1.595 409	5.51	5.23	10	39	01
	26	12	57	52.34	4	31	46.3	1.598 555	5.50	5.22	10	39	41
	27	13	02	29.14	5	00	50.9	1.601 654	5.49	5.21	10	40	21
	28	13	07	06.40	5	29	50.2	1.604 707	5.48	5.20	10	41	02
	29	13	11	44.17	5	58	43.4	1.607 715	5.47	5.19	10	41	44
	30	13	16	22.48	6	27	29.7	1.610 677	5.46	5.18	10	42	26
Nov.	31	13	21	01.36	-6	56	08.4	1.613 593	5.45	5.17	10	43	08
	1	13	25	40.86	7	24	38.7	1.616 465	5.44	5.16	10	43	52
	2	13	30	21.01	7	52	59.8	1.619 293	5.43	5.15	10	44	35
	3	13	35	01.84	8	21	11.1	1.622 076	5.42	5.14	10	45	20
	4	13	39	43.41	8	49	11.6	1.624 815	5.41	5.13	10	46	05
	5	13	44	25.74	9	17	00.8	1.627 511	5.40	5.12	10	46	52
	6	13	49	08.87	-9	44	37.7	1.630 163	5.39	5.12	10	47	39
	7	13	53	52.85	10	12	01.8	1.632 771	5.39	5.11	10	48	26
	8	13	58	37.70	10	39	12.1	1.635 336	5.38	5.10	10	49	15
	9	14	03	23.45	11	06	07.9	1.637 857	5.37	5.09	10	50	05
	10	14	08	10.14	11	32	48.5	1.640 334	5.36	5.08	10	50	55
	11	14	12	57.79	11	59	12.9	1.642 766	5.35	5.08	10	51	47
	12	14	17	46.43	-12	25	20.3	1.645 155	5.35	5.07	10	52	40
	13	14	22	36.08	12	51	10.0	1.647 498	5.34	5.06	10	53	33
	14	14	27	26.77	13	16	41.2	1.649 796	5.33	5.06	10	54	28
	15	14	32	18.53	13	41	52.9	1.652 050	5.32	5.05	10	55	24
16	14	37	11.38	-14	06	44.5	1.654 259	5.32	5.04	10	56	20	

VENUS, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"		h	m	s
Nov.	16	14	37	11.38	-14	06	44.5	1.654 259	5.32	5.04	10	56	20
	17	14	42	05.33	14	31	15.0	1.656 422	5.31	5.03	10	57	18
	18	14	47	00.41	14	55	23.8	1.658 541	5.30	5.03	10	58	17
	19	14	51	56.64	15	19	09.9	1.660 615	5.30	5.02	10	59	18
	20	14	56	54.02	15	42	32.5	1.662 644	5.29	5.02	11	00	19
	21	15	01	52.57	16	05	31.0	1.664 628	5.28	5.01	11	01	22
	22	15	06	52.30	-16	28	04.4	1.666 568	5.28	5.00	11	02	25
	23	15	11	53.21	16	50	11.9	1.668 463	5.27	5.00	11	03	30
	24	15	16	55.32	17	11	52.9	1.670 315	5.26	4.99	11	04	36
	25	15	21	58.62	17	33	06.4	1.672 122	5.26	4.99	11	05	44
	26	15	27	03.12	17	53	51.6	1.673 886	5.25	4.98	11	06	52
	27	15	32	08.81	18	14	07.9	1.675 607	5.25	4.98	11	08	02
	28	15	37	15.70	-18	33	54.5	1.677 286	5.24	4.97	11	09	13
	29	15	42	23.78	18	53	10.5	1.678 921	5.24	4.97	11	10	25
Dec.	30	15	47	33.04	19	11	55.3	1.680 515	5.23	4.96	11	11	39
	1	15	52	43.47	19	30	08.1	1.682 067	5.23	4.96	11	12	53
	2	15	57	55.08	19	47	48.2	1.683 578	5.22	4.95	11	14	09
	3	16	03	07.85	20	04	54.9	1.685 048	5.22	4.95	11	15	25
	4	16	08	21.77	-20	21	27.6	1.686 478	5.21	4.95	11	16	43
	5	16	13	36.82	20	37	25.5	1.687 868	5.21	4.94	11	18	03
	6	16	18	52.98	20	52	48.1	1.689 217	5.21	4.94	11	19	23
	7	16	24	10.22	21	07	34.7	1.690 526	5.20	4.93	11	20	44
	8	16	29	28.53	21	21	44.6	1.691 794	5.20	4.93	11	22	06
	9	16	34	47.86	21	35	17.2	1.693 023	5.19	4.93	11	23	30
	10	16	40	08.19	-21	48	11.8	1.694 211	5.19	4.92	11	24	54
	11	16	45	29.49	22	00	28.0	1.695 357	5.19	4.92	11	26	19
	12	16	50	51.72	22	12	05.0	1.696 463	5.18	4.92	11	27	45
	13	16	56	14.84	22	23	02.5	1.697 528	5.18	4.91	11	29	13
	14	17	01	38.80	22	33	19.8	1.698 552	5.18	4.91	11	30	40
	15	17	07	03.57	22	42	56.5	1.699 534	5.17	4.91	11	32	09
	16	17	12	29.10	-22	51	52.1	1.700 475	5.17	4.90	11	33	38
	17	17	17	55.33	23	00	06.2	1.701 374	5.17	4.90	11	35	09
18	17	23	22.21	23	07	38.4	1.702 232	5.17	4.90	11	36	39	
19	17	28	49.69	23	14	28.4	1.703 049	5.16	4.90	11	38	11	
20	17	34	17.71	23	20	35.7	1.703 824	5.16	4.89	11	39	42	
21	17	39	46.21	23	26	00.1	1.704 558	5.16	4.89	11	41	15	
22	17	45	15.13	-23	30	41.3	1.705 251	5.16	4.89	11	42	47	
23	17	50	44.40	23	34	39.1	1.705 902	5.16	4.89	11	44	20	
24	17	56	13.96	23	37	53.2	1.706 513	5.15	4.89	11	45	53	
25	18	01	43.74	23	40	23.5	1.707 083	5.15	4.89	11	47	27	
26	18	07	13.69	23	42	09.8	1.707 612	5.15	4.88	11	49	00	
27	18	12	43.74	23	43	12.0	1.708 102	5.15	4.88	11	50	34	
28	18	18	13.82	-23	43	30.1	1.708 551	5.15	4.88	11	52	08	
29	18	23	43.88	23	43	04.0	1.708 961	5.15	4.88	11	53	41	
30	18	29	13.85	23	41	53.7	1.709 332	5.14	4.88	11	55	15	
31	18	34	43.68	23	39	59.3	1.709 665	5.14	4.88	11	56	48	
32	18	40	13.29	-23	37	20.8	1.709 959	5.14	4.88	11	58	21	

MARS, 2025
HELIOCENTRIC POSITIONS FOR 0^h TERRESTRIAL TIME
MEAN EQUINOX AND ECLIPTIC OF DATE

Date	Heliocentric Longitude				Heliocentric Latitude			Radius Vector		Date	Heliocentric Longitude				Heliocentric Latitude			Radius Vector	
		°	'	"		°	'	"				°	'	"		°	'	"	
Jan.	1	109	13	54.7	+1	35	36.1	1.612	6065	Apr.	3	150	26	09.3	+1	49	02.8	1.665	0967
	3	110	09	45.6	1	36	30.2	1.614	5142		5	151	18	36.0	1	48	43.2	1.665	3541
	5	111	05	28.8	1	37	22.8	1.616	3927		7	152	11	01.9	1	48	22.1	1.665	5718
	7	112	01	04.2	1	38	13.6	1.618	2414		9	153	03	27.0	1	47	59.5	1.665	7498
	9	112	56	32.2	1	39	02.8	1.620	0601		11	153	55	51.5	1	47	35.4	1.665	8878
	11	113	51	52.8	1	39	50.3	1.621	8482		13	154	48	15.6	1	47	09.8	1.665	9861
	13	114	47	06.2	+1	40	36.2	1.623	6054		15	155	40	39.2	+1	46	42.8	1.666	0444
	15	115	42	12.5	1	41	20.5	1.625	3313		17	156	33	02.7	1	46	14.2	1.666	0629
	17	116	37	11.9	1	42	03.1	1.627	0255		19	157	25	26.3	1	45	44.2	1.666	0415
	19	117	32	04.6	1	42	44.0	1.628	6877		21	158	17	49.9	1	45	12.7	1.665	9802
21	118	26	50.6	1	43	23.3	1.630	3174	23	159	10	13.8	1	44	39.7	1.665	8790		
23	119	21	30.2	1	44	01.0	1.631	9144	25	160	02	38.1	1	44	05.2	1.665	7380		
25	120	16	03.4	+1	44	37.0	1.633	4783	27	160	55	03.0	+1	43	29.3	1.665	5571		
27	121	10	30.5	1	45	11.4	1.635	0088	29	161	47	28.6	1	42	52.0	1.665	3364		
29	122	04	51.6	1	45	44.1	1.636	5054	May	1	162	39	55.1	1	42	13.2	1.665	0760	
31	122	59	06.8	1	46	15.2	1.637	9681		3	163	32	22.6	1	41	32.9	1.664	7759	
Feb.	2	123	53	16.3	1	46	44.6	1.639		3963	5	164	24	51.3	1	40	51.2	1.664	4362
	4	124	47	20.2	1	47	12.5	1.640		7899	7	165	17	21.3	1	40	08.1	1.664	0568
	6	125	41	18.8	+1	47	38.6	1.642		1485	9	166	09	52.7	+1	39	23.6	1.663	6379
	8	126	35	12.0	1	48	03.2	1.643		4718	11	167	02	25.8	1	38	37.7	1.663	1796
	10	127	29	00.2	1	48	26.1	1.644		7597	13	167	55	00.7	1	37	50.3	1.662	6819
	12	128	22	43.4	1	48	47.4	1.646		0118	15	168	47	37.5	1	37	01.6	1.662	1450
	14	129	16	21.7	1	49	07.1	1.647		2279	17	169	40	16.3	1	36	11.4	1.661	5689
	16	130	09	55.5	1	49	25.1	1.648		4077	19	170	32	57.4	1	35	19.9	1.660	9538
	18	131	03	24.7	+1	49	41.6	1.649	5510	21	171	25	40.9	+1	34	27.0	1.660	2997	
	20	131	56	49.5	1	49	56.4	1.650	6576	23	172	18	26.8	1	33	32.6	1.659	6068	
22	132	50	10.1	1	50	09.7	1.651	7273	25	173	11	15.5	1	32	37.0	1.658	8753		
24	133	43	26.7	1	50	21.3	1.652	7598	27	174	04	06.9	1	31	39.9	1.658	1051		
26	134	36	39.4	1	50	31.3	1.653	7549	29	174	57	01.4	1	30	41.6	1.657	2966		
28	135	29	48.3	1	50	39.7	1.654	7125	31	175	49	59.0	1	29	41.8	1.656	4499		
Mar.	2	136	22	53.6	+1	50	46.6	1.655	6324	June	2	176	42	59.8	+1	28	40.7	1.655	5650
	4	137	15	55.4	1	50	51.8	1.656	5143		4	177	36	04.1	1	27	38.3	1.654	6423
	6	138	08	53.9	1	50	55.5	1.657	3582		6	178	29	11.9	1	26	34.6	1.653	6818
	8	139	01	49.3	1	50	57.5	1.658	1638		8	179	22	23.4	1	25	29.6	1.652	6838
	10	139	54	41.6	1	50	58.0	1.658	9310		10	180	15	38.9	1	24	23.2	1.651	6484
	12	140	47	31.1	1	50	57.0	1.659	6597		12	181	08	58.3	1	23	15.5	1.650	5759
	14	141	40	17.8	+1	50	54.4	1.660	3497		14	182	02	22.0	+1	22	06.5	1.649	4664
	16	142	33	02.1	1	50	50.1	1.661	0008		16	182	55	50.0	1	20	56.3	1.648	3202
	18	143	25	43.9	1	50	44.4	1.661	6131		18	183	49	22.5	1	19	44.8	1.647	1375
	20	144	18	23.4	1	50	37.1	1.662	1862		20	184	42	59.5	1	18	32.0	1.645	9185
22	145	11	00.8	1	50	28.2	1.662	7202	22	185	36	41.5	1	17	17.9	1.644	6635		
24	146	03	36.3	1	50	17.8	1.663	2150	24	186	30	28.3	1	16	02.7	1.643	3728		
26	146	56	09.9	+1	50	05.9	1.663	6703	26	187	24	20.2	+1	14	46.1	1.642	0465		
28	147	48	41.8	1	49	52.4	1.664	0863	28	188	18	17.4	1	13	28.4	1.640	6850		
30	148	41	12.3	1	49	37.4	1.664	4627	30	189	12	19.9	1	12	09.4	1.639	2886		
Apr.	1	149	33	41.4	1	49	20.8	1.664	7995	July	2	190	06	28.0	1	10	49.2	1.637	8575
	3	150	26	09.3	+1	49	02.8	1.665	0967		4	191	00	41.8	+1	09	27.8	1.636	3920

MARS, 2025
HELIOCENTRIC POSITIONS FOR 0^h TERRESTRIAL TIME
MEAN EQUINOX AND ECLIPTIC OF DATE

Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector	Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector
	°	'	"		°	'	"				°	'	"		°	'	"		
July	2	190	06	28.0	+1	10	49.2	1.637 8575	Oct.	2	233	59	38.3	-0	08	11.9	1.541 5008		
	4	191	00	41.8	1	09	27.8	1.636 3920		4	235	00	53.0	0	10	10.2	1.538 9405		
	6	191	55	01.4	1	08	05.2	1.634 8924		6	236	02	19.9	0	12	08.6	1.536 3710		
	8	192	49	27.1	1	06	41.5	1.633 3591		8	237	03	59.2	0	14	07.2	1.533 7929		
	10	193	43	58.9	1	05	16.6	1.631 7923		10	238	05	51.0	0	16	05.9	1.531 2072		
	12	194	38	37.0	1	03	50.5	1.630 1924		12	239	07	55.4	0	18	04.8	1.528 6146		
	14	195	33	21.5	+1	02	23.3	1.628 5597		14	240	10	12.6	-0	20	03.6	1.526 0160		
	16	196	28	12.7	1	00	55.0	1.626 8947		16	241	12	42.4	0	22	02.5	1.523 4121		
	18	197	23	10.6	0	59	25.5	1.625 1975		18	242	15	25.2	0	24	01.4	1.520 8039		
	20	198	18	15.4	0	57	55.0	1.623 4687		20	243	18	21.0	0	26	00.1	1.518 1921		
	22	199	13	27.3	0	56	23.3	1.621 7086		22	244	21	29.8	0	27	58.8	1.515 5777		
	24	200	08	46.4	0	54	50.6	1.619 9175		24	245	24	51.7	0	29	57.3	1.512 9616		
Aug.	26	201	04	12.9	+0	53	16.8	1.618 0959	Nov.	26	246	28	26.8	-0	31	55.6	1.510 3445		
	28	201	59	46.9	0	51	42.0	1.616 2442		28	247	32	15.3	0	33	53.6	1.507 7275		
	30	202	55	28.5	0	50	06.1	1.614 3628		30	248	36	17.0	0	35	51.4	1.505 1114		
	1	203	51	18.0	0	48	29.3	1.612 4521		1	249	40	32.3	0	37	48.8	1.502 4971		
	3	204	47	15.4	0	46	51.4	1.610 5125		3	250	45	01.0	0	39	45.8	1.499 8855		
	5	205	43	20.9	0	45	12.5	1.608 5446		5	251	49	43.2	0	41	42.4	1.497 2777		
	7	206	39	34.7	+0	43	32.7	1.606 5487		7	252	54	39.0	-0	43	38.5	1.494 6744		
	9	207	35	56.9	0	41	51.9	1.604 5253		9	253	59	48.5	0	45	34.1	1.492 0768		
	11	208	32	27.7	0	40	10.2	1.602 4749		11	255	05	11.6	0	47	29.1	1.489 4856		
	13	209	29	07.2	0	38	27.5	1.600 3980		13	256	10	48.4	0	49	23.4	1.486 9020		
	15	210	25	55.5	0	36	44.0	1.598 2951		15	257	16	39.0	0	51	17.0	1.484 3268		
	17	211	22	52.8	0	34	59.6	1.596 1667		17	258	22	43.4	0	53	10.0	1.481 7610		
Sept.	19	212	19	59.3	+0	33	14.3	1.594 0133	Dec.	19	259	29	01.6	-0	55	02.1	1.479 2057		
	21	213	17	15.0	0	31	28.2	1.591 8354		21	260	35	33.5	0	56	53.4	1.476 6617		
	23	214	14	40.2	0	29	41.3	1.589 6337		23	261	42	19.3	0	58	43.8	1.474 1302		
	25	215	12	15.0	0	27	53.6	1.587 4085		25	262	49	18.9	1	00	33.2	1.471 6121		
	27	216	09	59.5	0	26	05.1	1.585 1605		27	263	56	32.4	1	02	21.6	1.469 1083		
	29	217	07	53.8	0	24	15.8	1.582 8903		29	265	03	59.6	1	04	08.9	1.466 6200		
	31	218	05	58.2	+0	22	25.9	1.580 5984		1	266	11	40.6	-1	05	55.2	1.464 1481		
	2	219	04	12.7	0	20	35.1	1.578 2855		3	267	19	35.4	1	07	40.2	1.461 6937		
	4	220	02	37.5	0	18	43.8	1.575 9521		5	268	27	43.9	1	09	24.0	1.459 2577		
	6	221	01	12.7	0	16	51.8	1.573 5989		7	269	36	06.1	1	11	06.5	1.456 8412		
	8	221	59	58.4	0	14	59.1	1.571 2264		9	270	44	42.0	1	12	47.6	1.454 4452		
	10	222	58	54.9	0	13	05.8	1.568 8354		11	271	53	31.5	1	14	27.4	1.452 0707		
Oct.	12	223	58	02.2	+0	11	12.0	1.566 4264		13	273	02	34.5	-1	16	05.6	1.449 7187		
	14	224	57	20.4	0	09	17.6	1.564 0001		15	274	11	51.1	1	17	42.3	1.447 3904		
	16	225	56	49.7	0	07	22.7	1.561 5573		17	275	21	21.0	1	19	17.5	1.445 0866		
	18	226	56	30.2	0	05	27.3	1.559 0985		19	276	31	04.3	1	20	50.9	1.442 8084		
	20	227	56	22.1	0	03	31.3	1.556 6245		21	277	41	00.8	1	22	22.7	1.440 5569		
	22	228	56	25.4	+0	01	35.0	1.554 1359		23	278	51	10.4	1	23	52.7	1.438 3331		
	24	229	56	40.3	-0	00	21.7	1.551 6336		25	280	01	33.2	-1	25	20.9	1.436 1379		
	26	230	57	07.0	0	02	18.8	1.549 1182		27	281	12	08.8	1	26	47.2	1.433 9723		
	28	231	57	45.4	0	04	16.2	1.546 5904		29	282	22	57.2	1	28	11.5	1.431 8375		
	30	232	58	35.8	0	06	13.9	1.544 0510		31	283	33	58.3	1	29	33.8	1.429 7343		
	2	233	59	38.3	-0	08	11.9	1.541 5008		33	284	45	12.0	-1	30	54.1	1.427 6638		

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GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Jan.	0	122	14	28.0	+3	52	41.6	Feb.	15	107	32	31.2	+3	57	14.2
	1	121	55	05.5	3	54	52.6		16	107	25	53.0	3	55	36.0
	2	121	35	07.1	3	56	59.3		17	107	20	02.2	3	53	56.1
	3	121	14	35.0	3	59	01.5		18	107	14	58.7	3	52	14.7
	4	120	53	31.4	4	00	59.1		19	107	10	42.4	3	50	32.0
	5	120	31	58.7	4	02	51.7		20	107	07	12.7	3	48	48.0
	6	120	09	59.2	+4	04	39.1		21	107	04	29.6	+3	47	03.0
	7	119	47	35.6	4	06	21.1		22	107	02	32.5	3	45	17.1
	8	119	24	50.6	4	07	57.6		23	107	01	21.1	3	43	30.4
	9	119	01	46.6	4	09	28.3		24	107	00	54.9	3	41	43.1
	10	118	38	26.4	4	10	53.1		25	107	01	13.4	3	39	55.2
11	118	14	52.8	4	12	11.8	26	107	02	16.2	3	38	06.8		
12	117	51	08.3	+4	13	24.3	Mar.	27	107	04	02.6	+3	36	18.2	
13	117	27	15.7	4	14	30.5		28	107	06	32.2	3	34	29.3	
14	117	03	17.6	4	15	30.3		1	107	09	44.4	3	32	40.2	
15	116	39	17.0	4	16	23.6		2	107	13	38.5	3	30	51.1	
16	116	15	16.4	4	17	10.5		3	107	18	14.1	3	29	02.0	
17	115	51	18.7	4	17	50.7		4	107	23	30.3	3	27	13.0	
18	115	27	26.7	+4	18	24.4		5	107	29	26.5	+3	25	24.1	
19	115	03	43.1	4	18	51.6		6	107	36	01.9	3	23	35.5	
20	114	40	10.8	4	19	12.2		7	107	43	15.7	3	21	47.1	
21	114	16	52.5	4	19	26.4		8	107	51	07.0	3	19	59.0	
22	113	53	50.8	4	19	34.2		9	107	59	35.0	3	18	11.4	
23	113	31	08.5	4	19	35.6	10	108	08	38.9	3	16	24.1		
24	113	08	48.0	+4	19	30.8	Apr.	11	108	18	17.8	+3	14	37.4	
25	112	46	51.9	4	19	19.9		12	108	28	31.1	3	12	51.1	
26	112	25	22.4	4	19	03.1		13	108	39	17.9	3	11	05.4	
27	112	04	22.0	4	18	40.4		14	108	50	37.5	3	09	20.3	
28	111	43	52.8	4	18	12.0		15	109	02	29.2	3	07	35.9	
29	111	23	56.9	4	17	38.1		16	109	14	52.4	3	05	52.0	
30	111	04	36.2	+4	16	58.9		17	109	27	46.3	+3	04	08.9	
31	110	45	52.6	4	16	14.5		18	109	41	10.4	3	02	26.5	
1	110	27	47.8	4	15	25.3		19	109	55	03.9	3	00	44.7	
2	110	10	23.4	4	14	31.2		20	110	09	26.3	2	59	03.8	
3	109	53	40.8	4	13	32.7		21	110	24	17.0	2	57	23.5	
4	109	37	41.3	4	12	29.8	22	110	39	35.4	2	55	44.1		
5	109	22	26.0	+4	11	22.8	23	110	55	20.8	+2	54	05.4		
6	109	07	55.7	4	10	11.9	24	111	11	32.8	2	52	27.5		
7	108	54	11.2	4	08	57.4	25	111	28	10.8	2	50	50.4		
8	108	41	13.1	4	07	39.4	26	111	45	14.2	2	49	14.1		
9	108	29	01.8	4	06	18.1	27	112	02	42.5	2	47	38.6		
10	108	17	37.8	4	04	53.8	28	112	20	35.3	2	46	03.8		
11	108	07	01.1	+4	03	26.8	29	112	38	52.1	+2	44	29.9		
12	107	57	12.1	4	01	57.0	30	112	57	32.3	2	42	56.7		
13	107	48	10.8	4	00	24.9	31	113	16	35.6	2	41	24.4		
14	107	39	57.1	3	58	50.6	1	113	36	01.5	2	39	52.8		
15	107	32	31.2	+3	57	14.2	2	113	55	49.3	+2	38	21.9		

MARS, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Apr.	1	113	36	01.5	+2	39	52.8	May	17	133	17	31.0	+1	42	01.8
	2	113	55	49.3	2	38	21.9		18	133	47	40.4	1	40	59.5
	3	114	15	58.6	2	36	51.9		19	134	17	58.0	1	39	57.6
	4	114	36	28.8	2	35	22.6		20	134	48	23.6	1	38	56.2
	5	114	57	19.2	2	33	54.1		21	135	18	57.1	1	37	55.2
	6	115	18	29.5	2	32	26.3		22	135	49	38.5	1	36	54.5
	7	115	39	58.9	+2	30	59.3		23	136	20	27.8	+1	35	54.3
	8	116	01	47.2	2	29	33.1		24	136	51	24.8	1	34	54.5
	9	116	23	53.7	2	28	07.6		25	137	22	29.5	1	33	55.0
	10	116	46	18.1	2	26	42.8		26	137	53	41.8	1	32	55.9
	11	117	08	59.9	2	25	18.8		27	138	25	01.7	1	31	57.2
	12	117	31	58.8	2	23	55.6		28	138	56	28.9	1	30	58.8
	13	117	55	14.4	+2	22	33.0	June	29	139	28	03.4	+1	30	00.7
	14	118	18	46.2	2	21	11.3		30	139	59	44.9	1	29	03.0
	15	118	42	34.1	2	19	50.2		31	140	31	33.2	1	28	05.6
	16	119	06	37.6	2	18	29.9		1	141	03	28.2	1	27	08.6
	17	119	30	56.4	2	17	10.2		2	141	35	29.8	1	26	11.8
	18	119	55	30.3	2	15	51.3		3	142	07	37.9	1	25	15.5
	19	120	20	18.8	+2	14	33.1		4	142	39	52.3	+1	24	19.4
	20	120	45	21.7	2	13	15.5		5	143	12	12.9	1	23	23.6
	21	121	10	38.8	2	11	58.6		6	143	44	39.7	1	22	28.2
	22	121	36	09.7	2	10	42.4		7	144	17	12.6	1	21	33.1
	23	122	01	54.2	2	09	26.9		8	144	49	51.4	1	20	38.3
	24	122	27	52.1	2	08	11.9		9	145	22	36.1	1	19	43.8
	25	122	54	03.1	+2	06	57.6		10	145	55	26.7	+1	18	49.6
	26	123	20	27.1	2	05	43.9		11	146	28	23.0	1	17	55.7
	27	123	47	03.9	2	04	30.8		12	147	01	25.0	1	17	02.2
	28	124	13	53.2	2	03	18.3		13	147	34	32.6	1	16	08.9
	29	124	40	54.9	2	02	06.4		14	148	07	45.7	1	15	15.8
	30	125	08	08.6	2	00	55.0		15	148	41	04.3	1	14	23.1
May	1	125	35	34.1	+1	59	44.2		16	149	14	28.3	+1	13	30.6
	2	126	03	11.0	1	58	34.0		17	149	47	57.7	1	12	38.4
	3	126	30	59.0	1	57	24.2		18	150	21	32.5	1	11	46.5
	4	126	58	57.9	1	56	15.0		19	150	55	12.7	1	10	54.8
	5	127	27	07.3	1	55	06.4		20	151	28	58.2	1	10	03.3
	6	127	55	27.1	1	53	58.3		21	152	02	49.2	1	09	12.1
	7	128	23	57.0	+1	52	50.6		22	152	36	45.5	+1	08	21.1
	8	128	52	36.8	1	51	43.5		23	153	10	47.2	1	07	30.3
	9	129	21	26.3	1	50	36.9		24	153	44	54.3	1	06	39.7
	10	129	50	25.3	1	49	30.9		25	154	19	06.6	1	05	49.4
	11	130	19	33.6	1	48	25.3		26	154	53	24.1	1	04	59.2
	12	130	48	51.2	1	47	20.2		27	155	27	46.6	1	04	09.3
	13	131	18	17.7	+1	46	15.6	July	28	156	02	14.0	+1	03	19.5
	14	131	47	53.1	1	45	11.4		29	156	36	46.3	1	02	30.0
	15	132	17	37.3	1	44	07.8		30	157	11	23.4	1	01	40.6
	16	132	47	29.9	1	43	04.5		1	157	46	05.2	1	00	51.5
	17	133	17	31.0	+1	42	01.8		2	158	20	51.7	+1	00	02.5

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Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
July	1	157	46	05.2	+1	00	51.5	Aug.	16	185	39	35.0	+0	26	07.2
	2	158	20	51.7	1	00	02.5		17	186	17	32.5	0	25	24.9
	3	158	55	42.8	0	59	13.8		18	186	55	33.9	0	24	42.7
	4	159	30	38.6	0	58	25.3		19	187	33	39.5	0	24	00.5
	5	160	05	38.8	0	57	36.9		20	188	11	49.0	0	23	18.5
	6	160	40	43.6	0	56	48.8		21	188	50	02.4	0	22	36.5
	7	161	15	52.8	+0	56	00.8		22	189	28	19.8	+0	21	54.6
	8	161	51	06.5	0	55	13.1		23	190	06	41.0	0	21	12.8
	9	162	26	24.5	0	54	25.6		24	190	45	06.2	0	20	31.1
	10	163	01	46.9	0	53	38.2		25	191	23	35.2	0	19	49.5
	11	163	37	13.5	0	52	51.0		26	192	02	08.1	0	19	08.0
	12	164	12	44.5	0	52	04.0		27	192	40	44.8	0	18	26.6
	13	164	48	19.6	+0	51	17.2	Sept.	28	193	19	25.3	+0	17	45.3
	14	165	23	59.0	0	50	30.5		29	193	58	09.7	0	17	04.1
	15	165	59	42.6	0	49	44.0		30	194	36	57.9	0	16	23.0
	16	166	35	30.5	0	48	57.7		31	195	15	49.8	0	15	42.1
	17	167	11	22.8	0	48	11.5		1	195	54	45.6	0	15	01.2
	18	167	47	19.3	0	47	25.5		2	196	33	45.0	0	14	20.4
	19	168	23	20.3	+0	46	39.6		3	197	12	48.1	+0	13	39.7
	20	168	59	25.6	0	45	53.9		4	197	51	54.9	0	12	59.2
	21	169	35	35.4	0	45	08.2		5	198	31	05.3	0	12	18.7
	22	170	11	49.6	0	44	22.7		6	199	10	19.4	0	11	38.3
	23	170	48	08.1	0	43	37.4		7	199	49	37.1	0	10	58.0
	24	171	24	30.8	0	42	52.1		8	200	28	58.4	0	10	17.9
	25	172	00	57.8	+0	42	07.0		9	201	08	23.4	+0	09	37.8
	26	172	37	28.9	0	41	22.0		10	201	47	52.2	0	08	57.8
	27	173	14	04.1	0	40	37.2		11	202	27	24.9	0	08	17.8
	28	173	50	43.4	0	39	52.5		12	203	07	01.4	0	07	38.0
	29	174	27	26.8	0	39	07.9		13	203	46	41.8	0	06	58.2
	30	175	04	14.1	0	38	23.4		14	204	26	26.2	0	06	18.5
Aug.	31	175	41	05.5	+0	37	39.1		15	205	06	14.5	+0	05	38.9
	1	176	18	00.9	0	36	54.9		16	205	46	06.7	0	04	59.4
	2	176	55	00.2	0	36	10.8		17	206	26	02.8	0	04	19.9
	3	177	32	03.4	0	35	26.9		18	207	06	02.8	0	03	40.5
	4	178	09	10.6	0	34	43.1		19	207	46	06.6	0	03	01.2
	5	178	46	21.7	0	33	59.5		20	208	26	14.3	0	02	22.0
	6	179	23	36.5	+0	33	15.9		21	209	06	25.8	+0	01	42.9
	7	180	00	55.2	0	32	32.6		22	209	46	41.2	0	01	03.8
	8	180	38	17.7	0	31	49.3		23	210	27	00.4	+0	00	24.9
	9	181	15	44.0	0	31	06.1		24	211	07	23.5	-0	00	14.0
	10	181	53	14.0	0	30	23.1		25	211	47	50.4	0	00	52.7
	11	182	30	47.8	0	29	40.2		26	212	28	21.0	0	01	31.4
	12	183	08	25.4	+0	28	57.4	Oct.	27	213	08	55.5	-0	02	09.9
	13	183	46	06.8	0	28	14.7		28	213	49	33.7	0	02	48.4
	14	184	23	52.2	0	27	32.1		29	214	30	15.7	0	03	26.7
	15	185	01	41.6	0	26	49.6		30	215	11	01.3	0	04	05.0
	16	185	39	35.0	+0	26	07.2		1	215	51	50.6	-0	04	43.1

MARS, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Oct.	1	215	51	50.6	-0	04	43.1	Nov.	16	248	16	17.2	-0	31	59.6
	2	216	32	43.5	0	05	21.1		17	248	59	58.7	0	32	32.1
	3	217	13	40.0	0	05	59.1		18	249	43	43.8	0	33	04.4
	4	217	54	40.1	0	06	36.9		19	250	27	32.5	0	33	36.6
	5	218	35	43.8	0	07	14.6		20	251	11	24.7	0	34	08.6
	6	219	16	51.2	0	07	52.2		21	251	55	20.3	0	34	40.4
	7	219	58	02.1	-0	08	29.7		22	252	39	19.4	-0	35	12.1
	8	220	39	16.8	0	09	07.2		23	253	23	22.0	0	35	43.5
	9	221	20	35.3	0	09	44.5		24	254	07	27.8	0	36	14.8
	10	222	01	57.6	0	10	21.8		25	254	51	37.0	0	36	45.9
	11	222	43	23.7	0	10	58.9		26	255	35	49.3	0	37	16.8
	12	223	24	53.7	0	11	36.0		27	256	20	04.9	0	37	47.5
	13	224	06	27.6	-0	12	13.0		28	257	04	23.6	-0	38	18.0
	14	224	48	05.3	0	12	49.9		29	257	48	45.5	0	38	48.4
	15	225	29	46.7	0	13	26.7		30	258	33	10.5	0	39	18.5
	16	226	11	32.0	0	14	03.4	Dec.	1	259	17	38.5	0	39	48.5
	17	226	53	21.1	0	14	40.0		2	260	02	09.8	0	40	18.3
	18	227	35	14.0	0	15	16.4		3	260	46	44.2	0	40	47.8
	19	228	17	10.6	-0	15	52.8		4	261	31	21.8	-0	41	17.2
	20	228	59	11.1	0	16	29.1		5	262	16	02.6	0	41	46.4
	21	229	41	15.4	0	17	05.2		6	263	00	46.6	0	42	15.4
	22	230	23	23.5	0	17	41.3		7	263	45	33.7	0	42	44.3
	23	231	05	35.3	0	18	17.2		8	264	30	23.9	0	43	12.9
	24	231	47	50.9	0	18	53.0		9	265	15	17.3	0	43	41.3
	25	232	30	10.2	-0	19	28.6		10	266	00	13.7	-0	44	09.5
	26	233	12	33.2	0	20	04.1		11	266	45	13.2	0	44	37.4
	27	233	54	59.8	0	20	39.5		12	267	30	15.9	0	45	05.2
	28	234	37	30.0	0	21	14.8		13	268	15	21.7	0	45	32.7
	29	235	20	03.8	0	21	49.9		14	269	00	30.6	0	46	00.0
	30	236	02	41.1	0	22	24.9		15	269	45	42.5	0	46	27.1
Nov.	31	236	45	21.8	-0	22	59.8		16	270	30	57.6	-0	46	53.9
	1	237	28	06.1	0	23	34.5		17	271	16	15.6	0	47	20.5
	2	238	10	53.8	0	24	09.1		18	272	01	36.7	0	47	46.8
	3	238	53	44.9	0	24	43.6		19	272	47	00.7	0	48	12.9
	4	239	36	39.6	0	25	17.9		20	273	32	27.6	0	48	38.7
	5	240	19	37.9	0	25	52.1		21	274	17	57.3	0	49	04.2
	6	241	02	39.7	-0	26	26.2		22	275	03	29.8	-0	49	29.5
	7	241	45	45.2	0	27	00.1		23	275	49	04.9	0	49	54.6
	8	242	28	54.4	0	27	34.0		24	276	34	42.7	0	50	19.3
	9	243	12	07.2	0	28	07.7		25	277	20	23.1	0	50	43.9
	10	243	55	23.5	0	28	41.2		26	278	06	05.9	0	51	08.1
	11	244	38	43.5	0	29	14.6		27	278	51	51.3	0	51	32.1
	12	245	22	07.1	-0	29	47.9		28	279	37	39.2	-0	51	55.8
	13	246	05	34.2	0	30	21.1		29	280	23	29.5	0	52	19.2
	14	246	49	05.0	0	30	54.0		30	281	09	22.2	0	52	42.4
	15	247	32	39.3	0	31	26.9		31	281	55	17.5	0	53	05.3
	16	248	16	17.2	-0	31	59.6		32	282	41	15.2	-0	53	28.0

MARS, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Jan.	0	8	21	50.09	+23	26	07.9	0.659 288	13.34	7.10	1	41	48
	1	8	20	30.25	23	32	42.5	0.656 737	13.39	7.13	1	36	33
	2	8	19	07.68	23	39	19.0	0.654 383	13.44	7.15	1	31	15
	3	8	17	42.52	23	45	56.4	0.652 229	13.48	7.18	1	25	54
	4	8	16	14.93	23	52	33.9	0.650 279	13.52	7.20	1	20	31
	5	8	14	45.05	23	59	10.3	0.648 537	13.56	7.22	1	15	06
	6	8	13	13.05	+24	05	44.7	0.647 004	13.59	7.23	1	09	38
	7	8	11	39.11	24	12	16.2	0.645 682	13.62	7.25	1	04	09
	8	8	10	03.41	24	18	43.8	0.644 575	13.64	7.26	0	58	38
	9	8	08	26.13	24	25	06.7	0.643 684	13.66	7.27	0	53	05
	10	8	06	47.45	24	31	23.8	0.643 010	13.68	7.28	0	47	31
	11	8	05	07.56	24	37	34.5	0.642 554	13.69	7.28	0	41	56
	12	8	03	26.66	+24	43	37.9	0.642 318	13.69	7.29	0	36	20
	13	8	01	44.94	24	49	33.2	0.642 303	13.69	7.29	0	30	43
	14	8	00	02.59	24	55	19.8	0.642 510	13.69	7.28	0	25	06
	15	7	58	19.81	25	00	56.9	0.642 938	13.68	7.28	0	19	28
	16	7	56	36.80	25	06	23.9	0.643 589	13.66	7.27	0	13	49
	17	7	54	53.77	25	11	40.1	0.644 464	13.65	7.26	0	08	11
	18	7	53	10.93	+25	16	45.2	0.645 561	13.62	7.25	0	02	33
	19	7	51	28.47	25	21	38.4	0.646 881	13.59	7.23	23	51	18
	20	7	49	46.62	25	26	19.5	0.648 423	13.56	7.22	23	45	42
	21	7	48	05.57	25	30	47.9	0.650 187	13.53	7.20	23	40	07
	22	7	46	25.54	25	35	03.4	0.652 172	13.48	7.18	23	34	33
	23	7	44	46.71	25	39	05.8	0.654 377	13.44	7.15	23	29	00
	24	7	43	09.29	+25	42	54.7	0.656 800	13.39	7.13	23	23	29
	25	7	41	33.47	25	46	30.1	0.659 439	13.34	7.10	23	17	59
	26	7	39	59.43	25	49	51.8	0.662 294	13.28	7.07	23	12	32
	27	7	38	27.35	25	52	59.7	0.665 360	13.22	7.03	23	07	06
	28	7	36	57.40	25	55	54.0	0.668 637	13.15	7.00	23	01	43
	29	7	35	29.75	25	58	34.5	0.672 122	13.08	6.96	22	56	23
Feb.	30	7	34	04.54	+26	01	01.4	0.675 810	13.01	6.93	22	51	05
	31	7	32	41.94	26	03	14.8	0.679 700	12.94	6.89	22	45	49
	1	7	31	22.06	26	05	14.8	0.683 788	12.86	6.84	22	40	37
	2	7	30	05.04	26	07	01.7	0.688 069	12.78	6.80	22	35	27
	3	7	28	51.00	26	08	35.6	0.692 540	12.70	6.76	22	30	20
	4	7	27	40.03	26	09	56.7	0.697 197	12.61	6.71	22	25	17
	5	7	26	32.22	+26	11	05.5	0.702 036	12.53	6.67	22	20	17
	6	7	25	27.66	26	12	02.2	0.707 052	12.44	6.62	22	15	19
	7	7	24	26.40	26	12	47.2	0.712 241	12.35	6.57	22	10	26
	8	7	23	28.49	26	13	20.9	0.717 598	12.25	6.52	22	05	35
	9	7	22	33.97	26	13	43.6	0.723 120	12.16	6.47	22	00	48
	10	7	21	42.89	26	13	55.6	0.728 803	12.07	6.42	21	56	05
	11	7	20	55.25	+26	13	57.4	0.734 642	11.97	6.37	21	51	25
	12	7	20	11.08	26	13	49.3	0.740 633	11.87	6.32	21	46	48
	13	7	19	30.39	26	13	31.6	0.746 772	11.78	6.27	21	42	15
	14	7	18	53.19	26	13	04.7	0.753 056	11.68	6.21	21	37	45
	15	7	18	19.47	+26	12	28.8	0.759 481	11.58	6.16	21	33	19

MARS, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Feb.	15	7	18	19.47	+26	12	28.8	0.759 481	11.58	6.16	21	33	19
	16	7	17	49.24	26	11	44.4	0.766 043	11.48	6.11	21	28	56
	17	7	17	22.49	26	10	51.8	0.772 738	11.38	6.06	21	24	37
	18	7	16	59.20	26	09	51.1	0.779 563	11.28	6.00	21	20	21
	19	7	16	39.36	26	08	42.8	0.786 514	11.18	5.95	21	16	08
	20	7	16	22.96	26	07	27.0	0.793 587	11.08	5.90	21	11	59
Mar.	21	7	16	09.96	+26	06	04.1	0.800 778	10.98	5.84	21	07	53
	22	7	16	00.34	26	04	34.2	0.808 085	10.88	5.79	21	03	50
	23	7	15	54.07	26	02	57.7	0.815 503	10.78	5.74	20	59	51
	24	7	15	51.11	26	01	14.7	0.823 030	10.69	5.69	20	55	55
	25	7	15	51.44	25	59	25.3	0.830 661	10.59	5.63	20	52	02
	26	7	15	55.00	25	57	29.9	0.838 393	10.49	5.58	20	48	13
	27	7	16	01.77	+25	55	28.4	0.846 222	10.39	5.53	20	44	26
	28	7	16	11.69	25	53	21.1	0.854 145	10.30	5.48	20	40	43
	1	7	16	24.73	25	51	08.0	0.862 157	10.20	5.43	20	37	03
	2	7	16	40.83	25	48	49.3	0.870 256	10.11	5.38	20	33	25
	3	7	16	59.96	25	46	25.1	0.878 438	10.01	5.33	20	29	51
	4	7	17	22.06	25	43	55.4	0.886 698	9.92	5.28	20	26	19
	5	7	17	47.07	+25	41	20.4	0.895 034	9.83	5.23	20	22	51
	6	7	18	14.94	25	38	40.1	0.903 441	9.73	5.18	20	19	25
	7	7	18	45.59	25	35	54.8	0.911 917	9.64	5.13	20	16	02
	8	7	19	18.97	25	33	04.3	0.920 458	9.55	5.08	20	12	41
	9	7	19	55.01	25	30	08.9	0.929 062	9.47	5.04	20	09	24
	10	7	20	33.65	25	27	08.5	0.937 726	9.38	4.99	20	06	08
	11	7	21	14.83	+25	24	03.2	0.946 446	9.29	4.94	20	02	55
	12	7	21	58.48	25	20	53.0	0.955 221	9.21	4.90	19	59	45
	13	7	22	44.55	25	17	37.9	0.964 049	9.12	4.85	19	56	37
	14	7	23	32.98	25	14	17.9	0.972 926	9.04	4.81	19	53	31
	15	7	24	23.71	25	10	53.1	0.981 850	8.96	4.77	19	50	27
	16	7	25	16.69	25	07	23.4	0.990 820	8.88	4.72	19	47	26
	17	7	26	11.86	+25	03	48.9	0.999 834	8.80	4.68	19	44	27
	18	7	27	09.19	25	00	09.4	1.008 888	8.72	4.64	19	41	30
	19	7	28	08.61	24	56	25.0	1.017 983	8.64	4.60	19	38	35
	20	7	29	10.08	24	52	35.8	1.027 114	8.56	4.56	19	35	41
	21	7	30	13.55	24	48	41.5	1.036 282	8.49	4.52	19	32	50
	22	7	31	18.97	24	44	42.3	1.045 483	8.41	4.48	19	30	01
	23	7	32	26.30	+24	40	38.1	1.054 716	8.34	4.44	19	27	14
	24	7	33	35.49	24	36	28.8	1.063 979	8.27	4.40	19	24	28
	25	7	34	46.49	24	32	14.4	1.073 270	8.19	4.36	19	21	44
	26	7	35	59.26	24	27	54.8	1.082 588	8.12	4.32	19	19	02
	27	7	37	13.77	24	23	30.0	1.091 930	8.05	4.29	19	16	22
	28	7	38	29.96	24	18	59.8	1.101 294	7.99	4.25	19	13	43
Apr.	29	7	39	47.81	+24	14	24.3	1.110 679	7.92	4.21	19	11	06
	30	7	41	07.27	24	09	43.3	1.120 081	7.85	4.18	19	08	30
	31	7	42	28.30	24	04	56.9	1.129 500	7.79	4.14	19	05	56
	1	7	43	50.87	24	00	04.8	1.138 934	7.72	4.11	19	03	24
	2	7	45	14.93	+23	55	07.2	1.148 379	7.66	4.08	19	00	53

MARS, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
Apr.	1	7	43	50.87	+24	00	04.8	1.138 934	7.72	4.11	19	03	24
	2	7	45	14.93	23	55	07.2	1.148 379	7.66	4.08	19	00	53
	3	7	46	40.44	23	50	04.0	1.157 834	7.60	4.04	18	58	23
	4	7	48	07.34	23	44	55.1	1.167 297	7.53	4.01	18	55	55
	5	7	49	35.60	23	39	40.6	1.176 767	7.47	3.98	18	53	28
	6	7	51	05.17	23	34	20.4	1.186 243	7.41	3.95	18	51	02
	7	7	52	36.01	+23	28	54.5	1.195 722	7.35	3.91	18	48	37
	8	7	54	08.08	23	23	22.8	1.205 204	7.30	3.88	18	46	14
	9	7	55	41.35	23	17	45.3	1.214 687	7.24	3.85	18	43	52
	10	7	57	15.76	23	12	01.9	1.224 170	7.18	3.82	18	41	31
	11	7	58	51.31	23	06	12.7	1.233 652	7.13	3.79	18	39	11
	12	8	00	27.94	23	00	17.5	1.243 133	7.07	3.76	18	36	52
	13	8	02	05.63	+22	54	16.4	1.252 611	7.02	3.74	18	34	34
	14	8	03	44.34	22	48	09.3	1.262 085	6.97	3.71	18	32	17
	15	8	05	24.06	22	41	56.2	1.271 554	6.92	3.68	18	30	02
	16	8	07	04.76	22	35	37.1	1.281 018	6.86	3.65	18	27	47
	17	8	08	46.39	22	29	11.9	1.290 476	6.81	3.63	18	25	33
	18	8	10	28.95	22	22	40.5	1.299 927	6.77	3.60	18	23	20
	19	8	12	12.39	+22	16	03.1	1.309 369	6.72	3.57	18	21	07
	20	8	13	56.71	22	09	19.5	1.318 803	6.67	3.55	18	18	56
	21	8	15	41.87	22	02	29.6	1.328 227	6.62	3.52	18	16	45
	22	8	17	27.85	21	55	33.6	1.337 641	6.57	3.50	18	14	36
	23	8	19	14.62	21	48	31.2	1.347 042	6.53	3.47	18	12	27
	24	8	21	02.18	21	41	22.6	1.356 432	6.48	3.45	18	10	18
	25	8	22	50.49	+21	34	07.5	1.365 807	6.44	3.43	18	08	11
	26	8	24	39.55	21	26	46.1	1.375 168	6.39	3.40	18	06	04
	27	8	26	29.32	21	19	18.2	1.384 512	6.35	3.38	18	03	58
	28	8	28	19.80	21	11	43.8	1.393 839	6.31	3.36	18	01	53
	29	8	30	10.97	21	04	02.9	1.403 148	6.27	3.34	17	59	48
	30	8	32	02.80	20	56	15.5	1.412 436	6.23	3.31	17	57	44
May	1	8	33	55.27	+20	48	21.7	1.421 703	6.19	3.29	17	55	40
	2	8	35	48.35	20	40	21.4	1.430 948	6.15	3.27	17	53	38
	3	8	37	42.02	20	32	14.7	1.440 170	6.11	3.25	17	51	35
	4	8	39	36.25	20	24	01.6	1.449 368	6.07	3.23	17	49	34
	5	8	41	31.03	20	15	42.0	1.458 541	6.03	3.21	17	47	32
	6	8	43	26.32	20	07	16.1	1.467 688	5.99	3.19	17	45	32
	7	8	45	22.12	+19	58	43.7	1.476 810	5.95	3.17	17	43	31
	8	8	47	18.41	19	50	04.9	1.485 905	5.92	3.15	17	41	32
	9	8	49	15.17	19	41	19.8	1.494 973	5.88	3.13	17	39	32
	10	8	51	12.38	19	32	28.3	1.504 013	5.85	3.11	17	37	33
	11	8	53	10.04	19	23	30.4	1.513 026	5.81	3.09	17	35	35
	12	8	55	08.12	19	14	26.2	1.522 011	5.78	3.07	17	33	37
	13	8	57	06.62	+19	05	15.7	1.530 967	5.74	3.06	17	31	39
	14	8	59	05.51	18	55	58.9	1.539 894	5.71	3.04	17	29	42
	15	9	01	04.80	18	46	35.8	1.548 792	5.68	3.02	17	27	45
	16	9	03	04.46	18	37	06.4	1.557 660	5.65	3.00	17	25	49
	17	9	05	04.48	+18	27	30.7	1.566 498	5.61	2.99	17	23	53

MARS, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
May	17	9	05	04.48	+18	27	30.7	1.566 498	5.61	2.99	17	23	53
	18	9	07	04.86	18	17	48.9	1.575 306	5.58	2.97	17	21	57
	19	9	09	05.58	18	08	00.8	1.584 084	5.55	2.95	17	20	02
	20	9	11	06.63	17	58	06.5	1.592 830	5.52	2.94	17	18	06
	21	9	13	08.01	17	48	06.0	1.601 545	5.49	2.92	17	16	12
	22	9	15	09.71	17	37	59.2	1.610 227	5.46	2.91	17	14	17
	23	9	17	11.72	+17	27	46.3	1.618 876	5.43	2.89	17	12	23
	24	9	19	14.03	17	17	27.1	1.627 493	5.40	2.88	17	10	29
	25	9	21	16.65	17	07	01.7	1.636 074	5.38	2.86	17	08	36
	26	9	23	19.56	16	56	30.1	1.644 621	5.35	2.85	17	06	42
June	27	9	25	22.76	16	45	52.4	1.653 131	5.32	2.83	17	04	49
	28	9	27	26.24	16	35	08.6	1.661 604	5.29	2.82	17	02	57
	29	9	29	29.98	+16	24	18.7	1.670 039	5.27	2.80	17	01	04
	30	9	31	33.98	16	13	22.8	1.678 436	5.24	2.79	16	59	12
	31	9	33	38.22	16	02	21.0	1.686 794	5.21	2.77	16	57	20
	1	9	35	42.68	15	51	13.4	1.695 111	5.19	2.76	16	55	28
	2	9	37	47.36	15	39	59.9	1.703 389	5.16	2.75	16	53	36
	3	9	39	52.26	15	28	40.6	1.711 626	5.14	2.73	16	51	45
	4	9	41	57.36	+15	17	15.6	1.719 822	5.11	2.72	16	49	54
	5	9	44	02.66	15	05	44.9	1.727 977	5.09	2.71	16	48	03
	6	9	46	08.15	14	54	08.5	1.736 090	5.07	2.70	16	46	12
	7	9	48	13.83	14	42	26.6	1.744 163	5.04	2.68	16	44	22
	8	9	50	19.69	14	30	39.1	1.752 193	5.02	2.67	16	42	31
	9	9	52	25.72	14	18	46.2	1.760 182	5.00	2.66	16	40	41
	10	9	54	31.93	+14	06	47.8	1.768 130	4.97	2.65	16	38	51
	11	9	56	38.31	13	54	44.0	1.776 035	4.95	2.64	16	37	01
	12	9	58	44.85	13	42	34.9	1.783 899	4.93	2.62	16	35	11
	13	10	00	51.55	13	30	20.6	1.791 721	4.91	2.61	16	33	21
	14	10	02	58.41	13	18	01.0	1.799 501	4.89	2.60	16	31	32
	15	10	05	05.43	13	05	36.2	1.807 239	4.87	2.59	16	29	43
	16	10	07	12.59	+12	53	06.3	1.814 934	4.85	2.58	16	27	54
	17	10	09	19.91	12	40	31.3	1.822 588	4.83	2.57	16	26	05
	18	10	11	27.37	12	27	51.2	1.830 199	4.81	2.56	16	24	16
	19	10	13	34.99	12	15	06.1	1.837 767	4.79	2.55	16	22	27
	20	10	15	42.76	12	02	16.0	1.845 291	4.77	2.54	16	20	38
	21	10	17	50.69	11	49	20.9	1.852 772	4.75	2.53	16	18	50
	22	10	19	58.77	+11	36	20.8	1.860 209	4.73	2.52	16	17	02
	23	10	22	07.02	11	23	15.8	1.867 601	4.71	2.51	16	15	14
	24	10	24	15.42	11	10	06.0	1.874 947	4.69	2.50	16	13	26
	25	10	26	23.97	10	56	51.4	1.882 248	4.67	2.49	16	11	38
	26	10	28	32.68	10	43	32.2	1.889 501	4.65	2.48	16	09	50
	27	10	30	41.53	10	30	08.3	1.896 707	4.64	2.47	16	08	03
	28	10	32	50.52	+10	16	39.9	1.903 865	4.62	2.46	16	06	16
	29	10	34	59.64	10	03	07.1	1.910 975	4.60	2.45	16	04	28
	30	10	37	08.91	9	49	29.9	1.918 037	4.58	2.44	16	02	41
July	1	10	39	18.30	9	35	48.4	1.925 050	4.57	2.43	16	00	54
	2	10	41	27.83	+9	22	02.7	1.932 014	4.55	2.42	15	59	08

MARS, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
July	1	10	39	18.30	+9	35	48.4	1.925 050	4.57	2.43	16	00	54
	2	10	41	27.83	+9	22	02.7	1.932 014	4.55	2.42	15	59	08
	3	10	43	37.50	+9	08	12.8	1.938 929	4.54	2.41	15	57	21
	4	10	45	47.30	+8	54	18.8	1.945 795	4.52	2.41	15	55	34
	5	10	47	57.23	+8	40	20.8	1.952 613	4.50	2.40	15	53	48
	6	10	50	07.30	+8	26	18.9	1.959 381	4.49	2.39	15	52	02
	7	10	52	17.51	+8	12	13.1	1.966 101	4.47	2.38	15	50	16
	8	10	54	27.85	7	58	03.5	1.972 772	4.46	2.37	15	48	30
	9	10	56	38.32	7	43	50.1	1.979 394	4.44	2.36	15	46	44
	10	10	58	48.94	7	29	33.2	1.985 968	4.43	2.36	15	44	58
	11	11	00	59.69	7	15	12.6	1.992 494	4.41	2.35	15	43	12
	12	11	03	10.58	7	00	48.6	1.998 971	4.40	2.34	15	41	27
	13	11	05	21.62	+6	46	21.1	2.005 400	4.39	2.33	15	39	42
	14	11	07	32.80	6	31	50.3	2.011 781	4.37	2.33	15	37	57
	15	11	09	44.12	6	17	16.1	2.018 115	4.36	2.32	15	36	12
	16	11	11	55.60	6	02	38.7	2.024 400	4.34	2.31	15	34	27
	17	11	14	07.25	5	47	58.0	2.030 637	4.33	2.30	15	32	42
	18	11	16	19.05	5	33	14.1	2.036 825	4.32	2.30	15	30	58
	19	11	18	31.04	+5	18	27.1	2.042 965	4.30	2.29	15	29	13
	20	11	20	43.20	5	03	37.0	2.049 056	4.29	2.28	15	27	29
	21	11	22	55.54	4	48	44.0	2.055 098	4.28	2.28	15	25	45
	22	11	25	08.07	4	33	48.0	2.061 089	4.27	2.27	15	24	01
	23	11	27	20.78	4	18	49.1	2.067 030	4.25	2.26	15	22	18
	24	11	29	33.68	4	03	47.6	2.072 921	4.24	2.26	15	20	34
	25	11	31	46.77	+3	48	43.3	2.078 760	4.23	2.25	15	18	51
	26	11	34	00.05	3	33	36.6	2.084 547	4.22	2.25	15	17	08
	27	11	36	13.51	3	18	27.4	2.090 282	4.21	2.24	15	15	25
	28	11	38	27.17	3	03	15.8	2.095 966	4.20	2.23	15	13	43
	29	11	40	41.03	2	48	01.9	2.101 597	4.18	2.23	15	12	00
	30	11	42	55.09	2	32	45.8	2.107 176	4.17	2.22	15	10	18
Aug.	31	11	45	09.34	+2	17	27.7	2.112 702	4.16	2.22	15	08	36
	1	11	47	23.81	2	02	07.5	2.118 176	4.15	2.21	15	06	54
	2	11	49	38.49	1	46	45.4	2.123 599	4.14	2.20	15	05	12
	3	11	51	53.38	1	31	21.5	2.128 969	4.13	2.20	15	03	31
	4	11	54	08.49	1	15	55.9	2.134 287	4.12	2.19	15	01	50
	5	11	56	23.82	1	00	28.6	2.139 554	4.11	2.19	15	00	09
	6	11	58	39.38	+0	44	59.8	2.144 769	4.10	2.18	14	58	28
	7	12	00	55.16	0	29	29.5	2.149 934	4.09	2.18	14	56	48
	8	12	03	11.17	+0	13	57.8	2.155 047	4.08	2.17	14	55	07
	9	12	05	27.42	-0	01	35.1	2.160 110	4.07	2.17	14	53	27
	10	12	07	43.91	0	17	09.2	2.165 122	4.06	2.16	14	51	47
	11	12	10	00.64	0	32	44.3	2.170 085	4.05	2.16	14	50	08
	12	12	12	17.63	-0	48	20.5	2.174 997	4.04	2.15	14	48	29
	13	12	14	34.88	1	03	57.7	2.179 860	4.03	2.15	14	46	50
	14	12	16	52.41	1	19	35.8	2.184 674	4.03	2.14	14	45	11
	15	12	19	10.21	1	35	14.7	2.189 437	4.02	2.14	14	43	32
16	12	21	28.30	-1	50	54.3	2.194 150	4.01	2.13	14	41	54	

MARS, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit				
	h	m	s	°	'	"		"	"	h	m	s		
Aug.	16	12	21	28.30	-1	50	54.3	2.194 150	4.01	2.13	14	41	54	
	17	12	23	46.70	2	06	34.7	2.198 814	4.00	2.13	14	40	16	
	18	12	26	05.39	2	22	15.6	2.203 427	3.99	2.12	14	38	39	
	19	12	28	24.39	2	37	56.9	2.207 989	3.98	2.12	14	37	01	
	20	12	30	43.70	2	53	38.7	2.212 500	3.97	2.12	14	35	25	
	21	12	33	03.32	3	09	20.7	2.216 960	3.97	2.11	14	33	48	
	22	12	35	23.26	-3	25	02.9	2.221 368	3.96	2.11	14	32	12	
	23	12	37	43.52	3	40	45.1	2.225 724	3.95	2.10	14	30	36	
	24	12	40	04.12	3	56	27.2	2.230 027	3.94	2.10	14	29	00	
	25	12	42	25.04	4	12	09.0	2.234 279	3.94	2.09	14	27	25	
	26	12	44	46.30	4	27	50.6	2.238 478	3.93	2.09	14	25	50	
	27	12	47	07.91	4	43	31.8	2.242 625	3.92	2.09	14	24	15	
	28	12	49	29.87	-4	59	12.4	2.246 719	3.91	2.08	14	22	41	
	29	12	51	52.18	5	14	52.4	2.250 761	3.91	2.08	14	21	07	
	30	12	54	14.86	5	30	31.7	2.254 751	3.90	2.08	14	19	33	
	31	12	56	37.90	5	46	10.0	2.258 690	3.89	2.07	14	18	00	
	Sept.	1	12	59	01.30	6	01	47.4	2.262 577	3.89	2.07	14	16	27
		2	13	01	25.09	6	17	23.6	2.266 412	3.88	2.06	14	14	55
		3	13	03	49.25	-6	32	58.7	2.270 197	3.87	2.06	14	13	23
		4	13	06	13.79	6	48	32.3	2.273 931	3.87	2.06	14	11	51
5		13	08	38.72	7	04	04.5	2.277 615	3.86	2.05	14	10	20	
6		13	11	04.05	7	19	35.0	2.281 249	3.85	2.05	14	08	49	
7		13	13	29.77	7	35	03.9	2.284 833	3.85	2.05	14	07	18	
8		13	15	55.90	7	50	30.9	2.288 369	3.84	2.05	14	05	48	
9		13	18	22.45	-8	05	56.0	2.291 855	3.84	2.04	14	04	19	
10		13	20	49.42	8	21	19.0	2.295 294	3.83	2.04	14	02	49	
11		13	23	16.83	8	36	40.0	2.298 684	3.83	2.04	14	01	21	
12		13	25	44.69	8	51	58.7	2.302 026	3.82	2.03	13	59	52	
	13	13	28	13.00	9	07	15.1	2.305 320	3.81	2.03	13	58	24	
	14	13	30	41.77	9	22	29.1	2.308 566	3.81	2.03	13	56	57	
	15	13	33	11.01	-9	37	40.5	2.311 763	3.80	2.02	13	55	30	
	16	13	35	40.73	9	52	49.3	2.314 912	3.80	2.02	13	54	03	
	17	13	38	10.92	10	07	55.2	2.318 012	3.79	2.02	13	52	37	
	18	13	40	41.59	10	22	58.1	2.321 063	3.79	2.02	13	51	12	
	19	13	43	12.76	10	37	57.9	2.324 065	3.78	2.01	13	49	47	
	20	13	45	44.41	10	52	54.4	2.327 017	3.78	2.01	13	48	22	
	21	13	48	16.57	-11	07	47.6	2.329 920	3.77	2.01	13	46	58	
	22	13	50	49.23	11	22	37.2	2.332 773	3.77	2.01	13	45	35	
	23	13	53	22.41	11	37	23.1	2.335 577	3.77	2.00	13	44	12	
	24	13	55	56.10	11	52	05.2	2.338 332	3.76	2.00	13	42	49	
	25	13	58	30.32	12	06	43.3	2.341 037	3.76	2.00	13	41	27	
	26	14	01	05.06	12	21	17.3	2.343 693	3.75	2.00	13	40	06	
	27	14	03	40.34	-12	35	47.0	2.346 299	3.75	1.99	13	38	45	
	28	14	06	16.15	12	50	12.3	2.348 858	3.74	1.99	13	37	25	
	29	14	08	52.50	13	04	33.1	2.351 367	3.74	1.99	13	36	05	
	30	14	11	29.39	13	18	49.1	2.353 829	3.74	1.99	13	34	46	
	Oct.	1	14	14	06.83	-13	33	00.3	2.356 243	3.73	1.99	13	33	27

MARS, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
Oct.	h	m	s	°	'	"		"	"	h	m	s
1	14	14	06.83	-13	33	00.3	2.356 243	3.73	1.99	13	33	27
2	14	16	44.81	13	47	06.4	2.358 610	3.73	1.98	13	32	09
3	14	19	23.35	14	01	07.4	2.360 930	3.72	1.98	13	30	51
4	14	22	02.44	14	15	03.0	2.363 203	3.72	1.98	13	29	34
5	14	24	42.10	14	28	53.1	2.365 431	3.72	1.98	13	28	17
6	14	27	22.32	14	42	37.6	2.367 613	3.71	1.98	13	27	02
7	14	30	03.12	-14	56	16.3	2.369 751	3.71	1.97	13	25	46
8	14	32	44.50	15	09	49.0	2.371 845	3.71	1.97	13	24	31
9	14	35	26.48	15	23	15.8	2.373 894	3.70	1.97	13	23	17
10	14	38	09.05	15	36	36.3	2.375 900	3.70	1.97	13	22	04
11	14	40	52.23	15	49	50.6	2.377 863	3.70	1.97	13	20	51
12	14	43	36.02	16	02	58.3	2.379 781	3.70	1.97	13	19	38
13	14	46	20.43	-16	15	59.5	2.381 657	3.69	1.97	13	18	27
14	14	49	05.44	16	28	53.9	2.383 489	3.69	1.96	13	17	15
15	14	51	51.08	16	41	41.3	2.385 277	3.69	1.96	13	16	05
16	14	54	37.33	16	54	21.6	2.387 021	3.68	1.96	13	14	55
17	14	57	24.21	17	06	54.5	2.388 721	3.68	1.96	13	13	46
18	15	00	11.72	17	19	20.0	2.390 378	3.68	1.96	13	12	37
19	15	02	59.86	-17	31	37.8	2.391 990	3.68	1.96	13	11	29
20	15	05	48.63	17	43	47.8	2.393 558	3.67	1.96	13	10	22
21	15	08	38.04	17	55	49.8	2.395 083	3.67	1.95	13	09	15
22	15	11	28.09	18	07	43.7	2.396 563	3.67	1.95	13	08	09
23	15	14	18.77	18	19	29.2	2.398 000	3.67	1.95	13	07	03
24	15	17	10.09	18	31	06.3	2.399 394	3.67	1.95	13	05	58
25	15	20	02.05	-18	42	34.6	2.400 744	3.66	1.95	13	04	54
26	15	22	54.64	18	53	54.1	2.402 052	3.66	1.95	13	03	51
27	15	25	47.87	19	05	04.6	2.403 317	3.66	1.95	13	02	48
28	15	28	41.73	19	16	05.9	2.404 539	3.66	1.95	13	01	45
29	15	31	36.22	19	26	57.9	2.405 721	3.66	1.95	13	00	44
30	15	34	31.33	19	37	40.3	2.406 860	3.65	1.94	12	59	43
31	15	37	27.07	-19	48	12.9	2.407 960	3.65	1.94	12	58	42
Nov. 1	15	40	23.44	19	58	35.7	2.409 019	3.65	1.94	12	57	42
2	15	43	20.42	20	08	48.4	2.410 038	3.65	1.94	12	56	43
3	15	46	18.03	20	18	50.8	2.411 019	3.65	1.94	12	55	45
4	15	49	16.26	20	28	42.9	2.411 961	3.65	1.94	12	54	47
5	15	52	15.12	20	38	24.4	2.412 866	3.64	1.94	12	53	49
6	15	55	14.60	-20	47	55.2	2.413 734	3.64	1.94	12	52	53
7	15	58	14.71	20	57	15.2	2.414 564	3.64	1.94	12	51	57
8	16	01	15.45	21	06	24.2	2.415 359	3.64	1.94	12	51	01
9	16	04	16.80	21	15	22.0	2.416 118	3.64	1.94	12	50	06
10	16	07	18.77	21	24	08.5	2.416 840	3.64	1.94	12	49	12
11	16	10	21.35	21	32	43.6	2.417 526	3.64	1.94	12	48	19
12	16	13	24.53	-21	41	07.0	2.418 176	3.64	1.94	12	47	26
13	16	16	28.32	21	49	18.5	2.418 791	3.64	1.93	12	46	33
14	16	19	32.71	21	57	18.1	2.419 369	3.63	1.93	12	45	41
15	16	22	37.69	22	05	05.5	2.419 911	3.63	1.93	12	44	50
16	16	25	43.26	-22	12	40.5	2.420 417	3.63	1.93	12	43	59

MARS, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
Nov.	16	16	25	43.26	-22	12	40.5	2.420 417	3.63	1.93	12	43	59
	17	16	28	49.42	22	20	03.0	2.420 887	3.63	1.93	12	43	09
	18	16	31	56.15	22	27	12.9	2.421 321	3.63	1.93	12	42	20
	19	16	35	03.45	22	34	10.0	2.421 720	3.63	1.93	12	41	31
	20	16	38	11.31	22	40	54.2	2.422 083	3.63	1.93	12	40	43
	21	16	41	19.72	22	47	25.3	2.422 411	3.63	1.93	12	39	55
	22	16	44	28.67	-22	53	43.1	2.422 703	3.63	1.93	12	39	07
	23	16	47	38.15	22	59	47.6	2.422 962	3.63	1.93	12	38	21
	24	16	50	48.15	23	05	38.5	2.423 186	3.63	1.93	12	37	34
	25	16	53	58.65	23	11	15.7	2.423 376	3.63	1.93	12	36	49
Dec.	26	16	57	09.65	23	16	39.2	2.423 533	3.63	1.93	12	36	03
	27	17	00	21.12	23	21	48.7	2.423 657	3.63	1.93	12	35	18
	28	17	03	33.07	-23	26	44.1	2.423 748	3.63	1.93	12	34	34
	29	17	06	45.47	23	31	25.3	2.423 808	3.63	1.93	12	33	50
	30	17	09	58.32	23	35	52.1	2.423 837	3.63	1.93	12	33	07
	1	17	13	11.60	23	40	04.5	2.423 835	3.63	1.93	12	32	24
	2	17	16	25.32	23	44	02.2	2.423 804	3.63	1.93	12	31	41
	3	17	19	39.45	23	47	45.3	2.423 744	3.63	1.93	12	30	59
	4	17	22	53.99	-23	51	13.7	2.423 655	3.63	1.93	12	30	17
	5	17	26	08.93	23	54	27.2	2.423 539	3.63	1.93	12	29	36
	6	17	29	24.26	23	57	25.7	2.423 395	3.63	1.93	12	28	55
	7	17	32	39.95	24	00	09.2	2.423 225	3.63	1.93	12	28	14
	8	17	35	56.01	24	02	37.5	2.423 028	3.63	1.93	12	27	34
	9	17	39	12.41	24	04	50.7	2.422 804	3.63	1.93	12	26	54
	10	17	42	29.14	-24	06	48.4	2.422 554	3.63	1.93	12	26	14
	11	17	45	46.19	24	08	30.7	2.422 277	3.63	1.93	12	25	35
	12	17	49	03.54	24	09	57.5	2.421 974	3.63	1.93	12	24	56
	13	17	52	21.20	24	11	08.6	2.421 645	3.63	1.93	12	24	17
	14	17	55	39.13	24	12	04.1	2.421 289	3.63	1.93	12	23	39
	15	17	58	57.33	24	12	43.8	2.420 907	3.63	1.93	12	23	00
16	18	02	15.78	-24	13	07.7	2.420 499	3.63	1.93	12	22	23	
17	18	05	34.46	24	13	15.7	2.420 066	3.63	1.93	12	21	45	
18	18	08	53.36	24	13	07.8	2.419 606	3.63	1.93	12	21	07	
19	18	12	12.47	24	12	44.0	2.419 122	3.64	1.93	12	20	30	
20	18	15	31.75	24	12	04.2	2.418 612	3.64	1.93	12	19	53	
21	18	18	51.21	24	11	08.4	2.418 077	3.64	1.94	12	19	16	
22	18	22	10.80	-24	09	56.5	2.417 517	3.64	1.94	12	18	39	
23	18	25	30.53	24	08	28.6	2.416 934	3.64	1.94	12	18	02	
24	18	28	50.36	24	06	44.6	2.416 326	3.64	1.94	12	17	25	
25	18	32	10.28	24	04	44.5	2.415 695	3.64	1.94	12	16	49	
26	18	35	30.28	24	02	28.2	2.415 042	3.64	1.94	12	16	12	
27	18	38	50.33	23	59	55.8	2.414 366	3.64	1.94	12	15	36	
28	18	42	10.43	-23	57	07.3	2.413 669	3.64	1.94	12	14	59	
29	18	45	30.55	23	54	02.6	2.412 951	3.64	1.94	12	14	23	
30	18	48	50.69	23	50	41.9	2.412 213	3.65	1.94	12	13	47	
31	18	52	10.82	23	47	05.1	2.411 456	3.65	1.94	12	13	10	
32	18	55	30.95	-23	43	12.2	2.410 680	3.65	1.94	12	12	34	

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HELIOCENTRIC POSITIONS FOR 0^h TERRESTRIAL TIME
MEAN EQUINOX AND ECLIPTIC OF DATE

Date	Heliocentric Longitude			Heliocentric Latitude			Radius Vector		Date	Heliocentric Longitude			Heliocentric Latitude			Radius Vector	
		°	'	''	°	'	''				°	'	''	°	'	''	
Jan.	1	78	21	24.5	-0	29	45.2	5.082 5688	Apr.	3	86	18	40.3	-0	19	28.0	5.113 6403
	3	78	31	50.7	0	29	32.1	5.083 2248		5	86	28	58.9	0	19	14.4	5.114 3339
	5	78	42	16.8	0	29	18.9	5.083 8818		7	86	39	17.3	0	19	00.7	5.115 0282
	7	78	52	42.7	0	29	05.7	5.084 5397		9	86	49	35.5	0	18	47.1	5.115 7231
	9	79	03	08.4	0	28	52.5	5.085 1986		11	86	59	53.7	0	18	33.5	5.116 4186
	11	79	13	34.0	0	28	39.3	5.085 8584		13	87	10	11.6	0	18	19.8	5.117 1149
	13	79	23	59.4	-0	28	26.0	5.086 5191	15	87	20	29.3	-0	18	06.2	5.117 8117	
	15	79	34	24.6	0	28	12.8	5.087 1808	17	87	30	46.9	0	17	52.5	5.118 5093	
	17	79	44	49.7	0	27	59.5	5.087 8433	19	87	41	04.4	0	17	38.8	5.119 2074	
	19	79	55	14.6	0	27	46.2	5.088 5068	21	87	51	21.6	0	17	25.2	5.119 9062	
	21	80	05	39.4	0	27	32.9	5.089 1712	23	88	01	38.7	0	17	11.5	5.120 6056	
	23	80	16	04.0	0	27	19.7	5.089 8365	25	88	11	55.6	0	16	57.8	5.121 3057	
Feb.	25	80	26	28.4	-0	27	06.3	5.090 5027	27	88	22	12.3	-0	16	44.1	5.122 0063	
	27	80	36	52.7	0	26	53.0	5.091 1698	29	88	32	28.9	0	16	30.4	5.122 7076	
	29	80	47	16.7	0	26	39.7	5.091 8377	May	1	88	42	45.3	0	16	16.7	5.123 4095
	31	80	57	40.7	0	26	26.4	5.092 5066		3	88	53	01.5	0	16	03.0	5.124 1119
	2	81	08	04.4	0	26	13.0	5.093 1763		5	89	03	17.6	0	15	49.3	5.124 8149
	4	81	18	28.1	0	25	59.6	5.093 8468		7	89	13	33.5	0	15	35.6	5.125 5186
	6	81	28	51.5	-0	25	46.3	5.094 5182		9	89	23	49.2	-0	15	21.9	5.126 2228
	8	81	39	14.8	0	25	32.9	5.095 1905		11	89	34	04.7	0	15	08.1	5.126 9275
	10	81	49	37.9	0	25	19.5	5.095 8636	13	89	44	20.1	0	14	54.4	5.127 6329	
	12	82	00	00.8	0	25	06.1	5.096 5376	15	89	54	35.3	0	14	40.7	5.128 3388	
	14	82	10	23.6	0	24	52.7	5.097 2124	17	90	04	50.4	0	14	26.9	5.129 0452	
	16	82	20	46.2	0	24	39.3	5.097 8880	19	90	15	05.3	0	14	13.2	5.129 7522	
18	82	31	08.6	-0	24	25.8	5.098 5644	21	90	25	20.0	-0	13	59.4	5.130 4597		
20	82	41	30.9	0	24	12.4	5.099 2416	23	90	35	34.5	0	13	45.7	5.131 1677		
22	82	51	53.1	0	23	58.9	5.099 9197	25	90	45	48.9	0	13	31.9	5.131 8763		
24	83	02	15.0	0	23	45.5	5.100 5985	27	90	56	03.1	0	13	18.2	5.132 5854		
26	83	12	36.8	0	23	32.0	5.101 2781	29	91	06	17.1	0	13	04.4	5.133 2950		
28	83	22	58.4	0	23	18.5	5.101 9586	31	91	16	31.0	0	12	50.7	5.134 0051		
Mar.	2	83	33	19.9	-0	23	05.0	5.102 6398	June	2	91	26	44.6	-0	12	36.9	5.134 7157
	4	83	43	41.1	0	22	51.5	5.103 3217		4	91	36	58.2	0	12	23.1	5.135 4267
	6	83	54	02.2	0	22	38.0	5.104 0045		6	91	47	11.5	0	12	09.4	5.136 1383
	8	84	04	23.2	0	22	24.5	5.104 6880		8	91	57	24.7	0	11	55.6	5.136 8504
	10	84	14	44.0	0	22	11.0	5.105 3723		10	92	07	37.7	0	11	41.8	5.137 5629
	12	84	25	04.6	0	21	57.4	5.106 0573		12	92	17	50.5	0	11	28.0	5.138 2758
	14	84	35	25.0	-0	21	43.9	5.106 7430	14	92	28	03.2	-0	11	14.3	5.138 9893	
	16	84	45	45.3	0	21	30.3	5.107 4295	16	92	38	15.7	0	11	00.5	5.139 7032	
	18	84	56	05.4	0	21	16.8	5.108 1168	18	92	48	28.0	0	10	46.7	5.140 4175	
	20	85	06	25.4	0	21	03.2	5.108 8047	20	92	58	40.2	0	10	32.9	5.141 1323	
	22	85	16	45.2	0	20	49.6	5.109 4934	22	93	08	52.1	0	10	19.1	5.141 8475	
	24	85	27	04.7	0	20	36.1	5.110 1828	24	93	19	04.0	0	10	05.3	5.142 5631	
Apr.	26	85	37	24.2	-0	20	22.4	5.110 8729	26	93	29	15.6	-0	09	51.5	5.143 2792	
	28	85	47	43.5	0	20	08.9	5.111 5637	28	93	39	27.1	0	09	37.7	5.143 9956	
	30	85	58	02.6	0	19	55.3	5.112 2552	30	93	49	38.4	0	09	23.9	5.144 7125	
	1	86	08	21.5	0	19	41.6	5.112 9474	July	2	93	59	49.5	0	09	10.2	5.145 4298
	3	86	18	40.3	-0	19	28.0	5.113 6403		4	94	10	00.5	-0	08	56.3	5.146 1474

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HELIOCENTRIC POSITIONS FOR 0^h TERRESTRIAL TIME
MEAN EQUINOX AND ECLIPTIC OF DATE

Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector	Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector
	°	'	''	'''	°	'	''	'''			°	'	''	'''	°	'	''	'''	
July	2	93	59	49.5	-0	09	10.2	5.145 4298	Oct.	2	101	45	17.7	+0	01	23.5	5.178 7419		
	4	94	10	00.5	0	08	56.3	5.146 1474		4	101	55	20.8	0	01	37.2	5.179 4706		
	6	94	20	11.3	0	08	42.5	5.146 8655		6	102	05	23.8	0	01	50.9	5.180 1993		
	8	94	30	21.9	0	08	28.8	5.147 5839		8	102	15	26.6	0	02	04.6	5.180 9280		
	10	94	40	32.4	0	08	14.9	5.148 3027		10	102	25	29.2	0	02	18.3	5.181 6569		
	12	94	50	42.7	0	08	01.2	5.149 0219		12	102	35	31.7	0	02	32.0	5.182 3858		
	14	95	00	52.7	-0	07	47.4	5.149 7414		14	102	45	34.0	+0	02	45.7	5.183 1148		
	16	95	11	02.7	0	07	33.6	5.150 4613		16	102	55	36.1	0	02	59.4	5.183 8439		
	18	95	21	12.5	0	07	19.8	5.151 1815		18	103	05	38.1	0	03	13.0	5.184 5730		
	20	95	31	22.1	0	07	05.9	5.151 9021		20	103	15	39.9	0	03	26.7	5.185 3021		
	22	95	41	31.5	0	06	52.2	5.152 6230		22	103	25	41.4	0	03	40.4	5.186 0313		
	24	95	51	40.8	0	06	38.3	5.153 3443		24	103	35	42.9	0	03	54.0	5.186 7605		
Aug.	26	96	01	49.8	-0	06	24.6	5.154 0658	Nov.	26	103	45	44.2	+0	04	07.7	5.187 4898		
	28	96	11	58.8	0	06	10.8	5.154 7877		28	103	55	45.3	0	04	21.3	5.188 2190		
	30	96	22	07.5	0	05	57.0	5.155 5099		30	104	05	46.2	0	04	35.0	5.188 9483		
	1	96	32	16.1	0	05	43.2	5.156 2323		1	104	15	47.0	0	04	48.6	5.189 6776		
	3	96	42	24.5	0	05	29.4	5.156 9551		3	104	25	47.6	0	05	02.2	5.190 4069		
	5	96	52	32.7	0	05	15.6	5.157 6782		5	104	35	48.0	0	05	15.8	5.191 1362		
	7	97	02	40.8	-0	05	01.8	5.158 4015		7	104	45	48.3	+0	05	29.4	5.191 8655		
	9	97	12	48.7	0	04	48.0	5.159 1251		9	104	55	48.4	0	05	43.1	5.192 5948		
	11	97	22	56.4	0	04	34.2	5.159 8490		11	105	05	48.4	0	05	56.7	5.193 3240		
	13	97	33	04.0	0	04	20.4	5.160 5732		13	105	15	48.1	0	06	10.3	5.194 0532		
	15	97	43	11.4	0	04	06.6	5.161 2976		15	105	25	47.7	0	06	23.8	5.194 7824		
	17	97	53	18.6	0	03	52.8	5.162 0222		17	105	35	47.1	0	06	37.4	5.195 5115		
Sept.	19	98	03	25.7	-0	03	39.1	5.162 7471	Dec.	19	105	45	46.4	+0	06	51.0	5.196 2406		
	21	98	13	32.5	0	03	25.3	5.163 4722		21	105	55	45.5	0	07	04.5	5.196 9697		
	23	98	23	39.2	0	03	11.5	5.164 1975		23	106	05	44.4	0	07	18.1	5.197 6987		
	25	98	33	45.8	0	02	57.7	5.164 9231		25	106	15	43.1	0	07	31.7	5.198 4276		
	27	98	43	52.2	0	02	43.9	5.165 6489		27	106	25	41.7	0	07	45.2	5.199 1564		
	29	98	53	58.3	0	02	30.2	5.166 3749		29	106	35	40.1	0	07	58.7	5.199 8852		
	31	99	04	04.4	-0	02	16.4	5.167 1010		1	106	45	38.4	+0	08	12.2	5.200 6139		
	2	99	14	10.2	0	02	02.6	5.167 8274		3	106	55	36.5	0	08	25.8	5.201 3425		
	4	99	24	15.9	0	01	48.9	5.168 5540		5	107	05	34.4	0	08	39.3	5.202 0710		
	6	99	34	21.4	0	01	35.1	5.169 2807		7	107	15	32.1	0	08	52.8	5.202 7994		
	8	99	44	26.8	0	01	21.3	5.170 0076		9	107	25	29.7	0	09	06.3	5.203 5277		
	10	99	54	32.0	0	01	07.6	5.170 7347		11	107	35	27.1	0	09	19.8	5.204 2559		
Oct.	12	100	04	37.0	-0	00	53.8	5.171 4620		13	107	45	24.4	+0	09	33.3	5.204 9839		
	14	100	14	41.8	0	00	40.1	5.172 1894		15	107	55	21.5	0	09	46.7	5.205 7119		
	16	100	24	46.5	0	00	26.3	5.172 9169		17	108	05	18.4	0	10	00.2	5.206 4397		
	18	100	34	51.0	-0	00	12.6	5.173 6446		19	108	15	15.1	0	10	13.6	5.207 1674		
	20	100	44	55.3	+0	00	01.2	5.174 3724		21	108	25	11.7	0	10	27.1	5.207 8949		
	22	100	54	59.4	0	00	14.9	5.175 1004		23	108	35	08.1	0	10	40.5	5.208 6223		
	24	101	05	03.4	+0	00	28.6	5.175 8285		25	108	45	04.4	+0	10	53.9	5.209 3496		
	26	101	15	07.2	0	00	42.3	5.176 5567		27	108	55	00.5	0	11	07.4	5.210 0766		
	28	101	25	10.9	0	00	56.1	5.177 2850		29	109	04	56.4	0	11	20.8	5.210 8036		
	30	101	35	14.4	0	01	09.8	5.178 0134		31	109	14	52.1	0	11	34.1	5.211 5303		
	2	101	45	17.7	+0	01	23.5	5.178 7419		33	109	24	47.7	+0	11	47.5	5.212 2569		

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GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Jan.	0	73	19	23.4	-0	36	17.4	Feb.	15	71	28	04.0	-0	26	34.0
	1	73	12	56.0	0	36	05.6		16	71	30	17.3	0	26	21.7
	2	73	06	37.0	0	35	53.7		17	71	32	42.3	0	26	09.5
	3	73	00	26.5	0	35	41.7		18	71	35	18.8	0	25	57.3
	4	72	54	24.9	0	35	29.6		19	71	38	06.9	0	25	45.2
	5	72	48	32.5	0	35	17.4		20	71	41	06.5	0	25	33.1
	6	72	42	49.4	-0	35	05.1		21	71	44	17.6	-0	25	21.1
	7	72	37	16.0	0	34	52.7		22	71	47	40.0	0	25	09.1
	8	72	31	52.5	0	34	40.2		23	71	51	13.6	0	24	57.2
	9	72	26	39.0	0	34	27.7		24	71	54	58.4	0	24	45.4
	10	72	21	35.9	0	34	15.2		25	71	58	54.3	0	24	33.6
	11	72	16	43.1	0	34	02.5		26	72	03	01.1	0	24	21.9
	12	72	12	00.9	-0	33	49.9	Mar.	27	72	07	18.8	-0	24	10.2
	13	72	07	29.4	0	33	37.1		28	72	11	47.2	0	23	58.6
	14	72	03	08.7	0	33	24.4		1	72	16	26.3	0	23	47.1
	15	71	58	58.9	0	33	11.6		2	72	21	16.0	0	23	35.7
	16	71	55	00.2	0	32	58.8		3	72	26	16.3	0	23	24.3
	17	71	51	12.6	0	32	45.9		4	72	31	27.0	0	23	13.0
	18	71	47	36.3	-0	32	33.0		5	72	36	48.0	-0	23	01.7
	19	71	44	11.5	0	32	20.1		6	72	42	19.2	0	22	50.6
	20	71	40	58.2	0	32	07.2		7	72	48	00.5	0	22	39.5
	21	71	37	56.6	0	31	54.3		8	72	53	51.6	0	22	28.5
	22	71	35	06.8	0	31	41.3		9	72	59	52.5	0	22	17.6
	23	71	32	28.9	0	31	28.3		10	73	06	03.0	0	22	06.7
	24	71	30	02.9	-0	31	15.3		11	73	12	23.0	-0	21	55.9
	25	71	27	49.1	0	31	02.3		12	73	18	52.3	0	21	45.3
	26	71	25	47.4	0	30	49.3		13	73	25	30.8	0	21	34.6
	27	71	23	57.8	0	30	36.3		14	73	32	18.5	0	21	24.1
	28	71	22	20.5	0	30	23.3		15	73	39	15.2	0	21	13.6
	29	71	20	55.4	0	30	10.3		16	73	46	20.8	0	21	03.2
	30	71	19	42.6	-0	29	57.3		17	73	53	35.2	-0	20	52.9
	31	71	18	42.1	0	29	44.4		18	74	00	58.4	0	20	42.7
Feb.	1	71	17	53.8	0	29	31.4		19	74	08	30.3	0	20	32.5
	2	71	17	17.9	0	29	18.5		20	74	16	10.7	0	20	22.3
	3	71	16	54.3	0	29	05.5		21	74	23	59.5	0	20	12.3
	4	71	16	43.2	0	28	52.7		22	74	31	56.6	0	20	02.3
	5	71	16	44.3	-0	28	39.8		23	74	40	02.0	-0	19	52.4
	6	71	16	57.9	0	28	27.0		24	74	48	15.4	0	19	42.5
	7	71	17	23.7	0	28	14.3		25	74	56	36.8	0	19	32.7
	8	71	18	01.8	0	28	01.5		26	75	05	06.0	0	19	23.0
	9	71	18	52.0	0	27	48.9		27	75	13	42.9	0	19	13.3
	10	71	19	54.2	0	27	36.3		28	75	22	27.5	0	19	03.7
	11	71	21	08.5	-0	27	23.7		29	75	31	19.5	-0	18	54.2
	12	71	22	34.6	0	27	11.2		30	75	40	19.0	0	18	44.8
	13	71	24	12.7	0	26	58.7		31	75	49	25.9	0	18	35.4
	14	71	26	02.5	0	26	46.3	Apr.	1	75	58	40.0	0	18	26.1
	15	71	28	04.0	-0	26	34.0		2	76	08	01.3	-0	18	16.8

JUPITER, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Apr.	1	75	58	40.0	-0	18	26.1	May	17	84	42	04.6	-0	12	21.9
	2	76	08	01.3	0	18	16.8		18	84	55	00.2	0	12	15.1
	3	76	17	29.6	0	18	07.6		19	85	07	58.4	0	12	08.4
	4	76	27	04.6	0	17	58.6		20	85	20	59.0	0	12	01.6
	5	76	36	46.4	0	17	49.5		21	85	34	02.1	0	11	55.0
	6	76	46	34.7	0	17	40.6		22	85	47	07.5	0	11	48.3
	7	76	56	29.4	-0	17	31.7		23	86	00	15.2	-0	11	41.7
	8	77	06	30.3	0	17	22.9		24	86	13	25.2	0	11	35.1
	9	77	16	37.5	0	17	14.1		25	86	26	37.4	0	11	28.5
	10	77	26	50.7	0	17	05.4		26	86	39	51.7	0	11	22.0
	11	77	37	09.9	0	16	56.8		27	86	53	08.2	0	11	15.5
	12	77	47	34.9	0	16	48.3		28	87	06	26.6	0	11	09.1
	13	77	58	05.8	-0	16	39.8	June	29	87	19	46.8	-0	11	02.7
	14	78	08	42.5	0	16	31.3		30	87	33	08.8	0	10	56.4
	15	78	19	24.7	0	16	22.9		31	87	46	32.3	0	10	50.0
	16	78	30	12.6	0	16	14.6		1	87	59	57.4	0	10	43.7
	17	78	41	05.9	0	16	06.3		2	88	13	23.9	0	10	37.5
	18	78	52	04.5	0	15	58.1		3	88	26	51.7	0	10	31.2
	19	79	03	08.4	-0	15	49.9		4	88	40	20.9	-0	10	25.0
	20	79	14	17.4	0	15	41.8		5	88	53	51.3	0	10	18.9
	21	79	25	31.5	0	15	33.7		6	89	07	22.9	0	10	12.7
	22	79	36	50.6	0	15	25.7		7	89	20	55.6	0	10	06.6
	23	79	48	14.4	0	15	17.8		8	89	34	29.5	0	10	00.5
	24	79	59	43.1	0	15	09.9		9	89	48	04.3	0	09	54.4
	25	80	11	16.3	-0	15	02.0		10	90	01	40.2	-0	09	48.4
	26	80	22	54.2	0	14	54.2		11	90	15	16.9	0	09	42.3
	27	80	34	36.7	0	14	46.4		12	90	28	54.5	0	09	36.3
	28	80	46	23.6	0	14	38.7		13	90	42	32.9	0	09	30.3
	29	80	58	14.9	0	14	31.1		14	90	56	11.9	0	09	24.4
	30	81	10	10.5	0	14	23.5		15	91	09	51.5	0	09	18.4
May	1	81	22	10.3	-0	14	16.0		16	91	23	31.7	-0	09	12.5
	2	81	34	14.0	0	14	08.5		17	91	37	12.3	0	09	06.5
	3	81	46	21.6	0	14	01.1		18	91	50	53.3	0	09	00.6
	4	81	58	33.0	0	13	53.7		19	92	04	34.7	0	08	54.7
	5	82	10	48.0	0	13	46.4		20	92	18	16.5	0	08	48.9
	6	82	23	06.5	0	13	39.1		21	92	31	58.5	0	08	43.0
	7	82	35	28.5	-0	13	31.9		22	92	45	40.9	-0	08	37.2
	8	82	47	53.9	0	13	24.7		23	92	59	23.5	0	08	31.4
	9	83	00	22.7	0	13	17.6		24	93	13	06.6	0	08	25.9
	10	83	12	54.7	0	13	10.5		25	93	26	47.3	0	08	20.2
	11	83	25	29.9	0	13	03.4		26	93	40	30.4	0	08	14.2
	12	83	38	08.3	0	12	56.4		27	93	54	12.7	0	08	08.4
	13	83	50	49.7	-0	12	49.4	July	28	94	07	54.7	-0	08	02.7
	14	84	03	34.2	0	12	42.5		29	94	21	36.1	0	07	57.0
	15	84	16	21.5	0	12	35.6		30	94	35	17.1	0	07	51.3
	16	84	29	11.7	0	12	28.8		1	94	48	57.5	0	07	45.7
	17	84	42	04.6	-0	12	21.9		2	95	02	37.3	-0	07	40.0

JUPITER, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
July	1	94	48	57.5	-0	07	45.7	Aug.	16	104	49	28.7	-0	03	29.3
	2	95	02	37.3	0	07	40.0		17	105	01	27.7	0	03	23.7
	3	95	16	16.5	0	07	34.4		18	105	13	22.7	0	03	18.0
	4	95	29	54.9	0	07	28.8		19	105	25	13.7	0	03	12.3
	5	95	43	32.6	0	07	23.2		20	105	37	00.5	0	03	06.6
	6	95	57	09.5	0	07	17.6		21	105	48	43.0	0	03	00.8
	7	96	10	45.5	-0	07	12.0		22	106	00	21.1	-0	02	55.1
	8	96	24	20.6	0	07	06.4		23	106	11	54.7	0	02	49.4
	9	96	37	54.7	0	07	00.8		24	106	23	23.6	0	02	43.6
	10	96	51	27.8	0	06	55.2		25	106	34	47.8	0	02	37.8
	11	97	04	59.6	0	06	49.6		26	106	46	07.3	0	02	32.1
	12	97	18	30.3	0	06	44.1		27	106	57	21.9	0	02	26.2
	13	97	31	59.6	-0	06	38.5	Sept.	28	107	08	31.6	-0	02	20.4
	14	97	45	27.6	0	06	32.9		29	107	19	36.3	0	02	14.6
	15	97	58	54.2	0	06	27.3		30	107	30	35.9	0	02	08.7
	16	98	12	19.2	0	06	21.8		31	107	41	30.3	0	02	02.8
	17	98	25	42.8	0	06	16.2		1	107	52	19.4	0	01	56.8
	18	98	39	04.8	0	06	10.7		2	108	03	03.2	0	01	50.9
	19	98	52	25.3	-0	06	05.1		3	108	13	41.5	-0	01	44.9
	20	99	05	44.1	0	05	59.6		4	108	24	14.2	0	01	38.9
	21	99	19	01.1	0	05	54.0		5	108	34	41.2	0	01	32.8
	22	99	32	16.3	0	05	48.5		6	108	45	02.4	0	01	26.8
	23	99	45	29.6	0	05	43.0		7	108	55	17.8	0	01	20.7
	24	99	58	40.8	0	05	37.5		8	109	05	27.1	0	01	14.5
	25	100	11	49.8	-0	05	32.0		9	109	15	30.5	-0	01	08.4
	26	100	24	56.5	0	05	26.5		10	109	25	27.8	0	01	02.2
	27	100	38	00.9	0	05	21.0		11	109	35	18.9	0	00	56.0
	28	100	51	02.8	0	05	15.5		12	109	45	03.8	0	00	49.8
	29	101	04	02.2	0	05	09.9		13	109	54	42.3	0	00	43.5
	30	101	16	59.1	0	05	04.4		14	110	04	14.4	0	00	37.3
	31	101	29	53.4	-0	04	58.9		15	110	13	39.9	-0	00	31.0
Aug.	1	101	42	45.0	0	04	53.4		16	110	22	58.6	0	00	24.6
	2	101	55	33.8	0	04	47.9		17	110	32	10.4	0	00	18.3
	3	102	08	19.9	0	04	42.3		18	110	41	15.2	0	00	11.9
	4	102	21	03.1	0	04	36.8		19	110	50	12.7	-0	00	05.5
	5	102	33	43.4	0	04	31.2		20	110	59	03.0	+0	00	00.9
	6	102	46	20.6	-0	04	25.7		21	111	07	46.0	+0	00	07.4
	7	102	58	54.7	0	04	20.1		22	111	16	21.4	0	00	13.9
	8	103	11	25.6	0	04	14.5		23	111	24	49.3	0	00	20.4
	9	103	23	53.2	0	04	08.9		24	111	33	09.4	0	00	27.0
	10	103	36	17.5	0	04	03.3		25	111	41	21.9	0	00	33.6
	11	103	48	38.3	0	03	57.6		26	111	49	26.4	0	00	40.2
	12	104	00	55.6	-0	03	52.0	Oct.	27	111	57	23.0	+0	00	46.9
	13	104	13	09.3	0	03	46.3		28	112	05	11.5	0	00	53.6
	14	104	25	19.4	0	03	40.7		29	112	12	51.9	0	01	00.4
	15	104	37	25.9	0	03	35.0		30	112	20	23.9	0	01	07.2
	16	104	49	28.7	-0	03	29.3		1	112	27	47.5	+0	01	14.1

JUPITER, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Oct.	1	112	27	47.5	+0	01	14.1	Nov.	16	115	07	17.4	+0	07	16.5
	2	112	35	02.5	0	01	21.0		17	115	06	19.5	0	07	25.4
	3	112	42	08.9	0	01	27.9		18	115	05	09.5	0	07	34.3
	4	112	49	06.5	0	01	34.9		19	115	03	47.5	0	07	43.3
	5	112	55	55.3	0	01	42.0		20	115	02	13.6	0	07	52.3
	6	113	02	35.2	0	01	49.0		21	115	00	27.7	0	08	01.3
	7	113	09	06.0	+0	01	56.2		22	114	58	29.9	+0	08	10.4
	8	113	15	27.7	0	02	03.3		23	114	56	20.3	0	08	19.6
	9	113	21	40.3	0	02	10.5		24	114	53	58.8	0	08	28.7
	10	113	27	43.7	0	02	17.7		25	114	51	25.6	0	08	37.9
	11	113	33	37.7	0	02	25.0		26	114	48	40.7	0	08	47.1
	12	113	39	22.2	0	02	32.3		27	114	45	44.2	0	08	56.4
	13	113	44	57.0	+0	02	39.7	Dec.	28	114	42	36.2	+0	09	05.7
	14	113	50	22.0	0	02	47.0		29	114	39	16.8	0	09	15.0
	15	113	55	37.0	0	02	54.5		30	114	35	46.1	0	09	24.3
	16	114	00	41.9	0	03	01.9		1	114	32	04.3	0	09	33.7
	17	114	05	36.6	0	03	09.4		2	114	28	11.6	0	09	43.0
	18	114	10	21.0	0	03	17.0		3	114	24	08.0	0	09	52.4
	19	114	14	55.0	+0	03	24.6		4	114	19	53.7	+0	10	01.8
	20	114	19	18.5	0	03	32.2		5	114	15	29.0	0	10	11.2
	21	114	23	31.5	0	03	39.9		6	114	10	53.7	0	10	20.5
	22	114	27	33.8	0	03	47.6		7	114	06	08.2	0	10	29.9
	23	114	31	25.4	0	03	55.4		8	114	01	12.4	0	10	39.3
	24	114	35	06.1	0	04	03.3		9	113	56	06.5	0	10	48.7
	25	114	38	36.0	+0	04	11.1		10	113	50	50.7	+0	10	58.1
	26	114	41	54.9	0	04	19.1		11	113	45	25.1	0	11	07.5
	27	114	45	02.7	0	04	27.1		12	113	39	50.0	0	11	16.9
	28	114	47	59.3	0	04	35.1		13	113	34	05.6	0	11	26.2
	29	114	50	44.7	0	04	43.2		14	113	28	12.2	0	11	35.6
	30	114	53	18.7	0	04	51.4		15	113	22	09.9	0	11	45.0
	31	114	55	41.3	+0	04	59.6		16	113	15	59.0	+0	11	54.3
Nov.	1	114	57	52.5	0	05	07.8		17	113	09	39.8	0	12	03.7
	2	114	59	52.2	0	05	16.1		18	113	03	12.5	0	12	13.0
	3	115	01	40.3	0	05	24.5		19	112	56	37.5	0	12	22.3
	4	115	03	16.9	0	05	32.9		20	112	49	54.9	0	12	31.6
	5	115	04	41.9	0	05	41.3		21	112	43	05.0	0	12	40.9
	6	115	05	55.4	+0	05	49.8		22	112	36	08.2	+0	12	50.2
	7	115	06	57.2	0	05	58.3		23	112	29	04.7	0	12	59.4
	8	115	07	47.3	0	06	06.8		24	112	21	54.9	0	13	08.7
	9	115	08	25.5	0	06	15.4		25	112	14	39.0	0	13	17.8
	10	115	08	51.9	0	06	24.0		26	112	07	17.3	0	13	27.0
	11	115	09	06.3	0	06	32.7		27	111	59	50.4	0	13	36.1
	12	115	09	08.7	+0	06	41.4		28	111	52	18.4	+0	13	45.2
	13	115	08	59.0	0	06	50.1		29	111	44	41.8	0	13	54.2
	14	115	08	37.2	0	06	58.8		30	111	37	00.9	0	14	03.1
	15	115	08	03.4	0	07	07.7		31	111	29	16.1	0	14	12.0
	16	115	07	17.4	+0	07	16.5		32	111	21	27.8	+0	14	20.9

JUPITER, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Jan.	0	4	47	59.47	+21	47	50.6	4.183 118	2.10	22.01	22	04	17
	1	4	47	31.77	21	47	14.6	4.190 735	2.10	21.97	21	59	54
	2	4	47	04.66	21	46	39.5	4.198 627	2.09	21.93	21	55	32
	3	4	46	38.16	21	46	05.2	4.206 791	2.09	21.88	21	51	10
	4	4	46	12.31	21	45	31.9	4.215 223	2.09	21.84	21	46	49
	5	4	45	47.10	21	44	59.6	4.223 919	2.08	21.79	21	42	29
	6	4	45	22.57	+21	44	28.3	4.232 875	2.08	21.75	21	38	09
	7	4	44	58.72	21	43	58.0	4.242 086	2.07	21.70	21	33	50
	8	4	44	35.58	21	43	28.8	4.251 548	2.07	21.65	21	29	32
	9	4	44	13.16	21	43	00.8	4.261 257	2.06	21.60	21	25	14
	10	4	43	51.47	21	42	34.0	4.271 208	2.06	21.55	21	20	57
	11	4	43	30.53	21	42	08.4	4.281 398	2.05	21.50	21	16	41
	12	4	43	10.34	+21	41	44.1	4.291 821	2.05	21.45	21	12	26
	13	4	42	50.91	21	41	21.1	4.302 474	2.04	21.40	21	08	12
	14	4	42	32.25	21	40	59.5	4.313 353	2.04	21.34	21	03	58
	15	4	42	14.36	21	40	39.2	4.324 453	2.03	21.29	20	59	45
	16	4	41	57.26	21	40	20.4	4.335 769	2.03	21.23	20	55	33
	17	4	41	40.96	21	40	02.9	4.347 299	2.02	21.18	20	51	21
	18	4	41	25.46	+21	39	46.8	4.359 038	2.02	21.12	20	47	10
	19	4	41	10.78	21	39	32.2	4.370 981	2.01	21.06	20	43	01
	20	4	40	56.91	21	39	19.0	4.383 123	2.01	21.00	20	38	52
	21	4	40	43.88	21	39	07.4	4.395 462	2.00	20.94	20	34	44
	22	4	40	31.69	21	38	57.3	4.407 991	2.00	20.88	20	30	36
	23	4	40	20.34	21	38	48.8	4.420 707	1.99	20.82	20	26	30
	24	4	40	09.85	+21	38	41.8	4.433 605	1.98	20.76	20	22	24
	25	4	40	00.21	21	38	36.5	4.446 679	1.98	20.70	20	18	19
	26	4	39	51.43	21	38	32.8	4.459 926	1.97	20.64	20	14	15
	27	4	39	43.52	21	38	30.7	4.473 341	1.97	20.58	20	10	12
	28	4	39	36.48	21	38	30.4	4.486 918	1.96	20.52	20	06	10
	29	4	39	30.31	21	38	31.7	4.500 652	1.95	20.45	20	02	09
Feb.	30	4	39	25.01	+21	38	34.6	4.514 538	1.95	20.39	19	58	08
	31	4	39	20.58	21	38	39.3	4.528 572	1.94	20.33	19	54	09
	1	4	39	17.02	21	38	45.6	4.542 746	1.94	20.27	19	50	10
	2	4	39	14.34	21	38	53.5	4.557 058	1.93	20.20	19	46	12
	3	4	39	12.54	21	39	03.0	4.571 500	1.92	20.14	19	42	15
	4	4	39	11.62	21	39	14.2	4.586 067	1.92	20.07	19	38	19
	5	4	39	11.58	+21	39	27.1	4.600 755	1.91	20.01	19	34	24
	6	4	39	12.41	21	39	41.6	4.615 558	1.91	19.95	19	30	30
	7	4	39	14.12	21	39	57.7	4.630 471	1.90	19.88	19	26	36
	8	4	39	16.70	21	40	15.5	4.645 489	1.89	19.82	19	22	43
	9	4	39	20.14	21	40	35.0	4.660 608	1.89	19.75	19	18	52
	10	4	39	24.44	21	40	56.1	4.675 822	1.88	19.69	19	15	01
	11	4	39	29.60	+21	41	18.7	4.691 128	1.87	19.62	19	11	11
	12	4	39	35.60	21	41	43.0	4.706 520	1.87	19.56	19	07	21
	13	4	39	42.44	21	42	08.8	4.721 994	1.86	19.50	19	03	33
	14	4	39	50.13	21	42	36.1	4.737 546	1.86	19.43	18	59	45
	15	4	39	58.65	+21	43	04.9	4.753 172	1.85	19.37	18	55	58

JUPITER, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Feb.	15	4	39	58.65	+21	43	04.9	4.753 172	1.85	19.37	18	55	58
	16	4	40	08.00	21	43	35.2	4.768 866	1.84	19.30	18	52	13
	17	4	40	18.19	21	44	07.0	4.784 626	1.84	19.24	18	48	27
	18	4	40	29.20	21	44	40.3	4.800 445	1.83	19.18	18	44	43
	19	4	40	41.04	21	45	14.9	4.816 321	1.83	19.11	18	41	00
	20	4	40	53.70	21	45	51.1	4.832 248	1.82	19.05	18	37	17
	21	4	41	07.17	+21	46	28.6	4.848 223	1.81	18.99	18	33	35
	22	4	41	21.45	21	47	07.6	4.864 240	1.81	18.93	18	29	54
	23	4	41	36.54	21	47	47.9	4.880 295	1.80	18.86	18	26	14
	24	4	41	52.43	21	48	29.6	4.896 385	1.80	18.80	18	22	34
Mar.	25	4	42	09.10	21	49	12.7	4.912 504	1.79	18.74	18	18	55
	26	4	42	26.56	21	49	57.0	4.928 648	1.78	18.68	18	15	17
	27	4	42	44.79	+21	50	42.6	4.944 812	1.78	18.62	18	11	40
	28	4	43	03.80	21	51	29.4	4.960 992	1.77	18.56	18	08	04
	1	4	43	23.56	21	52	17.4	4.977 183	1.77	18.50	18	04	28
	2	4	43	44.09	21	53	06.4	4.993 381	1.76	18.44	18	00	53
	3	4	44	05.37	21	53	56.6	5.009 580	1.76	18.38	17	57	19
	4	4	44	27.41	21	54	47.9	5.025 778	1.75	18.32	17	53	46
	5	4	44	50.18	+21	55	40.2	5.041 968	1.74	18.26	17	50	13
	6	4	45	13.69	21	56	33.6	5.058 147	1.74	18.20	17	46	41
	7	4	45	37.92	21	57	27.9	5.074 312	1.73	18.14	17	43	10
	8	4	46	02.86	21	58	23.3	5.090 457	1.73	18.08	17	39	39
	9	4	46	28.50	21	59	19.5	5.106 580	1.72	18.03	17	36	09
	10	4	46	54.83	22	00	16.7	5.122 677	1.72	17.97	17	32	40
	11	4	47	21.84	+22	01	14.7	5.138 745	1.71	17.91	17	29	11
	12	4	47	49.53	22	02	13.4	5.154 779	1.71	17.86	17	25	43
	13	4	48	17.88	22	03	12.9	5.170 777	1.70	17.80	17	22	16
	14	4	48	46.89	22	04	13.2	5.186 736	1.70	17.75	17	18	50
	15	4	49	16.56	22	05	14.1	5.202 652	1.69	17.69	17	15	24
	16	4	49	46.87	22	06	15.6	5.218 522	1.69	17.64	17	11	58
	17	4	50	17.82	+22	07	17.8	5.234 342	1.68	17.59	17	08	34
	18	4	50	49.40	22	08	20.5	5.250 110	1.68	17.53	17	05	10
	19	4	51	21.61	22	09	23.8	5.265 823	1.67	17.48	17	01	46
	20	4	51	54.44	22	10	27.7	5.281 477	1.67	17.43	16	58	24
	21	4	52	27.88	22	11	32.0	5.297 069	1.66	17.38	16	55	01
	22	4	53	01.93	22	12	36.8	5.312 596	1.66	17.33	16	51	40
	23	4	53	36.57	+22	13	42.0	5.328 055	1.65	17.28	16	48	19
	24	4	54	11.80	22	14	47.7	5.343 442	1.65	17.23	16	44	58
	25	4	54	47.60	22	15	53.7	5.358 754	1.64	17.18	16	41	38
	26	4	55	23.98	22	16	60.0	5.373 989	1.64	17.13	16	38	19
	27	4	56	00.92	22	18	06.6	5.389 143	1.63	17.08	16	35	00
	28	4	56	38.42	22	19	13.4	5.404 212	1.63	17.03	16	31	42
	29	4	57	16.47	+22	20	20.3	5.419 193	1.62	16.99	16	28	24
	30	4	57	55.06	22	21	27.4	5.434 082	1.62	16.94	16	25	07
	31	4	58	34.19	22	22	34.6	5.448 878	1.61	16.90	16	21	51
Apr.	1	4	59	13.85	22	23	41.9	5.463 576	1.61	16.85	16	18	34
	2	4	59	54.04	+22	24	49.2	5.478 173	1.61	16.80	16	15	19

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 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
Apr.	1	4	59	13.85	+22	23	41.9	5.463 576	1.61	16.85	16	18	34
	2	4	59	54.04	22	24	49.2	5.478 173	1.61	16.80	16	15	19
	3	5	00	34.74	22	25	56.5	5.492 667	1.60	16.76	16	12	04
	4	5	01	15.94	22	27	03.9	5.507 055	1.60	16.72	16	08	49
	5	5	01	57.63	22	28	11.2	5.521 334	1.59	16.67	16	05	35
	6	5	02	39.80	22	29	18.4	5.535 503	1.59	16.63	16	02	21
	7	5	03	22.44	+22	30	25.5	5.549 558	1.58	16.59	15	59	08
	8	5	04	05.54	22	31	32.4	5.563 498	1.58	16.55	15	55	56
	9	5	04	49.10	22	32	39.1	5.577 321	1.58	16.51	15	52	43
	10	5	05	33.11	22	33	45.5	5.591 024	1.57	16.47	15	49	32
	11	5	06	17.56	22	34	51.7	5.604 605	1.57	16.43	15	46	20
	12	5	07	02.45	22	35	57.5	5.618 064	1.57	16.39	15	43	09
	13	5	07	47.77	+22	37	03.0	5.631 396	1.56	16.35	15	39	59
	14	5	08	33.51	22	38	08.1	5.644 601	1.56	16.31	15	36	49
	15	5	09	19.68	22	39	12.9	5.657 677	1.55	16.27	15	33	39
	16	5	10	06.25	22	40	17.2	5.670 622	1.55	16.23	15	30	29
	17	5	10	53.23	22	41	21.1	5.683 433	1.55	16.20	15	27	21
	18	5	11	40.61	22	42	24.5	5.696 109	1.54	16.16	15	24	12
	19	5	12	28.38	+22	43	27.4	5.708 648	1.54	16.13	15	21	04
	20	5	13	16.53	22	44	29.9	5.721 048	1.54	16.09	15	17	56
	21	5	14	05.06	22	45	31.8	5.733 306	1.53	16.06	15	14	49
	22	5	14	53.95	22	46	33.1	5.745 422	1.53	16.02	15	11	42
	23	5	15	43.21	22	47	33.8	5.757 392	1.53	15.99	15	08	35
	24	5	16	32.82	22	48	33.8	5.769 214	1.52	15.96	15	05	29
	25	5	17	22.78	+22	49	33.1	5.780 887	1.52	15.92	15	02	23
	26	5	18	13.09	22	50	31.7	5.792 408	1.52	15.89	14	59	17
	27	5	19	03.74	22	51	29.5	5.803 775	1.52	15.86	14	56	12
	28	5	19	54.72	22	52	26.6	5.814 986	1.51	15.83	14	53	07
	29	5	20	46.04	22	53	22.8	5.826 039	1.51	15.80	14	50	02
	30	5	21	37.67	22	54	18.3	5.836 932	1.51	15.77	14	46	58
May	1	5	22	29.62	+22	55	12.9	5.847 663	1.50	15.74	14	43	54
	2	5	23	21.86	22	56	06.7	5.858 231	1.50	15.71	14	40	50
	3	5	24	14.40	22	56	59.7	5.868 635	1.50	15.69	14	37	47
	4	5	25	07.22	22	57	51.7	5.878 873	1.50	15.66	14	34	44
	5	5	26	00.31	22	58	42.8	5.888 945	1.49	15.63	14	31	41
	6	5	26	53.67	22	59	33.0	5.898 848	1.49	15.61	14	28	38
	7	5	27	47.29	+23	00	22.1	5.908 582	1.49	15.58	14	25	36
	8	5	28	41.17	23	01	10.2	5.918 146	1.49	15.56	14	22	33
	9	5	29	35.31	23	01	57.3	5.927 540	1.48	15.53	14	19	32
	10	5	30	29.69	23	02	43.3	5.936 761	1.48	15.51	14	16	30
	11	5	31	24.31	23	03	28.3	5.945 809	1.48	15.48	14	13	28
	12	5	32	19.17	23	04	12.2	5.954 683	1.48	15.46	14	10	27
	13	5	33	14.26	+23	04	55.0	5.963 383	1.47	15.44	14	07	26
	14	5	34	09.58	23	05	36.6	5.971 906	1.47	15.42	14	04	26
	15	5	35	05.12	23	06	17.2	5.980 253	1.47	15.39	14	01	25
	16	5	36	00.87	23	06	56.7	5.988 422	1.47	15.37	13	58	25
	17	5	36	56.84	+23	07	35.0	5.996 412	1.47	15.35	13	55	25

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 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
May	17	5	36	56.84	+23	07	35.0	5.996 412	1.47	15.35	13	55	25
	18	5	37	53.00	23	08	12.1	6.004 221	1.46	15.33	13	52	25
	19	5	38	49.36	23	08	48.1	6.011 850	1.46	15.31	13	49	25
	20	5	39	45.90	23	09	22.9	6.019 297	1.46	15.29	13	46	26
	21	5	40	42.63	23	09	56.4	6.026 560	1.46	15.28	13	43	26
	22	5	41	39.54	23	10	28.7	6.033 639	1.46	15.26	13	40	27
	23	5	42	36.62	+23	10	59.7	6.040 532	1.46	15.24	13	37	28
	24	5	43	33.88	23	11	29.4	6.047 238	1.45	15.22	13	34	29
June	25	5	44	31.30	23	11	57.8	6.053 755	1.45	15.21	13	31	31
	26	5	45	28.89	23	12	24.9	6.060 083	1.45	15.19	13	28	32
	27	5	46	26.63	23	12	50.7	6.066 221	1.45	15.18	13	25	34
	28	5	47	24.52	23	13	15.2	6.072 167	1.45	15.16	13	22	35
	29	5	48	22.55	+23	13	38.4	6.077 920	1.45	15.15	13	19	37
	30	5	49	20.71	23	14	00.2	6.083 480	1.45	15.13	13	16	39
	31	5	50	18.99	23	14	20.8	6.088 847	1.44	15.12	13	13	42
	1	5	51	17.39	23	14	40.0	6.094 020	1.44	15.11	13	10	44
	2	5	52	15.89	23	14	57.8	6.098 999	1.44	15.09	13	07	46
	3	5	53	14.50	23	15	14.2	6.103 783	1.44	15.08	13	04	49
	4	5	54	13.21	+23	15	29.2	6.108 372	1.44	15.07	13	01	51
	5	5	55	12.01	23	15	42.8	6.112 767	1.44	15.06	12	58	54
	6	5	56	10.90	23	15	55.0	6.116 966	1.44	15.05	12	55	57
	7	5	57	09.87	23	16	05.7	6.120 970	1.44	15.04	12	52	59
	8	5	58	08.93	23	16	15.1	6.124 778	1.44	15.03	12	50	02
	9	5	59	08.06	23	16	23.0	6.128 391	1.43	15.02	12	47	05
	10	6	00	07.27	+23	16	29.6	6.131 808	1.43	15.01	12	44	08
	11	6	01	06.55	23	16	34.7	6.135 029	1.43	15.01	12	41	12
	12	6	02	05.88	23	16	38.4	6.138 053	1.43	15.00	12	38	15
	13	6	03	05.27	23	16	40.7	6.140 881	1.43	14.99	12	35	18
	14	6	04	04.71	23	16	41.6	6.143 513	1.43	14.98	12	32	21
	15	6	05	04.20	23	16	41.1	6.145 947	1.43	14.98	12	29	25
	16	6	06	03.72	+23	16	39.2	6.148 183	1.43	14.97	12	26	28
	17	6	07	03.28	23	16	35.8	6.150 222	1.43	14.97	12	23	31
	18	6	08	02.87	23	16	31.0	6.152 062	1.43	14.96	12	20	35
	19	6	09	02.48	23	16	24.7	6.153 703	1.43	14.96	12	17	38
	20	6	10	02.11	23	16	17.0	6.155 145	1.43	14.96	12	14	42
	21	6	11	01.77	23	16	07.7	6.156 387	1.43	14.95	12	11	45
	22	6	12	01.44	+23	15	57.0	6.157 428	1.43	14.95	12	08	49
	23	6	13	01.13	23	15	44.9	6.158 268	1.43	14.95	12	05	52
	24	6	14	00.85	23	15	31.0	6.158 907	1.43	14.95	12	02	55
	25	6	15	00.39	23	15	16.0	6.159 345	1.43	14.95	11	59	59
	26	6	16	00.11	23	15	00.0	6.159 581	1.43	14.95	11	57	02
	27	6	16	59.76	23	14	42.3	6.159 616	1.43	14.95	11	54	06
July	28	6	17	59.38	+23	14	23.1	6.159 449	1.43	14.95	11	51	09
	29	6	18	58.96	23	14	02.5	6.159 082	1.43	14.95	11	48	13
	30	6	19	58.50	23	13	40.5	6.158 514	1.43	14.95	11	45	16
	1	6	20	57.99	23	13	17.1	6.157 745	1.43	14.95	11	42	19
	2	6	21	57.44	+23	12	52.2	6.156 777	1.43	14.95	11	39	22

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 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
July	1	6	20	57.99	+23	13	17.1	6.157 745	1.43	14.95	11	42	19
	2	6	21	57.44	23	12	52.2	6.156 777	1.43	14.95	11	39	22
	3	6	22	56.83	23	12	26.0	6.155 610	1.43	14.96	11	36	26
	4	6	23	56.16	23	11	58.3	6.154 244	1.43	14.96	11	33	29
	5	6	24	55.43	23	11	29.3	6.152 680	1.43	14.96	11	30	32
	6	6	25	54.64	23	10	58.9	6.150 919	1.43	14.97	11	27	35
	7	6	26	53.77	+23	10	27.1	6.148 960	1.43	14.97	11	24	38
	8	6	27	52.83	23	09	54.1	6.146 804	1.43	14.98	11	21	40
	9	6	28	51.81	23	09	19.6	6.144 452	1.43	14.98	11	18	43
	10	6	29	50.71	23	08	43.9	6.141 905	1.43	14.99	11	15	46
	11	6	30	49.51	23	08	06.9	6.139 162	1.43	15.00	11	12	48
	12	6	31	48.21	23	07	28.6	6.136 224	1.43	15.00	11	09	51
	13	6	32	46.81	+23	06	49.0	6.133 092	1.43	15.01	11	06	53
	14	6	33	45.30	23	06	08.2	6.129 765	1.43	15.02	11	03	56
	15	6	34	43.68	23	05	26.0	6.126 245	1.44	15.03	11	00	58
	16	6	35	41.94	23	04	42.6	6.122 530	1.44	15.04	10	58	00
	17	6	36	40.08	23	03	57.9	6.118 622	1.44	15.05	10	55	02
	18	6	37	38.09	23	03	11.9	6.114 519	1.44	15.06	10	52	03
	19	6	38	35.98	+23	02	24.7	6.110 224	1.44	15.07	10	49	05
	20	6	39	33.75	23	01	36.3	6.105 735	1.44	15.08	10	46	07
	21	6	40	31.37	23	00	46.6	6.101 054	1.44	15.09	10	43	08
	22	6	41	28.85	22	59	55.9	6.096 180	1.44	15.10	10	40	09
	23	6	42	26.17	22	59	03.9	6.091 113	1.44	15.11	10	37	10
	24	6	43	23.34	22	58	10.9	6.085 856	1.45	15.13	10	34	11
	25	6	44	20.33	+22	57	16.7	6.080 408	1.45	15.14	10	31	12
	26	6	45	17.15	22	56	21.5	6.074 770	1.45	15.15	10	28	12
	27	6	46	13.78	22	55	25.2	6.068 943	1.45	15.17	10	25	13
	28	6	47	10.22	22	54	27.8	6.062 929	1.45	15.18	10	22	13
	29	6	48	06.47	22	53	29.3	6.056 728	1.45	15.20	10	19	13
	30	6	49	02.52	22	52	29.8	6.050 342	1.45	15.22	10	16	13
Aug.	31	6	49	58.37	+22	51	29.3	6.043 772	1.46	15.23	10	13	12
	1	6	50	54.02	22	50	27.8	6.037 019	1.46	15.25	10	10	12
	2	6	51	49.45	22	49	25.3	6.030 085	1.46	15.27	10	07	11
	3	6	52	44.67	22	48	21.8	6.022 970	1.46	15.28	10	04	10
	4	6	53	39.67	22	47	17.5	6.015 676	1.46	15.30	10	01	09
	5	6	54	34.44	22	46	12.3	6.008 204	1.46	15.32	9	58	07
	6	6	55	28.98	+22	45	06.2	6.000 555	1.47	15.34	9	55	05
	7	6	56	23.28	22	43	59.3	5.992 730	1.47	15.36	9	52	03
	8	6	57	17.33	22	42	51.6	5.984 732	1.47	15.38	9	49	01
	9	6	58	11.13	22	41	43.1	5.976 560	1.47	15.40	9	45	59
	10	6	59	04.67	22	40	33.9	5.968 216	1.47	15.43	9	42	56
	11	6	59	57.96	22	39	23.9	5.959 700	1.48	15.45	9	39	53
	12	7	00	50.97	+22	38	13.1	5.951 015	1.48	15.47	9	36	50
	13	7	01	43.72	22	37	01.6	5.942 160	1.48	15.49	9	33	46
	14	7	02	36.19	22	35	49.4	5.933 137	1.48	15.52	9	30	42
	15	7	03	28.38	22	34	36.5	5.923 946	1.48	15.54	9	27	38
16	7	04	20.29	+22	33	23.0	5.914 588	1.49	15.56	9	24	34	

JUPITER, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
Aug.	16	7	04	20.29	+22	33	23.0	5.914 588	1.49	15.56	9	24	34
	17	7	05	11.91	22	32	08.9	5.905 066	1.49	15.59	9	21	29
	18	7	06	03.24	22	30	54.2	5.895 379	1.49	15.62	9	18	24
	19	7	06	54.26	22	29	38.9	5.885 528	1.49	15.64	9	15	19
	20	7	07	44.97	22	28	23.2	5.875 516	1.50	15.67	9	12	13
	21	7	08	35.35	22	27	07.1	5.865 344	1.50	15.70	9	09	08
	22	7	09	25.40	+22	25	50.5	5.855 013	1.50	15.72	9	06	01
Sept.	23	7	10	15.11	22	24	33.5	5.844 526	1.50	15.75	9	02	55
	24	7	11	04.47	22	23	16.1	5.833 883	1.51	15.78	8	59	48
	25	7	11	53.48	22	21	58.3	5.823 087	1.51	15.81	8	56	41
	26	7	12	42.14	22	20	40.2	5.812 140	1.51	15.84	8	53	33
	27	7	13	30.43	22	19	21.9	5.801 045	1.52	15.87	8	50	25
	28	7	14	18.36	+22	18	03.2	5.789 802	1.52	15.90	8	47	17
	29	7	15	05.91	22	16	44.3	5.778 414	1.52	15.93	8	44	08
	30	7	15	53.09	22	15	25.2	5.766 884	1.52	15.96	8	40	59
	31	7	16	39.88	22	14	06.0	5.755 213	1.53	16.00	8	37	49
	1	7	17	26.28	22	12	46.7	5.743 404	1.53	16.03	8	34	39
	2	7	18	12.28	22	11	27.3	5.731 458	1.53	16.06	8	31	29
	3	7	18	57.88	+22	10	07.9	5.719 378	1.54	16.10	8	28	18
	4	7	19	43.07	22	08	48.5	5.707 167	1.54	16.13	8	25	07
	5	7	20	27.83	22	07	29.2	5.694 825	1.54	16.17	8	21	56
	6	7	21	12.17	22	06	09.9	5.682 355	1.55	16.20	8	18	44
	7	7	21	56.08	22	04	50.7	5.669 760	1.55	16.24	8	15	32
	8	7	22	39.55	22	03	31.6	5.657 040	1.55	16.27	8	12	19
	9	7	23	22.58	+22	02	12.7	5.644 199	1.56	16.31	8	09	05
	10	7	24	05.16	22	00	53.9	5.631 237	1.56	16.35	8	05	52
	11	7	24	47.29	21	59	35.3	5.618 158	1.57	16.39	8	02	38
	12	7	25	28.96	21	58	17.0	5.604 962	1.57	16.42	7	59	23
13	7	26	10.17	21	56	58.9	5.591 651	1.57	16.46	7	56	08	
14	7	26	50.91	21	55	41.2	5.578 228	1.58	16.50	7	52	52	
15	7	27	31.16	+21	54	23.9	5.564 695	1.58	16.54	7	49	36	
16	7	28	10.93	21	53	07.1	5.551 055	1.58	16.58	7	46	20	
17	7	28	50.19	21	51	50.7	5.537 309	1.59	16.63	7	43	03	
18	7	29	28.94	21	50	34.9	5.523 460	1.59	16.67	7	39	45	
19	7	30	07.17	21	49	19.6	5.509 512	1.60	16.71	7	36	27	
20	7	30	44.87	21	48	04.9	5.495 466	1.60	16.75	7	33	09	
21	7	31	22.04	+21	46	50.8	5.481 327	1.60	16.80	7	29	50	
22	7	31	58.67	21	45	37.4	5.467 096	1.61	16.84	7	26	30	
23	7	32	34.75	21	44	24.7	5.452 778	1.61	16.88	7	23	10	
24	7	33	10.28	21	43	12.7	5.438 375	1.62	16.93	7	19	49	
25	7	33	45.24	21	42	01.5	5.423 890	1.62	16.97	7	16	28	
26	7	34	19.64	21	40	51.1	5.409 327	1.63	17.02	7	13	06	
27	7	34	53.47	+21	39	41.6	5.394 689	1.63	17.06	7	09	44	
28	7	35	26.72	21	38	33.1	5.379 980	1.63	17.11	7	06	21	
29	7	35	59.38	21	37	25.4	5.365 202	1.64	17.16	7	02	57	
30	7	36	31.44	21	36	18.9	5.350 359	1.64	17.21	6	59	33	
Oct. 1	7	37	02.90	+21	35	13.3	5.335 454	1.65	17.25	6	56	08	

JUPITER, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
	h	m	s	°	'	"				h	m	s
Oct.	1	7	37	02.90	+21	35	13.3	5.335 454	1.65	17.25	6	56 08
	2	7	37	33.75	21	34	08.9	5.320 491	1.65	17.30	6	52 43
	3	7	38	03.98	21	33	05.6	5.305 472	1.66	17.35	6	49 17
	4	7	38	33.58	21	32	03.4	5.290 402	1.66	17.40	6	45 50
	5	7	39	02.55	21	31	02.4	5.275 283	1.67	17.45	6	42 23
	6	7	39	30.89	21	30	02.6	5.260 119	1.67	17.50	6	38 55
	7	7	39	58.58	+21	29	04.1	5.244 912	1.68	17.55	6	35 26
	8	7	40	25.62	21	28	06.8	5.229 666	1.68	17.60	6	31 57
	9	7	40	52.02	21	27	10.8	5.214 384	1.69	17.66	6	28 27
	10	7	41	17.75	21	26	16.2	5.199 068	1.69	17.71	6	24 57
	11	7	41	42.82	21	25	22.9	5.183 723	1.70	17.76	6	21 26
	12	7	42	07.22	21	24	31.1	5.168 352	1.70	17.81	6	17 54
	13	7	42	30.92	+21	23	40.9	5.152 958	1.71	17.87	6	14 21
	14	7	42	53.93	21	22	52.2	5.137 544	1.71	17.92	6	10 48
	15	7	43	16.24	21	22	05.0	5.122 115	1.72	17.97	6	07 14
	16	7	43	37.83	21	21	19.5	5.106 674	1.72	18.03	6	03 40
	17	7	43	58.69	21	20	35.6	5.091 226	1.73	18.08	6	00 04
	18	7	44	18.83	21	19	53.4	5.075 775	1.73	18.14	5	56 28
	19	7	44	38.23	+21	19	12.9	5.060 326	1.74	18.19	5	52 51
	20	7	44	56.89	21	18	34.1	5.044 881	1.74	18.25	5	49 14
	21	7	45	14.81	21	17	57.1	5.029 447	1.75	18.30	5	45 36
	22	7	45	31.97	21	17	21.9	5.014 027	1.75	18.36	5	41 57
	23	7	45	48.37	21	16	48.5	4.998 626	1.76	18.42	5	38 17
	24	7	46	04.02	21	16	17.0	4.983 248	1.76	18.47	5	34 36
	25	7	46	18.89	+21	15	47.4	4.967 898	1.77	18.53	5	30 55
	26	7	46	32.99	21	15	19.8	4.952 581	1.78	18.59	5	27 13
	27	7	46	46.31	21	14	54.1	4.937 301	1.78	18.65	5	23 30
	28	7	46	58.84	21	14	30.4	4.922 063	1.79	18.70	5	19 46
	29	7	47	10.58	21	14	08.8	4.906 871	1.79	18.76	5	16 02
	30	7	47	21.53	21	13	49.2	4.891 729	1.80	18.82	5	12 17
Nov.	31	7	47	31.67	+21	13	31.6	4.876 643	1.80	18.88	5	08 31
	1	7	47	41.00	21	13	16.2	4.861 617	1.81	18.94	5	04 44
	2	7	47	49.53	21	13	02.8	4.846 655	1.81	18.99	5	00 56
	3	7	47	57.24	21	12	51.4	4.831 762	1.82	19.05	4	57 08
	4	7	48	04.14	21	12	42.2	4.816 941	1.83	19.11	4	53 19
	5	7	48	10.23	21	12	35.1	4.802 198	1.83	19.17	4	49 29
	6	7	48	15.50	+21	12	30.0	4.787 536	1.84	19.23	4	45 38
	7	7	48	19.96	21	12	27.1	4.772 960	1.84	19.29	4	41 46
	8	7	48	23.59	21	12	26.4	4.758 473	1.85	19.35	4	37 54
	9	7	48	26.39	21	12	27.9	4.744 081	1.85	19.41	4	34 01
	10	7	48	28.36	21	12	31.6	4.729 788	1.86	19.46	4	30 07
	11	7	48	29.49	21	12	37.5	4.715 599	1.86	19.52	4	26 12
	12	7	48	29.77	+21	12	45.6	4.701 519	1.87	19.58	4	22 16
	13	7	48	29.20	21	12	56.0	4.687 552	1.88	19.64	4	18 19
	14	7	48	27.78	21	13	08.6	4.673 705	1.88	19.70	4	14 22
	15	7	48	25.51	21	13	23.4	4.659 982	1.89	19.76	4	10 23
	16	7	48	22.40	+21	13	40.4	4.646 388	1.89	19.81	4	06 24

JUPITER, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
Nov.	16	7	48	22.40	+21	13	40.4	4.646 388	1.89	19.81	4	06	24
	17	7	48	18.44	21	13	59.6	4.632 929	1.90	19.87	4	02	24
	18	7	48	13.63	21	14	21.0	4.619 609	1.90	19.93	3	58	23
	19	7	48	07.98	21	14	44.6	4.606 435	1.91	19.99	3	54	22
	20	7	48	01.48	21	15	10.3	4.593 410	1.91	20.04	3	50	19
	21	7	47	54.15	21	15	38.3	4.580 542	1.92	20.10	3	46	16
	22	7	47	45.98	+21	16	08.4	4.567 834	1.93	20.15	3	42	12
	23	7	47	36.97	21	16	40.7	4.555 292	1.93	20.21	3	38	07
	24	7	47	27.13	21	17	15.2	4.542 920	1.94	20.26	3	34	01
	25	7	47	16.47	21	17	51.8	4.530 725	1.94	20.32	3	29	54
Dec.	26	7	47	04.98	21	18	30.4	4.518 710	1.95	20.37	3	25	47
	27	7	46	52.67	21	19	11.1	4.506 881	1.95	20.43	3	21	39
	28	7	46	39.55	+21	19	53.9	4.495 243	1.96	20.48	3	17	30
	29	7	46	25.63	21	20	38.6	4.483 799	1.96	20.53	3	13	20
	30	7	46	10.91	21	21	25.3	4.472 555	1.97	20.58	3	09	09
	1	7	45	55.40	21	22	13.8	4.461 516	1.97	20.63	3	04	58
	2	7	45	39.12	21	23	04.2	4.450 684	1.98	20.68	3	00	45
	3	7	45	22.07	21	23	56.4	4.440 065	1.98	20.73	2	56	32
	4	7	45	04.27	+21	24	50.4	4.429 662	1.99	20.78	2	52	19
	5	7	44	45.72	21	25	46.1	4.419 480	1.99	20.83	2	48	04
	6	7	44	26.43	21	26	43.6	4.409 522	1.99	20.88	2	43	49
	7	7	44	06.41	21	27	42.8	4.399 794	2.00	20.92	2	39	33
	8	7	43	45.66	21	28	43.6	4.390 298	2.00	20.97	2	35	17
	9	7	43	24.20	21	29	46.0	4.381 040	2.01	21.01	2	30	59
	10	7	43	02.03	+21	30	50.0	4.372 024	2.01	21.06	2	26	41
	11	7	42	39.16	21	31	55.4	4.363 254	2.02	21.10	2	22	23
	12	7	42	15.62	21	33	02.3	4.354 734	2.02	21.14	2	18	03
	13	7	41	51.41	21	34	10.5	4.346 470	2.02	21.18	2	13	43
14	7	41	26.55	21	35	20.1	4.338 464	2.03	21.22	2	09	22	
15	7	41	01.07	21	36	30.9	4.330 721	2.03	21.26	2	05	01	
16	7	40	34.97	+21	37	42.8	4.323 245	2.03	21.29	2	00	39	
17	7	40	08.28	21	38	56.0	4.316 041	2.04	21.33	1	56	17	
18	7	39	41.00	21	40	10.2	4.309 111	2.04	21.36	1	51	54	
19	7	39	13.17	21	41	25.4	4.302 460	2.04	21.40	1	47	30	
20	7	38	44.80	21	42	41.6	4.296 091	2.05	21.43	1	43	06	
21	7	38	15.91	21	43	58.7	4.290 007	2.05	21.46	1	38	41	
22	7	37	46.51	+21	45	16.6	4.284 211	2.05	21.49	1	34	16	
23	7	37	16.63	21	46	35.3	4.278 708	2.06	21.52	1	29	50	
24	7	36	46.30	21	47	54.7	4.273 498	2.06	21.54	1	25	24	
25	7	36	15.52	21	49	14.7	4.268 585	2.06	21.57	1	20	58	
26	7	35	44.33	21	50	35.2	4.263 972	2.06	21.59	1	16	31	
27	7	35	12.75	21	51	56.1	4.259 660	2.06	21.61	1	12	03	
28	7	34	40.80	+21	53	17.4	4.255 651	2.07	21.63	1	07	36	
29	7	34	08.51	21	54	39.0	4.251 948	2.07	21.65	1	03	08	
30	7	33	35.91	21	56	00.8	4.248 551	2.07	21.67	0	58	39	
31	7	33	03.02	21	57	22.8	4.245 463	2.07	21.68	0	54	11	
32	7	32	29.87	+21	58	44.8	4.242 683	2.07	21.70	0	49	42	

SATURN, 2025
HELIOCENTRIC POSITIONS FOR 0^h TERRESTRIAL TIME
MEAN EQUINOX AND ECLIPTIC OF DATE

Date	Heliocentric Longitude				Heliocentric Latitude			Radius Vector		Date	Heliocentric Longitude				Heliocentric Latitude			Radius Vector	
		°	'	"	°	'	"				°	'	"	°	'	"			
Jan.	1	349	47	03.7	-2	03	30.7	9.630 4378	Apr.	3	352	48	57.5	-2	07	45.4	9.602 4935		
	3	349	51	00.3	2	03	36.4	9.629 8332		5	352	52	55.5	2	07	50.7	9.601 8833		
	5	349	54	57.0	2	03	42.2	9.629 2285		7	352	56	53.5	2	07	56.0	9.601 2731		
	7	349	58	53.6	2	03	47.9	9.628 6236		9	353	00	51.5	2	08	01.3	9.600 6628		
	9	350	02	50.3	2	03	53.6	9.628 0186		11	353	04	49.5	2	08	06.6	9.600 0524		
	11	350	06	47.0	2	03	59.3	9.627 4134		13	353	08	47.6	2	08	11.9	9.599 4418		
	13	350	10	43.7	-2	04	05.0	9.626 8081		15	353	12	45.7	-2	08	17.1	9.598 8312		
	15	350	14	40.5	2	04	10.7	9.626 2027		17	353	16	43.8	2	08	22.4	9.598 2205		
	17	350	18	37.3	2	04	16.4	9.625 5971		19	353	20	42.0	2	08	27.7	9.597 6097		
	19	350	22	34.1	2	04	22.1	9.624 9914		21	353	24	40.2	2	08	32.9	9.596 9988		
Feb.	21	350	26	31.0	2	04	27.7	9.624 3855	23	353	28	38.4	2	08	38.1	9.596 3878			
	23	350	30	27.9	2	04	33.4	9.623 7795	25	353	32	36.7	2	08	43.3	9.595 7767			
	25	350	34	24.8	-2	04	39.0	9.623 1734	27	353	36	34.9	-2	08	48.6	9.595 1655			
	27	350	38	21.7	2	04	44.6	9.622 5671	29	353	40	33.2	2	08	53.8	9.594 5542			
	29	350	42	18.7	2	04	50.3	9.621 9608	May	1	353	44	31.6	2	08	59.0	9.593 9428		
	31	350	46	15.7	2	04	55.9	9.621 3542		3	353	48	30.0	2	09	04.1	9.593 3313		
	2	350	50	12.8	2	05	01.5	9.620 7476	5	353	52	28.4	2	09	09.3	9.592 7197			
	4	350	54	09.8	2	05	07.1	9.620 1408	7	353	56	26.8	2	09	14.5	9.592 1081			
	6	350	58	06.9	-2	05	12.7	9.619 5339	9	354	00	25.3	-2	09	19.6	9.591 4963			
	8	351	02	04.0	2	05	18.3	9.618 9269	11	354	04	23.8	2	09	24.8	9.590 8845			
Mar.	10	351	06	01.2	2	05	23.8	9.618 3197	13	354	08	22.3	2	09	29.9	9.590 2725			
	12	351	09	58.4	2	05	29.4	9.617 7125	15	354	12	20.9	2	09	35.0	9.589 6605			
	14	351	13	55.6	2	05	34.9	9.617 1051	17	354	16	19.4	2	09	40.1	9.589 0484			
	16	351	17	52.8	2	05	40.5	9.616 4976	19	354	20	18.0	2	09	45.3	9.588 4361			
	18	351	21	50.1	-2	05	46.0	9.615 8899	21	354	24	16.7	-2	09	50.4	9.587 8238			
	20	351	25	47.4	2	05	51.6	9.615 2822	23	354	28	15.3	2	09	55.4	9.587 2114			
	22	351	29	44.7	2	05	57.0	9.614 6743	25	354	32	14.0	2	10	00.5	9.586 5989			
	24	351	33	42.1	2	06	02.5	9.614 0663	27	354	36	12.8	2	10	05.6	9.585 9864			
	26	351	37	39.5	2	06	08.1	9.613 4582	29	354	40	11.6	2	10	10.7	9.585 3737			
	28	351	41	36.9	2	06	13.5	9.612 8500	31	354	44	10.4	2	10	15.7	9.584 7610			
Apr.	2	351	45	34.3	-2	06	19.0	9.612 2416	June	2	354	48	09.2	-2	10	20.7	9.584 1481		
	4	351	49	31.8	2	06	24.5	9.611 6332		4	354	52	08.0	2	10	25.7	9.583 5352		
	6	351	53	29.3	2	06	29.9	9.611 0246		6	354	56	06.9	2	10	30.8	9.582 9222		
	8	351	57	26.8	2	06	35.4	9.610 4159		8	355	00	05.8	2	10	35.8	9.582 3091		
	10	352	01	24.4	2	06	40.8	9.609 8071		10	355	04	04.8	2	10	40.8	9.581 6959		
	12	352	05	22.0	2	06	46.3	9.609 1982		12	355	08	03.8	2	10	45.8	9.581 0826		
	14	352	09	19.6	-2	06	51.7	9.608 5892		14	355	12	02.8	-2	10	50.8	9.580 4693		
	16	352	13	17.3	2	06	57.1	9.607 9801		16	355	16	01.8	2	10	55.7	9.579 8559		
	18	352	17	15.0	2	07	02.5	9.607 3709		18	355	20	00.9	2	11	00.7	9.579 2423		
	20	352	21	12.7	2	07	07.9	9.606 7616		20	355	23	60.0	2	11	05.6	9.578 6288		
Apr.	22	352	25	10.4	2	07	13.3	9.606 1522	22	355	27	59.1	2	11	10.5	9.578 0151			
	24	352	29	08.2	2	07	18.7	9.605 5426	24	355	31	58.3	2	11	15.5	9.577 4013			
	26	352	33	06.0	-2	07	24.0	9.604 9330	26	355	35	57.4	-2	11	20.4	9.576 7875			
	28	352	37	03.8	2	07	29.4	9.604 3233	28	355	39	56.7	2	11	25.3	9.576 1736			
	30	352	41	01.7	2	07	34.7	9.603 7134	30	355	43	55.9	2	11	30.2	9.575 5596			
	1	352	44	59.6	2	07	40.1	9.603 1035	July	2	355	47	55.2	2	11	35.1	9.574 9455		
	3	352	48	57.5	-2	07	45.4	9.602 4935		4	355	51	54.5	-2	11	40.0	9.574 3314		

SATURN, 2025
HELIOCENTRIC POSITIONS FOR 0^h TERRESTRIAL TIME
MEAN EQUINOX AND ECLIPTIC OF DATE

Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector	Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector
	°	'	"		°	'	"				°	'	"		°	'	"		
July	2	355	47	55.2	-2	11	35.1	9.574 9455	Oct.	2	358	51	55.0	-2	15	09.0	9.546 6274		
	4	355	51	54.5	2	11	40.0	9.574 3314		4	358	55	55.7	2	15	13.5	9.546 0106		
	6	355	55	53.9	2	11	44.9	9.573 7172		6	358	59	56.5	2	15	17.8	9.545 3938		
	8	355	59	53.2	2	11	49.7	9.573 1029		8	359	03	57.3	2	15	22.2	9.544 7769		
	10	356	03	52.7	2	11	54.6	9.572 4885		10	359	07	58.0	2	15	26.6	9.544 1600		
	12	356	07	52.1	2	11	59.4	9.571 8741		12	359	11	58.9	2	15	31.0	9.543 5431		
	14	356	11	51.5	-2	12	04.2	9.571 2596		14	359	15	59.7	-2	15	35.4	9.542 9262		
	16	356	15	51.0	2	12	09.1	9.570 6450		16	359	20	00.6	2	15	39.7	9.542 3092		
	18	356	19	50.6	2	12	13.9	9.570 0303		18	359	24	01.6	2	15	44.0	9.541 6922		
	20	356	23	50.1	2	12	18.6	9.569 4156		20	359	28	02.5	2	15	48.3	9.541 0752		
	22	356	27	49.7	2	12	23.5	9.568 8007		22	359	32	03.5	2	15	52.6	9.540 4581		
	24	356	31	49.3	2	12	28.2	9.568 1859		24	359	36	04.5	2	15	57.0	9.539 8411		
Aug.	26	356	35	48.9	-2	12	33.0	9.567 5709	Nov.	26	359	40	05.6	-2	16	01.3	9.539 2240		
	28	356	39	48.6	2	12	37.7	9.566 9559		28	359	44	06.6	2	16	05.5	9.538 6069		
	30	356	43	48.3	2	12	42.5	9.566 3408		30	359	48	07.8	2	16	09.8	9.537 9897		
	1	356	47	48.1	2	12	47.3	9.565 7256		1	359	52	08.9	2	16	14.1	9.537 3725		
	3	356	51	47.8	2	12	52.0	9.565 1104		3	359	56	10.1	2	16	18.3	9.536 7554		
	5	356	55	47.7	2	12	56.7	9.564 4951		5	360	00	11.3	2	16	22.6	9.536 1382		
	7	356	59	47.5	-2	13	01.4	9.563 8798		7	360	04	12.5	-2	16	26.8	9.535 5209		
	9	357	03	47.3	2	13	06.1	9.563 2643		9	360	08	13.8	2	16	31.0	9.534 9037		
	11	357	07	47.2	2	13	10.8	9.562 6488		11	360	12	15.1	2	16	35.2	9.534 2864		
	13	357	11	47.1	2	13	15.5	9.562 0333		13	360	16	16.4	2	16	39.4	9.533 6692		
	15	357	15	47.1	2	13	20.1	9.561 4177		15	360	20	17.7	2	16	43.6	9.533 0519		
	17	357	19	47.1	2	13	24.8	9.560 8020		17	0	24	19.1	2	16	47.8	9.532 4346		
Sept.	19	357	23	47.1	-2	13	29.4	9.560 1863	Dec.	19	0	28	20.5	-2	16	52.0	9.531 8173		
	21	357	27	47.1	2	13	34.1	9.559 5705		21	0	32	22.0	2	16	56.1	9.531 1999		
	23	357	31	47.2	2	13	38.7	9.558 9546		23	0	36	23.5	2	17	00.2	9.530 5826		
	25	357	35	47.3	2	13	43.3	9.558 3387		25	0	40	25.0	2	17	04.4	9.529 9652		
	27	357	39	47.4	2	13	47.9	9.557 7227		27	0	44	26.5	2	17	08.5	9.529 3478		
	29	357	43	47.6	2	13	52.5	9.557 1067		29	0	48	28.1	2	17	12.6	9.528 7305		
	31	357	47	47.8	-2	13	57.1	9.556 4907		1	0	52	29.7	-2	17	16.7	9.528 1131		
	2	357	51	48.0	2	14	01.7	9.555 8745		3	0	56	31.3	2	17	20.8	9.527 4957		
	4	357	55	48.3	2	14	06.2	9.555 2584		5	1	00	33.0	2	17	24.9	9.526 8783		
	6	357	59	48.5	2	14	10.8	9.554 6421		7	1	04	34.7	2	17	29.0	9.526 2609		
	8	358	03	48.9	2	14	15.3	9.554 0259		9	1	08	36.4	2	17	33.0	9.525 6435		
	10	358	07	49.2	2	14	19.8	9.553 4096		11	1	12	38.2	2	17	37.0	9.525 0261		
Oct.	12	358	11	49.6	-2	14	24.4	9.552 7932		13	1	16	40.0	-2	17	41.1	9.524 4087		
	14	358	15	50.0	2	14	28.9	9.552 1768		15	1	20	41.8	2	17	45.1	9.523 7913		
	16	358	19	50.4	2	14	33.4	9.551 5603		17	1	24	43.6	2	17	49.1	9.523 1738		
	18	358	23	50.9	2	14	37.9	9.550 9439		19	1	28	45.5	2	17	53.2	9.522 5564		
	20	358	27	51.4	2	14	42.4	9.550 3273		21	1	32	47.4	2	17	57.1	9.521 9390		
	22	358	31	51.9	2	14	46.8	9.549 7108		23	1	36	49.4	2	18	01.1	9.521 3216		
	24	358	35	52.5	-2	14	51.3	9.549 0942		25	1	40	51.4	-2	18	05.1	9.520 7042		
	26	358	39	53.1	2	14	55.7	9.548 4775		27	1	44	53.3	2	18	09.0	9.520 0868		
	28	358	43	53.7	2	15	00.2	9.547 8608		29	1	48	55.4	2	18	13.0	9.519 4694		
	30	358	47	54.3	2	15	04.6	9.547 2441		31	1	52	57.4	2	18	16.9	9.518 8519		
	2	358	51	55.0	-2	15	09.0	9.546 6274		33	1	56	59.6	-2	18	20.9	9.518 2345		

SATURN, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Jan.	0	344	26	56.6	-1	58	47.3	Feb.	15	349	00	28.5	-1	54	49.4
	1	344	31	26.5	1	58	39.2		16	349	07	31.3	1	54	47.7
	2	344	36	01.1	1	58	31.3		17	349	14	35.8	1	54	46.1
	3	344	40	40.5	1	58	23.4		18	349	21	41.9	1	54	44.7
	4	344	45	24.5	1	58	15.6		19	349	28	49.7	1	54	43.4
	5	344	50	13.2	1	58	08.0		20	349	35	59.0	1	54	42.3
	6	344	55	06.4	-1	58	00.4		21	349	43	09.8	-1	54	41.3
	7	345	00	04.1	1	57	53.0		22	349	50	22.0	1	54	40.5
	8	345	05	06.4	1	57	45.7		23	349	57	35.6	1	54	39.9
	9	345	10	13.0	1	57	38.6		24	350	04	50.4	1	54	39.4
	10	345	15	24.0	1	57	31.5		25	350	12	06.3	1	54	39.0
	11	345	20	39.3	1	57	24.6		26	350	19	23.3	1	54	38.9
	12	345	25	58.8	-1	57	17.8	Mar.	27	350	26	41.2	-1	54	38.9
	13	345	31	22.4	1	57	11.1		28	350	34	00.1	1	54	39.0
	14	345	36	50.0	1	57	04.6		1	350	41	19.7	1	54	39.3
	15	345	42	21.6	1	56	58.2		2	350	48	40.2	1	54	39.8
	16	345	47	57.0	1	56	51.9		3	350	56	01.3	1	54	40.4
	17	345	53	36.2	1	56	45.8		4	351	03	23.2	1	54	41.2
	18	345	59	19.1	-1	56	39.8		5	351	10	45.7	-1	54	42.2
	19	346	05	05.8	1	56	33.9		6	351	18	08.7	1	54	43.3
	20	346	10	56.1	1	56	28.1		7	351	25	32.2	1	54	44.6
	21	346	16	50.1	1	56	22.5		8	351	32	56.0	1	54	46.1
	22	346	22	47.6	1	56	17.1		9	351	40	20.1	1	54	47.7
	23	346	28	48.6	1	56	11.7		10	351	47	44.4	1	54	49.5
	24	346	34	53.1	-1	56	06.6		11	351	55	08.7	-1	54	51.5
	25	346	41	01.0	1	56	01.5		12	352	02	33.1	1	54	53.7
	26	346	47	12.2	1	55	56.6		13	352	09	57.4	1	54	56.0
	27	346	53	26.6	1	55	51.8		14	352	17	21.6	1	54	58.4
	28	346	59	44.2	1	55	47.2		15	352	24	45.8	1	55	00.9
	29	347	06	04.8	1	55	42.7		16	352	32	09.8	1	55	03.6
	30	347	12	28.3	-1	55	38.3		17	352	39	33.7	-1	55	06.5
	31	347	18	54.7	1	55	34.1		18	352	46	57.3	1	55	09.6
Feb.	1	347	25	23.9	1	55	30.1		19	352	54	20.5	1	55	12.8
	2	347	31	55.8	1	55	26.2		20	353	01	43.5	1	55	16.2
	3	347	38	30.3	1	55	22.4		21	353	09	05.9	1	55	19.8
	4	347	45	07.5	1	55	18.8		22	353	16	27.9	1	55	23.5
	5	347	51	47.3	-1	55	15.4		23	353	23	49.3	-1	55	27.4
	6	347	58	29.6	1	55	12.1		24	353	31	10.0	1	55	31.5
	7	348	05	14.3	1	55	08.9		25	353	38	29.9	1	55	35.7
	8	348	12	01.3	1	55	05.9		26	353	45	49.0	1	55	40.0
	9	348	18	50.6	1	55	03.1		27	353	53	07.2	1	55	44.6
	10	348	25	42.0	1	55	00.4		28	354	00	24.3	1	55	49.2
	11	348	32	35.5	-1	54	57.9	Apr.	29	354	07	40.4	-1	55	54.1
	12	348	39	31.0	1	54	55.6		30	354	14	55.4	1	55	59.1
	13	348	46	28.3	1	54	53.3		31	354	22	09.3	1	56	04.3
	14	348	53	27.5	1	54	51.3		1	354	29	22.0	1	56	09.6
	15	349	00	28.5	-1	54	49.4		2	354	36	33.4	-1	56	15.1

SATURN, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Apr.	1	354	29	22.0	-1	56	09.6	May	17	359	20	42.6	-2	03	04.5
	2	354	36	33.4	1	56	15.1		18	359	25	47.2	2	03	17.0
	3	354	43	43.6	1	56	20.8		19	359	30	47.5	2	03	29.5
	4	354	50	52.2	1	56	26.6		20	359	35	43.7	2	03	42.3
	5	354	57	59.4	1	56	32.6		21	359	40	35.5	2	03	55.1
	6	355	05	05.0	1	56	38.8		22	359	45	23.0	2	04	08.1
	7	355	12	08.8	-1	56	45.1		23	359	50	06.2	-2	04	21.1
	8	355	19	10.9	1	56	51.6		24	359	54	44.8	2	04	34.4
	9	355	26	11.2	1	56	58.3		25	359	59	19.1	2	04	47.7
	10	355	33	09.7	1	57	05.1		26	0	03	48.8	2	05	01.2
	11	355	40	06.2	1	57	12.1		27	0	08	14.0	2	05	14.8
	12	355	47	00.8	1	57	19.2		28	0	12	34.6	2	05	28.5
	13	355	53	53.5	-1	57	26.5	June	29	0	16	50.5	-2	05	42.3
	14	356	00	44.1	1	57	33.9		30	0	21	01.6	2	05	56.3
	15	356	07	32.7	1	57	41.5		31	0	25	07.8	2	06	10.3
	16	356	14	19.2	1	57	49.3		1	0	29	09.0	2	06	24.5
	17	356	21	03.5	1	57	57.2		2	0	33	05.3	2	06	38.8
	18	356	27	45.5	1	58	05.2		3	0	36	56.6	2	06	53.2
	19	356	34	25.2	-1	58	13.4		4	0	40	42.8	-2	07	07.7
	20	356	41	02.5	1	58	21.8		5	0	44	24.0	2	07	22.3
	21	356	47	37.3	1	58	30.3		6	0	48	00.1	2	07	37.0
	22	356	54	09.5	1	58	39.0		7	0	51	31.1	2	07	51.9
	23	357	00	39.1	1	58	47.8		8	0	54	57.0	2	08	06.8
	24	357	07	06.0	1	58	56.8		9	0	58	17.7	2	08	21.7
	25	357	13	30.1	-1	59	05.9		10	1	01	33.2	-2	08	36.8
	26	357	19	51.4	1	59	15.2		11	1	04	43.4	2	08	52.0
	27	357	26	09.8	1	59	24.6		12	1	07	48.4	2	09	07.3
	28	357	32	25.4	1	59	34.2		13	1	10	48.0	2	09	22.6
	29	357	38	38.0	1	59	44.0		14	1	13	42.2	2	09	38.0
	30	357	44	47.6	1	59	53.9		15	1	16	30.9	2	09	53.5
May	1	357	50	54.1	-2	00	03.9		16	1	19	14.1	-2	10	09.1
	2	357	56	57.4	2	00	14.1		17	1	21	51.8	2	10	24.7
	3	358	02	57.4	2	00	24.5		18	1	24	23.8	2	10	40.4
	4	358	08	54.0	2	00	35.0		19	1	26	50.1	2	10	56.2
	5	358	14	47.2	2	00	45.7		20	1	29	10.8	2	11	12.0
	6	358	20	36.9	2	00	56.5		21	1	31	25.9	2	11	28.0
	7	358	26	23.1	-2	01	07.4		22	1	33	35.2	-2	11	43.9
	8	358	32	05.8	2	01	18.5		23	1	35	38.9	2	12	00.0
	9	358	37	44.8	2	01	29.7		24	1	37	36.8	2	12	16.1
	10	358	43	20.2	2	01	41.1		25	1	39	28.9	2	12	32.2
	11	358	48	51.9	2	01	52.6		26	1	41	15.1	2	12	48.4
	12	358	54	20.0	2	02	04.3		27	1	42	55.4	2	13	04.7
	13	358	59	44.3	-2	02	16.0	July	28	1	44	29.7	-2	13	20.9
	14	359	05	04.7	2	02	28.0		29	1	45	58.0	2	13	37.3
	15	359	10	21.3	2	02	40.0		30	1	47	20.3	2	13	53.6
	16	359	15	34.0	2	02	52.2		1	1	48	36.5	2	14	10.0
	17	359	20	42.6	-2	03	04.5		2	1	49	46.8	-2	14	26.4

SATURN, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
July	1	1	48	36.5	-2	14	10.0	Aug.	16	1	00	29.3	-2	25	54.6
	2	1	49	46.8	2	14	26.4		17	0	57	18.3	2	26	06.9
	3	1	50	51.0	2	14	42.8		18	0	54	02.8	2	26	19.1
	4	1	51	49.3	2	14	59.2		19	0	50	42.9	2	26	31.0
	5	1	52	41.6	2	15	15.7		20	0	47	18.7	2	26	42.7
	6	1	53	27.9	2	15	32.1		21	0	43	50.1	2	26	54.2
	7	1	54	08.3	-2	15	48.6		22	0	40	17.2	-2	27	05.4
	8	1	54	42.6	2	16	05.0		23	0	36	40.3	2	27	16.5
	9	1	55	11.0	2	16	21.5		24	0	32	59.4	2	27	27.2
	10	1	55	33.3	2	16	37.9		25	0	29	14.6	2	27	37.8
	11	1	55	49.5	2	16	54.3		26	0	25	26.1	2	27	48.1
	12	1	55	59.7	2	17	10.7		27	0	21	34.0	2	27	58.1
	13	1	56	03.8	-2	17	27.1	Sept.	28	0	17	38.5	-2	28	07.8
	14	1	56	01.8	2	17	43.4		29	0	13	39.6	2	28	17.3
	15	1	55	53.7	2	17	59.7		30	0	09	37.6	2	28	26.5
	16	1	55	39.5	2	18	16.0		31	0	05	32.6	2	28	35.5
	17	1	55	19.3	2	18	32.2		1	0	01	24.6	2	28	44.1
	18	1	54	53.0	2	18	48.4		2	359	57	13.8	2	28	52.5
	19	1	54	20.8	-2	19	04.5		3	359	53	00.2	-2	29	00.6
	20	1	53	42.5	2	19	20.6		4	359	48	44.1	2	29	08.4
	21	1	52	58.3	2	19	36.7		5	359	44	25.5	2	29	15.9
	22	1	52	08.1	2	19	52.6		6	359	40	04.6	2	29	23.0
	23	1	51	11.9	2	20	08.5		7	359	35	41.4	2	29	29.9
	24	1	50	09.7	2	20	24.4		8	359	31	16.1	2	29	36.5
	25	1	49	01.6	-2	20	40.1		9	359	26	48.8	-2	29	42.8
	26	1	47	47.4	2	20	55.8		10	359	22	19.8	2	29	48.8
	27	1	46	27.3	2	21	11.3		11	359	17	49.1	2	29	54.5
	28	1	45	01.3	2	21	26.8		12	359	13	16.9	2	29	59.9
	29	1	43	29.5	2	21	42.2		13	359	08	43.4	2	30	05.0
	30	1	41	51.9	2	21	57.4		14	359	04	08.6	2	30	09.7
Aug.	31	1	40	08.7	-2	22	12.6		15	358	59	32.8	-2	30	14.2
	1	1	38	19.8	2	22	27.6		16	358	54	56.0	2	30	18.3
	2	1	36	25.4	2	22	42.5		17	358	50	18.3	2	30	22.1
	3	1	34	25.5	2	22	57.3		18	358	45	39.9	2	30	25.6
	4	1	32	20.1	2	23	11.9		19	358	41	00.9	2	30	28.7
	5	1	30	09.3	2	23	26.4		20	358	36	21.5	2	30	31.6
	6	1	27	53.2	-2	23	40.7		21	358	31	41.8	-2	30	34.1
	7	1	25	31.8	2	23	54.8		22	358	27	02.0	2	30	36.3
	8	1	23	05.1	2	24	08.8		23	358	22	22.4	2	30	38.1
	9	1	20	33.1	2	24	22.7		24	358	17	43.1	2	30	39.6
	10	1	17	56.0	2	24	36.4		25	358	13	04.2	2	30	40.8
	11	1	15	13.8	2	24	49.9		26	358	08	25.9	2	30	41.7
	12	1	12	26.6	-2	25	03.2	Oct.	27	358	03	48.4	-2	30	42.2
	13	1	09	34.4	2	25	16.3		28	357	59	11.9	2	30	42.4
	14	1	06	37.4	2	25	29.2		29	357	54	36.4	2	30	42.3
	15	1	03	35.7	2	25	42.0		30	357	50	02.1	2	30	41.9
	16	1	00	29.3	-2	25	54.6		1	357	45	29.2	-2	30	41.1

SATURN, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Oct.	1	357	45	29.2	-2	30	41.1	Nov.	16	355	17	21.6	-2	25	11.4
	2	357	40	57.7	2	30	40.0		17	355	16	07.1	2	24	59.5
	3	357	36	27.8	2	30	38.6		18	355	14	58.9	2	24	47.6
	4	357	31	59.7	2	30	36.8		19	355	13	56.9	2	24	35.5
	5	357	27	33.4	2	30	34.8		20	355	13	01.3	2	24	23.4
	6	357	23	09.1	2	30	32.4		21	355	12	12.1	2	24	11.1
	7	357	18	47.0	-2	30	29.7		22	355	11	29.3	-2	23	58.8
	8	357	14	27.3	2	30	26.7		23	355	10	52.9	2	23	46.3
	9	357	10	10.0	2	30	23.4		24	355	10	22.9	2	23	33.8
	10	357	05	55.4	2	30	19.9		25	355	09	59.4	2	23	21.2
	11	357	01	43.6	2	30	16.0		26	355	09	42.3	2	23	08.6
	12	356	57	34.6	2	30	11.8		27	355	09	31.6	2	22	55.9
	13	356	53	28.6	-2	30	07.3		28	355	09	27.3	-2	22	43.1
	14	356	49	25.7	2	30	02.6		29	355	09	29.5	2	22	30.3
	15	356	45	26.0	2	29	57.5	Dec.	30	355	09	38.1	2	22	17.4
	16	356	41	29.5	2	29	52.2		1	355	09	53.2	2	22	04.5
	17	356	37	36.6	2	29	46.6		2	355	10	14.9	2	21	51.6
	18	356	33	47.2	2	29	40.7		3	355	10	43.0	2	21	38.6
	19	356	30	01.5	-2	29	34.6		4	355	11	17.7	-2	21	25.7
	20	356	26	19.8	2	29	28.2		5	355	11	58.8	2	21	12.7
	21	356	22	42.1	2	29	21.5		6	355	12	46.5	2	20	59.7
	22	356	19	08.6	2	29	14.5		7	355	13	40.6	2	20	46.7
	23	356	15	39.4	2	29	07.3		8	355	14	41.0	2	20	33.7
	24	356	12	14.6	2	28	59.8		9	355	15	47.7	2	20	20.7
	25	356	08	54.3	-2	28	52.1		10	355	17	00.8	-2	20	07.7
	26	356	05	38.6	2	28	44.2		11	355	18	20.3	2	19	54.7
	27	356	02	27.7	2	28	36.0		12	355	19	46.0	2	19	41.7
	28	355	59	21.6	2	28	27.6		13	355	21	18.1	2	19	28.8
	29	355	56	20.3	2	28	18.9		14	355	22	56.6	2	19	15.8
	30	355	53	24.0	2	28	10.0		15	355	24	41.4	2	19	02.9
Nov.	31	355	50	32.8	-2	28	00.9		16	355	26	32.6	-2	18	50.1
	1	355	47	46.6	2	27	51.7		17	355	28	30.1	2	18	37.2
	2	355	45	05.7	2	27	42.2		18	355	30	33.8	2	18	24.4
	3	355	42	30.1	2	27	32.5		19	355	32	43.9	2	18	11.7
	4	355	39	59.8	2	27	22.6		20	355	35	00.1	2	17	58.9
	5	355	37	35.1	2	27	12.5		21	355	37	22.5	2	17	46.3
	6	355	35	15.9	-2	27	02.3		22	355	39	51.1	-2	17	33.7
	7	355	33	02.4	2	26	51.9		23	355	42	25.7	2	17	21.1
	8	355	30	54.6	2	26	41.3		24	355	45	06.2	2	17	08.6
	9	355	28	52.5	2	26	30.6		25	355	47	52.8	2	16	56.2
	10	355	26	56.1	2	26	19.7		26	355	50	45.2	2	16	43.8
	11	355	25	05.6	2	26	08.6		27	355	53	43.5	2	16	31.6
	12	355	23	20.8	-2	25	57.4		28	355	56	47.6	-2	16	19.4
	13	355	21	42.0	2	25	46.1		29	355	59	57.6	2	16	07.3
	14	355	20	09.1	2	25	34.7		30	356	03	13.3	2	15	55.2
	15	355	18	42.3	2	25	23.1		31	356	06	34.8	2	15	43.3
	16	355	17	21.6	-2	25	11.4		32	356	10	01.9	-2	15	31.5

SATURN, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Jan.	0	23	05	47.40	-7	56	52.2	10.010 343	0.88	7.37	16	23	38
	1	23	06	03.92	7	55	00.4	10.025 271	0.88	7.36	16	19	58
	2	23	06	20.75	7	53	06.8	10.040 076	0.88	7.35	16	16	19
	3	23	06	37.87	7	51	11.4	10.054 755	0.87	7.34	16	12	41
	4	23	06	55.28	7	49	14.3	10.069 304	0.87	7.33	16	09	02
	5	23	07	12.98	7	47	15.5	10.083 718	0.87	7.32	16	05	24
	6	23	07	30.96	-7	45	15.0	10.097 994	0.87	7.31	16	01	46
	7	23	07	49.22	7	43	12.8	10.112 129	0.87	7.30	15	58	09
	8	23	08	07.76	7	41	09.0	10.126 118	0.87	7.29	15	54	32
	9	23	08	26.57	7	39	03.5	10.139 959	0.87	7.28	15	50	55
	10	23	08	45.66	7	36	56.3	10.153 649	0.87	7.27	15	47	18
	11	23	09	05.01	7	34	47.6	10.167 184	0.86	7.26	15	43	41
	12	23	09	24.62	-7	32	37.4	10.180 562	0.86	7.25	15	40	05
	13	23	09	44.49	7	30	25.6	10.193 780	0.86	7.24	15	36	29
	14	23	10	04.60	7	28	12.4	10.206 834	0.86	7.23	15	32	53
	15	23	10	24.96	7	25	57.7	10.219 722	0.86	7.22	15	29	18
	16	23	10	45.56	7	23	41.7	10.232 441	0.86	7.21	15	25	43
	17	23	11	06.40	7	21	24.2	10.244 988	0.86	7.21	15	22	08
	18	23	11	27.47	-7	19	05.3	10.257 359	0.86	7.20	15	18	33
	19	23	11	48.76	7	16	45.1	10.269 553	0.86	7.19	15	14	58
	20	23	12	10.29	7	14	23.5	10.281 566	0.86	7.18	15	11	24
	21	23	12	32.04	7	12	00.6	10.293 395	0.85	7.17	15	07	50
	22	23	12	54.00	7	09	36.3	10.305 037	0.85	7.16	15	04	16
	23	23	13	16.19	7	07	10.8	10.316 489	0.85	7.16	15	00	42
	24	23	13	38.59	-7	04	44.0	10.327 748	0.85	7.15	14	57	09
	25	23	14	01.20	7	02	16.0	10.338 812	0.85	7.14	14	53	35
	26	23	14	24.02	6	59	46.7	10.349 676	0.85	7.13	14	50	02
	27	23	14	47.04	6	57	16.3	10.360 340	0.85	7.13	14	46	29
	28	23	15	10.25	6	54	44.8	10.370 799	0.85	7.12	14	42	57
	29	23	15	33.64	6	52	12.1	10.381 051	0.85	7.11	14	39	24
Feb.	30	23	15	57.22	-6	49	38.4	10.391 093	0.85	7.10	14	35	52
	31	23	16	20.98	6	47	03.7	10.400 922	0.85	7.10	14	32	20
	1	23	16	44.91	6	44	27.9	10.410 537	0.84	7.09	14	28	48
	2	23	17	09.01	6	41	51.2	10.419 935	0.84	7.08	14	25	16
	3	23	17	33.27	6	39	13.5	10.429 114	0.84	7.08	14	21	44
	4	23	17	57.69	6	36	34.9	10.438 072	0.84	7.07	14	18	13
	5	23	18	22.28	-6	33	55.3	10.446 807	0.84	7.07	14	14	41
	6	23	18	47.02	6	31	14.9	10.455 318	0.84	7.06	14	11	10
	7	23	19	11.91	6	28	33.6	10.463 603	0.84	7.05	14	07	39
	8	23	19	36.94	6	25	51.5	10.471 661	0.84	7.05	14	04	08
	9	23	20	02.11	6	23	08.6	10.479 490	0.84	7.04	14	00	37
	10	23	20	27.42	6	20	24.9	10.487 089	0.84	7.04	13	57	07
	11	23	20	52.85	-6	17	40.6	10.494 457	0.84	7.03	13	53	36
	12	23	21	18.40	6	14	55.5	10.501 592	0.84	7.03	13	50	06
	13	23	21	44.07	6	12	09.8	10.508 494	0.84	7.02	13	46	35
	14	23	22	09.86	6	09	23.5	10.515 160	0.84	7.02	13	43	05
	15	23	22	35.76	-6	06	36.6	10.521 590	0.84	7.02	13	39	35

SATURN, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Feb.	15	23	22	35.76	-6	06	36.6	10.521 590	0.84	7.02	13	39	35
	16	23	23	01.76	6	03	49.0	10.527 782	0.84	7.01	13	36	05
	17	23	23	27.88	6	01	00.9	10.533 735	0.83	7.01	13	32	35
	18	23	23	54.09	5	58	12.2	10.539 447	0.83	7.00	13	29	05
	19	23	24	20.41	5	55	22.9	10.544 917	0.83	7.00	13	25	36
	20	23	24	46.82	5	52	33.2	10.550 144	0.83	7.00	13	22	06
	21	23	25	13.32	-5	49	42.9	10.555 127	0.83	6.99	13	18	37
	22	23	25	39.91	5	46	52.2	10.559 864	0.83	6.99	13	15	07
	23	23	26	06.58	5	44	01.1	10.564 354	0.83	6.99	13	11	38
	24	23	26	33.33	5	41	09.5	10.568 596	0.83	6.98	13	08	09
Mar.	25	23	27	00.16	5	38	17.7	10.572 589	0.83	6.98	13	04	39
	26	23	27	27.04	5	35	25.5	10.576 332	0.83	6.98	13	01	10
	27	23	27	53.99	-5	32	33.0	10.579 823	0.83	6.98	12	57	41
	28	23	28	20.99	5	29	40.3	10.583 062	0.83	6.98	12	54	12
	1	23	28	48.05	5	26	47.3	10.586 048	0.83	6.97	12	50	43
	2	23	29	15.15	5	23	54.1	10.588 780	0.83	6.97	12	47	14
	3	23	29	42.29	5	21	00.8	10.591 258	0.83	6.97	12	43	45
	4	23	30	09.48	5	18	07.3	10.593 483	0.83	6.97	12	40	17
	5	23	30	36.71	-5	15	13.6	10.595 453	0.83	6.97	12	36	48
	6	23	31	03.98	5	12	19.9	10.597 169	0.83	6.97	12	33	19
	7	23	31	31.27	5	09	26.0	10.598 631	0.83	6.97	12	29	50
	8	23	31	58.59	5	06	32.2	10.599 840	0.83	6.96	12	26	22
	9	23	32	25.92	5	03	38.3	10.600 795	0.83	6.96	12	22	53
	10	23	32	53.27	5	00	44.5	10.601 498	0.83	6.96	12	19	24
	11	23	33	20.62	-4	57	50.9	10.601 947	0.83	6.96	12	15	55
	12	23	33	47.97	4	54	57.3	10.602 144	0.83	6.96	12	12	27
	13	23	34	15.32	4	52	03.8	10.602 089	0.83	6.96	12	08	58
	14	23	34	42.67	4	49	10.4	10.601 782	0.83	6.96	12	05	29
	15	23	35	10.01	4	46	17.1	10.601 223	0.83	6.96	12	02	01
	16	23	35	37.35	4	43	24.0	10.600 412	0.83	6.96	11	58	32
	17	23	36	04.68	-4	40	31.1	10.599 351	0.83	6.96	11	55	03
	18	23	36	31.99	4	37	38.4	10.598 038	0.83	6.97	11	51	34
	19	23	36	59.28	4	34	45.9	10.596 474	0.83	6.97	11	48	06
	20	23	37	26.56	4	31	53.8	10.594 660	0.83	6.97	11	44	37
	21	23	37	53.81	4	29	01.9	10.592 596	0.83	6.97	11	41	08
	22	23	38	21.03	4	26	10.3	10.590 281	0.83	6.97	11	37	39
	23	23	38	48.21	-4	23	19.0	10.587 718	0.83	6.97	11	34	10
	24	23	39	15.35	4	20	28.2	10.584 904	0.83	6.97	11	30	41
	25	23	39	42.45	4	17	37.8	10.581 842	0.83	6.98	11	27	12
	26	23	40	09.50	4	14	47.8	10.578 532	0.83	6.98	11	23	43
	27	23	40	36.50	4	11	58.3	10.574 974	0.83	6.98	11	20	14
	28	23	41	03.43	4	09	09.3	10.571 168	0.83	6.98	11	16	45
Apr.	29	23	41	30.30	-4	06	20.9	10.567 117	0.83	6.99	11	13	16
	30	23	41	57.11	4	03	33.0	10.562 820	0.83	6.99	11	09	47
	31	23	42	23.84	4	00	45.7	10.558 278	0.83	6.99	11	06	17
	1	23	42	50.51	3	57	59.0	10.553 494	0.83	6.99	11	02	48
	2	23	43	17.11	-3	55	12.9	10.548 469	0.83	7.00	10	59	19

SATURN, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
Apr.	1	23	42	50.51	-3	57	59.0	10.553 494	0.83	6.99	11	02	48
	2	23	43	17.11	3	55	12.9	10.548 469	0.83	7.00	10	59	19
	3	23	43	43.62	3	52	27.4	10.543 203	0.83	7.00	10	55	49
	4	23	44	10.05	3	49	42.7	10.537 700	0.83	7.01	10	52	19
	5	23	44	36.39	3	46	58.7	10.531 960	0.83	7.01	10	48	50
	6	23	45	02.63	3	44	15.5	10.525 986	0.84	7.01	10	45	20
	7	23	45	28.77	-3	41	33.0	10.519 779	0.84	7.02	10	41	50
	8	23	45	54.81	3	38	51.4	10.513 341	0.84	7.02	10	38	20
	9	23	46	20.73	3	36	10.6	10.506 673	0.84	7.03	10	34	50
	10	23	46	46.55	3	33	30.7	10.499 777	0.84	7.03	10	31	19
	11	23	47	12.25	3	30	51.7	10.492 655	0.84	7.04	10	27	49
	12	23	47	37.84	3	28	13.6	10.485 308	0.84	7.04	10	24	18
	13	23	48	03.31	-3	25	36.3	10.477 739	0.84	7.05	10	20	48
	14	23	48	28.66	3	23	00.0	10.469 948	0.84	7.05	10	17	17
	15	23	48	53.88	3	20	24.7	10.461 937	0.84	7.06	10	13	46
	16	23	49	18.98	3	17	50.3	10.453 708	0.84	7.06	10	10	15
	17	23	49	43.94	3	15	16.9	10.445 262	0.84	7.07	10	06	44
	18	23	50	08.77	3	12	44.5	10.436 602	0.84	7.07	10	03	13
	19	23	50	33.46	-3	10	13.2	10.427 728	0.84	7.08	9	59	41
	20	23	50	58.01	3	07	43.0	10.418 642	0.84	7.09	9	56	10
	21	23	51	22.41	3	05	13.9	10.409 347	0.84	7.09	9	52	38
	22	23	51	46.65	3	02	45.9	10.399 843	0.85	7.10	9	49	06
	23	23	52	10.73	3	00	19.1	10.390 134	0.85	7.10	9	45	34
	24	23	52	34.65	2	57	53.6	10.380 219	0.85	7.11	9	42	02
	25	23	52	58.41	-2	55	29.3	10.370 103	0.85	7.12	9	38	30
	26	23	53	21.99	2	53	06.2	10.359 786	0.85	7.13	9	34	57
	27	23	53	45.40	2	50	44.4	10.349 271	0.85	7.13	9	31	24
	28	23	54	08.64	2	48	23.8	10.338 560	0.85	7.14	9	27	52
	29	23	54	31.70	2	46	04.6	10.327 657	0.85	7.15	9	24	19
	30	23	54	54.58	2	43	46.7	10.316 564	0.85	7.16	9	20	45
May	1	23	55	17.28	-2	41	30.2	10.305 283	0.85	7.16	9	17	12
	2	23	55	39.78	2	39	15.1	10.293 819	0.85	7.17	9	13	38
	3	23	56	02.08	2	37	01.4	10.282 174	0.86	7.18	9	10	05
	4	23	56	24.18	2	34	49.2	10.270 350	0.86	7.19	9	06	31
	5	23	56	46.07	2	32	38.5	10.258 351	0.86	7.20	9	02	56
	6	23	57	07.76	2	30	29.3	10.246 180	0.86	7.20	8	59	22
	7	23	57	29.23	-2	28	21.7	10.233 839	0.86	7.21	8	55	47
	8	23	57	50.48	2	26	15.6	10.221 331	0.86	7.22	8	52	12
	9	23	58	11.52	2	24	11.0	10.208 660	0.86	7.23	8	48	37
	10	23	58	32.34	2	22	08.0	10.195 828	0.86	7.24	8	45	02
	11	23	58	52.94	2	20	06.6	10.182 837	0.86	7.25	8	41	27
	12	23	59	13.32	2	18	06.9	10.169 691	0.86	7.26	8	37	51
	13	23	59	33.46	-2	16	08.7	10.156 392	0.87	7.27	8	34	15
	14	23	59	53.38	2	14	12.1	10.142 943	0.87	7.28	8	30	39
	15	0	00	13.07	2	12	17.3	10.129 347	0.87	7.29	8	27	02
	16	0	00	32.51	2	10	24.1	10.115 606	0.87	7.30	8	23	26
	17	0	00	51.72	-2	08	32.6	10.101 724	0.87	7.31	8	19	49

SATURN, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
May	17	0	00	51.72	-2	08	32.6	10.101 724	0.87	7.31	8	19	49
	18	0	01	10.68	2	06	42.9	10.087 703	0.87	7.32	8	16	12
	19	0	01	29.38	2	04	55.0	10.073 546	0.87	7.33	8	12	34
	20	0	01	47.83	2	03	08.8	10.059 256	0.87	7.34	8	08	57
	21	0	02	06.02	2	01	24.5	10.044 835	0.88	7.35	8	05	19
	22	0	02	23.95	1	59	42.1	10.030 288	0.88	7.36	8	01	41
	23	0	02	41.61	-1	58	01.5	10.015 617	0.88	7.37	7	58	02
	24	0	02	59.00	1	56	22.8	10.000 825	0.88	7.38	7	54	23
	25	0	03	16.13	1	54	45.9	9.985 916	0.88	7.39	7	50	44
	26	0	03	32.98	1	53	11.0	9.970 893	0.88	7.40	7	47	05
	27	0	03	49.56	1	51	38.0	9.955 761	0.88	7.41	7	43	26
	28	0	04	05.86	1	50	06.9	9.940 523	0.88	7.43	7	39	46
	29	0	04	21.87	-1	48	37.9	9.925 183	0.89	7.44	7	36	06
	30	0	04	37.60	1	47	10.8	9.909 745	0.89	7.45	7	32	26
June	31	0	04	53.02	1	45	45.8	9.894 214	0.89	7.46	7	28	45
	1	0	05	08.15	1	44	22.9	9.878 592	0.89	7.47	7	25	04
	2	0	05	22.98	1	43	02.1	9.862 885	0.89	7.48	7	21	23
	3	0	05	37.50	1	41	43.3	9.847 096	0.89	7.50	7	17	41
	4	0	05	51.72	-1	40	26.7	9.831 229	0.89	7.51	7	13	59
	5	0	06	05.63	1	39	12.1	9.815 288	0.90	7.52	7	10	17
	6	0	06	19.24	1	37	59.7	9.799 276	0.90	7.53	7	06	35
	7	0	06	32.53	1	36	49.4	9.783 197	0.90	7.55	7	02	52
	8	0	06	45.52	1	35	41.2	9.767 055	0.90	7.56	6	59	09
	9	0	06	58.19	1	34	35.1	9.750 854	0.90	7.57	6	55	25
	10	0	07	10.54	-1	33	31.3	9.734 597	0.90	7.58	6	51	42
	11	0	07	22.58	1	32	29.5	9.718 288	0.90	7.60	6	47	58
	12	0	07	34.29	1	31	30.0	9.701 931	0.91	7.61	6	44	13
	13	0	07	45.68	1	30	32.7	9.685 530	0.91	7.62	6	40	29
July	14	0	07	56.74	1	29	37.6	9.669 088	0.91	7.63	6	36	44
	15	0	08	07.47	1	28	44.7	9.652 608	0.91	7.65	6	32	58
	16	0	08	17.86	-1	27	54.1	9.636 095	0.91	7.66	6	29	13
	17	0	08	27.91	1	27	05.8	9.619 553	0.91	7.67	6	25	27
	18	0	08	37.62	1	26	19.8	9.602 985	0.92	7.69	6	21	40
	19	0	08	46.99	1	25	36.1	9.586 395	0.92	7.70	6	17	54
	20	0	08	56.01	1	24	54.7	9.569 788	0.92	7.71	6	14	07
	21	0	09	04.69	1	24	15.6	9.553 167	0.92	7.73	6	10	19
	22	0	09	13.02	-1	23	38.9	9.536 537	0.92	7.74	6	06	31
	23	0	09	21.01	1	23	04.5	9.519 903	0.92	7.75	6	02	43
	24	0	09	28.64	1	22	32.4	9.503 269	0.93	7.77	5	58	55
	25	0	09	35.92	1	22	02.6	9.486 640	0.93	7.78	5	55	06
	26	0	09	42.85	1	21	35.3	9.470 020	0.93	7.80	5	51	17
	27	0	09	49.41	1	21	10.3	9.453 415	0.93	7.81	5	47	28
	28	0	09	55.61	-1	20	47.8	9.436 829	0.93	7.82	5	43	38
	29	0	10	01.44	1	20	27.7	9.420 267	0.93	7.84	5	39	48
	30	0	10	06.90	1	20	10.0	9.403 733	0.94	7.85	5	35	57
	1	0	10	12.00	1	19	54.7	9.387 232	0.94	7.86	5	32	06
	2	0	10	16.73	-1	19	41.8	9.370 769	0.94	7.88	5	28	15

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Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
	h	m	s	°	'	"				h	m	s
July	1	0	10	12.00	-1	19	54.7	9.387 232	0.94	7.86	5	32 06
	2	0	10	16.73	1	19	41.8	9.370 769	0.94	7.88	5	28 15
	3	0	10	21.09	1	19	31.4	9.354 348	0.94	7.89	5	24 23
	4	0	10	25.09	1	19	23.3	9.337 973	0.94	7.91	5	20 31
	5	0	10	28.72	1	19	17.6	9.321 649	0.94	7.92	5	16 39
	6	0	10	31.99	1	19	14.3	9.305 379	0.95	7.93	5	12 46
	7	0	10	34.90	-1	19	13.4	9.289 170	0.95	7.95	5	08 53
	8	0	10	37.43	1	19	14.8	9.273 023	0.95	7.96	5	05 00
	9	0	10	39.60	1	19	18.6	9.256 944	0.95	7.97	5	01 06
	10	0	10	41.40	1	19	24.8	9.240 938	0.95	7.99	4	57 11
	11	0	10	42.83	1	19	33.4	9.225 007	0.95	8.00	4	53 17
	12	0	10	43.89	1	19	44.4	9.209 156	0.95	8.02	4	49 22
	13	0	10	44.57	-1	19	57.8	9.193 390	0.96	8.03	4	45 27
	14	0	10	44.88	1	20	13.6	9.177 713	0.96	8.04	4	41 31
	15	0	10	44.82	1	20	31.8	9.162 128	0.96	8.06	4	37 35
	16	0	10	44.38	1	20	52.3	9.146 641	0.96	8.07	4	33 39
	17	0	10	43.58	1	21	15.3	9.131 255	0.96	8.08	4	29 42
	18	0	10	42.40	1	21	40.6	9.115 975	0.96	8.10	4	25 45
	19	0	10	40.86	-1	22	08.2	9.100 805	0.97	8.11	4	21 47
	20	0	10	38.94	1	22	38.2	9.085 751	0.97	8.12	4	17 49
	21	0	10	36.67	1	23	10.4	9.070 817	0.97	8.14	4	13 51
	22	0	10	34.02	1	23	45.0	9.056 008	0.97	8.15	4	09 52
	23	0	10	31.01	1	24	21.9	9.041 329	0.97	8.16	4	05 53
	24	0	10	27.63	1	25	01.2	9.026 785	0.97	8.18	4	01 54
	25	0	10	23.88	-1	25	42.7	9.012 380	0.98	8.19	3	57 54
	26	0	10	19.76	1	26	26.5	8.998 120	0.98	8.20	3	53 54
	27	0	10	15.27	1	27	12.7	8.984 009	0.98	8.22	3	49 54
	28	0	10	10.43	1	28	01.0	8.970 051	0.98	8.23	3	45 53
	29	0	10	05.22	1	28	51.6	8.956 252	0.98	8.24	3	41 52
	30	0	09	59.66	1	29	44.4	8.942 614	0.98	8.25	3	37 50
Aug.	31	0	09	53.75	-1	30	39.3	8.929 144	0.98	8.27	3	33 49
	1	0	09	47.49	1	31	36.3	8.915 845	0.99	8.28	3	29 46
	2	0	09	40.89	1	32	35.5	8.902 720	0.99	8.29	3	25 44
	3	0	09	33.95	1	33	36.7	8.889 775	0.99	8.30	3	21 41
	4	0	09	26.67	1	34	39.9	8.877 012	0.99	8.32	3	17 38
	5	0	09	19.06	1	35	45.2	8.864 436	0.99	8.33	3	13 34
	6	0	09	11.12	-1	36	52.4	8.852 051	0.99	8.34	3	09 31
	7	0	09	02.85	1	38	01.6	8.839 861	0.99	8.35	3	05 26
	8	0	08	54.25	1	39	12.8	8.827 868	1.00	8.36	3	01 22
	9	0	08	45.33	1	40	25.9	8.816 077	1.00	8.37	2	57 17
	10	0	08	36.09	1	41	40.8	8.804 492	1.00	8.38	2	53 12
	11	0	08	26.53	1	42	57.7	8.793 115	1.00	8.40	2	49 06
	12	0	08	16.66	-1	44	16.4	8.781 951	1.00	8.41	2	45 01
	13	0	08	06.49	1	45	36.9	8.771 003	1.00	8.42	2	40 55
	14	0	07	56.01	1	46	59.1	8.760 275	1.00	8.43	2	36 48
	15	0	07	45.23	1	48	23.1	8.749 770	1.01	8.44	2	32 42
	16	0	07	34.17	-1	49	48.7	8.739 493	1.01	8.45	2	28 35

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 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"				h	m	s	
Aug.	16	0	07	34.17	-1	49	48.7	8.739 493	1.01	8.45	2	28	35
	17	0	07	22.82	1	51	15.9	8.729 448	1.01	8.46	2	24	27
	18	0	07	11.20	1	52	44.8	8.719 638	1.01	8.47	2	20	20
	19	0	06	59.29	1	54	15.2	8.710 067	1.01	8.48	2	16	12
	20	0	06	47.11	1	55	47.2	8.700 739	1.01	8.48	2	12	04
	21	0	06	34.66	1	57	20.7	8.691 657	1.01	8.49	2	07	56
	22	0	06	21.95	-1	58	55.6	8.682 826	1.01	8.50	2	03	47
	23	0	06	08.98	2	00	32.0	8.674 249	1.01	8.51	1	59	38
	24	0	05	55.76	2	02	09.7	8.665 929	1.01	8.52	1	55	29
	25	0	05	42.30	2	03	48.7	8.657 869	1.02	8.53	1	51	20
	26	0	05	28.60	2	05	29.0	8.650 072	1.02	8.53	1	47	10
	27	0	05	14.67	2	07	10.5	8.642 542	1.02	8.54	1	43	01
	28	0	05	00.53	-2	08	53.1	8.635 280	1.02	8.55	1	38	51
	29	0	04	46.18	2	10	36.8	8.628 289	1.02	8.56	1	34	40
Sept.	30	0	04	31.62	2	12	21.5	8.621 573	1.02	8.56	1	30	30
	31	0	04	16.88	2	14	07.2	8.615 132	1.02	8.57	1	26	20
	1	0	04	01.94	2	15	53.7	8.608 970	1.02	8.57	1	22	09
	2	0	03	46.83	2	17	41.2	8.603 088	1.02	8.58	1	17	58
	3	0	03	31.54	-2	19	29.4	8.597 488	1.02	8.59	1	13	47
	4	0	03	16.09	2	21	18.4	8.592 173	1.02	8.59	1	09	35
	5	0	03	00.47	2	23	08.1	8.587 143	1.02	8.60	1	05	24
	6	0	02	44.71	2	24	58.5	8.582 400	1.02	8.60	1	01	12
	7	0	02	28.80	2	26	49.5	8.577 947	1.03	8.61	0	57	01
	8	0	02	12.75	2	28	41.1	8.573 784	1.03	8.61	0	52	49
	9	0	01	56.57	-2	30	33.2	8.569 913	1.03	8.61	0	48	37
	10	0	01	40.27	2	32	25.7	8.566 336	1.03	8.62	0	44	25
	11	0	01	23.87	2	34	18.6	8.563 053	1.03	8.62	0	40	12
	12	0	01	07.36	2	36	11.8	8.560 067	1.03	8.62	0	36	00
Oct.	13	0	00	50.77	2	38	05.2	8.557 380	1.03	8.63	0	31	48
	14	0	00	34.09	2	39	58.9	8.554 992	1.03	8.63	0	27	35
	15	0	00	17.34	-2	41	52.6	8.552 905	1.03	8.63	0	23	23
	16	0	00	00.52	2	43	46.5	8.551 121	1.03	8.63	0	00	15
	17	23	59	43.64	2	45	40.5	8.549 640	1.03	8.63	0	29	45
	18	23	59	26.70	2	47	34.4	8.548 464	1.03	8.64	0	10	45
	19	23	59	09.72	2	49	28.3	8.547 594	1.03	8.64	0	06	32
	20	23	58	52.70	2	51	22.1	8.547 030	1.03	8.64	0	02	19
	21	23	58	35.66	-2	53	15.6	8.546 773	1.03	8.64	23	53	53
	22	23	58	18.60	2	55	08.9	8.546 823	1.03	8.64	23	49	40
	23	23	58	01.54	2	57	01.8	8.547 181	1.03	8.64	23	45	27
	24	23	57	44.49	2	58	54.3	8.547 846	1.03	8.64	23	41	15
	25	23	57	27.46	3	00	46.3	8.548 818	1.03	8.64	23	37	02
	26	23	57	10.46	3	02	37.8	8.550 096	1.03	8.63	23	32	49
27	23	56	53.50	-3	04	28.6	8.551 681	1.03	8.63	23	28	36	
28	23	56	36.58	3	06	18.8	8.553 570	1.03	8.63	23	24	24	
29	23	56	19.72	3	08	08.3	8.555 765	1.03	8.63	23	20	11	
30	23	56	02.93	3	09	57.0	8.558 263	1.03	8.63	23	15	58	
1	23	55	46.20	-3	11	44.8	8.561 063	1.03	8.62	23	11	46	

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RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension				Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"				h	m	s
Oct.	1	23	55	46.20	-3	11	44.8	8.561 063	1.03	8.62	23	11	46
	2	23	55	29.56	3	13	31.7	8.564 164	1.03	8.62	23	07	34
	3	23	55	13.01	3	15	17.8	8.567 566	1.03	8.62	23	03	21
	4	23	54	56.55	3	17	02.8	8.571 265	1.03	8.61	22	59	09
	5	23	54	40.20	3	18	46.8	8.575 262	1.03	8.61	22	54	57
	6	23	54	23.96	3	20	29.7	8.579 553	1.03	8.60	22	50	45
	7	23	54	07.85	-3	22	11.5	8.584 139	1.02	8.60	22	46	33
	8	23	53	51.87	3	23	52.0	8.589 016	1.02	8.59	22	42	22
	9	23	53	36.04	3	25	31.3	8.594 184	1.02	8.59	22	38	10
	10	23	53	20.36	3	27	09.2	8.599 641	1.02	8.58	22	33	59
	11	23	53	04.84	3	28	45.8	8.605 386	1.02	8.58	22	29	48
	12	23	52	49.49	3	30	20.9	8.611 417	1.02	8.57	22	25	37
	13	23	52	34.31	-3	31	54.6	8.617 732	1.02	8.57	22	21	26
	14	23	52	19.31	3	33	26.9	8.624 329	1.02	8.56	22	17	15
	15	23	52	04.50	3	34	57.5	8.631 207	1.02	8.55	22	13	05
	16	23	51	49.89	3	36	26.6	8.638 363	1.02	8.55	22	08	54
	17	23	51	35.47	3	37	54.1	8.645 796	1.02	8.54	22	04	44
	18	23	51	21.27	3	39	19.9	8.653 502	1.02	8.53	22	00	35
	19	23	51	07.29	-3	40	43.9	8.661 479	1.02	8.52	21	56	25
	20	23	50	53.54	3	42	06.2	8.669 724	1.01	8.51	21	52	16
	21	23	50	40.03	3	43	26.6	8.678 234	1.01	8.51	21	48	06
	22	23	50	26.77	3	44	45.0	8.687 006	1.01	8.50	21	43	58
	23	23	50	13.77	3	46	01.6	8.696 037	1.01	8.49	21	39	49
	24	23	50	01.03	3	47	16.1	8.705 323	1.01	8.48	21	35	41
	25	23	49	48.56	-3	48	28.6	8.714 860	1.01	8.47	21	31	33
	26	23	49	36.36	3	49	39.0	8.724 645	1.01	8.46	21	27	25
	27	23	49	24.45	3	50	47.4	8.734 675	1.01	8.45	21	23	17
	28	23	49	12.83	3	51	53.6	8.744 945	1.01	8.44	21	19	10
	29	23	49	01.50	3	52	57.7	8.755 451	1.00	8.43	21	15	03
	30	23	48	50.46	3	53	59.6	8.766 189	1.00	8.42	21	10	57
Nov.	31	23	48	39.73	-3	54	59.3	8.777 156	1.00	8.41	21	06	50
	1	23	48	29.31	3	55	56.8	8.788 347	1.00	8.40	21	02	44
	2	23	48	19.20	3	56	52.0	8.799 758	1.00	8.39	20	58	39
	3	23	48	09.40	3	57	44.9	8.811 385	1.00	8.38	20	54	33
	4	23	47	59.94	3	58	35.5	8.823 223	1.00	8.37	20	50	28
	5	23	47	50.80	3	59	23.8	8.835 269	1.00	8.36	20	46	23
	6	23	47	42.00	-4	00	09.7	8.847 519	0.99	8.34	20	42	19
	7	23	47	33.55	4	00	53.1	8.859 969	0.99	8.33	20	38	15
	8	23	47	25.43	4	01	34.2	8.872 615	0.99	8.32	20	34	11
	9	23	47	17.67	4	02	12.8	8.885 453	0.99	8.31	20	30	08
	10	23	47	10.25	4	02	49.1	8.898 479	0.99	8.30	20	26	05
	11	23	47	03.18	4	03	22.8	8.911 690	0.99	8.28	20	22	02
	12	23	46	56.47	-4	03	54.2	8.925 080	0.99	8.27	20	18	00
	13	23	46	50.11	4	04	23.0	8.938 645	0.98	8.26	20	13	58
	14	23	46	44.12	4	04	49.4	8.952 382	0.98	8.25	20	09	57
	15	23	46	38.49	4	05	13.2	8.966 286	0.98	8.23	20	05	55
	16	23	46	33.23	-4	05	34.5	8.980 351	0.98	8.22	20	01	55

SATURN, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
	h	m	s	°	'	"				h	m	s
Nov.	16	23	46	33.23	-4	05	8.980 351	0.98	8.22	20	01	55
	17	23	46	28.35	4	05	8.994 573	0.98	8.21	19	57	54
	18	23	46	23.85	4	06	9.008 948	0.98	8.19	19	53	54
	19	23	46	19.74	4	06	9.023 469	0.97	8.18	19	49	54
	20	23	46	16.01	4	06	9.038 133	0.97	8.17	19	45	55
	21	23	46	12.67	4	06	9.052 933	0.97	8.15	19	41	56
	22	23	46	09.71	-4	06	9.067 866	0.97	8.14	19	37	58
	23	23	46	07.15	4	06	9.082 925	0.97	8.13	19	34	00
	24	23	46	04.98	4	06	9.098 105	0.97	8.11	19	30	02
	25	23	46	03.21	4	06	9.113 401	0.96	8.10	19	26	04
	26	23	46	01.82	4	06	9.128 808	0.96	8.09	19	22	07
	27	23	46	00.83	4	06	9.144 320	0.96	8.07	19	18	11
	28	23	46	00.23	-4	06	9.159 933	0.96	8.06	19	14	15
	29	23	46	00.02	4	06	9.175 640	0.96	8.05	19	10	19
Dec.	30	23	46	00.21	4	05	9.191 437	0.96	8.03	19	06	23
	1	23	46	00.79	4	05	9.207 319	0.96	8.02	19	02	28
	2	23	46	01.77	4	05	9.223 280	0.95	8.00	18	58	34
	3	23	46	03.15	4	04	9.239 316	0.95	7.99	18	54	40
	4	23	46	04.93	-4	04	9.255 422	0.95	7.98	18	50	46
	5	23	46	07.11	4	04	9.271 593	0.95	7.96	18	46	52
	6	23	46	09.69	4	03	9.287 825	0.95	7.95	18	42	59
	7	23	46	12.65	4	02	9.304 113	0.95	7.93	18	39	07
	8	23	46	16.01	4	02	9.320 452	0.94	7.92	18	35	14
	9	23	46	19.76	4	01	9.336 839	0.94	7.91	18	31	23
	10	23	46	23.89	-4	01	9.353 267	0.94	7.89	18	27	31
	11	23	46	28.41	4	00	9.369 733	0.94	7.88	18	23	40
	12	23	46	33.32	3	59	9.386 231	0.94	7.86	18	19	49
	13	23	46	38.62	3	58	9.402 756	0.94	7.85	18	15	59
	14	23	46	44.31	3	57	9.419 304	0.93	7.84	18	12	09
	15	23	46	50.39	3	57	9.435 869	0.93	7.82	18	08	19
	16	23	46	56.86	-3	56	9.452 446	0.93	7.81	18	04	30
	17	23	47	03.72	3	55	9.469 030	0.93	7.80	18	00	41
	18	23	47	10.96	3	54	9.485 616	0.93	7.78	17	56	53
	19	23	47	18.59	3	53	9.502 198	0.93	7.77	17	53	05
	20	23	47	26.60	3	51	9.518 773	0.92	7.76	17	49	17
	21	23	47	34.99	3	50	9.535 333	0.92	7.74	17	45	30
	22	23	47	43.75	-3	49	9.551 875	0.92	7.73	17	41	43
	23	23	47	52.89	3	48	9.568 392	0.92	7.71	17	37	56
	24	23	48	02.39	3	47	9.584 881	0.92	7.70	17	34	10
	25	23	48	12.27	3	45	9.601 336	0.92	7.69	17	30	24
	26	23	48	22.50	3	44	9.617 753	0.91	7.68	17	26	39
	27	23	48	33.10	3	43	9.634 125	0.91	7.66	17	22	54
	28	23	48	44.05	-3	41	9.650 449	0.91	7.65	17	19	09
	29	23	48	55.36	3	40	9.666 721	0.91	7.64	17	15	25
	30	23	49	07.03	3	38	9.682 935	0.91	7.62	17	11	41
	31	23	49	19.05	3	37	9.699 087	0.91	7.61	17	07	57
	32	23	49	31.42	-3	35	9.715 174	0.91	7.60	17	04	14

URANUS, 2025
HELIOCENTRIC POSITIONS FOR 0^h TERRESTRIAL TIME
MEAN EQUINOX AND ECLIPTIC OF DATE

Date	Heliocentric Longitude				Heliocentric Latitude			Radius Vector		Date	Heliocentric Longitude				Heliocentric Latitude			Radius Vector	
		°	'	"	°	'	"				°	'	"	°	'	"			
Jan.	1	55	44	50.7	-0	14	37.9	19.553 2641	Apr.	3	56	47	33.1	-0	13	49.7	19.537 6158		
	3	55	46	12.4	0	14	36.9	19.552 9261		5	56	48	54.9	0	13	48.6	19.537 2735		
	5	55	47	34.2	0	14	35.9	19.552 5880		7	56	50	16.8	0	13	47.6	19.536 9312		
	7	55	48	55.9	0	14	34.8	19.552 2498		9	56	51	38.6	0	13	46.5	19.536 5887		
	9	55	50	17.6	0	14	33.8	19.551 9115		11	56	53	00.5	0	13	45.5	19.536 2462		
	11	55	51	39.4	0	14	32.7	19.551 5731		13	56	54	22.3	0	13	44.4	19.535 9036		
	13	55	53	01.1	-0	14	31.7	19.551 2346		15	56	55	44.2	-0	13	43.4	19.535 5609		
	15	55	54	22.9	0	14	30.6	19.550 8960		17	56	57	06.1	0	13	42.3	19.535 2181		
	17	55	55	44.6	0	14	29.6	19.550 5572		19	56	58	27.9	0	13	41.3	19.534 8752		
	19	55	57	06.4	0	14	28.5	19.550 2184		21	56	59	49.8	0	13	40.2	19.534 5323		
	21	55	58	28.1	0	14	27.5	19.549 8795		23	57	01	11.7	0	13	39.1	19.534 1893		
23	55	59	49.9	0	14	26.4	19.549 5405	25	57	02	33.6	0	13	38.1	19.533 8462				
Feb.	25	56	01	11.7	-0	14	25.4	19.549 2014	27	57	03	55.4	-0	13	37.0	19.533 5030			
	27	56	02	33.4	0	14	24.3	19.548 8622	29	57	05	17.3	0	13	36.0	19.533 1598			
	29	56	03	55.2	0	14	23.3	19.548 5229	May	1	57	06	39.2	0	13	34.9	19.532 8164		
	31	56	05	17.0	0	14	22.2	19.548 1835		3	57	08	01.1	0	13	33.9	19.532 4730		
	2	56	06	38.7	0	14	21.2	19.547 8440		5	57	09	23.0	0	13	32.8	19.532 1296		
	4	56	08	00.5	0	14	20.1	19.547 5044		7	57	10	44.9	0	13	31.8	19.531 7860		
	6	56	09	22.3	-0	14	19.1	19.547 1647		9	57	12	06.8	-0	13	30.7	19.531 4423		
	8	56	10	44.0	0	14	18.0	19.546 8249		11	57	13	28.7	0	13	29.6	19.531 0986		
	10	56	12	05.8	0	14	17.0	19.546 4850		13	57	14	50.6	0	13	28.6	19.530 7548		
	12	56	13	27.6	0	14	15.9	19.546 1451		15	57	16	12.5	0	13	27.5	19.530 4109		
	14	56	14	49.4	0	14	14.9	19.545 8050		17	57	17	34.4	0	13	26.5	19.530 0670		
16	56	16	11.2	0	14	13.8	19.545 4648	19		57	18	56.3	0	13	25.4	19.529 7229			
18	56	17	33.0	-0	14	12.8	19.545 1246	21		57	20	18.2	-0	13	24.3	19.529 3788			
20	56	18	54.8	0	14	11.7	19.544 7842	23	57	21	40.1	0	13	23.3	19.529 0346				
22	56	20	16.6	0	14	10.7	19.544 4437	25	57	23	02.0	0	13	22.3	19.528 6903				
24	56	21	38.4	0	14	09.6	19.544 1032	27	57	24	23.9	0	13	21.2	19.528 3460				
26	56	23	00.2	0	14	08.6	19.543 7626	29	57	25	45.9	0	13	20.1	19.528 0015				
28	56	24	22.0	0	14	07.6	19.543 4218	31	57	27	07.8	0	13	19.1	19.527 6570				
Mar.	2	56	25	43.8	-0	14	06.5	19.543 0810	June	2	57	28	29.7	-0	13	18.0	19.527 3124		
	4	56	27	05.6	0	14	05.5	19.542 7401		4	57	29	51.7	0	13	17.0	19.526 9677		
	6	56	28	27.4	0	14	04.4	19.542 3991		6	57	31	13.6	0	13	15.9	19.526 6229		
	8	56	29	49.2	0	14	03.4	19.542 0580		8	57	32	35.5	0	13	14.8	19.526 2781		
	10	56	31	11.1	0	14	02.3	19.541 7168		10	57	33	57.5	0	13	13.8	19.525 9331		
	12	56	32	32.9	0	14	01.3	19.541 3755		12	57	35	19.4	0	13	12.7	19.525 5881		
	14	56	33	54.7	-0	14	00.2	19.541 0342		14	57	36	41.4	-0	13	11.7	19.525 2430		
	16	56	35	16.5	0	13	59.2	19.540 6927		16	57	38	03.3	0	13	10.6	19.524 8978		
	18	56	36	38.3	0	13	58.1	19.540 3512		18	57	39	25.2	0	13	09.6	19.524 5526		
	20	56	38	00.2	0	13	57.0	19.540 0095		20	57	40	47.2	0	13	08.5	19.524 2072		
	22	56	39	22.0	0	13	56.0	19.539 6678		22	57	42	09.2	0	13	07.4	19.523 8618		
24	56	40	43.8	0	13	54.9	19.539 3260	24	57	43	31.1	0	13	06.4	19.523 5163				
Apr.	26	56	42	05.7	-0	13	53.9	19.538 9842	26	57	44	53.1	-0	13	05.3	19.523 1707			
	28	56	43	27.5	0	13	52.8	19.538 6422	28	57	46	15.0	0	13	04.2	19.522 8250			
	30	56	44	49.4	0	13	51.8	19.538 3002	30	57	47	37.0	0	13	03.2	19.522 4793			
	1	56	46	11.2	0	13	50.7	19.537 9580	July	2	57	48	59.0	0	13	02.1	19.522 1334		
	3	56	47	33.1	-0	13	49.7	19.537 6158		4	57	50	21.0	-0	13	01.1	19.521 7875		

URANUS, 2025
HELIOCENTRIC POSITIONS FOR 0^h TERRESTRIAL TIME
MEAN EQUINOX AND ECLIPTIC OF DATE

Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector		Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector	
		°	'	"	°	'	"				°	'	"	°	'	"					
July	2	57	48	59.0	-0	13	02.1	19.522 1334	Oct.	2	58	51	52.5	-0	12	13.2	19.506 1325				
	4	57	50	21.0	0	13	01.1	19.521 7875		4	58	53	14.6	0	12	12.1	19.505 7826				
	6	57	51	42.9	0	13	00.0	19.521 4415		6	58	54	36.7	0	12	11.0	19.505 4327				
	8	57	53	04.9	0	12	58.9	19.521 0954		8	58	55	58.8	0	12	10.0	19.505 0826				
	10	57	54	26.9	0	12	57.9	19.520 7493		10	58	57	20.9	0	12	08.9	19.504 7325				
	12	57	55	48.9	0	12	56.8	19.520 4030		12	58	58	43.0	0	12	07.9	19.504 3823				
	14	57	57	10.9	-0	12	55.8	19.520 0567		14	59	00	05.1	-0	12	06.8	19.504 0321				
	16	57	58	32.8	0	12	54.7	19.519 7103		16	59	01	27.2	0	12	05.7	19.503 6817				
	18	57	59	54.8	0	12	53.7	19.519 3638		18	59	02	49.3	0	12	04.6	19.503 3313				
	20	58	01	16.8	0	12	52.6	19.519 0172		20	59	04	11.4	0	12	03.5	19.502 9808				
	22	58	02	38.8	0	12	51.5	19.518 6705		22	59	05	33.6	0	12	02.5	19.502 6302				
	24	58	04	00.8	0	12	50.4	19.518 3238		24	59	06	55.7	0	12	01.4	19.502 2795				
Aug.	26	58	05	22.8	-0	12	49.4	19.517 9769	Nov.	26	59	08	17.8	-0	12	00.4	19.501 9288				
	28	58	06	44.8	0	12	48.3	19.517 6300		28	59	09	39.9	0	11	59.3	19.501 5779				
	30	58	08	06.8	0	12	47.3	19.517 2830		30	59	11	02.1	0	11	58.2	19.501 2270				
	1	58	09	28.9	0	12	46.2	19.516 9359		1	59	12	24.2	0	11	57.1	19.500 8760				
	3	58	10	50.9	0	12	45.1	19.516 5887		3	59	13	46.4	0	11	56.1	19.500 5250				
	5	58	12	12.9	0	12	44.1	19.516 2414		5	59	15	08.5	0	11	55.0	19.500 1738				
	7	58	13	34.9	-0	12	43.0	19.515 8940		7	59	16	30.6	-0	11	53.9	19.499 8226				
	9	58	14	56.9	0	12	41.9	19.515 5466		9	59	17	52.8	0	11	52.8	19.499 4713				
	11	58	16	18.9	0	12	40.9	19.515 1991		11	59	19	14.9	0	11	51.8	19.499 1199				
	13	58	17	41.0	0	12	39.8	19.514 8514		13	59	20	37.0	0	11	50.7	19.498 7685				
	15	58	19	03.0	0	12	38.8	19.514 5037		15	59	21	59.2	0	11	49.6	19.498 4170				
	17	58	20	25.0	0	12	37.7	19.514 1559		17	59	23	21.4	0	11	48.6	19.498 0654				
Sept.	19	58	21	47.1	-0	12	36.6	19.513 8081	Dec.	19	59	24	43.5	-0	11	47.5	19.497 7137				
	21	58	23	09.1	0	12	35.6	19.513 4601		21	59	26	05.7	0	11	46.4	19.497 3619				
	23	58	24	31.1	0	12	34.5	19.513 1120		23	59	27	27.9	0	11	45.4	19.497 0101				
	25	58	25	53.2	0	12	33.4	19.512 7639		25	59	28	50.0	0	11	44.3	19.496 6582				
	27	58	27	15.2	0	12	32.4	19.512 4156		27	59	30	12.2	0	11	43.2	19.496 3062				
	29	58	28	37.3	0	12	31.3	19.512 0673		29	59	31	34.3	0	11	42.1	19.495 9541				
	31	58	29	59.3	-0	12	30.2	19.511 7189		1	59	32	56.5	-0	11	41.1	19.495 6020				
	2	58	31	21.4	0	12	29.2	19.511 3704		3	59	34	18.7	0	11	40.0	19.495 2498				
	4	58	32	43.4	0	12	28.1	19.511 0218		5	59	35	40.9	0	11	38.9	19.494 8975				
	6	58	34	05.5	0	12	27.0	19.510 6731		7	59	37	03.0	0	11	37.8	19.494 5451				
	8	58	35	27.6	0	12	26.0	19.510 3243		9	59	38	25.2	0	11	36.8	19.494 1927				
	10	58	36	49.6	0	12	24.9	19.509 9755		11	59	39	47.4	0	11	35.7	19.493 8402				
Oct.	12	58	38	11.7	-0	12	23.8	19.509 6265		13	59	41	09.6	-0	11	34.6	19.493 4876				
	14	58	39	33.8	0	12	22.8	19.509 2775		15	59	42	31.8	0	11	33.6	19.493 1349				
	16	58	40	55.8	0	12	21.7	19.508 9284		17	59	43	54.0	0	11	32.5	19.492 7822				
	18	58	42	17.9	0	12	20.6	19.508 5792		19	59	45	16.2	0	11	31.4	19.492 4294				
	20	58	43	40.0	0	12	19.6	19.508 2299		21	59	46	38.4	0	11	30.3	19.492 0765				
	22	58	45	02.1	0	12	18.5	19.507 8805		23	59	48	00.6	0	11	29.3	19.491 7236				
	24	58	46	24.1	-0	12	17.4	19.507 5311		25	59	49	22.8	-0	11	28.2	19.491 3706				
	26	58	47	46.2	0	12	16.4	19.507 1816		27	59	50	45.0	0	11	27.1	19.491 0175				
	28	58	49	08.3	0	12	15.3	19.506 8319		29	59	52	07.2	0	11	26.1	19.490 6643				
	30	58	50	30.4	0	12	14.2	19.506 4822		31	59	53	29.4	0	11	25.0	19.490 3111				
	2	58	51	52.5	-0	12	13.2	19.506 1325		33	59	54	51.6	-0	11	23.9	19.489 9578				

URANUS, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Jan.	0	53	39	38.3	-0	15	11.0	Feb.	15	53	21	54.9	-0	14	13.2
	1	53	38	09.2	0	15	09.8		16	53	22	44.8	0	14	12.0
	2	53	36	42.8	0	15	08.7		17	53	23	37.7	0	14	10.7
	3	53	35	18.8	0	15	07.5		18	53	24	33.7	0	14	09.4
	4	53	33	57.5	0	15	06.3		19	53	25	32.9	0	14	08.2
	5	53	32	38.8	0	15	05.1		20	53	26	35.1	0	14	06.9
	6	53	31	22.9	-0	15	03.9		21	53	27	40.4	-0	14	05.7
	7	53	30	09.7	0	15	02.7		22	53	28	48.7	0	14	04.4
	8	53	28	59.3	0	15	01.5		23	53	30	00.1	0	14	03.2
	9	53	27	51.8	0	15	00.3		24	53	31	14.5	0	14	01.9
	10	53	26	47.1	0	14	59.1		25	53	32	31.9	0	14	00.7
	11	53	25	45.4	0	14	57.9	Mar.	26	53	33	52.1	0	13	59.5
	12	53	24	46.7	-0	14	56.6		27	53	35	15.2	-0	13	58.2
	13	53	23	50.8	0	14	55.4		28	53	36	41.2	0	13	57.0
	14	53	22	57.8	0	14	54.2		1	53	38	10.1	0	13	55.8
	15	53	22	07.7	0	14	52.9		2	53	39	41.8	0	13	54.6
	16	53	21	20.6	0	14	51.7		3	53	41	16.3	0	13	53.4
	17	53	20	36.3	0	14	50.4		4	53	42	53.8	0	13	52.1
	18	53	19	55.1	-0	14	49.2		5	53	44	34.0	-0	13	50.9
	19	53	19	16.8	0	14	47.9		6	53	46	17.1	0	13	49.8
	20	53	18	41.6	0	14	46.7		7	53	48	03.0	0	13	48.6
	21	53	18	09.5	0	14	45.4		8	53	49	51.6	0	13	47.4
	22	53	17	40.5	0	14	44.1		9	53	51	42.8	0	13	46.2
	23	53	17	14.6	0	14	42.8		10	53	53	36.6	0	13	45.1
	24	53	16	51.9	-0	14	41.6		11	53	55	32.9	-0	13	43.9
	25	53	16	32.4	0	14	40.3		12	53	57	31.8	0	13	42.8
	26	53	16	16.0	0	14	39.0		13	53	59	33.2	0	13	41.6
	27	53	16	02.8	0	14	37.7		14	54	01	37.0	0	13	40.5
	28	53	15	52.9	0	14	36.4		15	54	03	43.4	0	13	39.4
	29	53	15	46.0	0	14	35.1		16	54	05	52.2	0	13	38.3
	30	53	15	42.3	-0	14	33.8		17	54	08	03.4	-0	13	37.2
	31	53	15	41.7	0	14	32.6		18	54	10	17.1	0	13	36.1
Feb.	1	53	15	44.3	0	14	31.3		19	54	12	33.1	0	13	35.0
	2	53	15	50.0	0	14	30.0		20	54	14	51.6	0	13	33.9
	3	53	15	59.0	0	14	28.7		21	54	17	12.4	0	13	32.8
	4	53	16	11.1	0	14	27.4		22	54	19	35.5	0	13	31.8
	5	53	16	26.5	-0	14	26.1		23	54	22	00.9	-0	13	30.7
	6	53	16	45.2	0	14	24.8		24	54	24	28.5	0	13	29.7
	7	53	17	07.1	0	14	23.5		25	54	26	58.2	0	13	28.6
	8	53	17	32.1	0	14	22.2		26	54	29	30.0	0	13	27.6
	9	53	18	00.4	0	14	20.9		27	54	32	03.9	0	13	26.5
	10	53	18	31.8	0	14	19.6		28	54	34	39.9	0	13	25.5
	11	53	19	06.3	-0	14	18.3	Apr.	29	54	37	17.8	-0	13	24.5
	12	53	19	43.8	0	14	17.0		30	54	39	57.8	0	13	23.5
	13	53	20	24.5	0	14	15.8		31	54	42	39.7	0	13	22.5
	14	53	21	08.1	0	14	14.5		1	54	45	23.7	0	13	21.5
	15	53	21	54.9	-0	14	13.2		2	54	48	09.6	-0	13	20.5

URANUS, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Apr.	1	54	45	23.7	-0	13	21.5	May	17	57	14	24.8	-0	12	47.0
	2	54	48	09.6	0	13	20.5		18	57	17	53.3	0	12	48.2
	3	54	50	57.5	0	13	19.5		19	57	21	23.4	0	12	46.0
	4	54	53	47.1	0	13	18.6		20	57	24	53.2	0	12	45.4
	5	54	56	38.5	0	13	17.6		21	57	28	22.9	0	12	44.9
	6	54	59	31.5	0	13	16.7		22	57	31	52.3	0	12	44.4
	7	55	02	26.2	-0	13	15.8		23	57	35	21.6	-0	12	43.9
	8	55	05	22.5	0	13	14.9		24	57	38	50.7	0	12	43.5
	9	55	08	20.4	0	13	14.0		25	57	42	19.7	0	12	43.0
	10	55	11	19.7	0	13	13.1		26	57	45	48.4	0	12	42.6
	11	55	14	20.6	0	13	12.2		27	57	49	16.9	0	12	42.1
	12	55	17	22.9	0	13	11.3		28	57	52	45.1	0	12	41.7
	13	55	20	26.7	-0	13	10.5	June	29	57	56	12.9	-0	12	41.3
	14	55	23	32.0	0	13	09.6		30	57	59	40.2	0	12	40.9
	15	55	26	38.7	0	13	08.8		31	58	03	07.1	0	12	40.5
	16	55	29	46.7	0	13	07.9		1	58	06	33.3	0	12	40.1
	17	55	32	56.1	0	13	07.1		2	58	09	58.8	0	12	39.8
	18	55	36	06.8	0	13	06.3		3	58	13	23.8	0	12	39.4
	19	55	39	18.8	-0	13	05.5		4	58	16	48.0	-0	12	39.1
	20	55	42	31.9	0	13	04.7		5	58	20	11.5	0	12	38.7
	21	55	45	46.2	0	13	03.9		6	58	23	34.4	0	12	38.4
	22	55	49	01.5	0	13	03.1		7	58	26	56.5	0	12	38.1
	23	55	52	17.9	0	13	02.3		8	58	30	17.8	0	12	37.8
	24	55	55	35.3	0	13	01.5		9	58	33	38.3	0	12	37.5
	25	55	58	53.6	-0	13	00.8		10	58	36	58.1	-0	12	37.2
	26	56	02	12.8	0	13	00.0		11	58	40	16.9	0	12	36.9
	27	56	05	33.0	0	12	59.3		12	58	43	34.9	0	12	36.6
	28	56	08	54.2	0	12	58.6		13	58	46	51.8	0	12	36.4
	29	56	12	16.2	0	12	57.9		14	58	50	07.8	0	12	36.1
	30	56	15	39.1	0	12	57.2		15	58	53	22.6	0	12	35.9
May	1	56	19	02.7	-0	12	56.5		16	58	56	36.4	-0	12	35.6
	2	56	22	27.1	0	12	55.8		17	58	59	49.0	0	12	35.4
	3	56	25	52.0	0	12	55.1		18	59	03	00.4	0	12	35.1
	4	56	29	17.5	0	12	54.5		19	59	06	10.5	0	12	34.9
	5	56	32	43.5	0	12	53.8		20	59	09	19.5	0	12	34.7
	6	56	36	10.0	0	12	53.2		21	59	12	27.2	0	12	34.5
	7	56	39	36.9	-0	12	52.6		22	59	15	33.6	-0	12	34.3
	8	56	43	04.2	0	12	52.0		23	59	18	38.8	0	12	34.1
	9	56	46	31.9	0	12	51.4		24	59	21	42.7	0	12	33.9
	10	56	50	00.0	0	12	50.8		25	59	24	45.2	0	12	33.8
	11	56	53	28.4	0	12	50.2		26	59	27	46.2	0	12	33.6
	12	56	56	57.2	0	12	49.6		27	59	30	45.6	0	12	33.5
	13	57	00	26.2	-0	12	49.1	July	28	59	33	43.5	-0	12	33.3
	14	57	03	55.5	0	12	48.5		29	59	36	39.7	0	12	33.2
	15	57	07	25.1	0	12	48.0		30	59	39	34.2	0	12	33.1
	16	57	10	54.8	0	12	47.5		1	59	42	27.1	0	12	33.0
	17	57	14	24.8	-0	12	47.0		2	59	45	18.2	-0	12	32.9

URANUS, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
July	1	59	42	27.1	-0	12	33.0	Aug.	16	61	16	28.1	-0	12	33.8
	2	59	45	18.2	0	12	32.9		17	61	17	30.5	0	12	34.0
	3	59	48	07.6	0	12	32.8		18	61	18	30.0	0	12	34.1
	4	59	50	55.3	0	12	32.7		19	61	19	26.6	0	12	34.2
	5	59	53	41.2	0	12	32.6		20	61	20	20.2	0	12	34.3
	6	59	56	25.4	0	12	32.5		21	61	21	10.9	0	12	34.4
	7	59	59	07.8	-0	12	32.4		22	61	21	58.5	-0	12	34.5
	8	60	01	48.3	0	12	32.4		23	61	22	43.1	0	12	34.7
	9	60	04	26.9	0	12	32.3		24	61	23	24.6	0	12	34.8
	10	60	07	03.6	0	12	32.2		25	61	24	03.0	0	12	34.9
	11	60	09	38.4	0	12	32.2		26	61	24	38.5	0	12	35.0
	12	60	12	11.1	0	12	32.2		27	61	25	10.9	0	12	35.2
	13	60	14	41.7	-0	12	32.1	Sept.	28	61	25	40.3	-0	12	35.3
	14	60	17	10.3	0	12	32.1		29	61	26	06.7	0	12	35.4
	15	60	19	36.7	0	12	32.0		30	61	26	30.2	0	12	35.5
	16	60	22	01.0	0	12	32.0		31	61	26	50.6	0	12	35.6
	17	60	24	23.1	0	12	32.0		1	61	27	08.0	0	12	35.8
	18	60	26	43.1	0	12	32.0		2	61	27	22.4	0	12	35.9
	19	60	29	00.9	-0	12	32.0		3	61	27	33.8	-0	12	36.0
	20	60	31	16.5	0	12	32.0		4	61	27	42.1	0	12	36.1
	21	60	33	29.9	0	12	32.0		5	61	27	47.3	0	12	36.2
	22	60	35	41.1	0	12	32.0		6	61	27	49.5	0	12	36.3
	23	60	37	49.9	0	12	32.0		7	61	27	48.6	0	12	36.4
	24	60	39	56.3	0	12	32.1		8	61	27	44.6	0	12	36.5
	25	60	42	00.3	-0	12	32.1		9	61	27	37.6	-0	12	36.6
	26	60	44	01.7	0	12	32.2		10	61	27	27.5	0	12	36.7
	27	60	46	00.7	0	12	32.2		11	61	27	14.5	0	12	36.8
	28	60	47	57.1	0	12	32.3		12	61	26	58.5	0	12	36.8
	29	60	49	51.0	0	12	32.3		13	61	26	39.6	0	12	36.9
	30	60	51	42.3	0	12	32.4		14	61	26	17.7	0	12	37.0
	31	60	53	31.1	-0	12	32.5		15	61	25	52.9	-0	12	37.1
	1	60	55	17.3	0	12	32.5		16	61	25	25.0	0	12	37.2
	2	60	57	00.9	0	12	32.6		17	61	24	54.1	0	12	37.2
	3	60	58	42.0	0	12	32.7		18	61	24	20.2	0	12	37.3
	4	61	00	20.5	0	12	32.8		19	61	23	43.2	0	12	37.4
	5	61	01	56.3	0	12	32.8		20	61	23	03.2	0	12	37.4
Aug.	6	61	03	29.4	-0	12	32.9		21	61	22	20.3	-0	12	37.5
	7	61	04	59.9	0	12	33.0		22	61	21	34.4	0	12	37.6
	8	61	06	27.6	0	12	33.1		23	61	20	45.6	0	12	37.6
	9	61	07	52.5	0	12	33.2		24	61	19	53.9	0	12	37.6
	10	61	09	14.6	0	12	33.3		25	61	18	59.4	0	12	37.7
	11	61	10	33.9	0	12	33.4		26	61	18	02.1	0	12	37.7
	12	61	11	50.4	-0	12	33.4		27	61	17	02.1	-0	12	37.7
	13	61	13	04.0	0	12	33.5		28	61	15	59.2	0	12	37.7
	14	61	14	14.8	0	12	33.6		29	61	14	53.7	0	12	37.7
	15	61	15	22.9	0	12	33.7		30	61	13	45.4	0	12	37.7
	16	61	16	28.1	-0	12	33.8		1	61	12	34.4	-0	12	37.7
								Oct.							

URANUS, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Oct.	1	61	12	34.4	-0	12	37.7	Nov.	16	59	40	34.6	-0	12	26.9
	2	61	11	20.7	0	12	37.7		17	59	38	04.6	0	12	26.4
	3	61	10	04.4	0	12	37.7		18	59	35	34.3	0	12	25.9
	4	61	08	45.3	0	12	37.6		19	59	33	03.8	0	12	25.3
	5	61	07	23.7	0	12	37.6		20	59	30	33.2	0	12	24.8
	6	61	05	59.4	0	12	37.5		21	59	28	02.5	0	12	24.2
	7	61	04	32.7	-0	12	37.5		22	59	25	31.7	-0	12	23.7
	8	61	03	03.5	0	12	37.4		23	59	23	01.1	0	12	23.1
	9	61	01	31.9	0	12	37.3		24	59	20	30.5	0	12	22.5
	10	60	59	57.9	0	12	37.2		25	59	18	00.1	0	12	21.9
	11	60	58	21.7	0	12	37.2		26	59	15	29.9	0	12	21.3
	12	60	56	43.1	0	12	37.1		27	59	13	00.0	0	12	20.6
	13	60	55	02.2	-0	12	37.0	Dec.	28	59	10	30.4	-0	12	20.0
	14	60	53	18.9	0	12	36.8		29	59	08	01.2	0	12	19.3
	15	60	51	33.4	0	12	36.7		30	59	05	32.5	0	12	18.6
	16	60	49	45.6	0	12	36.6		1	59	03	04.4	0	12	17.9
	17	60	47	55.6	0	12	36.4		2	59	00	36.9	0	12	17.2
	18	60	46	03.5	0	12	36.3		3	58	58	10.3	0	12	16.5
	19	60	44	09.2	-0	12	36.1		4	58	55	44.4	-0	12	15.8
	20	60	42	13.0	0	12	36.0		5	58	53	19.5	0	12	15.1
	21	60	40	14.7	0	12	35.8		6	58	50	55.5	0	12	14.3
	22	60	38	14.6	0	12	35.6		7	58	48	32.5	0	12	13.6
	23	60	36	12.7	0	12	35.4		8	58	46	10.4	0	12	12.8
	24	60	34	09.0	0	12	35.2		9	58	43	49.3	0	12	12.0
	25	60	32	03.5	-0	12	34.9		10	58	41	29.3	-0	12	11.3
	26	60	29	56.4	0	12	34.7		11	58	39	10.4	0	12	10.5
	27	60	27	47.6	0	12	34.5		12	58	36	52.7	0	12	09.7
	28	60	25	37.3	0	12	34.2		13	58	34	36.3	0	12	08.9
	29	60	23	25.4	0	12	33.9		14	58	32	21.3	0	12	08.0
	30	60	21	12.0	0	12	33.6		15	58	30	07.8	0	12	07.2
	31	60	18	57.2	-0	12	33.3		16	58	27	55.9	-0	12	06.3
Nov.	1	60	16	40.9	0	12	33.0		17	58	25	45.5	0	12	05.5
	2	60	14	23.3	0	12	32.7		18	58	23	36.8	0	12	04.6
	3	60	12	04.4	0	12	32.3		19	58	21	29.8	0	12	03.7
	4	60	09	44.4	0	12	32.0		20	58	19	24.6	0	12	02.8
	5	60	07	23.3	0	12	31.6		21	58	17	21.2	0	12	01.9
	6	60	05	01.2	-0	12	31.2		22	58	15	19.7	-0	12	01.0
	7	60	02	38.2	0	12	30.8		23	58	13	20.1	0	12	00.1
	8	60	00	14.3	0	12	30.5		24	58	11	22.4	0	11	59.1
	9	59	57	49.5	0	12	30.0		25	58	09	26.6	0	11	58.2
	10	59	55	23.8	0	12	29.6		26	58	07	33.0	0	11	57.2
	11	59	52	57.3	0	12	29.2		27	58	05	41.4	0	11	56.3
	12	59	50	30.1	-0	12	28.8		28	58	03	52.0	-0	11	55.3
	13	59	48	02.1	0	12	28.3		29	58	02	04.9	0	11	54.3
	14	59	45	33.5	0	12	27.8		30	58	00	20.0	0	11	53.3
	15	59	43	04.3	0	12	27.4		31	57	58	37.6	0	11	52.3
	16	59	40	34.6	-0	12	26.9		32	57	56	57.6	-0	11	51.3

URANUS, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Jan.	0	3	25	22.59	+18	26	32.6	18.859 217	0.47	1.86	20	42	14
	1	3	25	16.51	18	26	11.6	18.871 645	0.47	1.86	20	38	12
	2	3	25	10.61	18	25	51.3	18.884 284	0.47	1.85	20	34	10
	3	3	25	04.87	18	25	31.6	18.897 130	0.47	1.85	20	30	09
	4	3	24	59.32	18	25	12.5	18.910 178	0.47	1.85	20	26	08
	5	3	24	53.94	18	24	54.1	18.923 424	0.46	1.85	20	22	07
	6	3	24	48.75	+18	24	36.4	18.936 861	0.46	1.85	20	18	06
	7	3	24	43.75	18	24	19.3	18.950 486	0.46	1.85	20	14	05
	8	3	24	38.94	18	24	02.9	18.964 293	0.46	1.85	20	10	04
	9	3	24	34.32	18	23	47.2	18.978 277	0.46	1.85	20	06	04
	10	3	24	29.91	18	23	32.2	18.992 434	0.46	1.84	20	02	04
	11	3	24	25.69	18	23	17.9	19.006 760	0.46	1.84	19	58	04
	12	3	24	21.67	+18	23	04.4	19.021 248	0.46	1.84	19	54	04
	13	3	24	17.85	18	22	51.7	19.035 895	0.46	1.84	19	50	05
	14	3	24	14.22	18	22	39.7	19.050 696	0.46	1.84	19	46	05
	15	3	24	10.79	18	22	28.4	19.065 646	0.46	1.84	19	42	06
	16	3	24	07.56	18	22	17.9	19.080 741	0.46	1.84	19	38	07
	17	3	24	04.53	18	22	08.1	19.095 976	0.46	1.83	19	34	09
	18	3	24	01.70	+18	21	59.0	19.111 346	0.46	1.83	19	30	10
	19	3	23	59.08	18	21	50.7	19.126 847	0.46	1.83	19	26	12
	20	3	23	56.66	18	21	43.1	19.142 474	0.46	1.83	19	22	13
	21	3	23	54.45	18	21	36.2	19.158 222	0.46	1.83	19	18	16
	22	3	23	52.46	18	21	30.2	19.174 085	0.46	1.83	19	14	18
	23	3	23	50.68	18	21	24.9	19.190 060	0.46	1.82	19	10	20
	24	3	23	49.11	+18	21	20.4	19.206 140	0.46	1.82	19	06	23
	25	3	23	47.76	18	21	16.8	19.222 321	0.46	1.82	19	02	26
	26	3	23	46.63	18	21	13.9	19.238 597	0.46	1.82	18	58	29
	27	3	23	45.71	18	21	11.9	19.254 963	0.46	1.82	18	54	32
	28	3	23	45.01	18	21	10.6	19.271 413	0.46	1.82	18	50	36
	29	3	23	44.52	18	21	10.2	19.287 942	0.46	1.82	18	46	40
Feb.	30	3	23	44.24	+18	21	10.6	19.304 545	0.46	1.81	18	42	44
	31	3	23	44.18	18	21	11.8	19.321 215	0.46	1.81	18	38	48
	1	3	23	44.33	18	21	13.7	19.337 947	0.45	1.81	18	34	52
	2	3	23	44.70	18	21	16.4	19.354 735	0.45	1.81	18	30	57
	3	3	23	45.28	18	21	19.9	19.371 573	0.45	1.81	18	27	02
	4	3	23	46.08	18	21	24.2	19.388 457	0.45	1.81	18	23	07
	5	3	23	47.11	+18	21	29.3	19.405 379	0.45	1.80	18	19	12
	6	3	23	48.36	18	21	35.2	19.422 336	0.45	1.80	18	15	18
	7	3	23	49.82	18	21	41.9	19.439 321	0.45	1.80	18	11	23
	8	3	23	51.50	18	21	49.5	19.456 329	0.45	1.80	18	07	29
	9	3	23	53.40	18	21	57.8	19.473 356	0.45	1.80	18	03	35
	10	3	23	55.51	18	22	06.9	19.490 396	0.45	1.80	17	59	42
	11	3	23	57.84	+18	22	16.9	19.507 444	0.45	1.80	17	55	48
	12	3	24	00.37	18	22	27.6	19.524 496	0.45	1.79	17	51	55
	13	3	24	03.11	18	22	39.0	19.541 547	0.45	1.79	17	48	02
	14	3	24	06.06	18	22	51.2	19.558 592	0.45	1.79	17	44	09
	15	3	24	09.21	+18	23	04.2	19.575 625	0.45	1.79	17	40	17

URANUS, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Feb.	15	3	24	09.21	+18	23	04.2	19.575 625	0.45	1.79	17	40	17
	16	3	24	12.58	18	23	17.9	19.592 643	0.45	1.79	17	36	24
	17	3	24	16.16	18	23	32.3	19.609 641	0.45	1.79	17	32	32
	18	3	24	19.95	18	23	47.5	19.626 613	0.45	1.78	17	28	40
	19	3	24	23.95	18	24	03.5	19.643 554	0.45	1.78	17	24	48
	20	3	24	28.16	18	24	20.2	19.660 460	0.45	1.78	17	20	57
	21	3	24	32.58	+18	24	37.7	19.677 326	0.45	1.78	17	17	05
	22	3	24	37.21	18	24	56.0	19.694 146	0.45	1.78	17	13	14
	23	3	24	42.05	18	25	15.0	19.710 916	0.45	1.78	17	09	23
	24	3	24	47.09	18	25	34.8	19.727 631	0.45	1.78	17	05	32
Mar.	25	3	24	52.33	18	25	55.3	19.744 285	0.45	1.77	17	01	42
	26	3	24	57.77	18	26	16.5	19.760 874	0.45	1.77	16	57	52
	27	3	25	03.41	+18	26	38.5	19.777 392	0.44	1.77	16	54	01
	28	3	25	09.24	18	27	01.1	19.793 835	0.44	1.77	16	50	11
	1	3	25	15.26	18	27	24.4	19.810 196	0.44	1.77	16	46	22
	2	3	25	21.48	18	27	48.4	19.826 471	0.44	1.77	16	42	32
	3	3	25	27.90	18	28	13.0	19.842 655	0.44	1.76	16	38	43
	4	3	25	34.51	18	28	38.4	19.858 744	0.44	1.76	16	34	53
	5	3	25	41.32	+18	29	04.4	19.874 731	0.44	1.76	16	31	04
	6	3	25	48.32	18	29	31.0	19.890 614	0.44	1.76	16	27	16
	7	3	25	55.51	18	29	58.4	19.906 387	0.44	1.76	16	23	27
	8	3	26	02.88	18	30	26.4	19.922 046	0.44	1.76	16	19	39
	9	3	26	10.44	18	30	55.1	19.937 587	0.44	1.76	16	15	50
	10	3	26	18.17	18	31	24.4	19.953 007	0.44	1.76	16	12	02
	11	3	26	26.08	+18	31	54.3	19.968 301	0.44	1.75	16	08	14
	12	3	26	34.16	18	32	24.8	19.983 466	0.44	1.75	16	04	26
	13	3	26	42.41	18	32	55.9	19.998 497	0.44	1.75	16	00	39
	14	3	26	50.83	18	33	27.5	20.013 391	0.44	1.75	15	56	51
	15	3	26	59.42	18	33	59.8	20.028 145	0.44	1.75	15	53	04
	16	3	27	08.18	18	34	32.5	20.042 754	0.44	1.75	15	49	17
	17	3	27	17.11	+18	35	05.9	20.057 215	0.44	1.75	15	45	30
	18	3	27	26.20	18	35	39.7	20.071 524	0.44	1.74	15	41	43
	19	3	27	35.46	18	36	14.2	20.085 678	0.44	1.74	15	37	57
	20	3	27	44.89	18	36	49.2	20.099 672	0.44	1.74	15	34	10
	21	3	27	54.47	18	37	24.7	20.113 504	0.44	1.74	15	30	24
	22	3	28	04.21	18	38	00.8	20.127 169	0.44	1.74	15	26	38
	23	3	28	14.11	+18	38	37.4	20.140 664	0.44	1.74	15	22	52
	24	3	28	24.16	18	39	14.5	20.153 984	0.44	1.74	15	19	06
	25	3	28	34.36	18	39	52.1	20.167 128	0.44	1.74	15	15	21
	26	3	28	44.71	18	40	30.2	20.180 090	0.44	1.74	15	11	35
	27	3	28	55.19	18	41	08.8	20.192 867	0.44	1.73	15	07	50
	28	3	29	05.82	18	41	47.7	20.205 456	0.44	1.73	15	04	04
Apr.	29	3	29	16.58	+18	42	27.2	20.217 852	0.43	1.73	15	00	19
	30	3	29	27.49	18	43	07.0	20.230 053	0.43	1.73	14	56	34
	31	3	29	38.53	18	43	47.2	20.242 054	0.43	1.73	14	52	49
	1	3	29	49.71	18	44	27.9	20.253 852	0.43	1.73	14	49	05
	2	3	30	01.03	+18	45	09.0	20.265 445	0.43	1.73	14	45	20

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 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
	h	m	s	°	'	"				h	m	s
Apr.	1	3	29	49.71	+18	44	20.253 852	0.43	1.73	14	49	05
	2	3	30	01.03	18	45	20.265 445	0.43	1.73	14	45	20
	3	3	30	12.48	18	45	20.276 830	0.43	1.73	14	41	36
	4	3	30	24.05	18	46	20.288 004	0.43	1.73	14	37	51
	5	3	30	35.75	18	47	20.298 964	0.43	1.73	14	34	07
	6	3	30	47.56	18	47	20.309 708	0.43	1.72	14	30	23
	7	3	30	59.48	+18	48	20.320 234	0.43	1.72	14	26	39
	8	3	31	11.52	18	49	20.330 539	0.43	1.72	14	22	55
	9	3	31	23.66	18	50	20.340 622	0.43	1.72	14	19	11
	10	3	31	35.91	18	50	20.350 480	0.43	1.72	14	15	28
	11	3	31	48.26	18	51	20.360 112	0.43	1.72	14	11	44
	12	3	32	00.72	18	52	20.369 514	0.43	1.72	14	08	01
	13	3	32	13.28	+18	53	20.378 686	0.43	1.72	14	04	17
	14	3	32	25.95	18	53	20.387 625	0.43	1.72	14	00	34
	15	3	32	38.71	18	54	20.396 329	0.43	1.72	13	56	51
	16	3	32	51.56	18	55	20.404 797	0.43	1.72	13	53	08
	17	3	33	04.52	18	56	20.413 026	0.43	1.72	13	49	25
	18	3	33	17.56	18	56	20.421 014	0.43	1.71	13	45	42
	19	3	33	30.69	+18	57	20.428 760	0.43	1.71	13	41	59
	20	3	33	43.90	18	58	20.436 261	0.43	1.71	13	38	17
	21	3	33	57.19	18	59	20.443 517	0.43	1.71	13	34	34
	22	3	34	10.56	18	59	20.450 523	0.43	1.71	13	30	51
	23	3	34	24.00	19	00	20.457 280	0.43	1.71	13	27	09
	24	3	34	37.51	19	01	20.463 784	0.43	1.71	13	23	26
	25	3	34	51.09	+19	02	20.470 035	0.43	1.71	13	19	44
	26	3	35	04.74	19	03	20.476 030	0.43	1.71	13	16	02
	27	3	35	18.45	19	03	20.481 767	0.43	1.71	13	12	20
	28	3	35	32.24	19	04	20.487 245	0.43	1.71	13	08	37
	29	3	35	46.08	19	05	20.492 463	0.43	1.71	13	04	55
	30	3	35	59.99	19	06	20.497 419	0.43	1.71	13	01	13
May	1	3	36	13.95	+19	07	20.502 113	0.43	1.71	12	57	31
	2	3	36	27.96	19	07	20.506 543	0.43	1.71	12	53	49
	3	3	36	42.01	19	08	20.510 710	0.43	1.71	12	50	07
	4	3	36	56.10	19	09	20.514 611	0.43	1.71	12	46	26
	5	3	37	10.23	19	10	20.518 248	0.43	1.71	12	42	44
	6	3	37	24.40	19	11	20.521 620	0.43	1.71	12	39	02
	7	3	37	38.60	+19	11	20.524 726	0.43	1.71	12	35	20
	8	3	37	52.82	19	12	20.527 566	0.43	1.71	12	31	38
	9	3	38	07.08	19	13	20.530 140	0.43	1.71	12	27	57
	10	3	38	21.37	19	14	20.532 448	0.43	1.71	12	24	15
	11	3	38	35.68	19	15	20.534 489	0.43	1.71	12	20	33
	12	3	38	50.02	19	16	20.536 263	0.43	1.71	12	16	52
	13	3	39	04.38	+19	16	20.537 770	0.43	1.71	12	13	10
	14	3	39	18.76	19	17	20.539 010	0.43	1.71	12	09	28
	15	3	39	33.16	19	18	20.539 982	0.43	1.70	12	05	47
	16	3	39	47.58	19	19	20.540 687	0.43	1.70	12	02	05
	17	3	40	02.01	+19	20	20.541 124	0.43	1.70	11	58	24

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Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
May	17	3	40	02.01	+19	20	04.4	20.541 124	0.43	1.70	11	58	24
	18	3	40	16.38	19	20	50.8	20.541 293	0.43	1.70	11	54	42
	19	3	40	30.80	19	21	40.8	20.541 195	0.43	1.70	11	51	01
	20	3	40	45.23	19	22	29.1	20.540 827	0.43	1.70	11	47	19
	21	3	40	59.65	19	23	17.1	20.540 192	0.43	1.70	11	43	37
	22	3	41	14.06	19	24	05.1	20.539 288	0.43	1.71	11	39	56
	23	3	41	28.46	+19	24	52.9	20.538 116	0.43	1.71	11	36	14
	24	3	41	42.86	19	25	40.5	20.536 675	0.43	1.71	11	32	33
	25	3	41	57.24	19	26	28.0	20.534 966	0.43	1.71	11	28	51
	26	3	42	11.61	19	27	15.4	20.532 988	0.43	1.71	11	25	09
June	27	3	42	25.97	19	28	02.6	20.530 743	0.43	1.71	11	21	28
	28	3	42	40.31	19	28	49.7	20.528 230	0.43	1.71	11	17	46
	29	3	42	54.63	+19	29	36.7	20.525 451	0.43	1.71	11	14	04
	30	3	43	08.91	19	30	23.5	20.522 407	0.43	1.71	11	10	23
	31	3	43	23.16	19	31	10.1	20.519 099	0.43	1.71	11	06	41
	1	3	43	37.37	19	31	56.5	20.515 528	0.43	1.71	11	02	59
	2	3	43	51.54	19	32	42.7	20.511 696	0.43	1.71	10	59	17
	3	3	44	05.67	19	33	28.7	20.507 603	0.43	1.71	10	55	36
	4	3	44	19.76	+19	34	14.4	20.503 251	0.43	1.71	10	51	54
	5	3	44	33.79	19	34	59.8	20.498 642	0.43	1.71	10	48	12
	6	3	44	47.79	19	35	45.1	20.493 777	0.43	1.71	10	44	30
	7	3	45	01.73	19	36	30.0	20.488 657	0.43	1.71	10	40	48
	8	3	45	15.62	19	37	14.7	20.483 284	0.43	1.71	10	37	05
	9	3	45	29.46	19	37	59.2	20.477 660	0.43	1.71	10	33	23
	10	3	45	43.25	+19	38	43.4	20.471 785	0.43	1.71	10	29	41
	11	3	45	56.98	19	39	27.3	20.465 662	0.43	1.71	10	25	59
	12	3	46	10.65	19	40	11.0	20.459 291	0.43	1.71	10	22	16
	13	3	46	24.25	19	40	54.4	20.452 675	0.43	1.71	10	18	34
	14	3	46	37.78	19	41	37.6	20.445 814	0.43	1.71	10	14	52
	15	3	46	51.24	19	42	20.4	20.438 710	0.43	1.71	10	11	09
	16	3	47	04.63	+19	43	03.0	20.431 365	0.43	1.71	10	07	26
	17	3	47	17.94	19	43	45.2	20.423 779	0.43	1.71	10	03	44
	18	3	47	31.16	19	44	27.1	20.415 955	0.43	1.72	10	00	01
	19	3	47	44.31	19	45	08.6	20.407 894	0.43	1.72	9	56	18
	20	3	47	57.37	19	45	49.8	20.399 598	0.43	1.72	9	52	35
	21	3	48	10.35	19	46	30.6	20.391 067	0.43	1.72	9	48	52
	22	3	48	23.24	+19	47	11.0	20.382 305	0.43	1.72	9	45	09
	23	3	48	36.05	19	47	51.2	20.373 312	0.43	1.72	9	41	26
	24	3	48	48.77	19	48	30.9	20.364 092	0.43	1.72	9	37	42
	25	3	49	01.40	19	49	10.4	20.354 646	0.43	1.72	9	33	59
	26	3	49	13.92	19	49	49.4	20.344 976	0.43	1.72	9	30	16
	27	3	49	26.34	19	50	28.1	20.335 086	0.43	1.72	9	26	32
July	28	3	49	38.65	+19	51	06.5	20.324 978	0.43	1.72	9	22	48
	29	3	49	50.85	19	51	44.4	20.314 654	0.43	1.72	9	19	04
	30	3	50	02.93	19	52	21.8	20.304 119	0.43	1.72	9	15	20
	1	3	50	14.90	19	52	58.9	20.293 374	0.43	1.73	9	11	36
	2	3	50	26.75	+19	53	35.5	20.282 423	0.43	1.73	9	07	52

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 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
	h	m	s	°	'	"				h	m	s
July	1	3	50	14.90	+19	52	20.293 374	0.43	1.73	9	11	36
	2	3	50	26.75	19	53	20.282 423	0.43	1.73	9	07	52
	3	3	50	38.49	19	54	20.271 268	0.43	1.73	9	04	08
	4	3	50	50.10	19	54	20.259 913	0.43	1.73	9	00	24
	5	3	51	01.60	19	55	20.248 360	0.43	1.73	8	56	39
	6	3	51	12.98	19	55	20.236 612	0.43	1.73	8	52	54
	7	3	51	24.23	+19	56	20.224 673	0.43	1.73	8	49	10
	8	3	51	35.35	19	57	20.212 545	0.44	1.73	8	45	25
	9	3	51	46.35	19	57	20.200 231	0.44	1.73	8	41	40
	10	3	51	57.21	19	58	20.187 734	0.44	1.73	8	37	55
	11	3	52	07.94	19	58	20.175 057	0.44	1.74	8	34	09
	12	3	52	18.53	19	59	20.162 202	0.44	1.74	8	30	24
	13	3	52	28.98	+19	59	20.149 174	0.44	1.74	8	26	38
	14	3	52	39.28	20	00	20.135 974	0.44	1.74	8	22	53
	15	3	52	49.44	20	00	20.122 605	0.44	1.74	8	19	07
	16	3	52	59.45	20	01	20.109 070	0.44	1.74	8	15	21
	17	3	53	09.31	20	01	20.095 372	0.44	1.74	8	11	35
	18	3	53	19.02	20	02	20.081 515	0.44	1.74	8	07	48
	19	3	53	28.59	+20	02	20.067 501	0.44	1.75	8	04	02
	20	3	53	38.00	20	03	20.053 334	0.44	1.75	8	00	15
	21	3	53	47.26	20	03	20.039 016	0.44	1.75	7	56	28
	22	3	53	56.37	20	04	20.024 552	0.44	1.75	7	52	42
	23	3	54	05.31	20	04	20.009 946	0.44	1.75	7	48	55
	24	3	54	14.09	20	05	19.995 200	0.44	1.75	7	45	07
	25	3	54	22.70	+20	05	19.980 319	0.44	1.75	7	41	20
	26	3	54	31.13	20	05	19.965 308	0.44	1.75	7	37	32
	27	3	54	39.39	20	06	19.950 170	0.44	1.76	7	33	45
	28	3	54	47.48	20	06	19.934 910	0.44	1.76	7	29	57
	29	3	54	55.39	20	07	19.919 531	0.44	1.76	7	26	09
	30	3	55	03.12	20	07	19.904 039	0.44	1.76	7	22	20
Aug.	31	3	55	10.68	+20	07	19.888 436	0.44	1.76	7	18	32
	1	3	55	18.07	20	08	19.872 728	0.44	1.76	7	14	43
	2	3	55	25.27	20	08	19.856 919	0.44	1.76	7	10	54
	3	3	55	32.29	20	08	19.841 012	0.44	1.77	7	07	05
	4	3	55	39.14	20	09	19.825 011	0.44	1.77	7	03	16
	5	3	55	45.80	20	09	19.808 922	0.44	1.77	6	59	27
	6	3	55	52.28	+20	09	19.792 748	0.44	1.77	6	55	37
	7	3	55	58.56	20	10	19.776 493	0.44	1.77	6	51	48
	8	3	56	04.66	20	10	19.760 161	0.45	1.77	6	47	58
	9	3	56	10.57	20	10	19.743 757	0.45	1.77	6	44	08
	10	3	56	16.28	20	11	19.727 283	0.45	1.78	6	40	17
	11	3	56	21.79	20	11	19.710 745	0.45	1.78	6	36	27
	12	3	56	27.11	+20	11	19.694 145	0.45	1.78	6	32	36
	13	3	56	32.23	20	11	19.677 489	0.45	1.78	6	28	45
	14	3	56	37.16	20	12	19.660 779	0.45	1.78	6	24	54
	15	3	56	41.89	20	12	19.644 021	0.45	1.78	6	21	03
	16	3	56	46.43	+20	12	19.627 218	0.45	1.78	6	17	12

URANUS, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit				
	h	m	s	°	'	"		"	"	h	m	s		
Aug.	16	3	56	46.43	+20	12	34.8	19.627 218	0.45	1.78	6	17	12	
	17	3	56	50.77	20	12	47.4	19.610 375	0.45	1.79	6	13	20	
	18	3	56	54.91	20	12	59.4	19.593 496	0.45	1.79	6	09	28	
	19	3	56	58.85	20	13	10.8	19.576 587	0.45	1.79	6	05	36	
	20	3	57	02.58	20	13	21.6	19.559 651	0.45	1.79	6	01	44	
	21	3	57	06.10	20	13	31.8	19.542 693	0.45	1.79	5	57	51	
	22	3	57	09.42	+20	13	41.4	19.525 719	0.45	1.79	5	53	59	
	23	3	57	12.52	20	13	50.4	19.508 734	0.45	1.80	5	50	06	
	24	3	57	15.41	20	13	58.8	19.491 743	0.45	1.80	5	46	13	
	25	3	57	18.09	20	14	06.5	19.474 750	0.45	1.80	5	42	19	
	26	3	57	20.55	20	14	13.6	19.457 761	0.45	1.80	5	38	26	
	27	3	57	22.81	20	14	20.0	19.440 781	0.45	1.80	5	34	32	
	28	3	57	24.86	+20	14	25.8	19.423 815	0.45	1.80	5	30	38	
	29	3	57	26.70	20	14	31.1	19.406 867	0.45	1.80	5	26	44	
	30	3	57	28.33	20	14	35.7	19.389 943	0.45	1.81	5	22	50	
	31	3	57	29.75	20	14	39.7	19.373 048	0.45	1.81	5	18	55	
	Sept.	1	3	57	30.97	20	14	43.1	19.356 185	0.45	1.81	5	15	01
		2	3	57	31.97	20	14	45.9	19.339 361	0.45	1.81	5	11	06
		3	3	57	32.76	+20	14	48.1	19.322 580	0.46	1.81	5	07	10
		4	3	57	33.34	20	14	49.7	19.305 846	0.46	1.81	5	03	15
5		3	57	33.71	20	14	50.7	19.289 165	0.46	1.82	4	59	20	
6		3	57	33.86	20	14	51.1	19.272 540	0.46	1.82	4	55	24	
7		3	57	33.80	20	14	50.9	19.255 976	0.46	1.82	4	51	28	
8		3	57	33.52	20	14	50.0	19.239 478	0.46	1.82	4	47	31	
9		3	57	33.03	+20	14	48.5	19.223 050	0.46	1.82	4	43	35	
10		3	57	32.34	20	14	46.4	19.206 696	0.46	1.82	4	39	38	
	11	3	57	31.43	20	14	43.6	19.190 421	0.46	1.82	4	35	42	
	12	3	57	30.32	20	14	40.2	19.174 229	0.46	1.83	4	31	44	
	13	3	57	29.01	20	14	36.3	19.158 126	0.46	1.83	4	27	47	
	14	3	57	27.49	20	14	31.7	19.142 115	0.46	1.83	4	23	50	
	15	3	57	25.76	+20	14	26.6	19.126 203	0.46	1.83	4	19	52	
	16	3	57	23.82	20	14	20.9	19.110 393	0.46	1.83	4	15	54	
	17	3	57	21.67	20	14	14.6	19.094 691	0.46	1.83	4	11	56	
	18	3	57	19.31	20	14	07.7	19.079 102	0.46	1.84	4	07	58	
	19	3	57	16.74	20	14	00.1	19.063 631	0.46	1.84	4	03	59	
	20	3	57	13.96	20	13	52.0	19.048 284	0.46	1.84	4	00	01	
	21	3	57	10.97	+20	13	43.2	19.033 064	0.46	1.84	3	56	02	
	22	3	57	07.78	20	13	33.9	19.017 978	0.46	1.84	3	52	03	
	23	3	57	04.39	20	13	23.9	19.003 031	0.46	1.84	3	48	03	
	24	3	57	00.79	20	13	13.3	18.988 227	0.46	1.84	3	44	04	
	25	3	56	57.00	20	13	02.2	18.973 571	0.46	1.85	3	40	04	
	26	3	56	53.02	20	12	50.4	18.959 068	0.46	1.85	3	36	04	
	27	3	56	48.84	+20	12	38.1	18.944 723	0.46	1.85	3	32	04	
	28	3	56	44.47	20	12	25.3	18.930 540	0.46	1.85	3	28	04	
	29	3	56	39.91	20	12	11.9	18.916 523	0.46	1.85	3	24	03	
	30	3	56	35.17	20	11	58.0	18.902 678	0.47	1.85	3	20	03	
Oct.	1	3	56	30.23	+20	11	43.5	18.889 008	0.47	1.85	3	16	02	

URANUS, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
Oct.	h	m	s	°	'	"		"	"	h	m	s
1	3	56	30.23	+20	11	43.5	18.889 008	0.47	1.85	3	16	02
2	3	56	25.10	20	11	28.5	18.875 518	0.47	1.86	3	12	01
3	3	56	19.79	20	11	13.0	18.862 212	0.47	1.86	3	08	00
4	3	56	14.30	20	10	56.9	18.849 094	0.47	1.86	3	03	58
5	3	56	08.62	20	10	40.3	18.836 168	0.47	1.86	2	59	57
6	3	56	02.76	20	10	23.1	18.823 437	0.47	1.86	2	55	55
7	3	55	56.73	+20	10	05.4	18.810 906	0.47	1.86	2	51	53
8	3	55	50.53	20	09	47.1	18.798 577	0.47	1.86	2	47	51
9	3	55	44.16	20	09	28.3	18.786 456	0.47	1.86	2	43	49
10	3	55	37.63	20	09	09.0	18.774 545	0.47	1.87	2	39	46
11	3	55	30.94	20	08	49.3	18.762 849	0.47	1.87	2	35	44
12	3	55	24.09	20	08	29.1	18.751 372	0.47	1.87	2	31	41
13	3	55	17.08	+20	08	08.4	18.740 118	0.47	1.87	2	27	38
14	3	55	09.90	20	07	47.3	18.729 090	0.47	1.87	2	23	35
15	3	55	02.57	20	07	25.7	18.718 293	0.47	1.87	2	19	32
16	3	54	55.08	20	07	03.6	18.707 731	0.47	1.87	2	15	28
17	3	54	47.44	20	06	41.0	18.697 408	0.47	1.87	2	11	25
18	3	54	39.64	20	06	18.0	18.687 328	0.47	1.87	2	07	21
19	3	54	31.71	+20	05	54.5	18.677 494	0.47	1.87	2	03	17
20	3	54	23.63	20	05	30.5	18.667 911	0.47	1.88	1	59	13
21	3	54	15.42	20	05	06.2	18.658 582	0.47	1.88	1	55	09
22	3	54	07.07	20	04	41.4	18.649 511	0.47	1.88	1	51	05
23	3	53	58.61	20	04	16.2	18.640 700	0.47	1.88	1	47	01
24	3	53	50.01	20	03	50.6	18.632 154	0.47	1.88	1	42	56
25	3	53	41.30	+20	03	24.7	18.623 875	0.47	1.88	1	38	52
26	3	53	32.48	20	02	58.4	18.615 866	0.47	1.88	1	34	47
27	3	53	23.54	20	02	31.7	18.608 129	0.47	1.88	1	30	42
28	3	53	14.49	20	02	04.8	18.600 669	0.47	1.88	1	26	37
29	3	53	05.33	20	01	37.5	18.593 486	0.47	1.88	1	22	32
30	3	52	56.07	20	01	09.9	18.586 584	0.47	1.88	1	18	27
31	3	52	46.71	+20	00	41.9	18.579 965	0.47	1.88	1	14	22
Nov. 1	3	52	37.25	20	00	13.7	18.573 631	0.47	1.89	1	10	17
2	3	52	27.71	19	59	45.1	18.567 583	0.47	1.89	1	06	11
3	3	52	18.07	19	59	16.3	18.561 824	0.47	1.89	1	02	06
4	3	52	08.36	19	58	47.1	18.556 355	0.47	1.89	0	58	00
5	3	51	58.57	19	58	17.6	18.551 178	0.47	1.89	0	53	54
6	3	51	48.71	+19	57	48.0	18.546 295	0.47	1.89	0	49	49
7	3	51	38.79	19	57	18.1	18.541 707	0.47	1.89	0	45	43
8	3	51	28.81	19	56	48.0	18.537 416	0.47	1.89	0	41	37
9	3	51	18.77	19	56	17.7	18.533 424	0.47	1.89	0	37	31
10	3	51	08.67	19	55	47.2	18.529 733	0.47	1.89	0	33	25
11	3	50	58.51	19	55	16.6	18.526 344	0.47	1.89	0	29	19
12	3	50	48.30	+19	54	45.8	18.523 259	0.47	1.89	0	25	13
13	3	50	38.04	19	54	14.8	18.520 480	0.47	1.89	0	21	07
14	3	50	27.73	19	53	43.6	18.518 008	0.47	1.89	0	17	01
15	3	50	17.39	19	53	12.3	18.515 845	0.47	1.89	0	12	55
16	3	50	07.02	+19	52	40.8	18.513 992	0.48	1.89	0	08	48

URANUS, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
	h	m	s	°	'	"				h	m	s
Nov.	16	3	50	07.02	+19	52	40.8	18.513 992	0.48	1.89	0	08 48
	17	3	49	56.63	19	52	09.2	18.512 449	0.48	1.89	0	04 42
	18	3	49	46.21	19	51	37.5	18.511 219	0.48	1.89	0	00 36
	19	3	49	35.79	19	51	05.7	18.510 300	0.48	1.89	23	52 23
	20	3	49	25.35	19	50	33.9	18.509 695	0.48	1.89	23	48 17
	21	3	49	14.91	19	50	02.0	18.509 403	0.48	1.89	23	44 11
	22	3	49	04.47	+19	49	30.1	18.509 425	0.48	1.89	23	40 05
	23	3	48	54.03	19	48	58.2	18.509 761	0.48	1.89	23	35 58
	24	3	48	43.61	19	48	26.4	18.510 411	0.48	1.89	23	31 52
	25	3	48	33.19	19	47	54.5	18.511 373	0.48	1.89	23	27 46
Dec.	26	3	48	22.79	19	47	22.7	18.512 649	0.48	1.89	23	23 39
	27	3	48	12.41	19	46	51.0	18.514 237	0.47	1.89	23	19 33
	28	3	48	02.05	+19	46	19.3	18.516 137	0.47	1.89	23	15 27
	29	3	47	51.72	19	45	47.6	18.518 347	0.47	1.89	23	11 21
	30	3	47	41.43	19	45	16.0	18.520 867	0.47	1.89	23	07 15
	1	3	47	31.18	19	44	44.5	18.523 695	0.47	1.89	23	03 09
	2	3	47	20.98	19	44	13.0	18.526 830	0.47	1.89	22	59 03
	3	3	47	10.83	19	43	41.7	18.530 271	0.47	1.89	22	54 57
	4	3	47	00.74	+19	43	10.6	18.534 017	0.47	1.89	22	50 51
	5	3	46	50.71	19	42	39.6	18.538 065	0.47	1.89	22	46 45
	6	3	46	40.75	19	42	08.9	18.542 416	0.47	1.89	22	42 39
	7	3	46	30.86	19	41	38.3	18.547 067	0.47	1.89	22	38 34
	8	3	46	21.03	19	41	08.0	18.552 017	0.47	1.89	22	34 28
	9	3	46	11.27	19	40	37.8	18.557 266	0.47	1.89	22	30 23
	10	3	46	01.58	+19	40	07.9	18.562 811	0.47	1.89	22	26 17
	11	3	45	51.98	19	39	38.2	18.568 651	0.47	1.89	22	22 12
	12	3	45	42.46	19	39	08.7	18.574 785	0.47	1.89	22	18 06
	13	3	45	33.03	19	38	39.5	18.581 211	0.47	1.88	22	14 01
	14	3	45	23.69	19	38	10.6	18.587 927	0.47	1.88	22	09 56
	15	3	45	14.46	19	37	41.9	18.594 930	0.47	1.88	22	05 51
	16	3	45	05.34	+19	37	13.6	18.602 219	0.47	1.88	22	01 46
	17	3	44	56.33	19	36	45.5	18.609 791	0.47	1.88	21	57 41
	18	3	44	47.43	19	36	17.9	18.617 644	0.47	1.88	21	53 37
	19	3	44	38.66	19	35	50.6	18.625 774	0.47	1.88	21	49 32
	20	3	44	30.01	19	35	23.7	18.634 180	0.47	1.88	21	45 28
	21	3	44	21.48	19	34	57.2	18.642 857	0.47	1.88	21	41 24
	22	3	44	13.08	+19	34	31.2	18.651 803	0.47	1.88	21	37 19
	23	3	44	04.81	19	34	05.5	18.661 014	0.47	1.88	21	33 15
	24	3	43	56.68	19	33	40.3	18.670 488	0.47	1.88	21	29 12
	25	3	43	48.68	19	33	15.5	18.680 219	0.47	1.87	21	25 08
	26	3	43	40.82	19	32	51.1	18.690 206	0.47	1.87	21	21 04
	27	3	43	33.11	19	32	27.2	18.700 443	0.47	1.87	21	17 01
	28	3	43	25.55	+19	32	03.7	18.710 927	0.47	1.87	21	12 58
	29	3	43	18.15	19	31	40.7	18.721 653	0.47	1.87	21	08 54
	30	3	43	10.91	19	31	18.2	18.732 619	0.47	1.87	21	04 51
	31	3	43	03.83	19	30	56.2	18.743 820	0.47	1.87	21	00 49
	32	3	42	56.92	+19	30	34.8	18.755 251	0.47	1.87	20	56 46

NEPTUNE, 2025
HELIOCENTRIC POSITIONS FOR 0^h TERRESTRIAL TIME
MEAN EQUINOX AND ECLIPTIC OF DATE

Date	Heliocentric Longitude				Heliocentric Latitude			Radius Vector		Date	Heliocentric Longitude				Heliocentric Latitude			Radius Vector	
	°	'	"		°	'	"				°	'	"		°	'	"		
Jan.	1	359	08	00.2	-1	17	40.4	29.894 3258	Apr.	3	359	41	39.6	-1	18	22.2	29.891 9088		
	3	359	08	44.1	1	17	41.3	29.894 2732		5	359	42	23.5	1	18	23.1	29.891 8564		
	5	359	09	28.0	1	17	42.2	29.894 2205		7	359	43	07.4	1	18	24.1	29.891 8041		
	7	359	10	11.9	1	17	43.1	29.894 1679		9	359	43	51.3	1	18	25.0	29.891 7518		
	9	359	10	55.8	1	17	44.0	29.894 1153		11	359	44	35.2	1	18	25.9	29.891 6996		
	11	359	11	39.7	1	17	44.9	29.894 0626		13	359	45	19.1	1	18	26.8	29.891 6473		
	13	359	12	23.6	-1	17	45.8	29.894 0100		15	359	46	03.0	-1	18	27.7	29.891 5951		
	15	359	13	07.5	1	17	46.7	29.893 9574		17	359	46	46.9	1	18	28.6	29.891 5428		
	17	359	13	51.4	1	17	47.6	29.893 9047		19	359	47	30.8	1	18	29.5	29.891 4906		
	19	359	14	35.3	1	17	48.6	29.893 8521		21	359	48	14.7	1	18	30.4	29.891 4384		
Feb.	21	359	15	19.2	1	17	49.5	29.893 7994	23	359	48	58.6	1	18	31.3	29.891 3862			
	23	359	16	03.1	1	17	50.4	29.893 7468	25	359	49	42.5	1	18	32.2	29.891 3340			
	25	359	16	47.0	-1	17	51.3	29.893 6942	27	359	50	26.4	-1	18	33.1	29.891 2818			
	27	359	17	30.9	1	17	52.2	29.893 6416	29	359	51	10.3	1	18	34.0	29.891 2296			
	29	359	18	14.9	1	17	53.1	29.893 5889	May	1	359	51	54.2	1	18	34.9	29.891 1775		
	31	359	18	58.8	1	17	54.0	29.893 5363		3	359	52	38.1	1	18	35.8	29.891 1253		
	2	359	19	42.6	1	17	55.0	29.893 4837	5	359	53	21.9	1	18	36.7	29.891 0732			
	4	359	20	26.5	1	17	55.9	29.893 4311	7	359	54	05.9	1	18	37.6	29.891 0210			
	6	359	21	10.4	-1	17	56.8	29.893 3785	9	359	54	49.8	-1	18	38.5	29.890 9689			
	8	359	21	54.4	1	17	57.7	29.893 3259	11	359	55	33.6	1	18	39.4	29.890 9168			
Mar.	10	359	22	38.3	1	17	58.6	29.893 2733	13	359	56	17.5	1	18	40.3	29.890 8647			
	12	359	23	22.2	1	17	59.5	29.893 2207	15	359	57	01.5	1	18	41.2	29.890 8126			
	14	359	24	06.0	1	18	00.4	29.893 1681	17	359	57	45.3	1	18	42.1	29.890 7605			
	16	359	24	50.0	1	18	01.4	29.893 1155	19	359	58	29.2	1	18	43.0	29.890 7084			
	18	359	25	33.9	-1	18	02.3	29.893 0629	21	359	59	13.1	-1	18	44.0	29.890 6563			
	20	359	26	17.8	1	18	03.2	29.893 0103	23	359	59	57.0	1	18	44.9	29.890 6042			
	22	359	27	01.7	1	18	04.1	29.892 9578	25	360	00	40.9	1	18	45.8	29.890 5522			
	24	359	27	45.5	1	18	05.0	29.892 9052	27	360	01	24.8	1	18	46.7	29.890 5001			
	26	359	28	29.5	1	18	05.9	29.892 8527	29	360	02	08.7	1	18	47.6	29.890 4480			
	28	359	29	13.4	1	18	06.8	29.892 8001	31	360	02	52.6	1	18	48.4	29.890 3960			
Apr.	2	359	29	57.3	-1	18	07.7	29.892 7476	June	2	360	03	36.5	-1	18	49.3	29.890 3439		
	4	359	30	41.2	1	18	08.6	29.892 6951		4	360	04	20.4	1	18	50.2	29.890 2919		
	6	359	31	25.0	1	18	09.5	29.892 6426		6	360	05	04.3	1	18	51.1	29.890 2399		
	8	359	32	09.0	1	18	10.4	29.892 5901		8	360	05	48.2	1	18	52.0	29.890 1878		
	10	359	32	52.9	1	18	11.4	29.892 5376		10	360	06	32.1	1	18	52.9	29.890 1358		
	12	359	33	36.8	1	18	12.3	29.892 4851		12	360	07	16.0	1	18	53.9	29.890 0838		
	14	359	34	20.6	-1	18	13.2	29.892 4327		14	360	07	59.8	-1	18	54.8	29.890 0318		
	16	359	35	04.5	1	18	14.1	29.892 3802		16	360	08	43.8	1	18	55.7	29.889 9798		
	18	359	35	48.5	1	18	15.0	29.892 3278		18	360	09	27.7	1	18	56.6	29.889 9278		
	20	359	36	32.3	1	18	15.9	29.892 2753		20	360	10	11.5	1	18	57.5	29.889 8758		
Apr.	22	359	37	16.2	1	18	16.8	29.892 2229	22	360	10	55.4	1	18	58.4	29.889 8238			
	24	359	38	00.1	1	18	17.7	29.892 1705	24	360	11	39.3	1	18	59.3	29.889 7718			
	26	359	38	44.1	-1	18	18.6	29.892 1181	26	360	12	23.2	-1	19	00.1	29.889 7198			
	28	359	39	27.9	1	18	19.5	29.892 0658	28	360	13	07.1	1	19	01.0	29.889 6678			
	30	359	40	11.8	1	18	20.5	29.892 0134	30	360	13	51.0	1	19	01.9	29.889 6158			
	1	359	40	55.7	1	18	21.4	29.891 9611	July	2	360	14	34.9	1	19	02.8	29.889 5639		
	3	359	41	39.6	-1	18	22.2	29.891 9088		4	360	15	18.8	-1	19	03.7	29.889 5119		

NEPTUNE, 2025
HELIOCENTRIC POSITIONS FOR 0^h TERRESTRIAL TIME
MEAN EQUINOX AND ECLIPTIC OF DATE

Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector		Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector	
	°	'	"		°	'	"				°	'	"		°	'	"				
July	2	360	14	34.9	-1	19	02.8	29.889 5639	Oct.	2	0	48	13.9	-1	19	43.9	29.887 1774				
	4	360	15	18.8	1	19	03.7	29.889 5119		4	0	48	57.7	1	19	44.8	29.887 1257				
	6	360	16	02.7	1	19	04.6	29.889 4599		6	0	49	41.6	1	19	45.7	29.887 0740				
	8	360	16	46.6	1	19	05.5	29.889 4080		8	0	50	25.5	1	19	46.5	29.887 0224				
	10	360	17	30.5	1	19	06.4	29.889 3560		10	0	51	09.4	1	19	47.4	29.886 9707				
	12	360	18	14.4	1	19	07.3	29.889 3041		12	0	51	53.3	1	19	48.3	29.886 9191				
	14	360	18	58.2	-1	19	08.2	29.889 2521		14	0	52	37.2	-1	19	49.2	29.886 8675				
	16	360	19	42.2	1	19	09.1	29.889 2002		16	0	53	21.1	1	19	50.1	29.886 8159				
	18	360	20	26.1	1	19	10.0	29.889 1482		18	0	54	04.9	1	19	51.0	29.886 7643				
	20	360	21	09.9	1	19	10.9	29.889 0963		20	0	54	48.8	1	19	51.8	29.886 7127				
	22	0	21	53.8	1	19	11.8	29.889 0443		22	0	55	32.7	1	19	52.7	29.886 6612				
	24	0	22	37.7	1	19	12.7	29.888 9924		24	0	56	16.6	1	19	53.6	29.886 6097				
Aug.	26	0	23	21.6	-1	19	13.6	29.888 9404	Nov.	26	0	57	00.5	-1	19	54.5	29.886 5581				
	28	0	24	05.5	1	19	14.5	29.888 8885		28	0	57	44.4	1	19	55.4	29.886 5066				
	30	0	24	49.4	1	19	15.4	29.888 8366		30	0	58	28.2	1	19	56.3	29.886 4551				
	1	0	25	33.3	1	19	16.3	29.888 7846		1	0	59	12.1	1	19	57.1	29.886 4037				
	3	0	26	17.2	1	19	17.2	29.888 7327		3	0	59	56.0	1	19	58.0	29.886 3522				
	5	0	27	01.1	1	19	18.1	29.888 6808		5	1	00	39.9	1	19	58.9	29.886 3008				
	7	0	27	45.0	-1	19	19.0	29.888 6289		7	1	01	23.8	-1	19	59.8	29.886 2493				
	9	0	28	28.9	1	19	19.9	29.888 5769		9	1	02	07.7	1	20	00.7	29.886 1979				
	11	0	29	12.7	1	19	20.7	29.888 5250		11	1	02	51.6	1	20	01.6	29.886 1465				
	13	0	29	56.6	1	19	21.6	29.888 4731		13	1	03	35.5	1	20	02.4	29.886 0952				
	15	0	30	40.5	1	19	22.5	29.888 4212		15	1	04	19.3	1	20	03.3	29.886 0438				
	17	0	31	24.4	1	19	23.4	29.888 3693		17	1	05	03.2	1	20	04.2	29.885 9925				
Sept.	19	0	32	08.3	-1	19	24.3	29.888 3174	Dec.	19	1	05	47.1	-1	20	05.1	29.885 9411				
	21	0	32	52.2	1	19	25.2	29.888 2655		21	1	06	31.0	1	20	06.0	29.885 8898				
	23	0	33	36.1	1	19	26.1	29.888 2136		23	1	07	14.9	1	20	06.9	29.885 8385				
	25	0	34	20.0	1	19	27.0	29.888 1617		25	1	07	58.8	1	20	07.8	29.885 7873				
	27	0	35	03.9	1	19	27.9	29.888 1098		27	1	08	42.6	1	20	08.6	29.885 7360				
	29	0	35	47.8	1	19	28.8	29.888 0579		29	1	09	26.5	1	20	09.5	29.885 6848				
	31	0	36	31.7	-1	19	29.6	29.888 0060		1	1	10	10.4	-1	20	10.4	29.885 6335				
	2	0	37	15.5	1	19	30.5	29.887 9542		3	1	10	54.3	1	20	11.3	29.885 5823				
	4	0	37	59.4	1	19	31.4	29.887 9023		5	1	11	38.2	1	20	12.1	29.885 5312				
	6	0	38	43.3	1	19	32.3	29.887 8505		7	1	12	22.1	1	20	13.0	29.885 4800				
	8	0	39	27.2	1	19	33.2	29.887 7986		9	1	13	05.9	1	20	13.9	29.885 4288				
	10	0	40	11.1	1	19	34.1	29.887 7468		11	1	13	49.8	1	20	14.8	29.885 3777				
Oct.	12	0	40	55.0	-1	19	35.0	29.887 6950		13	1	14	33.7	-1	20	15.7	29.885 3266				
	14	0	41	38.9	1	19	35.9	29.887 6432		15	1	15	17.6	1	20	16.6	29.885 2755				
	16	0	42	22.7	1	19	36.8	29.887 5914		17	1	16	01.4	1	20	17.4	29.885 2245				
	18	0	43	06.7	1	19	37.7	29.887 5396		19	1	16	45.4	1	20	18.3	29.885 1734				
	20	0	43	50.5	1	19	38.5	29.887 4878		21	1	17	29.2	1	20	19.2	29.885 1224				
	22	0	44	34.4	1	19	39.4	29.887 4360		23	1	18	13.1	1	20	20.1	29.885 0714				
	24	0	45	18.3	-1	19	40.3	29.887 3843		25	1	18	57.0	-1	20	20.9	29.885 0204				
	26	0	46	02.2	1	19	41.2	29.887 3325		27	1	19	40.9	1	20	21.8	29.884 9694				
	28	0	46	46.1	1	19	42.1	29.887 2808		29	1	20	24.7	1	20	22.7	29.884 9185				
	30	0	47	30.0	1	19	43.0	29.887 2291		31	1	21	08.6	1	20	23.6	29.884 8675				
	2	0	48	13.9	-1	19	43.9	29.887 1774		33	1	21	52.5	-1	20	24.4	29.884 8166				

NEPTUNE, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date				Apparent Geocentric Longitude				Apparent Geocentric Latitude				Date				Apparent Geocentric Longitude				Apparent Geocentric Latitude			
				°	'	"		°	'	"						°	'	"		°	'	"	
Jan.	0	357	17	03.2	-1	17	09.7	Feb.	15	358	24	10.3	-1	15	54.0	Mar.	27	358	49	11.6	-1	15	45.4
	1	357	17	51.9	1	17	07.5		16	358	26	10.4	1	15	53.1		28	358	51	21.6	1	15	45.0
	2	357	18	42.6	1	17	05.4		17	358	28	11.5	1	15	52.2		1	358	53	32.2	1	15	44.6
	3	357	19	35.2	1	17	03.3		18	358	30	13.6	1	15	51.3		2	358	55	43.4	1	15	44.2
	4	357	20	29.7	1	17	01.2		19	358	32	16.6	1	15	50.5		3	358	57	55.2	1	15	43.8
	5	357	21	26.1	1	16	59.1		20	358	34	20.6	1	15	49.8		4	359	00	07.5	1	15	43.5
	6	357	22	24.4	-1	16	57.0		21	358	36	25.5	-1	15	49.0		5	359	02	20.4	-1	15	43.3
	7	357	23	24.7	1	16	54.9		22	358	38	31.2	1	15	48.3		6	359	04	33.9	1	15	43.1
	8	357	24	26.9	1	16	52.9		23	358	40	37.8	1	15	47.7		7	359	06	47.7	1	15	42.9
	9	357	25	31.0	1	16	50.8		24	358	42	45.2	1	15	47.1		8	359	09	02.0	1	15	42.8
	10	357	26	37.0	1	16	48.8		25	358	44	53.3	1	15	46.5		9	359	11	16.6	1	15	42.7
Jan.	11	357	27	45.0	1	16	46.8	Feb.	26	358	47	02.2	1	15	45.9		10	359	13	31.6	1	15	42.6
	12	357	28	54.8	-1	16	44.9		27	358	49	11.6	-1	15	45.4		11	359	15	46.7	-1	15	42.6
	13	357	30	06.4	1	16	42.9		28	358	51	21.6	1	15	45.0		12	359	18	02.1	1	15	42.7
	14	357	31	19.8	1	16	41.0		1	358	53	32.2	1	15	44.6		13	359	20	17.7	1	15	42.8
	15	357	32	35.0	1	16	39.1		2	358	55	43.4	1	15	44.2		14	359	22	33.5	1	15	42.9
	16	357	33	51.8	1	16	37.2		3	358	57	55.2	1	15	43.8		15	359	24	49.5	1	15	43.1
	17	357	35	10.3	1	16	35.4		4	359	00	07.5	1	15	43.5		16	359	27	05.6	1	15	43.3
	18	357	36	30.5	-1	16	33.5		5	359	02	20.4	-1	15	43.3		17	359	29	21.9	-1	15	43.6
	19	357	37	52.4	1	16	31.7		6	359	04	33.9	1	15	43.1		18	359	31	38.3	1	15	43.9
	20	357	39	16.0	1	16	29.9		7	359	06	47.7	1	15	42.9		19	359	33	54.8	1	15	44.4
	21	357	40	41.2	1	16	28.2		8	359	09	02.0	1	15	42.8		20	359	36	11.2	1	15	44.9
Jan.	22	357	42	08.2	1	16	26.4		9	359	11	16.6	1	15	42.7		21	359	38	27.6	1	15	45.1
	23	357	43	36.8	1	16	24.7		10	359	13	31.6	1	15	42.6		22	359	40	44.3	1	15	45.5
	24	357	45	07.0	-1	16	23.1		11	359	15	46.7	-1	15	42.6		23	359	43	00.9	-1	15	45.9
	25	357	46	38.9	1	16	21.4		12	359	18	02.1	1	15	42.7		24	359	45	17.5	1	15	46.4
	26	357	48	12.5	1	16	19.8		13	359	20	17.7	1	15	42.8		25	359	47	33.9	1	15	47.0
	27	357	49	47.5	1	16	18.2		14	359	22	33.5	1	15	42.9		26	359	49	50.1	1	15	47.6
	28	357	51	24.1	1	16	16.6		15	359	24	49.5	1	15	43.1		27	359	52	06.0	1	15	48.3
	29	357	53	02.2	1	16	15.1		16	359	27	05.6	1	15	43.3		28	359	54	21.8	1	15	49.0
	30	357	54	41.7	-1	16	13.6		17	359	29	21.9	-1	15	43.6		29	359	56	37.2	-1	15	49.7
	31	357	56	22.5	1	16	12.1		18	359	31	38.3	1	15	43.9		30	359	58	52.4	1	15	50.5
Feb.	1	357	58	04.8	1	16	10.7	Mar.	19	359	33	54.8	1	15	44.4		31	0	01	07.3	1	15	51.3
	2	357	59	48.4	1	16	09.2		20	359	36	11.2	1	15	44.9		1	0	03	21.9	1	15	52.2
	3	358	01	33.3	1	16	07.9		21	359	38	27.6	1	15	45.1		2	0	05	36.3	-1	15	53.1
	4	358	03	19.6	1	16	06.5		22	359	40	44.3	1	15	45.5								
	5	358	05	07.3	-1	16	05.2		23	359	43	00.9	-1	15	45.9								
	6	358	06	56.3	1	16	03.9		24	359	45	17.5	1	15	46.4								
	7	358	08	46.6	1	16	02.7		25	359	47	33.9	1	15	47.0								
	8	358	10	38.2	1	16	01.5		26	359	49	50.1	1	15	47.6								
	9	358	12	31.0	1	16	00.3		27	359	52	06.0	1	15	48.3								
	10	358	14	24.9	1	15	59.1		28	359	54	21.8	1	15	49.0								
	11	358	16	19.9	-1	15	58.0	Apr.	29	359	56	37.2	-1	15	49.7								
	12	358	18	16.0	1	15	57.0		30	359	58	52.4	1	15	50.5								
	13	358	20	13.1	1	15	55.9		31	0	01	07.3	1	15	51.3								
	14	358	22	11.2	1	15	54.9		1	0	03	21.9	1	15	52.2								
	15	358	24	10.3	-1	15	54.0		2	0	05	36.3	-1	15	53.1								

NEPTUNE, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Apr.	1	0	03	21.9	-1	15	52.2	May	17	1	32	35.1	-1	17	13.2
	2	0	05	36.3	1	15	53.1		18	1	34	03.8	1	17	15.7
	3	0	07	50.3	1	15	54.0		19	1	35	31.0	1	17	18.3
	4	0	10	03.9	1	15	55.0		20	1	36	56.5	1	17	20.9
	5	0	12	17.0	1	15	56.1		21	1	38	20.5	1	17	23.5
	6	0	14	29.6	1	15	57.1		22	1	39	42.8	1	17	26.1
	7	0	16	41.6	-1	15	58.3		23	1	41	03.5	-1	17	28.8
	8	0	18	53.0	1	15	59.4		24	1	42	22.6	1	17	31.4
	9	0	21	03.9	1	16	00.6		25	1	43	40.0	1	17	34.1
	10	0	23	14.0	1	16	01.9		26	1	44	55.9	1	17	36.9
	11	0	25	23.6	1	16	03.1		27	1	46	10.2	1	17	39.6
	12	0	27	32.4	1	16	04.5		28	1	47	22.8	1	17	42.4
	13	0	29	40.7	-1	16	05.8	June	29	1	48	33.8	-1	17	45.2
	14	0	31	48.2	1	16	07.2		30	1	49	43.0	1	17	48.0
	15	0	33	55.1	1	16	08.6		31	1	50	50.4	1	17	50.8
	16	0	36	01.2	1	16	10.1		1	1	51	55.9	1	17	53.7
	17	0	38	06.6	1	16	11.6		2	1	52	59.7	1	17	56.6
	18	0	40	11.2	1	16	13.2		3	1	54	01.6	1	17	59.5
	19	0	42	15.1	-1	16	14.8		4	1	55	01.6	-1	18	02.4
	20	0	44	18.0	1	16	16.4		5	1	55	59.9	1	18	05.3
	21	0	46	20.1	1	16	18.0		6	1	56	56.4	1	18	08.3
	22	0	48	21.2	1	16	19.7		7	1	57	51.0	1	18	11.2
	23	0	50	21.3	1	16	21.5		8	1	58	43.9	1	18	14.2
	24	0	52	20.3	1	16	23.2		9	1	59	35.0	1	18	17.2
	25	0	54	18.4	-1	16	25.0		10	2	00	24.2	-1	18	20.2
	26	0	56	15.4	1	16	26.9		11	2	01	11.7	1	18	23.2
	27	0	58	11.4	1	16	28.7		12	2	01	57.3	1	18	26.2
	28	1	00	06.4	1	16	30.6		13	2	02	41.0	1	18	29.3
	29	1	02	00.3	1	16	32.6		14	2	03	22.8	1	18	32.3
	30	1	03	53.2	1	16	34.6		15	2	04	02.8	1	18	35.4
May	1	1	05	45.0	-1	16	36.6		16	2	04	40.7	-1	18	38.4
	2	1	07	35.5	1	16	38.6		17	2	05	16.7	1	18	41.5
	3	1	09	24.9	1	16	40.7		18	2	05	50.8	1	18	44.6
	4	1	11	12.9	1	16	42.8		19	2	06	22.8	1	18	47.7
	5	1	12	59.6	1	16	45.0		20	2	06	53.0	1	18	50.8
	6	1	14	45.0	1	16	47.2		21	2	07	21.2	1	18	53.9
	7	1	16	29.1	-1	16	49.4		22	2	07	47.6	-1	18	57.0
	8	1	18	11.8	1	16	51.6		23	2	08	12.1	1	19	00.1
	9	1	19	53.2	1	16	53.9		24	2	08	34.7	1	19	03.2
	10	1	21	33.3	1	16	56.2		25	2	08	55.3	1	19	06.3
	11	1	23	12.0	1	16	58.6		26	2	09	14.0	1	19	09.4
	12	1	24	49.4	1	17	00.9		27	2	09	30.7	1	19	12.6
	13	1	26	25.3	-1	17	03.3	July	28	2	09	45.3	-1	19	15.7
	14	1	27	59.9	1	17	05.8		29	2	09	57.9	1	19	18.8
	15	1	29	33.1	1	17	08.2		30	2	10	08.5	1	19	22.0
	16	1	31	04.8	1	17	10.7		1	2	10	17.0	1	19	25.1
	17	1	32	35.1	-1	17	13.2		2	2	10	23.6	-1	19	28.2

NEPTUNE, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
July	1	2	10	17.0	-1	19	25.1	Aug.	16	1	43	33.0	-1	21	33.8
	2	2	10	23.6	1	19	28.2		17	1	42	19.9	1	21	35.9
	3	2	10	28.2	1	19	31.3		18	1	41	05.5	1	21	38.1
	4	2	10	30.9	1	19	34.5		19	1	39	49.8	1	21	40.2
	5	2	10	31.7	1	19	37.6		20	1	38	32.9	1	21	42.3
	6	2	10	30.5	1	19	40.7		21	1	37	14.7	1	21	44.3
	7	2	10	27.5	-1	19	43.8		22	1	35	55.3	-1	21	46.3
	8	2	10	22.5	1	19	46.9		23	1	34	34.6	1	21	48.2
	9	2	10	15.7	1	19	50.0		24	1	33	12.7	1	21	50.2
	10	2	10	06.9	1	19	53.0		25	1	31	49.8	1	21	52.0
	11	2	09	56.2	1	19	56.1		26	1	30	25.7	1	21	53.8
	12	2	09	43.6	1	19	59.2		27	1	29	00.6	1	21	55.6
	13	2	09	29.0	-1	20	02.2		28	1	27	34.5	-1	21	57.4
	14	2	09	12.4	1	20	05.2		29	1	26	07.5	1	21	59.1
	15	2	08	53.9	1	20	08.2		30	1	24	39.6	1	22	00.7
	16	2	08	33.4	1	20	11.3	Sept.	31	1	23	10.9	1	22	02.3
	17	2	08	11.1	1	20	14.2		1	1	21	41.3	1	22	03.9
	18	2	07	46.9	1	20	17.2		2	1	20	10.9	1	22	05.4
	19	2	07	20.9	-1	20	20.2		3	1	18	39.7	-1	22	06.8
	20	2	06	53.1	1	20	23.1		4	1	17	07.8	1	22	08.3
	21	2	06	23.5	1	20	26.1		5	1	15	35.1	1	22	09.6
	22	2	05	52.1	1	20	29.0		6	1	14	01.7	1	22	10.9
	23	2	05	18.9	1	20	31.9		7	1	12	27.5	1	22	12.2
	24	2	04	43.9	1	20	34.8		8	1	10	52.7	1	22	13.4
	25	2	04	06.9	-1	20	37.6		9	1	09	17.3	-1	22	14.6
	26	2	03	28.2	1	20	40.5		10	1	07	41.3	1	22	15.7
	27	2	02	47.6	1	20	43.3		11	1	06	04.8	1	22	16.8
	28	2	02	05.1	1	20	46.1		12	1	04	27.9	1	22	17.8
	29	2	01	21.0	1	20	48.8		13	1	02	50.7	1	22	18.8
	30	2	00	35.0	1	20	51.6		14	1	01	13.0	1	22	19.7
Aug.	31	1	59	47.5	-1	20	54.3		15	0	59	35.0	-1	22	20.6
	1	1	58	58.2	1	20	57.0		16	0	57	56.7	1	22	21.5
	2	1	58	07.3	1	20	59.7		17	0	56	18.0	1	22	22.2
	3	1	57	14.9	1	21	02.3		18	0	54	38.9	1	22	23.0
	4	1	56	20.8	1	21	04.9		19	0	52	59.6	1	22	23.7
	5	1	55	25.2	1	21	07.5		20	0	51	20.1	1	22	24.3
	6	1	54	28.0	-1	21	10.1		21	0	49	40.4	-1	22	24.9
	7	1	53	29.3	1	21	12.6		22	0	48	00.5	1	22	25.4
	8	1	52	29.0	1	21	15.1		23	0	46	20.6	1	22	25.9
	9	1	51	27.2	1	21	17.5		24	0	44	40.7	1	22	26.3
	10	1	50	23.8	1	21	19.9		25	0	43	00.8	1	22	26.7
	11	1	49	18.9	1	21	22.3		26	0	41	21.1	1	22	27.0
	12	1	48	12.5	-1	21	24.7		27	0	39	41.4	-1	22	27.3
	13	1	47	04.6	1	21	27.0		28	0	38	02.0	1	22	27.5
	14	1	45	55.4	1	21	29.3		29	0	36	22.8	1	22	27.6
	15	1	44	44.9	1	21	31.5		30	0	34	43.8	1	22	27.8
	16	1	43	33.0	-1	21	33.8	Oct.	1	0	33	05.0	-1	22	27.8

NEPTUNE, 2025
GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"	°	'	"
Oct.	1	0	33	05.0	-1	22	27.8	Nov.	16	359	32	23.7	-1	21	40.4
	2	0	31	26.5	1	22	27.8		17	359	31	36.4	1	21	38.5
	3	0	29	48.3	1	22	27.8		18	359	30	51.0	1	21	36.5
	4	0	28	10.5	1	22	27.7		19	359	30	07.3	1	21	34.6
	5	0	26	33.0	1	22	27.5		20	359	29	25.6	1	21	32.5
	6	0	24	55.9	1	22	27.3		21	359	28	45.8	1	21	30.5
	7	0	23	19.3	-1	22	27.1		22	359	28	07.9	-1	21	28.5
	8	0	21	43.2	1	22	26.8		23	359	27	31.9	1	21	26.4
	9	0	20	07.8	1	22	26.4		24	359	26	57.8	1	21	24.3
	10	0	18	33.0	1	22	26.0		25	359	26	25.6	1	21	22.1
	11	0	16	58.9	1	22	25.6		26	359	25	55.4	1	21	20.0
	12	0	15	25.5	1	22	25.1		27	359	25	27.0	1	21	17.8
	13	0	13	52.8	-1	22	24.6		28	359	25	00.6	-1	21	15.6
	14	0	12	20.8	1	22	24.0		29	359	24	36.1	1	21	13.4
	15	0	10	49.5	1	22	23.3		30	359	24	13.6	1	21	11.2
	16	0	09	18.9	1	22	22.7	Dec.	1	359	23	53.1	1	21	09.0
	17	0	07	49.2	1	22	21.9		2	359	23	34.7	1	21	06.7
	18	0	06	20.3	1	22	21.2		3	359	23	18.3	1	21	04.5
	19	0	04	52.3	-1	22	20.3		4	359	23	04.0	-1	21	02.2
	20	0	03	25.3	1	22	19.5		5	359	22	51.9	1	20	59.9
	21	0	01	59.3	1	22	18.5		6	359	22	41.8	1	20	57.6
	22	0	00	34.4	1	22	17.6		7	359	22	33.7	1	20	55.3
	23	359	59	10.5	1	22	16.6		8	359	22	27.7	1	20	53.0
	24	359	57	47.9	1	22	15.5		9	359	22	23.7	1	20	50.6
	25	359	56	26.4	-1	22	14.4		10	359	22	21.6	-1	20	48.3
	26	359	55	06.1	1	22	13.3		11	359	22	21.6	1	20	46.0
	27	359	53	47.0	1	22	12.1		12	359	22	23.6	1	20	43.6
	28	359	52	29.2	1	22	10.9		13	359	22	27.7	1	20	41.3
	29	359	51	12.7	1	22	09.6		14	359	22	33.8	1	20	38.9
	30	359	49	57.4	1	22	08.3		15	359	22	42.2	1	20	36.6
Nov.	31	359	48	43.5	-1	22	06.9		16	359	22	52.6	-1	20	34.2
	1	359	47	30.8	1	22	05.5		17	359	23	05.2	1	20	31.8
	2	359	46	19.5	1	22	04.1		18	359	23	19.9	1	20	29.5
	3	359	45	09.6	1	22	02.6		19	359	23	36.7	1	20	27.1
	4	359	44	01.2	1	22	01.1		20	359	23	55.7	1	20	24.7
	5	359	42	54.3	1	21	59.6		21	359	24	16.8	1	20	22.4
	6	359	41	48.9	-1	21	58.0		22	359	24	40.0	-1	20	20.0
	7	359	40	45.2	1	21	56.4		23	359	25	05.2	1	20	17.6
	8	359	39	43.1	1	21	54.7		24	359	25	32.5	1	20	15.3
	9	359	38	42.5	1	21	53.1		25	359	26	01.8	1	20	12.9
	10	359	37	43.6	1	21	51.3		26	359	26	33.1	1	20	10.5
	11	359	36	46.2	1	21	49.6		27	359	27	06.5	1	20	08.2
	12	359	35	50.4	-1	21	47.8		28	359	27	41.9	-1	20	05.9
	13	359	34	56.2	1	21	46.0		29	359	28	19.4	1	20	03.5
	14	359	34	03.6	1	21	44.2		30	359	28	59.0	1	20	01.2
	15	359	33	12.8	1	21	42.3		31	359	29	40.7	1	19	58.9
	16	359	32	23.7	-1	21	40.4		32	359	30	24.4	-1	19	56.6

NEPTUNE, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Jan.	0	23	52	04.66	-2	15	35.9	30.091 928	0.29	1.11	17	09	38
	1	23	52	07.59	2	15	14.5	30.108 841	0.29	1.11	17	05	45
	2	23	52	10.63	2	14	52.4	30.125 683	0.29	1.11	17	01	53
	3	23	52	13.79	2	14	29.6	30.142 450	0.29	1.11	16	58	00
	4	23	52	17.07	2	14	05.9	30.159 134	0.29	1.11	16	54	07
	5	23	52	20.47	2	13	41.6	30.175 732	0.29	1.11	16	50	15
	6	23	52	23.98	-2	13	16.5	30.192 238	0.29	1.11	16	46	23
	7	23	52	27.62	2	12	50.6	30.208 647	0.29	1.11	16	42	30
	8	23	52	31.37	2	12	24.0	30.224 954	0.29	1.11	16	38	38
	9	23	52	35.24	2	11	56.7	30.241 156	0.29	1.11	16	34	46
	10	23	52	39.23	2	11	28.6	30.257 246	0.29	1.11	16	30	54
	11	23	52	43.33	2	10	59.7	30.273 221	0.29	1.11	16	27	03
	12	23	52	47.55	-2	10	30.2	30.289 076	0.29	1.11	16	23	11
	13	23	52	51.89	2	09	59.9	30.304 808	0.29	1.11	16	19	19
	14	23	52	56.33	2	09	29.0	30.320 411	0.29	1.10	16	15	28
	15	23	53	00.87	2	08	57.4	30.335 883	0.29	1.10	16	11	37
	16	23	53	05.53	2	08	25.1	30.351 217	0.29	1.10	16	07	46
	17	23	53	10.28	2	07	52.2	30.366 411	0.29	1.10	16	03	54
	18	23	53	15.14	-2	07	18.6	30.381 460	0.29	1.10	16	00	03
	19	23	53	20.10	2	06	44.4	30.396 360	0.29	1.10	15	56	12
	20	23	53	25.17	2	06	09.5	30.411 106	0.29	1.10	15	52	22
	21	23	53	30.34	2	05	34.0	30.425 694	0.29	1.10	15	48	31
	22	23	53	35.62	2	04	57.9	30.440 119	0.29	1.10	15	44	40
	23	23	53	40.99	2	04	21.1	30.454 378	0.29	1.10	15	40	50
	24	23	53	46.47	-2	03	43.6	30.468 466	0.29	1.10	15	37	00
	25	23	53	52.05	2	03	05.6	30.482 379	0.29	1.10	15	33	09
	26	23	53	57.73	2	02	26.9	30.496 113	0.29	1.10	15	29	19
	27	23	54	03.50	2	01	47.6	30.509 663	0.29	1.10	15	25	29
	28	23	54	09.37	2	01	07.8	30.523 025	0.29	1.10	15	21	39
	29	23	54	15.33	2	00	27.4	30.536 195	0.29	1.10	15	17	49
Feb.	30	23	54	21.38	-1	59	46.5	30.549 169	0.29	1.10	15	13	59
	31	23	54	27.51	1	59	05.0	30.561 942	0.29	1.10	15	10	09
	1	23	54	33.73	1	58	23.0	30.574 512	0.29	1.10	15	06	20
	2	23	54	40.03	1	57	40.5	30.586 874	0.29	1.10	15	02	30
	3	23	54	46.42	1	56	57.5	30.599 025	0.29	1.09	14	58	41
	4	23	54	52.89	1	56	14.0	30.610 962	0.29	1.09	14	54	51
	5	23	54	59.44	-1	55	30.0	30.622 681	0.29	1.09	14	51	02
	6	23	55	06.07	1	54	45.4	30.634 179	0.29	1.09	14	47	13
	7	23	55	12.79	1	54	00.4	30.645 455	0.29	1.09	14	43	23
	8	23	55	19.59	1	53	14.9	30.656 504	0.29	1.09	14	39	34
	9	23	55	26.45	1	52	29.0	30.667 324	0.29	1.09	14	35	45
	10	23	55	33.39	1	51	42.7	30.677 913	0.29	1.09	14	31	56
	11	23	55	40.40	-1	50	55.9	30.688 269	0.29	1.09	14	28	07
	12	23	55	47.47	1	50	08.8	30.698 388	0.29	1.09	14	24	19
	13	23	55	54.61	1	49	21.3	30.708 269	0.29	1.09	14	20	30
	14	23	56	01.81	1	48	33.4	30.717 908	0.29	1.09	14	16	41
	15	23	56	09.07	-1	47	45.1	30.727 304	0.29	1.09	14	12	52

NEPTUNE, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
Feb.	15	23	56	09.07	-1	47	45.1	30.727 304	0.29	1.09	14	12	52
	16	23	56	16.40	1	46	56.5	30.736 454	0.29	1.09	14	09	04
	17	23	56	23.78	1	46	07.6	30.745 355	0.29	1.09	14	05	15
	18	23	56	31.23	1	45	18.2	30.754 006	0.29	1.09	14	01	27
	19	23	56	38.73	1	44	28.6	30.762 403	0.29	1.09	13	57	38
	20	23	56	46.30	1	43	38.5	30.770 545	0.29	1.09	13	53	50
	21	23	56	53.92	-1	42	48.2	30.778 428	0.29	1.09	13	50	02
	22	23	57	01.59	1	41	57.5	30.786 052	0.29	1.09	13	46	14
	23	23	57	09.32	1	41	06.6	30.793 413	0.29	1.09	13	42	25
	24	23	57	17.10	1	40	15.3	30.800 509	0.29	1.09	13	38	37
Mar.	25	23	57	24.92	1	39	23.9	30.807 338	0.29	1.09	13	34	49
	26	23	57	32.79	1	38	32.1	30.813 899	0.29	1.09	13	31	01
	27	23	57	40.69	-1	37	40.2	30.820 189	0.29	1.09	13	27	13
	28	23	57	48.63	1	36	48.0	30.826 205	0.29	1.09	13	23	25
	1	23	57	56.61	1	35	55.7	30.831 948	0.29	1.09	13	19	37
	2	23	58	04.63	1	35	03.2	30.837 415	0.29	1.09	13	15	49
	3	23	58	12.68	1	34	10.5	30.842 604	0.29	1.09	13	12	01
	4	23	58	20.77	1	33	17.5	30.847 515	0.29	1.09	13	08	13
	5	23	58	28.89	-1	32	24.4	30.852 147	0.29	1.09	13	04	26
	6	23	58	37.04	1	31	31.2	30.856 499	0.29	1.09	13	00	38
	7	23	58	45.23	1	30	37.8	30.860 570	0.28	1.09	12	56	50
	8	23	58	53.44	1	29	44.2	30.864 361	0.28	1.09	12	53	02
	9	23	59	01.67	1	28	50.6	30.867 870	0.28	1.09	12	49	15
	10	23	59	09.93	1	27	56.9	30.871 097	0.28	1.09	12	45	27
	11	23	59	18.19	-1	27	03.1	30.874 043	0.28	1.09	12	41	39
	12	23	59	26.48	1	26	09.3	30.876 706	0.28	1.08	12	37	52
	13	23	59	34.77	1	25	15.5	30.879 086	0.28	1.08	12	34	04
	14	23	59	43.08	1	24	21.6	30.881 183	0.28	1.08	12	30	16
	15	23	59	51.40	1	23	27.6	30.882 996	0.28	1.08	12	26	29
	16	23	59	59.73	1	22	33.7	30.884 527	0.28	1.08	12	22	41
	17	0	00	08.08	-1	21	39.7	30.885 773	0.28	1.08	12	18	53
	18	0	00	16.43	1	20	45.8	30.886 735	0.28	1.08	12	15	06
	19	0	00	24.79	1	19	51.9	30.887 414	0.28	1.08	12	11	18
	20	0	00	33.15	1	18	58.1	30.887 807	0.28	1.08	12	07	31
	21	0	00	41.50	1	18	04.1	30.887 917	0.28	1.08	12	03	43
	22	0	00	49.87	1	17	10.1	30.887 742	0.28	1.08	11	59	55
	23	0	00	58.24	-1	16	16.1	30.887 282	0.28	1.08	11	56	08
	24	0	01	06.60	1	15	22.3	30.886 537	0.28	1.08	11	52	20
	25	0	01	14.96	1	14	28.5	30.885 508	0.28	1.08	11	48	33
	26	0	01	23.31	1	13	34.9	30.884 195	0.28	1.08	11	44	45
Apr.	27	0	01	31.64	1	12	41.4	30.882 598	0.28	1.08	11	40	57
	28	0	01	39.96	1	11	48.1	30.880 717	0.28	1.08	11	37	10
	29	0	01	48.26	-1	10	54.9	30.878 553	0.28	1.08	11	33	22
	30	0	01	56.55	1	10	01.9	30.876 107	0.28	1.08	11	29	34
	31	0	02	04.82	1	09	08.9	30.873 379	0.28	1.09	11	25	47
	1	0	02	13.08	1	08	16.2	30.870 370	0.28	1.09	11	21	59
	2	0	02	21.32	-1	07	23.6	30.867 083	0.28	1.09	11	18	11

NEPTUNE, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
Apr.	1	0	02	13.08	-1	08	16.2	30.870 370	0.28	1.09	11	21	59
	2	0	02	21.32	1	07	23.6	30.867 083	0.28	1.09	11	18	11
	3	0	02	29.54	1	06	31.2	30.863 519	0.28	1.09	11	14	24
	4	0	02	37.74	1	05	38.9	30.859 678	0.28	1.09	11	10	36
	5	0	02	45.91	1	04	46.9	30.855 564	0.29	1.09	11	06	48
	6	0	02	54.05	1	03	55.2	30.851 177	0.29	1.09	11	03	00
	7	0	03	02.15	-1	03	03.7	30.846 519	0.29	1.09	10	59	12
	8	0	03	10.22	1	02	12.5	30.841 593	0.29	1.09	10	55	24
	9	0	03	18.25	1	01	21.6	30.836 399	0.29	1.09	10	51	37
	10	0	03	26.25	1	00	30.9	30.830 940	0.29	1.09	10	47	49
	11	0	03	34.20	0	59	40.6	30.825 217	0.29	1.09	10	44	01
	12	0	03	42.12	0	58	50.5	30.819 232	0.29	1.09	10	40	12
	13	0	03	50.00	-0	58	00.8	30.812 987	0.29	1.09	10	36	24
	14	0	03	57.83	0	57	11.4	30.806 484	0.29	1.09	10	32	36
	15	0	04	05.63	0	56	22.2	30.799 723	0.29	1.09	10	28	48
	16	0	04	13.38	0	55	33.4	30.792 708	0.29	1.09	10	25	00
	17	0	04	21.09	0	54	44.9	30.785 440	0.29	1.09	10	21	12
	18	0	04	28.76	0	53	56.8	30.777 921	0.29	1.09	10	17	23
	19	0	04	36.37	-0	53	09.0	30.770 153	0.29	1.09	10	13	35
	20	0	04	43.93	0	52	21.6	30.762 137	0.29	1.09	10	09	47
	21	0	04	51.44	0	51	34.6	30.753 876	0.29	1.09	10	05	58
	22	0	04	58.89	0	50	48.0	30.745 371	0.29	1.09	10	02	10
	23	0	05	06.28	0	50	01.8	30.736 626	0.29	1.09	9	58	21
	24	0	05	13.61	0	49	16.0	30.727 641	0.29	1.09	9	54	32
	25	0	05	20.88	-0	48	30.7	30.718 420	0.29	1.09	9	50	44
	26	0	05	28.09	0	47	45.9	30.708 964	0.29	1.09	9	46	55
	27	0	05	35.23	0	47	01.5	30.699 277	0.29	1.09	9	43	06
	28	0	05	42.31	0	46	17.5	30.689 361	0.29	1.09	9	39	17
	29	0	05	49.33	0	45	34.0	30.679 220	0.29	1.09	9	35	28
	30	0	05	56.29	0	44	50.9	30.668 856	0.29	1.09	9	31	39
May	1	0	06	03.18	-0	44	08.4	30.658 273	0.29	1.09	9	27	50
	2	0	06	09.99	0	43	26.3	30.647 474	0.29	1.09	9	24	01
	3	0	06	16.73	0	42	44.7	30.636 464	0.29	1.09	9	20	12
	4	0	06	23.40	0	42	03.7	30.625 244	0.29	1.09	9	16	22
	5	0	06	29.98	0	41	23.2	30.613 819	0.29	1.09	9	12	33
	6	0	06	36.49	0	40	43.3	30.602 192	0.29	1.09	9	08	43
	7	0	06	42.91	-0	40	04.0	30.590 367	0.29	1.10	9	04	54
	8	0	06	49.25	0	39	25.2	30.578 346	0.29	1.10	9	01	04
	9	0	06	55.51	0	38	47.0	30.566 134	0.29	1.10	8	57	15
	10	0	07	01.69	0	38	09.3	30.553 733	0.29	1.10	8	53	25
	11	0	07	07.79	0	37	32.2	30.541 147	0.29	1.10	8	49	35
	12	0	07	13.81	0	36	55.7	30.528 379	0.29	1.10	8	45	45
	13	0	07	19.74	-0	36	19.7	30.515 432	0.29	1.10	8	41	55
	14	0	07	25.59	0	35	44.4	30.502 310	0.29	1.10	8	38	05
	15	0	07	31.36	0	35	09.6	30.489 017	0.29	1.10	8	34	15
	16	0	07	37.03	0	34	35.4	30.475 555	0.29	1.10	8	30	24
	17	0	07	42.62	-0	34	01.8	30.461 927	0.29	1.10	8	26	34

NEPTUNE, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
May	17	0	07	42.62	-0	34	01.8	30.461 927	0.29	1.10	8	26	34
	18	0	07	48.11	0	33	28.9	30.448 139	0.29	1.10	8	22	43
	19	0	07	53.51	0	32	56.5	30.434 191	0.29	1.10	8	18	53
	20	0	07	58.81	0	32	24.9	30.420 089	0.29	1.10	8	15	02
	21	0	08	04.01	0	31	53.9	30.405 836	0.29	1.10	8	11	11
	22	0	08	09.12	0	31	23.6	30.391 435	0.29	1.10	8	07	21
	23	0	08	14.12	-0	30	54.0	30.376 890	0.29	1.10	8	03	30
	24	0	08	19.03	0	30	25.0	30.362 205	0.29	1.10	7	59	39
	25	0	08	23.84	0	29	56.7	30.347 384	0.29	1.10	7	55	47
	26	0	08	28.55	0	29	29.0	30.332 431	0.29	1.10	7	51	56
	27	0	08	33.17	0	29	02.0	30.317 351	0.29	1.10	7	48	05
	28	0	08	37.68	0	28	35.7	30.302 149	0.29	1.11	7	44	13
	29	0	08	42.09	-0	28	10.1	30.286 828	0.29	1.11	7	40	22
	30	0	08	46.40	0	27	45.2	30.271 393	0.29	1.11	7	36	30
June	31	0	08	50.60	0	27	21.0	30.255 850	0.29	1.11	7	32	38
	1	0	08	54.68	0	26	57.5	30.240 202	0.29	1.11	7	28	46
	2	0	08	58.66	0	26	34.9	30.224 454	0.29	1.11	7	24	54
	3	0	09	02.52	0	26	12.9	30.208 611	0.29	1.11	7	21	02
	4	0	09	06.27	-0	25	51.7	30.192 678	0.29	1.11	7	17	10
	5	0	09	09.91	0	25	31.2	30.176 657	0.29	1.11	7	13	18
	6	0	09	13.44	0	25	11.5	30.160 555	0.29	1.11	7	09	25
	7	0	09	16.87	0	24	52.5	30.144 374	0.29	1.11	7	05	33
	8	0	09	20.18	0	24	34.2	30.128 121	0.29	1.11	7	01	40
	9	0	09	23.38	0	24	16.6	30.111 798	0.29	1.11	6	57	47
	10	0	09	26.47	-0	23	59.8	30.095 410	0.29	1.11	6	53	55
	11	0	09	29.45	0	23	43.7	30.078 961	0.29	1.11	6	50	02
	12	0	09	32.32	0	23	28.4	30.062 456	0.29	1.11	6	46	09
	13	0	09	35.08	0	23	13.8	30.045 898	0.29	1.11	6	42	15
July	14	0	09	37.72	0	22	60.0	30.029 293	0.29	1.12	6	38	22
	15	0	09	40.24	0	22	46.9	30.012 643	0.29	1.12	6	34	29
	16	0	09	42.64	-0	22	34.6	29.995 954	0.29	1.12	6	30	35
	17	0	09	44.93	0	22	23.1	29.979 230	0.29	1.12	6	26	41
	18	0	09	47.09	0	22	12.4	29.962 474	0.29	1.12	6	22	48
	19	0	09	49.13	0	22	02.5	29.945 692	0.29	1.12	6	18	54
	20	0	09	51.06	0	21	53.4	29.928 888	0.29	1.12	6	14	60
	21	0	09	52.87	0	21	45.0	29.912 067	0.29	1.12	6	11	05
	22	0	09	54.56	-0	21	37.4	29.895 233	0.29	1.12	6	07	11
	23	0	09	56.14	0	21	30.5	29.878 391	0.29	1.12	6	03	17
	24	0	09	57.61	0	21	24.4	29.861 547	0.29	1.12	5	59	22
	25	0	09	58.95	0	21	19.1	29.844 705	0.29	1.12	5	55	28
	26	0	10	00.18	0	21	14.5	29.827 871	0.29	1.12	5	51	33
	27	0	10	01.28	0	21	10.7	29.811 050	0.29	1.12	5	47	38
	28	0	10	02.26	-0	21	07.8	29.794 246	0.30	1.12	5	43	43
	29	0	10	03.11	0	21	05.7	29.777 466	0.30	1.13	5	39	48
	30	0	10	03.84	0	21	04.3	29.760 713	0.30	1.13	5	35	53
	1	0	10	04.45	0	21	03.8	29.743 993	0.30	1.13	5	31	58
	2	0	10	04.93	-0	21	04.1	29.727 310	0.30	1.13	5	28	02

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 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
		h	m	s	°	'	"		"	"	h	m	s
July	1	0	10	04.45	-0	21	03.8	29.743 993	0.30	1.13	5	31	58
	2	0	10	04.93	0	21	04.1	29.727 310	0.30	1.13	5	28	02
	3	0	10	05.30	0	21	05.1	29.710 670	0.30	1.13	5	24	07
	4	0	10	05.54	0	21	06.9	29.694 076	0.30	1.13	5	20	11
	5	0	10	05.67	0	21	09.4	29.677 533	0.30	1.13	5	16	15
	6	0	10	05.69	0	21	12.7	29.661 047	0.30	1.13	5	12	19
	7	0	10	05.58	-0	21	16.8	29.644 621	0.30	1.13	5	08	23
	8	0	10	05.36	0	21	21.6	29.628 259	0.30	1.13	5	04	27
	9	0	10	05.02	0	21	27.2	29.611 967	0.30	1.13	5	00	31
	10	0	10	04.57	0	21	33.5	29.595 748	0.30	1.13	4	56	34
	11	0	10	04.00	0	21	40.5	29.579 607	0.30	1.13	4	52	38
	12	0	10	03.30	0	21	48.4	29.563 549	0.30	1.13	4	48	41
	13	0	10	02.49	-0	21	56.9	29.547 576	0.30	1.13	4	44	44
	14	0	10	01.56	0	22	06.3	29.531 694	0.30	1.13	4	40	48
	15	0	10	00.51	0	22	16.4	29.515 907	0.30	1.13	4	36	51
	16	0	09	59.34	0	22	27.3	29.500 219	0.30	1.14	4	32	54
	17	0	09	58.05	0	22	38.9	29.484 635	0.30	1.14	4	28	56
	18	0	09	56.65	0	22	51.3	29.469 159	0.30	1.14	4	24	59
	19	0	09	55.14	-0	23	04.3	29.453 796	0.30	1.14	4	21	02
	20	0	09	53.51	0	23	18.1	29.438 550	0.30	1.14	4	17	04
	21	0	09	51.78	0	23	32.5	29.423 427	0.30	1.14	4	13	06
	22	0	09	49.94	0	23	47.7	29.408 431	0.30	1.14	4	09	09
	23	0	09	47.99	0	24	03.5	29.393 566	0.30	1.14	4	05	11
	24	0	09	45.92	0	24	20.1	29.378 839	0.30	1.14	4	01	13
	25	0	09	43.73	-0	24	37.4	29.364 252	0.30	1.14	3	57	15
	26	0	09	41.44	0	24	55.4	29.349 812	0.30	1.14	3	53	16
	27	0	09	39.03	0	25	14.1	29.335 523	0.30	1.14	3	49	18
	28	0	09	36.51	0	25	33.6	29.321 389	0.30	1.14	3	45	20
	29	0	09	33.88	0	25	53.7	29.307 414	0.30	1.14	3	41	21
	30	0	09	31.15	0	26	14.4	29.293 603	0.30	1.14	3	37	22
Aug.	31	0	09	28.31	-0	26	35.8	29.279 960	0.30	1.14	3	33	24
	1	0	09	25.37	0	26	57.9	29.266 488	0.30	1.14	3	29	25
	2	0	09	22.33	0	27	20.6	29.253 192	0.30	1.15	3	25	26
	3	0	09	19.19	0	27	43.8	29.240 076	0.30	1.15	3	21	27
	4	0	09	15.95	0	28	07.7	29.227 143	0.30	1.15	3	17	28
	5	0	09	12.62	0	28	32.2	29.214 397	0.30	1.15	3	13	29
	6	0	09	09.19	-0	28	57.2	29.201 841	0.30	1.15	3	09	29
	7	0	09	05.67	0	29	22.9	29.189 480	0.30	1.15	3	05	30
	8	0	09	02.04	0	29	49.1	29.177 316	0.30	1.15	3	01	30
	9	0	08	58.33	0	30	16.0	29.165 353	0.30	1.15	2	57	31
	10	0	08	54.52	0	30	43.4	29.153 594	0.30	1.15	2	53	31
	11	0	08	50.61	0	31	11.4	29.142 042	0.30	1.15	2	49	31
	12	0	08	46.61	-0	31	39.9	29.130 702	0.30	1.15	2	45	31
	13	0	08	42.52	0	32	09.0	29.119 576	0.30	1.15	2	41	31
	14	0	08	38.35	0	32	38.6	29.108 668	0.30	1.15	2	37	31
	15	0	08	34.10	0	33	08.7	29.097 981	0.30	1.15	2	33	31
	16	0	08	29.76	-0	33	39.3	29.087 518	0.30	1.15	2	29	31

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 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
	h	m	s	°	'	"				h	m	s
Aug.	16	0	08	29.76	-0	33	39.3	29.087 518	0.30	1.15	2	29 31
	17	0	08	25.35	0	34	10.4	29.077 285	0.30	1.15	2	25 30
	18	0	08	20.85	0	34	41.9	29.067 283	0.30	1.15	2	21 30
	19	0	08	16.28	0	35	14.0	29.057 518	0.30	1.15	2	17 30
	20	0	08	11.63	0	35	46.4	29.047 991	0.30	1.15	2	13 29
	21	0	08	06.90	0	36	19.4	29.038 707	0.30	1.15	2	09 28
	22	0	08	02.10	-0	36	52.8	29.029 669	0.30	1.15	2	05 28
	23	0	07	57.22	0	37	26.6	29.020 881	0.30	1.15	2	01 27
	24	0	07	52.26	0	38	00.9	29.012 344	0.30	1.15	1	57 26
	25	0	07	47.24	0	38	35.6	29.004 063	0.30	1.16	1	53 25
Sept.	26	0	07	42.14	0	39	10.7	28.996 041	0.30	1.16	1	49 24
	27	0	07	36.99	0	39	46.2	28.988 278	0.30	1.16	1	45 23
	28	0	07	31.77	-0	40	22.0	28.980 779	0.30	1.16	1	41 22
	29	0	07	26.49	0	40	58.2	28.973 546	0.30	1.16	1	37 21
	30	0	07	21.16	0	41	34.6	28.966 581	0.30	1.16	1	33 20
	31	0	07	15.78	0	42	11.4	28.959 885	0.30	1.16	1	29 18
	1	0	07	10.34	0	42	48.4	28.953 461	0.30	1.16	1	25 17
	2	0	07	04.85	0	43	25.7	28.947 311	0.30	1.16	1	21 16
	3	0	06	59.32	-0	44	03.3	28.941 437	0.30	1.16	1	17 14
	4	0	06	53.73	0	44	41.2	28.935 841	0.30	1.16	1	13 13
	5	0	06	48.10	0	45	19.3	28.930 523	0.30	1.16	1	09 11
	6	0	06	42.42	0	45	57.6	28.925 485	0.30	1.16	1	05 10
	7	0	06	36.69	0	46	36.2	28.920 730	0.30	1.16	1	01 08
	8	0	06	30.93	0	47	15.0	28.916 258	0.30	1.16	0	57 07
	9	0	06	25.12	-0	47	54.1	28.912 071	0.30	1.16	0	53 05
	10	0	06	19.28	0	48	33.3	28.908 170	0.30	1.16	0	49 03
	11	0	06	13.41	0	49	12.6	28.904 557	0.30	1.16	0	45 01
	12	0	06	07.51	0	49	52.1	28.901 233	0.30	1.16	0	41 00
	13	0	06	01.59	0	50	31.7	28.898 200	0.30	1.16	0	36 58
	14	0	05	55.64	0	51	11.3	28.895 460	0.30	1.16	0	32 56
	15	0	05	49.67	-0	51	51.1	28.893 014	0.30	1.16	0	28 54
	16	0	05	43.68	0	52	31.0	28.890 863	0.30	1.16	0	24 52
	17	0	05	37.67	0	53	11.0	28.889 009	0.30	1.16	0	20 50
	18	0	05	31.63	0	53	51.0	28.887 452	0.30	1.16	0	16 49
	19	0	05	25.58	0	54	31.1	28.886 195	0.30	1.16	0	12 47
	20	0	05	19.50	0	55	11.3	28.885 238	0.30	1.16	0	08 45
	21	0	05	13.42	-0	55	51.5	28.884 581	0.30	1.16	0	04 43
	22	0	05	07.33	0	56	31.7	28.884 225	0.30	1.16	0	00 41
	23	0	05	01.23	0	57	11.8	28.884 170	0.30	1.16	23	52 37
	24	0	04	55.13	0	57	52.0	28.884 418	0.30	1.16	23	48 35
	25	0	04	49.03	0	58	32.0	28.884 967	0.30	1.16	23	44 33
	26	0	04	42.94	0	59	12.0	28.885 817	0.30	1.16	23	40 31
	27	0	04	36.86	-0	59	51.8	28.886 969	0.30	1.16	23	36 29
	28	0	04	30.78	1	00	31.6	28.888 422	0.30	1.16	23	32 27
	29	0	04	24.72	1	01	11.2	28.890 175	0.30	1.16	23	28 25
	30	0	04	18.66	1	01	50.7	28.892 228	0.30	1.16	23	24 23
Oct.	1	0	04	12.63	-1	02	30.0	28.894 581	0.30	1.16	23	20 21

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RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit		
Oct.	h	m	s	°	'	"		"	"	h	m	s
1	0	04	12.63	-1	02	30.0	28.894 581	0.30	1.16	23	20	21
2	0	04	06.60	1	03	09.2	28.897 231	0.30	1.16	23	16	19
3	0	04	00.60	1	03	48.2	28.900 179	0.30	1.16	23	12	17
4	0	03	54.61	1	04	27.0	28.903 423	0.30	1.16	23	08	16
5	0	03	48.64	1	05	05.7	28.906 963	0.30	1.16	23	04	14
6	0	03	42.70	1	05	44.1	28.910 797	0.30	1.16	23	00	12
7	0	03	36.78	-1	06	22.3	28.914 923	0.30	1.16	22	56	10
8	0	03	30.90	1	07	00.2	28.919 342	0.30	1.16	22	52	09
9	0	03	25.05	1	07	37.9	28.924 052	0.30	1.16	22	48	07
10	0	03	19.25	1	08	15.2	28.929 051	0.30	1.16	22	44	05
11	0	03	13.48	1	08	52.2	28.934 340	0.30	1.16	22	40	04
12	0	03	07.76	1	09	28.9	28.939 916	0.30	1.16	22	36	02
13	0	03	02.07	-1	10	05.3	28.945 779	0.30	1.16	22	32	00
14	0	02	56.43	1	10	41.3	28.951 927	0.30	1.16	22	27	59
15	0	02	50.83	1	11	17.1	28.958 360	0.30	1.16	22	23	58
16	0	02	45.27	1	11	52.5	28.965 075	0.30	1.16	22	19	56
17	0	02	39.77	1	12	27.5	28.972 072	0.30	1.16	22	15	55
18	0	02	34.31	1	13	02.1	28.979 347	0.30	1.16	22	11	54
19	0	02	28.91	-1	13	36.4	28.986 899	0.30	1.16	22	07	52
20	0	02	23.56	1	14	10.2	28.994 726	0.30	1.16	22	03	51
21	0	02	18.28	1	14	43.5	29.002 826	0.30	1.16	21	59	50
22	0	02	13.06	1	15	16.4	29.011 195	0.30	1.15	21	55	49
23	0	02	07.90	1	15	48.9	29.019 832	0.30	1.15	21	51	48
24	0	02	02.82	1	16	20.8	29.028 733	0.30	1.15	21	47	47
25	0	01	57.81	-1	16	52.2	29.037 896	0.30	1.15	21	43	46
26	0	01	52.86	1	17	23.1	29.047 317	0.30	1.15	21	39	46
27	0	01	48.00	1	17	53.4	29.056 994	0.30	1.15	21	35	45
28	0	01	43.21	1	18	23.2	29.066 923	0.30	1.15	21	31	44
29	0	01	38.49	1	18	52.5	29.077 101	0.30	1.15	21	27	44
30	0	01	33.85	1	19	21.3	29.087 525	0.30	1.15	21	23	43
31	0	01	29.29	-1	19	49.4	29.098 190	0.30	1.15	21	19	43
Nov. 1	0	01	24.81	1	20	17.1	29.109 094	0.30	1.15	21	15	43
2	0	01	20.41	1	20	44.1	29.120 232	0.30	1.15	21	11	42
3	0	01	16.10	1	21	10.5	29.131 602	0.30	1.15	21	07	42
4	0	01	11.87	1	21	36.4	29.143 199	0.30	1.15	21	03	42
5	0	01	07.74	1	22	01.6	29.155 021	0.30	1.15	20	59	42
6	0	01	03.70	-1	22	26.1	29.167 063	0.30	1.15	20	55	42
7	0	00	59.76	1	22	50.0	29.179 323	0.30	1.15	20	51	43
8	0	00	55.92	1	23	13.2	29.191 797	0.30	1.15	20	47	43
9	0	00	52.17	1	23	35.7	29.204 481	0.30	1.15	20	43	44
10	0	00	48.52	1	23	57.6	29.217 372	0.30	1.15	20	39	44
11	0	00	44.96	1	24	18.8	29.230 467	0.30	1.15	20	35	45
12	0	00	41.50	-1	24	39.4	29.243 762	0.30	1.15	20	31	45
13	0	00	38.14	1	24	59.3	29.257 253	0.30	1.15	20	27	46
14	0	00	34.88	1	25	18.5	29.270 935	0.30	1.14	20	23	47
15	0	00	31.72	1	25	37.0	29.284 806	0.30	1.14	20	19	48
16	0	00	28.67	-1	25	54.8	29.298 860	0.30	1.14	20	15	49

NEPTUNE, 2025
 RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date	Apparent Right Ascension			Apparent Declination			True Distance from the Earth	Hor. Parallax	Semi Diameter	Ephemeris Transit			
	h	m	s	°	'	"		"	"	h	m	s	
Nov.	16	0	00	28.67	-1	25	54.8	29.298 860	0.30	1.14	20	15	49
	17	0	00	25.72	1	26	11.8	29.313 093	0.30	1.14	20	11	51
	18	0	00	22.89	1	26	28.1	29.327 500	0.30	1.14	20	07	52
	19	0	00	20.17	1	26	43.7	29.342 077	0.30	1.14	20	03	53
	20	0	00	17.56	1	26	58.4	29.356 820	0.30	1.14	19	59	55
	21	0	00	15.07	1	27	12.4	29.371 722	0.30	1.14	19	55	57
	22	0	00	12.70	-1	27	25.6	29.386 780	0.30	1.14	19	51	59
Dec.	23	0	00	10.44	1	27	38.0	29.401 988	0.30	1.14	19	48	01
	24	0	00	08.30	1	27	49.6	29.417 342	0.30	1.14	19	44	03
	25	0	00	06.28	1	28	00.5	29.432 835	0.30	1.14	19	40	05
	26	0	00	04.37	1	28	10.5	29.448 464	0.30	1.14	19	36	07
	27	0	00	02.58	1	28	19.8	29.464 222	0.30	1.14	19	32	09
	28	0	00	00.90	-1	28	28.3	29.480 105	0.30	1.14	15	58	13
	29	23	59	59.35	1	28	36.0	29.496 108	0.30	1.14	23	07	12
	30	23	59	57.91	1	28	43.0	29.512 224	0.30	1.14	19	20	17
	1	23	59	56.60	1	28	49.1	29.528 450	0.30	1.13	19	16	20
	2	23	59	55.41	1	28	54.3	29.544 779	0.30	1.13	19	12	23
	3	23	59	54.35	1	28	58.8	29.561 208	0.30	1.13	19	08	26
	4	23	59	53.42	-1	29	02.4	29.577 730	0.30	1.13	19	04	30
	5	23	59	52.61	1	29	05.1	29.594 343	0.30	1.13	19	00	33
	6	23	59	51.93	1	29	07.0	29.611 039	0.30	1.13	18	56	37
	7	23	59	51.38	1	29	08.1	29.627 816	0.30	1.13	18	52	40
	8	23	59	50.95	1	29	08.4	29.644 668	0.30	1.13	18	48	44
	9	23	59	50.64	1	29	07.8	29.661 590	0.30	1.13	18	44	48
	10	23	59	50.45	-1	29	06.5	29.678 577	0.30	1.13	18	40	52
	11	23	59	50.39	1	29	04.4	29.695 625	0.30	1.13	18	36	56
	12	23	59	50.45	1	29	01.4	29.712 728	0.30	1.13	18	33	00
	13	23	59	50.64	1	28	57.6	29.729 881	0.30	1.13	18	29	05
	14	23	59	50.95	1	28	53.0	29.747 078	0.30	1.13	18	25	09
	15	23	59	51.40	1	28	47.6	29.764 315	0.30	1.13	18	21	14
	16	23	59	51.97	-1	28	41.2	29.781 585	0.30	1.12	18	17	19
	17	23	59	52.68	1	28	34.1	29.798 883	0.30	1.12	18	13	23
	18	23	59	53.52	1	28	26.0	29.816 203	0.29	1.12	18	09	28
	19	23	59	54.49	1	28	17.1	29.833 541	0.29	1.12	18	05	34
	20	23	59	55.58	1	28	07.4	29.850 889	0.29	1.12	18	01	39
21	23	59	56.81	1	27	56.9	29.868 244	0.29	1.12	17	57	44	
22	23	59	58.16	-1	27	45.5	29.885 598	0.29	1.12	17	53	50	
23	23	59	59.65	1	27	33.3	29.902 947	0.29	1.12	17	49	55	
24	0	00	01.25	1	27	20.3	29.920 284	0.29	1.12	17	46	01	
25	0	00	02.98	1	27	06.4	29.937 605	0.29	1.12	17	42	07	
26	0	00	04.84	1	26	51.8	29.954 903	0.29	1.12	17	38	13	
27	0	00	06.81	1	26	36.4	29.972 173	0.29	1.12	17	34	19	
28	0	00	08.92	-1	26	20.2	29.989 410	0.29	1.12	17	30	26	
29	0	00	11.15	1	26	03.1	30.006 608	0.29	1.12	17	26	32	
30	0	00	13.51	1	25	45.2	30.023 763	0.29	1.12	17	22	39	
31	0	00	16.00	1	25	26.6	30.040 869	0.29	1.12	17	18	45	
32	0	00	18.61	-1	25	07.0	30.057 921	0.29	1.11	17	14	52	

PLUTO, 2025
HELIOCENTRIC POSITIONS FOR 0^h TERRESTRIAL TIME
MEAN EQUINOX AND ECLIPTIC OF DATE

Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector		Date	Heliocentric Longitude				Heliocentric Latitude				Radius Vector	
		°	'	"		°	'	"				°	'	"		°	'	"			
Jan.	1	301	37	36.2	-3	21	36.6	35.171	0943	July	5	302	29	24.8	-3	37	07.2	35.297	5941		
	6	301	39	00.6	3	22	01.8	35.174	5039		10	302	30	48.6	3	37	32.2	35.301	0221		
	11	301	40	24.8	3	22	27.1	35.177	9140		15	302	32	12.3	3	37	57.2	35.304	4505		
	16	301	41	49.1	3	22	52.4	35.181	3247		20	302	33	36.0	3	38	22.2	35.307	8794		
	21	301	43	13.4	3	23	17.6	35.184	7359		25	302	34	59.6	3	38	47.2	35.311	3087		
	26	301	44	37.6	3	23	42.9	35.188	1476		30	302	36	23.3	3	39	12.2	35.314	7384		
Feb.	31	301	46	01.8	-3	24	08.1	35.191	5598	Aug.	4	302	37	46.9	-3	39	37.2	35.318	1687		
	5	301	47	26.0	3	24	33.4	35.194	9726		9	302	39	10.5	3	40	02.1	35.321	5994		
	10	301	48	50.2	3	24	58.6	35.198	3860		14	302	40	34.1	3	40	27.1	35.325	0306		
	15	301	50	14.4	3	25	23.8	35.201	7998		19	302	41	57.7	3	40	52.0	35.328	4622		
	20	301	51	38.6	3	25	49.0	35.205	2142		24	302	43	21.3	3	41	17.0	35.331	8944		
	25	301	53	02.7	3	26	14.2	35.208	6292		29	302	44	44.9	3	41	41.9	35.335	3270		
Mar.	2	301	54	26.8	-3	26	39.4	35.212	0447	Sept.	3	302	46	08.4	-3	42	06.9	35.338	7601		
	7	301	55	50.9	3	27	04.6	35.215	4607		8	302	47	31.9	3	42	31.8	35.342	1938		
	12	301	57	15.0	3	27	29.8	35.218	8773		13	302	48	55.4	3	42	56.8	35.345	6280		
	17	301	58	39.1	3	27	55.0	35.222	2944		18	302	50	18.9	3	43	21.7	35.349	0627		
	22	302	00	03.2	3	28	20.2	35.225	7121		23	302	51	42.4	3	43	46.6	35.352	4979		
	27	302	01	27.2	3	28	45.3	35.229	1302		28	302	53	05.9	3	44	11.5	35.355	9336		
Apr.	1	302	02	51.2	-3	29	10.5	35.232	5489	Oct.	3	302	54	29.3	-3	44	36.4	35.359	3698		
	6	302	04	15.3	3	29	35.7	35.235	9681		8	302	55	52.8	3	45	01.3	35.362	8065		
	11	302	05	39.3	3	30	00.8	35.239	3878		13	302	57	16.2	3	45	26.2	35.366	2438		
	16	302	07	03.3	3	30	25.9	35.242	8080		18	302	58	39.6	3	45	51.0	35.369	6816		
	21	302	08	27.2	3	30	51.0	35.246	2287		23	303	00	03.0	3	46	15.9	35.373	1198		
	26	302	09	51.2	3	31	16.2	35.249	6499		28	303	01	26.3	3	46	40.8	35.376	5586		
May	1	302	11	15.1	-3	31	41.3	35.253	0715	Nov.	2	303	02	49.7	-3	47	05.6	35.379	9979		
	6	302	12	39.0	3	32	06.4	35.256	4936		7	303	04	13.0	3	47	30.5	35.383	4377		
	11	302	14	02.9	3	32	31.5	35.259	9162		12	303	05	36.4	3	47	55.3	35.386	8780		
	16	302	15	26.8	3	32	56.6	35.263	3392		17	303	06	59.7	3	48	20.1	35.390	3188		
	21	302	16	50.7	3	33	21.7	35.266	7627		22	303	08	23.0	3	48	45.0	35.393	7601		
	26	302	18	14.6	3	33	46.8	35.270	1866		27	303	09	46.3	3	49	09.8	35.397	2019		
June	31	302	19	38.4	-3	34	11.8	35.273	6109	Dec.	2	303	11	09.5	-3	49	34.6	35.400	6442		
	5	302	21	02.2	3	34	36.9	35.277	0357		7	303	12	32.8	3	49	59.4	35.404	0870		
	10	302	22	26.0	3	35	01.9	35.280	4610		12	303	13	56.0	3	50	24.2	35.407	5303		
	15	302	23	49.8	3	35	27.0	35.283	8867		17	303	15	19.2	3	50	49.0	35.410	9741		
	20	302	25	13.6	3	35	52.1	35.287	3129		22	303	16	42.4	3	51	13.8	35.414	4184		
	25	302	26	37.4	3	36	17.1	35.290	7395		27	303	18	05.6	3	51	38.6	35.417	8631		
July	30	302	28	01.1	-3	36	42.1	35.294	1666		32	303	19	28.8	-3	52	03.3	35.421	3083		
	5	302	29	24.8	-3	37	07.2	35.297	5941		37	303	20	52.0	-3	52	28.1	35.424	7540		

N.B: Pluto is now classified as a dwarf planet as per resolution of IAU

PLUTO, 2025

GEOCENTRIC LONGITUDE AND LATITUDE FOR 0^h TERRESTRIAL TIME

Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude			Date		Apparent Geocentric Longitude			Apparent Geocentric Latitude		
		°	'	"	°	'	"			°	'	"			
Jan.	1	301	03	53.6	-3	16	27.5	July	5	303	03	19.3	-3	43	09.0
	6	301	13	12.1	3	16	43.4		10	302	56	40.3	3	43	44.5
	11	301	22	41.3	3	17	01.5		15	302	49	49.4	3	44	17.4
	16	301	32	18.3	3	17	22.1		20	302	42	50.1	3	44	47.4
	21	301	41	58.2	3	17	45.1		25	302	35	47.3	3	45	14.7
	26	301	51	39.1	3	18	10.3		30	302	28	43.2	3	45	39.0
Feb.	31	302	01	17.4	-3	18	38.0	Aug.	4	302	21	43.2	-3	46	00.4
	5	302	10	48.2	3	19	08.1		9	302	14	51.2	3	46	19.0
	10	302	20	09.7	3	19	40.6		14	302	08	09.6	3	46	34.7
	15	302	29	17.1	3	20	15.4		19	302	01	43.5	3	46	47.7
	20	302	38	07.7	3	20	52.5		24	301	55	35.5	3	46	58.0
	25	302	46	39.6	3	21	31.8		29	301	49	49.0	3	47	05.7
Mar.	2	302	54	48.0	-3	22	13.3	Sept.	3	301	44	28.7	-3	47	11.0
	7	303	02	30.9	3	22	56.8		8	301	39	36.4	3	47	14.0
	12	303	09	45.5	3	23	42.2		13	301	35	14.7	3	47	14.9
	17	303	16	28.6	3	24	29.5		18	301	31	27.3	3	47	13.9
	22	303	22	39.3	3	25	18.4		23	301	28	14.9	3	47	11.3
	27	303	28	15.2	3	26	08.8		28	301	25	40.9	3	47	07.1
Apr.	1	303	33	13.3	-3	27	00.5	Oct.	3	301	23	47.2	-3	47	01.6
	6	303	37	33.5	3	27	53.5		8	301	22	33.6	3	46	55.1
	11	303	41	12.9	3	28	47.4		13	301	22	02.8	3	46	47.8
	16	303	44	11.4	3	29	42.1		18	301	22	14.3	3	46	40.0
	21	303	46	29.0	3	30	37.4		23	301	23	08.7	3	46	31.9
	26	303	48	03.7	3	31	33.1		28	301	24	47.4	3	46	23.7
May	1	303	48	56.2	-3	32	29.0	Nov.	2	301	27	08.8	-3	46	15.8
	6	303	49	06.2	3	33	24.8		7	301	30	12.4	3	46	08.2
	11	303	48	33.5	3	34	20.3		12	301	33	58.1	3	46	01.4
	16	303	47	20.3	3	35	15.3		17	301	38	23.3	3	45	55.5
	21	303	45	27.0	3	36	09.5		22	301	43	28.0	3	45	50.6
	26	303	42	54.1	3	37	02.8		27	301	49	10.4	3	45	47.1
June	31	303	39	44.5	-3	37	54.9	Dec.	2	301	55	27.1	-3	45	45.1
	5	303	35	58.5	3	38	45.6		7	302	02	17.4	3	45	44.9
	10	303	31	39.5	3	39	34.7		12	302	09	37.6	3	45	46.5
	15	303	26	50.3	3	40	21.9		17	302	17	25.4	3	45	50.2
	20	303	21	32.3	3	41	07.1		22	302	25	38.9	3	45	56.0
	25	303	15	49.3	3	41	50.1		27	302	34	13.9	3	46	04.2
July	30	303	09	44.0	-3	42	30.8	32	302	43	07.4	-3	46	14.8	
	5	303	03	19.3	-3	43	09.0	37	302	52	17.0	-3	46	27.9	

N.B : Pluto is now classified as a dwarf planet as per resolution of I.A.U

PLUTO, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Red. To Astrom. (J 2000.0)	Apparent Declination			Red. To Astrom. (J 2000.0)	True Distance from the Earth	Hor. Parallax	Ephemeris Transit	
		h	m	s	s	°	'	"	"		"	h	m
Jan.	1	20	16	15.57	+87.51	-23	06	50.9	-267.57	36.090 459	0.24	13	31
	6	20	16	55.21	87.49	23	05	01.9	268.72	36.120 384	0.24	13	12
	11	20	17	35.63	87.49	23	03	11.8	270.28	36.143 192	0.24	12	53
	16	20	18	16.62	87.53	23	01	22.1	271.68	36.158 791	0.24	12	34
	21	20	18	57.85	87.51	22	59	33.5	272.86	36.167 109	0.24	12	15
	26	20	19	39.16	87.53	22	57	46.0	274.55	36.168 091	0.24	11	56
Feb.	31	20	20	20.31	+87.59	-22	56	01.2	-276.00	36.161 732	0.24	11	37
	5	20	21	00.96	87.60	22	54	19.7	277.45	36.148 110	0.24	11	18
	10	20	21	40.97	87.68	22	52	42.1	279.15	36.127 401	0.24	10	59
	15	20	22	20.02	87.73	22	51	09.8	280.44	36.099 822	0.24	10	40
	20	20	22	57.92	87.77	22	49	42.8	281.96	36.065 596	0.24	10	21
	25	20	23	34.52	87.87	22	48	22.0	283.55	36.024 975	0.24	10	02
Mar.	2	20	24	09.51	+87.94	-22	47	08.4	-284.80	35.978 266	0.24	9	42
	7	20	24	42.72	88.04	22	46	02.0	286.43	35.925 865	0.24	9	23
	12	20	25	13.98	88.16	22	45	04.1	287.79	35.868 229	0.25	9	04
	17	20	25	43.05	88.24	22	44	14.9	289.01	35.805 814	0.25	8	45
	22	20	26	09.87	88.35	22	43	34.6	290.50	35.739 076	0.25	8	26
	27	20	26	34.27	88.50	22	43	04.1	291.69	35.668 495	0.25	8	07
Apr.	1	20	26	56.05	+88.60	-22	42	43.4	-292.89	35.594 605	0.25	7	47
	6	20	27	15.19	88.78	22	42	32.7	294.25	35.518 011	0.25	7	28
	11	20	27	31.49	88.91	22	42	32.9	295.14	35.439 320	0.25	7	09
	16	20	27	44.94	89.04	22	42	43.2	296.23	35.359 108	0.25	6	49
	21	20	27	55.53	89.23	22	43	03.9	297.28	35.277 944	0.25	6	30
	26	20	28	03.13	89.38	22	43	35.3	297.96	35.196 415	0.25	6	10
May	1	20	28	07.77	+89.57	-22	44	16.7	-299.00	35.115 154	0.25	5	50
	6	20	28	09.44	89.77	22	45	08.6	299.61	35.034 815	0.25	5	31
	11	20	28	08.11	89.91	22	46	10.2	300.10	34.956 002	0.25	5	11
	16	20	28	03.94	90.11	22	47	20.9	300.77	34.879 275	0.25	4	51
	21	20	27	56.94	90.31	22	48	40.8	301.05	34.805 181	0.25	4	32
	26	20	27	47.14	90.47	22	50	08.9	301.34	34.734 276	0.25	4	12
June	31	20	27	34.75	+90.70	-22	51	44.7	-301.71	34.667 140	0.25	3	52
	5	20	27	19.78	90.87	22	53	27.9	301.56	34.604 309	0.25	3	32
	10	20	27	02.46	91.03	22	55	17.1	301.61	34.546 245	0.25	3	12
	15	20	26	42.99	91.24	22	57	11.7	301.52	34.493 358	0.25	2	52
	20	20	26	21.44	91.39	22	59	11.2	301.07	34.446 044	0.26	2	32
	25	20	25	58.10	91.57	23	01	14.0	300.94	34.404 699	0.26	2	12
July	30	20	25	33.15	+91.75	-23	03	20.0	-300.38	34.369 696	0.26	1	52
	5	20	25	06.77	91.87	23	05	27.8	299.73	34.341 321	0.26	1	32
	10	20	24	39.32	92.03	23	07	36.0	299.26	34.319 780	0.26	1	12
	15	20	24	10.99	92.17	23	09	44.5	298.36	34.305 233	0.26	0	52
	20	20	23	42.00	92.26	23	11	51.6	297.60	34.297 824	0.26	0	32
	25	20	23	12.70	92.41	23	13	56.7	296.87	34.297 684	0.26	0	11
Aug.	30	20	22	43.26	+92.48	-23	15	59.1	-295.75	34.304 872	0.26	23	47
	4	20	22	14.03	92.55	23	17	57.1	294.90	34.319 347	0.26	23	27
	9	20	21	45.31	92.65	23	19	50.5	293.93	34.341 004	0.26	23	07
	14	20	21	17.27	92.67	23	21	38.4	292.75	34.369 702	0.26	22	47
	19	20	20	50.25	+92.73	-23	23	19.6	-291.97	34.405 297	0.26	22	27

N.B: Pluto is now classified as a dwarf planet as per resolution of I A U

PLUTO, 2025
RIGHT ASCENSION AND DECLINATION FOR 0^h TERRESTRIAL TIME

Date		Apparent Right Ascension			Red. To Astrom. (J 2000.0)	Apparent Declination			Red. To Astrom. (J 2000.0)	True Distance from the Earth	Hor. Parallax	Ephemeris Transit	
		h	m	s	s	°	'	"	"		"	h	m
Aug.	19	20	20	50.25	+92.73	-23	23	19.6	-291.97	34.405 297	0.26	22	27
	24	20	20	24.47	92.77	23	24	54.1	290.82	34.447 599	0.26	22	07
	29	20	20	00.14	92.74	23	26	20.8	289.79	34.496 329	0.25	21	47
Sept.	3	20	19	37.61	92.76	23	27	38.9	288.99	34.551 124	0.25	21	27
	8	20	19	17.03	92.75	23	28	48.5	287.91	34.611 588	0.25	21	07
	13	20	18	58.56	92.70	23	29	48.6	287.16	34.677 312	0.25	20	47
Oct.	18	20	18	42.48	+92.70	-23	30	39.2	-286.46	34.747 889	0.25	20	27
	23	20	18	28.84	92.62	23	31	20.2	285.56	34.822 844	0.25	20	07
	28	20	18	17.89	92.55	23	31	50.7	285.09	34.901 627	0.25	19	47
	3	20	18	09.76	92.51	23	32	11.1	284.56	34.983 648	0.25	19	27
	8	20	18	04.45	92.41	23	32	21.4	284.00	35.068 316	0.25	19	07
	13	20	18	02.15	92.35	23	32	21.0	283.96	35.155 064	0.25	18	48
Nov.	18	20	18	02.84	+92.27	-23	32	10.9	-283.60	35.243 313	0.25	18	28
	23	20	18	06.55	92.15	23	31	50.6	283.52	35.332 423	0.25	18	08
	28	20	18	13.39	92.08	23	31	20.2	283.70	35.421 725	0.25	17	49
	2	20	18	23.25	91.99	23	30	40.6	283.68	35.510 554	0.25	17	29
	7	20	18	36.09	91.89	23	29	51.5	284.12	35.598 285	0.25	17	10
	12	20	18	51.92	91.85	23	28	53.8	284.58	35.684 336	0.25	16	51
Dec.	17	20	19	10.55	+91.73	-23	27	47.8	-284.93	35.768 106	0.25	16	31
	22	20	19	31.98	91.65	23	26	33.6	285.72	35.848 969	0.25	16	12
	27	20	19	56.09	91.59	23	25	12.3	286.42	35.926 316	0.24	15	53
	2	20	20	22.64	91.49	23	23	44.3	287.14	35.999 588	0.24	15	34
	7	20	20	51.58	91.46	23	22	09.8	288.34	36.068 298	0.24	15	14
	12	20	21	22.65	91.41	23	20	30.4	289.19	36.132 001	0.24	14	55
	17	20	21	55.68	+91.33	-23	18	46.0	-290.33	36.190 240	0.24	14	36
	22	20	22	30.55	91.32	23	16	57.5	291.63	36.242 575	0.24	14	17
	27	20	23	06.95	91.27	23	15	06.0	292.68	36.288 626	0.24	13	58
	32	20	23	44.69	91.24	23	13	11.9	294.14	36.328 093	0.24	13	39
	37	20	24	23.58	+91.26	-23	11	16.2	-295.54	36.360 760	0.24	13	20

N.B: Pluto is now classified as a dwarf planet as per resolution of I A U

MAJOR PLANETS, 2025
HELIOCENTRIC OSCULATING ORBITAL ELEMENTS
REFERRED TO THE MEAN ECLIPTIC AND EQUINOX OF J 2000.0

Date		Julian Date 246	Inclina- tion <i>i</i>	Longitude		Mean Distance <i>a</i>	Daily Motion <i>n</i>	Eccentricity <i>e</i>	Mean Longitude <i>L</i>
				Asc. Node Ω	Perihelion ϖ				
MERCURY									
			°	°	°		°		°
Nov'24	26	0640.5	7.0035	48.300	77.4956788	0.387 097	4.092 37	0.205 637	34.1177
Jan'25	5	0680.5	7.0035	48.300	77.49585277	0.387 100	4.092 32	0.205 637	197.8115
Feb	14	0720.5	7.0035	48.299	77.49602674	0.387 099	4.092 33	0.205 637	1.5038
Mar	26	0760.5	7.0035	48.299	77.49620071	0.387 098	4.092 35	0.205 637	165.1983
May	5	0800.5	7.0035	48.299	77.49637468	0.387 101	4.092 31	0.205 637	328.8900
Jun	14	0840.5	7.0035	48.299	77.49654865	0.387 094	4.092 42	0.205 637	132.5863
Jul	24	0880.5	7.0035	48.299	77.49672263	0.387 102	4.092 29	0.205 637	296.2784
Sep	2	0920.5	7.0035	48.299	77.4968966	0.387 091	4.092 46	0.205 637	99.9743
Oct	12	0960.5	7.0035	48.299	77.49707057	0.387 102	4.092 29	0.205 637	263.6684
Nov	21	1000.5	7.0034	48.298	77.49724454	0.387 094	4.092 41	0.205 637	67.3618
Dec'25	31	1040.5	7.0034	48.298	77.49741851	0.387 100	4.092 32	0.205 637	231.0570
Feb'26	9	1080.5	7.0034	48.298	77.49759248	0.387 100	4.092 31	0.205 637	34.7487
VENUS									
Nov'24	26	0640.5	3.3944	76.611	131.564831	0.723 332	1.602 13	0.006 760	354.1639
Jan'25	5	0680.5	3.3944	76.610	131.5648356	0.723 346	1.602 09	0.006 760	58.2470
Feb	14	0720.5	3.3944	76.610	131.5648402	0.723 342	1.602 10	0.006 760	122.3294
Mar	26	0760.5	3.3944	76.610	131.5648448	0.723 334	1.602 12	0.006 760	186.4135
May	5	0800.5	3.3944	76.609	131.5648493	0.723 336	1.602 12	0.006 760	250.4981
Jun	14	0840.5	3.3944	76.609	131.5648539	0.723 341	1.602 10	0.006 760	314.5819
Jul	24	0880.5	3.3944	76.609	131.5648585	0.723 327	1.602 15	0.006 760	18.6663
Sep	2	0920.5	3.3944	76.609	131.564863	0.723 306	1.602 22	0.006 760	82.7533
Oct	12	0960.5	3.3944	76.608	131.5648676	0.723 314	1.602 19	0.006 760	146.8418
Nov	21	1000.5	3.3944	76.608	131.5648721	0.723 336	1.602 12	0.006 760	210.9282
Dec'25	31	1040.5	3.3944	76.608	131.5648767	0.723 348	1.602 08	0.006 760	275.0107
Feb'26	9	1080.5	3.3944	76.607	131.5648812	0.723 345	1.602 09	0.006 759	339.0924
EARTH*									
Nov'24	26	0640.5	0.0033	174.813	103.0176829	0.999 996	0.985 61	0.016 698	65.0702
Jan'25	5	0680.5	0.0033	174.813	103.0180362	1.000 011	0.985 59	0.016 698	104.4950
Feb	14	0720.5	0.0033	174.813	103.0183895	1.000 027	0.985 57	0.016 698	143.9184
Mar	26	0760.5	0.0033	174.812	103.0187429	1.000 022	0.985 58	0.016 698	183.3411
May	5	0800.5	0.0033	174.812	103.0190962	0.999 992	0.985 62	0.016 698	222.7652
Jun	14	0840.5	0.0033	174.812	103.0194496	0.999 962	0.985 66	0.016 698	262.1915
Jul	24	0880.5	0.0033	174.812	103.0198029	0.999 960	0.985 67	0.016 698	301.6190
Sep	2	0920.5	0.0034	174.811	103.0201562	0.999 983	0.985 63	0.016 698	341.0454
Oct	12	0960.5	0.0034	174.811	103.0205096	1.000 010	0.985 59	0.016 698	20.4697
Nov	21	1000.5	0.0034	174.811	103.0208629	1.000 025	0.985 57	0.016 698	59.8925
Dec'25	31	1040.5	0.0034	174.811	103.0212162	1.000 031	0.985 56	0.016 698	99.3148
Feb'26	9	1080.5	0.0034	174.810	103.0215696	1.000 033	0.985 56	0.016 698	138.7371

* Values labelled for the Earth are actually for the Earth/ Moon barycenter

FORMULAS

Mean anomaly, $M = L - \varpi$

Argument of perihelion, measured from node, $\omega = \varpi - \Omega$

True anomaly, $v = M + (2e - e^3/4)\sin M + (5e^2/4)\sin 2M + (13e^3/12)\sin 3M + \dots$ in radians

True distance, $r = a (1 - e^2) / (1 + e \cos v)$

Heliocentric rectangular co-ordinates, referred to the ecliptic of date, may be computed from:

$x = r \{ \cos (v + \omega) \cos \Omega - \sin (v + \omega) \cos i \sin \Omega \}$

$y = r \{ \cos (v + \omega) \sin \Omega + \sin (v + \omega) \cos i \cos \Omega \}$

$z = r \sin (v + \omega) \sin i$

MAJOR PLANETS, 2025
HELIOCENTRIC OSCULATING ORBITAL ELEMENTS
REFERRED TO THE MEAN ECLIPTIC AND EQUINOX OF J 2000.0

Date		Julian Date 246	Inclina- tion <i>i</i>	Longitude		Mean Distance <i>a</i>	Daily Motion <i>n</i>	Eccentricity <i>e</i>	Mean Longitude <i>L</i>
				Asc. Node Ω	Perihelion ϖ				
MARS									
Nov'24	26	0640.5	1.8477	49.485	336.1707641	1.523 708	0.524 02	0.093 423	81.7789
Jan'25	5	0680.5	1.8477	49.484	336.1712502	1.523 713	0.524 02	0.093 423	102.7406
Feb	14	0720.5	1.8477	49.484	336.1717362	1.523 726	0.524 02	0.093 423	123.7019
Mar	26	0760.5	1.8477	49.484	336.1722223	1.523 733	0.524 01	0.093 423	144.6626
May	5	0800.5	1.8477	49.483	336.1727083	1.523 720	0.524 02	0.093 424	165.6230
Jun	14	0840.5	1.8477	49.483	336.1731943	1.523 680	0.524 04	0.093 424	186.5838
Jul	24	0880.5	1.8476	49.483	336.1736804	1.523 616	0.524 07	0.093 424	207.5458
Sep	2	0920.5	1.8476	49.482	336.1741664	1.523 542	0.524 11	0.093 424	228.5094
Oct	12	0960.5	1.8476	49.482	336.1746524	1.523 476	0.524 14	0.093 424	249.4748
Nov	21	1000.5	1.8476	49.482	336.1751385	1.523 436	0.524 16	0.093 424	270.4414
Dec'25	31	1040.5	1.8476	49.481	336.1756245	1.523 436	0.524 16	0.093 424	291.4083
Feb'26	9	1080.5	1.8476	49.481	336.1761106	1.523 477	0.524 14	0.093 424	312.3743
JUPITER									
Nov'24	26	0640.5	1.3028	100.508	14.38492092	5.204 385	0.083 05	0.048 539	70.1116
Jan'25	5	0680.5	1.3028	100.509	14.38515734	5.204 379	0.083 05	0.048 539	73.4324
Feb	14	0720.5	1.3028	100.509	14.38539376	5.204 363	0.083 05	0.048 539	76.7533
Mar	26	0760.5	1.3028	100.509	14.38563019	5.204 339	0.083 05	0.048 539	80.0743
May	5	0800.5	1.3028	100.509	14.38586661	5.204 305	0.083 06	0.048 539	83.3952
Jun	14	0840.5	1.3028	100.509	14.38610304	5.204 263	0.083 06	0.048 539	86.7163
Jul	24	0880.5	1.3028	100.510	14.38633947	5.204 213	0.083 06	0.048 540	90.0374
Sep	2	0920.5	1.3028	100.510	14.3865759	5.204 154	0.083 06	0.048 540	93.3586
Oct	12	0960.5	1.3028	100.510	14.38681233	5.204 088	0.083 06	0.048 540	96.6799
Nov	21	1000.5	1.3028	100.510	14.38704877	5.204 015	0.083 06	0.048 540	100.0013
Dec'25	31	1040.5	1.3028	100.510	14.3872852	5.203 934	0.083 06	0.048 540	103.3229
Feb'26	9	1080.5	1.3028	100.511	14.38752164	5.203 848	0.083 07	0.048 541	106.6446
SATURN									
Nov'24	26	0640.5	2.4895	113.602	93.19835111	9.532 912	0.033 49	0.055 462	354.4796
Jan'25	5	0680.5	2.4895	113.601	93.19897184	9.532 839	0.033 49	0.055 461	355.8214
Feb	14	0720.5	2.4895	113.601	93.19959257	9.532 775	0.033 49	0.055 461	357.1632
Mar	26	0760.5	2.4895	113.601	93.20021331	9.532 721	0.033 49	0.055 461	358.5050
May	5	0800.5	2.4895	113.600	93.20083404	9.532 675	0.033 49	0.055 460	359.8467
Jun	14	0840.5	2.4895	113.600	93.20145478	9.532 639	0.033 49	0.055 460	1.1883
Jul	24	0880.5	2.4895	113.600	93.20207552	9.532 613	0.033 49	0.055 460	2.5299
Sep	2	0920.5	2.4895	113.600	93.20269626	9.532 596	0.033 49	0.055 459	3.8714
Oct	12	0960.5	2.4895	113.599	93.203317	9.532 590	0.033 49	0.055 459	5.2129
Nov	21	1000.5	2.4895	113.599	93.20393774	9.532 594	0.033 49	0.055 458	6.5542
Dec'25	31	1040.5	2.4895	113.599	93.20455848	9.532 608	0.033 49	0.055 458	7.8956
Feb'26	9	1080.5	2.4895	113.598	93.20517922	9.532 632	0.033 49	0.055 458	9.2368
URANUS									
Nov'24	26	0640.5	0.7728	74.024	173.0275281	19.172 959	0.011 74	0.046 374	59.7450
Feb'25	14	0720.5	0.7728	74.025	173.0277236	19.172 496	0.011 74	0.046 374	60.6845
May	5	0800.5	0.7728	74.025	173.0279191	19.171 991	0.011 74	0.046 374	61.6241
Jul	24	0880.5	0.7728	74.025	173.0281147	19.171 444	0.011 74	0.046 374	62.5638
Oct	12	0960.5	0.7728	74.025	173.0283102	19.170 859	0.011 74	0.046 374	63.5037
Dec'25	31	1040.5	0.7728	74.025	173.0285057	19.170 236	0.011 74	0.046 374	64.4438
Mar'26	21	1120.5	0.7728	74.025	173.0287013	19.169 580	0.011 74	0.046 374	65.3840
NEPTUNE									
Nov'24	26	0640.5	1.77001	131.783	48.12754835	30.081 988	0.005 97	0.009 457	359.4014
Feb'25	14	0720.5	1.77001	131.783	48.12761236	30.081 701	0.005 97	0.009 457	359.8802
May	5	0800.5	1.77001	131.782	48.12767637	30.081 397	0.005 97	0.009 457	360.3589
Jul	24	0880.5	1.77001	131.782	48.12774039	30.081 082	0.005 97	0.009 457	0.8375
Oct	12	0960.5	1.77001	131.782	48.1278044	30.080 763	0.005 97	0.009 457	1.3160
Dec'25	31	1040.5	1.77001	131.782	48.12786841	30.080 445	0.005 97	0.009 457	1.7944
Mar'26	21	1120.5	1.77001	131.782	48.12793243	30.080 135	0.005 97	0.009 457	2.2726

Distances are in astronomical units.

CENTRE OF MASS OF THE SOLAR SYSTEM, 2025

HELIOCENTRIC RECTANGULAR CO-ORDINATES
EQUATORIAL RECTANGULAR CO-ORDINATES OF THE BARYCENTRES S_4
(SUN TO MARS) AND S_9 (SUN TO PLUTO) REFERRED TO THE MEAN
EQUINOX AND EQUATOR OF J 2000.0

Date		Barycentre S_4 (In units of 10^{-10} a.u.)			Centre of Mass of the Solar System Barycentre S_9 (In units of 10^{-9} a.u.)		
		x	y	z	X	Y	Z
Jan.	0	+57374567	+45774719	+17888476	+5737063	+4573116	+1786990
	10	56647547	46102471	18043720	5665316	4605826	1802460
	20	55917274	46416807	18193329	5593253	4637377	1817444
	30	55184761	46717714	18337262	5520934	4667768	1831939
Feb.	9	54450981	47005368	18475556	5448415	4697007	1845946
	19	53716787	47280090	18608335	5375747	4725109	1859471
Mar.	29	+52982883	+47542136	+18735657	+5302973	+4752086	+1872516
	10	52250342	47791712	18857512	5230155	4777948	1885081
	20	51520585	48029773	18974197	5157373	4802743	1897180
	30	50794193	48257841	19086401	5084663	4826546	1908847
Apr.	9	50071036	48477266	19194770	5012027	4849425	1920114
	19	49350636	48689091	19299834	4939449	4871432	1931008
May	29	+48632324	+48894137	+19401994	+4866904	+4892608	+1941548
	9	47915206	49093005	19501597	4794355	4912983	1951752
	19	47198198	49285971	19598811	4721756	4932572	1961628
June	29	46480225	49472748	19693540	4649061	4951360	1971171
	8	45760867	49652747	19785472	4576257	4969319	1980366
	18	45040164	49825890	19874520	4503354	4986446	1989208
July	28	+44317611	+49992264	+19960818	+4430334	+5002745	+1997705
	8	43592513	50151581	20044268	4357171	5018203	2005851
	18	42864324	50303253	20124664	4283845	5032792	2013637
	28	42132745	50446553	20201695	4210349	5046476	2021047
Aug.	7	41397630	50580717	20275015	4136683	5059219	2028064
	17	40659018	50704822	20344221	4062857	5070975	2034669
Sept.	27	+39917268	+50817763	+20408737	+3988896	+5081691	+2040833
	6	39173683	50918564	20467979	3914874	5091319	2046527
	16	38429772	51007278	20521880	3840872	5099864	2051749
	26	37686452	51084299	20570603	3766945	5107347	2056507
Oct.	6	36944342	51149932	20614287	3693131	5113785	2060809
	16	36203990	51204517	20653071	3619464	5119197	2064662
Nov.	26	+35465834	+51248463	+20687149	+3545974	+5123605	+2068077
	5	34730112	51282200	20716726	3472680	5127033	2071065
	15	33996823	51306028	20741938	3399589	5129498	2073633
	25	33266061	51319894	20762729	3326713	5131000	2075779
Dec.	5	32538550	51323917	20779078	3254095	5131547	2077503
	15	31814757	51318938	20791384	3181766	5131183	2078826
	25	+31094377	+51305692	+20800052	+3109717	+5129948	+2079769
	35	+30376911	+51284516	+20805321	+3037930	+5127861	+2080345

The heliocentric equatorial rectangular co-ordinates of the barycentre of the solar system referred to the mean equator and equinox of J 2024.5 are given by $\mathbf{r} = \mathbf{Pr}_0$, where \mathbf{r} and \mathbf{r}_0 are the column vectors of the co-ordinates X, Y, Z and X_0, Y_0, Z_0 referred to J 2020.5 and J 2000.0 respectively.

PART - II

STARS

LONGITUDE AND LATITUDE OF STARS, 2025.5
MEAN PLACES FOR JULY 2^d.375 TERRESTRIAL TIME

Cat. No. FK5	BS= HR No.	Star	Mag.	Longitude			Annual Variation	Annual Proper Motion	Latitude			Annual Variation	Annual Proper Motion
				°	'	"	"	"	°	'	"	"	"
35	280	α Sculptoris	4.31	0	51	04.56	50.92	+0.025	-32	30	46.63	+0.050	-0.007
9	74	ι Ceti	3.56	1	16	21.83	50.43	-0.028	-10	01	17.53	+0.030	-0.028
82	674	ϕ Eridani	3.56	1	21	44.73	51.96	+0.110	-58	59	09.27	-0.020	-0.082
902	9072	ω Piscium	4.01	2	56	24.45	50.29	+0.095	+6	21	43.88	-0.080	-0.167
22	188	β Ceti	2.04	2	56	33.80	50.90	+0.242	-20	47	00.90	+0.020	-0.068
783	7957	η Cephei	3.43	5	02	25.17	49.82	+2.355	+71	46	58.67	+0.490	+0.368
156	1336	α Reticuli	3.35	7	52	46.96	54.95	+0.298	-78	02	23.48	+0.150	-0.015
869	8762	σ Andromedae	3.62	8	07	57.85	49.44	+0.022	+43	45	03.08	+0.160	-0.017
848	8585	α Lacertae	3.77	8	29	47.45	49.26	+0.200	+53	17	26.98	+0.100	-0.070
7	39	γ Pegasi	2.83	9	30	41.61	50.09	+0.001	+12	36	02.31	+0.180	-0.011
40	334	η Ceti	3.45	12	07	32.68	50.71	+0.151	-16	07	08.16	+0.020	-0.213
803	8162	α Cephei	2.44	13	07	42.70	48.30	+0.339	+68	54	50.47	+0.150	-0.100
836	8465	ζ Cephei	3.35	14	18	48.74	48.69	+0.028	+61	08	53.48	+0.270	-0.008
1	15	α Andromedae	2.06	14	39	49.04	49.92	+0.056	+25	40	48.33	+0.070	-0.207
47	402	θ Ceti	3.60	16	34	55.44	50.38	-0.163	-15	46	02.73	+0.130	-0.171
723	7310	δ Draconis	3.07	17	29	54.57	43.98	+0.758	+82	53	12.84	+0.230	-0.093
59	509	τ Ceti	3.50	18	09	59.84	49.34	-1.371	-24	48	15.07	+1.800	+1.463
890	8961	λ Andromedae	3.82v	18	38	21.71	49.33	-0.133	+43	46	26.70	-0.100	-0.441
1075	794	ι Eridani	4.11	19	07	58.52	51.57	+0.169	-51	42	49.40	+0.240	-0.095
71	585	ν Ceti	4.00	19	47	12.99	50.95	+0.134	-31	01	59.70	+0.280	-0.076
1033	361	ζ Piscium*	5.24	20	14	04.51	50.41	+0.112	-0	12	46.06	+0.250	-0.106
20	165	δ Andromedae	3.27	22	10	08.71	50.00	+0.092	+24	21	04.35	+0.250	-0.141
62	539	ζ Ceti	3.73	22	18	27.51	50.63	+0.025	-20	20	00.33	+0.340	-0.051
106	897	θ Eridani p	3.25	23	37	56.20	51.40	-0.051	-53	44	18.15	+0.450	+0.038
101	841	β Fornacis	4.46	26	35	43.16	51.35	+0.212	-45	51	12.94	+0.560	+0.103
1154	2015	δ Doradus	4.35	26	53	26.99	76.81	-0.279	-88	15	06.65	+0.490	+0.030
50	437	η Piscium	3.62	27	10	19.55	50.24	+0.024	+5	22	45.41	+0.450	-0.015
33	269	μ Andromedae	3.87	29	31	52.28	50.02	+0.173	+29	39	37.27	+0.460	-0.038
42	337	β Andromedae	2.06	30	45	39.84	50.04	+0.126	+25	56	38.47	+0.330	-0.178
863	8694	ι Cephei	3.52	33	35	23.00	48.53	-0.304	+62	37	04.74	+0.530	-0.017
66	553	β Arietis*	2.64	34	19	34.28	50.23	+0.051	+8	29	18.13	+0.420	-0.138
1085	919	τ Eridani	4.09	34	53	29.65	50.70	-0.198	-38	54	14.02	+0.570	+0.001
17	153	ζ Cassiopeiae	3.66	35	25	08.72	49.58	+0.016	+44	43	18.53	+0.560	-0.018
2	21	β Cassiopeiae	2.27	35	28	22.92	49.84	+0.462	+51	12	49.55	+0.100	-0.472
809	8238	β Cephei	3.23	35	53	43.27	48.17	+0.028	+71	09	17.60	+0.570	-0.008
64	544	α Trianguli	3.41	37	12	57.00	50.00	-0.079	+16	48	04.20	+0.370	-0.223
91	779	δ Ceti	4.07	37	55	41.90	50.49	+0.013	-14	27	34.26	+0.600	-0.008
74	617	α Arietis	2.00	38	01	09.13	50.30	+0.130	+9	57	57.33	+0.400	-0.204
21	168	α Cassiopeiae	2.23	38	08	15.51	49.58	+0.036	+46	37	26.58	+0.560	-0.056
171	1465	α Doradus	3.27	38	11	43.89	53.03	+0.155	-74	34	47.14	+0.580	-0.031
104	874	η Eridani	3.89	39	06	26.49	50.62	+0.008	-24	32	45.90	+0.380	-0.233

* No. 1 : *Alpheratz*, Uttara Bhadrapada - 2 No. 66 : *Sheratan*, Asvini

No. 1033 : *Revati*

Annual rate of Precession in longitude for the middle of the year = 50".29

LONGITUDE AND LATITUDE OF STARS, 2025.5
MEAN PLACES FOR JULY 2^d.375 TERRESTRIAL TIME

Cat. No. FK5	BS= HR No.	Star	Mag.	Longitude			Annual Variation	Annual Proper Motion	Latitude			Annual Variation	Annual Proper Motion
				°	'	"	"	"	°	'	"	"	"
75	622	β Trianguli	3.00	42	42	32.10	50.18	+0.134	+20	34	56.99	+0.570	-0.091
79	664	γ Trianguli	4.01	43	52	25.70	50.10	+0.028	+18	57	01.16	+0.610	-0.064
32	264	γ Cassiopeiae	var.	44	17	06.18	49.59	+0.027	+48	49	02.19	+0.660	-0.019
73	603	γ Andromed. p	2.26	44	34	50.56	49.98	+0.024	+27	48	29.84	+0.620	-0.065
107	911	α Ceti	2.53	44	40	35.89	50.40	-0.032	-12	35	00.89	+0.610	-0.072
155	1326	α Horologii	3.86	46	11	00.99	51.38	-0.073	-61	43	47.18	+0.490	-0.211
48	403	δ Cassiopeiae	2.68	48	17	11.12	50.00	+0.323	+46	24	16.88	+0.520	-0.202
127	1084	ε Eridani	3.73	48	31	03.40	49.56	-1.054	-27	42	39.90	+1.010	+0.280
100	838	41 Arietis*	3.63	48	33	34.57	50.21	+0.029	+10	27	05.18	+0.590	-0.132
135	1136	δ Eridani	3.54	51	13	12.54	50.72	+0.113	-28	40	06.04	+1.500	+0.744
121	1030	ο Tauri	3.60	51	31	10.46	50.30	-0.084	-9	19	54.83	+0.700	-0.059
123	1038	ξ Tauri	3.74	52	16	08.02	50.43	+0.049	-8	47	46.30	+0.710	-0.052
212	1922	β Doradus	3.48v	52	29	59.16	56.58	+0.072	-85	02	28.96	+0.770	+0.007
149	1231	γ Eridani	2.95	54	13	30.49	50.68	+0.039	-33	12	00.54	+0.660	-0.123
63	542	ε Cassiopeiae	3.38	55	07	05.54	49.77	+0.024	+47	33	03.10	+0.750	-0.034
109	921	ρ Persei	var.	55	16	01.72	50.20	+0.099	+20	34	35.54	+0.660	-0.139
1129	1502	α Caeli	4.45	56	30	17.74	50.90	-0.346	-62	59	07.78	+0.770	-0.032
111	936	β Persei	var.	56	31	23.52	50.10	+0.003	+22	25	53.31	+0.800	-0.002
103	854	τ Persei	3.95	58	16	01.22	49.98	-0.003	+34	22	27.20	+0.810	-0.005
99	834	η Persei	3.76	59	03	25.34	49.97	+0.013	+37	29	05.04	+0.800	-0.019
136	1142	17 Tauri	3.70	59	46	05.15	50.27	+0.009	+4	11	33.05	+0.780	-0.049
170	1464	ν [*] Eridani	3.82	60	14	33.99	50.77	-0.076	-51	48	51.11	+0.830	-0.002
151	1251	ν Tauri	3.91	60	16	32.82	50.41	+0.005	-14	26	55.29	+0.830	-0.004
139	1165	η Tauri*	2.87	60	20	54.89	50.27	+0.008	+4	03	12.99	+0.780	-0.049
108	915	γ Persei	2.93	60	22	36.26	50.00	-0.002	+34	31	59.63	+0.830	-0.004
893	8974	γ Cephei	3.21	60	26	54.34	49.66	+0.268	+64	40	25.59	+0.950	0.119
150	1239	λ Tauri	3.47v	60	59	27.23	50.34	-0.009	-7	57	24.62	+0.830	-0.011
120	1017	α Persei	1.79	62	26	11.60	50.08	+0.018	+30	07	42.12	+0.820	-0.030
144	1203	ζ Persei	2.85	63	28	47.54	50.23	+0.004	+11	20	11.43	+0.850	-0.011
134	1135	ν Persei	3.77	64	10	43.70	50.13	-0.015	+22	09	24.16	+0.870	+0.002
131	1122	δ Persei	3.01	65	09	28.32	50.14	+0.021	+27	18	16.67	+0.820	-0.040
148	1228	ξ Persei	4.04	65	19	42.23	50.20	+0.002	+14	56	49.01	+0.870	+0.000
147	1220	ε Persei	2.89	66	02	01.45	50.19	+0.013	+19	07	03.00	+0.840	-0.029
159	1346	γ Tauri	3.65	66	09	46.42	50.44	+0.110	-5	43	45.99	+0.830	-0.044
162	1373	δ Tauri	3.76	67	13	39.86	50.42	+0.101	-3	58	00.04	+0.840	-0.046
164	1409	ε Tauri	3.54	68	49	19.29	50.41	+0.100	-2	33	51.69	+0.840	-0.054
168	1457	α Tauri*	0.85	70	08	44.73	50.36	+0.036	-5	27	55.87	+0.700	-0.197
1134	1543	π [*] Orionis	3.19	72	17	04.51	50.85	+0.481	-15	22	52.57	+0.850	-0.045
186	1654	ε Leporis	3.19	72	24	45.81	50.57	+0.021	-44	57	42.88	+0.830	-0.076
179	1552	π [*] Orionis	3.69	72	27	26.16	50.37	-0.001	-16	46	07.15	+0.910	+0.001
180	1567	π [*] Orionis	3.72	72	50	50.18	50.39	+0.000	-20	00	06.60	+0.910	+0.000

* No. 100 : Bharani

No. 168 : Aldebaran, Rohini

No. 139 : Alcyone, Krittika.

Annual rate of Precession in longitude for the middle of the year = 50".29

LONGITUDE AND LATITUDE OF STARS, 2025.5
MEAN PLACES FOR JULY 2^d.375 TERRESTRIAL TIME

Cat. No. FK5	BS= HR No.	Star	Mag.	Longitude			Annual Variation	Annual Proper Motion	Latitude			Annual Variation	Annual Proper Motion
				°	'	"	"	"	°	'	"	"	"
188	1666	β Eridani	2.79	75	37	53.61	50.29	-0.116	-27	51	32.34	+0.840	-0.071
1144	1702	μ Leporis	3.31 _v	75	45	04.62	50.50	+0.051	-39	02	49.20	+0.880	-0.030
695	6927	χ Draconis	3.57	76	14	36.07	43.16	+3.503	+83	34	20.39	+1.080	-0.501
181	1577	ι Aurigae	2.69	76	59	44.23	50.27	+0.001	+10	27	27.59	+0.900	-0.018
194	1713	β Orionis	0.12	77	11	09.95	50.40	+0.000	-31	07	10.16	+0.920	-0.001
195	1735	τ Orionis	3.60	78	12	12.76	50.37	-0.018	-29	50	03.86	+0.910	-0.007
1137	1612	ζ Aurigae	3.75	78	59	22.43	50.25	+0.007	+18	12	19.62	+0.910	-0.023
183	1605	ε Aurigae	var.	79	11	51.06	50.24	-0.001	+20	56	51.57	+0.920	-0.004
185	1641	η Aurigae	3.17	79	48	08.92	50.28	+0.024	+18	17	11.97	+0.860	-0.070
204	1829	β Leporis	2.84	80	01	43.72	50.40	-0.015	-43	54	42.70	+0.840	-0.088
201	1790	γ Orionis	1.64	81	18	09.64	50.31	-0.010	-16	48	46.27	+0.920	-0.013
178	1542	α Camelopardi	4.29	81	20	08.32	50.20	+0.001	+43	25	20.20	+0.940	+0.006
182	1603	β Camelopardi	4.03	81	37	25.76	50.22	-0.010	+37	26	03.30	+0.920	-0.015
207	1865	α Leporis	2.58	81	44	12.98	50.39	+0.001	-41	03	16.08	+0.930	+0.002
193	1708	α Aurigae	0.08	82	12	51.83	50.31	+0.046	+22	51	52.56	+0.510	-0.429
215	1956	α Columbae	2.64	82	31	32.96	50.44	+0.009	-57	22	19.53	+0.910	-0.027
206	1852	δ Orionis	2.23	82	45	10.02	50.33	+0.002	-22	57	08.31	+0.930	-0.002
202	1791	β Tauri	1.65	82	55	52.49	50.30	+0.013	+5	23	13.76	+0.760	-0.176
209	1899	ι Orionis	2.77	83	21	13.67	50.33	+0.000	-29	11	47.99	+0.930	+0.001
210	1903	ε Orionis	1.70	83	49	11.69	50.32	+0.001	-24	30	11.13	+0.930	-0.002
(GC)	1879	λ Orionis*	3.56	84	03	47.10	50.31	-0.001	-13	21	58.06	+0.930	-0.002
211	1910	ζ Tauri	3.00	85	08	27.10	50.30	+0.000	-2	11	32.85	+0.910	-0.021
217	1983	γ Leporis	3.60	85	11	56.95	49.90	-0.439	-45	49	02.78	+0.570	-0.359
219	1998	ζ Leporis	3.55	86	20	32.59	50.29	-0.020	-38	12	45.01	+0.940	+0.000
220	2004	κ Orionis	2.06	86	45	17.35	50.30	+0.002	-33	04	02.51	+0.930	-0.002
223	2040	β Columbae	3.12	86	46	35.61	50.46	+0.136	-59	10	24.32	+1.330	+0.400
222	2035	δ Leporis	3.81	87	31	31.56	50.59	+0.301	-44	17	54.18	+0.290	-0.653
907	424	α Ursae Mins.	2.02	88	55	28.37	50.38	+0.038	+66	06	16.24	+0.900	-0.035
224	2061	α Orionis*	var.	89	06	39.52	50.31	+0.027	-16	01	25.09	+0.950	+0.009
226	2085	η Leporis	3.71	89	15	20.52	50.23	-0.052	-37	35	57.40	+1.080	+0.140
229	2120	η Columbae	3.96	89	58	02.72	50.26	+0.055	-66	15	03.62	+0.920	-0.014
227	2088	β Aurigae	1.90	90	15	58.64	50.26	-0.062	+21	30	41.46	+0.940	+0.000
225	2077	δ Aurigae	3.72	90	16	36.21	50.42	+0.095	+30	50	52.40	+0.810	-0.125
1168	2219	κ Aurigae	4.35	93	43	13.75	50.24	-0.066	+6	06	18.28	+0.670	-0.264
241	2286	μ Geminorum	2.88	95	39	30.68	50.35	+0.059	-0	49	03.51	+0.820	-0.109
244	2298	8ε Monocerotis	4.44	96	36	38.80	50.23	-0.019	-18	42	51.03	+0.940	+0.010
1173	2343	ν Geminorum	4.15	97	09	30.90	50.28	-0.007	-3	03	11.55	+0.910	-0.014
243	2294	β Canis Maj.	1.98	97	32	36.32	50.14	-0.008	-41	15	01.70	+0.920	+0.000
240	2282	ζ Canis Maj.	3.02	97	43	58.71	50.09	+0.015	-53	22	09.96	+0.930	+0.003
251	2421	γ Geminorum	1.93	99	27	40.14	50.32	+0.045	-6	44	22.41	+0.880	-0.039
254	2473	ε Geminorum	2.98	100	17	42.10	50.29	-0.005	+2	04	23.01	+0.900	-0.014

* No. GC : *Mrgasiras* .No. 224 : *Betelgeuse* , Mag. 0.4 to 1.3 Ardra.

Annual rate of Precession in longitude for the middle of the year = 50".29

LONGITUDE AND LATITUDE OF STARS, 2025.5
MEAN PLACES FOR JULY 2^d.375 TERRESTRIAL TIME

Cat. No. FK5	BS= HR No.	Star	Mag.	Longitude			Annual Variation	Annual Proper Motion	Latitude			Annual Variation	Annual Proper Motion
				°	'	"	"	"	°	'	"	"	"
261	2540	θ Geminorum	3.60	101	28	47.47	50.35	+0.003	+11	01	58.83	+0.870	-0.048
256	2484	ξ Geminorum	3.36	101	33	52.40	50.16	-0.101	-10	06	08.85	+0.710	-0.200
257	2491	α Canis Maj. cg	-1.46	104	25	58.17	49.51	-0.551	-39	36	39.58	-0.360	-1.256
245	2326	α Carinae	-0.72	105	18	46.35	49.24	+0.075	-75	49	14.17	+0.920	+0.024
269	2650	ζ Geminorum	3.79v	105	20	46.83	50.27	-0.009	-2	02	08.64	+0.900	-0.002
252	2451	v Puppis	3.17	107	30	05.03	49.58	0.008	-66	04	16.23	+0.870	-0.006
279	2777	δ Geminorum	3.53	108	52	31.20	50.27	-0.024	-0	10	31.69	+0.860	-0.016
1180	2538	κ Canis Maj.	3.96	108	55	13.56	49.79	-0.013	-55	08	40.11	+0.880	+0.003
277	2763	λ Geminorum	3.58	109	08	04.65	50.22	-0.042	-5	37	56.93	+0.830	-0.043
282	2821	ι Geminorum	3.79	109	18	46.36	50.22	-0.109	+5	45	38.16	+0.770	-0.103
1187	2714	22 δ Monocero	4.15	109	45	00.92	50.15	-0.002	-21	44	30.96	+0.880	+0.005
287	2891	α Gemino. Cg*	1.95	110	35	45.64	50.20	-0.155	+10	05	53.35	+0.740	-0.126
268	2618	ε Canis Maj.	1.50	111	07	02.39	49.83	+0.006	-51	21	25.85	+0.870	+0.003
270	2653	ο Canis Maj.	3.02	111	21	26.68	49.90	-0.007	-46	07	38.59	+0.860	+0.002
1183	2646	σ Canis Maj.	3.47	111	54	37.68	49.82	-0.009	-50	13	22.24	+0.860	+0.004
285	2845	β Canis Min.	2.90	112	32	50.08	50.15	-0.047	-13	29	04.51	+0.810	-0.046
317	3323	ο Ursae Maj.	3.36	113	21	09.13	50.52	-0.121	+40	14	43.21	+0.700	-0.145
295	2990	β Geminorum	1.14	113	34	03.78	49.73	-0.614	+6	41	09.60	+0.680	-0.158
273	2693	δ Canis Maj.	1.86	113	45	01.46	49.82	-0.006	-48	27	00.91	+0.840	+0.004
294	2985	κ Geminorum	3.57	114	01	18.88	50.30	-0.024	+3	04	51.75	+0.790	-0.057
291	2943	α C. Min. cg	0.38	116	08	14.69	49.63	-0.540	-16	01	29.06	-0.310	-1.132
263	2553	τ Puppis	2.93	118	04	41.88	48.95	+0.188	-72	51	03.18	+0.760	-0.056
293	2970	26 α Monocero	3.93	119	38	07.95	49.92	-0.078	-30	27	03.75	+0.760	-0.033
283	2827	η Canis Maj.	2.45	119	53	25.24	49.68	-0.008	-50	36	21.58	+0.800	+0.004
278	2773	π Puppis	2.70	120	39	13.12	49.44	-0.019	-58	31	20.07	+0.790	+0.002
335	3569	ι Ursae Maj.	3.14	123	09	15.88	50.20	-0.399	+29	34	30.86	+0.410	-0.359
341	3594	κ Ursae Maj.	3.60	124	17	38.48	50.59	-0.015	+28	58	54.00	+0.690	-0.062
312	3249	β Cancri	3.52	124	36	46.75	50.16	-0.032	-10	17	07.55	+0.690	-0.058
321	3366	η Cancri	5.33	125	45	49.55	50.28	-0.035	+1	34	24.60	+0.690	-0.054
1204	3045	ξ Puppis	3.34	126	23	44.56	49.71	-0.003	-44	56	13.14	+0.730	-0.003
368	3888	ν Ursae Maj.	3.80	126	37	27.08	50.59	-0.261	+42	39	10.61	+0.460	-0.269
328	3475	ι Cancri	4.02	126	42	09.60	50.40	-0.013	+10	25	43.21	+0.680	-0.047
358	3775	θ Ursae Maj.	3.17	127	36	57.83	49.90	-0.820	+34	53	32.53	-0.150	-0.863
1228	3449	γ Cancri	4.66	127	53	38.96	50.24	-0.092	+3	11	32.85	+0.640	-0.066
1194	2878	ρ Puppis	3.25	129	02	25.53	48.77	-0.262	-63	46	15.70	+0.860	+0.157
326	3461	δ Cancri*	3.94	129	04	42.73	50.34	+0.043	+0	04	40.66	+0.480	-0.225
1223	3410	δ Hydrae	4.16	130	39	34.73	50.09	-0.064	-12	23	25.45	+0.660	-0.024
433	4434	λ Draconis	3.84	130	41	36.71	51.27	-0.026	+57	14	35.72	+0.650	-0.040
1224	3418	σ Hydrae	4.44	131	33	55.20	50.11	-0.013	-14	35	59.00	+0.660	-0.022
308	3185	ρ Puppis	2.81	131	44	30.91	49.55	-0.128	-43	16	03.44	+0.700	+0.023
352	3705	α Lyncis	3.13	132	11	52.51	50.28	-0.227	+17	57	57.28	+0.620	-0.054

* No. 287 : *Castor*, Punarvasu-2, Mag. 1.95 & 2.95. No. 326 : *Pusya*.

Annual rate of Precession in longitude for the middle of the year = 50".29

LONGITUDE AND LATITUDE OF STARS, 2025.5
MEAN PLACES FOR JULY 2^d.375 TERRESTRIAL TIME

Cat. No. FK5	BS= HR No.	Star	Mag.	Longitude			Annual Variation	Annual Proper Motion	Latitude			Annual Variation	Annual Proper Motion
				°	'	"	"	"	°	'	"	"	"
1239	3627	ξ Cancri	5.14	133	34	01.97	50.36	+0.000	+5	25	34.16	+0.660	+0.005
550	5563	β Ursae Min.	2.08	133	41	01.18	52.47	-0.044	+72	59	22.60	+0.620	-0.031
337	3572	α Cancri	4.25	133	59	52.66	50.28	+0.041	-5	04	42.11	+0.620	-0.020
334	3547	ζ Hydrae	3.11	134	55	50.63	50.06	-0.101	-10	58	03.18	+0.620	-0.014
417	4301	α Ursae Maj.	1.79	135	33	22.21	51.03	-0.087	+49	40	53.16	+0.500	-0.125
(329)	3482	ε Hydrae m*	3.38	136	26	31.48	49.76	-0.228	-23	26	06.53	+0.510	-0.105
472	4787	κ Draconis	3.87 _v	136	37	01.17	51.52	-0.090	+61	45	50.43	+0.580	-0.042
306	3165	ζ Puppis	2.25	138	54	08.39	49.06	-0.057	-58	20	45.03	+0.580	+0.000
416	4295	β Ursae Maj.	2.37	139	47	39.06	51.11	+0.071	+45	08	07.56	+0.650	+0.073
383	4033	λ Ursae Maj.	3.45	139	54	23.63	50.57	-0.155	+29	53	11.50	+0.470	-0.103
347	3665	θ Hydrae	3.88	140	38	44.46	50.34	+0.224	-13	03	07.58	+0.300	-0.255
367	3873	ε Leonis	2.98	141	03	40.69	50.38	-0.040	+9	43	01.36	+0.530	-0.026
386	4069	μ Ursae Maj.	3.05	141	35	31.20	50.61	-0.101	+28	59	59.67	+0.550	-0.003
371	3905	μ Leonis	3.88	141	47	08.05	50.28	-0.188	+12	20	59.19	+0.420	-0.128
569	5735	γ Ursae Min.	3.05	141	57	51.94	53.11	-0.080	+75	14	34.14	+0.520	-0.019
262	2550	α Pictoris	3.27	144	26	03.54	41.93	-1.938	-83	02	13.50	+0.670	+0.147
365	3852	ο Leonis	3.52	144	36	08.17	50.12	-0.122	-3	45	21.89	+0.430	-0.081
327	3468	α Pyxidis	3.68	146	51	11.60	49.35	-0.022	-48	55	16.57	+0.480	0.006
354	3748	α Hydrae	1.98	147	38	02.73	49.94	-0.026	-22	22	50.53	+0.500	+0.026
309	3207	γ ⁻ Velorum	1.78	147	41	58.83	48.58	-0.015	-64	27	45.47	+0.470	+0.004
384	4031	ζ Leonis	3.44	147	55	20.89	50.49	+0.020	+11	51	59.68	+0.460	+0.000
1250	3845	ι Hydrae	3.91	147	59	52.20	50.16	+0.070	-14	16	33.81	+0.410	-0.044
379	3975	η Leonis	3.52	148	15	41.78	50.36	-0.001	+4	52	01.93	+0.460	-0.001
420	4335	ψ Ursae Maj.	3.01	149	10	15.77	50.83	-0.054	+35	32	19.71	+0.390	-0.055
380	3982	α Leonis*	1.35	150	11	01.55	50.07	-0.235	+0	27	56.39	+0.350	-0.082
447	4554	γ Ursae Maj.	2.44	150	50	13.94	51.30	+0.104	+47	08	36.06	+0.490	+0.065
303	3117	χ Carinae	3.47	151	04	33.75	47.84	-0.105	-70	19	31.04	+0.420	+0.001
456	4660	δ Ursae Maj.	3.31	151	25	32.78	51.48	+0.119	+51	39	30.87	+0.490	+0.074
364	3849	κ Hydrae	5.06	153	01	52.97	49.85	-0.020	-26	35	54.46	+0.360	-0.028
1243	3718	θ Pyxidis	4.72	153	24	46.52	49.59	-0.008	-39	01	59.83	+0.370	-0.012
441	4518	χ Ursae Maj.	3.71	154	01	04.34	50.88	-0.177	+41	32	41.17	+0.330	-0.048
396	4133	ρ Leonis	3.85	156	44	42.53	50.29	-0.005	+0	09	02.66	+0.330	-0.005
425	4377	ν Ursae Maj.	3.48	157	00	40.22	50.69	-0.040	+26	09	48.91	+0.340	+0.014
521	5291	α Draconis	3.65	157	49	08.15	52.20	-0.111	+66	21	46.16	+0.280	-0.037
1261	3970	ν ⁻ Hydrae	4.60	158	40	46.09	49.87	-0.045	-23	10	36.88	+0.300	+0.003
483	4905	ε Ursae Maj.	1.77	159	17	42.79	51.69	+0.150	+54	19	12.80	+0.360	+0.070
381	3994	λ Hydrae	3.61	159	43	14.78	49.77	-0.165	-22	00	51.15	+0.130	-0.159
1270	4116	δ Sextantis	5.21	160	27	43.06	50.07	-0.040	-11	20	42.39	+0.250	-0.031
345	3634	λ Velorum	2.21	161	32	20.07	48.93	-0.040	-55	52	12.08	+0.260	+0.001
422	4357	δ Leonis*	2.56	161	40	29.94	50.72	+0.188	+14	20	02.03	+0.200	-0.062
423	4359	θ Leonis	3.34	163	46	46.73	50.43	-0.025	+9	40	27.33	+0.130	-0.096

* No. 329 : Aslesa.

No. 422 : Zosma , Purva Phalguni-1.

No. 380 : Regulus , Magha.

Annual rate of Precession in longitude for the middle of the year = 50".29

LONGITUDE AND LATITUDE OF STARS, 2025.5
MEAN PLACES FOR JULY 2^d.375 TERRESTRIAL TIME

Cat. No. FK5	BS= HR No.	Star	Mag.	Longitude			Annual Variation	Annual Proper Motion	Latitude			Annual Variation	Annual Proper Motion
				°	'	"	"	"	°	'	"	"	"
1227	3447	α Velorum	3.62	165	04	56.82	48.14	-0.073	-66	16	32.94	+0.210	+0.001
389	4094	μ Hydrae	3.81	165	23	26.08	49.78	-0.093	-24	40	18.55	+0.070	-0.125
497	5054	ζ Ursae Maj. pr	2.27	166	03	45.46	51.87	+0.188	+56	22	47.79	+0.250	+0.067
1304	4527	93 Leonis*	4.53 _v	169	19	50.15	50.45	-0.140	+17	18	33.17	+0.070	-0.065
410	4232	ν Hydrae	3.11	170	43	15.63	49.93	+0.004	-21	47	46.45	+0.340	+0.221
444	4534	β Leonis	2.14	171	58	17.63	50.08	-0.417	+12	15	53.57	-0.220	-0.306
392	4104	α Antliae	4.25	172	47	37.96	49.49	-0.089	-37	25	39.28	+0.050	-0.025
315	3307	ε Carinae	1.86	173	28	27.53	47.20	-0.093	-72	40	47.82	+0.060	-0.012
1283	4287	θ Crateris	4.08	174	02	26.46	49.40	-0.512	-22	43	00.47	-0.020	-0.074
485	4915	α CVn sq	2.90	174	55	25.08	50.79	-0.302	+40	07	14.05	-0.030	-0.069
426	4382	δ Crateris	3.56	177	02	26.58	49.79	-0.206	-17	34	17.84	+0.150	+0.139
509	5191	η Ursae Maj.	1.86	177	17	34.49	51.45	-0.156	+54	23	14.30	-0.080	-0.083
445	4540	β Virginis	3.61	177	31	33.83	51.10	+0.789	+0	41	39.91	+0.050	+0.047
353	3734	κ Velorum	2.50	179	14	29.24	48.38	-0.027	-63	43	19.06	-0.030	+0.000
531	5404	θ Bootis	4.05	182	58	24.25	52.07	+0.147	+60	06	18.55	-0.550	-0.456
639	6396	ζ Draconis	3.17	183	46	14.52	60.18	-0.289	84	45	39.41	-0.120	-0.013
361	3803	N Velorum	3.13	184	33	46.07	48.31	-0.056	-64	14	20.96	-0.140	-0.020
460	4689	η Virginis	3.89	184	42	52.24	49.57	-1.319	+32	30	52.45	+0.310	0.429
492	4983	β Com	4.26	184	39	32.51	50.28	-0.051	2	35	19.40	-0.150	-0.042
571	5744	ι Draconis	3.29	185	18	54.37	52.95	-0.059	+71	05	34.68	-0.120	+0.004
351	3699	ι Carinae	2.25	185	40	28.29	48.05	-0.048	-67	07	01.45	-0.140	-0.011
1326	4828	ρ Virginis	4.88	185	52	16.22	50.64	0.116	+13	32	31.15	-0.190	-0.049
375	3940	ϕ Velorum	3.54	186	17	49.63	48.67	-0.019	-59	57	04.20	-0.140	-0.005
434	4450	ξ Hydrae	3.54	188	20	27.56	49.54	-0.193	-31	36	00.86	-0.300	-0.131
488	4932	ε Virginis	2.83	190	17	43.99	50.29	-0.269	+16	12	12.41	-0.300	-0.090
457	4662	γ Corvi	2.59	191	04	47.60	49.89	-0.161	-14	30	07.73	-0.260	-0.045
484	4910	δ Virginis	3.38	191	48	52.96	50.02	-0.415	+8	36	38.89	-0.470	-0.232
453	4630	ε Corvi	3.00	192	01	11.86	49.90	-0.074	-19	40	28.67	-0.250	-0.018
475	4813	χ Virginis	4.66	192	30	35.07	50.18	-0.060	-3	28	10.29	-0.290	-0.052
465	4757	δ Corvi*	2.95	193	48	22.71	49.96	-0.140	-12	11	55.90	-0.470	-0.211
319	3347	β Volantis	3.77	195	31	12.42	47.37	+0.547	-75	35	13.06	-0.380	-0.082
471	4786	β Corvi	2.65	197	43	24.10	50.04	+0.026	-18	02	46.43	-0.370	-0.048
535	5435	γ Bootis	3.03	198	01	17.00	51.06	-0.268	+49	33	03.04	-0.250	0.079
513	5235	η Bootis	2.68	199	41	42.46	50.85	+0.095	+28	04	23.52	-0.710	-0.354
281	2803	δ Volantis	3.98	199	45	25.91	43.68	-0.039	-82	28	42.95	-0.360	-0.006
501	5107	ζ Virginis	3.37	202	02	36.14	50.15	-0.284	+9	44	32.00	-0.460	-0.066
534	5429	ρ Bootis	3.58	203	08	36.73	50.88	-0.191	+42	27	02.40	-0.340	+0.066
498	5056	α Virginis*	0.98	204	11	50.39	50.24	-0.028	-2	03	22.97	-0.460	-0.041
526	5340	α Bootis*	-0.04	204	35	22.63	50.51	-0.286	+30	43	06.84	-2.690	-2.265
555	5602	β Bootis	3.50	204	36	38.04	51.42	-0.039	+54	08	56.59	-0.470	-0.044
495	5020	γ Hydrae	3.00	207	22	27.91	50.18	+0.079	-13	44	40.45	-0.480	-0.017

* No. 1304 : Uttara Phalguni-2.

No. 498 : Spica , Citra.

No. 465 : Algorel , Hasta.

No. 526 : Arcturus , Svati.

Annual rate of Precession in longitude for the middle of the year = 50".29

LONGITUDE AND LATITUDE OF STARS, 2025.5
MEAN PLACES FOR JULY 2^d.375 TERRESTRIAL TIME

Cat. No. FK5	BS= HR No.	Star	Mag.	Longitude			Annual Variation	Annual Proper Motion	Latitude			Annual Variation	Annual Proper Motion
				°	'	"	"	"	°	'	"	"	"
452	4621	δ Centauri	2.60	207	50	08.42	49.47	-0.033	-44	30	41.97	-0.500	-0.026
406	4199	θ Carinae	2.76	209	32	24.23	48.75	-0.046	-62	08	27.77	-0.500	-0.012
348	3685	β Carinae	1.68	212	18	48.52	47.42	-0.463	-72	14	20.36	-0.670	-0.133
496	5028	ι Centauri	2.75	213	28	54.01	49.62	-0.305	-26	01	11.50	-0.770	-0.219
563	5681	δ Bootis	3.47	213	31	05.21	51.36	+0.189	+48	57	46.79	-0.620	-0.069
525	5338	ι Virginis	4.08	214	09	17.81	50.53	+0.140	+7	11	40.36	-0.970	-0.409
523	5315	κ Virginis	4.19	214	50	59.49	50.29	-0.039	+2	54	42.46	-0.430	+0.135
436	4467	λ Centauri	3.13	214	53	45.82	49.11	-0.045	-56	47	29.94	-0.610	-0.033
455	4656	δ Crucis	2.80	216	01	03.32	49.37	-0.042	-50	25	19.01	-0.620	-0.032
468	4763	γ Crucis	1.63v	217	05	41.53	49.76	+0.257	-47	50	05.51	-0.800	-0.199
1371	5359	λ Virginis	4.52	217	18	29.78	50.28	-0.024	+0	29	18.91	-0.570	+0.023
385	4037	ω Carinae	3.32	217	47	22.54	48.53	-0.054	-67	23	05.62	-0.640	-0.033
519	5287	π Hydrae	3.27	218	58	48.93	50.23	+0.092	-13	03	09.59	-0.740	-0.115
572	5747	β Cr. Borealis	3.68	219	28	24.57	50.73	-0.286	+46	03	06.77	-0.610	+0.018
1189	2736	γ ⁻ Volantis	3.78	220	11	29.10	44.14	-0.682	-82	37	09.84	-0.660	+0.065
545	5487	μ Virginis	3.88	220	29	21.46	50.62	+0.203	+9	40	04.05	-0.910	-0.268
442	4520	λ Muscae	3.64	221	20	34.67	49.01	-0.181	-58	30	35.06	-0.710	-0.053
508	5193	μ Centauri	3.04v	221	53	27.94	49.91	-0.015	-28	58	54.76	-0.690	-0.028
481	4853	β Crucis	1.25	221	59	57.31	49.49	-0.046	-48	38	29.41	-0.690	-0.039
462	4730	α Crucis A	1.33	222	13	22.19	49.39	-0.031	-52	52	53.53	-0.690	-0.032
578	5793	α Cr. Borealis	2.23	222	39	20.51	51.14	+0.201	+44	19	14.83	-0.700	-0.044
520	5288	θ Centauri	2.06	222	39	41.93	49.71	-0.317	-22	05	13.83	-1.340	-0.672
608	6092	τ Herculis	3.89	224	44	42.18	51.65	-0.065	+65	49	39.37	-0.650	+0.032
512	5231	ζ Centauri	2.55	225	18	18.67	49.85	-0.040	-32	56	46.85	-0.750	-0.062
548	5531	α ⁻ Librae*	2.75	225	26	18.05	50.22	-0.082	+0	19	47.37	-0.790	-0.095
504	5132	ε Centauri	2.30	225	54	32.78	49.76	-0.023	-39	35	19.63	-0.730	-0.028
297	3024	ζ Volantis	3.95	226	06	15.11	46.83	-0.031	-79	23	23.77	-0.680	+0.034
391	4102	ι Carinae	4.00	228	26	09.30	48.89	+0.052	-67	53	09.37	-0.760	-0.027
564	5685	β Librae	2.61	229	43	39.46	50.30	-0.089	+8	29	34.45	-0.790	-0.043
583	5867	β Serpentis	3.67	230	18	24.13	50.78	+0.093	+34	19	25.52	-0.780	-0.026
537	5440	η Centauri	2.31	230	36	14.74	50.00	-0.023	-25	30	57.97	-0.800	-0.044
474	4798	α Muscae	2.69	230	43	37.51	49.40	-0.044	-56	33	36.27	-0.790	-0.043
556	5603	σ Librae	3.29	231	02	34.21	50.16	-0.059	-7	38	51.64	-0.820	-0.062
559	5652	ι Librae	4.54	231	21	38.60	50.26	-0.024	-1	51	09.57	-0.800	-0.047
582	5854	α Serpentis	2.65	232	25	59.74	50.68	+0.134	+25	30	20.83	-0.690	+0.079
591	5933	γ Serpentis	3.85	233	08	39.10	51.43	+0.758	+35	11	04.80	-1.940	-1.164
541	5469	α Lupi	2.30	233	51	32.20	49.98	-0.016	-30	01	43.95	-0.800	-0.024
518	5267	β Centauri	0.61	234	08	47.84	49.77	-0.026	-44	08	26.57	-0.820	-0.032
469	4773	γ Muscae	3.87	234	22	15.94	49.38	-0.069	-58	52	25.77	-0.830	-0.045
588	5892	ε Serpentis	3.71	234	41	19.94	50.65	+0.121	+24	00	16.17	-0.700	+0.091
553	5576	κ Centauri	3.13	235	09	00.65	50.06	-0.011	-24	02	04.33	-0.820	-0.029

* No. 548 : *Zuben el Genubi*, Visakha.

Annual rate of Precession in longitude for the middle of the year = 50".29

LONGITUDE AND LATITUDE OF STARS, 2025.5
MEAN PLACES FOR JULY 2^d.375 TERRESTRIAL TIME

Cat. No. FK5	BS= HR No.	Star	Mag.	Longitude			Annual Variation	Annual Proper Motion	Latitude			Annual Variation	Annual Proper Motion
				°	'	"	"	"	°	'	"	"	"
552	5571	β Lupi	2.68	235	22	51.12	50.04	-0.023	-25	02	57.86	-0.850	-0.048
577	5787	γ Librae	3.91	235	29	41.44	50.40	+0.061	+4	22	59.43	-0.770	+0.024
585	5881	μ Serpentis	3.54	236	17	42.97	50.36	-0.082	+16	14	05.91	-0.840	-0.042
487	4923	δ Muscae	3.62	236	32	46.76	49.92	+0.359	-56	46	38.46	-0.640	+0.163
566	5705	φ' Lupi	3.56	237	50	58.12	50.09	-0.067	-17	10	55.20	-0.920	-0.105
1413	5838	κ Librae	4.74	238	06	48.64	50.28	-0.013	-0	01	23.04	-0.930	-0.109
579	5794	ν Librae	3.58	238	57	55.41	50.22	-0.010	-8	30	37.59	-0.820	+0.001
1402	5695	δ Lupi	3.22	239	00	44.98	50.11	-0.008	-21	25	44.97	-0.850	-0.029
626	6220	η Herculis	3.53	239	08	50.47	51.19	+0.116	+60	17	10.92	-0.890	-0.070
609	6095	γ Herculis	3.75	239	34	17.07	50.59	-0.072	+40	00	17.90	-0.790	+0.032
538	5460	α Centauri cg	var.	239	47	55.80	45.00	-4.886	-42	36	19.20	-1.700	-0.858
401	4174	γ Chamaeleonti	4.11	240	46	25.57	49.19	-0.049	-68	05	15.05	-0.880	-0.040
558	5649	ζ Lupi	3.41	241	06	44.22	49.93	-0.099	-32	50	07.16	-0.950	-0.104
618	6148	β Herculis	2.77	241	26	52.38	50.55	-0.127	+42	41	56.72	-0.880	-0.034
613	6117	ω Herculis	4.57	241	55	58.91	50.65	+0.067	+35	09	53.81	-0.900	-0.050
603	6056	δ Ophiuchi	2.74	242	39	31.19	50.40	-0.018	+17	14	13.45	-0.990	-0.149
539	5463	α Circini	3.19	242	43	00.54	49.78	-0.104	-46	12	27.82	-1.150	-0.292
594	5953	δ Scorpii*	2.32	242	55	38.74	50.28	-0.001	-1	59	21.90	-0.890	-0.038
592	5944	π Scorpii	2.89	243	17	45.55	50.25	-0.006	-5	28	43.14	-0.880	-0.027
597	5984	β Scorpii pr	2.62	243	32	46.60	50.31	-0.002	+1	00	16.41	-0.870	-0.020
605	6075	ε Ophiuchi	3.24	243	52	02.01	50.49	+0.079	+16	26	13.12	-0.810	+0.055
459	4674	β Chamaeleonti	4.26	245	47	28.47	49.51	-0.083	-63	35	51.54	-0.910	-0.034
411	4234	δ~ Chamaeleonti	4.45	246	00	34.15	49.42	-0.030	-67	47	39.07	-0.920	-0.048
607	6084	σ Scorpii	2.89	248	09	20.66	50.27	-0.007	-4	02	26.69	-0.910	-0.022
634	6324	ε Herculis	3.92	248	41	02.22	50.62	-0.085	+53	14	43.03	-0.870	+0.019
622	6175	ζ Ophiuchi	2.56	249	35	08.54	50.37	+0.010	+11	23	17.89	-0.860	+0.028
560	5671	γ Tr. Austrini	2.89	249	44	53.07	49.90	-0.082	-48	06	23.45	-0.950	-0.056
616	6134	α Scorpii cg*	var.	250	07	06.05	50.27	-0.006	-4	34	23.95	-0.920	-0.022
620	6165	τ Scorpii	2.82	251	48	47.03	50.26	-0.005	-6	07	25.80	-0.930	-0.023
633	6299	κ Ophiuchi	3.20	252	10	32.91	50.11	-0.339	+31	49	57.31	-0.960	-0.046
589	5897	β Tr. Australis	2.85	252	11	45.78	49.98	-0.101	-41	57	08.06	-1.340	-0.434
653	6536	β Draconis	2.79	252	19	29.56	51.16	-0.072	+75	16	28.77	-0.890	+0.011
643	6418	π Herculis	3.16	252	25	28.61	50.67	-0.051	+59	32	51.17	-0.910	+0.000
542	5470	α Apodis	3.83	254	47	06.16	49.96	-0.002	-58	14	17.96	-0.940	-0.019
641	6410	δ Herculis	3.14	255	07	13.38	50.52	-0.004	+47	40	52.38	-1.070	-0.158
628	6241	ε Scorpii	2.29	255	41	13.66	49.67	-0.588	-11	44	38.96	-1.240	-0.326
1439	6247	μ' Scorpii	3.08v	256	30	42.07	50.24	-0.008	-15	25	35.98	-0.940	-0.026
1435	6229	η Arae	3.76	259	15	38.21	50.25	+0.051	-36	16	47.66	-0.950	-0.023
631	6285	ζ Arae	3.13	260	10	47.50	50.20	-0.018	-33	05	42.86	-0.970	-0.038
663	6588	ι Herculis	3.80	260	14	46.03	50.60	-0.015	+69	15	44.07	-0.920	+0.005
638	6380	η Scorpii	3.33	261	05	57.96	50.31	+0.052	-20	11	19.84	-1.220	-0.284

* No. 594 : *Dschubba*, *Anuradha*No. 616 : *Antares*, *Jyestha*, Mag. 0.9 to 1.8.

Annual rate of Precession in longitude for the middle of the year = 50".29

LONGITUDE AND LATITUDE OF STARS, 2025.5
MEAN PLACES FOR JULY 2^d.375 TERRESTRIAL TIME

Cat. No. FK5	BS= HR No.	Star	Mag.	Longitude			Annual Variation	Annual Proper Motion	Latitude			Annual Variation	Annual Proper Motion
				°	'	"	"	"	°	'	"	"	"
625	6217	α Tr. Austr.	1.92	261	15	07.31	50.22	0.028	-46	09	17.75	-0.960	-0.031
644	6453	θ Ophiuchi	3.27	261	45	03.96	50.29	-0.002	-1	50	49.06	-0.950	-0.020
656	6556	α Ophiuchi	2.08	262	48	22.16	50.51	+0.163	+35	49	49.15	-1.150	-0.220
611	6102	γ Apodis	3.89	263	03	29.56	50.00	-0.191	-56	00	40.25	-1.040	-0.106
649	6508	ν Scorpii	2.69	264	22	08.19	50.29	+0.000	-14	00	42.83	-0.970	-0.031
645	6461	β Arae	2.85	264	33	43.33	50.26	-0.008	-32	16	06.51	-0.970	-0.026
658	6561	ξ Serpentis	3.54	264	54	07.30	50.26	-0.040	+7	55	51.44	-0.990	-0.060
652	6527	λ Scorpii*	1.63	264	56	31.21	50.28	+0.000	-13	47	31.16	-0.970	-0.029
671	6688	ξ Draconis	3.75	265	06	55.02	51.06	+0.525	+80	16	47.11	-0.850	+0.085
651	6510	α Arae	2.95	265	17	25.23	50.25	-0.031	-26	33	52.07	-1.010	-0.072
667	6623	μ Herculis	3.42	265	34	39.50	49.88	-0.453	+51	05	42.36	-1.700	-0.762
665	6603	β Ophiuchi	2.77	265	41	33.46	50.26	-0.051	+27	56	15.02	-0.780	+0.158
648	6500	δ Arae	3.62	265	54	44.78	50.21	-0.067	-37	21	35.85	-1.030	-0.099
654	6553	θ Scorpii	1.87	265	57	21.09	50.31	+0.016	-19	38	54.50	-0.940	-0.001
660	6580	κ Scorpii	2.41	266	49	32.49	50.29	-0.005	-15	38	52.45	-0.960	-0.027
668	6629	γ Ophiuchi	3.75	266	59	18.92	50.28	-0.023	+26	06	26.37	-1.010	-0.074
666	6615	ι' Scorpii	3.03	267	52	43.73	50.30	+0.000	-16	43	04.22	-0.950	-0.008
669	6630	G Scorpii	3.21	268	16	28.40	50.35	+0.050	-13	37	31.52	-0.900	+0.034
676	6705	γ Draconis	2.23	268	19	26.62	50.23	-0.028	+74	55	07.61	-0.960	-0.020
661	6582	η Pavonis	3.62	268	19	46.85	50.29	-0.017	-41	18	48.06	-1.000	-0.055
672	6695	θ Herculis	3.86	268	49	58.50	50.27	+0.009	+60	40	53.68	-0.930	+0.006
674	6703	ξ Herculis	3.70	269	33	09.43	50.39	+0.139	+52	40	55.88	-0.950	-0.017
673	6698	ν Ophiuchi	3.34	270	06	33.61	50.28	-0.007	+13	39	40.66	-1.050	-0.116
1471	6743	θ Arae	3.66	271	32	46.85	50.32	-0.012	-26	39	45.09	-0.950	-0.014
679	6746	γ Sagittarii	2.99	271	37	02.45	50.25	-0.056	-6	59	44.79	-1.120	-0.184
680	6771	72 Ophiuchi	3.73	272	30	56.92	50.17	-0.070	+32	59	11.84	-0.860	+0.081
681	6779	ο Herculis	3.83	273	03	07.93	50.19	+0.002	+52	10	51.25	-0.920	+0.009
682	6812	μ Sagittarii	3.86	273	34	11.10	50.29	+0.002	+2	20	19.64	-0.930	+0.001
683	6832	η Sagittarii	3.11	273	58	59.42	50.19	-0.138	-13	22	56.47	-1.100	-0.162
687	6859	δ Sagittarii*	2.70	274	56	14.91	50.35	+0.034	-6	28	32.81	-0.960	-0.029
691	6897	α Telescopii	3.51	275	25	47.74	50.33	-0.021	-22	39	05.47	-0.990	-0.053
689	6879	ε Sagittarii	1.85	275	26	04.63	50.28	-0.045	-11	03	21.54	-1.050	-0.122
688	6869	η Serpentis	3.26	276	01	50.95	49.63	-0.614	+20	25	38.72	-1.610	-0.677
692	6913	λ Sagittarii	2.81	276	40	22.83	50.25	-0.053	-2	08	24.71	-1.110	-0.183
697	6951	θ Coronae Aust.	4.64	276	54	02.60	50.38	+0.031	-19	04	00.32	-0.940	-0.024
1482	6973	α Scuti	3.85	279	22	20.35	50.21	-0.037	+14	54	52.99	-1.230	-0.310
214	1953	γ Mensae	5.19	279	55	29.51	51.27	+1.085	-79	59	23.03	-1.220	0.238
1487	7039	φ Sagittarii	3.17	280	32	16.94	50.36	+0.053	-3	57	26.13	-0.910	-0.004
1489	7063	β Scuti	4.22	282	44	09.47	50.21	-0.006	+18	10	57.72	-0.920	-0.016
706	7121	σ Sagittarii*	2.02	282	44	30.07	50.32	+0.008	-3	27	11.17	-0.960	-0.055
710	7150	ξ ⁻ Sagittarii	3.51	283	48	27.23	50.32	+0.032	+1	39	28.67	-0.920	-0.015

* No. 652 : *Schaula* , Mula.No. 706 : *Nunki* , Uttarasadha.No. 687 : *Purvasadha-1*.

Annual rate of Precession in longitude for the middle of the year = 50".29

LONGITUDE AND LATITUDE OF STARS, 2025.5
MEAN PLACES FOR JULY 2^d.375 TERRESTRIAL TIME

Cat. No. FK5	BS= HR No.	Star	Mag.	Longitude			Annual Variation	Annual Proper Motion	Latitude			Annual Variation	Annual Proper Motion
				°	'	"	"	"	°	'	"	"	"
1496	7234	τ Sagittarii	3.32	285	11	24.20	50.24	-0.083	-5	05	37.43	-1.140	-0.242
699	7001	α Lyrae	0.03	285	40	26.36	50.25	+0.505	+61	43	53.48	-0.630	0.256
720	7264	π Sagittarii	2.89	286	36	28.82	50.29	-0.004	+1	26	01.32	-0.920	-0.035
717	7236	λ Aquilae	3.44	287	41	16.76	50.16	-0.029	+17	33	43.39	-0.970	-0.087
754	7665	δ Pavonis	3.56	287	58	43.83	51.77	+1.141	-44	42	45.70	-2.320	-1.445
712	7176	ε Aquilae	4.02	288	37	00.41	49.97	-0.075	+37	33	49.65	-0.940	-0.066
705	7106	β Lyrae	var.	289	14	16.81	49.78	+0.005	+55	58	51.90	-0.880	-0.003
810	8254	ν Octantis	3.76	290	02	44.53	50.65	-0.212	-57	47	02.17	-1.090	-0.217
716	7235	ζ Aquilae	2.99	290	09	03.86	50.01	-0.023	+36	10	55.18	-0.960	-0.094
713	7178	γ Lyrae	3.24	292	16	35.05	49.73	-0.003	+55	00	36.04	-0.850	+0.003
775	7913	β Pavonis	3.42	292	51	05.79	50.66	-0.055	-45	57	26.51	-0.820	+0.028
730	7377	δ Aquilae	3.36	293	59	43.16	50.40	+0.294	+24	48	51.89	-0.800	+0.040
764	7790	α Pavonis	1.94	294	10	28.97	50.58	-0.025	-36	16	16.24	-0.930	-0.087
751	7623	θ ⁺ Sagittarii	4.37	295	13	36.14	50.41	+0.001	-14	23	19.66	-0.860	-0.027
785	7986	β Indi	3.65	298	08	36.19	50.69	+0.008	-39	09	36.27	-0.840	-0.030
769	7869	α Indi	3.11	299	27	43.23	50.64	+0.078	-27	45	21.88	-0.750	0.048
1508	7405	α Vulpeculae	4.44	299	51	37.47	49.57	-0.209	+45	51	18.15	-0.870	-0.076
746	7570	η Aquilae	var.	300	47	21.47	50.10	+0.010	+21	31	13.77	-0.790	-0.009
741	7525	γ Aquilae	2.72	301	17	38.99	50.00	+0.020	+31	14	27.04	-0.780	-0.005
11	98	β Hydri	2.80	301	21	01.84	54.06	+2.669	-64	48	04.31	-2.710	-1.956
1513	7488	β Sagittae	4.37	301	33	38.56	49.88	+0.003	+38	12	54.75	-0.810	-0.033
732	7417	β Cygni <i>p</i>	3.08	301	36	20.64	49.70	+0.002	+48	57	53.94	-0.780	-0.002
745	7557	α Aquilae*	0.77	302	08	11.37	50.69	+0.697	+29	18	09.63	-0.510	+0.262
749	7602	β Aquilae	3.71	302	46	42.40	49.96	-0.064	+26	39	11.10	-1.250	-0.481
743	7536	δ Sagittae	3.82	303	44	30.74	49.86	+0.011	+38	54	36.91	-0.760	+0.006
761	7754	α ⁻ Capricorni	3.57	304	12	54.19	50.29	+0.063	+6	55	39.02	-0.760	-0.011
762	7776	β Capricorni	3.08	304	24	13.58	50.30	+0.042	+4	35	09.63	-0.760	-0.008
756	7710	θ Aquilae	3.23	305	40	05.21	50.12	+0.041	+20	19	28.27	-0.750	-0.005
752	7635	γ Sagittae	3.47	307	23	55.28	49.89	+0.090	+39	11	16.09	-0.710	+0.006
1550	8039	γ Microscopii	4.67	308	47	17.95	50.46	+0.000	-14	40	03.67	-0.700	+0.006
841	8502	α Tucanae	2.86	310	01	44.93	50.81	-0.120	-45	24	22.14	-0.700	+0.000
146	1208	γ Hydri	3.24	310	50	30.66	53.44	+0.537	-76	45	35.33	-0.760	-0.010
781	7950	ε Aquarii	3.77	312	04	45.47	50.22	+0.024	+8	04	40.68	-0.710	-0.042
1547	7990	μ Aquarii	4.73	313	24	51.25	50.24	+0.035	+8	14	14.90	-0.690	-0.041
768	7852	ε Delphini	4.03	314	24	57.46	49.93	+0.007	+29	04	14.90	-0.660	-0.024
726	7328	κ Cygni	3.77	315	16	06.61	48.31	+0.396	+73	48	02.49	-0.550	+0.080
829	8425	α Gruis	1.74	316	15	55.44	50.82	+0.064	-32	55	00.26	-0.810	-0.191
(771)	7882	β Delphini m*	3.64	316	41	47.25	49.93	+0.070	+31	54	55.39	-0.680	-0.069
806	8204	ζ Capricorni	3.74	317	17	36.78	50.40	+0.008	-6	59	34.25	-0.590	+0.022
774	7906	α Delphini	3.77	317	44	08.29	49.90	+0.074	+33	01	12.32	-0.620	-0.022
822	8353	γ Gruis	3.01	317	46	38.50	50.70	+0.095	-23	03	09.86	-0.660	-0.058

* No. 745 : *Altair* , *Sravana*.No. 771 : *Rotanev* , *Dhanistha-1*.

Annual rate of Precession in longitude for the middle of the year = 50".29

LONGITUDE AND LATITUDE OF STARS, 2025.5
MEAN PLACES FOR JULY 2^d.375 TERRESTRIAL TIME

Cat. No. FK5	BS= HR No.	Star	Mag.	Longitude			Annual Variation	Annual Proper Motion	Latitude			Annual Variation	Annual Proper Motion
				°	'	"	"	"	°	'	"	"	"
733	7420	ι Cygni	3.79	318	19	07.04	48.38	+0.252	+71	26	59.30	-0.480	+0.104
778	7928	δ Delphini	4.43	318	28	14.13	49.81	-0.037	+31	56	28.95	-0.620	-0.035
1541	7948	γ Delphini sq	4.27	319	43	20.15	49.71	-0.110	+32	41	56.81	-0.750	-0.177
860	8675	ε Gruis	3.49	321	05	20.57	51.00	+0.077	-39	47	25.77	-0.680	-0.115
846	8556	δ' Gruis	3.97	321	57	38.27	50.79	+0.027	-31	20	57.79	-0.560	-0.017
812	8278	γ Capricorni	3.68	322	08	54.14	50.50	+0.172	-2	33	35.01	-0.620	-0.084
856	8636	β Gruis	2.11v	322	41	11.74	50.99	+0.145	-35	26	03.91	-0.610	-0.071
800	8131	α Equulei	3.92	323	28	21.60	50.04	+0.029	+20	07	09.72	-0.630	-0.102
808	8232	β Aquarii	2.91	323	45	03.71	50.20	+0.017	+8	36	47.36	-0.540	-0.015
819	8322	δ Capricorni	2.87	323	54	00.01	50.49	+0.149	-2	36	21.68	-0.880	-0.368
1569	8264	ξ Aquarii	4.69	324	28	30.72	50.31	+0.103	+5	57	19.92	-0.570	-0.062
765	7796	γ Cygni	2.20	325	11	36.10	49.08	+0.007	+57	07	21.90	-0.500	-0.001
780	7949	ε Cygni	2.46	328	06	12.20	50.05	+0.705	+49	25	18.60	-0.300	+0.155
815	8308	ε Pegasi	var.	332	14	24.52	49.98	+0.031	+22	05	54.50	-0.410	-0.011
849	8592	ν Aquarii	5.20	332	54	01.25	50.61	+0.154	-10	54	13.53	-0.610	-0.218
797	8115	ζ Cygni	3.20	333	23	40.20	49.45	-0.031	+43	41	35.26	-0.430	-0.051
827	8414	α Aquarii	2.96	333	56	24.38	50.14	+0.015	+11	15	29.05	-0.390	-0.016
867	8728	α PsA	1.16	334	13	10.28	50.88	+0.253	-21	08	19.92	-0.650	-0.287
777	7924	α Cygni	1.25	335	40	48.44	48.80	+0.007	+59	54	18.20	-0.350	+0.001
842	8518	γ Aquarii	3.84	337	04	14.61	50.29	+0.126	+8	14	01.74	-0.370	-0.042
834	8450	θ Pegasi	3.53	337	11	25.36	50.32	+0.278	+16	20	20.52	-0.400	-0.077
861	8679	τ Aquarii	4.01	338	57	07.69	50.35	-0.026	-5	39	56.41	-0.330	-0.030
866	8709	δ Aquarii	3.27	339	13	47.48	50.37	-0.047	-8	11	32.35	-0.300	-0.008
3	25	ε Phoenicis	3.88	340	00	26.30	51.12	+0.011	-41	57	30.60	-0.510	-0.220
850	8597	η Aquarii	4.02	340	50	54.11	50.23	+0.064	+8	21	47.86	-0.360	-0.087
792	8079	ξ Cygni	3.72	341	09	03.46	48.94	+0.014	+56	34	52.30	-0.270	-0.003
864	8698	λ Aquarii*	3.74	341	55	57.11	50.33	+0.025	-0	23	13.85	-0.220	+0.030
72	591	α Hydri	2.86	342	29	02.53	52.59	+0.420	-64	14	39.34	-0.440	-0.194
831	8430	ι Pegasi	3.76	344	45	54.45	50.02	+0.339	+34	15	14.84	-0.310	-0.104
54	472	α Eridani	0.46	345	40	25.50	51.93	+0.084	-59	22	45.60	-0.280	-0.092
12	99	α Phoenicis	2.39	345	51	08.87	51.04	-0.042	-40	38	12.43	-0.640	-0.444
855	8634	ζ Pegasi	3.40	346	30	26.48	50.07	+0.072	+17	40	43.05	-0.230	-0.043
141	1175	β Reticuli	3.85	351	46	12.46	54.85	+0.797	-76	05	24.39	-0.350	-0.260
878	8852	γ Piscium	3.69	351	48	50.76	50.89	+0.713	+7	15	17.55	-0.380	-0.285
871	8781	α Pegasi	2.49	353	50	27.56	50.01	+0.043	+19	24	19.69	-0.130	-0.065
1044	440	δ Phoenicis	3.95	353	59	06.19	51.85	+0.337	-52	34	56.92	-0.020	+0.035
862	8684	μ Pegasi	3.48	354	44	28.44	49.90	+0.130	+29	23	10.05	-0.140	-0.102
857	8650	η Pegasi	2.94	356	04	01.84	49.64	+0.002	+35	06	28.87	-0.060	-0.029
68	566	χ Eridani	3.70	356	37	04.71	53.05	+1.308	-57	01	07.79	-0.230	-0.210
49	429	γ Phoenicis	3.41	358	30	07.52	51.13	-0.186	-47	35	09.76	-0.150	-0.167
870	8775	β Pegasi*	2.42v	359	43	49.31	50.00	+0.270	+31	08	27.78	+0.080	+0.037

* No. 864 : Satabhisaj.

No. 870 : Scheat , Purva Bhadrapada-2.

BS = Bright Star Catalogue

HR = Havard Revised Catalogue

FK5 = Fifth Fundamental Catalogue

MEAN PLACES OF STARS, J 2025.5
 FOR JULY 2^d.375 TERRESTRIAL TIME
 (The Annual Variations are for the middle of the year)

Cat. No. FK5	BS =HR No.	Star	Mag.	Spectral Type	Right Ascension			Annual Variation	Annual Proper motion	Declination			Annual Variation	Annual Proper motion
					h	m	s	s	s (0.0001)	°	'	"	"	" (0.001)
1	15	α Andromedae*	2.06	B9p Hg Mn	0	09	42.7	+3.118	+104	+29	13	52.09	+19.86	-163
2	21	β Cassiopeiae*	2.27	F2 III	0	10	33.3	+3.248	+685	+59	17	25.16	19.84	-181
3	25	ε Phoenicis	3.88	K0 III	0	10	41.8	+3.024	+118	-45	36	24.83	19.84	-181
7	39	γ Pegasi*	2.83	B2 IV	0	14	33.1	+3.099	+2	+15	19	30.63	19.99	-12
9	74	ι Ceti	3.56	K1 IIIb	0	20	43.6	+3.056	-9	-8	40	57.95	19.92	-36
11	98	β Hydri	2.80	G1 IV	0	27	03.2	+3.050	+6619	-77	06	39.46	20.22	+324
12	99	α Phoenicis	2.39	K0 III b	0	27	32.3	+2.949	+183	-42	10	04.35	+19.50	-396
17	153	ζ Cassiopeiae	3.66	B2 IV	0	38	24.4	+3.385	+22	+54	02	12.86	19.75	-9
20	165	δ Andromedae	3.27	K3 III	0	40	41.9	+3.228	+106	+31	00	00.40	19.63	-92
21	168	α Cassiopeiae*	2.23	K0 IIIa	0	41	58.3	+3.452	+64	+56	40	36.47	19.67	-32
22	188	β Ceti*	2.04	G9 III CH-I CN 0.5 Ca.1	0	44	52.1	+3.008	+164	-17	50	49.41	19.69	+32
33	269	μ Andromedae	3.87	A5 IV-V	0	58	10.7	+3.357	+130	+38	38	13.52	19.43	+33
32	264	γ Cassiopeiae*	2.47	B0 IVnpe(shell)	0	58	16.2	+3.682	+36	+60	51	15.13	+19.39	-5
35	280	α Sculptoris	4.31	B4 Vp	0	59	49.9	+2.884	+17	-29	13	12.69	19.37	+4
40	334	η Ceti	3.45	K2 III CN0.5	1	09	52.4	+3.019	+147	-10	02	51.77	18.98	-138
42	337	β Andromedae*	2.06	M0 IIIa	1	11	10.1	+3.384	+146	+35	45	18.17	18.97	-114
1033	361	ζ Piscium*	5.24	F0Vn	1	15	04.0	+3.143	+97	+7	42	34.12	18.92	-56
47	402	θ Ceti	3.60	K0 IIIb	1	25	17.9	+3.001	-53	-8	03	09.27	18.45	-218
48	403	δ Cassiopeiae	2.68	A5 IV	1	27	30.5	+3.991	+401	+60	22	00.62	+18.55	-52
49	429	γ Phoenicis	3.41	M0 IIIa	1	29	28.2	+2.597	-13	-43	11	17.89	18.32	-208
1044	440	δ Phoenicis	3.95	G9 III	1	32	18.6	+2.489	+144	-48	56	27.28	18.59	+151
50	437	η Piscium	3.62	G7 IIIa	1	32	51.2	+3.223	+19	+15	28	34.97	18.41	-6
54	472	α Eridani*	0.46	B3 Vnp(shell)	1	38	39.6	+2.225	+117	-57	06	28.19	18.18	-35
52	464	ς Andromedae	3.57	K3 III	1	39	34.3	+3.723	+65	+48	45	22.99	18.07	-113
59	509	τ Ceti	3.50	G8 V	1	45	15.2	+2.789	-1190	-15	48	14.33	+18.82	+858
62	539	ζ Ceti	3.73	K0 III	1	52	43.2	+2.965	+28	-10	12	36.04	17.63	-39
64	544	α Trianguli	3.41	F6 IV	1	54	32.6	+3.442	+8	+29	42	07.16	17.35	-235
66	553	β Arietis*	2.64	A4 V	1	56	03.3	+3.330	+68	+20	55	53.68	17.41	-111
63	542	ε Cassiopeiae	3.38	B3 IV:p(shell)	1	56	15.5	+4.399	+48	+63	47	39.47	17.50	-21
68	566	χ Eridani	3.70	G8 III-IVCN-0.5H80.5	1	56	56.9	+2.328	+729	-51	28	58.05	17.78	+291
72	591	α Hydri	2.86	F0n III-IV	1	59	34.4	+1.889	+368	-61	26	47.23	+17.40	+26
71	585	ν Ceti	4.00	M0 IIIb	2	01	12.4	+2.827	+97	-20	57	18.89	17.28	-24
70	580	ς Cassiopeiae	3.98	A1 Va	2	05	28.6	+3.716	40	+42	27	02.95	17.06	-52
73	603	γ Andromed.* p	2.26	K3 Iib	2	05	40.1	+5.280	-99	+72	32	34.70	17.13	22
74	617	α Arietis*	2.00	K2 IIIab	2	08	37.0	+3.400	+138	+23	34	54.41	16.82	-149
75	622	β Trianguli	3.00	A5 IV	2	11	04.2	+3.596	+122	+35	06	23.87	16.81	-41
82	674	ϕ Eridani	3.56	B8 V	2	17	25.2	+2.141	+102	-51	23	42.24	+16.52	-27
79	664	γ Trianguli	4.01	A0 IV-Vn	2	18	50.4	+3.592	+38	+33	57	49.78	16.42	-51
91	779	δ Ceti	4.07	B2 IV	2	40	47.5	+3.083	+9	+0	26	13.78	+15.30	-4

* No. 1 : *Alpheratz*, Uttara Bhadrapada - 2
 No. 2 : *Caph*
 No. 7 : *Algenib*, Uttara Bhadrapada - 1
 No. 21 : *Schedar*, Mag. 2.1 to 2.6
 No. 22 : *Deneb Kaitos* or *Diphda*
 No. 32 : *Cih*, Mag. 1.6 to 3.2

No. 42 : *Mirach*
 No. 1033 : *Revati*
 No. 54 : *Achernar*
 No. 66 : *Sheratan*, Asvini
 No. 73 : *Almach*, Mag. f. 5.1
 No. 74 : *Hamal*

MEAN PLACES OF STARS, J 2025.5
FOR JULY 2^d.375 TERRESTRIAL TIME
 (The Annual Variations are for the middle of the year)

Cat. No. FK5	BS =HR No.	Star	Mag.	Spectral Type	Right Ascension			Annual Variation	Annual Proper motion	Declination			Annual Variation	Annual Proper motion
					h	m	s	s	s (0.0001)	°	'	"	"	" (0.001)
1075	794	ι Eridani	4.11	K0.5 IIIb Fe-0.5	2	41	40.4	+2.367	+119	-39	44	50.53	+15.23	-32
94	801	35 Arietis	4.66	B3 V	2	44	57.3	+3.541	+6	+27	48	50.79	15.06	-12
101	841	β Fornacis	4.46	G8.5 III Fe-0.5	2	50	09.5	+2.512	+71	-32	18	00.08	14.92	155
100	838	41 Arietis*	3.63	B8 Vn	2	51	29.5	+3.551	+50	+27	21	50.50	14.57	-118
99	834	η Persei	3.76	K3 Ib-IIa	2	52	34.6	+4.432	+20	+55	59	57.76	14.61	-14
103	854	τ Persei	3.95	G5 III + A4 V	2	56	05.0	+4.301	+0	+52	51	53.73	14.41	-5
104	874	η Eridani	3.89	K1 IIIb	2	57	40.5	+2.936	+53	-8	47	53.00	+14.09	-220
106	897	θ Eridani* p	3.25	A5 IV	2	59	13.7	+2.276	-39	-40	12	13.12	14.24	+20
1085	919	τ' Eridani	4.09	A4 V	3	03	31.0	+2.647	-105	-23	31	32.66	13.90	-53
107	911	α Ceti*	2.53	M1.5 IIIa	3	03	36.9	+3.145	-6	+4	11	17.65	13.87	-78
907	424	α Ursae Mins.*	2.02	F5-8 Ib	3	05	10.4	+91.059	+2169	+89	22	10.26	13.83	-20
108	915	γ Persei	2.93	G5 III + A2 V	3	06	39.6	+4.394	0	+53	36	15.41	13.75	-5
109	921	ρ Persei*	3.39	M4 II	3	06	49.2	+3.872	+111	+38	56	14.11	+13.64	-106
111	936	β Persei*	2.12	B8 V + F:	3	09	50.3	+3.933	+3	+41	03	07.32	13.55	-1
120	1017	α Persei*	1.79	F5 Ib	3	26	09.4	+4.322	+25	+49	56	59.19	12.44	-25
121	1030	ο Tauri	3.60	G6 IIIa Fe-1	3	26	11.4	+3.239	-45	+9	07	00.90	12.38	-78
123	1038	ξ Tauri	3.74	B9 Vn	3	28	33.3	+3.262	+40	+9	49	11.63	12.26	-39
127	1084	ε Eridani	3.73	K2 V	3	34	08.1	+2.832	-658	-9	22	24.33	11.93	+23
135	1136	δ Eridani	3.54	K0 IV	3	44	28.3	+2.880	-61	-9	40	43.21	+11.92	+745
141	1175	β Reticuli	3.85	K2 III	3	44	31.6	+0.775	+489	-64	43	38.04	11.24	+74
131	1122	δ Persei	3.01	B5 III	3	44	45.2	+4.305	+28	+47	52	00.51	11.12	-34
136	1142	17 Tauri	3.70	B6 III	3	46	23.7	+3.578	+14	+24	11	29.59	10.99	-46
146	1208	γ Hydri	3.24	M2 III	3	46	52.3	-0.850	+116	-74	09	37.25	11.11	+114
134	1135	ν Persei	3.77	F5 II	3	46	56.2	+4.103	-13	+42	39	24.62	10.99	-2
139	1165	η Tauri*	2.87	B7 IIIIn	3	49	00.3	+3.581	+14	+24	10	55.10	+10.80	-46
142	1178	27 Tauri	3.63	B8 III	3	50	41.0	+3.582	+13	+24	07	45.79	10.67	-47
144	1203	ζ Persei	2.85	B1 Ib	3	55	44.5	+3.790	+4	+31	57	26.00	10.33	-10
147	1220	ε Persei	2.89	B 0.5 IV	3	59	13.2	+2.804	+42	-13	26	15.37	09.97	-112
149	1231	γ Eridani	2.95	M0.5 IIIb Ca-1	3	59	34.4	+4.050	+16	40	04	54.08	10.03	-26
148	1228	ξ Persei	4.04	O 7.5 IIIIf	4	00	37.6	+3.913	+2	+35	51	43.52	9.97	0
150	1239	λ Tauri	3.47v	B3 V	4	02	05.8	+3.334	-4	+12	33	37.77	+9.85	-12
151	1251	ν Tauri	3.91	A1 Va	4	04	30.9	+3.200	+3	+6	03	29.49	9.67	-3
152	1273	48 Persei	4.04	B3 Ve	4	10	31.4	+4.385	+20	+47	46	41.10	9.18	-31
156	1336	α Reticuli	3.35	G8II-III	4	14	45.6	+0.790	+65	-62	24	37.85	8.93	+45
155	1326	α Horologii	3.86	K2 III	4	14	50.9	+1.992	+41	-42	13	58.13	8.67	-209
159	1346	γ Tauri	3.65	G9.5 IIIab CN 0.5	4	21	14.9	+3.424	+80	+15	41	13.70	8.35	-25
162	1373	δ Tauri	3.76	G9.5 III CN 0.5	4	24	24.5	+3.470	+75	+17	36	00.76	+8.09	-30
1121	1393	43 Eridani	3.96	K3.5 IIIb	4	24	59.8	+2.257	+56	-33	57	32.65	8.12	+50
164	1409	ε Tauri	3.54	G9.5 III CN 0.5	4	30	06.6	+3.514	+76	+19	14	05.39	7.62	-38
171	1465	α Doradus	3.27	A0p Si	4	34	33.0	+1.305	+60	-54	59	35.56	7.30	-4
170	1464	ν ⁺ Eridani	3.82	G8.5 IIIa	4	36	32.6	+2.336	-35	-30	30	41.68	+7.13	-12

*
No. 907 : (Nb) : Polaris, Dhruva
No. 100 : Bharani
No. 106 : Acamar.
No. 107 : Menkar
No. 109 : Mag. 3.3 to 4.0.

No. 111 : Algol, Mag. 2.1 to 3.4.
No. 120 : Mirphak.
No. 139 : Alcyone, Krittika.

MEAN PLACES OF STARS, J 2025.5
 FOR JULY 2^d.375 TERRESTRIAL TIME
 (The Annual Variations are for the middle of the year)

Cat. No. FK5	BS =HR No.	Star	Mag.	Spectral Type	Right Ascension			Annual Variation	Annual Proper motion	Declination			Annual Variation	Annual Proper motion
					h	m	s	s	^s (0.0001)	°	'	"	"	" (0.001)
168	1457	α Tauri*	0.85	K5 III	4	37	23.2	+3.452	+44	+16	33	30.34	+6.88	-190
172	1481	53 Eridani	3.87	K1.5 IIIb	4	39	21.0	+2.752	-52	-14	15	20.71	6.75	-155
1129	1502	α Caeli	4.45	F1 V	4	41	23.1	+1.937	-126	-41	48	58.93	6.66	-77
1134	1543	π' Orionis	3.19	F6 V	4	51	13.6	+3.264	+313	+7	00	13.37	5.93	+10
179	1552	π* Orionis	3.69	B2 III	4	52	34.0	+3.202	-1	+5	38	47.99	5.81	+1
180	1567	π' Orionis	3.72	B2 III	4	55	34.9	+3.131	0	+2	28	49.52	5.56	0
178	1542	α Camelopardi	4.29	O9.5 Ia	4	56	36.2	+6.015	-1	+66	22	56.09	+5.48	+6
181	1577	ι Aurigae	2.69	K3 II	4	58	39.5	+3.919	+3	+33	12	14.43	5.28	-18
183	1605	ε Aurigae*	2.99V	A9 Ia	5	03	48.3	+4.321	-1	+43	51	29.78	4.86	-4
1137	1612	ζ Aurigae	3.75	K5 II + B5 V	5	04	15.9	+4.208	+8	+41	06	37.40	4.80	-22
182	1603	β Camelopardi	4.03	G1 Ib-Iia	5	05	41.9	+5.368	-9	+60	28	34.06	4.69	-16
186	1654	ε Leporis	3.19	K4 III	5	06	32.5	+2.543	+18	-22	20	18.38	4.56	-74
185	1641	η Aurigae	3.17	B3 V	5	08	18.5	+4.221	+26	+41	15	58.66	+4.41	-68
188	1666	β Eridani*	2.79	A3 IVn	5	09	06.3	+2.954	-63	-5	03	19.36	4.33	-81
1144	1702	μ Leporis	3.31	B9p Hg Mn	5	14	04.7	+2.699	+30	-16	10	37.66	3.96	-26
194	1713	β Orionis*	0.12	B8 Ia	5	15	45.9	+2.887	0	-8	10	26.64	3.84	-1
193	1708	α Aurigae*	0.08	G6 III + G2 II	5	18	34.6	+4.445	+71	+46	01	16.01	3.18	-425
195	1735	τ Orionis	3.60	B5 III	5	18	50.8	+2.917	-10	-6	49	07.43	3.57	-8
1147	1765	22 Orionis	4.73	B2 IV-V	5	23	03.9	+3.067	0	-0	21	33.66	+3.21	-1
201	1790	γ Orionis*	1.64	B2 III	5	26	30.0	+3.222	-6	+6	22	14.33	2.91	-14
202	1791	β Tauri*	1.65	B7 III	5	27	54.4	+3.799	+17	+28	37	35.32	2.62	-175
204	1829	β Leporis	2.84	G5 II	5	29	20.3	+2.574	-3	-20	44	26.97	2.58	-89
214	1953	γ Mensae	5.19	K2 III	5	30	53.2	-2.338	+322	-76	19	16.81	2.82	+282
206	1852	δ Orionis*	2.23	O9.5 II	5	33	18.6	+3.069	+1	-0	16	56.11	2.33	-2
212	1922	β Doradus	3.76v	F7-G2 Ib	5	33	51.0	+0.529	+3	-62	28	24.82	2.29	+9
207	1865	α Leporis*	2.58	F0 Ib	5	33	51.3	+2.649	+1	-17	48	20.79	+2.28	+2
(GC)	1879	λ Orionis*	3.54	O8 IIIf	5	36	32.6	+3.308	-1	+9	56	56.70	2.05	-2
209	1899	ι Orionis	2.77	O9 III	5	36	40.9	+2.938	0	-5	53	42.29	2.04	+1
210	1903	ε Orionis*	1.70	B0 Ia	5	37	30.5	+3.048	+1	-1	11	15.57	1.96	-2
211	1910	ζ Tauri	3.00	B2 IIIpe (shell)	5	39	10.2	+3.590	0	+21	09	20.60	1.80	-21
215	1956	α Columbae*	2.64	B7 IV	5	40	34.4	+2.176	+5	-34	03	43.38	+1.67	-26
217	1983	γ Leporis	3.60	F7 V	5	44	49.3	+0.114	-49	-65	43	33.87	1.33	8
1154	2015	δ Doradus	4.35	A7 V ⁻ n	5	45	31.6	+2.503	-212	-22	26	30.29	0.90	-369
219	1998	ζ Leporis	3.55	A2 Van	5	48	06.7	+2.721	-11	-14	48	51.35	1.04	-1
220	2004	κ Orionis*	2.06	B0.5 Ia	5	48	58.0	+2.848	+1	-9	39	44.87	0.96	-2
223	2040	β Columbae	3.12	K1.5 III	5	51	51.6	+2.119	+49	-35	45	36.81	1.11	+401
222	2035	δ Leporis	3.81	K0 III Fe 1.5 CH 0.5	5	52	25.1	+2.582	+161	-20	52	43.32	+0.01	-649
224	2061	α Orionis*	0.5	M1 M2 Ia Iab	5	56	33.2	+3.251	+17	+7	24	34.80	+0.31	+9

*
 No. 168 : *Aldebaran*, *Rohini*
 No. 183 : *Mag. 2.9 to 3.8.*
 No. 188 : *Cursa* .
 No. 194 : *Rigel* .
 No. 193 : *Capella* , *Brahmahridaya* .
 No. 201 : *Bellatrix* .
 No. 202 : *El Nath* , *Agni* .
 No. 206 : *Mintaka* .

No. 207 : *Arneb* .
 No. GC : *Mrgasiras* .
 No. 210 : *Alnilam* .
 No. 215 : *Phakt* .
 No. 220 : *Saiph* .
 No. 224 : *Betelgeuse* , *Mag. 0.4 to 1.3 Ardra* .

MEAN PLACES OF STARS, J 2025.5
 FOR JULY 2^d.375 TERRESTRIAL TIME
 (The Annual Variations are for the middle of the year)

Cat. No. FK5	BS =HR No.	Star	Mag.	Spectral Type	Right Ascension			Annual Variation	Annual Proper motion	Declination			Annual Variation	Annual Proper motion
					h	m	s	s	^s (0.0001)	°	'	"	"	" (0.001)
226	2085	η Leporis	3.71	F1 V	5	57	34.0	+2.735	-28	-14	09	53.60	+0.35	+139
229	2120	η Columbae	3.96	G8/K1 II	5	59	55.7	+1.840	+20	-42	48	54.17	-0.01	-14
227	2088	β Aurigae*	1.90	A1 IV	6	01	24.0	+4.404	-54	+44	56	49.75	0.12	1
225	2077	δ Aurigae*	3.72	K0 III	6	01	37.7	+4.943	+92	+54	17	00.46	0.27	-126
1163	2134	1 Geminorum	4.16	G5 III-IV	6	05	40.2	+3.649	-6	+23	15	34.69	0.60	-100
1168	2219	κ Aurigae	4.35	G9 IIIb	6	17	00.2	+3.823	-57	+29	29	10.19	1.75	-262
240	2282	ζ Canis Maj.	3.02	B2.5 V	6	21	17.6	+2.306	+7	-30	04	34.52	-1.86	+3
243	2294	β Canis Maj.*	1.98	B1 II-III	6	23	49.4	+2.644	-4	-17	58	13.15	2.08	0
241	2286	μ Geminorum	2.88	M3 IIIab	6	24	30.2	+3.630	+39	+22	29	53.13	2.25	-111
245	2326	α Carinae*	-0.7	A9 II	6	24	31.1	+1.333	+25	-52	42	37.92	2.12	+21
244	2298	8ε Monocerotis	4.44	A6 IV	6	25	07.2	+3.181	-12	+4	34	40.11	2.18	+11
1173	2343	ν Geminorum	4.15	B6 III	6	30	28.6	+3.562	-5	+20	11	37.11	2.67	-14
252	2451	ν Puppis	3.17	B8 IIIIn	6	38	32.5	+1.838	+2	-43	13	10.34	-3.36	-6
251	2421	γ Geminorum*	1.93	A1 IVs	6	39	11.1	+3.465	+29	+16	22	31.03	3.45	-42
254	2473	ε Geminorum	2.98	G8 Ib	6	45	30.0	+3.689	-4	+25	06	12.48	3.97	-13
257	2491	α Canis Maj.* cg	-1.5	A0m A1 Va	6	46	16.3	+2.643	-387	-16	45	09.96	5.22	-1204
256	2484	ξ Geminorum	3.36	F5 IV	6	46	43.2	+3.366	-79	+12	51	57.24	4.25	-191
262	2550	α Pictoris	3.27	A6 Vn	6	48	27.1	+0.612	-96	-61	58	09.05	3.94	+269
263	2553	τ Puppis	2.93	K1 III	6	50	34.2	+1.490	+38	-50	38	45.68	-4.46	-70
1180	2538	κ Canis Maj.	3.96	B1.5 Ise	6	50	47.7	+2.243	-5	-32	32	21.80	4.40	+4
261	2540	θ Geminorum	3.60	A3 III-IV	6	54	28.1	+3.949	-2	+33	55	40.71	4.77	-48
268	2618	ε Canis Maj.*	1.50	B2 II	6	59	37.7	+2.360	+3	-29	00	29.82	5.15	+3
1183	2646	σ Canis Maj.	3.47	K7 IB	7	02	44.1	+2.392	-4	-27	58	22.39	5.41	+5
270	2653	ο Canis Maj.	3.02	B3 Ia	7	04	05.4	+2.507	-3	-23	52	19.80	5.53	+3
269	2650	ζ Geminorum*	3.79v	F9 Ib (var)	7	05	37.2	+3.555	-6	+20	31	50.27	-5.66	0
1189	2736	γ Volantis	3.78	G9 III	7	08	31.4	-0.533	+48	-70	32	24.41	5.80	+106
273	2693	δ Canis Maj.	1.86	F8 Ia	7	09	25.7	+2.441	-2	-26	26	06.80	5.97	+4
1187	2714	22δ Monocerotis	4.15	A1 III ⁺	7	13	10.0	+3.063	-1	-0	32	12.87	6.28	+5
281	2803	δ Volantis	3.98	F9 Ib	7	16	48.6	-0.049	-12	-68	00	14.02	6.59	+5
278	2773	π Puppis	2.70	K3 Ib	7	18	02.6	+2.121	-8	-37	08	40.72	6.69	+4
277	2763	λ Geminorum	3.58	A4 IV	7	19	33.4	+3.444	-33	+16	29	32.05	-6.85	-36
279	2777	δ Geminorum	3.53	F0 V ⁺	7	21	38.6	+3.578	-19	+21	55	59.33	7.00	-12
283	2827	η Canis Maj.	2.45	B5 Ia	7	25	06.3	+2.375	-3	-29	21	15.49	7.27	+5
282	2821	ι Geminorum	3.79	G9 IIIb	7	27	18.5	+3.719	-93	+27	44	42.41	7.54	-86
285	2845	β Canis Min.*	2.90	B8 V	7	28	32.0	+3.251	-35	+8	14	09.40	7.59	-38
1194	2878	ρ Puppis	3.25	K5 III	7	30	02.4	+1.905	-50	-43	21	15.35	7.49	+187
287	2891	α Gemino.* cg	1.95	Alm A2 Va	7	36	13.4	+3.819	-135	+31	49	49.35	-8.27	-98
291	2943	α C. Min.* cg	0.38	F5 IV-V	7	40	38.1	+3.137	-477	+5	09	28.07	9.54	-1021
297	3024	ζ Volantis	3.95	G9 III	7	41	29.4	-0.786	+67	-72	40	00.71	-8.57	+18

* No. 225 : Prajapati.
 No. 227 : Menkalina .
 No. 243 : Mirzam.
 No. 245 : Canopus , Agastya.
 No. 251 : Alhena .

No. 257 : Sirius , Lubdhaka Mag. - 1.46.
 No. 268 : Adhara.
 No. 269 : Mekbuda Mag. 3.7 to 4.1.
 No. 285 : Gomeisa.
 No. 287 : Castor, Punarvasu-2, Mag. 1.95 & 2.
 No. 291 : Procyon , Mag. 0.38 & 11.3.

MEAN PLACES OF STARS, J 2025.5
 FOR JULY 2^d.375 TERRESTRIAL TIME
 (The Annual Variations are for the middle of the year)

Cat. No. FK5	BS =HR No.	Star	Mag.	Spec- tral Type	Right Ascension			Annual Variation	Annual Proper motion	Declination			Annual Variation	Annual Proper motion
					h	m	s	s	^s (0.0001)	°	'	"	"	" (0.001)
293	2970	26α Monocerotis	3.93	G9 III Fe-1	7	42	27.9	+2.866	-49	-9	36	44.41	-8.68	-19
294	2985	κ Geminorum	3.57	G8 III	7	45	59.0	+3.614	-24	+24	20	04.92	8.99	-52
295	2990	β Geminorum*	1.14	K0 IIIb	7	46	52.4	+3.662	-474	+27	57	44.88	9.05	-44
1204	3045	ξ Puppis	3.34	G6 Iab-Ib	7	50	22.0	+2.525	-2	-24	55	31.01	9.28	-2
301	3080	213 G. Puppis	3.73	K1/2 II + A	7	53	05.7	+2.065	-8	-40	38	34.24	9.49	+3
303	3117	χ Carinae	3.47	B3p Si	7	57	25.6	+1.524	-32	-53	03	05.81	9.80	+21
306	3165	ζ Puppis	2.25	O5 Iafn	8	04	28.9	+2.111	-24	-40	04	34.61	-10.35	+12
308	3185	ρ Puppis	2.81	F5 (Ib-II)p	8	08	37.8	+2.557	-61	-24	22	45.18	10.62	+49
309	3207	γ ⁻ Velorum	1.78	WC8 + O9I:	8	10	19.1	+1.850	-4	-47	24	46.21	10.79	+6
312	3249	β Cancri	3.52	K 4 III Ba 0.5	8	17	53.8	+3.249	-30	+9	06	18.64	11.39	-49
315	3307	ε Carinae	1.86	K3: III + B2: V	8	23	02.1	+1.225	-35	-59	35	32.33	11.70	+15
319	3347	β Volantis	3.77	K2 III	8	26	00.4	+0.632	-61	-66	13	20.73	12.08	-155
316	3314	Br 1197 Hydrae	3.90	A0 Va	8	26	56.0	+2.996	-44	-3	59	28.26	-12.01	-23
317	3323	ο Ursae Maj.	3.36	G5 III	8	32	21.7	+4.926	-182	+60	37	49.27	12.47	-107
321	3366	η Cancri	5.33	K3 III	8	34	10.8	+3.460	-34	+20	21	09.87	12.53	-43
1223	3410	δ Hydrae	4.16	A1 Ivnn	8	39	00.3	+3.172	-44	+5	36	47.62	12.82	-7
1224	3418	σ Hydrae	4.44	K1 III	8	40	05.3	+3.132	-12	+3	15	00.99	12.91	-18
1227	3447	ο Velorum	3.62	B3 IV	8	41	01.4	+1.719	-24	-53	00	48.24	12.93	+20
1226	3445	53 G. Velorum	3.84	F0 Ia	8	41	28.4	+1.994	0	-46	44	25.79	-12.98	+3
327	3468	α Pyxidis	3.68	B1.5 III	8	44	37.1	+2.414	-9	-33	16	46.21	13.18	+11
1228	3449	γ Cancri	4.66	A1 Va	8	44	45.5	+3.461	-76	+21	22	30.19	13.24	-39
326	3461	δ Cancri*	3.94	K0 IIIb	8	46	07.8	+3.400	-13	+18	03	31.98	13.52	-228
(329)	3482	ε Hydrae* m	3.38	G5: III ⁺ A:	8	48	07.4	+3.170	-155	+6	19	25.63	13.46	-40
328	3475	ι Cancri	4.02	G8 II-III	8	48	14.1	+3.616	-19	+28	39	53.52	13.47	-42
336	3571	108 G. Carinae	3.84	B7 II-III	8	55	37.4	+1.354	-28	-60	44	33.71	-13.86	+38
334	3547	ζ Hydrae	3.11	G9 IIIa	8	56	44.4	+3.167	-66	+5	50	49.12	13.95	+15
337	3572	α Cancri*	4.25	A5m	8	59	52.8	+3.274	23	+11	45	26.90	14.19	-31
335	3569	ι Ursae Maj.	3.14	A7 Ivnn	9	00	56.5	+4.074	-442	+47	56	22.83	14.45	-225
342	3614	97 G. Velorum	3.75	K2 III	9	05	02.2	+2.073	-44	-47	12	00.88	14.49	-13
341	3594	κ Ursae Maj.	3.60	A0 IIIIn	9	05	21.3	+4.063	-32	+47	03	13.79	14.55	-54
345	3634	λ Velorum	2.21	K4.5 Ib	9	08	56.2	+2.212	-17	-43	32	11.54	-14.70	+13
1239	3627	ξ Cancri	5.14	G9 IIIa Fe-0.5 CH-I	9	10	49.2	+3.438	+1	+21	56	26.75	14.82	+5
348	3685	β Carinae	1.68	A1 III	9	13	28.1	+0.629	-311	-69	49	20.98	14.87	+109
347	3665	θ Hydrae	3.88	B9.5 IV (C II)	9	15	41.4	+3.118	+86	+2	12	19.04	15.42	-310
351	3699	ι Carinae	2.25	A7 Ib	9	17	46.3	+1.605	-26	-59	22	58.64	15.22	+8
352	3705	α Lyncis	3.13	K7 IIIab	9	22	36.1	+3.635	-179	+34	16	59.56	15.48	+19
1243	3718	θ Pyxidis	4.72	M0.5 III	9	22	37.4	+2.660	-8	-26	04	30.32	-15.51	-8
353	3734	κ Velorum*	2.50	B2 IV-V	9	22	54.3	+1.861	-10	-55	07	13.45	15.51	+9
354	3748	α Hydrae*	1.98	K3 II-III	9	28	50.4	+2.948	-9	-8	46	13.34	15.80	+33
361	3803	N Velorum	3.13	K5 III	9	31	59.9	+1.826	-39	-57	08	51.39	16.00	+4
355	3757	23 Ursae Maj.	3.67	F0 IV	9	33	30.7	+4.652	+160	+62	56	54.55	16.06	+27
358	3775	θ Ursae Maj.	3.17	F6 IV	9	34	32.8	+3.971	-1024	+51	33	34.42	-16.67	-529

* No. 295 : *Pollux*, *Punarvasu-1*.
 No. 326 : *Pusya*.
 No. 329 : *Aslesa*.

No. 337 : *Acubens*. (*Aslesa*).
 No. 353 : *Markeb*.
 No. 354 : *Alphard*.

MEAN PLACES OF STARS, J 2025.5
 FOR JULY 2^d.375 TERRESTRIAL TIME
 (The Annual Variations are for the middle of the year)

Cat. No. FK5	BS =HR No.	Star	Mag.	Spectral Type	Right Ascension			Annual Variation	Annual Proper motion	Declination			Annual Variation	Annual Proper motion
					h	m	s	s	s (0.0001)	°	'	"	"	" (0.001)
1250	3845	ι Hydrae	3.91	K2.5 III	9	41	09.5	+3.062	+32	-1	15	35.30	-16.54	-64
364	3849	κ Hydrae	5.06	B5 V	9	41	31.7	+2.878	-19	-14	26	56.71	16.51	-20
365	3852	ο Leonis	3.52	F5 II + A5?	9	42	30.6	+3.196	-96	+9	46	30.38	16.58	-36
367	3873	ε Leonis	2.98	G1 II	9	47	17.6	+3.392	-34	+23	39	20.05	16.78	-11
368	3888	ν Ursae Maj.	3.80	F0 IV	9	52	46.9	+4.206	-379	+58	55	02.33	17.18	-150
371	3905	μ Leonis	3.88	K2 III CN I Ca I	9	54	12.5	+3.398	-160	+25	53	08.34	17.15	-56
375	3940	φ Velorum	3.54	B5 Ib	9	57	45.7	+2.115	-12	-54	41	23.65	-17.25	+3
1261	3970	ν ⁺ Hydrae	4.60	B8 V	10	06	22.0	+2.924	-25	-13	11	21.26	17.61	+18
379	3975	η Leonis	3.52	A0 Ib	10	08	43.2	+3.262	-1	+16	38	14.25	17.72	0
380	3982	α Leonis*	1.35	B7 Vn	10	09	43.6	+3.188	-169	+11	50	29.71	17.76	+7
381	3994	λ Hydrae	3.61	K0 III CN 0.5	10	11	49.9	+2.927	-138	-12	28	51.54	17.94	-88
385	4037	ω Carinae	3.32	B8 III n	10	14	20.4	+1.420	-76	-70	09	53.80	17.94	+7
382	4023	191 G. Velorum	3.85	A2 Va	10	15	48.6	+2.529	-131	-42	14	56.82	-17.96	+45
1264	4050	187 G. Carinae	3.40	K2.5 II	10	17	56.3	+2.014	-34	-61	27	37.07	18.08	+5
384	4031	ζ Leonis	3.44	F0 III	10	18	06.2	+3.324	+13	+23	17	21.37	18.10	-7
383	4033	λ Ursae Maj.	3.45	A1 IV	10	18	37.5	+3.590	-149	+42	47	09.70	18.15	-38
1268	4080	204 G. Velorum	4.83	K1 III	10	23	25.5	+2.585	-20	-41	46	44.65	18.23	+56
386	4069	μ Ursae Maj.	3.05	M0 III	10	23	50.3	+3.548	-72	+41	22	13.09	18.27	+35
391	4102	I Carinae	4.00	F2 V	10	24	53.6	+1.171	-52	-74	09	41.94	-18.37	-26
389	4094	μ Hydrae	3.81	K4 ⁺ III	10	27	19.5	+2.906	-89	-16	58	02.20	18.50	-80
392	4104	α Antliae	4.25	K4.5 III	10	28	19.3	+2.755	-58	-31	11	54.05	18.45	+11
393	4114	196 G. Carinae	3.82	F0 Ib	10	28	49.2	+2.217	-17	-58	52	12.85	18.48	0
1270	4116	δ Sextantis	5.21	B9.5 V	10	30	46.4	+3.047	-32	-2	52	13.47	18.55	-14
397	4140	203 G. Carinae	3.32	B4 Vne	10	32	56.2	+2.148	-27	-61	49	01.35	18.60	+9
396	4133	ρ Leonis	3.85	B1 Iab	10	34	09.1	+3.154	-4	+9	10	28.51	-18.65	-3
401	4174	γ Chamaeleontis	4.11	M0 III	10	35	44.9	+0.649	-144	-78	44	24.42	18.69	+14
406	4199	θ Carinae	2.76	B0.5 Vp	10	43	52.3	+2.157	-35	-64	31	42.62	18.94	+10
411	4234	δ ⁻ Chamaeleontis	4.45	B2.5 IV	10	45	59.3	+0.473	-201	-80	40	29.03	19.00	+8
410	4232	ν Hydrae	3.11	K1.5 IIIb Hδ-0.5	10	50	53.1	+2.966	+66	-16	19	39.74	18.94	+200
412	4247	46 Leonis Min.	3.83	K0 ⁺ III-IV	10	54	43.9	+3.336	+70	+34	04	36.40	19.51	-279
1283	4287	α Crateris	4.08	K0 ⁺ III	11	01	01.2	+2.930	-323	-18	26	06.21	-19.25	+130
416	4295	β Ursae Maj.*	2.37	A1 IV-V	11	03	21.8	+3.574	+98	+56	14	42.39	19.40	+34
417	4301	α Ursae Maj.*	1.80	K0 ⁺ IIIa	11	05	16.8	+3.643	-167	+61	36	45.37	19.54	-66
1289	4337	260 G. Carinae	3.91	G4 0-Ia	11	09	41.3	+2.588	-9	-59	06	48.78	19.56	0
420	4335	ψ Ursae Maj.	3.01	K1 III	11	11	05.2	+3.346	-60	+44	21	34.76	19.61	-28
422	4357	δ Leonis*	2.56	A4 IV	11	15	27.7	+3.181	+101	+20	23	00.83	19.79	-130
423	4359	θ Leonis*	3.34	A2 IV (Kvar)	11	15	34.5	+3.142	-42	+15	17	23.15	-19.74	-79
425	4377	ν Ursae Maj.	3.48	K3 ⁺ III	11	19	51.0	+3.224	-20	+32	57	17.18	19.71	+28
426	4382	δ Crateris	3.56	G9 IIIb CH 0.2	11	20	37.1	+3.006	-84	-14	55	00.84	19.54	+208
433	4434	λ Draconis	3.84	M0 III Ca-1	11	32	53.4	+3.483	-73	+69	11	24.13	19.92	-17
434	4450	ξ Hydrae	3.54	G7 III	11	34	15.7	+2.966	-162	-31	59	56.21	19.95	-39
436	4467	λ Centauri	3.13	B9.5 Iin	11	36	58.2	+2.804	-61	-63	09	39.80	-19.94	-5

* No. 380 : *Regulus* , *Magha*.
 No. 416 : *Merak* , *Pulaha*.

No. 417 : *Dubhe* , *Kratu*.
 No. 422 : *Zosma* , *Purva Phalguni-1*.
 No. 423 : *Purva Phalguni-2*.

MEAN PLACES OF STARS, J 2025.5
 FOR JULY 2^d.375 TERRESTRIAL TIME
 (The Annual Variations are for the middle of the year)

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					h	m	s	s	^s (0.0001)	°	'	"	"	" (0.001)
442	4520	λ Muscae	3.64	A7 IV	11	46	49.6	+2.878	-174	-66	52	12.67	-19.97	+37
441	4518	χ Ursae Maj.	3.71	K0.5 IIIb	11	47	23.3	+3.142	-136	+47	38	16.44	19.98	+30
1304	4527	93 Leonis*	4.53v	G4 III-IV + A7 V	11	49	17.9	+3.088	-106	+20	04	37.59	20.02	-3
444	4534	β Leonis*	2.14	A3 Va	11	50	21.5	+3.056	-342	+14	25	45.89	20.14	-114
445	4540	β Virginis	3.61	F9 V	11	52	01.4	+3.126	+495	+1	37	15.24	20.30	-271
447	4554	γ Ursae Maj.*	2.44	A0 Van	11	55	09.6	+3.124	+107	+53	33	10.50	20.02	+12
452	4621	δ Centauri	2.60	B2 IVne	12	09	41.5	+3.141	-36	-50	51	51.63	-20.03	-8
453	4630	ε Corvi	3.00	K2.5 IIIa	12	11	26.4	+3.098	-51	-22	45	41.31	20.00	+13
455	4656	δ Crucis	2.80	B2 IV	12	16	30.9	+3.230	-53	-58	53	26.16	20.00	-9
456	4660	δ Ursae Maj.*	3.31	A2 Van	12	16	40.6	+2.939	+127	+56	53	27.84	19.98	+9
457	4662	γ Corvi*	2.59	B8p Hg Mn	12	17	07.3	+3.096	-112	-17	41	00.13	19.96	+23
459	4674	β Chamaeleontis	4.26	B5 Vn	12	19	53.8	+3.680	-175	-79	27	12.78	19.95	+17
460	4689	η Virginis	3.89	A1 IV ⁺	12	21	12.7	+3.073	-42	-0	48	29.99	-19.97	-18
462	4730	α Crucis*A	1.33	B0.5 IV	12	28	02.2	+3.393	-53	-63	14	24.33	19.90	-12
465	4757	δ Corvi*	2.95	B9.5 IVn	12	31	11.2	+3.115	-146	-16	39	25.63	19.99	-138
468	4763	γ Crucis	1.63v	M3.5 III	12	32	35.7	+3.373	+29	-57	15	20.32	20.10	-262
469	4773	γ Muscae	3.87	B5 V	12	34	01.4	+3.681	-127	-72	16	24.40	19.82	-2
472	4787	κ Draconis	3.87v	B6 IIIpe	12	34	33.4	+2.523	-112	+69	38	52.47	19.80	+12
471	4786	β Corvi	2.65	G5 IIb	12	35	43.9	+3.166	+2	-23	32	14.79	-19.85	-54
474	4798	α Muscae	2.69	B2 IV-V	12	38	43.9	+3.660	-90	-69	16	32.36	19.77	-13
475	4813	χ Virginis	4.66	K2 III CN 1.5	12	40	33.9	+3.104	-51	-8	08	08.20	19.75	-25
1326	4828	ρ Virginis	4.88	A0 Va(λ Boo)	12	43	10.5	+3.037	+57	+10	05	43.54	19.78	-90
481	4853	β Crucis	1.25	B0.5 III	12	49	13.8	+3.559	-63	-59	49	39.49	19.59	-14
483	4905	ε Ursae Maj.*	1.77	A0p Cr	12	55	08.6	+2.620	+132	+55	49	18.68	19.47	-6
484	4910	δ Virginis*	3.38	M3 ⁺ III	12	56	53.4	+3.025	-313	+3	15	33.62	-19.48	-54
485	4915	α CVn sq*	2.90	A0p Si Eu	12	57	13.0	+2.796	-198	+38	10	52.10	19.36	+56
488	4932	ε Virginis*	2.83	G8 IIIab	13	03	26.8	+2.987	-185	+10	49	21.39	19.26	+20
487	4923	δ Muscae	3.62	K2 III	13	04	03.9	+4.244	+544	-71	41	08.19	19.28	-20
492	4983	β Com	4.26	F9.5 V	13	13	03.7	+2.795	-604	+27	44	58.14	18.15	+881
495	5020	γ Hydrae	3.00	G8 IIIa	13	20	18.8	+3.278	+47	-23	18	19.34	18.87	-45
496	5028	ι Centauri	2.75	A2 Va	13	22	02.4	+3.398	-284	-36	50	45.74	-18.86	-86
497	5054	ζ Ursae Maj.*pr	2.27	A1 Va ⁺ (Si)	13	24	56.9	+2.404	+141	+54	47	34.10	18.70	-20
498	5056	α Virginis*	0.98	B1 V	13	26	32.4	+3.171	-28	-11	17	37.05	18.66	-28
501	5107	ζ Virginis	3.37	A2 IV ⁺	13	35	59.7	+3.063	-190	-0	43	31.80	18.27	+42
504	5132	ε Centauri	2.30	B1 III	13	41	31.2	+3.849	-32	-53	35	41.93	18.12	-17
509	5191	η Ursae Maj.*	1.86	B3 V	13	48	32.6	+2.357	-125	+49	11	12.34	17.85	-11
508	5193	μ Centauri	3.04	B2 IV-Vpne(shell)	13	51	09.8	+3.646	-21	-42	35	58.96	-17.75	-20
513	5235	η Bootis	2.68	G0 IV	13	55	53.9	+2.857	-44	+18	16	14.83	17.89	-358
512	5231	ζ Centauri	2.55	B2.5 IV	13	57	08.6	+3.781	-56	-47	24	45.83	-17.52	-43

*
 No. 1304 : Uttara Phalguni-2.
 No. 444 : Denebola, Uttara Phalguni-1.
 No. 447 : Phecda or Phad, Pulastya.
 No. 456 : Megrez, Atri.
 No. 457 : Minkar.
 No. 462 : Acrux .
 No. 465 : Algorel , Hasta.

No. 483 : Alioth, Angira.
 No. 484 : Minelauva.
 No. 485 : 12 Canum Venaticorum, Mag. p 2.9 .
 No. 488 : Vindemiatrix.
 No. 497 : Mizar , Vasista. Mag. f. 4.0.
 No. 498 : Spica , Citra.
 No. 509 : Alkaid, Benetnasch, Marichi.

MEAN PLACES OF STARS, J 2025.5
 FOR JULY 2^d.375 TERRESTRIAL TIME
 (The Annual Variations are for the middle of the year)

Cat. No. FK5	BS =HR No.	Star	Mag.	Spec- tral Type	Right Ascension			Annual Variation	Annual Proper motion	Declination			Annual Variation	Annual Proper motion
					h	m	s	s	^s (0.0001)	°	'	"	"	" (0.001)
521	5291	α Draconis*	3.65	A0 III	14	05	38.8	+4.302	-43	-60	29	40.51	-17.12	-19
518	5267	β Centauri*	0.61	B1 III	14	05	04.9	+1.629	-84	64	15	16.29	17.11	+18
519	5287	π Hydrae	3.27	K2 III Fe-0.5	14	07	49.8	+3.436	+33	-26	48	14.53	17.14	-139
520	5288	θ Centauri	2.06	K0 IIIb	14	08	11.5	+3.557	-429	-36	29	39.35	17.51	-520
523	5315	κ Virginis	4.19	K2.5 III Fe-0.5	14	14	15.6	+3.211	+5	-10	23	28.55	16.56	+140
526	5340	α Bootis*	-0.04	K1.5 III Fe-0.5	14	16	49.5	+2.739	-769	+19	03	02.34	18.57	-2000
525	5338	ι Virginis	4.08	F7 III-IV	14	17	21.4	+3.156	-2	-6	07	15.89	-16.98	-432
1371	5359	λ Virginis	4.52	A5m:	14	20	29.6	+3.259	-11	-13	29	14.12	16.36	+30
531	5404	θ Bootis	4.05	F7 V	14	26	03.9	+2.042	-253	+51	44	01.31	16.50	-398
534	5429	ρ Bootis	3.58	K3 III	14	32	55.7	+2.585	-77	+30	15	37.95	15.62	+119
535	5435	γ Bootis	3.03	A7 IV ⁺	14	33	06.3	+2.415	-97	+38	11	51.73	15.58	+153
537	5440	η Centauri	2.31	B1.5 IVpne(shell)	14	37	08.3	+3.841	-31	-42	16	06.00	15.55	-35
538	5460	α Centauri* cg	0.00	K1 V	14	41	21.0	+4.132	-5001	-60	56	20.55	-14.59	+690
541	5469	α Lupi	2.30	B1.5 III	14	43	38.3	+4.028	-21	-47	29	45.46	15.16	-18
545	5487	μ Virginis	3.88	F2 V	14	44	24.5	+3.171	+73	-5	46	03.71	15.42	-316
539	5463	α Circini	3.19	A 7p Sr Eu	14	44	35.9	+4.938	-302	-65	05	02.79	15.32	-233
544	5485	371 G.Cen	4.05	K3 IIIb	14	45	13.5	+3.694	-52	-35	16	55.03	15.23	-180
547	5511	109 Virginis	3.72	A0 Ivnn	14	47	32.4	+3.040	-76	+1	47	12.04	14.95	-27
550	5563	β Ursae Min.*	2.08	K4 III	14	50	39.5	-0.101	-76	+74	03	04.31	14.72	+12
542	5470	α Apodis	3.83	K3 III CN 0.5	14	51	09.2	+7.806	-41	-79	08	59.09	-14.72	-16
548	5531	α Librae*	2.75	A3 III-IV	14	52	17.6	+3.332	-73	-16	08	46.53	14.71	-67
552	5571	β Lupi	2.68	B2 IV	15	00	12.8	+3.961	-32	-43	14	05.77	14.20	-39
553	5576	κ Centauri	3.13	B2 V	15	00	49.9	+3.934	-17	-42	12	17.38	14.14	-24
555	5602	β Bootis	3.50	G8 IIIa Fe-0.5	15	02	54.4	+2.261	-35	+40	17	27.85	14.02	-28
556	5603	σ Librae	3.29	M2.5 III	15	05	34.1	+3.529	-54	-25	22	49.92	-13.87	-43
559	5652	ι Librae*	4.54	B9p Si	15	13	40.8	+3.434	-25	-19	53	11.65	13.34	-39
558	5649	ζ Lupi	3.41	G8 III	15	14	07.9	+4.354	-122	-52	11	39.21	13.34	-73
563	5681	δ Bootis	3.47	G8 III Fe-I	15	16	31.9	+2.421	+69	+33	13	15.18	13.22	-112
564	5685	β Librae*	2.61	B8 IIIIn	15	18	23.0	+3.239	-65	-9	28	31.46	13.01	-19
569	5735	γ Ursae Min.	3.05	A 3 III	15	20	42.5	-0.039	-40	+71	44	35.72	-12.81	+20
560	5671	γ Tr. Austrini	2.89	A1 III	15	21	19.7	+5.710	-132	-68	46	15.48	12.82	-31
1402	5695	δ Lupi	3.22	B1.5 IVn	15	23	03.3	+3.965	-13	-40	44	16.77	12.70	-26
566	5705	ϕ Lupi	3.56	K4 III	15	23	26.0	+3.831	-74	-36	21	07.20	12.74	-85
571	5744	ι Draconis	3.29	K2 III	15	25	30.0	+1.345	-12	+58	52	38.75	12.49	+17
572	5747	β Cr. Borealis	3.68	F0p Cr Eu	15	28	52.9	+2.476	-137	+29	01	08.76	12.19	+86
578	5793	α Cr. Borealis*	2.23	A0 IV	15	35	46.1	+2.543	+91	+26	37	48.89	11.88	-88
577	5787	γ Librae	3.91	G8.5 III	15	36	57.4	+3.368	+45	-14	52	22.14	-11.70	+9
579	5794	ν Librae	3.58	K3.5 III	15	38	34.7	+3.659	-7	-28	13	03.22	11.59	+3
1413	5838	κ Librae	4.74	M0 IIIb	15	43	25.2	+3.470	-26	-19	45	34.73	11.35	-103
582	5854	α Serpentis*	2.65	K2 IIIb CN I	15	45	31.6	+2.961	+92	+6	20	49.38	-11.05	+47

*
No. 518 : Agena .
No. 521 : Thuban .
No. 526 : Arcturus , Svati.
No. 538 : Rigil Kentaurus Mag. 0.33 & 1.70.
No. 548 : Zuben el Genubi, Visakha.

No. 550 : Kochab .
No. 559 : Visakha.
No. 564 : Zuben es Chamali.
No. 578 : Margarita, Alphecca.
No. 582 : Unukalhal.

MEAN PLACES OF STARS, J 2025.5
 FOR JULY 2^d.375 TERRESTRIAL TIME
 (The Annual Variations are for the middle of the year)

Cat. No. FK5	BS =HR No.	Star	Mag.	Spec- tral Type	Right Ascension			Annual Variation	Annual Proper motion	Declination			Annual Variation	Annual Proper motion
					h	m	s	s	s (0.0001)	°	'	"	"	" (0.001)
583	5867	β Serpentis	3.67	A2 IV	15	47	22.0	+2.773	+46	15	20	36.78	-11.01	-45
585	5881	μ Serpentis	3.54	A0 III	15	50	57.2	+3.139	-57	-3	30	23.48	10.72	-24
588	5892	ε Serpentis	3.71	A5m	15	52	05.4	+2.997	86	+4	24	09.58	10.55	+63
589	5897	β Tr. Australis	2.85	F0 IV	15	57	24.8	+5.353	-283	-63	30	23.21	10.61	-398
591	5933	γ Serpentis	3.85	F6 V	15	57	38.0	+2.777	+218	+15	34	47.99	11.48	-1281
592	5944	π Scorpii	2.89	B1 V + B2 V	16	00	24.0	+3.644	-8	-26	11	07.66	10.02	-26
594	5953	δ Scorpii*	2.32	B0.3 IV	16	01	50.8	+3.561	-8	-22	41	32.03	-9.90	-22
597	5984	β Scorpii*pr	2.62	B0.5 V	16	06	55.4	+3.500	-4	-19	52	23.50	9.51	-19
603	6056	δ Ophiuchi	2.74	M0.5 III	16	15	41.1	+3.151	-29	-3	45	29.21	8.95	-143
605	6075	ε Ophiuchi	3.24	G9.5 IIIb Fe-0.5	16	19	40.4	+3.182	+57	-4	45	09.95	8.45	+41
608	6092	τ Herculis	3.89	B5 IV	16	20	30.5	+1.808	-11	+46	15	13.49	8.39	+40
607	6084	σ Scorpii	2.89	B1 III	16	22	44.6	+3.659	-8	-25	39	06.71	8.27	-21
609	6095	γ Herculis	3.75	A9 IIIbn	16	23	02.8	+2.650	-33	+19	05	41.34	-8.18	+43
613	6117	ω Herculis	4.57	B9 p Cr	16	26	35.7	+2.773	+30	+13	58	34.46	8.00	-59
616	6134	α Scorpii* cg	0.96	M1.5 Iab-Ib	16	30	58.5	+3.691	-7	-26	29	10.85	7.61	-20
618	6148	β Herculis	2.77	G7 III a Fe-0.5	16	31	19.0	+2.583	-70	+21	26	08.19	7.58	-15
611	6102	γ Apodis	3.89	G8/K0 III	16	37	26.6	+9.432	-452	-78	56	55.91	7.14	-77
620	6165	τ Scorpii	2.82	B0 V	16	37	28.5	+3.747	-6	-28	16	00.02	7.08	-22
622	6175	ζ Ophiuchi	2.56	O9.5 Vn	16	38	33.9	+3.311	+9	-10	37	00.16	-6.95	+26
626	6220	η Herculis	3.53	G7 III Fe-1	16	43	46.3	+2.061	+32	+38	52	30.41	6.63	-82
1438	6243	20 Ophiuchi	4.65	F7 III	16	51	14.8	+3.326	+65	-10	49	33.80	6.01	-92
625	6217	α Tr. Austr.*	1.92	K2 IIb-IIIa	16	51	23.2	+6.416	+26	-69	04	14.31	5.94	-34
628	6241	ε Scorpii	2.29	K2 III	16	51	49.2	+3.899	-493	-34	20	13.83	6.13	-257
1435	6229	η Arae	3.76	K5 III	16	52	00.0	+5.214	+49	-59	05	01.64	5.89	-28
1439	6247	μ' Scorpii	3.08v	B1.5 IVn	16	53	36.2	+4.078	-9	-38	05	19.22	-5.75	-25
633	6299	κ Ophiuchi	3.20	K2 III	16	58	52.6	+2.844	-197	+9	20	13.82	5.29	-11
631	6285	ζ Arae	3.13	K4 III	17	00	44.4	+4.990	-23	-56	01	38.40	5.16	-36
634	6324	ε Herculis	3.92	A0 IV ⁺	17	01	16.0	+2.299	-36	+30	53	25.20	5.05	+27
635	6355	60 Herculis	4.91	A4 IV	17	06	33.7	+2.786	+35	+12	42	27.40	4.64	-10
639	6396	ζ Draconis	3.17	B6 III	17	08	51.9	+0.189	-33	+65	41	00.17	4.41	+22
638	6380	η Scorpii	3.33	F2 V:p(Cr)	17	13	59.1	+4.310	+23	-43	16	12.22	-4.28	-287
643	6418	π Herculis	3.16	K3 II	17	15	56.2	+2.093	-22	+36	46	54.47	3.83	+4
641	6410	δ Herculis	3.14	A1 Vann	17	16	04.8	+2.468	-15	+24	48	38.68	3.97	-157
644	6453	θ Ophiuchi	3.27	B2 IV	17	23	34.7	+3.691	-3	-25	01	21.36	3.19	-20
645	6461	β Arae	2.85	K3 Ib-IIa	17	27	25.5	+5.003	-9	-55	33	03.00	2.86	-25
1457	6486	44 Ophiuchi	4.17	A9m:	17	27	55.8	+3.670	0	-24	11	47.10	2.91	-116
653	6536	β Draconis	2.79	G2 Ib-IIa	17	31	00.6	+1.360	-17	+52	17	00.38	-2.51	+15
649	6508	v Scorpii	2.69	B2 IV	17	32	30.0	+4.086	-1	-37	18	48.92	2.43	-31
648	6500	δ Arae	3.62	B8 Vn	17	33	24.4	+5.432	-79	-60	42	05.87	2.42	-96
651	6510	α Arae	2.95	B2 Vne	17	33	49.0	+4.648	-32	-49	53	36.53	2.35	-70
652	6527	λ Scorpii*	1.63	B1.5 IV	17	35	20.6	+4.081	-1	-37	07	11.27	2.18	-29
656	6556	α Ophiuchi*	2.08	A5 Vnn	17	36	07.2	+2.788	+83	+12	32	35.90	-2.31	-226

* No. 594 : *Dschubba*, Anuradha
 No. 597 : *Graffias*, Mag. 2.9, 5.1
 No. 616 : *Antares*, Jyestha, Mag. 0.9 to 1.8.

No. 625 : *Atria*.
 No. 652 : *Schaula*, Mula.
 No. 656 : *Ras Alhague*.

MEAN PLACES OF STARS, J 2025.5
FOR JULY 2^d.375 TERRESTRIAL TIME
 (The Annual Variations are for the middle of the year)

Cat. No. FK5	BS =HR No.	Star	Mag.	Spec- tral Type	Right Ascension			Annual Variation	Annual Proper motion	Declination			Annual Variation	Annual Proper motion
					h	m	s	s	^s (0.0001)	°	'	"	"	" (0.001)
658	6561	ξ Serpentis	3.54	F0 IIIb	17	39	02.9	+3.439	-29	-15	24	44.54	-1.89	-58
654	6553	θ Scorp̄ii	1.87	F1 III	17	39	09.2	+4.318	+14	-43	00	40.71	1.82	-2
663	6588	ι Herculis	3.80	B3 IV	17	40	11.2	+1.697	-5	+45	59	38.10	1.73	+5
660	6580	κ Scorp̄ii	2.41	B1.5 III	17	44	15.2	+4.156	-5	-39	02	25.82	1.40	-27
665	6603	β Ophiuchi	2.77	K2 III CN 0.5	17	44	44.0	+2.966	-27	+4	33	30.90	1.17	159
667	6623	μ Herculis	3.42	G5IV	17	47	27.5	+2.352	-232	+27	42	26.12	1.85	-752
661	6582	η Pavonis	3.62	K1 IIIa CN I	17	48	14.4	+5.900	-21	-64	43	56.16	-1.08	-54
668	6629	γ Ophiuchi	3.75	A0 Van	17	49	10.3	+3.011	-14	+2	41	58.74	1.02	-74
666	6615	ι' Scorp̄ii	3.03	F2 Ia	17	49	22.2	+4.201	0	-40	08	03.25	0.94	-8
669	6630	G Scorp̄ii	3.21	K2 III	17	51	35.7	+4.087	+41	-37	02	55.69	0.70	+33
671	6688	ξ Draconis	3.75	K2 III	17	53	58.2	+1.040	+114	+56	52	09.66	0.45	+80
672	6695	θ Herculis	3.86	K1 IIa CN2	17	57	07.7	+2.060	+4	+37	14	54.68	0.24	+6
676	6705	γ Draconis*	2.23	K5 III	17	57	12.0	+1.396	-8	+51	29	12.81	-0.26	-19
674	6703	ξ Herculis	3.70	G8.5 III	17	58	45.4	+2.334	+64	+29	14	48.15	0.13	-17
673	6698	ν Ophiuchi	3.34	G 9 IIIa	18	00	25.9	+3.305	-4	-9	46	28.66	-0.08	-116
677	6714	67 Ophiuchi	3.97	B5 Ib	18	01	55.4	+3.007	+1	+2	55	56.25	+0.16	-8
679	6746	γ Sagittarii	2.99	K0 ⁺ III	18	07	26.8	+3.855	-41	-30	25	16.64	0.47	-185
681	6779	ο Herculis	3.83	A0 II-III	18	08	32.3	+2.343	+1	+28	46	03.18	0.76	+10
680	6771	72 Ophiuchi	3.73	A5 IV-V	18	08	33.6	+2.846	-41	+9	34	09.64	+0.83	+80
1471	6743	θ Arae	3.66	B2 Ib	18	08	37.0	+4.670	-10	-50	05	12.93	0.74	-14
682	6812	μ Sagittarii	3.86	B9 Ia	18	15	17.3	+3.589	+1	-21	02	59.39	1.34	+1
683	6832	η Sagittarii	3.11	M3.5 IIIab	18	19	21.2	+4.059	-106	-36	45	05.22	1.52	-167
695	6927	χ Draconis	3.57	F7 V	18	20	35.7	-1.088	+1201	+72	44	35.85	1.45	-345
687	6859	δ Sagittarii*	2.70	K2.5 IIIa CN 0.5	18	22	37.6	+3.840	+27	-29	48	53.48	1.95	-28
688	6869	η Serpentis	3.26	K0 III-IV	18	22	37.8	+3.106	-364	-2	53	24.70	+1.27	-702
690	6895	109 Herculis	3.84	K2 IIIab	18	24	47.1	+2.559	+141	+21	46	58.87	1.92	-242
689	6879	ε Sagittarii*	1.85	A0 II n(shell)	18	25	51.8	+3.980	-31	-34	22	12.22	2.13	-124
691	6897	α Telescopii	3.51	B3 IV	18	28	51.8	+4.444	-15	-45	57	05.70	2.46	-54
692	6913	λ Sagittarii	2.81	K1 IIIb	18	29	32.6	+3.702	-32	-25	24	18.91	2.39	-185
697	6951	θ Coronae Aust.	4.64	G8 III	18	35	19.3	+4.279	+28	-42	17	29.20	3.05	-22
1482	6973	α Scuti	3.85	K3 III	18	36	35.7	+3.265	-10	-8	13	26.86	+2.87	-312
699	7001	α Lyrae*	0.03	A0 Va	18	37	48.2	+2.033	+172	+38	48	31.44	3.58	+287
1487	7039	φ Sagittarii	3.17	B8 III	18	47	14.9	+3.745	+40	-26	57	43.93	4.10	+1
1489	7063	β Scuti	4.22	G4 IIa	18	48	31.6	+3.183	-3	-4	43	06.85	4.20	-16
705	7106	β Lyrae*	3.45	B7 Vpe(shell)	18	51	01.3	+2.217	+3	+33	23	37.39	4.42	-3
706	7121	σ Sagittarii*	2.02	B3 IV	18	56	50.7	+3.716	+10	-26	15	45.85	4.87	-54
710	7150	ξ ⁻ Sagittarii	3.51	K1 III	18	59	15.0	+3.575	+24	-21	04	15.25	+5.11	-12
713	7178	γ Lyrae	3.24	B9 II	18	59	53.9	+2.246	-2	+32	43	33.51	5.18	+2
712	7176	ε Aquilae	4.02	K1 III CN 0.5	19	00	46.8	+2.724	-35	+15	06	16.64	5.18	-74
716	7235	ζ Aquilae	2.99	A0 Vann	19	06	34.9	+2.758	-3	+13	54	11.13	5.64	-96
717	7236	λ Aquilae	3.44	A0 IVp(wk 4481)	19	07	36.1	+3.183	-11	-4	50	32.30	5.74	-90
1496	7234	τ Sagittarii	3.32	K1.5 IIIb	19	08	31.8	+3.740	-40	-27	37	51.10	+5.65	-251

No. 676 : *Eltanin*.No. 687 : *Purvasadha-1*.No. 689 : *Kaus Australis* , *Purvasadha-2*.No. 699 : *Vega* , *Abhijit*.No. 705 : *Sheliak* Mag. 3.3 to 4.3.No. 706 : *Nunki* , *Uttarasadha*.

MEAN PLACES OF STARS, J 2025.5
 FOR JULY 2^d.375 TERRESTRIAL TIME
 (The Annual Variations are for the middle of the year)

Cat. No. FK5	BS =HR No.	Star	Mag.	Spec- tral Type	Right Ascension			Annual Variation	Annual Proper motion	Declination			Annual Variation	Annual Proper motion
					h	m	s	s	s (0.0001)	°	'	"	"	" (0.001)
720	7264	π Sagittarii	2.89	F2 II-III	19	11	16.7	+3.563	0	-20	58	51.17	+6.10	-35
723	7310	δ Draconis	3.07	G9 III	19	12	33.2	-0.005	+164	+67	42	23.04	6.33	+93
726	7328	κ Cygni	3.77	G9 III	19	17	41.5	+1.384	+65	+53	24	59.06	6.79	+125
730	7377	δ Aquilae	3.36	F2 IV-V	19	26	47.0	+3.024	+171	+3	10	02.87	7.49	+83
1508	7405	α Vulpeculae	4.44	M0.5 IIIb	19	29	46.0	+2.498	-92	+24	43	04.96	7.54	-106
733	7420	ι Cygni	3.79	A4 V	19	30	20.9	+1.511	+21	+51	47	06.20	7.83	+130
732	7417	β Cygni* <i>p</i>	3.08	K3 II + B9.5 V	19	31	45.0	+2.421	+2	+28	00	52.91	+7.81	-2
1513	7488	β Sagittae	4.37	G8 IIIa CN 0.5	19	42	11.7	+2.695	+7	+17	32	12.19	8.61	-32
741	7525	γ Aquilae	2.72	K3 II	19	47	28.3	+2.852	+12	+10	40	37.49	9.06	-2
743	7536	δ Sagittae	3.82	M2 II + A0 V	19	48	31.5	+2.676	+5	+18	35	55.49	9.15	+8
745	7557	α Aquilae*	0.77	A7 Vnn	19	52	01.6	+2.926	+362	+8	56	14.66	9.80	+387
746	7570	η Aquilae	3.90V	F6-GI Ib	19	53	46.3	+3.054	+7	+1	04	22.33	9.54	-7
749	7602	β Aquilae*	3.71	G8 IV	19	56	33.9	+2.946	+33	+6	28	19.66	+9.28	-482
752	7635	γ Sagittae	3.47	M0 III	19	59	53.5	+2.669	+46	+19	33	46.63	10.04	+24
751	7623	θ Sagittarii	4.37	B2.5 IV	20	01	23.4	+3.889	+5	-35	12	18.78	10.10	-26
754	7665	δ Pavonis	3.56	G6/8 IV	20	11	12.1	+5.811	+1998	-66	06	49.68	9.73	-1125
756	7710	θ Aquilae	3.23	B9.5 III ⁺	20	12	37.2	+3.093	+26	-0	44	38.91	10.96	+4
757	7735	31 ϕ Cygni	3.79	K2 II+ B4 V	20	14	26.1	+1.890	+4	+46	49	11.08	11.10	+3
761	7754	α Capricorni*	3.57	G9III	20	19	28.0	+3.322	+44	-12	27	50.46	+11.46	+4
762	7776	β Capricorni	3.08	K0 II: + A5n: V:	20	22	26.5	+3.363	+29	-14	41	56.66	11.67	+2
765	7796	γ Cygni	2.20	F8 Ib	20	23	08.7	+2.155	+4	+40	20	22.17	11.72	0
764	7790	α Pavonis	1.94	B2.5 V	20	27	38.9	+4.700	+9	-56	39	03.49	11.95	-89
768	7852	ϵ Delphini	4.03	B6 III	20	34	25.9	+2.866	+9	+11	23	29.10	12.48	-22
(771)	7882	β Delphini*m	3.64	F5 IV	20	38	44.7	+2.814	+81	+14	41	06.43	12.75	-47
769	7869	α Indi	3.11	K0 III CN-1	20	39	21.0	+4.188	+52	-47	12	01.87	+12.90	+66
774	7906	α Delphini*	3.77	B9 IV	20	40	49.4	+2.787	+46	+16	00	12.14	12.93	-2
777	7924	α Cygni*	1.25	A2 Ia	20	42	18.1	+2.048	+3	+45	22	21.06	13.04	+2
778	7928	δ Delphini	4.43	F0m	20	44	39.0	+2.801	-13	+15	10	02.70	13.15	-43
783	7957	η Cephei	3.43	K0 IV	20	45	48.3	+1.209	+119	+61	56	18.42	14.09	+819
775	7913	β Pavonis	3.42	A6 IV ⁻	20	47	13.4	+5.316	-76	-66	06	32.35	13.37	+11
780	7949	ϵ Cygni	2.46	K0 III	20	47	14.7	+2.431	+286	+34	04	01.15	+13.69	+329
1541	7948	γ Delphini sq	4.27	K1 IV	20	47	50.5	+2.784	-22	+16	13	03.13	13.20	-197
781	7950	ϵ Aquarii	3.77	A1 III ⁺	20	49	03.2	+3.241	+24	-9	24	03.04	13.44	-34
1547	7990	μ Aquarii	4.73	F2m	20	54	01.6	+3.230	+30	-8	53	09.97	13.77	-30
785	7986	β Indi	3.65	K1 II	20	56	46.9	+4.632	+21	-58	21	20.97	13.95	-26
1550	8039	γ Microscopii	4.67	G8 III	21	02	50.9	+3.662	-2	-32	09	23.16	14.35	+5
792	8079	ξ Cygni	3.72	K4.5 Ib-II	21	05	51.6	+2.187	+8	+44	01	50.10	+14.53	+1
797	8115	ζ Cygni	3.20	G8 ⁺ III-IIIa Ba 0.5	21	14	01.4	+2.558	+1	+30	19	57.64	14.96	-56
800	8131	α Equulei	3.92	G2 II-III + A4 V	21	17	05.9	+2.998	+40	+5	21	16.40	15.10	-88
803	8162	α Cephei*	2.44	A7 V ⁻ n	21	19	11.2	+1.427	+219	+62	41	39.24	15.36	+50
806	8204	ζ Capricorni	3.74	G4 Ib: Ba 2	21	28	07.1	+3.413	+1	-22	17	58.32	+15.82	+23

* No. 732 : Albireo ., Mag. *f.* 5.4.
 No. 745 : Altair , Sraana.
 No. 749 : Alshain .
 No. 761 : Giedi or Algedi.

No. 771 : Rotanev , Dhanistha-1.
 No. 774 : Saulocin, Dhanistha-2.
 No. 777 : Deneb.
 No. 803 : Alderamin.

MEAN PLACES OF STARS, J 2025.5
 FOR JULY 2^d.375 TERRESTRIAL TIME
 (The Annual Variations are for the middle of the year)

Cat. No. FK5	BS =HR No.	Star	Mag.	Spec- tral Type	Right Ascension			Annual Variation	Annual Proper motion	Declination			Annual Variation	Annual Proper motion
					h	m	s	s	^s (0.0001)	°	'	"	"	" (0.001)
809	8238	β Cephei	3.23	B1 III	21	28	58.7	+0.745	+21	+70	40	22.64	+15.85	+7
808	8232	β Aquarii*	2.91	G0 Ib	21	32	54.0	+3.153	+14	-5	27	27.99	16.04	-8
1569	8264	ξ Aquarii	4.69	A5 Vn	21	39	06.4	+3.188	+78	-7	44	19.22	16.35	-25
812	8278	γ Capricorni	3.68	A7 m:	21	41	30.0	+3.314	+132	-16	32	45.34	16.47	-23
810	8254	ν Octantis	3.76	K0 III	21	44	12.7	+6.393	+141	-77	16	28.05	16.38	-240
815	8308	ε Pegasi*	2.34	K2 Ib-II	21	45	26.3	+2.947	+21	+9	59	34.61	16.68	-1
819	8322	δ Capricorni	2.87	F2m	21	48	26.7	+3.302	+183	-16	00	37.52	+16.53	-296
822	8353	γ Gruis	3.01	B8 IV-Vs	21	55	27.9	+3.609	+86	-37	14	37.57	17.13	-21
827	8414	α Aquarii*	2.96	G2 Ib	22	07	05.6	+3.079	+13	-0	11	42.11	17.65	-10
831	8430	ι Pegasi	3.76	F5 V	22	08	12.0	+2.799	+220	+25	28	13.79	17.73	+25
829	8425	α Gruis*	1.74	B7 Vn	22	09	49.7	+3.747	+126	-46	50	11.11	17.62	-151
834	8450	θ Pegasi	3.53	A2m AI IV-V	22	11	29.2	+3.026	+185	+6	19	27.15	17.86	+27
836	8465	ζ Cephei	3.35	K1.5 Ib	22	11	44.6	+2.092	+19	+58	19	39.26	+17.85	+4
841	8502	α Tucanae	2.86	K3 III	22	20	13.6	+4.047	-96	-60	07	53.11	18.13	-43
842	8518	γ Aquarii	3.84	B9.5 III-IV	22	22	58.3	+3.096	+88	-1	15	28.91	18.28	+7
846	8556	δ' Gruis	3.97	G6/8 III	22	30	47.0	+3.557	+26	-43	21	52.07	18.54	-5
848	8585	α Lacertae	3.77	A1 Va	22	32	20.9	+2.487	+144	+50	24	51.24	18.61	+19
849	8592	ν Aquarii	5.20	F5 V	22	36	05.1	+3.271	+158	-20	34	36.60	18.57	-144
850	8597	η Aquarii	4.02	B9 IV-V:n	22	36	40.0	+3.081	+61	+0	00	52.70	+18.67	-56
855	8634	ζ Pegasi	3.40	B8.5 III	22	42	44.1	+2.995	+55	+10	57	54.36	18.90	-12
856	8636	β Gruis	2.10	M4.5 III	22	44	10.7	+3.550	+133	-46	45	02.09	18.95	-8
857	8650	η Pegasi	2.94	G8 II + F0V	22	44	12.1	+2.822	+11	+30	21	18.81	18.93	-25
860	8675	ε Gruis	3.49	A2 Va	22	50	04.9	+3.586	+115	-51	10	55.60	19.04	-71
863	8694	ι Cephei	3.52	K0' III	22	50	35.7	+2.155	-108	+66	20	05.83	19.00	-125
861	8679	τ Aquarii	4.01	M0 III	22	50	56.4	+3.169	-8	-13	27	26.81	+19.10	-38
862	8684	μ Pegasi	3.48	G8 ⁺ III	22	51	14.2	+2.904	+108	+24	44	12.47	19.10	-42
864	8698	λ Aquarii*	3.74	M2.5 III Fe-0.5	22	53	56.6	+3.126	+8	-7	26	36.09	19.25	+37
866	8709	δ Aquarii	3.27	A3 IV-V	22	56	00.0	+3.176	-28	-15	41	04.74	19.24	-25
867	8728	α PsA*	1.16	A3 Va	22	59	03.3	+3.299	+255	-29	29	11.60	19.17	-164
869	8762	ο Andromedae	3.62	B6 pe (shell)	23	03	06.0	+2.777	+20	+42	27	48.42	19.42	-6
870	8775	β Pegasi*	2.42	M2.5 II-III	23	05	00.9	+2.919	+143	+28	13	17.71	+19.60	+138
871	8781	α Pegasi*	2.49	A0 III-IV	23	06	02.0	+2.994	+44	+15	20	34.45	19.45	-42
873	8812	88 Aquarii	3.66	K1.5 III	23	10	48.2	+3.189	+40	-21	02	00.82	19.61	+31
878	8852	γ Piscium	3.69	G9 III: Fe-2	23	18	29.3	+3.112	+509	+3	25	19.06	19.73	+17
890	8961	λ Andromedae	3.82v	G8 III-IV	23	38	49.3	+2.961	+157	+46	35	47.45	19.53	-421
893	8974	γ Cephei	3.21	K1 III-IV CN I	23	40	25.0	+2.528	-213	+77	46	29.75	20.12	+151
902	9072	ω Piscium	4.01	F4V	0	00	37.4	+3.086	+103	+7	00	15.96	+19.93	-115

BS = Bright Star Catalogue HR = Harvard Revised Catalogue FK5 = Fifth Fundamental Catalogue

* **No. 808 : Sadalsuud.**
No. 815 : Enif. Mag. 0.7 to 3.5.
No. 827 : Sadalmelik.
No. 829 : Al Nair.

No. 864 : Satabhisaj.
No. 867 : Fomalhaut.
No. 870 : Scheat, Purva Bhadrapada-2.
No. 871 : Markab, Purva Bhadrapada-1.

APPARENT PLACES OF STARS, 2025

FOR 0^h TERRESTRIAL TIME

Name	γ Pegasi (HR39)							α Phoenicis (HR 99)							β Ceti (HR 188) G9 III CH-1- CN 0.5 Ca I							β Andromedae (HR 337)						
Mag. Spect.	2.83			B2 IV				2.39			K0 III b				2.04							2.06			M0 ⁺ IIIa			
U.T.	Right			Declination				Right			Declination				Right			Declination				Right			Declination			
	Ascension							Ascension							Ascension							Ascension						
	h	m	s	°	'	"		h	m	s	°	'	"		h	m	s	°	'	"		h	m	s	°	'	"	
Jan.	1	0	14	31	+15	19	25	0	27	31	-42	10	28	0	44	51	-17	51	05	1	11	08	+35	45	22			
	11	0	14	31	15	19	25	0	27	31	42	10	28	0	44	51	17	51	06	1	11	08	35	45	22			
	21	0	14	31	15	19	24	0	27	31	42	10	27	0	44	51	17	51	06	1	11	08	35	45	21			
	31	0	14	31	15	19	23	0	27	31	42	10	26	0	44	50	17	51	06	1	11	08	35	45	20			
Feb.	10	0	14	31	15	19	22	0	27	31	42	10	25	0	44	50	17	51	06	1	11	08	35	45	19			
	20	0	14	31	15	19	21	0	27	30	42	10	23	0	44	50	17	51	05	1	11	07	35	45	17			
Mar.	2	0	14	31	+15	19	20	0	27	30	-42	10	21	0	44	50	-17	51	04	1	11	07	+35	45	16			
	12	0	14	31	15	19	19	0	27	30	42	10	18	0	44	50	17	51	03	1	11	07	35	45	14			
	22	0	14	31	15	19	19	0	27	30	42	10	16	0	44	50	17	51	02	1	11	07	35	45	13			
Apr.	1	0	14	31	15	19	18	0	27	30	42	10	13	0	44	50	17	51	00	1	11	07	35	45	11			
	11	0	14	31	15	19	18	0	27	31	42	10	09	0	44	50	17	50	58	1	11	07	35	45	10			
	21	0	14	31	15	19	18	0	27	31	42	10	06	0	44	50	17	50	56	1	11	08	35	45	09			
May	1	0	14	31	+15	19	19	0	27	31	-42	10	03	0	44	51	-17	50	54	1	11	08	+35	45	08			
	11	0	14	32	15	19	20	0	27	31	42	10	00	0	44	51	17	50	51	1	11	08	35	45	08			
	21	0	14	32	15	19	21	0	27	32	42	09	57	0	44	51	17	50	49	1	11	08	35	45	08			
	31	0	14	32	15	19	23	0	27	32	42	09	54	0	44	51	17	50	46	1	11	09	35	45	08			
June	10	0	14	33	15	19	24	0	27	32	42	09	52	0	44	52	17	50	44	1	11	09	35	45	09			
	20	0	14	33	15	19	26	0	27	33	42	09	50	0	44	52	17	50	42	1	11	09	35	45	10			
July	30	0	14	33	+15	19	28	0	27	33	-42	09	48	0	44	52	-17	50	39	1	11	10	+35	45	11			
	10	0	14	34	15	19	30	0	27	33	42	09	46	0	44	53	17	50	38	1	11	10	35	45	13			
	20	0	14	34	15	19	32	0	27	34	42	09	45	0	44	53	17	50	36	1	11	10	35	45	15			
	30	0	14	34	15	19	35	0	27	34	42	09	45	0	44	53	17	50	34	1	11	11	35	45	17			
Aug.	9	0	14	34	15	19	37	0	27	34	42	09	45	0	44	54	17	50	33	1	11	11	35	45	19			
	19	0	14	35	15	19	39	0	27	35	42	09	45	0	44	54	17	50	33	1	11	11	35	45	22			
Sept.	29	0	14	35	+15	19	41	0	27	35	-42	09	46	0	44	54	-17	50	32	1	11	12	+35	45	24			
	8	0	14	35	15	19	43	0	27	35	42	09	47	0	44	54	17	50	32	1	11	12	35	45	27			
	18	0	14	35	15	19	44	0	27	35	42	09	49	0	44	54	17	50	33	1	11	12	35	45	29			
	28	0	14	35	15	19	46	0	27	35	42	09	51	0	44	55	17	50	33	1	11	12	35	45	31			
Oct.	8	0	14	35	15	19	47	0	27	35	42	09	53	0	44	55	17	50	34	1	11	12	35	45	33			
	18	0	14	35	15	19	48	0	27	36	42	09	55	0	44	55	17	50	35	1	11	12	35	45	36			
Nov.	28	0	14	35	+15	19	48	0	27	35	-42	09	58	0	44	55	-17	50	37	1	11	12	+35	45	37			
	7	0	14	35	15	19	49	0	27	35	42	10	00	0	44	55	17	50	38	1	11	12	35	45	39			
	17	0	14	35	15	19	49	0	27	35	42	10	02	0	44	55	17	50	39	1	11	12	35	45	41			
	27	0	14	35	15	19	49	0	27	35	42	10	03	0	44	54	17	50	40	1	11	12	35	45	42			
Dec.	7	0	14	35	15	19	49	0	27	35	42	10	05	0	44	54	17	50	41	1	11	12	35	45	43			
	17	0	14	35	15	19	48	0	27	35	42	10	06	0	44	54	17	50	43	1	11	12	35	45	43			
	27	0	14	35	+15	19	48	0	27	35	-42	10	06	0	44	54	-17	50	43	1	11	12	+35	45	43			
	37	0	14	35	+15	19	47	0	27	34	-42	10	06	0	44	54	-17	50	44	1	11	12	+35	45	43			

APPARENT PLACES OF STARS, 2025

FOR 0^h TERRESTRIAL TIME

Name		ζ Ceti (HR 539)						ν Ceti (HR 585)						α Arietis (HR 617)						α Ceti (HR 911)					
Mag.	Spect.	3.73			K0 III			4.00			M0 IIIb			2.00			K2 IIIab			2.53			M1.5 IIIa		
U.T.		Right			Declination			Right			Declination			Right			Declination			Right			Declination		
		Ascension						Ascension						Ascension						Ascension					
		h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"
Jan	1	1	52	42	-10	12	46	2	01	12	-20	57	32	2	08	36	+23	34	57	3	03	36	+4	11	17
Jan	11	1	52	42	10	12	47	2	01	12	20	57	33	2	08	36	23	34	57	3	03	36	4	11	16
Jan	21	1	52	42	10	12	47	2	01	11	20	57	33	2	08	35	23	34	56	3	03	36	4	11	15
Jan	31	1	52	42	10	12	47	2	01	11	20	57	33	2	08	35	23	34	56	3	03	36	4	11	15
Feb	10	1	52	42	10	12	48	2	01	11	20	57	33	2	08	35	23	34	55	3	03	36	4	11	14
Feb	20	1	52	42	10	12	48	2	01	11	20	57	33	2	08	35	23	34	54	3	03	36	4	11	14
Mar	2	1	52	42	-10	12	47	2	01	11	-20	57	32	2	08	35	+23	34	53	3	03	35	+4	11	14
Mar	12	1	52	41	10	12	46	2	01	11	20	57	31	2	08	35	23	34	53	3	03	35	4	11	14
Mar	22	1	52	41	10	12	46	2	01	11	20	57	30	2	08	35	23	34	52	3	03	35	4	11	14
Apr	1	1	52	41	10	12	45	2	01	11	20	57	28	2	08	35	23	34	51	3	03	35	4	11	14
Apr	11	1	52	41	10	12	43	2	01	11	20	57	26	2	08	35	23	34	50	3	03	35	4	11	15
Apr	21	1	52	41	10	12	42	2	01	11	20	57	24	2	08	35	23	34	50	3	03	35	4	11	15
May	1	1	52	42	-10	12	40	2	01	11	-20	57	22	2	08	35	+23	34	49	3	03	35	+4	11	16
May	11	1	52	42	10	12	38	2	01	11	20	57	19	2	08	35	23	34	49	3	03	35	4	11	17
May	21	1	52	42	10	12	36	2	01	11	20	57	16	2	08	35	23	34	50	3	03	35	4	11	18
May	31	1	52	42	10	12	33	2	01	11	20	57	14	2	08	35	23	34	50	3	03	36	4	11	20
Jun	10	1	52	42	10	12	31	2	01	12	20	57	11	2	08	36	23	34	51	3	03	36	4	11	21
Jun	20	1	52	43	10	12	29	2	01	12	20	57	09	2	08	36	23	34	52	3	03	36	4	11	23
Jun	30	1	52	43	-10	12	27	2	01	12	-20	57	06	2	08	36	+23	34	54	3	03	36	+4	11	25
Jul	10	1	52	43	10	12	25	2	01	12	20	57	04	2	08	37	23	34	55	3	03	37	4	11	26
Jul	20	1	52	44	10	12	23	2	01	13	20	57	02	2	08	37	23	34	57	3	03	37	4	11	28
Jul	30	1	52	44	10	12	21	2	01	13	20	57	00	2	08	37	23	34	59	3	03	37	4	11	30
Aug	9	1	52	44	10	12	19	2	01	13	20	56	59	2	08	38	23	35	00	3	03	37	4	11	31
Aug	19	1	52	45	10	12	18	2	01	14	20	56	58	2	08	38	23	35	02	3	03	38	4	11	33
Aug	29	1	52	45	-10	12	18	2	01	14	-20	56	58	2	08	38	+23	35	04	3	03	38	+4	11	34
Sep	8	1	52	45	10	12	17	2	01	14	20	56	58	2	08	39	23	35	06	3	03	38	4	11	35
Sep	18	1	52	45	10	12	17	2	01	15	20	56	58	2	08	39	23	35	07	3	03	39	4	11	36
Sep	28	1	52	45	10	12	17	2	01	15	20	56	59	2	08	39	23	35	09	3	03	39	4	11	36
Oct	8	1	52	46	10	12	18	2	01	15	20	57	00	2	08	39	23	35	10	3	03	39	4	11	36
Oct	18	1	52	46	10	12	18	2	01	15	20	57	01	2	08	39	23	35	12	3	03	39	4	11	36
Oct	28	1	52	46	-10	12	19	2	01	15	-20	57	03	2	08	40	+23	35	13	3	03	39	+4	11	36
Nov	7	1	52	46	10	12	20	2	01	15	20	57	04	2	08	40	23	35	13	3	03	39	4	11	35
Nov	17	1	52	46	10	12	21	2	01	15	20	57	06	2	08	40	23	35	14	3	03	40	4	11	35
Nov	27	1	52	46	10	12	23	2	01	15	20	57	08	2	08	40	23	35	15	3	03	40	4	11	34
Dec	7	1	52	46	10	12	24	2	01	15	20	57	09	2	08	40	23	35	15	3	03	40	4	11	34
Dec	17	1	52	46	10	12	25	2	01	15	20	57	11	2	08	40	23	35	15	3	03	40	4	11	33
Dec	27	1	52	46	-10	12	26	2	01	15	-20	57	12	2	08	40	+23	35	16	3	03	40	+4	11	32
Jan	37	1	52	46	-10	12	27	2	01	15	-20	57	13	2	08	39	+23	35	15	3	03	40	+4	11	32

APPARENT PLACES OF STARS, 2025

FOR 0^h TERRESTRIAL TIME

Name	FOR O'ERREKLE TIME																							
Mag. Spect.	η Tauri (HR 1165)						α Tauri (HR 1457)						β Eridani (HR 1666)						γ Orionis (HR 1790)					
	2.87			B7 IIIIn			0.85			K5+III			2.79			A3 IVn			1.64			B2 III		
U.T.	Right			Declination			Right			Declination			Right			Declination			Right			Declination		
	Ascension						Ascension						Ascension						Ascension					
	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"
Jan 1	3	49	00	+24	11	01	4	37	23	+16	33	36	5	09	06	-5	03	15	5	26	30	+6	22	21
Jan 11	3	48	59	24	11	01	4	37	23	16	33	36	5	09	06	5	03	17	5	26	30	6	22	20
Jan 21	3	48	59	24	11	02	4	37	23	16	33	36	5	09	06	5	03	18	5	26	30	6	22	19
Jan 31	3	48	59	24	11	02	4	37	23	16	33	36	5	09	06	5	03	19	5	26	30	6	22	19
Feb 10	3	48	59	24	11	01	4	37	22	16	33	36	5	09	06	5	03	20	5	26	30	6	22	18
Feb 20	3	48	59	24	11	01	4	37	22	16	33	35	5	09	06	5	03	20	5	26	29	6	22	18
Mar 2	3	48	59	+24	11	01	4	37	22	+16	33	35	5	09	06	-5	03	21	5	26	29	+6	22	18
Mar 12	3	48	59	24	11	00	4	37	22	16	33	35	5	09	05	5	03	21	5	26	29	6	22	17
Mar 22	3	48	58	24	10	59	4	37	22	16	33	35	5	09	05	5	03	21	5	26	29	6	22	17
Apr 1	3	48	58	24	10	59	4	37	22	16	33	35	5	09	05	5	03	20	5	26	29	6	22	17
Apr 11	3	48	58	24	10	59	4	37	22	16	33	35	5	09	05	5	03	20	5	26	29	6	22	18
Apr 21	3	48	58	24	10	58	4	37	21	16	33	34	5	09	05	5	03	19	5	26	29	6	22	18
May 1	3	48	58	+24	10	57	4	37	21	+16	33	34	5	09	05	-5	03	18	5	26	28	+6	22	18
May 11	3	48	58	24	10	57	4	37	21	16	33	35	5	09	05	5	03	17	5	26	28	6	22	19
May 21	3	48	58	24	10	57	4	37	21	16	33	35	5	09	05	5	03	16	5	26	28	6	22	20
May 31	3	48	59	24	10	57	4	37	22	16	33	35	5	09	05	5	03	14	5	26	28	6	22	20
Jun 10	3	48	59	24	10	57	4	37	22	16	33	36	5	09	05	5	03	13	5	26	29	6	22	21
Jun 20	3	48	59	24	10	58	4	37	22	16	33	36	5	09	05	5	03	11	5	26	29	6	22	23
Jun 30	3	48	59	+24	10	59	4	37	22	+16	33	37	5	09	05	-5	03	09	5	26	29	+6	22	24
Jul 10	3	49	00	24	10	59	4	37	22	16	33	38	5	09	05	5	03	07	5	26	29	6	22	25
Jul 20	3	49	00	24	11	00	4	37	23	16	33	39	5	09	06	5	03	05	5	26	29	6	22	26
Jul 30	3	49	00	24	11	01	4	37	23	16	33	40	5	09	06	5	03	04	5	26	30	6	22	27
Aug 9	3	49	01	24	11	03	4	37	23	16	33	41	5	09	06	5	03	02	5	26	30	6	22	28
Aug 19	3	49	01	24	11	04	4	37	24	16	33	42	5	09	06	5	03	01	5	26	30	6	22	29
Aug 29	3	49	01	+24	11	05	4	37	24	+16	33	43	5	09	07	-5	03	00	5	26	30	+6	22	30
Sep 8	3	49	02	24	11	06	4	37	24	16	33	43	5	09	07	5	02	59	5	26	31	6	22	30
Sep 18	3	49	02	24	11	07	4	37	25	16	33	44	5	09	07	5	02	59	5	26	31	6	22	31
Sep 28	3	49	02	24	11	08	4	37	25	16	33	44	5	09	08	5	02	59	5	26	31	6	22	31
Oct 8	3	49	02	24	11	09	4	37	25	16	33	45	5	09	08	5	02	59	5	26	32	6	22	31
Oct 18	3	49	03	24	11	10	4	37	25	16	33	45	5	09	08	5	03	00	5	26	32	6	22	30
Oct 28	3	49	03	+24	11	10	4	37	26	+16	33	45	5	09	08	-5	03	01	5	26	32	+6	22	30
Nov 7	3	49	03	24	11	11	4	37	26	16	33	45	5	09	09	5	03	02	5	26	32	6	22	29
Nov 17	3	49	03	24	11	12	4	37	26	16	33	45	5	09	09	5	03	04	5	26	33	6	22	28
Nov 27	3	49	03	24	11	12	4	37	26	16	33	45	5	09	09	5	03	05	5	26	33	6	22	27
Dec 7	3	49	03	24	11	12	4	37	26	16	33	44	5	09	09	5	03	07	5	26	33	6	22	26
Dec 17	3	49	04	24	11	13	4	37	26	16	33	44	5	09	09	5	03	09	5	26	33	6	22	25
Dec 27	3	49	04	+24	11	13	4	37	26	+16	33	44	5	09	09	-5	03	10	5	26	33	+6	22	24
Jan 37	3	49	04	+24	11	13	4	37	27	+16	33	44	5	09	09	-5	03	12	5	26	33	+6	22	23

APPARENT PLACES OF STARS, 2025

FOR 0^h TERRESTRIAL TIME

Name Mag. Spect.		β Leporis (HR 1829) 2.84 G5 II						ι Orionis (HR 1899) 2.77 O9 III						α Columbae (HR 1956) 2.64 B7 IV						κ Orionis (HR 2004) 2.06 B0.5 Ia					
U.T.		Right Ascension			Declination			Right Ascension			Declination			Right Ascension			Declination			Right Ascension			Declination		
		h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"
Jan	1	5	29	21	-20	44	23	5	36	41	-5	53	37	5	40	35	-34	03	40	5	48	58	-9	39	39
Jan	11	5	29	20	20	44	26	5	36	41	5	53	39	5	40	35	34	03	43	5	48	58	9	39	41
Jan	21	5	29	20	20	44	27	5	36	41	5	53	40	5	40	35	34	03	45	5	48	58	9	39	42
Jan	31	5	29	20	20	44	29	5	36	41	5	53	41	5	40	35	34	03	47	5	48	58	9	39	44
Feb	10	5	29	20	20	44	30	5	36	41	5	53	42	5	40	35	34	03	49	5	48	58	9	39	45
Feb	20	5	29	20	20	44	31	5	36	40	5	53	43	5	40	34	34	03	50	5	48	58	9	39	46
Mar	2	5	29	20	-20	44	32	5	36	40	-5	53	43	5	40	34	-34	03	51	5	48	58	-9	39	46
Mar	12	5	29	20	20	44	32	5	36	40	5	53	43	5	40	34	34	03	51	5	48	57	9	39	46
Mar	22	5	29	19	20	44	32	5	36	40	5	53	43	5	40	34	34	03	51	5	48	57	9	39	47
Apr	1	5	29	19	20	44	32	5	36	40	5	53	43	5	40	33	34	03	51	5	48	57	9	39	46
Apr	11	5	29	19	20	44	31	5	36	40	5	53	43	5	40	33	34	03	50	5	48	57	9	39	46
Apr	21	5	29	19	20	44	30	5	36	40	5	53	42	5	40	33	34	03	49	5	48	57	9	39	45
May	1	5	29	19	-20	44	28	5	36	39	-5	53	41	5	40	33	-34	03	47	5	48	57	-9	39	44
May	11	5	29	19	20	44	27	5	36	39	5	53	40	5	40	33	34	03	45	5	48	57	9	39	43
May	21	5	29	19	20	44	25	5	36	39	5	53	39	5	40	33	34	03	42	5	48	57	9	39	41
May	31	5	29	19	20	44	23	5	36	39	5	53	37	5	40	33	34	03	40	5	48	57	9	39	40
Jun	10	5	29	19	20	44	20	5	36	39	5	53	36	5	40	33	34	03	37	5	48	57	9	39	38
Jun	20	5	29	19	20	44	18	5	36	40	5	53	34	5	40	33	34	03	34	5	48	57	9	39	36
Jun	30	5	29	19	-20	44	15	5	36	40	-5	53	32	5	40	33	-34	03	31	5	48	57	-9	39	34
Jul	10	5	29	19	20	44	13	5	36	40	5	53	31	5	40	33	34	03	28	5	48	57	9	39	33
Jul	20	5	29	19	20	44	11	5	36	40	5	53	29	5	40	33	34	03	26	5	48	57	9	39	31
Jul	30	5	29	20	20	44	08	5	36	40	5	53	27	5	40	34	34	03	23	5	48	57	9	39	29
Aug	9	5	29	20	20	44	06	5	36	41	5	53	26	5	40	34	34	03	21	5	48	58	9	39	27
Aug	19	5	29	20	20	44	05	5	36	41	5	53	25	5	40	34	34	03	19	5	48	58	9	39	26
Aug	29	5	29	21	-20	44	04	5	36	41	-5	53	23	5	40	34	-34	03	17	5	48	58	-9	39	25
Sep	8	5	29	21	20	44	03	5	36	41	5	53	23	5	40	35	34	03	16	5	48	59	9	39	24
Sep	18	5	29	21	20	44	03	5	36	42	5	53	22	5	40	35	34	03	16	5	48	59	9	39	24
Sep	28	5	29	21	20	44	03	5	36	42	5	53	23	5	40	35	34	03	16	5	48	59	9	39	24
Oct	8	5	29	22	20	44	03	5	36	42	5	53	23	5	40	36	34	03	17	5	48	59	9	39	24
Oct	18	5	29	22	20	44	04	5	36	43	5	53	23	5	40	36	34	03	18	5	49	00	9	39	25
Oct	28	5	29	22	-20	44	06	5	36	43	-5	53	25	5	40	36	-34	03	20	5	49	00	-9	39	26
Nov	7	5	29	23	20	44	08	5	36	43	5	53	26	5	40	37	34	03	22	5	49	00	9	39	28
Nov	17	5	29	23	20	44	10	5	36	43	5	53	27	5	40	37	34	03	25	5	49	00	9	39	29
Nov	27	5	29	23	20	44	12	5	36	44	5	53	29	5	40	37	34	03	28	5	49	01	9	39	31
Dec	7	5	29	23	20	44	15	5	36	44	5	53	31	5	40	37	34	03	31	5	49	01	9	39	33
Dec	17	5	29	23	20	44	17	5	36	44	5	53	33	5	40	37	34	03	34	5	49	01	9	39	35
Dec	27	5	29	23	-20	44	20	5	36	44	-5	53	34	5	40	37	-34	03	37	5	49	01	-9	39	37
Jan	37	5	29	23	-20	44	22	5	36	44	-5	53	36	5	40	37	-34	03	40	5	49	01	-9	39	39

APPARENT PLACES OF STARS, 2025

FOR 0^h TERRESTRIAL TIME

Name		α Orionis (HR 2061)					ζ Canis Majoris (HR 2282)					α Carinae (HR 2326)					γ Geminorum (HR 2421)								
Mag.	Spect.	0.4 - 1.3 M1 M2 Ia Iab					3.02 B2.5V					-0.72 A9 II					1.93 A1 IVs								
U.T.		Right		Declination			Right		Declination			Right		Declination			Right		Declination						
		Ascension					Ascension					Ascension					Ascension								
		h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"
Jan	1	5	56	33	+7	24	42	6	21	18	-30	04	27	6	24	33	-52	42	30	6	39	11	+16	22	39
Jan	11	5	56	33	7	24	41	6	21	18	30	04	30	6	24	33	52	42	34	6	39	11	16	22	38
Jan	21	5	56	33	7	24	41	6	21	18	30	04	32	6	24	33	52	42	37	6	39	11	16	22	38
Jan	31	5	56	33	7	24	40	6	21	18	30	04	35	6	24	32	52	42	40	6	39	11	16	22	38
Feb	10	5	56	33	7	24	40	6	21	18	30	04	37	6	24	32	52	42	42	6	39	11	16	22	38
Feb	20	5	56	33	7	24	39	6	21	18	30	04	38	6	24	32	52	42	44	6	39	11	16	22	38
Mar	2	5	56	33	+7	24	39	6	21	17	-30	04	40	6	24	32	-52	42	46	6	39	11	+16	22	38
Mar	12	5	56	32	7	24	39	6	21	17	30	04	40	6	24	31	52	42	47	6	39	11	16	22	38
Mar	22	5	56	32	7	24	39	6	21	17	30	04	41	6	24	31	52	42	48	6	39	10	16	22	38
Apr	1	5	56	32	7	24	39	6	21	17	30	04	41	6	24	30	52	42	47	6	39	10	16	22	38
Apr	11	5	56	32	7	24	39	6	21	17	30	04	40	6	24	30	52	42	47	6	39	10	16	22	38
Apr	21	5	56	32	7	24	39	6	21	16	30	04	39	6	24	30	52	42	46	6	39	10	16	22	38
May	1	5	56	32	+7	24	40	6	21	16	-30	04	38	6	24	30	-52	42	45	6	39	10	+16	22	38
May	11	5	56	32	7	24	40	6	21	16	30	04	36	6	24	29	52	42	42	6	39	10	16	22	39
May	21	5	56	32	7	24	41	6	21	16	30	04	34	6	24	29	52	42	40	6	39	10	16	22	39
May	31	5	56	32	7	24	41	6	21	16	30	04	32	6	24	29	52	42	38	6	39	10	16	22	39
Jun	10	5	56	32	7	24	42	6	21	16	30	04	30	6	24	29	52	42	35	6	39	10	16	22	39
Jun	20	5	56	32	7	24	43	6	21	16	30	04	27	6	24	29	52	42	31	6	39	10	16	22	40
Jun	30	5	56	32	+7	24	44	6	21	16	-30	04	24	6	24	29	-52	42	28	6	39	10	+16	22	40
Jul	10	5	56	32	7	24	45	6	21	16	30	04	22	6	24	29	52	42	25	6	39	10	16	22	40
Jul	20	5	56	32	7	24	46	6	21	16	30	04	19	6	24	29	52	42	22	6	39	10	16	22	40
Jul	30	5	56	33	7	24	47	6	21	17	30	04	17	6	24	29	52	42	19	6	39	10	16	22	41
Aug	9	5	56	33	7	24	48	6	21	17	30	04	14	6	24	30	52	42	16	6	39	11	16	22	41
Aug	19	5	56	33	7	24	49	6	21	17	30	04	13	6	24	30	52	42	14	6	39	11	16	22	41
Aug	29	5	56	33	+7	24	49	6	21	17	-30	04	11	6	24	30	-52	42	12	6	39	11	+16	22	41
Sep	8	5	56	34	7	24	50	6	21	18	30	04	10	6	24	31	52	42	10	6	39	11	16	22	41
Sep	18	5	56	34	7	24	50	6	21	18	30	04	09	6	24	31	52	42	09	6	39	12	16	22	41
Sep	28	5	56	34	7	24	50	6	21	18	30	04	09	6	24	31	52	42	09	6	39	12	16	22	41
Oct	8	5	56	35	7	24	50	6	21	19	30	04	09	6	24	32	52	42	09	6	39	12	16	22	41
Oct	18	5	56	35	7	24	49	6	21	19	30	04	10	6	24	32	52	42	11	6	39	13	16	22	40
Oct	28	5	56	35	+7	24	49	6	21	19	-30	04	12	6	24	33	-52	42	12	6	39	13	+16	22	39
Nov	7	5	56	36	7	24	48	6	21	20	30	04	14	6	24	33	52	42	15	6	39	13	16	22	39
Nov	17	5	56	36	7	24	47	6	21	20	30	04	16	6	24	33	52	42	17	6	39	14	16	22	38
Nov	27	5	56	36	7	24	46	6	21	20	30	04	19	6	24	34	52	42	20	6	39	14	16	22	37
Dec	7	5	56	36	7	24	45	6	21	20	30	04	22	6	24	34	52	42	24	6	39	14	16	22	36
Dec	17	5	56	36	7	24	44	6	21	20	30	04	25	6	24	34	52	42	27	6	39	14	16	22	36
Dec	27	5	56	37	+7	24	43	6	21	21	-30	04	28	6	24	34	-52	42	31	6	39	15	+16	22	35
Jan	37	5	56	37	+7	24	42	6	21	21	-30	04	31	6	24	34	-52	42	35	6	39	15	+16	22	34

APPARENT PLACES OF STARS, 2025

FOR 0^h TERRESTRIAL TIME

Name		α Canis Majoris A (HR 2491)					σ^2 Canis Majoris (HR 2653)					β Canis Minoris (HR 2845)					α Canis Minoris A (HR 2943)								
Mag.	Spect.	-1.46 A0m A1 Va					3.02 B3 Ia					2.90 B8 V					0.38 F5 IV-V								
U.T.		Right Declination					Right Declination					Right Declination					Right Declination								
		Ascension					Ascension					Ascension					Ascension								
		h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"
Jan	1	6	46	16	-16	45	01	7	04	06	-23	52	09	7	28	32	+8	14	19	7	40	38	+5	09	38
Jan	11	6	46	16	16	45	03	7	04	06	23	52	12	7	28	32	8	14	18	7	40	38	5	09	37
Jan	21	6	46	17	16	45	05	7	04	06	23	52	14	7	28	32	8	14	17	7	40	38	5	09	36
Jan	31	6	46	16	16	45	07	7	04	06	23	52	17	7	28	32	8	14	16	7	40	38	5	09	35
Feb	10	6	46	16	16	45	09	7	04	06	23	52	19	7	28	32	8	14	16	7	40	38	5	09	34
Feb	20	6	46	16	16	45	11	7	04	06	23	52	21	7	28	32	8	14	15	7	40	38	5	09	33
Mar	2	6	46	16	-16	45	12	7	04	05	-23	52	22	7	28	32	+8	14	15	7	40	38	+5	09	33
Mar	12	6	46	16	16	45	12	7	04	05	23	52	23	7	28	32	8	14	15	7	40	38	5	09	32
Mar	22	6	46	16	16	45	13	7	04	05	23	52	24	7	28	32	8	14	15	7	40	38	5	09	32
Apr	1	6	46	16	16	45	13	7	04	05	23	52	24	7	28	31	8	14	15	7	40	38	5	09	32
Apr	11	6	46	15	16	45	12	7	04	05	23	52	24	7	28	31	8	14	15	7	40	38	5	09	33
Apr	21	6	46	15	16	45	12	7	04	04	23	52	24	7	28	31	8	14	15	7	40	37	5	09	33
May	1	6	46	15	-16	45	11	7	04	04	-23	52	23	7	28	31	+8	14	16	7	40	37	+5	09	33
May	11	6	46	15	16	45	10	7	04	04	23	52	21	7	28	31	8	14	16	7	40	37	5	09	34
May	21	6	46	15	16	45	09	7	04	04	23	52	20	7	28	31	8	14	17	7	40	37	5	09	34
May	31	6	46	15	16	45	07	7	04	04	23	52	18	7	28	31	8	14	17	7	40	37	5	09	35
Jun	10	6	46	15	16	45	05	7	04	04	23	52	16	7	28	31	8	14	18	7	40	37	5	09	35
Jun	20	6	46	15	16	45	03	7	04	04	23	52	14	7	28	31	8	14	18	7	40	37	5	09	36
Jun	30	6	46	15	-16	45	01	7	04	04	-23	52	12	7	28	31	+8	14	19	7	40	37	+5	09	37
Jul	10	6	46	15	16	44	59	7	04	04	23	52	10	7	28	31	8	14	19	7	40	37	5	09	37
Jul	20	6	46	15	16	44	57	7	04	04	23	52	07	7	28	31	8	14	20	7	40	37	5	09	38
Jul	30	6	46	15	16	44	55	7	04	04	23	52	05	7	28	31	8	14	21	7	40	37	5	09	39
Aug	9	6	46	16	16	44	54	7	04	05	23	52	03	7	28	31	8	14	21	7	40	38	5	09	39
Aug	19	6	46	16	16	44	52	7	04	05	23	52	01	7	28	32	8	14	21	7	40	38	5	09	40
Aug	29	6	46	16	-16	44	51	7	04	05	-23	51	59	7	28	32	+8	14	22	7	40	38	+5	09	40
Sep	8	6	46	16	16	44	50	7	04	05	23	51	58	7	28	32	8	14	22	7	40	38	5	09	40
Sep	18	6	46	17	16	44	50	7	04	06	23	51	58	7	28	32	8	14	22	7	40	38	5	09	40
Sep	28	6	46	17	16	44	50	7	04	06	23	51	57	7	28	33	8	14	21	7	40	39	5	09	40
Oct	8	6	46	17	16	44	50	7	04	06	23	51	58	7	28	33	8	14	21	7	40	39	5	09	39
Oct	18	6	46	18	16	44	51	7	04	06	23	51	58	7	28	33	8	14	20	7	40	39	5	09	38
Oct	28	6	46	18	-16	44	52	7	04	07	-23	52	00	7	28	34	+8	14	19	7	40	40	+5	09	37
Nov	7	6	46	18	16	44	54	7	04	07	23	52	01	7	28	34	8	14	18	7	40	40	5	09	36
Nov	17	6	46	18	16	44	56	7	04	07	23	52	03	7	28	34	8	14	16	7	40	40	5	09	34
Nov	27	6	46	19	16	44	58	7	04	08	23	52	06	7	28	35	8	14	15	7	40	41	5	09	33
Dec	7	6	46	19	16	45	01	7	04	08	23	52	09	7	28	35	8	14	13	7	40	41	5	09	31
Dec	17	6	46	19	16	45	03	7	04	08	23	52	11	7	28	35	8	14	12	7	40	41	5	09	30
Dec	27	6	46	19	-16	45	06	7	04	08	-23	52	14	7	28	35	+8	14	11	7	40	41	+5	09	28
Jan	37	6	46	19	-16	45	08	7	04	08	-23	52	17	7	28	35	+8	14	10	7	40	42	+5	09	27

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Name Mag. Spect.		β Geminorum(HR 2990) 1.14 K0 IIIb					ξ Puppis(HR 3045) 3.34 G6 Iab-Ib					ρ Puppis(HR 3185) 2.81 F5 (Ib-II)p					ζ Hydrae(HR 3547) 3.11 G9 IIIa				
U.T.		Right Ascension					Right Ascension					Right Ascension					Right Ascension				
		h	m	s	°	'	h	m	s	°	'	h	m	s	°	'	h	m	s	°	'
Jan	1	7	46	52	+27	57	7	50	22	-24	55	8	08	38	-24	22	8	56	44	+5	50
Jan	11	7	46	52	27	57	7	50	22	24	55	8	08	38	24	22	8	56	44	5	50
Jan	21	7	46	52	27	57	7	50	22	24	55	8	08	38	24	22	8	56	44	5	50
Jan	31	7	46	53	27	57	7	50	22	24	55	8	08	38	24	22	8	56	45	5	50
Feb	10	7	46	53	27	57	7	50	22	24	55	8	08	38	24	22	8	56	45	5	50
Feb	20	7	46	53	27	57	7	50	22	24	55	8	08	38	24	22	8	56	45	5	50
Mar	2	7	46	52	+27	57	7	50	22	-24	55	8	08	38	-24	22	8	56	45	+5	50
Mar	12	7	46	52	27	57	7	50	22	24	55	8	08	38	24	22	8	56	45	5	50
Mar	22	7	46	52	27	57	7	50	22	24	55	8	08	38	24	22	8	56	45	5	50
Apr	1	7	46	52	27	57	7	50	22	24	55	8	08	38	24	22	8	56	44	5	50
Apr	11	7	46	52	27	57	7	50	21	24	55	8	08	37	24	22	8	56	44	5	50
Apr	21	7	46	52	27	57	7	50	21	24	55	8	08	37	24	22	8	56	44	5	50
May	1	7	46	51	+27	57	7	50	21	-24	55	8	08	37	-24	22	8	56	44	+5	50
May	11	7	46	51	27	57	7	50	21	24	55	8	08	37	24	22	8	56	44	5	50
May	21	7	46	51	27	57	7	50	21	24	55	8	08	37	24	22	8	56	44	5	50
May	31	7	46	51	27	57	7	50	21	24	55	8	08	37	24	22	8	56	44	5	50
Jun	10	7	46	51	27	57	7	50	21	24	55	8	08	37	24	22	8	56	44	5	50
Jun	20	7	46	51	27	57	7	50	21	24	55	8	08	36	24	22	8	56	44	5	50
Jun	30	7	46	51	+27	57	7	50	21	-24	55	8	08	36	-24	22	8	56	44	+5	50
Jul	10	7	46	51	27	57	7	50	21	24	55	8	08	37	24	22	8	56	44	5	50
Jul	20	7	46	51	27	57	7	50	21	24	55	8	08	37	24	22	8	56	44	5	50
Jul	30	7	46	52	27	57	7	50	21	24	55	8	08	37	24	22	8	56	44	5	50
Aug	9	7	46	52	27	57	7	50	21	24	55	8	08	37	24	22	8	56	44	5	50
Aug	19	7	46	52	27	57	7	50	21	24	55	8	08	37	24	22	8	56	44	5	50
Aug	29	7	46	52	+27	57	7	50	21	-24	55	8	08	37	-24	22	8	56	44	+5	50
Sep	8	7	46	53	27	57	7	50	22	24	55	8	08	37	24	22	8	56	44	5	50
Sep	18	7	46	53	27	57	7	50	22	24	55	8	08	38	24	22	8	56	44	5	50
Sep	28	7	46	53	27	57	7	50	22	24	55	8	08	38	24	22	8	56	45	5	50
Oct	8	7	46	53	27	57	7	50	22	24	55	8	08	38	24	22	8	56	45	5	50
Oct	18	7	46	54	27	57	7	50	23	24	55	8	08	38	24	22	8	56	45	5	50
Oct	28	7	46	54	+27	57	7	50	23	-24	55	8	08	39	-24	22	8	56	46	+5	50
Nov	7	7	46	55	27	57	7	50	23	24	55	8	08	39	24	22	8	56	46	5	50
Nov	17	7	46	55	27	57	7	50	24	24	55	8	08	39	24	22	8	56	46	5	50
Nov	27	7	46	55	27	57	7	50	24	24	55	8	08	40	24	22	8	56	47	5	50
Dec	7	7	46	56	27	57	7	50	24	24	55	8	08	40	24	22	8	56	47	5	50
Dec	17	7	46	56	27	57	7	50	25	24	55	8	08	40	24	22	8	56	47	5	50
Dec	27	7	46	56	+27	57	7	50	25	-24	55	8	08	41	-24	22	8	56	47	+5	50
Jan	37	7	46	56	+27	57	7	50	25	-24	55	8	08	41	-24	22	8	56	48	+5	50

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Name		λ Velorum(HR 3634)					α Hydrae(HR 3748)					α Leonis(HR 3982)					α Antliae(HR 4104)				
Mag.	Spect.	2.21 K4.5 Ib					1.98 K3 II-III					1.35 B7 Vn					4.25 K4.5 III				
U.T.		Right Declination					Right Declination					Right Declination					Right Declination				
		Ascension					Ascension					Ascension					Ascension				
		h	m	s	°	'	h	m	s	°	'	h	m	s	°	'	h	m	s	°	'
Jan	1	9	08	56	-43	31	9	28	50	-8	46	10	09	43	+11	50	10	28	18	-31	11
Jan	11	9	08	56	43	31	9	28	50	8	46	10	09	43	11	50	10	28	19	31	11
Jan	21	9	08	57	43	31	9	28	50	8	46	10	09	44	11	50	10	28	19	31	11
Jan	31	9	08	57	43	32	9	28	51	8	46	10	09	44	11	50	10	28	19	31	11
Feb	10	9	08	57	43	32	9	28	51	8	46	10	09	44	11	50	10	28	19	31	11
Feb	20	9	08	57	43	32	9	28	51	8	46	10	09	44	11	50	10	28	20	31	11
Mar	2	9	08	57	-43	32	9	28	51	-8	46	10	09	44	+11	50	10	28	20	-31	11
Mar	12	9	08	57	43	32	9	28	51	8	46	10	09	44	11	50	10	28	20	31	11
Mar	22	9	08	56	43	32	9	28	51	8	46	10	09	44	11	50	10	28	20	31	11
Apr	1	9	08	56	43	32	9	28	50	8	46	10	09	44	11	50	10	28	19	31	11
Apr	11	9	08	56	43	32	9	28	50	8	46	10	09	44	11	50	10	28	19	31	12
Apr	21	9	08	56	43	32	9	28	50	8	46	10	09	44	11	50	10	28	19	31	12
May	1	9	08	55	-43	32	9	28	50	-8	46	10	09	44	+11	50	10	28	19	-31	12
May	11	9	08	55	43	32	9	28	50	8	46	10	09	44	11	50	10	28	19	31	12
May	21	9	08	55	43	32	9	28	50	8	46	10	09	43	11	50	10	28	19	31	12
May	31	9	08	55	43	32	9	28	50	8	46	10	09	43	11	50	10	28	19	31	12
Jun	10	9	08	55	43	32	9	28	50	8	46	10	09	43	11	50	10	28	19	31	12
Jun	20	9	08	55	43	32	9	28	50	8	46	10	09	43	11	50	10	28	18	31	12
Jun	30	9	08	54	-43	32	9	28	50	-8	46	10	09	43	+11	50	10	28	18	-31	12
Jul	10	9	08	54	43	32	9	28	50	8	46	10	09	43	11	50	10	28	18	31	11
Jul	20	9	08	54	43	32	9	28	49	8	46	10	09	43	11	50	10	28	18	31	11
Jul	30	9	08	54	43	32	9	28	50	8	46	10	09	43	11	50	10	28	18	31	11
Aug	9	9	08	54	43	32	9	28	50	8	46	10	09	43	11	50	10	28	18	31	11
Aug	19	9	08	54	43	32	9	28	50	8	46	10	09	43	11	50	10	28	18	31	11
Aug	29	9	08	55	-43	31	9	28	50	-8	46	10	09	43	+11	50	10	28	18	-31	11
Sep	8	9	08	55	43	31	9	28	50	8	46	10	09	43	11	50	10	28	18	31	11
Sep	18	9	08	55	43	31	9	28	50	8	46	10	09	44	11	50	10	28	18	31	11
Sep	28	9	08	55	43	31	9	28	50	8	46	10	09	44	11	50	10	28	19	31	11
Oct	8	9	08	56	43	31	9	28	51	8	46	10	09	44	11	50	10	28	19	31	11
Oct	18	9	08	56	43	31	9	28	51	8	46	10	09	44	11	50	10	28	19	31	11
Oct	28	9	08	56	-43	31	9	28	51	-8	46	10	09	44	+11	50	10	28	19	-31	11
Nov	7	9	08	57	43	31	9	28	51	8	46	10	09	45	11	50	10	28	20	31	11
Nov	17	9	08	57	43	31	9	28	52	8	46	10	09	45	11	50	10	28	20	31	11
Nov	27	9	08	57	43	31	9	28	52	8	46	10	09	45	11	50	10	28	20	31	11
Dec	7	9	08	58	43	32	9	28	52	8	46	10	09	46	11	50	10	28	21	31	11
Dec	17	9	08	58	43	32	9	28	53	8	46	10	09	46	11	50	10	28	21	31	11
Dec	27	9	08	58	-43	32	9	28	53	-8	46	10	09	46	+11	50	10	28	21	-31	11
Jan	37	9	08	59	-43	32	9	28	53	-8	46	10	09	47	+11	50	10	28	22	-31	11

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Name	ν Hydrae(HR 4232)					ξ Hydrae(HR 4450)					β Leonis (HR 4534)					γ Corvi(HR 4662)									
Mag. Spect.	3.11	K1.5 IIIb Hδ-0.5				3.54	G7 III				2.14	A3 Va				2.59	B8p Hg Mn								
U.T.	Right Ascension					Right Declination					Right Ascension					Right Declination									
	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	
Jan.	1	10	50	52	-16	19	24	11	34	14	-31	59	36	11	50	20	+14	25	50	12	17	06	-17	40	46
	11	10	50	52	16	19	27	11	34	15	31	59	39	11	50	21	14	25	48	12	17	06	17	40	48
	21	10	50	53	16	19	29	11	34	15	31	59	41	11	50	21	14	25	46	12	17	06	17	40	51
	31	10	50	53	16	19	32	11	34	15	31	59	45	11	50	21	14	25	45	12	17	07	17	40	53
Feb.	10	10	50	53	16	19	34	11	34	16	31	59	48	11	50	22	14	25	44	12	17	07	17	40	56
	20	10	50	53	16	19	36	11	34	16	31	59	50	11	50	22	14	25	44	12	17	07	17	40	58
Mar.	2	10	50	53	-16	19	38	11	34	16	-31	59	53	11	50	22	+14	25	44	12	17	07	-17	41	00
	12	10	50	53	16	19	40	11	34	16	31	59	56	11	50	22	14	25	44	12	17	07	17	41	02
	22	10	50	53	16	19	41	11	34	16	31	59	58	11	50	22	14	25	44	12	17	08	17	41	03
	1	10	50	53	16	19	42	11	34	16	32	00	00	11	50	22	14	25	45	12	17	08	17	41	04
Apr.	11	10	50	53	16	19	43	11	34	16	32	00	02	11	50	22	14	25	45	12	17	08	17	41	06
	21	10	50	53	16	19	44	11	34	16	32	00	04	11	50	22	14	25	46	12	17	08	17	41	06
May	1	10	50	53	-16	19	44	11	34	16	-32	00	05	11	50	22	+14	25	47	12	17	08	-17	41	07
	11	10	50	53	16	19	44	11	34	16	32	00	06	11	50	22	14	25	48	12	17	08	17	41	07
	21	10	50	53	16	19	44	11	34	16	32	00	06	11	50	22	14	25	49	12	17	08	17	41	08
	31	10	50	53	16	19	44	11	34	15	32	00	07	11	50	22	14	25	50	12	17	07	17	41	08
June	10	10	50	53	16	19	44	11	34	15	32	00	06	11	50	22	14	25	51	12	17	07	17	41	07
	20	10	50	53	16	19	43	11	34	15	32	00	06	11	50	22	14	25	51	12	17	07	17	41	07
July	30	10	50	52	-16	19	42	11	34	15	-32	00	06	11	50	22	+14	25	51	12	17	07	-17	41	07
	10	10	50	52	16	19	41	11	34	15	32	00	05	11	50	21	14	25	52	12	17	07	17	41	06
	20	10	50	52	16	19	40	11	34	15	32	00	03	11	50	21	14	25	52	12	17	07	17	41	05
	30	10	50	52	16	19	39	11	34	15	32	00	02	11	50	21	14	25	52	12	17	07	17	41	04
Aug.	9	10	50	52	16	19	37	11	34	15	32	00	00	11	50	21	14	25	52	12	17	07	17	41	03
	19	10	50	52	16	19	36	11	34	15	31	59	59	11	50	21	14	25	51	12	17	07	17	41	02
Sept.	29	10	50	52	-16	19	35	11	34	15	-31	59	57	11	50	21	+14	25	51	12	17	07	-17	41	01
	8	10	50	52	16	19	34	11	34	15	31	59	55	11	50	21	14	25	50	12	17	07	17	41	00
	18	10	50	53	16	19	33	11	34	15	31	59	54	11	50	21	14	25	49	12	17	07	17	41	00
	28	10	50	53	16	19	33	11	34	15	31	59	52	11	50	21	14	25	47	12	17	07	17	40	59
Oct.	8	10	50	53	16	19	32	11	34	15	31	59	51	11	50	21	14	25	46	12	17	07	17	40	58
	18	10	50	53	16	19	33	11	34	15	31	59	50	11	50	22	14	25	44	12	17	07	17	40	59
Nov.	28	10	50	53	-16	19	33	11	34	15	-31	59	50	11	50	22	+14	25	42	12	17	07	-17	40	59
	7	10	50	54	16	19	34	11	34	16	31	59	50	11	50	22	14	25	40	12	17	07	17	40	59
	17	10	50	54	16	19	35	11	34	16	31	59	50	11	50	22	14	25	38	12	17	08	17	41	00
	27	10	50	54	16	19	37	11	34	16	31	59	51	11	50	23	14	25	35	12	17	08	17	41	01
Dec.	7	10	50	55	16	19	39	11	34	17	31	59	53	11	50	23	14	25	33	12	17	08	17	41	03
	17	10	50	55	16	19	41	11	34	17	31	59	55	11	50	23	14	25	31	12	17	09	17	41	05
	27	10	50	55	-16	19	44	11	34	17	-31	59	57	11	50	24	+14	25	29	12	17	09	-17	41	07
	37	10	50	56	-16	19	46	11	34	18	-32	00	00	11	50	24	+14	25	26	12	17	09	-17	41	09

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Name Mag. Spect.		β Corvi (HR 4786) 2.65 G5 Iib					δ Virginis(HR 4910) 3.38 M3'III					ϵ Virginis(HR4932) 2.83 G8 IIIab					ι Centauri (HR 5028) 2.75 A2 Va				
U.T.		Right Ascension					Right Ascension					Right Ascension					Right Ascension				
		h	m	s	°	'	h	m	s	°	'	h	m	s	°	'	h	m	s	°	'
Jan.	1	12	35	42	-23	31	12	56	52	+3	15	13	03	25	+10	49	13	22	00	-36	50
	11	12	35	42	23	32	12	56	52	3	15	13	03	26	10	49	13	22	00	36	50
	21	12	35	43	23	32	12	56	52	3	15	13	03	26	10	49	13	22	01	36	50
	31	12	35	43	23	32	12	56	53	3	15	13	03	26	10	49	13	22	01	36	50
Feb.	10	12	35	43	23	32	12	56	53	3	15	13	03	27	10	49	13	22	02	36	50
	20	12	35	44	23	32	12	56	53	3	15	13	03	27	10	49	13	22	02	36	50
Mar.	2	12	35	44	-23	32	12	56	53	+3	15	13	03	27	+10	49	13	22	02	-36	50
	12	12	35	44	23	32	12	56	54	3	15	13	03	27	10	49	13	22	02	36	50
	22	12	35	44	23	32	12	56	54	3	15	13	03	27	10	49	13	22	02	36	50
	1	12	35	44	23	32	12	56	54	3	15	13	03	27	10	49	13	22	03	36	50
Apr.	11	12	35	44	23	32	12	56	54	3	15	13	03	28	10	49	13	22	03	36	50
	21	12	35	44	23	32	12	56	54	3	15	13	03	28	10	49	13	22	03	36	50
May	1	12	35	44	-23	32	12	56	54	+3	15	13	03	28	+10	49	13	22	03	-36	50
	11	12	35	44	23	32	12	56	54	3	15	13	03	28	10	49	13	22	03	36	50
	21	12	35	44	23	32	12	56	54	3	15	13	03	28	10	49	13	22	03	36	50
	31	12	35	44	23	32	12	56	54	3	15	13	03	27	10	49	13	22	03	36	50
June	10	12	35	44	23	32	12	56	54	3	15	13	03	27	10	49	13	22	03	36	51
	20	12	35	44	23	32	12	56	54	3	15	13	03	27	10	49	13	22	03	36	51
July	30	12	35	44	-23	32	12	56	54	+3	15	13	03	27	+10	49	13	22	03	-36	51
	10	12	35	44	23	32	12	56	54	3	15	13	03	27	10	49	13	22	02	36	51
	20	12	35	44	23	32	12	56	53	3	15	13	03	27	10	49	13	22	02	36	51
	30	12	35	44	23	32	12	56	53	3	15	13	03	27	10	49	13	22	02	36	50
Aug.	9	12	35	43	23	32	12	56	53	3	15	13	03	27	10	49	13	22	02	36	50
	19	12	35	43	23	32	12	56	53	3	15	13	03	27	10	49	13	22	02	36	50
Sept.	29	12	35	43	-23	32	12	56	53	+3	15	13	03	27	+10	49	13	22	02	-36	50
	8	12	35	43	23	32	12	56	53	3	15	13	03	27	10	49	13	22	02	36	50
	18	12	35	43	23	32	12	56	53	3	15	13	03	27	10	49	13	22	01	36	50
	28	12	35	43	23	32	12	56	53	3	15	13	03	27	10	49	13	22	01	36	50
Oct.	8	12	35	43	23	32	12	56	53	3	15	13	03	27	10	49	13	22	01	36	50
	18	12	35	43	23	32	12	56	53	3	15	13	03	27	10	49	13	22	02	36	50
Nov.	28	12	35	44	-23	32	12	56	53	+3	15	13	03	27	+10	49	13	22	02	-36	50
	7	12	35	44	23	32	12	56	53	3	15	13	03	27	10	49	13	22	02	36	50
	17	12	35	44	23	32	12	56	54	3	15	13	03	27	10	49	13	22	02	36	50
	27	12	35	44	23	32	12	56	54	3	15	13	03	27	10	49	13	22	02	36	50
Dec.	7	12	35	45	23	32	12	56	54	3	15	13	03	28	10	49	13	22	03	36	50
	17	12	35	45	23	32	12	56	55	3	15	13	03	28	10	49	13	22	03	36	50
	27	12	35	45	-23	32	12	56	55	+3	15	13	03	28	+10	49	13	22	04	-36	50
	37	12	35	46	-23	32	12	56	55	+3	15	13	03	29	+10	49	13	22	04	-36	50

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Name		α Virginis(HR 5056)					θ Centauri (HR 5288)					α^2 Librae (HR 5531)					β Lupi (HR 5571)								
Mag. Spect.		0.98 B1 V					2.06 K0 IIIb					2.75 A3 III-IV					2.68 B2 IV								
U.T.		Right Declination					Right Declination					Right Declination					Right Declination								
		Ascension					Ascension					Ascension					Ascension								
		h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"
Jan.	1	13	26	30	-11	17	29	14	08	09	-36	29	25	14	52	15	-16	08	42	15	00	09	-43	13	54
	11	13	26	31	11	17	31	14	08	09	36	29	26	14	52	15	16	08	43	15	00	10	43	13	55
	21	13	26	31	11	17	33	14	08	10	36	29	28	14	52	16	16	08	45	15	00	10	43	13	56
	31	13	26	31	11	17	35	14	08	10	36	29	30	14	52	16	16	08	47	15	00	11	43	13	57
Feb.	10	13	26	32	11	17	37	14	08	10	36	29	32	14	52	16	16	08	48	15	00	11	43	13	58
	20	13	26	32	11	17	38	14	08	11	36	29	34	14	52	17	16	08	50	15	00	11	43	14	00
Mar.	2	13	26	32	-11	17	40	14	08	11	-36	29	36	14	52	17	-16	08	51	15	00	12	-43	14	02
	12	13	26	32	-11	17	42	14	08	11	36	29	38	14	52	17	16	08	53	15	00	12	43	14	04
	22	13	26	33	-11	17	42	14	08	12	36	29	40	14	52	18	16	08	53	15	00	13	43	14	06
	1	13	26	33	-11	17	43	14	08	12	36	29	42	14	52	18	16	08	54	15	00	13	43	14	08
Apr.	11	13	26	33	-11	17	44	14	08	12	36	29	45	14	52	18	16	08	55	15	00	13	43	14	10
	21	13	26	33	-11	17	45	14	08	12	36	29	46	14	52	18	16	08	56	15	00	13	43	14	12
May	1	13	26	33	-11	17	45	14	08	12	-36	29	48	14	52	18	-16	08	56	15	00	14	-43	14	14
	11	13	26	33	11	17	45	14	08	12	36	29	50	14	52	18	16	08	56	15	00	14	43	14	15
	21	13	26	33	11	17	45	14	08	12	36	29	51	14	52	18	16	08	57	15	00	14	43	14	17
	31	13	26	33	11	17	45	14	08	12	36	29	52	14	52	19	16	08	57	15	00	14	43	14	19
June	10	13	26	33	11	17	44	14	08	12	36	29	53	14	52	19	16	08	57	15	00	14	43	14	20
	20	13	26	33	11	17	44	14	08	12	36	29	54	14	52	19	16	08	57	15	00	14	43	14	21
July	30	13	26	33	-11	17	44	14	08	12	-36	29	55	14	52	18	-16	08	57	15	00	14	-43	14	23
	10	13	26	33	11	17	43	14	08	12	36	29	55	14	52	18	16	08	56	15	00	14	43	14	23
	20	13	26	33	11	17	43	14	08	12	36	29	54	14	52	18	16	08	56	15	00	13	43	14	23
	30	13	26	32	11	17	42	14	08	12	36	29	54	14	52	18	16	08	56	15	00	13	43	14	24
Aug.	9	13	26	32	11	17	42	14	08	11	36	29	54	14	52	18	16	08	55	15	00	13	43	14	24
	19	13	26	32	11	17	41	14	08	11	36	29	53	14	52	18	16	08	55	15	00	13	43	14	23
Sept.	29	13	26	32	-11	17	40	14	08	11	-36	29	52	14	52	18	-16	08	54	15	00	13	-43	14	22
	8	13	26	32	11	17	40	14	08	11	36	29	51	14	52	18	16	08	54	15	00	13	43	14	21
	18	13	26	32	11	17	40	14	08	11	36	29	49	14	52	18	16	08	53	15	00	12	43	14	20
	28	13	26	32	11	17	39	14	08	11	36	29	48	14	52	17	16	08	53	15	00	12	43	14	19
Oct.	8	13	26	32	11	17	39	14	08	11	36	29	46	14	52	17	16	08	52	15	00	12	43	14	17
	18	13	26	32	11	17	40	14	08	11	36	29	45	14	52	17	16	08	52	15	00	12	43	14	16
Nov.	28	13	26	32	-11	17	40	14	08	11	-36	29	44	14	52	17	-16	08	52	15	00	12	-43	14	14
	7	13	26	32	11	17	41	14	08	11	36	29	43	14	52	18	16	08	52	15	00	12	43	14	13
	17	13	26	33	11	17	42	14	08	11	36	29	42	14	52	18	16	08	53	15	00	12	43	14	11
	27	13	26	33	11	17	43	14	08	12	36	29	42	14	52	18	16	08	54	15	00	13	43	14	11
Dec.	7	13	26	33	11	17	44	14	08	12	36	29	42	14	52	18	16	08	54	15	00	13	43	14	10
	17	13	26	33	11	17	46	14	08	12	36	29	42	14	52	18	16	08	56	15	00	13	43	14	09
	27	13	26	34	-11	17	48	14	08	13	-36	29	43	14	52	19	-16	08	57	15	00	14	-43	14	09
	37	13	26	34	-11	17	50	14	08	13	-36	29	45	14	52	19	-16	08	59	15	00	14	-43	14	10

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Name		β Librae (HR 5685)					α Serpentis (HR 5854)					δ Scorpii (HR 5953)					δ Ophiuchi (HR 6056)								
Mag.	Spect.	2.61 B8 IIIIn					2.65 K2 IIIb CN I					2.32 B0.3 IV					2.74 M0.5 III								
U.T.		Right		Declination			Right		Declination			Right		Declination			Right		Declination						
		Ascension					Ascension					Ascension					Ascension								
		h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"
Jan.	1	15	18	20	-9	28	30	15	45	29	+6	20	45	16	01	48	-22	41	31	16	15	38	-3	45	33
	11	15	18	21	9	28	32	15	45	29	6	20	42	16	01	48	22	41	32	16	15	39	3	45	35
	21	15	18	21	9	28	34	15	45	30	6	20	40	16	01	48	22	41	33	16	15	39	3	45	37
	31	15	18	21	9	28	35	15	45	30	6	20	38	16	01	49	22	41	34	16	15	39	3	45	38
Feb.	10	15	18	22	9	28	37	15	45	30	6	20	37	16	01	49	22	41	35	16	15	40	3	45	39
	20	15	18	22	9	28	38	15	45	31	6	20	36	16	01	49	22	41	36	16	15	40	3	45	41
Mar.	2	15	18	22	-9	28	39	15	45	31	+6	20	35	16	01	50	-22	41	38	16	15	40	-3	45	42
	12	15	18	23	9	28	40	15	45	31	6	20	34	16	01	50	22	41	39	16	15	41	3	45	42
	22	15	18	23	9	28	41	15	45	32	6	20	34	16	01	50	22	41	39	16	15	41	3	45	42
	1	15	18	23	9	28	42	15	45	32	6	20	35	16	01	51	22	41	40	16	15	41	3	45	43
Apr.	11	15	18	23	9	28	42	15	45	32	6	20	35	16	01	51	22	41	41	16	15	41	3	45	43
	21	15	18	24	9	28	42	15	45	32	6	20	36	16	01	51	22	41	42	16	15	42	3	45	42
May	1	15	18	24	-9	28	42	15	45	32	+6	20	37	16	01	51	-22	41	42	16	15	42	-3	45	42
	11	15	18	24	9	28	42	15	45	32	6	20	38	16	01	52	22	41	43	16	15	42	3	45	41
	21	15	18	24	9	28	42	15	45	33	6	20	39	16	01	52	22	41	43	16	15	42	3	45	40
	31	15	18	24	9	28	41	15	45	33	6	20	41	16	01	52	22	41	43	16	15	42	3	45	39
June	10	15	18	24	9	28	41	15	45	33	6	20	42	16	01	52	22	41	44	16	15	42	3	45	38
	20	15	18	24	9	28	40	15	45	33	6	20	43	16	01	52	22	41	44	16	15	42	3	45	38
July	30	15	18	24	-9	28	40	15	45	33	+6	20	44	16	01	52	-22	41	44	16	15	42	-3	45	37
	10	15	18	24	9	28	39	15	45	33	6	20	46	16	01	52	22	41	44	16	15	42	3	45	36
	20	15	18	24	9	28	39	15	45	33	6	20	46	16	01	52	22	41	44	16	15	42	3	45	35
	30	15	18	24	9	28	39	15	45	33	6	20	47	16	01	52	22	41	44	16	15	42	3	45	35
Aug.	9	15	18	24	9	28	38	15	45	32	6	20	48	16	01	52	22	41	44	16	15	42	3	45	34
	19	15	18	23	9	28	38	15	45	32	6	20	48	16	01	52	22	41	44	16	15	42	3	45	34
Sept.	29	15	18	23	-9	28	37	15	45	32	+6	20	48	16	01	51	-22	41	43	16	15	42	-3	45	33
	8	15	18	23	9	28	37	15	45	32	6	20	48	16	01	51	22	41	43	16	15	42	3	45	33
	18	15	18	23	9	28	37	15	45	32	6	20	48	16	01	51	22	41	43	16	15	41	3	45	33
	28	15	18	23	9	28	37	15	45	32	6	20	48	16	01	51	22	41	42	16	15	41	3	45	33
Oct.	8	15	18	23	9	28	37	15	45	32	6	20	47	16	01	51	22	41	42	16	15	41	3	45	34
	18	15	18	23	9	28	37	15	45	32	6	20	46	16	01	51	22	41	41	16	15	41	3	45	34
Nov.	28	15	18	23	-9	28	37	15	45	31	+6	20	45	16	01	51	-22	41	41	16	15	41	-3	45	35
	7	15	18	23	9	28	38	15	45	31	6	20	44	16	01	51	22	41	40	16	15	41	3	45	35
	17	15	18	23	9	28	39	15	45	32	6	20	42	16	01	51	22	41	40	16	15	41	3	45	36
	27	15	18	23	9	28	40	15	45	32	6	20	40	16	01	51	22	41	41	16	15	41	3	45	38
Dec.	7	15	18	23	9	28	41	15	45	32	6	20	38	16	01	51	22	41	41	16	15	41	3	45	39
	17	15	18	24	9	28	42	15	45	32	6	20	36	16	01	51	22	41	41	16	15	41	3	45	40
	27	15	18	24	-9	28	44	15	45	32	+6	20	34	16	01	52	-22	41	42	16	15	42	-3	45	42
	37	15	18	24	-9	28	45	15	45	33	+6	20	31	16	01	52	-22	41	42	16	15	42	-3	45	44

APPARENT PLACES OF STARS, 2025

FOR 0^h TERRESTRIAL TIME

Name Mag. Spect.	α Scorpii A (HR 6134) 0.9 - 1.8 M1.5 Iab-Ib					ζ Ophiuchi (HR 6175) 2.56 O9.5 Vn					ϵ Scorpii (HR 6241) 2.29 K2 III					θ Ophiuchi (HR 6453) 3.27 B2 IV									
	Right Ascension		Declination			Right Ascension		Declination			Right Ascension		Declination			Right Ascension		Declination							
U.T.	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	
Jan.	1	16	30	55	-26	29	12	16	38	31	-10	37	04	16	51	46	-34	20	15	17	23	31	-25	01	27
	11	16	30	56	26	29	12	16	38	31	10	37	05	16	51	46	34	20	15	17	23	32	25	01	27
	21	16	30	56	26	29	13	16	38	32	10	37	07	16	51	46	34	20	15	17	23	32	25	01	28
	31	16	30	56	26	29	13	16	38	32	10	37	08	16	51	47	34	20	15	17	23	32	25	01	28
Feb.	10	16	30	57	26	29	14	16	38	32	10	37	09	16	51	47	34	20	15	17	23	33	25	01	28
	20	16	30	57	26	29	15	16	38	33	10	37	10	16	51	47	34	20	16	17	23	33	25	01	29
Mar.	2	16	30	57	-26	29	16	16	38	33	-10	37	11	16	51	48	-34	20	17	17	23	33	-25	01	29
	12	16	30	58	26	29	17	16	38	33	10	37	12	16	51	48	34	20	17	17	23	34	25	01	30
	22	16	30	58	26	29	17	16	38	33	10	37	12	16	51	48	34	20	18	17	23	34	25	01	30
	1	16	30	58	26	29	18	16	38	34	10	37	12	16	51	49	34	20	19	17	23	34	25	01	30
Apr.	11	16	30	59	26	29	19	16	38	34	10	37	13	16	51	49	34	20	20	17	23	35	25	01	30
	21	16	30	59	26	29	19	16	38	34	10	37	12	16	51	49	34	20	20	17	23	35	25	01	30
May	1	16	30	59	-26	29	20	16	38	35	-10	37	12	16	51	50	-34	20	21	17	23	35	-25	01	30
	11	16	30	59	26	29	21	16	38	35	10	37	12	16	51	50	34	20	22	17	23	35	25	01	31
	21	16	31	00	26	29	21	16	38	35	10	37	11	16	51	50	34	20	23	17	23	36	25	01	31
	31	16	31	00	26	29	21	16	38	35	10	37	11	16	51	50	34	20	23	17	23	36	25	01	31
June	10	16	31	00	26	29	22	16	38	35	10	37	10	16	51	51	34	20	24	17	23	36	25	01	31
	20	16	31	00	26	29	22	16	38	35	10	37	10	16	51	51	34	20	25	17	23	36	25	01	31
July	30	16	31	00	-26	29	23	16	38	35	-10	37	09	16	51	51	-34	20	26	17	23	36	-25	01	32
	10	16	31	00	26	29	23	16	38	35	10	37	08	16	51	51	34	20	27	17	23	36	25	01	32
	20	16	31	00	26	29	23	16	38	35	10	37	08	16	51	51	34	20	27	17	23	36	25	01	32
	30	16	31	00	26	29	23	16	38	35	10	37	08	16	51	51	34	20	28	17	23	36	25	01	32
Aug.	9	16	31	00	26	29	23	16	38	35	10	37	07	16	51	51	34	20	28	17	23	36	25	01	32
	19	16	31	00	26	29	23	16	38	35	10	37	07	16	51	50	34	20	28	17	23	36	25	01	32
Sept.	29	16	30	59	-26	29	23	16	38	35	-10	37	07	16	51	50	-34	20	28	17	23	36	-25	01	32
	8	16	30	59	26	29	23	16	38	35	10	37	07	16	51	50	34	20	29	17	23	36	25	01	33
	18	16	30	59	26	29	23	16	38	35	10	37	06	16	51	50	34	20	28	17	23	36	25	01	32
	28	16	30	59	26	29	22	16	38	34	10	37	06	16	51	50	34	20	28	17	23	35	25	01	32
Oct.	8	16	30	59	26	29	22	16	38	34	10	37	06	16	51	49	34	20	27	17	23	35	25	01	32
	18	16	30	59	26	29	21	16	38	34	10	37	06	16	51	49	34	20	27	17	23	35	25	01	32
Nov.	28	16	30	59	-26	29	20	16	38	34	10	37	06	16	51	49	-34	20	25	17	23	35	-25	01	31
	7	16	30	59	26	29	20	16	38	34	10	37	07	16	51	49	34	20	24	17	23	35	25	01	31
	17	16	30	59	26	29	20	16	38	34	10	37	07	16	51	49	34	20	24	17	23	35	25	01	31
	27	16	30	59	26	29	19	16	38	34	10	37	08	16	51	49	34	20	23	17	23	35	25	01	30
Dec.	7	16	30	59	26	29	19	16	38	34	10	37	09	16	51	49	34	20	22	17	23	35	25	01	30
	17	16	30	59	26	29	19	16	38	34	10	37	10	16	51	50	34	20	22	17	23	35	25	01	30
	27	16	30	59	-26	29	20	16	38	35	-10	37	11	16	51	50	-34	20	21	17	23	35	-25	01	30
	37	16	31	00	-26	29	20	16	38	35	-10	37	12	16	51	50	-34	20	21	17	23	36	-25	01	30

APPARENT PLACES OF STARS, 2025

FOR 0^h TERRESTRIAL TIME

Name	λ Scorpii (HR 6527)						α Ophiuchi (HR 6556)						β Ophiuchi (HR 6603)						δ Sagittarii (HR 6859)					
Mag. Spect.	1.63 B1.5 IV						2.08 A5 Vnn						2.77 K2 III CN 0.5						2.70 K2.5 IIIa CN 0.5					
U.T.	Right Ascension			Declination			Right Ascension			Declination			Right Ascension			Declination			Right Ascension			Declination		
	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"
Jan. 1	17	35	17	-37	07	16	17	36	04	+12	32	26	17	44	41	+4	33	21	18	22	34	-29	49	03
11	17	35	17	37	07	16	17	36	05	12	32	24	17	44	41	4	33	19	18	22	34	29	49	03
21	17	35	17	37	07	16	17	36	05	12	32	21	17	44	42	4	33	17	18	22	35	29	49	03
31	17	35	18	37	07	15	17	36	05	12	32	19	17	44	42	4	33	16	18	22	35	29	49	02
Feb. 10	17	35	18	37	07	15	17	36	05	12	32	18	17	44	42	4	33	15	18	22	35	29	49	02
20	17	35	18	37	07	15	17	36	06	12	32	17	17	44	42	4	33	13	18	22	35	29	49	02
Mar. 2	17	35	19	-37	07	15	17	36	06	+12	32	15	17	44	43	+4	33	12	18	22	36	-29	49	02
12	17	35	19	37	07	15	17	36	06	12	32	15	17	44	43	4	33	12	18	22	36	29	49	01
22	17	35	20	37	07	15	17	36	07	12	32	15	17	44	43	4	33	12	18	22	36	29	49	01
1	17	35	20	37	07	16	17	36	07	12	32	15	17	44	44	4	33	12	18	22	37	29	49	01
Apr. 11	17	35	20	37	07	16	17	36	07	12	32	16	17	44	44	4	33	13	18	22	37	29	49	01
21	17	35	21	37	07	17	17	36	07	12	32	17	17	44	44	4	33	14	18	22	38	29	49	00
May 1	17	35	21	-37	07	17	17	36	08	+12	32	19	17	44	44	+4	33	15	18	22	38	-29	49	00
11	17	35	21	37	07	18	17	36	08	12	32	20	17	44	45	4	33	16	18	22	38	29	49	00
21	17	35	22	37	07	19	17	36	08	12	32	22	17	44	45	4	33	17	18	22	38	29	49	00
31	17	35	22	37	07	19	17	36	08	12	32	24	17	44	45	4	33	19	18	22	39	29	49	00
June 10	17	35	22	37	07	20	17	36	08	12	32	26	17	44	45	4	33	21	18	22	39	29	49	00
20	17	35	22	37	07	21	17	36	09	12	32	28	17	44	45	4	33	22	18	22	39	29	49	01
July 30	17	35	22	-37	07	22	17	36	09	+12	32	30	17	44	45	+4	33	24	18	22	39	-29	49	01
10	17	35	22	37	07	23	17	36	09	12	32	32	17	44	45	4	33	25	18	22	39	29	49	01
20	17	35	22	37	07	23	17	36	09	12	32	33	17	44	45	4	33	27	18	22	39	29	49	02
30	17	35	22	37	07	24	17	36	09	12	32	34	17	44	45	4	33	28	18	22	39	29	49	02
Aug. 9	17	35	22	37	07	25	17	36	09	12	32	36	17	44	45	4	33	29	18	22	39	29	49	03
19	17	35	22	37	07	25	17	36	08	12	32	37	17	44	45	4	33	30	18	22	39	29	49	03
Sept. 29	17	35	22	-37	07	26	17	36	08	+12	32	37	17	44	45	+4	33	30	18	22	39	-29	49	04
8	17	35	22	37	07	26	17	36	08	12	32	38	17	44	45	4	33	30	18	22	39	29	49	04
18	17	35	22	37	07	26	17	36	08	12	32	38	17	44	45	4	33	31	18	22	39	29	49	04
28	17	35	21	37	07	26	17	36	08	12	32	38	17	44	45	4	33	31	18	22	39	29	49	04
Oct. 8	17	35	21	37	07	26	17	36	08	12	32	37	17	44	44	4	33	30	18	22	39	29	49	04
18	17	35	21	37	07	25	17	36	07	12	32	37	17	44	44	4	33	30	18	22	38	29	49	04
Nov. 28	17	35	21	-37	07	24	17	36	07	+12	32	36	17	44	44	+4	33	29	18	22	38	-29	49	04
7	17	35	21	37	07	23	17	36	07	12	32	35	17	44	44	4	33	28	18	22	38	29	49	03
17	17	35	21	37	07	23	17	36	07	12	32	33	17	44	44	4	33	27	18	22	38	29	49	03
27	17	35	21	37	07	22	17	36	07	12	32	31	17	44	44	4	33	26	18	22	38	29	49	03
Dec. 7	17	35	21	37	07	20	17	36	07	12	32	29	17	44	44	4	33	24	18	22	38	29	49	02
17	17	35	21	37	07	20	17	36	07	12	32	27	17	44	44	4	33	23	18	22	38	29	49	02
27	17	35	21	-37	07	19	17	36	07	+12	32	25	17	44	44	+4	33	21	18	22	38	-29	49	01
37	17	35	21	-37	07	18	17	36	08	+12	32	23	17	44	45	+4	33	19	18	22	38	-29	49	01

APPARENT PLACES OF STARS, 2025

FOR 0^h TERRESTRIAL TIME

Name	ε Sagittarii (HR 6879)					σ Sagittarii (HR 7121)					ζ Aquilae (HR 7235)					γ Aquilae (HR 7525)																
Mag. Spect.	1.85		A0 II n(shell)			2.02		B3 IV			2.99		A0 Vann			2.72		K3 II														
U.T.	Right Declination					Right Declination					Right Declination					Right Declination																
	Ascension					Ascension					Ascension					Ascension																
	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"								
Jan.	1	18	25	48	-34	22	22	18	56	47	-26	15	59	19	06	32	+13	53	59	19	47	25	+10	40	25							
	11	18	25	48	34	22	21	18	56	48	26	15	58	19	06	32	13	53	57	19	47	26	10	40	23							
	21	18	25	49	34	22	21	18	56	48	26	15	58	19	06	32	13	53	55	19	47	26	10	40	21							
	31	18	25	49	34	22	20	18	56	48	26	15	58	19	06	33	13	53	53	19	47	26	10	40	20							
Feb.	10	18	25	49	34	22	20	18	56	48	26	15	57	19	06	33	13	53	52	19	47	26	10	40	18							
	20	18	25	50	34	22	19	18	56	48	26	15	57	19	06	33	13	53	50	19	47	26	10	40	17							
Mar.	2	18	25	50	-34	22	19	18	56	49	-26	15	57	19	06	33	+13	53	49	19	47	26	+10	40	16							
	12	18	25	50	34	22	19	18	56	49	26	15	56	19	06	34	13	53	48	19	47	27	10	40	15							
	22	18	25	51	34	22	18	18	56	49	26	15	56	19	06	34	13	53	48	19	47	27	10	40	15							
	1	18	25	51	34	22	18	18	56	50	26	15	55	19	06	34	13	53	48	19	47	27	10	40	15							
Apr.	11	18	25	51	34	22	18	18	56	50	26	15	55	19	06	34	13	53	49	19	47	28	10	40	16							
	21	18	25	52	34	22	18	18	56	51	26	15	54	19	06	35	13	53	50	19	47	28	10	40	17							
May	1	18	25	52	-34	22	18	18	56	51	-26	15	53	19	06	35	+13	53	51	19	47	28	+10	40	18							
	11	18	25	52	34	22	18	18	56	51	26	15	53	19	06	35	13	53	53	19	47	28	10	40	20							
	21	18	25	53	34	22	18	18	56	51	26	15	53	19	06	36	13	53	55	19	47	29	10	40	22							
	31	18	25	53	34	22	18	18	56	52	26	15	52	19	06	36	13	53	57	19	47	29	10	40	24							
June	10	18	25	53	34	22	19	18	56	52	26	15	52	19	06	36	13	53	59	19	47	29	10	40	26							
	20	18	25	54	34	22	19	18	56	52	26	15	52	19	06	36	13	54	01	19	47	29	10	40	28							
July	30	18	25	54	-34	22	20	18	56	52	-26	15	52	19	06	36	+13	54	04	19	47	30	+10	40	30							
	10	18	25	54	34	22	20	18	56	53	26	15	52	19	06	37	13	54	06	19	47	30	10	40	32							
	20	18	25	54	34	22	21	18	56	53	26	15	52	19	06	37	13	54	08	19	47	30	10	40	34							
	30	18	25	54	34	22	22	18	56	53	26	15	52	19	06	37	13	54	10	19	47	30	10	40	36							
Aug.	9	18	25	54	34	22	23	18	56	53	26	15	53	19	06	37	13	54	12	19	47	30	10	40	38							
	19	18	25	54	34	22	23	18	56	53	26	15	53	19	06	37	13	54	13	19	47	30	10	40	40							
Sept.	29	18	25	54	-34	22	24	18	56	53	-26	15	54	19	06	36	+13	54	14	19	47	30	+10	40	41							
	8	18	25	53	34	22	24	18	56	52	26	15	54	19	06	36	13	54	15	19	47	30	10	40	42							
	18	18	25	53	34	22	25	18	56	52	26	15	54	19	06	36	13	54	16	19	47	30	10	40	43							
	28	18	25	53	34	22	25	18	56	52	26	15	54	19	06	36	13	54	16	19	47	30	10	40	43							
Oct.	8	18	25	53	34	22	25	18	56	52	26	15	55	19	06	36	13	54	16	19	47	29	10	40	43							
	18	18	25	53	34	22	25	18	56	52	26	15	55	19	06	36	13	54	16	19	47	29	10	40	43							
Nov.	28	18	25	53	-34	22	24	18	56	52	-26	15	55	19	06	35	+13	54	16	19	47	29	+10	40	43							
	7	18	25	52	34	22	24	18	56	51	26	15	54	19	06	35	13	54	15	19	47	29	10	40	42							
	17	18	25	52	34	22	23	18	56	51	26	15	54	19	06	35	13	54	14	19	47	29	10	40	41							
	27	18	25	52	34	22	22	18	56	51	26	15	54	19	06	35	13	54	12	19	47	29	10	40	40							
Dec.	7	18	25	52	34	22	21	18	56	51	26	15	54	19	06	35	13	54	11	19	47	29	10	40	39							
	17	18	25	52	34	22	21	18	56	51	26	15	53	19	06	35	13	54	09	19	47	29	10	40	38							
	27	18	25	53	-34	22	20	18	56	51	-26	15	53	19	06	35	+13	54	07	19	47	29	+10	40	36							
	37	18	25	53	-34	22	19	18	56	52	-26	15	53	19	06	35	+13	54	05	19	47	29	+10	40	35							

APPARENT PLACES OF STARS, 2025

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Name Mag. Spect.	α Aquilae (HR 7557) 0.77 A7 Vnn					γ Cygni (HR 7796) 2.20 F8 Ib					α Cygni (HR 7924) 1.25 A2 Ia					β Aquarii (HR 8232) 2.91 G0 Ib									
U.T.	Right Ascension		Declination			Right Ascension		Declination			Right Ascension		Declination			Right Ascension		Declination							
	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	
Jan.	1	19	51	59	+8	56	02	20	23	06	+40	20	14	20	42	15	+45	22	14	21	32	51	-5	27	44
	11	19	51	59	8	56	00	20	23	06	40	20	11	20	42	15	45	22	12	21	32	51	5	27	45
	21	19	51	59	8	55	58	20	23	06	40	20	08	20	42	15	45	22	09	21	32	51	5	27	45
	31	19	51	59	8	55	57	20	23	06	40	20	05	20	42	15	45	22	06	21	32	51	5	27	45
Feb.	10	19	51	59	8	55	56	20	23	06	40	20	03	20	42	15	45	22	03	21	32	52	5	27	46
	20	19	51	59	8	55	54	20	23	06	40	20	00	20	42	15	45	22	00	21	32	52	5	27	46
Mar.	2	19	52	00	+8	55	53	20	23	06	+40	19	58	20	42	15	+45	21	58	21	32	52	-5	27	46
	12	19	52	00	8	55	53	20	23	07	40	19	56	20	42	16	45	21	56	21	32	52	5	27	45
	22	19	52	00	8	55	53	20	23	07	40	19	55	20	42	16	45	21	54	21	32	52	5	27	45
	1	19	52	01	8	55	53	20	23	07	40	19	54	20	42	16	45	21	53	21	32	52	5	27	44
Apr.	11	19	52	01	8	55	53	20	23	07	40	19	54	20	42	17	45	21	53	21	32	53	5	27	43
	21	19	52	01	8	55	55	20	23	08	40	19	55	20	42	17	45	21	53	21	32	53	5	27	42
May	1	19	52	01	+8	55	56	20	23	08	+40	19	56	20	42	17	+45	21	54	21	32	53	-5	27	40
	11	19	52	02	8	55	57	20	23	09	40	19	57	20	42	18	45	21	55	21	32	54	5	27	39
	21	19	52	02	8	55	59	20	23	09	40	19	59	20	42	18	45	21	57	21	32	54	5	27	37
	31	19	52	02	8	56	01	20	23	09	40	20	02	20	42	19	45	21	59	21	32	54	5	27	35
June	10	19	52	03	8	56	03	20	23	10	40	20	04	20	42	19	45	22	02	21	32	55	5	27	33
	20	19	52	03	8	56	05	20	23	10	40	20	07	20	42	19	45	22	05	21	32	55	5	27	32
July	30	19	52	03	+8	56	08	20	23	10	+40	20	10	20	42	19	+45	22	08	21	32	55	-5	27	30
	10	19	52	03	8	56	10	20	23	10	40	20	14	20	42	20	45	22	12	21	32	55	5	27	28
	20	19	52	03	8	56	12	20	23	10	40	20	17	20	42	20	45	22	15	21	32	56	5	27	27
	30	19	52	03	8	56	13	20	23	10	40	20	20	20	42	20	45	22	18	21	32	56	5	27	25
Aug.	9	19	52	03	8	56	15	20	23	10	40	20	23	20	42	20	45	22	22	21	32	56	5	27	24
	19	19	52	03	8	56	17	20	23	10	40	20	26	20	42	20	45	22	25	21	32	56	5	27	23
Sept.	29	19	52	03	+8	56	18	20	23	10	+40	20	29	20	42	20	+45	22	28	21	32	56	-5	27	23
	8	19	52	03	8	56	19	20	23	10	40	20	31	20	42	20	45	22	30	21	32	56	5	27	22
	18	19	52	03	8	56	20	20	23	10	40	20	33	20	42	20	45	22	33	21	32	56	5	27	22
	28	19	52	03	8	56	20	20	23	10	40	20	35	20	42	19	45	22	35	21	32	56	5	27	22
Oct.	8	19	52	03	8	56	20	20	23	10	40	20	36	20	42	19	45	22	36	21	32	56	5	27	22
	18	19	52	03	8	56	20	20	23	09	40	20	37	20	42	19	45	22	37	21	32	56	5	27	22
Nov.	28	19	52	02	+8	56	20	20	23	09	+40	20	37	20	42	19	+45	22	38	21	32	56	-5	27	22
	7	19	52	02	8	56	19	20	23	09	40	20	37	20	42	18	45	22	38	21	32	55	5	27	23
	17	19	52	02	8	56	18	20	23	09	40	20	36	20	42	18	45	22	37	21	32	55	5	27	23
	27	19	52	02	8	56	18	20	23	08	40	20	35	20	42	18	45	22	36	21	32	55	5	27	24
Dec.	7	19	52	02	8	56	16	20	23	08	40	20	33	20	42	18	45	22	35	21	32	55	5	27	24
	17	19	52	02	8	56	15	20	23	08	40	20	31	20	42	17	45	22	33	21	32	55	5	27	25
	27	19	52	02	+8	56	13	20	23	08	+40	20	28	20	42	17	+45	22	30	21	32	55	-5	27	26
	37	19	52	02	+8	56	12	20	23	08	+40	20	26	20	42	17	+45	22	28	21	32	55	-5	27	26

APPARENT PLACES OF STARS, 2025

FOR 0^h TERRESTRIAL TIME

Name		ϵ Pegasi (HR 8308)					α Aquarii (HR 8414))					δ Aquarii (HR 8709)					α Pegasi (HR 8781)						
Mag.	Spect.	0.7 - 3.5					2.96					3.27					2.49						
		K2 Ib-II					G2 Ib					A3 IV-V					A0 III-IV						
U.T.		Right					Declination					Right					Declination						
		Ascension					Ascension					Ascension					Ascension						
		h	m	s	°	'	h	m	s	°	'	h	m	s	°	'	h	m	s	°	'		
Jan.	1	21	45	24	+9	59	22	07	03	-0	11	22	55	58	-15	41	23	23	06	00	+15	20	
	11	21	45	24	9	59	22	07	03	0	11	22	55	58	15	41	23	23	06	00	15	20	
	21	21	45	24	9	59	20	22	07	03	0	11	22	55	58	15	41	23	23	06	00	15	20
	31	21	45	24	9	59	19	22	07	03	0	11	22	55	58	15	41	23	23	06	00	15	20
Feb.	10	21	45	24	9	59	18	22	07	03	0	11	22	55	58	15	41	23	23	06	00	15	20
	20	21	45	24	9	59	17	22	07	03	0	12	22	55	58	15	41	22	23	06	00	15	20
Mar.	2	21	45	24	+9	59	16	22	07	03	-0	12	22	55	58	-15	41	21	23	06	00	+15	20
	12	21	45	24	9	59	15	22	07	03	0	12	22	55	58	15	41	20	23	06	00	15	20
	22	21	45	24	9	59	15	22	07	04	0	11	22	55	58	15	41	19	23	06	00	15	20
	1	21	45	25	9	59	15	22	07	04	0	11	22	55	58	15	41	18	23	06	00	15	20
Apr.	11	21	45	25	9	59	16	22	07	04	0	11	22	55	58	15	41	16	23	06	00	15	20
	21	21	45	25	9	59	16	22	07	04	0	11	22	55	59	15	41	14	23	06	00	15	20
May	1	21	45	25	+9	59	18	22	07	05	-0	11	22	55	59	-15	41	12	23	06	01	+15	20
	11	21	45	26	9	59	19	22	07	05	0	11	22	55	59	15	41	10	23	06	01	15	20
	21	21	45	26	9	59	21	22	07	05	0	11	22	56	00	15	41	08	23	06	01	15	20
	31	21	45	26	9	59	23	22	07	06	0	11	22	56	00	15	41	06	23	06	02	15	20
June	10	21	45	27	9	59	25	22	07	06	0	11	22	56	00	15	41	04	23	06	02	15	20
	20	21	45	27	9	59	27	22	07	06	0	11	22	56	01	15	41	02	23	06	02	15	20
July	30	21	45	27	+9	59	29	22	07	07	-0	11	22	56	01	-15	41	00	23	06	02	+15	20
	10	21	45	28	9	59	32	22	07	07	0	11	22	56	01	15	40	59	23	06	03	15	20
	20	21	45	28	9	59	34	22	07	07	0	11	22	56	01	15	40	57	23	06	03	15	20
	30	21	45	28	9	59	36	22	07	07	0	11	22	56	02	15	40	56	23	06	03	15	20
Aug.	9	21	45	28	9	59	38	22	07	07	0	11	22	56	02	15	40	55	23	06	04	15	20
	19	21	45	28	9	59	40	22	07	07	0	11	22	56	02	15	40	55	23	06	04	15	20
Sept.	29	21	45	28	+9	59	41	22	07	08	-0	11	22	56	02	-15	40	55	23	06	04	+15	20
	8	21	45	28	9	59	43	22	07	08	0	11	22	56	02	15	40	55	23	06	04	15	20
	18	21	45	28	9	59	44	22	07	08	0	11	22	56	02	15	40	55	23	06	04	15	20
	28	21	45	28	9	59	45	22	07	08	0	11	22	56	02	15	40	56	23	06	04	15	20
Oct.	8	21	45	28	9	59	45	22	07	07	0	11	22	56	02	15	40	56	23	06	04	15	20
	18	21	45	28	9	59	46	22	07	07	0	11	22	56	02	15	40	57	23	06	04	15	20
Nov.	28	21	45	28	+9	59	46	22	07	07	-0	11	22	56	02	-15	40	58	23	06	04	+15	20
	7	21	45	28	9	59	46	22	07	07	0	11	22	56	02	15	40	59	23	06	04	15	20
	17	21	45	27	9	59	45	22	07	07	0	11	22	56	02	15	41	00	23	06	04	15	20
	27	21	45	27	9	59	45	22	07	07	0	11	22	56	02	15	41	00	23	06	03	15	20
Dec.	7	21	45	27	9	59	44	22	07	07	0	11	22	56	02	15	41	01	23	06	03	15	20
	17	21	45	27	9	59	43	22	07	07	0	11	22	56	02	15	41	01	23	06	03	15	20
	27	21	45	27	+9	59	42	22	07	07	-0	11	22	56	02	-15	41	02	23	06	03	+15	20
	37	21	45	27	+9	59	41	22	07	07	-0	11	22	56	01	-15	41	02	23	06	03	+15	20

BESSELIAN DAY NUMBERS, 2025.5
FOR 0^h TERRESTRIAL TIME

Date	τ	A	B	C	D	E s (0.0001)	d ψ	d ϵ	
		"	"	"	"				
Jan.	0	-0.5021	-10.049	-8.460	-3.281	+20.529	+0	+0.039	-0.109
	1	0.4993	9.929	8.497	3.611	20.463	0	0.140	0.079
	2	0.4966	9.824	8.554	3.941	20.390	0	0.204	-0.030
	3	0.4938	9.741	8.620	4.269	20.311	1	0.214	+0.027
	4	0.4911	9.681	8.682	4.595	20.225	1	0.166	0.079
	5	0.4884	9.641	8.727	4.920	20.132	0	+0.070	0.114
	6	-0.4856	-9.611	-8.746	-5.242	+20.033	+0	-0.051	+0.123
	7	0.4829	9.579	8.737	5.563	19.928	0	0.165	0.103
	8	0.4802	9.532	8.704	5.881	19.817	0	0.242	+0.057
	9	0.4774	9.462	8.657	6.197	19.700	0	0.261	-0.002
	10	0.4747	9.367	8.612	6.511	19.577	0	0.214	0.060
	11	0.4719	9.250	8.582	6.822	19.448	1	-0.111	0.103
	12	-0.4692	-9.121	-8.577	-7.132	+19.314	+1	+0.023	-0.122
	13	0.4665	8.992	8.601	7.439	19.175	1	0.157	0.113
	14	0.4637	8.876	8.649	7.743	19.029	1	0.262	0.080
	15	0.4610	8.780	8.713	8.046	18.879	2	0.317	-0.032
	16	0.4582	8.707	8.782	8.346	18.723	2	0.315	+0.021
	17	0.4555	8.656	8.844	8.644	18.561	2	0.260	0.067
	18	-0.4528	-8.621	-8.893	-8.940	+18.394	+1	+0.165	+0.099
	19	0.4500	8.595	8.923	9.233	18.221	1	+0.049	0.111
	20	0.4473	8.570	8.934	9.523	18.043	1	-0.069	0.105
	21	0.4446	8.541	8.927	9.811	17.859	1	0.173	0.080
	22	0.4418	8.500	8.907	10.095	17.669	1	0.247	+0.041
	23	0.4391	8.444	8.880	10.377	17.473	1	0.282	-0.005
	24	-0.4363	-8.370	-8.852	-10.656	+17.273	+1	-0.271	-0.051
	25	0.4336	8.280	8.833	10.932	17.066	1	0.215	0.089
	26	0.4309	8.175	8.829	11.204	16.854	2	0.123	0.112
	27	0.4281	8.063	8.847	11.473	16.636	2	-0.010	0.114
	28	0.4254	7.952	8.889	11.738	16.413	2	+0.103	0.092
	29	0.4227	7.852	8.953	11.999	16.184	2	0.187	-0.048
Feb.	30	-0.4199	-7.773	-9.030	-12.257	+15.950	+2	+0.222	+0.009
	31	0.4172	7.719	9.108	12.510	15.711	2	0.195	0.067
	1	0.4144	7.688	9.171	12.758	15.466	2	+0.111	0.109
	2	0.4117	7.672	9.208	13.003	15.217	2	-0.006	0.126
	3	0.4090	7.657	9.214	13.242	14.963	2	0.125	0.112
	4	0.4062	7.630	9.193	13.477	14.705	2	0.213	0.070
	5	-0.4035	-7.581	-9.155	-13.708	+14.443	+2	-0.245	+0.013
	6	0.4008	7.508	9.116	13.934	14.176	2	0.212	-0.047
	7	0.3980	7.413	9.089	14.155	13.906	2	0.124	0.094
	8	0.3953	7.305	9.084	14.371	13.633	2	-0.001	0.119
	9	0.3925	7.194	9.105	14.583	13.355	2	+0.129	0.117
	10	0.3898	7.093	9.151	14.790	13.074	2	0.238	0.091
	11	-0.3871	-7.009	-9.215	-14.993	+12.790	+2	+0.306	-0.047
	12	0.3843	6.946	9.286	15.192	12.502	2	0.320	+0.005
	13	0.3816	6.906	9.354	15.385	12.211	2	0.281	0.053
	14	0.3789	6.884	9.410	15.575	11.916	2	0.197	0.090
	15	-0.3761	-6.874	-9.448	-15.760	+11.618	+2	+0.086	+0.110

BESSELIAN DAY NUMBERS, 2025.5
FOR 0^h TERRESTRIAL TIME

Date	τ	A	B	C	D	E s (0.0001)	d ψ	d ϵ		
		"	"	"	"					
Feb.	15	-0.3761	-6.874	-9.448	-15.760	+11.618	+2	+0.086	+0.110	
	16	0.3734	6.867	9.466	15.940	11.317	2	-0.035	0.109	
	17	0.3706	6.858	9.464	16.115	11.012	2	0.145	0.090	
	18	0.3679	6.839	9.447	16.286	10.704	2	0.231	0.055	
	19	0.3652	6.806	9.420	16.452	10.392	2	0.280	+0.011	
	20	0.3624	6.757	9.391	16.613	10.078	2	0.285	-0.035	
	21	-0.3597	-6.690	-9.366	-16.769	+9.760	+2	-0.248	-0.076	
	22	0.3569	6.609	9.353	16.920	9.439	2	0.171	0.105	
	23	0.3542	6.518	9.358	17.066	9.115	2	-0.068	0.115	
	24	0.3515	6.424	9.386	17.207	8.789	2	+0.044	0.103	
	25	0.3487	6.336	9.436	17.342	8.459	2	0.141	0.068	
	26	0.3460	6.264	9.504	17.472	8.126	2	0.200	-0.014	
Mar.	27	-0.3433	-6.215	-9.577	-17.596	+7.791	+2	+0.201	+0.046	
	28	0.3405	6.192	9.642	17.714	7.453	2	0.139	0.098	
	1	0.3378	6.188	9.683	17.826	7.113	2	+0.031	0.126	
	2	0.3350	6.190	9.691	17.933	6.771	2	-0.093	0.123	
	3	0.3323	6.183	9.667	18.033	6.428	2	0.194	0.087	
	4	0.3296	6.155	9.621	18.127	6.083	1	0.240	+0.030	
	5	-0.3268	-6.101	-9.569	-18.216	+5.736	+1	-0.219	-0.032	
	6	0.3241	6.023	9.526	18.298	5.389	2	0.137	0.085	
	7	0.3214	5.930	9.504	18.375	5.040	2	-0.016	0.116	
	8	0.3186	5.832	9.508	18.446	4.691	2	+0.116	0.120	
	9	0.3159	5.742	9.536	18.512	4.342	2	0.231	0.099	
	10	0.3131	5.667	9.583	18.572	3.991	2	0.308	0.059	
	11	-0.3104	-5.612	-9.640	-18.626	+3.640	+2	+0.333	-0.009	
	12	0.3077	5.579	9.695	18.675	3.289	2	0.306	+0.041	
	13	0.3049	5.564	9.741	18.719	2.937	2	0.233	0.082	
	14	0.3022	5.563	9.770	18.758	2.584	2	0.127	0.106	
	15	0.2995	5.567	9.779	18.791	2.231	1	+0.007	0.111	
	16	0.2967	5.570	9.768	18.819	1.878	1	-0.109	0.097	
	17	-0.2940	-5.564	-9.739	-18.841	+1.524	+1	-0.204	+0.067	
	18	0.2912	5.545	9.699	18.858	1.170	1	0.265	+0.026	
	19	0.2885	5.510	9.654	18.870	0.816	1	0.285	-0.021	
	20	0.2858	5.458	9.611	18.876	0.461	1	0.263	0.064	
	21	0.2830	5.390	9.578	18.877	+0.106	1	0.201	0.096	
	22	0.2803	5.311	9.560	18.872	-0.249	1	0.111	0.113	
	23	-0.2775	-5.227	-9.563	-18.862	-0.603	+1	-0.008	-0.108	
	24	0.2748	5.145	9.586	18.846	0.958	1	+0.090	0.082	
	25	0.2721	5.073	9.628	18.824	1.313	1	0.161	-0.037	
	26	0.2693	5.020	9.682	18.796	1.667	1	0.184	+0.021	
	27	0.2666	4.991	9.734	18.763	2.021	1	0.149	0.078	
	28	0.2639	4.983	9.770	18.724	2.374	1	+0.059	0.118	
	29	-0.2611	-4.988	-9.775	-18.678	-2.727	+1	-0.063	+0.130	
	30	0.2584	4.990	9.745	18.627	3.078	1	0.179	0.106	
	31	0.2556	4.973	9.686	18.569	3.428	0	0.249	+0.054	
	Apr.	1	0.2529	4.929	9.612	18.506	3.777	0	0.248	-0.011
		2	-0.2502	-4.855	-9.543	-18.437	-4.123	+1	-0.176	-0.072

BESSELIAN DAY NUMBERS, 2025.5
FOR 0^h TERRESTRIAL TIME

Date	τ	A	B	C	D	E s (0.0001)	d ψ	d ϵ	
		"	"	"	"				
Apr.	1	-0.2529	-4.929	-9.612	-18.506	-3.777	+0	-0.248	-0.011
	2	0.2502	4.855	9.543	18.437	4.123	1	0.176	0.072
	3	0.2474	4.761	9.494	18.363	4.468	1	-0.053	0.112
	4	0.2447	4.659	9.472	18.283	4.810	1	+0.089	0.124
	5	0.2420	4.562	9.478	18.197	5.150	1	0.218	0.108
	6	0.2392	4.480	9.504	18.107	5.488	1	0.310	0.071
	7	-0.2365	-4.418	-9.542	-18.011	-5.824	+1	+0.349	-0.022
	8	0.2337	4.378	9.580	17.911	6.157	1	0.334	+0.029
	9	0.2310	4.356	9.611	17.805	6.488	1	0.270	0.072
	10	0.2283	4.348	9.627	17.695	6.817	1	0.171	0.101
	11	0.2255	4.348	9.623	17.580	7.143	1	+0.053	0.111
	12	0.2228	4.347	9.600	17.460	7.467	0	-0.066	0.102
	13	-0.2201	-4.339	-9.560	-17.336	-7.789	+0	-0.168	+0.076
	14	0.2173	4.318	9.506	17.207	8.108	0	0.240	+0.037
	15	0.2146	4.282	9.445	17.073	8.425	0	0.272	-0.008
	16	0.2118	4.228	9.386	16.934	8.739	0	0.261	0.052
	17	0.2091	4.157	9.334	16.791	9.051	0	0.211	0.088
	18	0.2064	4.075	9.296	16.643	9.360	0	0.131	0.109
	19	-0.2036	-3.985	-9.278	-16.491	-9.667	+0	-0.035	-0.110
	20	0.2009	3.896	9.280	16.334	9.971	0	+0.060	0.091
	21	0.1982	3.814	9.301	16.172	10.272	1	0.133	0.052
	22	0.1954	3.748	9.335	16.005	10.570	1	0.168	-0.000
	23	0.1927	3.701	9.373	15.834	10.866	1	0.151	+0.056
	24	0.1899	3.675	9.402	15.658	11.158	0	+0.080	0.103
	25	-0.1872	-3.665	-9.408	-15.477	-11.447	+0	-0.032	+0.128
	26	0.1845	3.659	9.381	15.291	11.733	0	0.156	0.120
	27	0.1817	3.642	9.322	15.100	12.015	+0	0.251	0.080
	28	0.1790	3.599	9.240	14.905	12.293	-0	0.283	+0.017
	29	0.1762	3.523	9.154	14.705	12.566	0	0.237	-0.050
	30	0.1735	3.421	9.082	14.501	12.836	0	-0.123	0.102
May	1	-0.1708	-3.303	-9.039	-14.292	-13.101	+0	+0.028	-0.126
	2	0.1680	3.185	9.026	14.080	13.361	1	0.177	0.119
	3	0.1653	3.081	9.039	13.864	13.617	1	0.291	0.086
	4	0.1626	2.997	9.068	13.644	13.869	1	0.353	-0.037
	5	0.1598	2.935	9.101	13.421	14.115	1	0.355	+0.015
	6	0.1571	2.895	9.127	13.194	14.358	1	0.304	0.062
	7	-0.1543	-2.870	-9.141	-12.964	-14.596	+1	+0.213	+0.095
	8	0.1516	2.854	9.136	12.731	14.829	1	+0.097	0.110
	9	0.1489	2.839	9.112	12.494	15.058	0	-0.023	0.106
	10	0.1461	2.819	9.070	12.254	15.283	0	0.130	0.083
	11	0.1434	2.787	9.014	12.012	15.503	0	0.210	0.047
	12	0.1407	2.740	8.951	11.766	15.719	0	0.252	+0.003
	13	-0.1379	-2.675	-8.887	-11.518	-15.931	+0	-0.252	-0.042
	14	0.1352	2.593	8.830	11.266	16.138	0	0.210	0.080
	15	0.1324	2.498	8.786	11.011	16.340	1	0.137	0.104
	16	0.1297	2.395	8.761	10.754	16.538	1	-0.044	0.111
	17	-0.1270	-2.291	-8.757	-10.494	-16.732	+1	+0.050	-0.097

BESSELIAN DAY NUMBERS, 2025.5
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Date	τ	A	B	C	D	E s (0.0001)	d ψ	d ε	
		"	"	"	"				
May	17	-0.1270	-2.291	-8.757	-10.494	-16.732	+1	+0.050	-0.097
	18	0.1242	2.193	8.773	10.231	16.921	1	0.126	0.063
	19	0.1215	2.109	8.803	9.964	17.106	1	0.167	-0.015
	20	0.1188	2.044	8.839	9.695	17.286	1	0.160	+0.039
	21	0.1160	1.998	8.870	9.424	17.461	1	0.102	0.088
	22	0.1133	1.969	8.885	9.149	17.632	1	+0.001	0.119
	23	-0.1105	-1.948	-8.873	-8.871	-17.797	+1	-0.122	+0.124
	24	0.1078	1.922	8.830	8.591	17.957	1	0.233	0.097
	25	0.1051	1.876	8.761	8.307	18.112	1	0.296	+0.044
	26	0.1023	1.801	8.679	8.021	18.262	1	0.287	-0.022
June	27	0.0996	1.695	8.603	7.733	18.405	1	0.201	0.083
	28	0.0969	1.567	8.551	7.442	18.543	1	-0.059	0.121
	29	-0.0941	-1.430	-8.530	-7.150	-18.675	+2	+0.102	-0.127
	30	0.0914	1.302	8.541	6.855	18.801	2	0.242	0.103
	31	0.0886	1.193	8.574	6.559	18.921	2	0.332	0.057
	1	0.0859	1.109	8.615	6.261	19.036	2	0.360	-0.002
	2	0.0832	1.048	8.654	5.962	19.144	2	0.327	+0.049
	3	0.0804	1.005	8.680	5.662	19.247	2	0.247	0.087
	4	-0.0777	-0.975	-8.690	-5.361	-19.345	+2	+0.137	+0.108
	5	0.0749	0.948	8.679	5.059	19.437	2	+0.017	0.109
	6	0.0722	0.917	8.651	4.755	19.523	2	-0.095	0.091
	7	0.0695	0.877	8.608	4.451	19.604	2	0.183	0.057
	8	0.0667	0.822	8.556	4.146	19.679	2	0.234	+0.014
	9	0.0640	0.750	8.502	3.840	19.750	2	0.244	-0.031
	10	-0.0613	-0.661	-8.453	-3.533	-19.814	+2	-0.212	-0.071
	11	0.0585	0.558	8.417	3.226	19.874	2	0.144	0.100
	12	0.0558	0.445	8.399	2.918	19.928	2	-0.053	0.111
	13	0.0530	0.330	8.402	2.609	19.977	2	+0.044	0.102
	14	0.0503	0.221	8.426	2.299	20.021	3	0.127	0.072
	15	0.0476	0.124	8.466	1.989	20.060	3	0.177	-0.027
	16	-0.0448	-0.046	-8.515	-1.678	-20.093	+3	+0.180	+0.026
	17	0.0421	+0.012	8.561	1.367	20.121	3	0.132	0.076
	18	0.0394	0.052	8.593	1.054	20.143	3	+0.038	0.112
	19	0.0366	0.081	8.602	0.742	20.160	3	-0.081	0.123
	20	0.0339	0.112	8.582	0.428	20.171	3	0.198	0.106
	21	0.0311	0.156	8.537	0.114	20.177	3	0.281	0.062
	22	-0.0284	+0.224	-8.475	+0.200	-20.176	+3	-0.303	+0.001
	23	0.0257	0.322	8.412	0.515	20.170	3	0.251	-0.061
	24	0.0229	0.446	8.366	0.829	20.157	3	-0.134	0.108
	25	0.0202	0.584	8.347	1.144	20.138	3	+0.020	0.128
	26	0.0175	0.722	8.361	1.458	20.113	4	0.173	0.116
	27	0.0147	0.845	8.402	1.771	20.082	4	0.289	0.077
July	28	-0.0120	+0.944	-8.458	+2.084	-20.044	+4	+0.345	-0.023
	29	0.0092	1.017	8.517	2.396	20.001	4	0.337	+0.032
	30	0.0065	1.068	8.566	2.707	19.952	4	0.273	0.077
	1	0.0038	1.104	8.598	3.016	19.897	4	0.171	0.105
	2	-0.0010	+1.132	-8.610	+3.325	-19.836	+4	+0.052	+0.112

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Date	τ	A	B	C	D	E s (0.0001)	d ψ	d ε	
		"	"	"	"				
July	1	-0.0038	+1.104	-8.598	+3.016	-19.897	+4	+0.171	+0.105
	2	-0.0010	1.132	8.610	3.325	19.836	4	+0.052	0.112
	3	+0.0017	1.162	8.602	3.632	19.770	4	-0.064	0.098
	4	0.0044	1.200	8.579	3.938	19.699	4	0.160	0.069
	5	0.0072	1.250	8.544	4.242	19.622	4	0.222	+0.027
	6	0.0099	1.317	8.506	4.545	19.539	4	0.244	-0.019
	7	+0.0127	+1.400	-8.471	+4.846	-19.452	+4	-0.222	-0.062
	8	0.0154	1.499	8.446	5.146	19.359	4	0.162	0.094
	9	0.0181	1.608	8.439	5.445	19.262	4	-0.074	0.111
	10	0.0209	1.722	8.452	5.742	19.159	4	+0.027	0.107
	11	0.0236	1.832	8.487	6.037	19.051	4	0.119	0.082
	12	0.0264	1.930	8.540	6.330	18.938	5	0.182	-0.039
	13	+0.0291	+2.010	-8.604	+6.622	-18.821	+5	+0.199	+0.014
	14	0.0318	2.069	8.668	6.913	18.698	5	0.163	0.066
	15	0.0346	2.107	8.719	7.202	18.570	5	+0.079	0.106
	16	0.0373	2.133	8.749	7.489	18.438	5	-0.037	0.123
	17	0.0400	2.156	8.750	7.775	18.300	4	0.157	0.112
	18	0.0428	2.190	8.726	8.059	18.157	4	0.251	+0.075
	19	+0.0455	+2.244	-8.683	+8.341	-18.008	+4	-0.292	+0.018
	20	0.0483	2.324	8.635	8.621	17.854	4	0.266	-0.043
	21	0.0510	2.430	8.598	8.899	17.695	5	0.175	0.094
	22	0.0537	2.553	8.584	9.175	17.530	5	-0.038	0.123
	23	0.0565	2.682	8.600	9.449	17.359	5	+0.112	0.122
	24	0.0592	2.801	8.645	9.719	17.183	5	0.240	0.092
	25	+0.0619	+2.900	-8.709	+9.987	-17.002	+5	+0.319	-0.043
	26	0.0647	2.973	8.781	10.252	16.816	6	0.335	+0.013
	27	0.0674	3.022	8.847	10.514	16.624	6	0.290	0.063
	28	0.0702	3.052	8.898	10.772	16.428	5	0.200	0.098
	29	0.0729	3.071	8.929	11.027	16.226	5	+0.084	0.113
	30	0.0756	3.089	8.939	11.279	16.020	5	-0.035	0.106
Aug.	31	+0.0784	+3.112	-8.930	+11.527	-15.810	+5	-0.138	+0.081
	1	0.0811	3.147	8.908	11.772	15.595	5	0.212	+0.042
	2	0.0838	3.197	8.880	12.014	15.376	5	0.246	-0.004
	3	0.0866	3.262	8.852	12.251	15.153	5	0.238	0.049
	4	0.0893	3.344	8.832	12.486	14.926	5	0.190	0.086
	5	0.0921	3.438	8.827	12.716	14.694	5	0.109	0.108
	6	+0.0948	+3.538	-8.841	+12.943	-14.459	+5	-0.010	-0.111
	7	0.0975	3.638	8.877	13.167	14.220	6	+0.089	0.093
	8	0.1003	3.729	8.933	13.387	13.977	6	0.167	0.054
	9	0.1030	3.803	9.002	13.603	13.731	6	0.203	-0.002
	10	0.1057	3.855	9.074	13.816	13.481	6	0.186	+0.053
	11	0.1085	3.885	9.137	14.025	13.227	6	0.116	0.098
	12	+0.111	+3.899	-9.179	+14.231	-12.970	+6	+0.006	+0.123
	13	0.114	3.908	9.192	14.433	12.709	5	-0.116	0.119
	14	0.1167	3.923	9.176	14.632	12.444	5	0.219	0.086
	15	0.1194	3.958	9.140	14.827	12.175	5	0.273	+0.033
	16	+0.1222	+4.017	-9.095	+15.019	-11.902	+5	-0.263	-0.029

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Date	τ	A	B	C	D	E s (0.0001)	d ψ	d ε	
		"	"	"	"				
Aug.	16	+0.1222	+4.017	-9.095	+15.019	-11.902	+5	-0.263	-0.029
	17	0.1249	4.102	9.057	15.206	11.626	5	0.188	0.083
	18	0.1277	4.205	9.039	15.390	11.345	5	-0.066	0.117
	19	0.1304	4.316	9.049	15.569	11.061	6	+0.077	0.124
	20	0.1331	4.421	9.086	15.744	10.773	6	0.207	0.102
	21	0.1359	4.510	9.145	15.914	10.481	6	0.298	0.059
	22	+0.1386	+4.576	-9.214	+16.080	-10.185	+6	+0.332	-0.005
	23	0.1413	4.617	9.282	16.241	9.886	6	0.305	+0.048
	24	0.1441	4.637	9.337	16.397	9.584	6	0.228	0.089
	25	0.1468	4.644	9.374	16.548	9.279	6	+0.118	0.110
	26	0.1496	4.647	9.388	16.694	8.971	5	-0.002	0.111
	27	0.1523	4.653	9.382	16.834	8.660	5	0.113	0.091
	28	+0.1550	+4.668	-9.360	+16.970	-8.347	+5	-0.197	+0.056
	29	0.1578	4.698	9.329	17.101	8.031	5	0.245	+0.012
Sept.	30	0.1605	4.744	9.295	17.227	7.713	5	0.251	-0.034
	31	0.1632	4.806	9.267	17.348	7.393	5	0.217	0.074
	1	0.1660	4.881	9.251	17.463	7.071	5	0.148	0.102
	2	0.1687	4.965	9.252	17.574	6.747	5	-0.056	0.112
	3	+0.1715	+5.051	-9.273	+17.680	-6.421	+5	+0.043	-0.101
	4	0.1742	5.132	9.315	17.780	6.093	5	0.130	0.070
	5	0.1769	5.200	9.372	17.876	5.764	5	0.184	-0.022
	6	0.1797	5.248	9.437	17.967	5.433	5	0.190	+0.034
	7	0.1824	5.274	9.497	18.053	5.101	5	0.140	0.085
	8	0.1851	5.280	9.539	18.134	4.768	5	+0.042	0.120
	9	+0.1879	+5.277	-9.553	+18.210	-4.433	+5	-0.080	+0.126
	10	0.1906	5.277	9.535	18.282	4.096	5	0.193	0.101
	11	0.1934	5.294	9.490	18.349	3.758	5	0.262	+0.050
	12	0.1961	5.337	9.433	18.411	3.418	5	0.265	-0.013
Oct.	13	0.1988	5.406	9.379	18.468	3.077	5	0.200	0.072
	14	0.2016	5.497	9.343	18.520	2.734	5	-0.083	0.112
	15	+0.2043	+5.597	-9.334	+18.566	-2.389	+5	+0.058	-0.125
	16	0.2070	5.694	9.352	18.608	2.043	5	0.192	0.110
	17	0.2098	5.776	9.393	18.644	1.695	5	0.291	0.071
	18	0.2125	5.838	9.447	18.674	1.346	5	0.337	-0.020
	19	0.2153	5.876	9.501	18.698	0.997	5	0.324	+0.034
	20	0.2180	5.893	9.546	18.717	0.646	5	0.259	0.078
	21	+0.2207	+5.895	-9.574	+18.730	-0.295	+5	+0.156	+0.106
	22	0.2235	5.891	9.580	18.737	+0.056	5	+0.037	0.112
	23	0.2262	5.887	9.565	18.738	0.408	4	-0.079	0.099
	24	0.2290	5.893	9.532	18.734	0.760	4	0.174	0.068
	25	0.2317	5.912	9.488	18.723	1.111	4	0.234	+0.026
	26	0.2344	5.947	9.439	18.707	1.463	4	0.254	-0.019
27	+0.2372	+5.998	-9.392	+18.685	+1.814	+4	-0.233	-0.061	
28	0.2399	6.064	9.356	18.658	2.164	4	0.176	0.093	
29	0.2426	6.140	9.335	18.625	2.514	4	0.094	0.109	
30	0.2454	6.221	9.332	18.586	2.863	4	-0.001	0.105	
1	+0.2481	+6.299	-9.349	+18.542	+3.211	+4	+0.087	-0.082	

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Date	τ	A	B	C	D	E s (0.0001)	d ψ	d ε	
		"	"	"	"				
Oct.	1	+0.2481	+6.299	-9.349	+18.542	+3.211	+4	+0.087	-0.082
	2	0.2509	6.368	9.382	18.492	3.558	4	0.151	-0.041
	3	0.2536	6.422	9.427	18.437	3.904	4	0.174	+0.012
	4	0.2563	6.455	9.473	18.377	4.248	4	0.147	0.066
	5	0.2591	6.468	9.506	18.312	4.592	4	+0.067	0.109
	6	0.2618	6.466	9.515	18.242	4.934	4	-0.048	0.128
	7	+0.2645	+6.463	-9.492	+18.166	+5.275	+4	-0.169	+0.115
	8	0.2673	6.473	9.438	18.086	5.614	4	0.259	0.072
	9	0.2700	6.508	9.363	18.001	5.953	4	0.285	+0.009
	10	0.2728	6.574	9.286	17.910	6.290	4	0.235	-0.056
	11	0.2755	6.665	9.224	17.815	6.627	4	-0.121	0.105
	12	0.2782	6.771	9.189	17.714	6.962	4	+0.028	0.127
	13	+0.2810	+6.876	-9.183	+17.608	+7.296	+4	+0.175	-0.118
	14	0.2837	6.969	9.203	17.496	7.628	4	0.288	0.083
	15	0.2864	7.040	9.238	17.379	7.959	4	0.348	-0.033
	16	0.2892	7.089	9.276	17.257	8.288	4	0.348	+0.021
	17	0.2919	7.116	9.307	17.128	8.616	4	0.294	0.068
	18	0.2947	7.127	9.322	16.995	8.941	4	0.198	0.099
	19	+0.2974	+7.130	-9.318	+16.855	+9.263	+4	+0.081	+0.112
	20	0.3001	7.133	9.292	16.710	9.584	4	-0.038	0.103
	21	0.3029	7.143	9.247	16.560	9.901	4	0.140	0.077
	22	0.3056	7.166	9.190	16.404	10.216	3	0.211	+0.038
	23	0.3084	7.205	9.127	16.243	10.527	3	0.243	-0.007
	24	0.3111	7.261	9.064	16.077	10.836	3	0.234	0.050
	25	+0.3138	+7.332	-9.010	+15.906	+11.141	+3	-0.188	-0.084
	26	0.3166	7.415	8.970	15.729	11.443	4	0.114	0.105
	27	0.3193	7.503	8.948	15.548	11.741	4	-0.027	0.107
	28	0.3220	7.592	8.945	15.362	12.035	4	+0.059	0.090
	29	0.3248	7.674	8.959	15.171	12.326	4	0.125	0.055
	30	0.3275	7.743	8.986	14.975	12.613	4	0.158	-0.007
Nov.	31	+0.3303	+7.794	-9.017	+14.775	+12.896	+4	+0.145	+0.045
	1	0.3330	7.827	9.043	14.571	13.174	4	+0.084	0.092
	2	0.3357	7.843	9.051	14.362	13.449	4	-0.019	0.122
	3	0.3385	7.853	9.031	14.150	13.720	4	0.142	0.124
	4	0.3412	7.869	8.980	13.933	13.987	3	0.250	0.094
	5	0.3439	7.906	8.901	13.712	14.250	3	0.308	+0.038
	6	+0.3467	+7.973	-8.812	+13.488	+14.509	+3	-0.289	-0.030
	7	0.3494	8.073	8.730	13.260	14.765	4	0.192	0.090
	8	0.3522	8.195	8.673	13.027	15.016	4	-0.041	0.125
	9	0.3549	8.323	8.648	12.791	15.264	4	+0.125	0.127
	10	0.3576	8.441	8.655	12.550	15.508	4	0.264	0.098
	11	0.3604	8.538	8.682	12.306	15.748	4	0.348	-0.050
	12	+0.3631	+8.610	-8.716	+12.057	+15.984	+4	+0.368	+0.006
	13	0.3658	8.659	8.744	11.804	16.215	4	0.328	0.057
	14	0.3686	8.690	8.759	11.546	16.441	4	0.241	0.093
	15	0.3713	8.711	8.754	11.285	16.663	4	0.127	0.110
	16	+0.3741	+8.731	-8.729	+11.020	+16.880	+4	+0.007	+0.106

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Date	τ	A	B	C	D	E s (0.0001)	d ψ	d ϵ	
		"	"	"	"				
Nov.	16	+0.3741	+8.731	-8.729	+11.020	+16.880	+4	+0.007	+0.106
	17	0.3768	8.755	8.685	10.750	17.092	4	-0.100	0.084
	18	0.3795	8.792	8.628	10.478	17.298	4	0.180	0.047
	19	0.3823	8.844	8.564	10.201	17.499	4	0.222	+0.004
	20	0.3850	8.913	8.499	9.921	17.695	4	0.223	-0.040
	21	0.3877	8.997	8.442	9.637	17.885	4	0.186	0.077
	22	+0.3905	+9.095	-8.399	+9.350	+18.069	+4	-0.119	-0.101
	23	0.3932	9.199	8.373	9.061	18.247	4	-0.035	0.107
	24	0.3960	9.305	8.366	8.768	18.420	5	+0.050	0.095
	25	0.3987	9.404	8.377	8.472	18.587	5	0.119	0.065
Dec.	26	0.4014	9.492	8.403	8.174	18.747	5	0.157	-0.021
	27	0.4042	9.564	8.435	7.873	18.902	5	0.153	+0.029
	28	+0.4069	+9.618	-8.465	+7.570	+19.050	+5	+0.103	+0.077
	29	0.4097	9.656	8.482	7.264	19.193	5	+0.011	0.112
	30	0.4124	9.684	8.478	6.957	19.329	5	-0.107	0.124
	1	0.4151	9.712	8.446	6.647	19.460	5	0.225	0.108
	2	0.4179	9.755	8.386	6.336	19.585	5	0.309	+0.063
	3	0.4206	9.823	8.307	6.024	19.704	5	0.329	-0.000
	4	+0.4233	+9.924	-8.228	+5.710	+19.817	+5	-0.269	-0.065
	5	0.4261	10.053	8.165	5.394	19.924	5	-0.137	0.114
	6	0.4288	10.198	8.134	5.076	20.027	5	+0.033	0.132
	7	0.4316	10.342	8.138	4.757	20.123	6	0.198	0.115
	8	0.4343	10.467	8.170	4.436	20.214	6	0.317	0.071
	9	0.4370	10.566	8.216	4.113	20.299	6	0.368	-0.014
	10	+0.4398	+10.638	-8.261	+3.789	+20.378	+6	+0.350	+0.042
	11	0.4425	10.688	8.293	3.463	20.452	6	0.277	0.085
	12	0.4452	10.724	8.306	3.135	20.519	6	0.169	0.108
	13	0.4480	10.756	8.298	2.806	20.579	6	+0.049	0.109
	14	0.4507	10.791	8.272	2.475	20.633	6	-0.062	0.090
	15	0.4535	10.837	8.231	2.144	20.681	6	0.149	0.057
	16	+0.4562	+10.896	-8.181	+1.811	+20.722	+6	-0.201	+0.014
	17	0.4589	10.972	8.130	1.477	20.756	6	0.212	-0.031
	18	0.4617	11.064	8.086	1.143	20.784	6	0.183	0.070
	19	0.4644	11.169	8.054	0.808	20.805	6	0.121	0.097
	20	0.4671	11.283	8.039	0.473	20.819	6	-0.038	0.108
	21	0.4699	11.398	8.044	0.137	20.826	7	+0.049	0.100
	22	+0.4726	+11.508	-8.068	-0.199	+20.826	+7	+0.124	-0.073
	23	0.4754	11.607	8.107	0.534	20.820	7	0.169	-0.032
	24	0.4781	11.690	8.155	0.870	20.807	7	0.174	+0.017
	25	0.4808	11.754	8.203	1.205	20.786	7	0.133	0.066
	26	0.4836	11.801	8.241	1.539	20.760	7	+0.048	0.103
	27	0.4863	11.836	8.260	1.872	20.726	7	-0.065	0.121
	28	+0.4890	+11.868	-8.254	-2.205	+20.686	+7	-0.186	+0.113
	29	0.4918	11.909	8.222	2.536	20.640	7	0.285	0.079
	30	0.4945	11.969	8.170	2.866	20.587	7	0.334	+0.024
	31	0.4973	12.058	8.110	3.195	20.528	7	0.311	-0.040
	32	+0.5000	+12.176	-8.059	-3.523	+20.464	+7	-0.215	-0.095

SECOND-ORDER DAY NUMBERS, 2025
J FOR NORTHERN DECLINATIONS
FOR 0^h TT AND EQUINOX J 2025.5

Date		RIGHT ASCENSION												
		0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	8 ^h	9 ^h	10 ^h	11 ^h	12 ^h
		12 ^h	13 ^h	14 ^h	15 ^h	16 ^h	17 ^h	18 ^h	19 ^h	20 ^h	21 ^h	22 ^h	23 ^h	24 ^h
Jan.	-3	-11	-3	5	12	16	15	10	2	-6	-13	-17	-16	-11
	7	-15	-7	3	11	17	17	14	6	-4	-12	-18	-18	-15
	17	-17	-10	-1	9	16	19	16	9	0	-10	-17	-20	-17
	27	-19	-13	-4	6	15	19	18	12	3	-7	-16	-20	-19
Feb.	6	-20	-16	-8	2	12	18	19	15	7	-3	-13	-19	-20
	16	-21	-18	-11	-1	9	17	20	17	10	0	-10	-18	-21
	26	-20	-19	-14	-5	6	14	19	18	13	4	-7	-15	-20
Mar.	8	-18	-19	-15	-7	2	11	17	18	14	6	-3	-12	-18
	18	-15	-18	-16	-10	-1	7	14	17	15	9	0	-8	-15
	28	-12	-16	-15	-11	-4	4	11	15	14	10	3	-5	-12
Apr.	7	-9	-13	-14	-11	-5	2	8	12	13	10	4	-3	-9
	17	-6	-11	-12	-11	-7	-1	5	10	11	10	6	0	-6
	27	-4	-8	-10	-10	-7	-2	3	7	9	9	6	1	-4
May	7	-2	-6	-8	-8	-6	-3	1	5	7	7	5	2	-2
	17	-1	-4	-6	-6	-5	-3	0	3	5	5	4	2	-1
	27	0	-3	-4	-5	-4	-3	-1	2	3	4	3	2	0
June	6	0	-2	-3	-3	-3	-2	-1	1	2	2	2	1	0
	16	0	-1	-2	-2	-2	-1	-1	0	1	1	1	0	0
	26	-1	-1	-1	-1	-1	-1	0	0	0	0	0	0	-1
July	6	-1	-1	-1	-1	-1	0	0	0	0	0	0	-1	-1
	16	-1	-1	0	0	0	0	0	0	-1	-1	-1	-1	-1
	26	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	0
Aug.	5	1	1	1	1	0	-1	-2	-2	-2	-2	-1	0	1
	15	2	2	2	1	0	-2	-3	-3	-3	-2	-1	1	2
	25	3	4	4	3	0	-2	-4	-5	-5	-4	-1	1	3
Sept.	4	5	6	6	4	1	-3	-6	-7	-7	-5	-2	2	5
	14	6	9	9	7	2	-3	-7	-10	-10	-8	-3	2	6
	24	7	11	12	10	4	-2	-8	-12	-13	-11	-5	1	7
Oct.	4	8	14	16	13	7	-1	-9	-15	-17	-14	-8	0	8
	14	9	17	20	18	11	1	-10	-18	-21	-19	-12	-2	9
	24	8	18	23	22	15	3	-9	-19	-24	-23	-16	-4	8
Nov.	3	6	19	27	27	20	7	-7	-20	-28	-28	-21	-8	6
	13	4	20	30	32	25	12	-5	-21	-31	-33	-26	-13	4
	23	1	19	32	36	31	17	-2	-20	-33	-37	-32	-18	1
Dec.	3	-4	16	32	39	36	22	3	-17	-33	-40	-37	-23	-4
	13	-10	13	31	42	41	28	9	-14	-32	-43	-42	-29	-10
	23	-15	8	30	43	44	34	14	-9	-31	-44	-45	-35	-15
	33	-21	3	26	42	47	38	20	-4	-27	-43	-48	-39	-21

The second-order day number J given in this table in units of 0^s.00001

The apparent right ascension of a star is given by:

$$\alpha = \alpha_1 + \tau\mu_\alpha/100 + Aa + Bb + Cc + Dd + E + J \tan^2\delta_1$$

Where the position (α_1 , δ_1) and centennial proper motion in right ascension (μ_α) are referred to the mean equator and equinox of J 2025.5

SECOND-ORDER DAY NUMBERS, 2025
J' FOR NORTHERN DECLINATIONS
FOR 0^h TT AND EQUINOX J 2025.5

Date	RIGHT ASCENSION												
	0 ^h 12 ^h	1 ^h 13 ^h	2 ^h 14 ^h	3 ^h 15 ^h	4 ^h 16 ^h	5 ^h 17 ^h	6 ^h 18 ^h	7 ^h 19 ^h	8 ^h 20 ^h	9 ^h 21 ^h	10 ^h 22 ^h	11 ^h 23 ^h	12 ^h 24 ^h
Jan.	-3	-2	0	-1	-5	-11	-18	-23	-24	-20	-14	-8	-2
	7	-4	0	0	-4	-9	-16	-23	-27	-28	-19	-11	-4
	17	-8	-3	0	-1	-7	-14	-22	-28	-30	-28	-15	-7
	27	-11	-4	-1	-1	-6	-13	-20	-27	-30	-30	-18	-11
Feb.	6	-13	-6	-2	-1	-4	-10	-18	-25	-30	-31	-21	-13
	16	-16	-9	-3	-1	-2	-8	-15	-23	-28	-31	-24	-16
	26	-18	-11	-4	-1	-1	-5	-12	-20	-26	-29	-25	-18
Mar.	8	-19	-12	-6	-1	-1	-3	-9	-16	-23	-27	-25	-19
	18	-20	-14	-7	-3	-1	-2	-6	-13	-19	-24	-25	-20
	28	-20	-15	-9	-4	-1	-1	-4	-10	-16	-21	-24	-20
Apr.	7	-19	-15	-9	-4	-1	-1	-3	-7	-13	-17	-21	-19
	17	-17	-14	-9	-5	-2	-1	-2	-5	-9	-14	-18	-17
	27	-15	-13	-9	-5	-2	-1	-1	-3	-7	-11	-15	-15
May	7	-12	-11	-8	-5	-2	-1	-1	-2	-5	-8	-12	-12
	17	-9	-9	-7	-5	-2	-1	-1	-3	-5	-8	-9	-9
	27	-7	-7	-5	-4	-2	-1	-1	-2	-4	-5	-7	-7
June	6	-5	-5	-4	-3	-2	-1	-1	-1	-3	-4	-5	-5
	16	-3	-3	-2	-2	-1	-1	-1	-1	-2	-2	-3	-3
	26	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-2	-2
July	6	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	16	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	26	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Aug.	5	-1	-1	-2	-2	-3	-3	-2	-2	-1	-1	-1	-1
	15	-1	-2	-3	-4	-5	-5	-4	-3	-2	-1	-1	-1
	25	-2	-3	-5	-7	-7	-6	-5	-3	-1	-1	-1	-2
Sept.	4	-2	-5	-7	-10	-11	-9	-7	-4	-2	-1	-1	-2
	14	-3	-6	-10	-13	-15	-15	-13	-10	-6	-3	-1	-3
	24	-3	-7	-12	-16	-19	-20	-18	-14	-9	-4	-1	-3
Oct.	4	-2	-7	-13	-20	-24	-25	-23	-19	-12	-6	-2	-2
	14	-2	-7	-15	-23	-29	-31	-30	-24	-17	-9	-3	-2
	24	-2	-7	-16	-25	-33	-37	-36	-30	-22	-12	-5	-2
Nov.	3	-1	-6	-16	-27	-37	-42	-42	-37	-28	-17	-7	-1
	13	-1	-6	-16	-28	-40	-48	-49	-44	-34	-22	-10	-1
	23	-1	-5	-15	-29	-42	-52	-55	-51	-41	-27	-13	-1
Dec.	3	-1	-3	-13	-28	-43	-55	-60	-57	-48	-33	-18	-1
	13	-1	-2	-11	-26	-43	-57	-64	-64	-55	-40	-23	-1
	23	-2	-1	-9	-24	-41	-57	-67	-68	-61	-46	-28	-2
	33	-4	-1	-7	-21	-39	-56	-68	-71	-65	-51	-33	-4

The second-order day number J' given in this table in units of 0".0001

The apparent declination of a star is given by:

$$\delta = \delta_1 + \tau\mu_\delta/100 + Aa' + Bb' + Cc' + J' \tan\delta_1$$

Where the declination (δ_1) and centennial proper motion in declination (μ_δ) are referred to the mean equator and equinox of J 2025.5

SECOND-ORDER DAY NUMBERS, 2025
J FOR SOUTHERN DECLINATIONS
FOR 0^h TT AND EQUINOX J 2025.5

Date	RIGHT ASCENSION												
	0 ^h 12 ^h	1 ^h 13 ^h	2 ^h 14 ^h	3 ^h 15 ^h	4 ^h 16 ^h	5 ^h 17 ^h	6 ^h 18 ^h	7 ^h 19 ^h	8 ^h 20 ^h	9 ^h 21 ^h	10 ^h 22 ^h	11 ^h 23 ^h	12 ^h 24 ^h
Jan.	-3	2	2	2	1	0	-2	-3	-3	-2	-1	1	2
	7	0	1	1	1	0	-1	-1	-2	-2	-1	0	0
	17	0	0	0	0	0	0	-1	-1	-1	-1	-1	0
	27	-1	-1	0	0	0	0	0	-1	-1	-1	-1	-1
Feb.	6	-1	-1	-1	-1	-1	0	0	0	0	0	-1	-1
	16	0	0	-1	-1	-1	-1	-1	0	0	0	0	0
	26	1	1	0	-1	-2	-2	-2	-1	0	1	1	1
Mar.	8	2	2	1	0	-2	-3	-3	-2	-1	1	2	2
	18	3	4	3	1	-1	-3	-4	-5	-4	0	2	3
	28	5	6	5	3	0	-3	-6	-7	-6	-4	-1	2
Apr.	7	5	8	8	6	2	-2	-6	-9	-7	-3	1	5
	17	6	9	10	9	4	-1	-7	-10	-11	-5	0	6
	27	5	10	13	12	8	1	-6	-11	-14	-13	-2	5
May	7	3	11	15	16	11	4	-4	-12	-16	-17	-5	3
	17	1	11	17	19	15	7	-2	-12	-18	-20	-8	1
	27	-2	10	18	21	19	11	1	-11	-19	-22	-12	-2
June	6	-5	7	18	23	23	16	4	-8	-19	-24	-17	-5
	16	-9	4	17	25	26	20	8	-5	-18	-26	-27	-9
	26	-13	1	15	25	28	23	12	-2	-16	-26	-29	-13
July	6	-18	-3	12	24	29	27	17	2	-13	-25	-30	-18
	16	-22	-8	8	22	30	29	21	7	-9	-23	-31	-22
	26	-25	-12	4	19	29	31	24	11	-5	-20	-30	-25
Aug.	5	-27	-15	0	16	27	31	26	14	-1	-17	-28	-27
	15	-29	-19	-4	11	24	30	28	18	3	-12	-25	-31
	25	-29	-21	-8	7	20	28	28	20	7	-8	-21	-29
Sept.	4	-28	-22	-11	3	17	25	27	21	10	-4	-18	-28
	14	-26	-22	-13	0	13	22	25	21	12	-1	-14	-23
	24	-24	-22	-14	-3	9	18	23	21	13	2	-10	-19
Oct.	4	-21	-20	-14	-5	6	15	20	19	13	4	-7	-21
	14	-17	-18	-14	-6	3	11	16	17	13	5	-4	-12
	24	-14	-15	-12	-6	1	8	13	14	11	5	-2	-9
Nov.	3	-11	-12	-11	-6	0	6	10	11	10	5	-1	-11
	13	-9	-10	-8	-5	0	5	8	9	7	4	-1	-9
	23	-7	-7	-6	-3	0	3	6	6	5	2	-1	-7
Dec.	3	-5	-5	-4	-2	0	3	4	4	3	1	-1	-5
	13	-4	-4	-3	-1	1	3	3	3	2	0	-2	-4
	23	-3	-2	-1	0	2	2	2	1	0	-1	-3	-3
	33	-2	-1	0	2	2	2	1	0	-1	-3	-3	-2

The second-order day number J given in this table in units of 0^s.00001

The apparent right ascension of a star is given by:

$$\alpha = \alpha_1 + \tau\mu_\alpha/100 + Aa + Bb + Cc + Dd + E + J \tan^2\delta_1$$

Where the position (α_1 , δ_1) and centennial proper motion in right ascension (μ_α) are referred to the mean equator and equinox of J 2025.5

SECOND-ORDER DAY NUMBERS, 2025
J' FOR SOUTHERN DECLINATIONS
FOR 0^h TT AND EQUINOX J 2025.5

Date	RIGHT ASCENSION												
	0 ^h 12 ^h	1 ^h 13 ^h	2 ^h 14 ^h	3 ^h 15 ^h	4 ^h 16 ^h	5 ^h 17 ^h	6 ^h 18 ^h	7 ^h 19 ^h	8 ^h 20 ^h	9 ^h 21 ^h	10 ^h 22 ^h	11 ^h 23 ^h	12 ^h 24 ^h
Jan.	-3	-1	-2	-3	-4	-4	-3	-2	-2	-1	-1	-1	-1
	7	-1	-1	-2	-2	-3	-3	-2	-2	-1	-1	-1	-1
	17	-1	-1	-1	-1	-1	-2	-2	-1	-1	-1	-1	-1
	27	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Feb.	6	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	16	-2	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-2
	26	-2	-3	-3	-3	-2	-2	-1	-1	-1	-1	-1	-2
Mar.	8	-2	-3	-4	-5	-4	-4	-3	-2	-1	-1	-1	-2
	18	-3	-4	-6	-7	-7	-6	-5	-3	-2	-1	-1	-3
	28	-2	-5	-7	-9	-10	-9	-8	-6	-3	-1	-1	-2
Apr.	7	-2	-5	-8	-11	-13	-13	-12	-9	-5	-3	-1	-2
	17	-2	-5	-9	-13	-16	-17	-16	-12	-8	-4	-1	-2
	27	-1	-5	-9	-15	-19	-21	-20	-17	-12	-7	-3	-1
May	7	-1	-4	-9	-16	-21	-25	-25	-22	-16	-10	-4	-1
	17	-1	-3	-9	-16	-23	-28	-29	-27	-21	-13	-6	-1
	27	-1	-2	-8	-16	-24	-31	-33	-31	-26	-18	-9	-1
June	6	-1	-1	-7	-15	-25	-32	-37	-36	-31	-22	-13	-5
	16	-2	-1	-5	-14	-24	-34	-39	-40	-36	-27	-17	-2
	26	-3	-1	-4	-12	-23	-34	-41	-43	-40	-32	-21	-3
July	6	-5	-1	-3	-10	-21	-32	-41	-45	-43	-36	-25	-5
	16	-7	-1	-1	-8	-18	-30	-40	-46	-46	-40	-29	-7
	26	-9	-2	-1	-6	-16	-28	-39	-46	-47	-42	-33	-9
Aug.	5	-12	-3	-1	-4	-13	-24	-36	-44	-47	-44	-35	-12
	15	-14	-5	-1	-2	-10	-21	-32	-42	-46	-44	-37	-14
	25	-17	-7	-1	-1	-7	-17	-28	-38	-44	-44	-38	-17
Sept.	4	-18	-8	-2	-1	-5	-14	-24	-34	-41	-42	-38	-18
	14	-19	-10	-3	-1	-3	-10	-20	-29	-36	-39	-36	-19
	24	-20	-11	-4	-1	-2	-8	-16	-25	-32	-35	-34	-20
Oct.	4	-19	-11	-5	-1	-1	-5	-13	-20	-27	-31	-31	-19
	14	-18	-11	-5	-1	-1	-4	-10	-16	-23	-26	-27	-18
	24	-16	-10	-5	-1	-1	-3	-7	-13	-18	-21	-22	-16
Nov.	3	-14	-9	-5	-1	-1	-2	-5	-10	-14	-17	-18	-14
	13	-11	-7	-4	-1	-1	-2	-4	-8	-11	-14	-15	-11
	23	-8	-5	-3	-1	-1	-1	-3	-6	-9	-10	-11	-8
Dec.	3	-5	-4	-2	-1	-1	-1	-3	-5	-7	-8	-7	-5
	13	-3	-2	-1	-1	-1	-2	-3	-4	-6	-6	-5	-3
	23	-2	-1	-1	-1	-1	-2	-3	-4	-5	-5	-4	-2
	33	-1	-1	-1	-1	-2	-3	-4	-4	-4	-3	-2	-1

The second-order day number J' given in this table in units of 0".0001

The apparent declination of a star is given by:

$$\delta = \delta_1 + \tau\mu_\delta/100 + Aa' + Bb' + Cc' + J' \tan\delta_1$$

Where the declination (δ_1) and centennial proper motion in declination (μ_δ) are referred to the mean equator and equinox of J 2025.5

POSITION AND VELOCITY OF THE EARTH, 2025
ORIGIN AT SOLAR SYSTEM BARYCENTRE
MEAN EQUATOR AND EQUINOX J 2000.0

Date 0 ^h T.D.B.		X	Y	Z	\dot{X}	\dot{Y}	\dot{Z}
Jan.	0	-0.167 188 59	+0.885 427 71	+0.384 019 82	-1725 0989	-265 5414	-115 1251
	1	0.184 413 35	0.882 633 26	0.382 808 22	1719 7578	293 3328	127 1876
	2	0.201 581 83	0.879 561 39	0.381 476 22	1713 8439	321 0230	139 2050
	3	0.218 688 34	0.876 213 19	0.380 024 30	1707 3626	348 5946	151 1689
	4	0.235 727 22	0.872 589 94	0.378 453 05	1700 3217	376 0314	163 0714
	5	0.252 692 94	0.868 693 06	0.376 763 10	1692 7317	403 3185	174 9054
	6	-0.269 580 07	+0.864 524 11	+0.374 955 19	-1684 6049	-430 4434	-186 6651
	7	0.286 383 30	0.860 084 77	0.373 030 07	1675 9548	457 3957	198 3457
	8	0.303 097 47	0.855 376 80	0.370 988 55	1666 7955	484 1678	209 9443
	9	0.319 717 55	0.850 402 03	0.368 831 46	1657 1401	510 7550	221 4590
	10	0.336 238 66	0.845 162 33	0.366 559 65	1647 0008	537 1547	232 8895
	11	0.352 655 99	0.839 659 57	0.364 173 95	1636 3876	563 3662	244 2364
	12	-0.368 964 85	+0.833 895 63	+0.361 675 19	-1625 3076	-589 3904	-255 5010
	13	0.385 160 60	0.827 872 38	0.359 064 20	1613 7651	615 2282	266 6849
	14	0.401 238 62	0.821 591 68	0.356 341 76	1601 7614	640 8804	277 7894
	15	0.417 194 29	0.815 055 39	0.353 508 67	1589 2957	666 3461	288 8149
	16	0.433 022 98	0.808 265 39	0.350 565 73	1576 3654	691 6225	299 7610
	17	0.448 720 04	0.801 223 59	0.347 513 72	1562 9675	716 7052	310 6259
	18	-0.464 280 76	+0.793 931 95	+0.344 353 49	-1549 0993	-741 5880	-321 4073
	19	0.479 700 45	0.786 392 52	0.341 085 87	1534 7584	766 2630	332 1020
	20	0.494 974 35	0.778 607 41	0.337 711 75	1519 9435	790 7219	342 7059
	21	0.510 097 73	0.770 578 83	0.334 232 06	1504 6540	814 9555	353 2152
	22	0.525 065 85	0.762 309 09	0.330 647 78	1488 8901	838 9544	363 6255
	23	0.539 873 96	0.753 800 56	0.326 959 90	1472 6522	862 7088	373 9325
	24	-0.554 517 32	+0.745 055 76	+0.323 169 49	-1455 9410	-886 2086	-384 1312
	25	0.568 991 20	0.736 077 27	0.319 277 65	1438 7577	909 4433	394 2170
	26	0.583 290 90	0.726 867 81	0.315 285 54	1421 1034	932 4012	404 1841
	27	0.597 411 71	0.717 430 21	0.311 194 38	1402 9799	955 0697	414 0264
	28	0.611 348 95	0.707 767 43	0.307 005 45	1384 3907	977 4348	423 7373
	29	0.625 097 99	0.697 882 58	0.302 720 10	1365 3409	999 4814	433 3091
Feb.	30	-0.638 654 25	+0.687 778 92	+0.298 339 76	-1345 8383	-1021 1937	-442 7341
	31	0.652 013 28	0.677 459 87	0.293 865 94	1325 8947	1042 5564	452 0045
	1	0.665 170 73	0.666 929 00	0.289 300 21	1305 5251	1063 5553	461 1135
	2	0.678 122 42	0.656 190 01	0.284 644 22	1284 7467	1084 1789	470 0556
	3	0.690 864 36	0.645 246 70	0.279 899 67	1263 5788	1104 4190	478 8270
	4	0.703 392 76	0.634 102 93	0.275 068 26	1242 0405	1124 2709	487 4257
	5	-0.715 704 00	+0.622 762 58	+0.270 151 73	-1220 1497	-1143 7330	-495 8518
	6	0.727 794 63	0.611 229 57	0.265 151 80	1197 9225	1162 8056	504 1061
	7	0.739 661 37	0.599 507 76	0.260 070 17	1175 3723	1181 4910	512 1905
	8	0.751 301 04	0.587 601 03	0.254 908 54	1152 5099	1199 7922	520 1073
	9	0.762 710 56	0.575 513 19	0.249 668 58	1129 3441	1217 7126	527 8588
	10	0.773 886 93	0.563 248 04	0.244 351 91	1105 8807	1235 2549	535 4475
	11	-0.784 827 20	+0.550 809 34	+0.238 960 16	-1082 1238	-1252 4214	-542 8749
	12	0.795 528 44	0.538 200 86	0.233 494 95	1058 0760	1269 2129	550 1421
	13	0.805 987 75	0.525 426 33	0.227 957 86	1033 7388	1285 6290	557 2494
	14	0.816 202 25	0.512 489 54	0.222 350 49	1009 1133	1301 6675	564 1962
	15	-0.826 169 06	+0.499 394 25	+0.216 674 47	-984 2006	-1317 3251	-570 9811
		\dot{X} ,	\dot{Y} ,	\dot{Z}	are in units of 10^{-9} a.u. per day		

FRAME BIAS, PRECESSION AND NUTATION, 2025
MATRIX ELEMENTS FOR CONVERSION FROM
GCRS TO TRUE EQUINOX OF DATE

Date		M ₁₁ - 1	M ₁₂	M ₁₃	M ₂₁	M ₂₂ - 1	M ₂₃	M ₃₁	M ₃₂	M ₃₃ - 1
0 ^h TT										
Jan.	0	-1858	-559 025	-242 879	+559 015	-1563	-4777	+242 902	+3419	-295
	1	1858	559 158	242 937	559 148	1563	4796	242 960	3437	295
	2	1859	559 276	242 988	559 266	1564	4823	243 011	3464	295
	3	1860	559 369	243 028	559 359	1565	4855	243 052	3496	295
	4	1860	559 436	243 057	559 425	1565	4886	243 081	3526	296
	5	1861	559 480	243 077	559 470	1565	4908	243 101	3548	296
	6	-1861	-559 514	-243 091	+559 504	-1565	-4917	+243 115	+3557	-296
	7	1861	559 550	243 107	559 540	1566	4913	243 131	3553	296
	8	1861	559 602	243 130	559 592	1566	4897	243 153	3536	296
	9	1862	559 680	243 163	559 669	1566	4875	243 187	3514	296
	10	1863	559 786	243 210	559 776	1567	4853	243 233	3491	296
	11	1863	559 917	243 266	559 907	1568	4839	243 290	3477	296
	12	-1864	-560 061	-243 329	+560 051	-1568	-4837	+243 352	+3474	-296
	13	1865	560 205	243 391	560 195	1569	4848	243 415	3485	296
	14	1866	560 335	243 448	560 325	1570	4872	243 471	3508	296
	15	1867	560 443	243 495	560 433	1571	4903	243 518	3539	297
	16	1867	560 524	243 530	560 514	1571	4937	243 554	3572	297
	17	1868	560 581	243 555	560 571	1571	4968	243 579	3602	297
	18	-1868	-560 620	-243 572	+560 610	-1572	-4991	+243 596	+3626	-297
	19	1868	560 649	243 584	560 639	1572	5006	243 609	3640	297
	20	1869	560 676	243 596	560 666	1572	5011	243 620	3645	297
	21	1869	560 709	243 610	560 699	1572	5008	243 635	3642	297
	22	1869	560 755	243 630	560 744	1572	4998	243 654	3632	297
	23	1869	560 817	243 657	560 807	1573	4985	243 681	3619	297
	24	-1870	-560 899	-243 693	+560 889	-1573	-4972	+243 717	+3605	-297
	25	1871	561 000	243 737	560 990	1574	4963	243 761	3595	297
	26	1871	561 117	243 788	561 107	1574	4961	243 812	3593	297
	27	1872	561 243	243 842	561 232	1575	4970	243 866	3601	297
	28	1873	561 367	243 896	561 356	1576	4991	243 920	3621	298
	29	1874	561 478	243 944	561 467	1576	5022	243 969	3652	298
Feb.	30	-1874	-561 566	-243 983	+561 556	-1577	-5060	+244 007	+3689	-298
	31	1875	561 626	244 009	561 616	1577	5097	244 033	3727	298
	1	1875	561 661	244 024	561 650	1577	5128	244 048	3757	298
	2	1875	561 679	244 031	561 668	1577	5146	244 056	3775	298
	3	1875	561 695	244 039	561 685	1578	5149	244 064	3778	298
	4	1876	561 726	244 052	561 715	1578	5139	244 077	3768	298
	5	-1876	-561 780	-244 075	+561 769	-1578	-5121	+244 100	+3750	-298
	6	1876	561 862	244 111	561 851	1579	5102	244 136	3730	298
	7	1877	561 968	244 157	561 957	1579	5089	244 182	3717	298
	8	1878	562 088	244 209	562 078	1580	5087	244 234	3714	298
	9	1879	562 212	244 263	562 201	1580	5097	244 288	3724	298
	10	1880	562 325	244 312	562 315	1581	5120	244 337	3746	299
	11	-1880	-562 420	-244 353	+562 409	-1582	-5151	+244 378	+3777	-299
	12	1881	562 489	244 383	562 478	1582	5186	244 409	3811	299
	13	1881	562 534	244 403	562 523	1582	5219	244 428	3844	299
	14	1881	562 559	244 414	562 548	1582	5246	244 439	3871	299
	15	-1881	-562 570	-244 419	+562 559	-1583	-5264	+244 444	+3889	-299

POSITION AND VELOCITY OF THE EARTH, 2025
ORIGIN AT SOLAR SYSTEM BARYCENTRE
MEAN EQUATOR AND EQUINOX J 2000.0

Date		X	Y	Z	\dot{X}	\dot{Y}	\dot{Z}
0 ^h T.D.B.							
Feb.	15	-0.826 169 06	+0.499 394 25	+0.216 674 47	-984 2006	-1317 3251	-570 9811
	16	0.835 885 31	0.486 144 32	0.210 931 42	959 0021	1332 5973	577 6022
	17	0.845 348 16	0.472 743 61	0.205 122 98	933 5203	1347 4787	584 0569
	18	0.854 554 78	0.459 196 07	0.199 250 84	907 7580	1361 9633	590 3427
	19	0.863 502 40	0.445 505 69	0.193 316 70	881 7188	1376 0448	596 4561
	20	0.872 188 25	0.431 676 54	0.187 322 30	855 4068	1389 7166	602 3942
	21	-0.880 609 64	+0.417 712 75	+0.181 269 41	-828 8264	-1402 9718	-608 1539
	22	0.888 763 90	0.403 618 51	0.175 159 83	801 9821	1415 8033	613 7312
	23	0.896 648 41	0.389 398 12	0.168 995 41	774 8788	1428 2029	619 1221
	24	0.904 260 63	0.375 055 92	0.162 778 03	747 5220	1440 1618	624 3223
Mar.	25	0.911 598 03	0.360 596 39	0.156 509 62	719 9183	1451 6696	629 3265
	26	0.918 658 20	0.346 024 07	0.150 192 17	692 0760	1462 7152	634 1287
	27	-0.925 438 80	+0.331 343 66	+0.143 827 74	-664 0069	-1473 2866	-638 7227
	28	0.931 937 63	0.316 559 96	0.137 418 43	635 7260	1483 3719	643 1027
	1	0.938 152 67	0.301 677 88	0.130 966 42	607 2520	1492 9616	647 2632
	2	0.944 082 10	0.286 702 41	0.124 473 91	578 6072	1502 0489	651 2012
	3	0.949 724 32	0.271 638 58	0.117 943 14	549 8142	1510 6317	654 9159
	4	0.955 077 96	0.256 491 45	0.111 376 33	520 8950	1518 7116	658 4083
	5	-0.960 141 87	+0.241 266 01	+0.104 775 70	-491 8695	-1526 2941	-661 6816
	6	0.964 915 05	0.225 967 20	0.098 143 41	462 7535	1533 3866	664 7403
	7	0.969 396 68	0.210 599 88	0.091 481 60	433 5596	1539 9971	667 5889
	8	0.973 586 02	0.195 168 84	0.084 792 32	404 2974	1546 1334	670 2318
	9	0.977 482 42	0.179 678 77	0.078 077 63	374 9738	1551 8027	672 6731
	10	0.981 085 31	0.164 134 32	0.071 339 52	345 5943	1557 0111	674 9161
	11	-0.984 394 14	+0.148 540 07	+0.064 579 96	-316 1631	-1561 7633	-676 9637
	12	0.987 408 41	0.132 900 56	0.057 800 89	286 6833	1566 0630	678 8179
	13	0.990 127 65	0.117 220 31	0.051 004 24	257 1577	1569 9127	680 4800
	14	0.992 551 42	0.101 503 80	0.044 191 93	227 5887	1573 3140	681 9509
	15	0.994 679 29	0.085 755 52	0.037 365 86	197 9790	1576 2669	683 2308
	16	0.996 510 87	0.069 979 96	0.030 527 95	168 3315	1578 7708	684 3192
	17	-0.998 045 80	+0.054 181 61	+0.023 680 12	-138 6492	-1580 8246	-685 2154
	18	0.999 283 75	0.038 364 98	0.016 824 29	108 9363	1582 4260	685 9183
	19	1.000 224 44	0.022 534 60	0.009 962 40	79 1970	1583 5727	686 4264
	20	1.000 867 62	+0.006 695 05	+0.003 096 42	49 4363	1584 2621	686 7382
	21	1.001 213 11	-0.009 149 10	-0.003 771 70	-19 6594	1584 4908	686 8518
	22	1.001 260 77	0.024 993 22	0.010 639 95	+10 1282	1584 2556	686 7652
	23	-1.001 010 53	-0.040 832 65	-0.017 506 33	+39 9201	-1583 5522	-686 4763
	24	1.000 462 38	0.056 662 69	0.024 368 80	69 7100	1582 3760	685 9821
	25	0.999 616 37	0.072 478 58	0.031 225 28	99 4900	1580 7210	685 2793
	26	0.998 472 64	0.088 275 49	0.038 073 67	129 2509	1578 5805	684 3640
Apr.	27	0.997 031 45	0.104 048 54	0.044 911 83	158 9802	1575 9471	683 2320
	28	0.995 293 19	0.119 792 77	0.051 737 58	188 6621	1572 8139	681 8795
	29	-0.993 258 43	-0.135 503 14	-0.058 548 68	+218 2775	-1569 1757	-680 3033
	30	0.990 927 94	0.151 174 59	0.065 342 90	247 8035	1565 0311	678 5027
	31	0.988 302 74	0.166 802 08	0.072 117 99	277 2168	1560 3830	676 4791
	1	0.985 384 05	0.182 380 60	0.078 871 75	306 4957	1555 2396	674 2367
	2	-0.982 173 33	-0.197 905 26	-0.085 602 01	+335 6214	-1549 6124	-671 7818

$\dot{X}, \quad \dot{Y}, \quad \dot{Z}$ are in units of 10^{-9} a.u. per day

FRAME BIAS, PRECESSION AND NUTATION, 2025
MATRIX ELEMENTS FOR CONVERSION FROM
GCRS TO TRUE EQUINOX OF DATE

	Date	$M_{11} - 1$	M_{12}	M_{13}	M_{21}	$M_{22} - 1$	M_{23}	M_{31}	M_{32}	$M_{33} - 1$
	0 ^h TT									
Feb.	15	-1881	-562 570	-244 419	+562 559	-1583	-5264	+244 444	+3889	-299
	16	1881	562 577	244 422	562 566	1583	5273	244 448	3898	299
	17	1881	562 588	244 426	562 576	1583	5272	244 452	3897	299
	18	1881	562 609	244 435	562 597	1583	5264	244 461	3889	299
	19	1882	562 645	244 451	562 634	1583	5251	244 477	3876	299
	20	1882	562 700	244 475	562 689	1583	5237	244 501	3861	299
	21	-1883	-562 775	-244 508	+562 763	-1584	-5225	+244 533	+3849	-299
	22	1883	562 865	244 547	562 854	1584	5219	244 572	3842	299
	23	1884	562 967	244 591	562 956	1585	5221	244 617	3844	299
	24	1885	563 072	244 637	563 061	1585	5235	244 662	3857	299
	25	1885	563 170	244 679	563 159	1586	5259	244 705	3881	299
	26	1886	563 251	244 714	563 240	1586	5292	244 740	3914	300
Mar.	27	-1886	-563 305	-244 738	+563 294	-1587	-5328	+244 764	+3950	-300
	28	1886	563 331	-244 749	563 320	1587	5360	244 776	3981	300
	1	1886	563 336	-244 751	563 325	1587	5380	244 778	4001	300
	2	1886	563 333	-244 750	563 322	1587	5384	244 777	4005	300
	3	1886	563 340	-244 753	563 329	1587	5372	244 780	3993	300
	4	1887	563 371	-244 767	563 360	1587	5350	244 793	3971	300
	5	-1887	-563 431	-244 793	+563 420	-1587	-5325	+244 819	+3945	-300
	6	1887	563 519	244 831	563 507	1588	5304	244 857	3924	300
	7	1888	563 623	244 876	563 612	1588	5293	244 902	3913	300
	8	1889	563 732	244 924	563 721	1589	5295	244 949	3915	300
	9	1890	563 833	244 967	563 822	1590	5309	244 994	3928	300
	10	1890	563 917	245 004	563 906	1590	5332	245 030	3951	300
	11	-1891	-563 978	-245 030	+563 967	-1590	-5360	+245 057	+3978	-300
	12	1891	564 015	-245 046	564 004	1591	5387	245 073	4005	300
	13	1891	564 032	-245 054	564 020	1591	5409	245 080	4027	300
	14	1891	564 033	-245 054	564 022	1591	5423	245 081	4041	300
	15	1891	564 029	-245 052	564 017	1591	5428	245 079	4045	300
	16	1891	564 025	-245 051	564 014	1591	5422	245 078	4040	300
	17	-1891	-564 032	-245 054	+564 020	-1591	-5409	+245 080	+4026	-300
	18	1891	564 052	245 063	564 041	1591	5389	245 089	4007	300
	19	1891	564 092	245 080	564 080	1591	5367	245 106	3985	300
	20	1892	564 150	245 105	564 139	1591	5346	245 132	3964	301
	21	1892	564 225	245 138	564 214	1592	5330	245 164	3947	301
	22	1893	564 314	245 176	564 302	1592	5322	245 203	3938	301
	23	-1893	-564 408	-245 217	+564 397	-1593	-5323	+245 244	+3939	-301
	24	1894	564 500	245 257	564 489	1593	5335	245 284	3950	301
	25	1895	564 580	245 292	564 568	1594	5355	245 318	3971	301
	26	1895	564 639	245 317	564 627	1594	5381	245 344	3996	301
	27	1895	564 671	245 332	564 660	1594	5407	245 358	4021	301
	28	1895	564 680	245 336	564 669	1594	5424	245 362	4039	301
Apr.	29	-1895	-564 675	-245 333	+564 663	-1594	-5427	+245 360	+4041	-301
	30	1895	564 672	245 332	564 661	1594	5413	245 359	4027	301
	31	1895	564 690	245 340	564 679	1594	5384	245 367	3998	301
	1	1896	564 740	245 362	564 729	1595	5348	245 388	3963	301
	2	-1896	-564 822	-245 397	+564 810	-1595	-5315	+245 423	+3929	-301

POSITION AND VELOCITY OF THE EARTH, 2025
ORIGIN AT SOLAR SYSTEM BARYCENTRE
MEAN EQUATOR AND EQUINOX J 2000.0

Date 0 ^h T.D.B.		X	Y	Z	\dot{X}	\dot{Y}	\dot{Z}
Apr.	1	-0.985 384 05	-0.182 380 60	-0.078 871 75	+306 4957	-1555 2396	-674 2367
	2	0.982 173 33	0.197 905 26	0.085 602 01	335 6214	1549 6124	671 7818
	3	0.978 672 18	0.213 371 28	0.092 306 70	364 5804	1543 5149	669 1213
	4	0.974 882 31	0.228 774 04	0.098 983 78	393 3633	1536 9603	666 2624
	5	0.970 805 52	0.244 109 01	0.105 631 31	421 9643	1529 9612	663 2117
	6	0.966 443 65	0.259 371 81	0.112 247 39	450 3798	1522 5281	659 9742
	7	-0.961 798 55	-0.274 558 15	-0.118 830 18	+478 6073	-1514 6697	-656 5547
	8	0.956 872 13	0.289 663 81	0.125 377 89	506 6454	1506 3934	652 9568
	9	0.951 666 28	0.304 684 65	0.131 888 73	534 4924	1497 7054	649 1833
	10	0.946 182 92	0.319 616 57	0.138 360 98	562 1469	1488 6106	645 2368
	11	0.940 423 99	0.334 455 52	0.144 792 90	589 6075	1479 1132	641 1189
	12	0.934 391 43	0.349 197 50	0.151 182 79	616 8727	1469 2166	636 8310
	13	-0.928 087 19	-0.363 838 53	-0.157 528 96	+643 9404	-1458 9233	-632 3743
	14	0.921 513 28	0.378 374 65	0.163 829 71	670 8089	1448 2352	627 7491
	15	0.914 671 69	0.392 801 92	0.170 083 38	697 4753	1437 1537	622 9558
	16	0.907 564 46	0.407 116 41	0.176 288 27	723 9368	1425 6795	617 9942
	17	0.900 193 65	0.421 314 20	0.182 442 70	750 1899	1413 8127	612 8642
	18	0.892 561 37	0.435 391 36	0.188 544 99	776 2307	1401 5535	607 5650
	19	-0.884 669 76	-0.449 343 96	-0.194 593 43	+802 0545	-1388 9011	-602 0958
	20	0.876 521 02	0.463 168 07	0.200 586 33	827 6560	1375 8543	596 4555
	21	0.868 117 40	0.476 859 73	0.206 521 97	853 0296	1362 4116	590 6428
	22	0.859 461 21	0.490 414 97	0.212 398 61	878 1680	1348 5707	584 6557
	23	0.850 554 85	0.503 829 80	0.218 214 50	903 0620	1334 3283	578 4922
	24	0.841 400 82	0.517 100 19	0.223 967 86	927 7006	1319 6814	572 1501
	25	-0.832 001 74	-0.530 222 07	-0.229 656 89	+952 0694	-1304 6277	-565 6273
	26	0.822 360 39	0.543 191 38	0.235 279 80	976 1507	1289 1662	558 9233
	27	0.812 479 75	0.556 004 05	0.240 834 76	999 9243	1273 2998	552 0389
	28	0.802 363 00	0.568 656 05	0.246 319 99	1023 3692	1257 0358	544 9777
	29	0.792 013 53	0.581 143 48	0.251 733 74	1046 4664	1240 3865	537 7459
	30	0.781 434 88	0.593 462 55	0.257 074 36	1069 2007	1223 3676	530 3517
May	1	-0.770 630 76	-0.605 609 66	-0.262 340 27	+1091 5622	-1205 9966	-522 8040
	2	0.759 604 90	0.617 581 37	0.267 529 96	1113 5458	1188 2907	515 1115
	3	0.748 361 10	0.629 374 41	0.272 642 04	1135 1505	1170 2650	507 2819
	4	0.736 903 15	0.640 985 64	0.277 675 16	1156 3772	1151 9322	499 3213
	5	0.725 234 81	0.652 412 06	0.282 628 05	1177 2278	1133 3031	491 2351
	6	0.713 359 84	0.663 650 75	0.287 499 46	1197 7045	1114 3862	483 0272
	7	-0.701 281 96	-0.674 698 85	-0.292 288 20	+1217 8087	-1095 1890	-474 7010
	8	0.689 004 90	0.685 553 61	0.296 993 09	1237 5420	1075 7176	466 2591
	9	0.676 532 36	0.696 212 31	0.301 613 00	1256 9056	1055 9779	457 7039
	10	0.663 868 02	0.706 672 29	0.306 146 80	1275 8999	1035 9748	449 0376
	11	0.651 015 59	0.716 930 94	0.310 593 39	1294 5260	1015 7126	440 2616
	12	0.637 978 73	0.726 985 69	0.314 951 67	1312 7838	995 1953	431 3775
	13	-0.624 761 14	-0.736 834 01	-0.319 220 58	+1330 6735	-974 4261	-422 3861
	14	0.611 366 49	0.746 473 38	0.323 399 04	1348 1949	953 4071	413 2882
	15	0.597 798 47	0.755 901 33	0.327 485 99	1365 3471	932 1408	404 0839
	16	0.584 060 78	0.765 115 38	0.331 480 37	1382 1283	910 6282	394 7736
	17	-0.570 157 15	-0.774 113 07	-0.335 381 11	+1398 5363	-888 8702	-385 3566

\dot{X} , \dot{Y} , \dot{Z} are in units of 10^{-9} a.u. per day

FRAME BIAS, PRECESSION AND NUTATION, 2025
MATRIX ELEMENTS FOR CONVERSION FROM
GCRS TO TRUE EQUINOX OF DATE

Date 0 ^h TT		M ₁₁ - 1	M ₁₂	M ₁₃	M ₂₁	M ₂₂ - 1	M ₂₃	M ₃₁	M ₃₂	M ₃₃ - 1
Apr.	1	-1896	-564 740	-245 362	+564 729	-1595	-5348	+245 388	+3963	-301
	2	1896	564 822	245 397	564 810	1595	5315	245 423	3929	301
	3	1897	564 927	245 443	564 916	1596	5291	245 469	3904	301
	4	1898	565 041	245 492	565 030	1596	5281	245 518	3893	301
	5	1898	565 149	245 539	565 138	1597	5283	245 565	3896	302
	6	1899	565 241	245 579	565 230	1598	5296	245 605	3908	302
	7	-1900	-565 310	-245 609	+565 299	-1598	-5315	+245 636	+3926	-302
	8	1900	565 356	245 629	565 344	1598	5334	245 655	3945	302
	9	1900	565 380	245 640	565 368	1598	5349	245 666	3960	302
	10	1900	565 388	245 643	565 377	1598	5357	245 670	3968	302
	11	1900	565 389	245 644	565 378	1598	5355	245 670	3966	302
	12	1900	565 390	245 644	565 378	1598	5344	245 670	3955	302
	13	-1900	-565 399	-245 648	+565 387	-1598	-5324	+245 674	+3935	-302
	14	1900	565 421	245 658	565 410	1599	5298	245 684	3909	302
	15	1901	565 462	245 676	565 451	1599	5269	245 702	3879	302
	16	1901	565 523	245 702	565 512	1599	5240	245 728	3850	302
	17	1901	565 601	245 736	565 590	1600	5215	245 762	3825	302
	18	1902	565 694	245 776	565 682	1600	5197	245 802	3806	302
	19	-1903	-565 794	-245 820	+565 783	-1601	-5188	+245 845	+3797	-302
	20	1903	565 894	245 863	565 883	1601	5189	245 888	3798	302
	21	1904	565 985	245 903	565 974	1602	5199	245 928	3808	302
	22	1905	566 059	245 935	566 048	1602	5216	245 960	3824	303
	23	1905	566 111	245 957	566 100	1602	5235	245 983	3842	303
	24	1905	566 140	245 970	566 128	1603	5249	245 996	3856	303
	25	-1905	-566 151	-245 975	+566 139	-1603	-5252	+246 000	+3859	-303
	26	1905	566 157	245 978	566 146	1603	5239	246 003	3846	303
	27	1905	566 176	245 986	566 165	1603	5211	246 012	3818	303
	28	1906	566 224	246 007	566 213	1603	5171	246 032	3778	303
	29	1906	566 308	246 043	566 297	1604	5129	246 068	3736	303
	30	1907	566 423	246 093	566 412	1604	5095	246 118	3701	303
May	1	-1908	-566 554	-246 150	+566 544	-1605	-5074	+246 175	+3679	-303
	2	1909	566 686	246 207	566 675	1606	5068	246 232	3673	303
	3	1910	566 803	246 258	566 792	1606	5074	246 283	3679	303
	4	1910	566 897	246 299	566 886	1607	5089	246 324	3692	303
	5	1911	566 965	246 328	566 954	1607	5105	246 353	3708	304
	6	1911	567 010	246 348	566 999	1608	5118	246 373	3721	304
	7	-1911	-567 038	-246 360	+567 027	-1608	-5125	+246 385	+3728	-304
	8	1911	567 056	246 368	567 045	1608	5123	246 393	3725	304
	9	1911	567 072	246 375	567 061	1608	5111	246 400	3714	304
	10	1912	567 095	246 385	567 084	1608	5091	246 410	3693	304
	11	1912	567 130	246 400	567 119	1608	5064	246 425	3666	304
	12	1912	567 183	246 423	567 172	1609	5033	246 448	3635	304
	13	-1913	-567 255	-246 455	+567 245	-1609	-5002	+246 479	+3604	-304
	14	1913	567 346	246 494	567 336	1609	4974	246 518	3576	304
	15	1914	567 452	246 540	567 442	1610	4954	246 564	3555	304
	16	1915	567 568	246 590	567 557	1611	4942	246 614	3542	304
	17	-1916	-567 684	-246 641	+567 674	-1611	-4940	+246 665	+3540	-304

POSITION AND VELOCITY OF THE EARTH, 2025
ORIGIN AT SOLAR SYSTEM BARYCENTRE
MEAN EQUATOR AND EQUINOX J 2000.0

Date 0 ^h T.D.B.		X	Y	Z	\dot{X}	\dot{Y}	\dot{Z}
May	17	-0.570 157 15	-0.774 113 07	-0.335 381 11	+1398 5363	-888 8702	-385 3566
	18	0.556 091 31	0.782 891 96	0.339 187 14	1414 5676	866 8671	375 8325
	19	0.541 867 07	0.791 449 60	0.342 897 40	1430 2178	844 6190	366 2009
	20	0.527 488 25	0.799 783 53	0.346 510 80	1445 4810	822 1256	356 4605
	21	0.512 958 76	0.807 891 29	0.350 026 24	1460 3494	799 3866	346 6107
	22	0.498 282 61	0.815 770 44	0.353 442 64	1474 8132	776 4019	336 6508
	23	-0.483 463 89	-0.823 418 52	-0.356 758 89	+1488 8604	-753 1726	-326 5806
	24	0.468 506 84	0.830 833 09	0.359 973 89	1502 4760	729 7017	316 4014
	25	0.453 415 86	0.838 011 76	0.363 086 56	1515 6440	705 9955	306 1158
	26	0.438 195 51	0.844 952 25	0.366 095 87	1528 3477	682 0645	295 7290
	27	0.422 850 50	0.851 652 35	0.369 000 83	1540 5727	657 9231	285 2482
	28	0.407 385 68	0.858 110 07	0.371 800 55	1552 3085	633 5891	274 6823
June	29	-0.391 805 98	-0.864 323 56	-0.374 494 23	+1563 5499	-609 0818	-264 0413
	30	0.376 116 34	0.870 291 18	0.377 081 15	1574 2962	584 4193	253 3341
	31	0.360 321 69	0.876 011 48	0.379 560 71	1584 5509	559 6181	242 5690
	1	0.344 426 94	0.881 483 13	0.381 932 36	1594 3197	534 6919	231 7525
	2	0.328 436 90	0.886 704 94	0.384 195 61	1603 6086	509 6517	220 8896
	3	0.312 356 34	0.891 675 81	0.386 350 01	1612 4237	484 5062	209 9845
	4	-0.296 189 99	-0.896 394 74	-0.388 395 17	+1620 7703	-459 2628	-199 0402
	5	0.279 942 48	0.900 860 76	0.390 330 70	1628 6531	433 9281	188 0595
	6	0.263 618 46	0.905 073 01	0.392 156 25	1636 0760	408 5078	177 0445
	7	0.247 222 48	0.909 030 65	0.393 871 48	1643 0430	383 0073	165 9975
	8	0.230 759 11	0.912 732 91	0.395 476 10	1649 5574	357 4315	154 9203
	9	0.214 232 83	0.916 179 05	0.396 969 79	1655 6223	331 7845	143 8142
	10	-0.197 648 15	-0.919 368 37	-0.398 352 29	+1661 2409	-306 0702	-132 6806
	11	0.181 009 49	0.922 300 23	0.399 623 31	1666 4159	280 2915	121 5201
	12	0.164 321 30	0.924 974 00	0.400 782 60	1671 1491	254 4505	110 3331
July	13	0.147 587 98	0.927 389 04	0.401 829 89	1675 4418	228 5489	99 1198
	14	0.130 813 93	0.929 544 77	0.402 764 91	1679 2940	202 5873	87 8797
	15	0.114 003 57	0.931 440 59	0.403 587 39	1682 7044	176 5663	76 6121
	16	-0.097 161 33	-0.933 075 90	-0.404 297 06	+1685 6700	-150 4864	-65 3169
	17	0.080 291 67	0.934 450 12	0.404 893 63	1688 1860	124 3479	53 9933
	18	0.063 399 13	0.935 562 67	0.405 376 83	1690 2462	98 1521	42 6413
	19	0.046 488 29	0.936 412 98	0.405 746 37	1691 8424	71 9011	31 2617
	20	0.029 563 86	0.937 000 52	0.406 001 98	1692 9643	45 5988	19 8556
	21	0.012 630 63	0.937 324 80	0.406 143 40	1693 6007	19 2513	8 4258
	22	+0.004 306 50	-0.937 385 42	-0.406 170 43	+1693 7400	+7 1326	+3 0232
	23	0.021 242 48	0.937 182 07	0.406 082 89	1693 3710	33 5401	14 4857
	24	0.038 172 19	0.936 714 59	0.405 880 70	1692 4850	59 9561	25 9534
	25	0.055 090 44	0.935 982 98	0.405 563 84	1691 0771	86 3625	37 4177
	26	0.071 991 99	0.934 987 44	0.405 132 39	1689 1466	112 7407	48 8691
	27	0.088 871 64	0.933 728 32	0.404 586 53	1686 6978	139 0729	60 2986
	28	+0.105 724 25	-0.932 206 19	-0.403 926 51	+1683 7379	+165 3433	+71 6987
	29	0.122 544 73	0.930 421 71	0.403 152 67	1680 2763	191 5390	83 0633
	30	0.139 328 13	0.928 375 69	0.402 265 38	1676 3228	217 6496	94 3875
	1	0.156 069 58	0.926 069 03	0.401 265 07	1671 8871	243 6672	105 6678
	2	+0.172 764 30	-0.923 502 68	-0.400 152 18	+1666 9779	+269 5851	+116 9017

\dot{X} , \dot{Y} , \dot{Z} are in units of 10^{-9} a.u. per day

FRAME BIAS, PRECESSION AND NUTATION, 2025
MATRIX ELEMENTS FOR CONVERSION FROM
GCRS TO TRUE EQUINOX OF DATE

	Date 0 ^h TT	M ₁₁ - 1	M ₁₂	M ₁₃	M ₂₁	M ₂₂ - 1	M ₂₃	M ₃₁	M ₃₂	M ₃₃ - 1
May	17	-1916	-567 684	-246 641	+567 674	-1611	-4940	+246 665	+3540	-304
	18	1916	567 793	246 688	567 783	1612	4948	246 712	3547	304
	19	1917	567 887	246 729	567 877	1613	4963	246 753	3561	304
	20	1917	567 961	246 761	567 950	1613	4980	246 785	3579	305
	21	1918	568 012	246 783	568 001	1613	4996	246 807	3594	305
	22	1918	568 044	246 797	568 033	1613	5003	246 821	3601	305
	23	-1918	-568 067	-246 807	+568 057	-1614	-4997	+246 832	+3595	-305
	24	1918	568 096	246 820	568 086	1614	4977	246 844	3574	305
	25	1919	568 147	246 842	568 136	1614	4943	246 866	3541	305
	26	1919	568 230	246 878	568 219	1615	4904	246 902	3501	305
	27	1920	568 348	246 929	568 338	1615	4867	246 953	3464	305
	28	1921	568 492	246 991	568 481	1616	4842	247 015	3438	305
	29	-1922	-568 644	-247 058	+568 634	-1617	-4832	+247 081	+3428	-305
	30	1923	568 788	247 120	568 778	1618	4838	247 143	3432	305
	31	1924	568 910	247 173	568 900	1618	4854	247 196	3448	306
June	1	1924	569 004	247 214	568 994	1619	4874	247 238	3468	306
	2	1925	569 072	247 243	569 062	1619	4894	247 267	3486	306
	3	1925	569 119	247 264	569 109	1620	4907	247 288	3499	306
	4	-1925	-569 153	-247 278	+569 143	-1620	-4911	+247 302	+3504	-306
	5	1926	569 183	247 292	569 173	1620	4907	247 315	3499	306
	6	1926	569 217	247 306	569 207	1620	4893	247 330	3485	306
	7	1926	569 262	247 326	569 252	1620	4872	247 350	3464	306
	8	1927	569 323	247 353	569 313	1621	4847	247 376	3439	306
	9	1927	569 403	247 387	569 393	1621	4821	247 411	3412	306
	10	-1928	-569 503	-247 430	+569 492	-1622	-4797	+247 454	+3388	-306
	11	1929	569 618	247 480	569 608	1622	4780	247 504	3370	306
	12	1929	569 744	247 535	569 734	1623	4772	247 558	3361	306
	13	1930	569 872	247 591	569 862	1624	4774	247 614	3362	307
	14	1931	569 995	247 644	569 984	1625	4785	247 667	3374	307
	15	1932	570 102	247 691	570 092	1625	4805	247 714	3393	307
	16	-1932	-570 190	-247 729	+570 179	-1626	-4829	+247 752	+3416	-307
	17	1933	570 254	-247 757	570 244	1626	4851	247 780	3438	307
	18	1933	570 299	-247 776	570 288	1626	4867	247 800	3454	307
	19	1933	570 332	-247 790	570 321	1626	4872	247 814	3458	307
	20	1934	570 365	-247 805	570 355	1627	4862	247 829	3449	307
	21	1934	570 414	-247 826	570 404	1627	4840	247 850	3427	307
	22	-1934	-570 490	-247 859	+570 480	-1627	-4811	+247 883	+3397	-307
	23	1935	570 599	247 907	570 589	1628	4781	247 930	3366	307
	24	1936	570 737	247 966	570 727	1629	4758	247 990	3343	308
	25	1937	570 892	248 034	570 882	1630	4749	248 057	3333	308
	26	1938	571 046	248 100	571 036	1631	4756	248 123	3340	308
	27	1939	571 183	248 160	571 173	1631	4777	248 183	3359	308
	28	-1940	-571 294	-248 208	+571 284	-1632	-4804	+248 231	+3386	-308
	29	1940	571 376	248 243	571 366	1632	4833	248 267	3414	308
	30	1941	571 432	248 268	571 422	1633	4857	248 292	3438	308
July	1	1941	571 472	248 285	571 461	1633	4873	248 309	3454	308
	2	-1941	-571 504	-248 299	+571 493	-1633	-4879	+248 323	+3459	-308

POSITION AND VELOCITY OF THE EARTH, 2025
 ORIGIN AT SOLAR SYSTEM BARYCENTRE
 MEAN EQUATOR AND EQUINOX J 2000.0

Date		X	Y	Z	\dot{X}	\dot{Y}	\dot{Z}
0 ^h T.D.B.							
July	1	+0.156 069 58	-0.926 069 03	-0.401 265 07	+1671 8871	+243 6672	+105 6678
	2	0.172 764 30	0.923 502 68	0.400 152 18	1666 9779	269 5851	116 9017
	3	0.189 407 59	0.920 677 68	0.398 927 20	1661 6030	295 3976	128 0868
	4	0.205 994 83	0.917 595 09	0.397 590 61	1655 7694	321 0999	139 2214
	5	0.222 521 47	0.914 256 06	0.396 142 94	1649 4838	346 6873	150 3038
	6	0.238 983 02	0.910 661 74	0.394 584 72	1642 7523	372 1557	161 3325
	7	+0.255 375 05	-0.906 813 35	-0.392 916 47	+1635 5811	+397 5015	+172 3065
	8	0.271 693 19	0.902 712 13	0.391 138 77	1627 9760	422 7213	183 2245
	9	0.287 933 14	0.898 359 36	0.389 252 17	1619 9424	447 8128	194 0866
	10	0.304 090 63	0.893 756 31	0.387 257 23	1611 4852	472 7750	204 8926
	11	0.320 161 44	0.888 904 29	0.385 154 51	1602 6084	497 6069	215 6427
	12	0.336 141 40	0.883 804 61	0.382 944 56	1593 3142	522 3087	226 3381
	13	+0.352 026 34	-0.878 458 55	-0.380 627 92	+1583 6032	+546 8814	+236 9797
	14	0.367 812 07	0.872 867 41	0.378 205 14	1573 4737	571 3248	247 5682
	15	0.383 494 41	0.867 032 48	0.375 676 73	1562 9223	595 6386	258 1043
	16	0.399 069 09	0.860 955 07	0.373 043 23	1551 9432	619 8214	268 5873
	17	0.414 531 82	0.854 636 50	0.370 305 17	1540 5298	643 8693	279 0160
	18	0.429 878 22	0.848 078 15	0.367 463 10	1528 6743	667 7765	289 3878
	19	+0.445 103 81	-0.841 281 47	-0.364 517 61	+1516 3689	+691 5347	+299 6985
	20	0.460 204 07	0.834 247 99	0.361 469 35	1503 6066	715 1331	309 9427
	21	0.475 174 40	0.826 979 39	0.358 319 00	1490 3822	738 5582	320 1137
	22	0.490 010 17	0.819 477 46	0.355 067 35	1476 6931	761 7944	330 2038
	23	0.504 706 72	0.811 744 18	0.351 715 23	1462 5402	784 8253	340 2045
	24	0.519 259 44	0.803 781 69	0.348 263 58	1447 9279	807 6344	350 1075
	25	+0.533 663 77	-0.795 592 29	-0.344 713 43	+1432 8645	+830 2059	+359 9053
	26	0.547 915 26	0.787 178 41	0.341 065 85	1417 3608	852 5266	369 5911
	27	0.562 009 56	0.778 542 63	0.337 321 99	1401 4292	874 5851	379 1598
	28	0.575 942 46	0.769 687 61	0.333 483 06	1385 0823	896 3729	388 6076
	29	0.589 709 87	0.760 616 09	0.329 550 26	1368 3328	917 8836	397 9317
	30	0.603 307 81	0.751 330 88	0.325 524 84	1351 1923	939 1121	407 1302
Aug.	31	+0.616 732 45	-0.741 834 81	-0.321 408 07	+1333 6713	+960 0546	+416 2018
	1	0.629 980 01	0.732 130 75	0.317 201 23	1315 7797	980 7077	425 1454
	2	0.643 046 83	0.722 221 63	0.312 905 60	1297 5266	1001 0685	433 9602
	3	0.655 929 36	0.712 110 37	0.308 522 46	1278 9209	1021 1344	442 6454
	4	0.668 624 10	0.701 799 93	0.304 053 12	1259 9709	1040 9032	451 2005
	5	0.681 127 66	0.691 293 30	0.299 498 88	1240 6851	1060 3734	459 6255
	6	+0.693 436 71	-0.680 593 46	-0.294 861 04	+1221 0715	+1079 5443	+467 9207
	7	0.705 548 02	0.669 703 41	0.290 140 90	1201 1375	1098 4160	476 0867
	8	0.717 458 42	0.658 626 13	0.285 339 74	1180 8892	1116 9897	484 1249
	9	0.729 164 77	0.647 364 60	0.280 458 82	1160 3310	1135 2677	492 0370
	10	0.740 664 01	0.635 921 76	0.275 499 41	1139 4654	1153 2523	499 8248
	11	0.751 953 06	0.624 300 53	0.270 462 73	1118 2918	1170 9455	507 4901
	12	+0.763 028 81	-0.612 503 82	-0.265 350 01	+1096 8073	+1188 3481	+515 0334
	13	0.773 888 15	0.600 534 54	0.260 162 47	1075 0072	1205 4586	522 4544
	14	0.784 527 89	0.588 395 63	0.254 901 34	1052 8857	1222 2728	529 7512
	15	0.794 944 77	0.576 090 09	0.249 567 88	1030 4373	1238 7838	536 9202
	16	+0.805 135 53	-0.563 621 00	-0.244 163 38	+1007 6577	+1254 9820	+543 9566

\dot{X} , \dot{Y} , \dot{Z} are in units of 10^{-9} a.u. per day

FRAME BIAS, PRECESSION AND NUTATION, 2025
MATRIX ELEMENTS FOR CONVERSION FROM
GCRS TO TRUE EQUINOX OF DATE

Date 0 ^h TT		M ₁₁ - 1	M ₁₂	M ₁₃	M ₂₁	M ₂₂ - 1	M ₂₃	M ₃₁	M ₃₂	M ₃₃ - 1
July	1	-1941	-571 472	-248 285	+571 461	-1633	-4873	+248 309	+3454	-308
	2	1941	571 504	248 299	571 493	1633	4879	248 323	3459	308
	3	1942	571 537	248 313	571 526	1633	4875	248 337	3456	308
	4	1942	571 579	248 332	571 568	1634	4864	248 355	3444	308
	5	1942	571 635	248 356	571 625	1634	4847	248 380	3427	309
	6	1943	571 709	248 388	571 699	1634	4829	248 412	3408	309
	7	-1943	-571 802	-248 429	+571 792	-1635	-4812	+248 452	+3391	-309
	8	1944	571 912	248 476	571 902	1635	4800	248 500	3379	309
	9	1945	572 034	248 529	572 024	1636	4797	248 553	3375	309
	10	1946	572 161	248 585	572 151	1637	4803	248 608	3381	309
	11	1947	572 284	248 638	572 274	1638	4821	248 662	3398	309
	12	1947	572 394	248 686	572 384	1638	4847	248 709	3423	309
	13	-1948	-572 483	-248 724	+572 473	-1639	-4878	+248 748	+3454	-309
	14	1948	572 548	248 753	572 538	1639	4909	248 777	3485	310
	15	1949	572 591	248 771	572 581	1639	4934	248 796	3510	310
	16	1949	572 620	248 784	572 609	1640	4948	248 808	3524	310
	17	1949	572 646	248 795	572 635	1640	4949	248 819	3525	310
	18	1949	572 683	248 811	572 672	1640	4938	248 835	3513	310
	19	-1950	-572 743	-248 837	+572 733	-1640	-4917	+248 861	+3492	-310
	20	1950	572 833	248 876	572 822	1641	4894	248 900	3469	310
	21	1951	572 951	248 928	572 941	1641	4876	248 951	3450	310
	22	1952	573 089	248 987	573 079	1642	4870	249 011	3443	310
	23	1953	573 232	249 050	573 222	1643	4878	249 074	3450	310
	24	1954	573 365	249 107	573 355	1644	4900	249 131	3471	310
	25	-1955	-573 476	-249 155	+573 465	-1644	-4931	+249 180	+3503	-311
	26	1955	573 558	249 191	573 547	1645	4966	249 215	3537	311
	27	1956	573 612	249 215	573 602	1645	4999	249 239	3569	311
	28	1956	573 646	249 229	573 635	1645	5024	249 254	3594	311
	29	1956	573 667	249 238	573 656	1646	5039	249 263	3609	311
	30	1956	573 687	249 247	573 676	1646	5043	249 272	3613	311
Aug.	31	-1956	-573 712	-249 258	+573 701	-1646	-5039	+249 283	+3609	-311
	1	1957	573 751	249 275	573 740	1646	5029	249 300	3598	311
	2	1957	573 806	249 299	573 795	1646	5015	249 324	3584	311
	3	1958	573 880	249 331	573 869	1647	5002	249 355	3571	311
	4	1958	573 971	249 370	573 960	1647	4992	249 395	3561	311
	5	1959	574 075	249 416	574 065	1648	4990	249 440	3558	311
	6	-1960	-574 188	-249 465	+574 177	-1649	-4997	+249 489	+3565	-311
	7	1960	574 299	249 513	574 288	1649	5015	249 538	3582	311
	8	1961	574 401	249 557	574 390	1650	5042	249 582	3609	312
	9	1962	574 483	249 593	574 472	1650	5076	249 618	3642	312
	10	1962	574 541	249 618	574 530	1651	5111	249 643	3677	312
	11	1962	574 575	249 633	574 564	1651	5142	249 658	3707	312
	12	-1962	-574 590	-249 639	+574 579	-1651	-5162	+249 665	+3728	-312
	13	1962	574 599	249 643	574 588	1651	5168	249 669	3734	312
	14	1963	574 617	249 651	574 606	1651	5161	249 677	3726	312
	15	1963	574 655	249 668	574 644	1651	5143	249 693	3708	312
	16	-1963	-574 721	-249 697	+574 710	-1652	-5122	+249 722	+3686	-312

POSITION AND VELOCITY OF THE EARTH, 2025
ORIGIN AT SOLAR SYSTEM BARYCENTRE
MEAN EQUATOR AND EQUINOX J 2000.0

Date 0 ^h T.D.B.	X	Y	Z	\dot{X}	\dot{Y}	\dot{Z}
Aug. 16	+0.805 135 53	-0.563 621 00	-0.244 163 38	+1007 6577	+1254 9820	+543 9566
17	0.815 096 82	0.550 991 53	0.238 689 21	984 5447	1270 8553	550 8541
18	0.824 825 31	0.538 205 02	0.233 146 78	961 0990	1286 3907	557 6061
19	0.834 317 70	0.525 264 89	0.227 537 59	937 3239	1301 5739	564 2054
20	0.843 570 71	0.512 174 76	0.221 863 21	913 2259	1316 3910	570 6446
21	0.852 581 17	0.498 938 34	0.216 125 26	888 8146	1330 8288	576 9172
22	+0.861 346 00	-0.485 559 49	-0.210 325 44	+864 1017	+1344 8752	+583 0174
23	0.869 862 25	0.472 042 17	0.204 465 50	839 1008	1358 5202	588 9402
24	0.878 127 10	0.458 390 45	0.198 547 24	813 8267	1371 7560	594 6820
25	0.886 137 92	0.444 608 44	0.192 572 47	788 2944	1384 5767	600 2402
26	0.893 892 18	0.430 700 31	0.186 543 05	762 5184	1396 9787	605 6135
27	0.901 387 52	0.416 670 27	0.180 460 82	736 5124	1408 9591	610 8010
28	+0.908 621 71	-0.402 522 54	-0.174 327 65	+710 2895	+1420 5166	+615 8023
29	0.915 592 63	0.388 261 35	0.168 145 40	683 8614	1431 6506	620 6179
30	0.922 298 29	0.373 890 94	0.161 915 91	657 2395	1442 3605	625 2477
31	0.928 736 81	0.359 415 55	0.155 641 06	630 4347	1452 6465	629 6923
Sept. 1	0.934 906 41	0.344 839 42	0.149 322 68	603 4572	1462 5089	633 9526
2	0.940 805 41	0.330 166 78	0.142 962 62	576 3172	1471 9487	638 0294
3	+0.946 432 24	-0.315 401 85	-0.136 562 70	+549 0247	+1480 9677	+641 9240
4	0.951 785 42	0.300 548 82	0.130 124 74	521 5887	1489 5686	645 6385
5	0.956 863 56	0.285 611 86	0.123 650 52	494 0172	1497 7554	649 1752
6	0.961 665 34	0.270 595 08	0.117 141 82	466 3162	1505 5326	652 5371
7	0.966 189 47	0.255 502 56	0.110 600 36	438 4893	1512 9053	655 7269
8	0.970 434 70	0.240 338 31	0.104 027 84	410 5369	1519 8785	658 7478
9	+0.974 399 78	-0.225 106 31	-0.097 425 96	+382 4566	+1526 4548	+661 6011
10	0.978 083 39	0.209 810 53	0.090 796 38	354 2439	1532 6342	664 2869
11	0.981 484 20	0.194 454 96	0.084 140 78	325 8937	1538 4132	666 8033
12	0.984 600 80	0.179 043 63	0.077 460 89	297 4022	1543 7847	669 1463
13	0.987 431 77	0.163 580 66	0.070 758 45	268 7684	1548 7391	671 3108
14	0.989 975 70	0.148 070 27	0.064 035 29	239 9943	1553 2646	673 2904
15	+0.992 231 20	-0.132 516 83	-0.057 293 28	+211 0855	+1557 3496	+675 0791
16	0.994 196 99	0.116 924 79	0.050 534 37	182 0508	1560 9827	676 6707
17	0.995 871 84	0.101 298 72	0.043 760 54	152 9017	1564 1535	678 0600
18	0.997 254 68	0.085 643 29	0.036 973 86	123 6515	1566 8535	679 2424
19	0.998 344 58	0.069 963 24	0.030 176 40	94 3148	1569 0753	680 2143
20	0.999 140 74	0.054 263 39	0.023 370 28	64 9075	1570 8137	680 9732
21	+0.999 642 55	-0.038 548 59	-0.016 557 65	+35 4453	+1572 0653	+681 5176
22	0.999 849 52	0.022 823 72	0.009 740 65	+5 9446	1572 8282	681 8467
23	0.999 761 36	0.007 093 66	0.002 921 43	-23 5791	1573 1022	681 9606
24	0.999 377 91	0.008 636 70	0.003 897 85	53 1112	1572 8884	681 8601
25	0.998 699 16	0.024 362 49	0.010 715 06	82 6374	1572 1887	681 5467
26	0.997 725 23	0.040 078 87	0.017 528 08	112 1446	1571 0059	681 0219
27	+0.996 456 37	+0.055 781 01	+0.024 334 80	-141 6207	+1569 3431	+680 2875
28	0.994 892 96	0.071 464 14	0.031 133 14	171 0537	1567 2042	679 3458
29	0.993 035 48	0.087 123 52	0.037 921 04	200 4324	1564 5929	678 1990
30	0.990 884 52	0.102 754 44	0.044 696 45	229 7461	1561 5141	676 8495
Oct. 1	+0.988 440 80	+0.118 352 26	+0.051 457 36	-258 9846	+1557 9729	+675 3004

\dot{X} , \dot{Y} , \dot{Z} are in units of 10^{-9} a.u. per day

FRAME BIAS, PRECESSION AND NUTATION, 2025
MATRIX ELEMENTS FOR CONVERSION FROM
GCRS TO TRUE EQUINOX OF DATE

	Date	$M_{11} - 1$	M_{12}	M_{13}	M_{21}	$M_{22} - 1$	M_{23}	M_{31}	M_{32}	$M_{33} - 1$
	0 ^h TT									
Aug.	16	-1963	-574 721	-249 697	+574 710	-1652	-5122	+249 722	+3686	-312
	17	1964	574 816	249 738	574 805	1652	5104	249 763	3668	312
	18	1965	574 931	249 788	574 920	1653	5095	249 813	3659	312
	19	1966	575 055	249 841	575 044	1654	5100	249 866	3663	312
	20	1966	575 172	249 892	575 161	1654	5118	249 918	3681	312
	21	1967	575 272	249 935	575 261	1655	5147	249 961	3709	312
	22	-1968	-575 345	-249 967	+575 334	-1655	-5181	+249 993	+3743	-313
	23	1968	575 391	-249 987	575 380	1655	5214	250 013	3776	313
	24	1968	575 414	-249 997	575 403	1656	5241	250 023	3803	313
	25	1968	575 422	-250 001	575 410	1656	5259	250 027	3820	313
	26	1968	575 424	-250 002	575 413	1656	5266	250 028	3827	313
	27	1968	575 430	-250 004	575 419	1656	5263	250 031	3824	313
	28	-1968	-575 448	-250 012	+575 436	-1656	-5252	+250 038	+3813	-313
	29	1968	575 481	250 027	575 470	1656	5237	250 053	3798	313
	30	1969	575 532	250 049	575 521	1656	5221	250 075	3782	313
	31	1969	575 601	250 079	575 590	1657	5207	250 105	3768	313
Sept.	1	1970	575 685	250 115	575 674	1657	5200	250 141	3760	313
	2	1971	575 779	250 156	575 768	1658	5201	250 182	3760	313
	3	-1971	-575 876	-250 198	+575 864	-1658	-5211	+250 224	+3770	-313
	4	1972	575 966	250 237	575 955	1659	5231	250 263	3790	313
	5	1972	576 042	250 270	576 030	1659	5259	250 296	3818	313
	6	1973	576 095	250 293	576 084	1660	5291	250 320	3849	313
	7	1973	576 124	250 306	576 112	1660	5320	250 332	3878	313
	8	1973	576 131	250 309	576 119	1660	5341	250 335	3899	313
	9	-1973	-576 127	-250 307	+576 115	-1660	-5347	+250 334	+3905	-313
	10	1973	576 126	250 307	576 115	1660	5338	250 334	3896	313
	11	1973	576 145	250 315	576 134	1660	5317	250 342	3875	313
	12	1973	576 193	250 336	576 181	1660	5289	250 362	3847	313
	13	1974	576 271	250 370	576 259	1661	5263	250 396	3821	314
	14	1975	576 372	250 414	576 361	1661	5246	250 440	3803	314
	15	-1975	-576 484	-250 462	+576 472	-1662	-5242	+250 488	+3798	-314
	16	1976	576 592	250 509	576 580	1662	5251	250 535	3807	314
	17	1977	576 684	250 549	576 673	1663	5271	250 575	3826	314
	18	1977	576 753	250 579	576 741	1663	5297	250 605	3852	314
	19	1977	576 796	250 598	576 784	1664	5324	250 624	3879	314
	20	1978	576 815	250 606	576 803	1664	5346	250 633	3900	314
	21	-1978	-576 817	-250 607	+576 806	-1664	-5360	+250 634	+3914	-314
	22	1978	576 812	250 605	576 800	1664	5363	250 632	3917	314
	23	1978	576 808	250 603	576 796	1664	5355	250 630	3910	314
	24	1978	576 814	250 606	576 802	1664	5339	250 632	3894	314
	25	1978	576 835	250 615	576 823	1664	5318	250 641	3872	314
	26	1978	576 874	250 632	576 862	1664	5294	250 658	3848	314
	27	-1978	-576 931	-250 657	+576 920	-1664	-5272	+250 683	+3825	-314
	28	1979	577 005	250 689	576 994	1665	5254	250 715	3808	314
	29	1980	577 090	250 726	577 079	1665	5244	250 752	3797	314
	30	1980	577 180	250 765	577 169	1666	5243	250 791	3795	315
Oct.	1	-1981	-577 268	-250 803	+577 256	-1666	-5251	+250 829	+3803	-315

POSITION AND VELOCITY OF THE EARTH, 2025
ORIGIN AT SOLAR SYSTEM BARYCENTRE
MEAN EQUATOR AND EQUINOX J 2000.0

Date		X	Y	Z	\dot{X}	\dot{Y}	\dot{Z}
0 ^h T.D.B.							
Oct.	1	+0.988 440 80	+0.118 352 26	+0.051 457 36	-258 9846	+1557 9729	+675 3004
	2	0.985 705 12	0.133 912 38	0.058 201 80	288 1382	1553 9755	673 5550
	3	0.982 678 35	0.149 430 27	0.064 927 82	317 1986	1549 5289	671 6172
	4	0.979 361 48	0.164 901 49	0.071 633 52	346 1593	1544 6412	669 4911
	5	0.975 755 51	0.180 321 65	0.078 317 03	375 0166	1539 3210	667 1812
	6	0.971 861 49	0.195 686 49	0.084 976 54	403 7699	1533 5760	664 6916
	7	+0.967 680 45	+0.210 991 78	+0.091 610 27	-432 4218	+1527 4122	+662 0250
	8	0.963 213 38	0.226 233 35	0.098 216 46	460 9772	1520 8324	659 1825
	9	0.958 461 21	0.241 407 03	0.104 793 33	489 4413	1513 8346	656 1628
	10	0.953 424 84	0.256 508 63	0.111 339 11	517 8173	1506 4133	652 9624
	11	0.948 105 16	0.271 533 86	0.117 851 96	546 1048	1498 5599	649 5762
	12	0.942 503 06	0.286 478 36	0.124 330 00	574 2988	1490 2648	645 9985
	13	+0.936 619 53	+0.301 337 65	+0.130 771 28	-602 3899	+1481 5186	+642 2244
	14	0.930 455 65	0.316 107 20	0.137 173 81	630 3658	1472 3136	638 2494
	15	0.924 012 64	0.330 782 38	0.143 535 58	658 2121	1462 6447	634 0706
	16	0.917 291 89	0.345 358 53	0.149 854 54	685 9131	1452 5083	629 6860
	17	0.910 294 92	0.359 830 98	0.156 128 62	713 4529	1441 9029	625 0948
	18	0.903 023 42	0.374 195 03	0.162 355 75	740 8154	1430 8291	620 2969
	19	+0.895 479 25	+0.388 446 01	+0.168 533 87	-767 9845	+1419 2883	+615 2934
	20	0.887 664 42	0.402 579 25	0.174 660 93	794 9453	1407 2839	610 0857
	21	0.879 581 09	0.416 590 15	0.180 734 91	821 6826	1394 8201	604 6758
	22	0.871 231 56	0.430 474 14	0.186 753 79	848 1823	1381 9023	599 0668
	23	0.862 618 28	0.444 226 71	0.192 715 59	874 4312	1368 5366	593 2617
	24	0.853 743 82	0.457 843 40	0.198 618 38	900 4165	1354 7299	587 2637
	25	+0.844 610 87	+0.471 319 86	+0.204 460 24	-926 1268	+1340 4899	+581 0770
	26	0.835 222 24	0.484 651 78	0.210 239 30	951 5512	1325 8245	574 7054
	27	0.825 580 83	0.497 834 96	0.215 953 74	976 6795	1310 7419	568 1530
	28	0.815 689 67	0.510 865 26	0.221 601 77	1001 5023	1295 2513	561 4245
	29	0.805 551 83	0.523 738 66	0.227 181 66	1026 0109	1279 3618	554 5243
	30	0.795 170 52	0.536 451 20	0.232 691 70	1050 1978	1263 0837	547 4575
Nov.	31	+0.784 548 97	+0.548 999 07	+0.238 130 27	-1074 0565	+1246 4277	+540 2296
	1	0.773 690 50	0.561 378 53	0.243 495 78	1097 5821	1229 4052	532 8458
	2	0.762 598 45	0.573 585 99	0.248 786 69	1120 7729	1212 0276	525 3122
	3	0.751 276 16	0.585 617 94	0.254 001 54	1143 6297	1194 3064	517 6338
	4	0.739 726 95	0.597 471 00	0.259 138 90	1166 1564	1176 2503	509 8147
	5	0.727 954 11	0.609 141 85	0.264 197 37	1188 3597	1157 8650	501 8571
	6	+0.715 960 82	+0.620 627 21	+0.269 175 57	-1210 2459	+1139 1518	+493 7607
	7	0.703 750 23	0.631 923 78	0.274 072 11	1231 8195	1120 1074	485 5230
	8	0.691 325 47	0.643 028 23	0.278 885 55	1253 0808	1100 7257	477 1397
	9	0.678 689 67	0.653 937 15	0.283 614 41	1274 0244	1080 9995	468 6063
	10	0.665 846 07	0.664 647 05	0.288 257 16	1294 6402	1060 9225	459 9192
	11	0.652 798 00	0.675 154 42	0.292 812 27	1314 9151	1040 4914	451 0757
	12	+0.639 548 96	+0.685 455 70	+0.297 278 15	-1334 8340	+1019 7056	+442 0752
	13	0.626 102 56	0.695 547 35	0.301 653 25	1354 3816	998 5671	432 9183
	14	0.612 462 61	0.705 425 88	0.305 936 00	1373 5430	977 0799	423 6067
	15	0.598 633 04	0.715 087 81	0.310 124 88	1392 3042	955 2502	414 1433
	16	+0.584 617 91	+0.724 529 76	+0.314 218 37	-1410 6516	+933 0848	+404 5312

$\dot{X}, \quad \dot{Y}, \quad \dot{Z}$ are in units of 10^{-9} a.u. per day

FRAME BIAS, PRECESSION AND NUTATION, 2025
MATRIX ELEMENTS FOR CONVERSION FROM
GCRS TO TRUE EQUINOX OF DATE

Date 0 ^h TT		M ₁₁ - 1	M ₁₂	M ₁₃	M ₂₁	M ₂₂ - 1	M ₂₃	M ₃₁	M ₃₂	M ₃₃ - 1
Oct.	1	-1981	-577 268	-250 803	+577 256	-1666	-5251	+250 829	+3803	-315
	2	1981	577 345	250 837	577 334	1667	5268	250 863	3819	315
	3	1982	577 405	250 862	577 393	1667	5290	250 889	3841	315
	4	1982	577 442	250 879	577 430	1667	5312	250 905	3863	315
	5	1982	577 456	250 885	577 444	1667	5328	250 911	3879	315
	6	1982	577 454	250 884	577 443	1667	5333	250 911	3884	315
	7	-1982	-577 450	-250 882	+577 439	-1667	-5322	+250 909	+3873	-315
	8	1982	577 461	250 887	577 449	1667	5295	250 913	3847	315
	9	1982	577 500	250 904	577 489	1668	5259	250 930	3810	315
	10	1983	577 574	250 936	577 562	1668	5222	250 962	3772	315
	11	1984	577 676	250 981	577 665	1669	5192	251 006	3742	315
	12	1984	577 794	251 032	577 783	1669	5175	251 058	3725	315
	13	-1985	-577 912	-251 083	+577 901	-1670	-5173	+251 109	+3722	-315
	14	1986	578 015	251 128	578 004	1671	5183	251 153	3731	315
	15	1986	578 095	251 163	578 084	1671	5200	251 188	3748	316
	16	1987	578 149	251 186	578 138	1671	5219	251 212	3766	316
	17	1987	578 180	251 199	578 168	1672	5234	251 225	3781	316
	18	1987	578 192	251 205	578 181	1672	5241	251 231	3789	316
	19	-1987	-578 196	-251 206	+578 184	-1672	-5239	+251 232	+3787	-316
	20	1987	578 199	251 208	578 187	1672	5227	251 234	3774	316
	21	1987	578 210	251 212	578 198	1672	5205	251 238	3753	316
	22	1987	578 235	251 224	578 224	1672	5178	251 249	3725	316
	23	1988	578 279	251 242	578 267	1672	5147	251 268	3694	316
	24	1988	578 341	251 270	578 330	1672	5117	251 295	3663	316
	25	-1989	-578 421	-251 304	+578 410	-1673	-5090	+251 329	+3637	-316
	26	1989	578 513	251 344	578 502	1673	5071	251 369	3617	316
	27	1990	578 612	251 387	578 601	1674	5061	251 412	3606	316
	28	1991	578 711	251 430	578 700	1675	5059	251 455	3604	316
	29	1991	578 803	251 470	578 792	1675	5066	251 495	3611	316
	30	1992	578 880	251 503	578 869	1676	5080	251 529	3624	316
Nov.	31	-1992	-578 937	-251 528	+578 926	-1676	-5095	+251 554	+3639	-316
	1	1992	578 973	251 544	578 962	1676	5108	251 569	3651	317
	2	1993	578 992	251 552	578 981	1676	5112	251 578	3655	317
	3	1993	579 002	251 557	578 991	1676	5102	251 582	3646	317
	4	1993	579 020	251 565	579 009	1676	5078	251 590	3621	317
	5	1993	579 061	251 582	579 050	1677	5040	251 607	3583	317
	6	-1994	-579 137	-251 615	+579 126	-1677	-4996	+251 640	+3539	-317
	7	1994	579 248	251 664	579 238	1678	4957	251 688	3499	317
	8	1995	579 384	251 723	579 374	1679	4930	251 747	3471	317
	9	1996	579 527	251 785	579 517	1679	4918	251 809	3459	317
	10	1997	579 659	251 842	579 649	1680	4922	251 866	3462	317
	11	1998	579 768	251 889	579 758	1681	4935	251 914	3475	317
	12	-1998	-579 849	-251 924	+579 838	-1681	-4952	+251 949	+3491	-317
	13	1999	579 903	251 948	579 893	1682	4966	251 973	3505	318
	14	1999	579 938	251 963	579 927	1682	4973	251 988	3512	318
	15	1999	579 961	251 973	579 951	1682	4971	251 998	3509	318
	16	-1999	-579 983	-251 983	+579 972	1682	-4959	+252 007	+3497	-318

POSITION AND VELOCITY OF THE EARTH, 2025
ORIGIN AT SOLAR SYSTEM BARYCENTRE
MEAN EQUATOR AND EQUINOX J 2000.0

Date 0 ^h T.D.B.	X	Y	Z	\dot{X}	\dot{Y}	\dot{Z}
Nov. 16	+0.584 617 91	+0.724 529 76	+0.314 218 37	-1410 6516	+933 0848	+404 5312
17	0.570 421 43	0.733 748 41	0.318 215 02	1428 5729	910 5917	394 7744
18	0.556 047 91	0.742 740 53	0.322 113 39	1446 0564	887 7797	384 8767
19	0.541 501 79	0.751 502 98	0.325 912 10	1463 0909	864 6584	374 8430
20	0.526 787 62	0.760 032 70	0.329 609 81	1479 6663	841 2378	364 6780
21	0.511 910 03	0.768 326 77	0.333 205 24	1495 7728	817 5291	354 3872
22	+0.496 873 76	+0.776 382 36	+0.336 697 16	-1511 4022	+793 5436	+343 9758
23	0.481 683 60	0.784 196 76	0.340 084 38	1526 5468	769 2933	333 4497
24	0.466 344 46	0.791 767 39	0.343 365 79	1541 1998	744 7907	322 8151
25	0.450 861 26	0.799 091 78	0.346 540 33	1555 3559	720 0487	312 0778
26	0.435 239 01	0.806 167 61	0.349 607 02	1569 0106	695 0802	301 2441
27	0.419 482 73	0.812 992 67	0.352 564 92	1582 1607	669 8988	290 3207
28	+0.403 597 49	+0.819 564 92	+0.355 413 16	-1594 8045	+644 5181	+279 3137
29	0.387 588 33	0.825 882 42	0.358 150 94	1606 9418	618 9520	268 2299
30	0.371 460 33	0.831 943 38	0.360 777 52	1618 5750	593 2142	257 0754
Dec. 1	0.355 218 50	0.837 746 17	0.363 292 23	1629 7091	567 3171	245 8560
2	0.338 867 79	0.843 289 23	0.365 694 44	1640 3510	541 2715	234 5763
3	0.322 413 09	0.848 571 13	0.367 983 56	1650 5101	515 0850	223 2390
4	+0.305 859 17	+0.853 590 47	+0.370 159 03	-1660 1956	+488 7609	+211 8446
5	0.289 210 73	0.858 345 89	0.372 220 26	1669 4147	462 2986	200 3918
6	0.272 472 42	0.862 835 97	0.374 166 66	1678 1701	435 6939	188 8772
7	0.255 648 88	0.867 059 28	0.375 997 59	1686 4594	408 9423	177 2974
8	0.238 744 81	0.871 014 32	0.377 712 38	1694 2750	382 0404	165 6498
9	0.221 765 00	0.874 699 58	0.379 310 35	1701 6060	354 9875	153 9333
10	+0.204 714 35	+0.878 113 57	+0.380 790 82	-1708 4397	+327 7866	+142 1489
11	0.187 597 90	0.881 254 84	0.382 153 11	1714 7640	300 4433	130 2991
12	0.170 420 80	0.884 121 99	0.383 396 59	1720 5674	272 9661	118 3876
13	0.153 188 32	0.886 713 74	0.384 520 67	1725 8402	245 3646	106 4190
14	0.135 905 80	0.889 028 90	0.385 524 80	1730 5735	217 6495	94 3983
15	0.118 578 67	0.891 066 39	0.386 408 48	1734 7601	189 8320	82 3308
16	+0.101 212 44	+0.892 825 24	+0.387 171 28	-1738 3934	+161 9241	+70 2221
17	0.083 812 67	0.894 304 61	0.387 812 81	1741 4676	133 9378	58 0779
18	0.066 384 97	0.895 503 78	0.388 332 74	1743 9778	105 8856	45 9041
19	0.048 935 01	0.896 422 15	0.388 730 81	1745 9197	77 7809	33 7070
20	0.031 468 48	0.897 059 27	0.389 006 82	1747 2898	49 6373	21 4933
21	0.013 991 12	0.897 414 81	0.389 160 64	1748 0860	21 4690	9 2694
22	-0.003 491 32	+0.897 488 61	+0.389 192 20	-1748 3069	-6 7093	-2 9576
23	0.020 973 10	0.897 280 64	0.389 101 50	1747 9529	34 8830	15 1806
24	0.038 448 47	0.896 791 02	0.388 888 63	1747 0261	63 0369	27 3925
25	0.055 911 72	0.896 020 02	0.388 553 71	1745 5294	91 1560	39 5866
26	0.073 357 18	0.894 968 06	0.388 096 98	1743 4680	119 2261	51 7559
27	0.090 779 22	0.893 635 71	0.387 518 70	1740 8487	147 2330	63 8942
28	-0.108 172 32	+0.892 023 66	+0.386 819 22	-1737 6801	-175 1637	-75 9958
29	0.125 531 02	0.890 132 73	0.385 998 92	1733 9724	203 0067	88 0556
30	0.142 850 01	0.887 963 85	0.385 058 26	1729 7375	230 7527	100 0698
31	0.160 124 06	0.885 518 02	0.383 997 68	1724 9883	258 3951	112 0364
32	-0.177 348 10	+0.882 796 30	+0.382 817 69	-1719 7372	-285 9308	-123 9552

$\dot{X}, \quad \dot{Y}, \quad \dot{Z}$ are in units of 10^{-9} a.u. per day

FRAME BIAS, PRECESSION AND NUTATION, 2025
MATRIX ELEMENTS FOR CONVERSION FROM
GCRS TO TRUE EQUINOX OF DATE

	Date 0 ^h TT	M ₁₁ - 1	M ₁₂	M ₁₃	M ₂₁	M ₂₂ - 1	M ₂₃	M ₃₁	M ₃₂	M ₃₃ - 1
Nov.	16	-1999	-579 983	-251 983	+579 972	-1682	-4959	+252 007	+3497	-318
	17	2000	580 010	251 995	580 000	1682	4938	252 019	3476	318
	18	2000	580 051	252 012	580 041	1682	4910	252 037	3448	318
	19	2000	580 109	252 037	580 099	1683	4879	252 062	3417	318
	20	2001	580 186	252 071	580 176	1683	4848	252 095	3385	318
	21	2001	580 281	252 112	580 270	1684	4820	252 136	3357	318
	22	-2002	-580 389	-252 159	+580 379	-1684	-4799	+252 183	+3336	-318
	23	2003	580 506	252 210	580 496	1685	4787	252 233	3323	318
	24	2004	580 624	252 261	580 614	1686	4784	252 285	3319	318
	25	2005	580 736	252 309	580 725	1686	4790	252 333	3325	318
	26	2005	580 834	252 352	580 824	1687	4803	252 376	3337	319
	27	2006	580 914	252 387	580 904	1687	4819	252 411	3352	319
	28	-2006	-580 975	-252 413	+580 964	-1688	-4833	+252 437	+3367	-319
	29	2007	581 017	252 431	581 006	1688	4842	252 455	3375	319
	30	2007	581 048	252 445	581 037	1688	4840	252 469	3373	319
Dec.	1	2007	581 079	252 459	581 069	1688	4824	252 483	3357	319
	2	2007	581 126	252 479	581 116	1689	4795	252 503	3328	319
	3	2008	581 203	252 512	581 192	1689	4758	252 536	3290	319
	4	-2009	-581 315	-252 561	+581 305	-1690	-4719	+252 584	+3251	-319
	5	2010	581 460	252 624	581 450	1691	4689	252 647	3220	319
	6	2011	581 622	252 694	581 612	1691	4675	252 717	3205	319
	7	2012	581 783	252 764	581 773	1692	4677	252 787	3206	320
	8	2013	581 923	252 825	581 913	1693	4693	252 848	3221	320
	9	2014	582 033	252 873	582 023	1694	4715	252 896	3243	320
	10	-2014	-582 113	-252 908	+582 103	-1694	-4737	+252 931	+3265	-320
	11	2014	582 169	252 932	582 159	1695	4753	252 955	3281	320
	12	2015	582 210	252 949	582 199	1695	4760	252 973	3287	320
	13	2015	582 245	252 965	582 235	1695	4756	252 988	3283	320
	14	2015	582 284	252 982	582 274	1695	4743	253 005	3270	320
	15	2016	582 335	253 004	582 325	1696	4724	253 027	3250	320
	16	-2016	-582 402	-253 033	+582 392	-1696	-4700	+253 056	+3226	-320
	17	2017	582 486	253 070	582 477	1697	4675	253 093	3201	320
	18	2017	582 589	253 114	582 579	1697	4654	253 137	3179	320
	19	2018	582 706	253 165	582 697	1698	4638	253 188	3163	321
	20	2019	582 833	253 220	582 823	1699	4632	253 243	3156	321
	21	2020	582 962	253 276	582 952	1699	4634	253 299	3158	321
	22	-2021	-583 085	-253 330	+583 075	-1700	-4646	+253 352	+3169	-321
	23	2022	583 196	253 377	583 186	1701	4666	253 400	3188	321
	24	2022	583 288	253 418	583 278	1701	4689	253 441	3211	321
	25	2023	583 360	253 449	583 349	1702	4713	253 472	3234	321
	26	2023	583 412	253 471	583 402	1702	4731	253 495	3252	321
	27	2023	583 451	253 488	583 441	1702	4740	253 512	3261	321
	28	-2024	-583 487	-253 504	+583 477	-1702	-4738	+253 527	+3258	-321
	29	2024	583 532	253 524	583 522	1703	4722	253 547	3243	321
	30	2024	583 600	253 553	583 590	1703	4697	253 576	3218	322
	31	2025	583 698	253 596	583 688	1704	4669	253 619	3188	322
	32	-2026	-583 830	-253 653	+583 820	-1704	-4644	+253 676	+3163	-322

APPARENT PLACES OF POLARIS, 2025

FOR 0^h TERRESTRIAL TIME

α Ursae Minoris							Mag. 2.02							F5-F8 Ib										
	JANUARY						FEBRUARY						MARCH						APRIL					
Date	Right			Declination			Right			Declination			Right			Declination			Right			Declination		
	Ascension						Ascension						Ascension						Ascension					
	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"
1	3	05	05	+89	22	26	3	04	12	+89	22	32	3	03	19	+89	22	31	3	02	34	+89	22	24
2	3	05	04	+89	22	27	3	04	10	+89	22	32	3	03	17	+89	22	31	3	02	33	+89	22	24
3	3	05	02	+89	22	27	3	04	08	+89	22	32	3	03	15	+89	22	30	3	02	33	+89	22	24
4	3	05	01	+89	22	27	3	04	06	+89	22	32	3	03	13	+89	22	30	3	02	32	+89	22	24
5	3	04	59	+89	22	27	3	04	04	+89	22	32	3	03	12	+89	22	30	3	02	32	+89	22	23
6	3	04	57	+89	22	28	3	04	03	+89	22	32	3	03	10	+89	22	30	3	02	31	+89	22	23
7	3	04	55	+89	22	28	3	04	01	+89	22	32	3	03	09	+89	22	30	3	02	30	+89	22	23
8	3	04	54	+89	22	28	3	03	59	+89	22	32	3	03	08	+89	22	30	3	02	29	+89	22	23
9	3	04	53	+89	22	28	3	03	58	+89	22	32	3	03	06	+89	22	29	3	02	28	+89	22	22
10	3	04	51	+89	22	28	3	03	56	+89	22	32	3	03	05	+89	22	29	3	02	27	+89	22	22
11	3	04	50	+89	22	29	3	03	54	+89	22	32	3	03	03	+89	22	29	3	02	26	+89	22	22
12	3	04	49	+89	22	29	3	03	52	+89	22	32	3	03	01	+89	22	29	3	02	25	+89	22	22
13	3	04	47	+89	22	29	3	03	49	+89	22	32	3	02	59	+89	22	29	3	02	25	+89	22	21
14	3	04	46	+89	22	29	3	03	47	+89	22	32	3	02	57	+89	22	29	3	02	24	+89	22	21
15	3	04	44	+89	22	29	3	03	45	+89	22	32	3	02	55	+89	22	29	3	02	24	+89	22	20
16	3	04	42	+89	22	30	3	03	43	+89	22	32	3	02	54	+89	22	28	3	02	23	+89	22	20
17	3	04	40	+89	22	30	3	03	41	+89	22	32	3	02	52	+89	22	28	3	02	23	+89	22	20
18	3	04	38	+89	22	30	3	03	39	+89	22	32	3	02	51	+89	22	28	3	02	23	+89	22	20
19	3	04	36	+89	22	30	3	03	37	+89	22	31	3	02	50	+89	22	28	3	02	23	+89	22	19
20	3	04	34	+89	22	30	3	03	35	+89	22	31	3	02	49	+89	22	27	3	02	22	+89	22	19
21	3	04	32	+89	22	30	3	03	34	+89	22	31	3	02	48	+89	22	27	3	02	22	+89	22	19
22	3	04	31	+89	22	30	3	03	32	+89	22	31	3	02	46	+89	22	27	3	02	22	+89	22	19
23	3	04	29	+89	22	30	3	03	30	+89	22	31	3	02	45	+89	22	27	3	02	21	+89	22	18
24	3	04	27	+89	22	31	3	03	29	+89	22	31	3	02	44	+89	22	26	3	02	21	+89	22	18
25	3	04	26	+89	22	31	3	03	27	+89	22	31	3	02	43	+89	22	26	3	02	20	+89	22	18
26	3	04	24	+89	22	31	3	03	25	+89	22	31	3	02	41	+89	22	26	3	02	20	+89	22	17
27	3	04	22	+89	22	31	3	03	23	+89	22	31	3	02	40	+89	22	26	3	02	20	+89	22	17
28	3	04	21	+89	22	31	3	03	21	+89	22	31	3	02	38	+89	22	26	3	02	20	+89	22	17
29	3	04	19	+89	22	31							3	02	37	+89	22	25	3	02	20	+89	22	16
30	3	04	17	+89	22	31							3	02	36	+89	22	25	3	02	21	+89	22	16
31	3	04	14	+89	22	31							3	02	35	+89	22	25						

APPARENT PLACES OF POLARIS, 2025

FOR 0^h TERRESTRIAL TIME

α Ursae Minoris							Mag. 2.02							F5-F8 Ib										
	MAY						JUNE						JULY						AUGUST					
Date	Right			Declination			Right			Declination			Right			Declination			Right			Declination		
	Ascension						Ascension						Ascension						Ascension					
	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"
1	3	02	21	+89	22	16	3	02	41	+89	22	07	3	03	27	+89	22	01	3	04	30	+89	22	00
2	3	02	22	+89	22	15	3	02	42	+89	22	07	3	03	28	+89	22	01	3	04	32	+89	22	00
3	3	02	22	+89	22	15	3	02	43	+89	22	07	3	03	30	+89	22	01	3	04	35	+89	22	00
4	3	02	22	+89	22	15	3	02	44	+89	22	06	3	03	32	+89	22	01	3	04	37	+89	22	00
5	3	02	22	+89	22	15	3	02	45	+89	22	06	3	03	34	+89	22	01	3	04	39	+89	22	00
6	3	02	22	+89	22	14	3	02	46	+89	22	06	3	03	36	+89	22	01	3	04	42	+89	22	00
7	3	02	22	+89	22	14	3	02	48	+89	22	05	3	03	38	+89	22	00	3	04	44	+89	22	00
8	3	02	22	+89	22	14	3	02	49	+89	22	05	3	03	40	+89	22	00	3	04	46	+89	22	00
9	3	02	22	+89	22	13	3	02	50	+89	22	05	3	03	43	+89	22	00	3	04	48	+89	22	00
10	3	02	23	+89	22	13	3	02	52	+89	22	05	3	03	45	+89	22	00	3	04	50	+89	22	00
11	3	02	23	+89	22	13	3	02	54	+89	22	05	3	03	47	+89	22	00	3	04	52	+89	22	00
12	3	02	24	+89	22	12	3	02	55	+89	22	04	3	03	49	+89	22	00	3	04	54	+89	22	00
13	3	02	24	+89	22	12	3	02	57	+89	22	04	3	03	50	+89	22	00	3	04	56	+89	22	01
14	3	02	25	+89	22	12	3	02	59	+89	22	04	3	03	52	+89	22	00	3	04	58	+89	22	01
15	3	02	26	+89	22	11	3	03	00	+89	22	04	3	03	54	+89	22	00	3	05	00	+89	22	01
16	3	02	27	+89	22	11	3	03	01	+89	22	04	3	03	56	+89	22	00	3	05	03	+89	22	01
17	3	02	27	+89	22	11	3	03	02	+89	22	04	3	03	58	+89	22	00	3	05	05	+89	22	01
18	3	02	28	+89	22	11	3	03	04	+89	22	03	3	04	00	+89	22	00	3	05	08	+89	22	01
19	3	02	29	+89	22	10	3	03	05	+89	22	03	3	04	02	+89	22	00	3	05	10	+89	22	01
20	3	02	29	+89	22	10	3	03	07	+89	22	03	3	04	04	+89	22	00	3	05	12	+89	22	01
21	3	02	30	+89	22	10	3	03	08	+89	22	03	3	04	07	+89	22	00	3	05	15	+89	22	01
22	3	02	30	+89	22	10	3	03	10	+89	22	02	3	04	09	+89	22	00	3	05	17	+89	22	02
23	3	02	31	+89	22	09	3	03	12	+89	22	02	3	04	12	+89	22	00	3	05	19	+89	22	02
24	3	02	32	+89	22	09	3	03	14	+89	22	02	3	04	14	+89	22	00	3	05	20	+89	22	02
25	3	02	33	+89	22	09	3	03	16	+89	22	02	3	04	16	+89	22	00	3	05	22	+89	22	02
26	3	02	34	+89	22	08	3	03	18	+89	22	02	3	04	18	+89	22	00	3	05	24	+89	22	02
27	3	02	35	+89	22	08	3	03	20	+89	22	02	3	04	20	+89	22	00	3	05	26	+89	22	02
28	3	02	37	+89	22	08	3	03	22	+89	22	02	3	04	22	+89	22	00	3	05	28	+89	22	02
29	3	02	38	+89	22	08	3	03	24	+89	22	02	3	04	24	+89	22	00	3	05	30	+89	22	03
30	3	02	39	+89	22	07	3	03	25	+89	22	01	3	04	26	+89	22	00	3	05	33	+89	22	03
31	3	02	40	+89	22	07							3	04	28	+89	22	00	3	05	35	+89	22	03

APPARENT PLACES OF POLARIS, 2025

FOR 0^h TERRESTRIAL TIME

α Ursae Minoris							Mag. 2.02							F5-F8 Ib										
	SEPTEMBER						OCTOBER						NOVEMBER						DECEMBER					
Date	Right			Declination			Right			Declination			Right			Declination			Right			Declination		
	Ascension						Ascension						Ascension						Ascension					
	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"	h	m	s	°	'	"
1	3	05	37	+89	22	03	3	06	33	+89	22	10	3	07	09	+89	22	21	3	07	15	+89	22	32
2	3	05	39	+89	22	03	3	06	34	+89	22	11	3	07	09	+89	22	21	3	07	14	+89	22	32
3	3	05	42	+89	22	03	3	06	36	+89	22	11	3	07	10	+89	22	22	3	07	14	+89	22	32
4	3	05	44	+89	22	04	3	06	37	+89	22	11	3	07	10	+89	22	22	3	07	14	+89	22	33
5	3	05	46	+89	22	04	3	06	38	+89	22	12	3	07	11	+89	22	22	3	07	14	+89	22	33
6	3	05	47	+89	22	04	3	06	39	+89	22	12	3	07	12	+89	22	22	3	07	14	+89	22	33
7	3	05	49	+89	22	04	3	06	41	+89	22	12	3	07	13	+89	22	23	3	07	14	+89	22	34
8	3	05	51	+89	22	05	3	06	42	+89	22	12	3	07	14	+89	22	23	3	07	13	+89	22	34
9	3	05	52	+89	22	05	3	06	44	+89	22	13	3	07	14	+89	22	24	3	07	13	+89	22	35
10	3	05	54	+89	22	05	3	06	45	+89	22	13	3	07	15	+89	22	24	3	07	12	+89	22	35
11	3	05	56	+89	22	05	3	06	47	+89	22	13	3	07	15	+89	22	24	3	07	11	+89	22	35
12	3	05	58	+89	22	05	3	06	49	+89	22	14	3	07	16	+89	22	25	3	07	10	+89	22	36
13	3	06	01	+89	22	05	3	06	50	+89	22	14	3	07	16	+89	22	25	3	07	09	+89	22	36
14	3	06	03	+89	22	06	3	06	52	+89	22	14	3	07	16	+89	22	26	3	07	08	+89	22	36
15	3	06	05	+89	22	06	3	06	53	+89	22	15	3	07	16	+89	22	26	3	07	07	+89	22	36
16	3	06	07	+89	22	06	3	06	54	+89	22	15	3	07	16	+89	22	26	3	07	07	+89	22	37
17	3	06	09	+89	22	07	3	06	55	+89	22	16	3	07	16	+89	22	27	3	07	06	+89	22	37
18	3	06	11	+89	22	07	3	06	56	+89	22	16	3	07	16	+89	22	27	3	07	05	+89	22	37
19	3	06	12	+89	22	07	3	06	57	+89	22	16	3	07	16	+89	22	27	3	07	05	+89	22	38
20	3	06	14	+89	22	07	3	06	57	+89	22	17	3	07	17	+89	22	28	3	07	04	+89	22	38
21	3	06	15	+89	22	08	3	06	58	+89	22	17	3	07	17	+89	22	28	3	07	03	+89	22	38
22	3	06	17	+89	22	08	3	06	60	+89	22	17	3	07	17	+89	22	28	3	07	02	+89	22	39
23	3	06	19	+89	22	08	3	07	01	+89	22	17	3	07	17	+89	22	29	3	07	01	+89	22	39
24	3	06	20	+89	22	08	3	07	02	+89	22	18	3	07	17	+89	22	29	3	07	00	+89	22	39
25	3	06	22	+89	22	09	3	07	03	+89	22	18	3	07	17	+89	22	30	3	06	58	+89	22	40
26	3	06	24	+89	22	09	3	07	04	+89	22	18	3	07	17	+89	22	30	3	06	57	+89	22	40
27	3	06	26	+89	22	09	3	07	05	+89	22	19	3	07	17	+89	22	30	3	06	55	+89	22	40
28	3	06	28	+89	22	09	3	07	06	+89	22	19	3	07	16	+89	22	31	3	06	54	+89	22	40
29	3	06	30	+89	22	10	3	07	07	+89	22	20	3	07	16	+89	22	31	3	06	53	+89	22	41
30	3	06	31	+89	22	10	3	07	08	+89	22	20	3	07	15	+89	22	31	3	06	51	+89	22	41
31							3	07	08	+89	22	20							3	06	50	+89	22	41
32																			3	06	49	+89	22	41

POLARIS TABLE, 2025

LST	0 ^h		1 ^h		2 ^h		3 ^h		4 ^h		5 ^h	
	<i>a</i> ₀	<i>b</i> ₀	<i>a</i> ₀	<i>b</i> ₀	<i>a</i> ₀	<i>b</i> ₀	<i>a</i> ₀	<i>b</i> ₀	<i>a</i> ₀	<i>b</i> ₀	<i>a</i> ₀	<i>b</i> ₀
m	'	'	'	'	'	'	'	'	'	'	'	'
0	-26.0	+27.4	-32.2	+19.7	-36.2	+10.6	-37.7	+0.8	-36.6	-9.1	-33.0	-18.4
3	26.3	27.1	32.5	19.3	36.3	10.1	37.7	+0.3	36.5	9.6	32.7	18.8
6	26.7	26.8	32.7	18.9	36.5	9.7	37.7	-0.2	36.3	10.1	32.5	19.3
9	27.0	26.4	33.0	18.4	36.6	9.2	37.7	0.7	36.2	10.6	32.2	19.7
12	27.4	26.0	33.2	18.0	36.7	8.7	37.7	1.2	36.1	11.1	32.0	20.1
15	-27.7	+25.7	-33.4	+17.6	-36.8	+8.2	-37.7	-1.7	-35.9	-11.5	-31.7	-20.5
18	28.1	25.3	33.7	17.1	36.9	7.7	37.6	2.2	35.8	12.0	31.4	21.0
21	28.4	24.9	33.9	16.7	37.0	7.2	37.6	2.7	35.6	12.5	31.2	21.4
24	28.7	24.6	34.1	16.2	37.1	6.7	37.6	3.2	35.4	13.0	30.9	21.8
27	29.0	24.2	34.3	15.8	37.2	6.2	37.5	3.7	35.3	13.4	30.6	22.2
30	-29.4	+23.8	-34.5	+15.3	-37.3	+5.8	-37.5	-4.2	-35.1	-13.9	-30.3	-22.6
33	29.7	23.4	34.7	14.9	37.3	5.3	37.4	4.7	34.9	14.4	30.0	23.0
36	30.0	23.0	34.9	14.4	37.4	4.8	37.4	5.2	34.7	14.8	29.7	23.4
39	30.3	22.6	35.1	13.9	37.5	4.3	37.3	5.7	34.5	15.3	29.4	23.8
42	30.6	22.2	35.3	13.5	37.5	3.8	37.2	6.2	34.3	15.7	29.1	24.1
45	-30.8	+21.8	-35.4	+13.0	-37.6	+3.3	-37.1	-6.7	-34.1	-16.2	-28.7	-24.5
48	31.1	21.4	35.6	12.5	37.6	2.8	37.0	7.2	33.9	16.6	28.4	24.9
51	31.4	21.0	35.8	12.1	37.6	2.3	36.9	7.7	33.7	17.1	28.1	25.3
54	31.7	20.6	35.9	11.6	37.7	1.8	36.8	8.2	33.4	17.5	27.8	25.6
57	31.9	20.2	36.1	11.1	37.7	1.3	36.7	8.6	33.2	18.0	27.4	26.0
60	-32.2	+19.7	-36.2	+10.6	-37.7	+0.8	-36.6	-9.1	-33.0	-18.4	-27.1	-26.4
Lat. °	<i>a</i> ₁	<i>b</i> ₁	<i>a</i> ₁	<i>b</i> ₁	<i>a</i> ₁	<i>b</i> ₁	<i>a</i> ₁	<i>b</i> ₁	<i>a</i> ₁	<i>b</i> ₁	<i>a</i> ₁	<i>b</i> ₁
0	-.1	-.2	-.1	-.2	.0	-.1	.0	.0	.0	.1	-.1	+.2
10	-.1	-.2	-.1	-.2	.0	-.1	.0	.0	.0	.1	.0	+.2
20	-.1	-.2	.0	-.2	.0	-.1	.0	.0	.0	.1	.0	+.1
30	-.1	-.1	.0	-.1	.0	-.1	.0	.0	.0	.1	.0	+.1
40	.0	-.1	.0	-.1	.0	.0	.0	.0	.0	.0	.0	+.1
45	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
50	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
55	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
60	+.1	+.1	.0	+.1	.0	+.1	.0	.0	.0	-.1	.0	-.1
62	+.1	+.1	.0	+.1	.0	+.1	.0	.0	.0	-.1	.0	-.1
64	+.1	+.2	.0	+.2	.0	+.1	.0	.0	.0	-.1	.0	-.2
66	+.1	+.2	+.1	+.2	.0	+.1	.0	.0	.0	-.1	+.1	-.2
Month	<i>a</i> ₂	<i>b</i> ₂	<i>a</i> ₂	<i>b</i> ₂	<i>a</i> ₂	<i>b</i> ₂	<i>a</i> ₂	<i>b</i> ₂	<i>a</i> ₂	<i>b</i> ₂	<i>a</i> ₂	<i>b</i> ₂
Jan.	+.1	-.1	+.2	-.1	+.2	.0	+.2	.0	+.2	+.1	+.2	+.1
Feb.	+.1	-.3	+.1	-.2	+.2	-.2	+.2	-.1	+.3	-.1	+.3	.0
Mar.	-.1	-.3	.0	-.3	+.1	-.3	+.2	-.3	+.2	-.2	+.3	-.2
Apr.	-.2	-.3	-.1	-.3	-.1	-.4	.0	-.4	+.1	-.3	+.2	-.3
May	-.3	-.2	-.3	-.3	-.2	-.3	-.1	-.3	.0	-.4	+.1	-.4
June	-.3	.0	-.3	-.1	-.3	-.2	-.2	-.3	-.2	-.3	-.1	-.3
July	-.3	+.1	-.3	+.1	-.3	.0	-.3	-.1	-.3	-.2	-.2	-.2
Aug.	-.1	+.2	-.2	+.2	-.2	+.1	-.3	+.1	-.3	.0	-.3	-.1
Sept.	.0	+.3	.0	+.3	-.1	+.3	-.2	+.2	-.2	+.2	-.3	+.1
Oct.	+.2	+.3	+.2	+.3	+.1	+.4	.0	+.4	-.1	+.3	-.2	+.3
Nov.	+.4	+.2	+.3	+.3	+.3	+.4	+.2	+.4	.0	+.5	-.1	+.4
Dec.	+.5	.0	+.5	+.2	+.4	+.3	+.3	+.4	+.2	+.5	+.1	+.5

Latitude = Corrected observed altitude of *Polaris* + *a*₀ + *a*₁ + *a*₂Azimuth of *Polaris* = (*b*₀ + *b*₁ + *b*₂) / cos (latitude)

POLARIS TABLE, 2025

LST	6 ^h		7 ^h		8 ^h		9 ^h		10 ^h		11 ^h	
	<i>a</i> ₀	<i>b</i> ₀	<i>a</i> ₀	<i>b</i> ₀	<i>a</i> ₀	<i>b</i> ₀	<i>a</i> ₀	<i>b</i> ₀	<i>a</i> ₀	<i>b</i> ₀	<i>a</i> ₀	<i>b</i> ₀
m	'	'	'	'	'	'	'	'	'	'	'	'
0	-27.1	-26.4	-19.3	-32.5	-10.3	-36.4	-0.5	-37.7	+9.3	-36.5	+18.4	-32.8
3	26.7	26.7	18.9	32.7	9.8	36.5	0.0	37.7	9.7	36.4	18.8	32.6
6	26.4	27.1	18.5	33.0	9.3	36.6	+0.5	37.7	10.2	36.2	19.2	32.3
9	26.0	27.4	18.0	33.2	8.8	36.7	1.0	37.7	10.7	36.1	19.7	32.1
12	25.7	27.8	17.6	33.5	8.4	36.8	1.5	37.7	11.2	36.0	20.1	31.8
15	-25.3	-28.1	-17.2	-33.7	-7.9	-36.9	+2.0	-37.6	+11.6	-35.8	+20.5	-31.5
18	24.9	28.4	16.7	33.9	7.4	37.0	2.4	37.6	12.1	35.6	20.9	31.3
21	24.6	28.7	16.3	34.1	6.9	37.1	2.9	37.6	12.6	35.5	21.3	31.0
24	24.2	29.1	15.8	34.3	6.4	37.2	3.4	37.5	13.0	35.3	21.7	30.7
27	23.8	29.4	15.4	34.5	5.9	37.3	3.9	37.5	13.5	35.1	22.1	30.4
30	-23.4	-29.7	-14.9	-34.7	-5.4	-37.4	+4.4	-37.4	+13.9	-35.0	+22.5	-30.1
33	23.0	30.0	14.5	34.9	4.9	37.4	4.9	37.4	14.4	34.8	22.9	29.8
36	22.6	30.3	14.0	35.1	4.5	37.5	5.4	37.3	14.8	34.6	23.3	29.5
39	22.2	30.6	13.6	35.3	4.0	37.5	5.9	37.2	15.3	34.4	23.7	29.2
42	21.8	30.9	13.1	35.4	3.5	37.6	6.4	37.1	15.7	34.2	24.1	28.9
45	-21.4	-31.2	-12.6	-35.6	-3.0	-37.6	+6.8	-37.0	+16.2	-34.0	+24.4	-28.6
48	21.0	31.4	12.2	35.8	2.5	37.6	7.3	36.9	16.6	33.7	24.8	28.3
51	20.6	31.7	11.7	35.9	2.0	37.7	7.8	36.8	17.1	33.5	25.2	28.0
54	20.2	32.0	11.2	36.1	1.5	37.7	8.3	36.7	17.5	33.3	25.5	27.6
57	19.8	32.2	10.7	36.2	1.0	37.7	8.8	36.6	17.9	33.1	25.9	27.3
60	-19.3	-32.5	-10.3	-36.4	-0.5	-37.7	+9.3	-36.5	+18.4	-32.8	+26.2	-27.0
Lat. _°	<i>a</i> ₁	<i>b</i> ₁	<i>a</i> ₁	<i>b</i> ₁	<i>a</i> ₁	<i>b</i> ₁	<i>a</i> ₁	<i>b</i> ₁	<i>a</i> ₁	<i>b</i> ₁	<i>a</i> ₁	<i>b</i> ₁
0	-.1	+.2	-.2	+.2	-.2	+.1	-.2	.0	-.2	-.1	-.2	-.2
10	-.1	+.2	-.2	+.2	-.2	+.1	-.2	.0	-.2	-.1	-.2	-.2
20	-.1	+.2	-.1	+.2	-.2	+.1	-.2	.0	-.2	-.1	-.1	-.1
30	-.1	+.1	-.1	+.1	-.1	+.1	-.1	.0	-.1	-.1	-.1	-.1
40	.0	+.1	-.1	+.1	-.1	.0	-.1	.0	-.1	.0	-.1	-.1
45	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
50	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
55	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
60	+.1	-.1	+.1	-.1	+.1	-.1	+.1	.0	+.1	+.1	+.1	+.1
62	+.1	-.1	+.1	-.1	+.1	-.1	+.1	.0	+.1	+.1	+.1	+.1
64	+.1	-.2	+.1	-.2	+.2	-.1	+.2	.0	+.2	+.1	+.1	+.2
66	+.1	-.2	+.2	-.2	+.2	-.1	+.2	.0	+.2	+.1	+.2	+.2
Month	<i>a</i> ₂	<i>b</i> ₂	<i>a</i> ₂	<i>b</i> ₂	<i>a</i> ₂	<i>b</i> ₂	<i>a</i> ₂	<i>b</i> ₂	<i>a</i> ₂	<i>b</i> ₂	<i>a</i> ₂	<i>b</i> ₂
Jan.	+.1	+.1	+.1	+.1	.0	+.2	.0	+.2	-.1	+.2	-.1	+.2
Feb.	+.3	+.1	+.2	+.1	+.2	+.2	+.1	+.2	+.1	+.3	.0	+.3
Mar.	+.3	-.1	+.3	-.1	+.3	+.1	+.3	+.2	+.2	+.2	+.2	+.3
Apr.	+.3	-.2	+.3	-.2	+.4	-.1	+.4	.0	+.3	+.1	+.3	+.2
May	+.2	-.3	+.3	-.3	+.3	-.2	+.4	-.1	+.4	.0	+.4	+.1
June	.0	-.3	+.1	-.3	+.2	-.3	+.3	-.2	+.3	-.2	+.3	-.1
July	-.1	-.3	-.1	-.3	.0	-.3	+.1	-.3	+.2	-.3	+.2	-.2
Aug.	-.2	-.1	-.2	-.1	-.1	-.2	-.1	-.3	.0	-.3	+.1	-.3
Sept.	-.3	.0	-.3	.0	-.3	-.1	-.2	-.2	-.2	-.2	-.1	-.3
Oct.	-.3	+.2	-.3	+.2	-.4	+.1	-.4	.0	-.3	-.1	-.3	-.2
Nov.	-.2	+.4	-.3	+.4	-.4	+.3	-.4	+.2	-.5	.0	-.4	-.1
Dec.	.0	+.5	-.2	+.5	-.3	+.4	-.4	+.3	-.5	+.2	-.5	+.1

Latitude = Corrected observed altitude of *Polaris* + *a*₀ + *a*₁ + *a*₂Azimuth of *Polaris* = (*b*₀ + *b*₁ + *b*₂) / cos (latitude)

POLARIS TABLE, 2025

LST	12 ^h		13 ^h		14 ^h		15 ^h		16 ^h		17 ^h	
	a_0	b_0	a_0	b_0	a_0	b_0	a_0	b_0	a_0	b_0	a_0	b_0
m	'	'	'	'	'	'	'	'	'	'	'	'
0	+26.2	-27.0	+32.3	-19.3	+36.2	-10.4	+37.7	-0.8	+36.6	+8.9	+33.1	+18.0
3	26.6	26.6	32.6	18.9	36.4	9.9	37.7	-0.3	36.5	9.4	32.9	18.4
6	26.9	26.3	32.8	18.4	36.5	9.4	37.7	+0.2	36.4	9.9	32.6	18.8
9	27.3	25.9	33.1	18.0	36.6	8.9	37.7	0.7	36.3	10.3	32.4	19.3
12	27.6	25.5	33.3	17.6	36.7	8.5	37.7	1.2	36.1	10.8	32.1	19.7
15	+28.0	-25.2	+33.5	-17.2	+36.8	-8.0	+37.7	+1.7	+36.0	+11.3	+31.8	+20.1
18	28.3	24.8	33.8	16.7	36.9	7.5	37.6	2.2	35.8	11.7	31.6	20.5
21	28.6	24.5	34.0	16.3	37.0	7.0	37.6	2.7	35.7	12.2	31.3	20.9
24	28.9	24.1	34.2	15.8	37.1	6.6	37.6	3.1	35.5	12.6	31.0	21.3
27	29.2	23.7	34.4	15.4	37.2	6.1	37.5	3.6	35.3	13.1	30.7	21.7
30	+29.5	-23.3	+34.6	-15.0	+37.3	-5.6	+37.5	+4.1	+35.2	+13.6	+30.5	+22.1
33	29.8	22.9	34.8	14.5	37.4	5.1	37.4	4.6	35.0	14.0	30.2	22.5
36	30.1	22.5	35.0	14.1	37.4	4.6	37.4	5.1	34.8	14.5	29.9	22.9
39	30.4	22.1	35.1	13.6	37.5	4.2	37.3	5.6	34.6	14.9	29.6	23.3
42	30.7	21.8	35.3	13.1	37.5	3.7	37.2	6.0	34.4	15.4	29.3	23.7
45	+31.0	-21.3	+35.5	-12.7	+37.6	-3.2	+37.1	+6.5	+34.2	+15.8	+29.0	+24.0
48	31.3	20.9	35.6	12.2	37.6	2.7	37.0	7.0	34.0	16.2	28.6	24.4
51	31.6	20.5	35.8	11.8	37.6	2.2	37.0	7.5	33.8	16.7	28.3	24.8
54	31.8	20.1	36.0	11.3	37.7	1.7	36.9	8.0	33.5	17.1	28.0	25.2
57	32.1	19.7	36.1	10.8	37.7	1.2	36.7	8.4	33.3	17.6	27.7	25.5
60	+32.3	-19.3	+36.2	-10.4	+37.7	-0.8	+36.6	+8.9	+33.1	+18.0	+27.3	+25.9
Lat. °	a_1	b_1	a_1	b_1	a_1	b_1	a_1	b_1	a_1	b_1	a_1	b_1
0	-.1	-.2	-.1	-.2	.0	-.1	.0	.0	.0	+1	-.1	+2
10	-.1	-.2	-.1	-.2	.0	-.1	.0	.0	.0	+1	.0	+2
20	-.1	-.2	.0	-.2	.0	-.1	.0	.0	.0	+1	.0	+1
30	-.1	-.1	.0	-.1	.0	-.1	.0	.0	.0	+1	.0	+1
40	.0	-.1	.0	-.1	.0	.0	.0	.0	.0	.0	.0	+1
45	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
50	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
55	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
60	+1	+1	.0	+1	.0	+1	.0	.0	.0	-.1	.0	-.1
62	+1	+1	.0	+1	.0	+1	.0	.0	.0	-.1	.0	-.1
64	+1	+2	.0	+2	.0	+1	.0	.0	.0	-.1	.0	-.2
66	+1	+2	+1	+2	.0	+1	.0	.0	.0	-.1	+1	-.2
Month	a_2	b_2	a_2	b_2	a_2	b_2	a_2	b_2	a_2	b_2	a_2	b_2
Jan.	-.1	+1	-.2	+1	-.2	.0	-.2	.0	-.2	-.1	-.2	-.1
Feb.	-.1	+3	-.1	+2	-.2	+2	-.2	+1	-.3	+1	-.3	.0
Mar.	+1	+3	.0	+3	-.1	+3	-.2	+3	-.2	+2	-.3	+2
Apr.	+2	+3	+1	+3	+1	+4	.0	+4	-.1	+3	-.2	+3
May	+3	+2	+3	+3	+2	+3	+1	+4	.0	+4	-.1	+4
June	+3	.0	+3	+1	+3	+2	+2	+3	+2	+3	+1	+3
July	+3	-.1	+3	-.1	+3	.0	+3	+1	+3	+2	+2	+2
Aug.	+1	-.2	+2	-.2	+2	-.1	+3	-.1	+3	.0	+3	+1
Sept.	.0	-.3	.0	-.3	+1	-.3	+2	-.2	+2	-.2	+3	-.1
Oct.	-.2	-.3	-.2	-.3	-.1	-.4	.0	-.4	+1	-.3	+2	-.3
Nov.	-.4	-.2	-.3	-.3	-.3	-.4	-.2	-.4	.0	-.5	+1	-.4
Dec.	-.5	.0	-.5	-.2	-.4	-.3	-.3	-.4	-.2	-.5	-.1	-.5

Latitude = Corrected observed altitude of *Polaris* + a_0 + a_1 + a_2 Azimuth of *Polaris* = $(b_0 + b_1 + b_2) / \cos(\text{latitude})$

POLARIS TABLE, 2025

LST	18 ^h		19 ^h		20 ^h		21 ^h		22 ^h		23 ^h	
	a_0	b_0	a_0	b_0	a_0	b_0	a_0	b_0	a_0	b_0	a_0	b_0
m	'	'	'	'	'	'	'	'	'	'	'	'
0	+27.3	+25.9	+19.7	+32.1	+10.7	+36.1	+1.0	+37.7	-8.8	+36.7	-18.0	+33.2
3	27.0	26.2	19.3	32.3	10.2	36.2	+0.5	37.7	9.3	36.6	18.4	33.0
6	26.6	26.6	18.8	32.6	9.8	36.4	0.0	37.7	9.7	36.5	18.9	32.8
9	26.3	26.9	18.4	32.8	9.3	36.5	-0.5	37.7	10.2	36.4	19.3	32.5
12	25.9	27.3	18.0	33.0	8.8	36.6	1.0	37.7	10.7	36.2	19.7	32.3
15	+25.6	+27.6	+17.6	+33.3	+8.3	+36.7	-1.5	+37.7	-11.2	+36.1	-20.1	+32.0
18	25.2	27.9	17.1	33.5	7.9	36.8	2.0	37.7	11.6	35.9	20.6	31.7
21	24.8	28.3	16.7	33.7	7.4	36.9	2.4	37.6	12.1	35.8	21.0	31.5
24	24.5	28.6	16.2	33.9	6.9	37.0	2.9	37.6	12.6	35.6	21.4	31.2
27	24.1	28.9	15.8	34.2	6.4	37.1	3.4	37.6	13.0	35.5	21.8	30.9
30	+23.7	+29.2	+15.3	+34.4	+5.9	+37.2	-3.9	+37.5	-13.5	+35.3	-22.2	+30.6
33	23.3	29.5	14.9	34.6	5.4	37.3	4.4	37.5	14.0	35.1	22.6	30.3
36	22.9	29.8	14.4	34.8	4.9	37.4	4.9	37.4	14.4	34.9	23.0	30.0
39	22.5	30.1	14.0	34.9	4.5	37.4	5.4	37.4	14.9	34.7	23.4	29.7
42	22.1	30.4	13.5	35.1	4.0	37.5	5.9	37.3	15.3	34.5	23.8	29.4
45	+21.7	+30.7	+13.1	+35.3	+3.5	+37.5	-6.4	+37.2	-15.8	+34.3	-24.1	+29.1
48	21.3	31.0	12.6	35.5	3.0	37.6	6.9	37.1	16.2	34.1	24.5	28.8
51	20.9	31.3	12.1	35.6	2.5	37.6	7.3	37.0	16.7	33.9	24.9	28.4
54	20.5	31.5	11.7	35.8	2.0	37.6	7.8	36.9	17.1	33.7	25.3	28.1
57	20.1	31.8	11.2	35.9	1.5	37.7	8.3	36.8	17.6	33.5	25.6	27.8
60	+19.7	+32.1	+10.7	+36.1	+1.0	+37.7	-8.8	+36.7	-18.0	+33.2	-26.0	+27.4
Lat. °	a_1	b_1	a_1	b_1	a_1	b_1	a_1	b_1	a_1	b_1	a_1	b_1
0	-1	+2	-2	+2	-2	+1	-2	.0	-2	-1	-2	-2
10	-1	+2	-2	+2	-2	+1	-2	.0	-2	-1	-2	-2
20	-1	+2	-1	+2	-2	+1	-2	.0	-2	-1	-1	-1
30	-1	+1	-1	+1	-1	+1	-1	.0	-1	-1	-1	-1
40	.0	+1	-1	+1	-1	.0	-1	.0	-1	.0	-1	-1
45	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
50	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
55	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
60	+1	-1	+1	-1	+1	-1	+1	.0	+1	+1	+1	+1
62	+1	-1	+1	-1	+1	-1	+1	.0	+1	+1	+1	+1
64	+1	-2	+1	-2	+2	-1	+2	.0	+2	+1	+1	+2
66	+1	-2	+2	-2	+2	-1	+2	.0	+2	+1	+2	+2
Month	a_2	b_2	a_2	b_2	a_2	b_2	a_2	b_2	a_2	b_2	a_2	b_2
Jan.	-1	-1	-1	-2	.0	-2	.0	-2	.1	-2	+1	-2
Feb.	-3	-1	-2	-1	-2	-2	-1	-2	-1	-3	.0	-3
Mar.	-3	+1	-3	.0	-3	-1	-3	-2	-2	-2	-2	-3
Apr.	-3	+2	-3	+1	-4	+1	-4	.0	-3	-1	-3	-2
May	-2	+3	-3	+3	-3	+2	-4	+1	-4	.0	-4	-1
June	.0	+3	-1	+3	-2	+3	-3	+2	-3	+2	-3	+1
July	+1	+3	+1	+3	.0	+3	-1	+3	-2	+3	-2	+2
Aug.	+2	+1	+2	+2	+1	+2	+1	+3	.0	+3	-1	+3
Sept.	+3	.0	+3	.0	+3	+1	+2	+2	+2	+2	+1	+3
Oct.	+3	-2	+3	-2	+4	-1	+4	.0	+3	+1	+3	+2
Nov.	+2	-4	+3	-3	+4	-3	+4	-2	+5	.0	+4	+1
Dec.	.0	-5	+2	-5	+3	-4	+4	-3	+5	-2	+5	-1

Latitude = Corrected observed altitude of *Polaris* + a_0 + a_1 + a_2 Azimuth of *Polaris* = $(b_0 + b_1 + b_2) / \cos(\text{latitude})$

PART - III

SUNRISE, SUNSET AND MOONRISE, MOONSET

SUNRISE, 2025**LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB) AND BEGINNING
OF MORNING TWILIGHT ON THE MERIDIAN OF GREENWICH**

To obtain the standard time at any station, add four minutes for each degree if the station is west of the standard meridian, or deduct four minutes for each degree if the station is east of the standard meridian.

In India, to obtain I.S.T., add $4 \times (82^\circ.5 - \lambda)$ mins. or deduct $4 \times (\lambda - 82^\circ.5)$ mins. as the station is west or east of $82^\circ.5$ E. Longitude.

Lat. Date		0°	10°	20°	30°	35°	40°	45°	50°	52°	54°	56°	58°	60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan.	0	5 59	6 17	6 35	6 56	7 08	7 22	7 38	7 59	8 08	8 19	8 31	8 46	9 03
	4	6 01	6 18	6 36	6 57	7 08	7 22	7 38	7 58	8 07	8 18	8 30	8 44	9 00
	8	6 03	6 19	6 37	6 57	7 09	7 22	7 38	7 57	8 06	8 16	8 28	8 41	8 57
	12	6 05	6 21	6 38	6 57	7 08	7 21	7 36	7 55	8 03	8 13	8 24	8 37	8 52
	16	6 06	6 21	6 38	6 56	7 07	7 20	7 34	7 52	8 00	8 09	8 20	8 32	8 46
	20	6 07	6 22	6 38	6 56	7 06	7 18	7 31	7 48	7 56	8 05	8 15	8 26	8 39
Feb.	24	6 08	6 22	6 37	6 54	7 04	7 15	7 28	7 44	7 51	8 00	8 09	8 19	8 31
	28	6 09	6 23	6 37	6 52	7 02	7 12	7 24	7 39	7 46	7 54	8 02	8 12	8 23
	1	6 10	6 22	6 35	6 50	6 59	7 09	7 20	7 34	7 40	7 47	7 55	8 04	8 14
	5	6 10	6 22	6 34	6 48	6 56	7 05	7 15	7 28	7 33	7 40	7 47	7 55	8 04
	9	6 11	6 21	6 32	6 45	6 52	7 00	7 10	7 21	7 26	7 32	7 39	7 46	7 54
	13	6 11	6 20	6 30	6 42	6 48	6 55	7 04	7 14	7 19	7 24	7 30	7 36	7 44
Mar.	17	6 11	6 19	6 28	6 38	6 44	6 50	6 58	7 07	7 11	7 16	7 21	7 26	7 33
	21	6 10	6 18	6 26	6 34	6 39	6 45	6 52	6 59	7 03	7 07	7 11	7 16	7 21
	25	6 10	6 16	6 23	6 30	6 35	6 39	6 45	6 52	6 55	6 58	7 02	7 06	7 10
	1	6 09	6 14	6 20	6 26	6 30	6 34	6 38	6 43	6 46	6 49	6 52	6 55	6 59
	5	6 08	6 12	6 17	6 22	6 24	6 27	6 31	6 35	6 37	6 39	6 41	6 44	6 47
	9	6 07	6 10	6 14	6 17	6 19	6 21	6 24	6 27	6 28	6 30	6 31	6 33	6 35
Apr.	13	6 06	6 08	6 10	6 12	6 14	6 15	6 16	6 18	6 19	6 20	6 21	6 22	6 23
	17	6 05	6 06	6 07	6 08	6 08	6 08	6 09	6 09	6 10	6 10	6 10	6 11	6 11
	21	6 04	6 04	6 03	6 03	6 02	6 02	6 01	6 01	6 01	6 00	6 00	5 59	5 59
	25	6 03	6 01	6 00	5 58	5 57	5 56	5 54	5 52	5 51	5 50	5 49	5 48	5 47
	29	6 01	5 59	5 56	5 53	5 51	5 49	5 47	5 43	5 42	5 40	5 39	5 37	5 35
	2	6 00	5 57	5 53	5 48	5 46	5 43	5 39	5 35	5 33	5 31	5 28	5 25	5 22

BEGINNING OF MORNING TWILIGHT

		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan.	0	4 44	5 01	5 16	5 30	5 37	5 44	5 52	6 00	6 03	6 06	6 10	6 14	6 18
	8	4 49	5 05	5 19	5 32	5 39	5 45	5 52	5 59	6 02	6 05	6 09	6 12	6 16
	16	4 52	5 07	5 21	5 33	5 38	5 44	5 50	5 56	5 59	6 01	6 04	6 07	6 10
	24	4 56	5 09	5 21	5 31	5 36	5 41	5 46	5 50	5 52	5 54	5 56	5 58	6 00
Feb.	1	4 58	5 10	5 20	5 28	5 32	5 36	5 39	5 42	5 43	5 44	5 45	5 46	5 47
	9	5 00	5 10	5 18	5 24	5 26	5 29	5 30	5 32	5 32	5 32	5 32	5 32	5 31
Mar.	17	5 00	5 08	5 14	5 18	5 19	5 20	5 20	5 19	5 18	5 17	5 16	5 14	5 13
	25	5 00	5 06	5 09	5 11	5 10	5 09	5 07	5 04	5 02	5 00	4 58	4 55	4 51
	5	4 59	5 02	5 04	5 02	5 00	4 58	4 54	4 48	4 45	4 42	4 38	4 33	4 28
	13	4 57	4 58	4 57	4 53	4 50	4 45	4 39	4 30	4 26	4 21	4 15	4 09	4 02
	21	4 55	4 54	4 50	4 43	4 38	4 31	4 23	4 11	4 05	3 59	3 52	3 43	3 33
	29	4 53	4 49	4 43	4 33	4 26	4 17	4 06	3 51	3 44	3 35	3 26	3 14	3 00
Apr.	6	4 50	4 44	4 35	4 22	4 13	4 02	3 48	3 30	3 21	3 10	2 57	2 42	2 23

SUNSET, 2025**LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB) AND ENDING
OF EVENING TWILIGHT ON THE MERIDIAN OF GREENWICH**

To obtain the standard time at any station, add four minutes for each degree if the station is west of the standard meridian, or deduct four minutes for each degree if the station is east of the standard meridian.
In India, to obtain I.S.T., add $4 \times (82^\circ.5 - \lambda)$ mins. or deduct $4 \times (\lambda - 82^\circ.5)$ mins. as the station is west or east of $82^\circ.5$ E. Longitude.

Date	Lat.	0°	10°	20°	30°	35°	40°	45°	50°	52°	54°	56°	58°	60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan.	0	18 07	17 50	17 32	17 11	16 59	16 45	16 28	16 08	15 58	15 47	15 35	15 21	15 04
	4	18 09	17 52	17 34	17 14	17 02	16 48	16 32	16 12	16 03	15 52	15 40	15 26	15 10
	8	18 10	17 54	17 37	17 17	17 05	16 52	16 36	16 17	16 08	15 58	15 46	15 33	15 17
	12	18 12	17 56	17 39	17 20	17 09	16 56	16 41	16 22	16 14	16 04	15 53	15 40	15 25
	16	18 13	17 58	17 42	17 23	17 13	17 00	16 46	16 28	16 20	16 10	16 00	15 48	15 34
Feb.	20	18 15	18 00	17 44	17 27	17 16	17 05	16 51	16 34	16 26	16 18	16 08	15 57	15 44
	24	18 16	18 02	17 47	17 30	17 20	17 09	16 56	16 41	16 33	16 25	16 16	16 05	15 53
	28	18 16	18 03	17 49	17 34	17 25	17 14	17 02	16 47	16 41	16 33	16 24	16 15	16 04
	1	18 17	18 05	17 52	17 37	17 29	17 19	17 08	16 54	16 48	16 41	16 33	16 24	16 14
	5	18 17	18 06	17 54	17 41	17 33	17 24	17 13	17 01	16 55	16 49	16 42	16 34	16 25
Mar.	9	18 18	18 07	17 56	17 44	17 37	17 29	17 19	17 08	17 03	16 57	16 51	16 43	16 35
	13	18 18	18 08	17 58	17 47	17 41	17 33	17 25	17 15	17 10	17 05	16 59	16 53	16 46
	17	18 17	18 09	18 00	17 50	17 45	17 38	17 31	17 22	17 18	17 13	17 08	17 03	16 56
	21	18 17	18 10	18 02	17 53	17 48	17 43	17 36	17 29	17 25	17 21	17 17	17 12	17 07
	25	18 16	18 10	18 04	17 56	17 52	17 47	17 42	17 35	17 32	17 29	17 25	17 21	17 17
Apr.	1	18 16	18 10	18 05	17 59	17 56	17 52	17 47	17 42	17 40	17 37	17 34	17 31	17 27
	5	18 15	18 11	18 06	18 02	17 59	17 56	17 53	17 49	17 47	17 45	17 43	17 40	17 37
	9	18 14	18 11	18 08	18 04	18 02	18 00	17 58	17 55	17 54	17 53	17 51	17 49	17 47
	13	18 13	18 11	18 09	18 07	18 06	18 05	18 03	18 02	18 01	18 00	17 59	17 58	17 57
	17	18 12	18 11	18 10	18 09	18 09	18 09	18 08	18 08	18 08	18 08	18 07	18 07	18 07
Apr.	21	18 10	18 11	18 11	18 12	18 12	18 13	18 14	18 14	18 15	18 15	18 16	18 16	18 17
	25	18 09	18 11	18 12	18 14	18 16	18 17	18 19	18 21	18 22	18 23	18 24	18 25	18 27
	29	18 08	18 11	18 13	18 17	18 19	18 21	18 24	18 27	18 29	18 30	18 32	18 34	18 36
	2	18 07	18 10	18 15	18 19	18 22	18 25	18 29	18 33	18 35	18 38	18 40	18 43	18 46

END OF EVENING TWILIGHT

		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan.	0	19 22	19 05	18 50	18 36	18 29	18 22	18 15	18 07	18 03	18 00	17 56	17 52	17 48
	8	19 25	19 09	18 55	18 41	18 35	18 28	18 22	18 15	18 12	18 08	18 05	18 02	17 58
	16	19 27	19 12	18 59	18 47	18 41	18 36	18 30	18 24	18 21	18 19	18 16	18 13	18 10
	24	19 28	19 15	19 03	18 53	18 48	18 44	18 39	18 34	18 32	18 31	18 29	18 27	18 25
Feb.	1	19 29	19 17	19 07	18 59	18 55	18 52	18 49	18 46	18 45	18 44	18 43	18 42	18 41
	9	19 29	19 19	19 11	19 05	19 02	19 00	18 59	18 58	18 57	18 57	18 57	18 58	18 58
Mar.	17	19 28	19 20	19 14	19 10	19 09	19 09	19 09	19 10	19 11	19 12	19 13	19 15	19 17
	25	19 26	19 20	19 17	19 16	19 16	19 17	19 19	19 23	19 25	19 27	19 30	19 33	19 36
	5	19 24	19 21	19 20	19 21	19 23	19 26	19 30	19 36	19 39	19 43	19 47	19 52	19 57
	13	19 21	19 21	19 22	19 26	19 30	19 35	19 41	19 50	19 54	19 59	20 05	20 12	20 19
	21	19 19	19 21	19 25	19 32	19 37	19 44	19 53	20 05	20 10	20 17	20 25	20 34	20 44
Apr.	29	19 17	19 21	19 27	19 37	19 45	19 54	20 05	20 20	20 28	20 36	20 46	20 58	21 12
	6	19 15	19 21	19 30	19 43	19 52	20 04	20 18	20 37	20 46	20 57	21 10	21 26	21 45

SUNRISE, 2025**LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB) AND BEGINNING
OF MORNING TWILIGHT ON THE MERIDIAN OF GREENWICH**

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Lat. Date		0°	10°	20°	30°	35°	40°	45°	50°	52°	54°	56°	58°	60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr.	2	6 00	5 57	5 53	5 48	5 46	5 43	5 39	5 35	5 33	5 31	5 28	5 25	5 22
	6	5 59	5 54	5 49	5 44	5 40	5 36	5 32	5 26	5 24	5 21	5 18	5 14	5 10
	10	5 58	5 52	5 46	5 39	5 35	5 30	5 24	5 18	5 15	5 11	5 07	5 03	4 58
	14	5 57	5 50	5 43	5 34	5 30	5 24	5 17	5 09	5 06	5 02	4 57	4 52	4 47
	18	5 56	5 48	5 40	5 30	5 24	5 18	5 10	5 01	4 57	4 52	4 47	4 41	4 35
	22	5 55	5 46	5 37	5 26	5 19	5 12	5 04	4 53	4 49	4 43	4 37	4 31	4 23
May	26	5 54	5 45	5 34	5 22	5 15	5 07	4 57	4 46	4 40	4 34	4 28	4 20	4 12
	30	5 54	5 43	5 32	5 18	5 10	5 01	4 51	4 38	4 32	4 26	4 19	4 10	4 01
	4	5 53	5 42	5 29	5 15	5 06	4 57	4 45	4 31	4 25	4 18	4 10	4 00	3 50
	8	5 53	5 41	5 27	5 12	5 02	4 52	4 40	4 25	4 18	4 10	4 01	3 51	3 40
	12	5 53	5 40	5 25	5 09	4 59	4 48	4 35	4 19	4 11	4 03	3 53	3 42	3 30
	16	5 53	5 39	5 24	5 06	4 56	4 44	4 30	4 13	4 05	3 56	3 45	3 34	3 20
June	20	5 53	5 38	5 22	5 04	4 53	4 41	4 26	4 08	3 59	3 49	3 39	3 26	3 11
	24	5 53	5 38	5 21	5 02	4 51	4 38	4 22	4 03	3 54	3 44	3 32	3 19	3 03
	28	5 54	5 38	5 21	5 01	4 49	4 35	4 19	3 59	3 50	3 39	3 27	3 13	2 56
	1	5 54	5 38	5 20	4 59	4 47	4 33	4 17	3 56	3 46	3 35	3 22	3 07	2 49
	5	5 55	5 38	5 20	4 59	4 46	4 32	4 15	3 53	3 43	3 32	3 18	3 03	2 44
	9	5 56	5 38	5 20	4 58	4 46	4 31	4 13	3 52	3 41	3 29	3 15	2 59	2 40
July	13	5 56	5 39	5 20	4 58	4 46	4 31	4 13	3 51	3 40	3 28	3 14	2 57	2 37
	17	5 57	5 40	5 21	4 59	4 46	4 31	4 13	3 50	3 39	3 27	3 13	2 56	2 36
	21	5 58	5 41	5 22	4 59	4 46	4 31	4 13	3 51	3 40	3 27	3 13	2 56	2 36
	25	5 59	5 41	5 23	5 00	4 48	4 32	4 14	3 52	3 41	3 29	3 15	2 58	2 37
	29	6 00	5 42	5 24	5 02	4 49	4 34	4 16	3 54	3 43	3 31	3 17	3 00	2 40
	3	6 01	5 43	5 25	5 03	4 51	4 36	4 18	3 56	3 46	3 34	3 20	3 04	2 45

BEGINNING OF MORNING TWILIGHT

		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr.	6	4 50	4 44	4 35	4 22	4 13	4 02	3 48	3 30	3 21	3 10	2 57	2 42	2 23
	14	4 47	4 39	4 28	4 11	4 01	3 48	3 30	3 08	2 56	2 42	2 26	2 05	1 37
	22	4 45	4 34	4 20	4 01	3 49	3 33	3 12	2 45	2 30	2 12	1 50	1 18	
May	30	4 43	4 30	4 14	3 52	3 37	3 19	2 55	2 21	2 02	1 38	1 01		
	8	4 41	4 27	4 08	3 43	3 26	3 05	2 37	1 55	1 30	0 51			
	16	4 40	4 24	4 03	3 35	3 17	2 53	2 21	1 28	0 49				
June	24	4 40	4 22	4 00	3 29	3 09	2 43	2 06	0 57					
	1	4 40	4 21	3 57	3 25	3 03	2 35	1 53						
	9	4 41	4 21	3 56	3 23	3 00	2 29	1 44						
	17	4 42	4 22	3 57	3 22	2 59	2 28	1 40						
July	25	4 44	4 24	3 58	3 24	3 00	2 29	1 41						
	3	4 46	4 26	4 01	3 27	3 04	2 34	1 48						
	11	4 48	4 29	4 05	3 32	3 10	2 42	2 00						

SUNSET, 2025

LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB) AND ENDING OF EVENING TWILIGHT ON THE MERIDIAN OF GREENWICH

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Lat. Date	0°	10°	20°	30°	35°	40°	45°	50°	52°	54°	56°	58°	60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 2	18 07	18 10	18 15	18 19	18 22	18 25	18 29	18 33	18 35	18 38	18 40	18 43	18 46
6	18 06	18 10	18 16	18 22	18 25	18 29	18 34	18 40	18 42	18 45	18 48	18 52	18 56
10	18 05	18 10	18 17	18 24	18 28	18 33	18 39	18 46	18 49	18 53	18 57	19 01	19 06
14	18 04	18 10	18 18	18 27	18 32	18 37	18 44	18 52	18 56	19 00	19 05	19 10	19 16
18	18 03	18 11	18 19	18 29	18 35	18 41	18 49	18 58	19 03	19 08	19 13	19 19	19 25
22	18 02	18 11	18 20	18 32	18 38	18 45	18 54	19 05	19 10	19 15	19 21	19 28	19 35
26	18 01	18 11	18 22	18 34	18 41	18 50	18 59	19 11	19 16	19 22	19 29	19 37	19 45
30	18 01	18 11	18 23	18 37	18 45	18 54	19 04	19 17	19 23	19 30	19 37	19 46	19 55
May 4	18 00	18 12	18 25	18 39	18 48	18 58	19 09	19 23	19 30	19 37	19 45	19 55	20 05
8	18 00	18 13	18 26	18 42	18 51	19 02	19 14	19 29	19 36	19 44	19 53	20 03	20 15
12	18 00	18 13	18 28	18 44	18 54	19 05	19 19	19 35	19 43	19 51	20 01	20 12	20 25
16	18 00	18 14	18 29	18 47	18 57	19 09	19 23	19 41	19 49	19 58	20 08	20 20	20 34
20	18 00	18 15	18 31	18 50	19 00	19 13	19 28	19 46	19 55	20 05	20 16	20 28	20 43
24	18 00	18 16	18 33	18 52	19 03	19 16	19 32	19 51	20 00	20 11	20 22	20 36	20 52
28	18 01	18 17	18 34	18 54	19 06	19 20	19 36	19 56	20 06	20 16	20 29	20 43	21 00
June 1	18 01	18 18	18 36	18 56	19 09	19 23	19 40	20 00	20 10	20 22	20 34	20 50	21 08
5	18 02	18 19	18 37	18 59	19 11	19 25	19 43	20 04	20 14	20 26	20 39	20 55	21 14
9	18 03	18 20	18 39	19 00	19 13	19 28	19 45	20 07	20 18	20 30	20 44	21 00	21 19
13	18 04	18 21	18 40	19 02	19 15	19 30	19 48	20 10	20 21	20 33	20 47	21 03	21 24
17	18 05	18 22	18 41	19 03	19 16	19 31	19 49	20 12	20 23	20 35	20 49	21 06	21 26
21	18 05	18 23	18 42	19 04	19 17	19 32	19 50	20 13	20 24	20 36	20 50	21 07	21 28
25	18 06	18 24	18 43	19 05	19 18	19 33	19 51	20 13	20 24	20 36	20 51	21 07	21 28
29	18 07	18 25	18 43	19 05	19 18	19 33	19 51	20 13	20 24	20 36	20 50	21 06	21 26
July 3	18 08	18 25	18 44	19 05	19 18	19 32	19 50	20 12	20 22	20 34	20 48	21 04	21 23

END OF EVENING TWILIGHT

	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 6	19 15	19 21	19 30	19 43	19 52	20 04	20 18	20 37	20 46	20 57	21 10	21 26	21 45
14	19 13	19 22	19 33	19 50	20 01	20 14	20 31	20 55	21 07	21 21	21 38	21 59	22 29
22	19 12	19 23	19 37	19 56	20 09	20 25	20 46	21 14	21 29	21 48	22 11	22 46	
30	19 12	19 24	19 41	20 03	20 18	20 37	21 01	21 36	21 56	22 21	23 00		
May 8	19 12	19 27	19 45	20 11	20 28	20 49	21 17	22 00	22 27	23 10			
16	19 13	19 29	19 50	20 18	20 37	21 01	21 34	22 28	23 10				
24	19 14	19 32	19 54	20 25	20 45	21 12	21 50	23 00					
June 1	19 16	19 35	19 59	20 31	20 53	21 22	22 04						
9	19 18	19 38	20 02	20 36	20 59	21 30	22 15						
17	19 20	19 40	20 05	20 40	21 03	21 35	22 22						
25	19 21	19 42	20 07	20 41	21 05	21 36	22 24						
July 3	19 23	19 42	20 07	20 41	21 04	21 34	22 19						
11	19 23	19 42	20 06	20 38	21 00	21 29	22 10						

SUNRISE, 2025**LOCAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB) AND BEGINNING
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Lat.		0°	10°	20°	30°	35°	40°	45°	50°	52°	54°	56°	58°	60°
Date		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July	3	6 01	5 43	5 25	5 03	4 51	4 36	4 18	3 56	3 46	3 34	3 20	3 04	2 45
	7	6 01	5 44	5 26	5 05	4 53	4 38	4 21	4 00	3 49	3 38	3 24	3 09	2 50
	11	6 02	5 45	5 28	5 07	4 55	4 41	4 24	4 03	3 53	3 42	3 29	3 14	2 56
	15	6 02	5 46	5 29	5 09	4 57	4 44	4 28	4 08	3 58	3 47	3 35	3 21	3 04
	19	6 03	5 47	5 31	5 11	5 00	4 47	4 31	4 12	4 03	3 53	3 41	3 28	3 12
Aug.	23	6 03	5 48	5 32	5 14	5 03	4 50	4 35	4 17	4 08	3 59	3 48	3 35	3 20
	27	6 03	5 49	5 34	5 16	5 06	4 54	4 40	4 22	4 14	4 05	3 55	3 43	3 29
	31	6 03	5 50	5 35	5 18	5 09	4 57	4 44	4 28	4 20	4 12	4 02	3 51	3 38
	4	6 03	5 50	5 37	5 21	5 12	5 01	4 49	4 34	4 26	4 18	4 10	3 59	3 48
	8	6 02	5 51	5 38	5 23	5 15	5 05	4 53	4 39	4 33	4 25	4 17	4 08	3 57
Sept.	12	6 02	5 51	5 39	5 26	5 18	5 09	4 58	4 45	4 39	4 32	4 25	4 17	4 07
	16	6 01	5 51	5 40	5 28	5 21	5 12	5 03	4 51	4 46	4 40	4 33	4 25	4 17
	20	6 00	5 51	5 41	5 30	5 24	5 16	5 08	4 57	4 52	4 47	4 41	4 34	4 26
	24	5 59	5 51	5 43	5 33	5 27	5 20	5 12	5 03	4 59	4 54	4 49	4 43	4 36
	28	5 58	5 51	5 44	5 35	5 30	5 24	5 17	5 09	5 05	5 01	4 56	4 51	4 45
Oct.	1	5 57	5 51	5 44	5 37	5 33	5 28	5 22	5 15	5 12	5 08	5 04	5 00	4 55
	5	5 55	5 51	5 45	5 39	5 36	5 31	5 27	5 21	5 18	5 15	5 12	5 08	5 04
	9	5 54	5 50	5 46	5 41	5 38	5 35	5 31	5 27	5 25	5 22	5 20	5 17	5 14
	13	5 53	5 50	5 47	5 43	5 41	5 39	5 36	5 33	5 31	5 29	5 28	5 25	5 23
	17	5 51	5 50	5 48	5 46	5 44	5 43	5 41	5 39	5 38	5 37	5 35	5 34	5 32
Sept.	21	5 50	5 49	5 49	5 48	5 47	5 47	5 46	5 45	5 44	5 44	5 43	5 43	5 42
	25	5 48	5 49	5 50	5 50	5 50	5 51	5 51	5 51	5 51	5 51	5 51	5 51	5 51
	29	5 47	5 49	5 50	5 52	5 53	5 54	5 55	5 57	5 57	5 58	5 59	6 00	6 01
	3	5 46	5 49	5 51	5 54	5 56	5 58	6 00	6 03	6 04	6 05	6 07	6 08	6 10

BEGINNING OF MORNING TWILIGHT

		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July	3	4 46	4 26	4 01	3 27	3 04	2 34	1 48						
	11	4 48	4 29	4 05	3 32	3 10	2 42	2 00						
	19	4 49	4 31	4 09	3 38	3 18	2 52	2 14	1 04					
Aug.	27	4 50	4 34	4 13	3 45	3 26	3 02	2 30	1 36	0 54				
	4	4 51	4 36	4 17	3 52	3 35	3 14	2 45	2 03	1 37	0 54			
	12	4 51	4 38	4 21	3 59	3 44	3 25	3 01	2 26	2 07	1 41	1 02		
Sept.	20	4 50	4 39	4 25	4 05	3 53	3 36	3 16	2 47	2 32	2 14	1 50	1 15	
	28	4 48	4 40	4 28	4 12	4 01	3 47	3 30	3 06	2 54	2 40	2 23	2 01	1 31
	5	4 46	4 40	4 31	4 17	4 08	3 57	3 43	3 24	3 14	3 03	2 50	2 34	2 14
	13	4 44	4 40	4 33	4 23	4 16	4 06	3 55	3 40	3 32	3 23	3 13	3 01	2 47
	21	4 41	4 40	4 35	4 28	4 22	4 15	4 06	3 54	3 48	3 42	3 34	3 25	3 14
Oct.	29	4 38	4 39	4 37	4 33	4 29	4 24	4 17	4 08	4 04	3 59	3 53	3 46	3 38
	7	4 36	4 39	4 39	4 37	4 35	4 32	4 28	4 21	4 18	4 15	4 10	4 06	4 00

SUNSET, 2025

LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB) AND ENDING OF EVENING TWILIGHT ON THE MERIDIAN OF GREENWICH

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Date	Lat.	0°	10°	20°	30°	35°	40°	45°	50°	52°	54°	56°	58°	60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July	3	18 08	18 25	18 44	19 05	19 18	19 32	19 50	20 12	20 22	20 34	20 48	21 04	21 23
	7	18 09	18 25	18 44	19 05	19 17	19 31	19 49	20 10	20 20	20 32	20 45	21 00	21 19
	11	18 09	18 26	18 43	19 04	19 16	19 30	19 47	20 07	20 17	20 28	20 41	20 56	21 14
	15	18 10	18 26	18 43	19 03	19 14	19 28	19 44	20 04	20 13	20 24	20 36	20 50	21 07
	19	18 10	18 25	18 42	19 01	19 12	19 25	19 41	20 00	20 09	20 19	20 31	20 44	21 00
Aug.	23	18 10	18 25	18 41	18 59	19 10	19 22	19 37	19 55	20 04	20 13	20 24	20 37	20 51
	27	18 10	18 24	18 39	18 57	19 07	19 19	19 33	19 50	19 58	20 07	20 17	20 29	20 42
	31	18 10	18 23	18 38	18 54	19 04	19 15	19 28	19 44	19 52	20 00	20 10	20 20	20 33
	4	18 10	18 22	18 36	18 51	19 00	19 11	19 23	19 38	19 45	19 53	20 01	20 11	20 23
	8	18 09	18 21	18 33	18 48	18 56	19 06	19 17	19 31	19 38	19 45	19 53	20 02	20 12
Sept.	12	18 08	18 19	18 31	18 44	18 52	19 01	19 11	19 24	19 30	19 36	19 44	19 52	20 01
	16	18 08	18 17	18 28	18 40	18 47	18 55	19 05	19 16	19 22	19 28	19 34	19 42	19 50
	20	18 07	18 16	18 25	18 36	18 43	18 50	18 58	19 09	19 14	19 19	19 25	19 31	19 39
	24	18 06	18 14	18 22	18 32	18 37	18 44	18 52	19 01	19 05	19 10	19 15	19 21	19 27
	28	18 05	18 11	18 19	18 27	18 32	18 38	18 45	18 53	18 56	19 00	19 05	19 10	19 16
Oct.	1	18 03	18 09	18 15	18 23	18 27	18 32	18 37	18 44	18 47	18 51	18 55	18 59	19 04
	5	18 02	18 07	18 12	18 18	18 21	18 25	18 30	18 36	18 38	18 41	18 44	18 48	18 52
	9	18 01	18 04	18 08	18 13	18 16	18 19	18 22	18 27	18 29	18 31	18 34	18 36	18 40
	13	17 59	18 02	18 05	18 08	18 10	18 12	18 15	18 18	18 20	18 21	18 23	18 25	18 27
	17	17 58	17 59	18 01	18 03	18 04	18 06	18 07	18 09	18 10	18 11	18 12	18 14	18 15
Oct.	21	17 56	17 57	17 57	17 58	17 58	17 59	18 00	18 00	18 01	18 01	18 02	18 02	18 03
	25	17 55	17 54	17 54	17 53	17 53	17 52	17 52	17 52	17 52	17 51	17 51	17 51	17 51
	29	17 54	17 52	17 50	17 48	17 47	17 46	17 44	17 43	17 42	17 41	17 41	17 40	17 39
	3	17 52	17 49	17 46	17 43	17 41	17 39	17 37	17 34	17 33	17 32	17 30	17 28	17 27

END OF EVENING TWILIGHT

		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July	3	19 23	19 42	20 07	20 41	21 04	21 34	22 19						
	11	19 23	19 42	20 06	20 38	21 00	21 29	22 10						
	19	19 24	19 41	20 04	20 34	20 54	21 20	21 57	23 05					
Aug.	27	19 23	19 39	20 00	20 27	20 46	21 10	21 42	22 34	23 13				
	4	19 22	19 36	19 55	20 20	20 36	20 57	21 25	22 07	22 32	23 11			
	12	19 20	19 32	19 48	20 11	20 25	20 44	21 08	21 42	22 00	22 25	23 01		
Sept.	20	19 17	19 28	19 42	20 01	20 13	20 29	20 50	21 18	21 32	21 50	22 13	22 45	
	28	19 14	19 23	19 34	19 50	20 01	20 14	20 31	20 54	21 06	21 20	21 36	21 57	22 26
	5	19 11	19 17	19 26	19 39	19 48	19 59	20 13	20 32	20 41	20 52	21 05	21 20	21 39
	13	19 08	19 12	19 18	19 28	19 36	19 44	19 56	20 11	20 18	20 27	20 37	20 48	21 02
	21	19 05	19 06	19 10	19 18	19 23	19 30	19 39	19 50	19 56	20 03	20 10	20 19	20 30
Oct.	29	19 02	19 01	19 03	19 07	19 11	19 16	19 22	19 31	19 35	19 40	19 46	19 53	20 00
	7	19 00	18 57	18 56	18 58	19 00	19 03	19 07	19 13	19 16	19 20	19 24	19 28	19 34

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Lat. Date		0°	10°	20°	30°	35°	40°	45°	50°	52°	54°	56°	58°	60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct.	3	5 46	5 49	5 51	5 54	5 56	5 58	6 00	6 03	6 04	6 05	6 07	6 08	6 10
	7	5 45	5 48	5 52	5 57	5 59	6 02	6 05	6 09	6 11	6 13	6 15	6 17	6 20
	11	5 43	5 48	5 54	5 59	6 03	6 06	6 10	6 15	6 18	6 20	6 23	6 26	6 29
	15	5 42	5 48	5 55	6 02	6 06	6 10	6 16	6 22	6 25	6 28	6 31	6 35	6 39
	19	5 42	5 49	5 56	6 04	6 09	6 15	6 21	6 28	6 32	6 35	6 39	6 44	6 49
Nov.	23	5 41	5 49	5 58	6 07	6 13	6 19	6 26	6 35	6 39	6 43	6 48	6 53	6 59
	27	5 41	5 50	5 59	6 10	6 16	6 23	6 32	6 41	6 46	6 51	6 56	7 02	7 09
	31	5 40	5 50	6 01	6 13	6 20	6 28	6 37	6 48	6 53	6 59	7 05	7 12	7 20
	4	5 40	5 51	6 03	6 16	6 24	6 32	6 42	6 55	7 00	7 06	7 13	7 21	7 30
	8	5 40	5 52	6 05	6 19	6 28	6 37	6 48	7 01	7 07	7 14	7 22	7 30	7 40
Dec.	12	5 41	5 53	6 07	6 23	6 31	6 42	6 53	7 08	7 14	7 22	7 30	7 40	7 50
	16	5 41	5 55	6 09	6 26	6 35	6 46	6 59	7 14	7 21	7 30	7 38	7 49	8 00
	20	5 42	5 56	6 12	6 29	6 39	6 51	7 04	7 21	7 28	7 37	7 47	7 58	8 10
	24	5 43	5 58	6 14	6 32	6 43	6 55	7 09	7 27	7 35	7 44	7 54	8 06	8 20
	28	5 44	6 00	6 17	6 36	6 47	6 59	7 14	7 33	7 41	7 51	8 02	8 14	8 29
	2	5 46	6 02	6 19	6 39	6 50	7 03	7 19	7 38	7 47	7 57	8 08	8 21	8 37
	6	5 47	6 04	6 22	6 42	6 54	7 07	7 23	7 43	7 52	8 03	8 14	8 28	8 44
	10	5 49	6 06	6 24	6 45	6 57	7 11	7 27	7 47	7 57	8 08	8 20	8 34	8 51
	14	5 51	6 08	6 27	6 48	7 00	7 14	7 30	7 51	8 01	8 12	8 24	8 39	8 56
	18	5 53	6 10	6 29	6 50	7 02	7 17	7 33	7 54	8 04	8 15	8 28	8 42	9 00
	22	5 55	6 12	6 31	6 52	7 04	7 19	7 36	7 56	8 06	8 17	8 30	8 45	9 02
	26	5 57	6 14	6 33	6 54	7 06	7 20	7 37	7 58	8 08	8 19	8 31	8 46	9 03
	30	5 59	6 16	6 34	6 55	7 07	7 21	7 38	7 59	8 08	8 19	8 32	8 46	9 03
	34	6 01	6 18	6 36	6 56	7 08	7 22	7 38	7 58	8 08	8 18	8 31	8 45	9 01

BEGINNING OF MORNING TWILIGHT

		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct.	7	4 36	4 39	4 39	4 37	4 35	4 32	4 28	4 21	4 18	4 15	4 10	4 06	4 00
	15	4 33	4 38	4 41	4 42	4 42	4 40	4 38	4 34	4 32	4 30	4 27	4 24	4 20
	23	4 31	4 38	4 44	4 47	4 48	4 48	4 48	4 47	4 46	4 44	4 43	4 41	4 39
	31	4 29	4 39	4 46	4 52	4 54	4 56	4 58	4 58	4 58	4 58	4 58	4 58	4 57
Nov.	8	4 29	4 40	4 49	4 57	5 01	5 04	5 07	5 10	5 11	5 12	5 13	5 13	5 14
	16	4 29	4 42	4 53	5 03	5 08	5 12	5 17	5 21	5 23	5 24	5 26	5 28	5 30
Dec.	24	4 30	4 44	4 57	5 09	5 14	5 20	5 26	5 31	5 34	5 36	5 39	5 41	5 44
	2	4 31	4 47	5 01	5 14	5 21	5 27	5 34	5 41	5 44	5 47	5 50	5 53	5 57
	10	4 34	4 51	5 06	5 20	5 27	5 34	5 41	5 49	5 52	5 55	5 59	6 03	6 07
	18	4 38	4 55	5 10	5 24	5 32	5 39	5 46	5 55	5 58	6 02	6 05	6 09	6 14
	26	4 42	4 59	5 14	5 28	5 36	5 43	5 50	5 58	6 02	6 05	6 09	6 13	6 18
	34	4 46	5 03	5 17	5 31	5 38	5 45	5 52	6 00	6 03	6 06	6 10	6 14	6 18
	42	4 50	5 06	5 20	5 33	5 39	5 45	5 52	6 01	6 04	6 07	6 11	6 14	

SUNSET, 2025**LOCAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB) AND ENDING
OF EVENING TWILIGHT ON THE MERIDIAN OF GREENWICH**

To obtain the standard time at any station, add four minutes for each degree if the station is west of the standard meridian, or deduct four minutes for each degree if the station is east of the standard meridian.
In India, to obtain I.S.T., add $4 \times (82^\circ.5 - \lambda)$ mins. or deduct $4 \times (\lambda - 82^\circ.5)$ mins. as the station is west or east of $82^\circ.5$ E. Longitude.

Date	Lat.	0°	10°	20°	30°	35°	40°	45°	50°	52°	54°	56°	58°	60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct.	3	17 52	17 49	17 46	17 43	17 41	17 39	17 37	17 34	17 33	17 32	17 30	17 28	17 27
	7	17 51	17 47	17 43	17 38	17 36	17 33	17 30	17 26	17 24	17 22	17 20	17 17	17 15
	11	17 50	17 45	17 40	17 34	17 30	17 27	17 22	17 17	17 15	17 12	17 09	17 06	17 03
	15	17 49	17 43	17 37	17 29	17 25	17 21	17 15	17 09	17 06	17 03	16 59	16 56	16 51
	19	17 48	17 41	17 34	17 25	17 20	17 15	17 08	17 01	16 58	16 54	16 50	16 45	16 40
Nov.	23	17 48	17 39	17 31	17 21	17 15	17 09	17 02	16 53	16 49	16 45	16 40	16 35	16 28
	27	17 47	17 38	17 28	17 17	17 11	17 04	16 56	16 46	16 41	16 36	16 31	16 24	16 17
	31	17 47	17 37	17 26	17 14	17 07	16 59	16 50	16 39	16 34	16 28	16 22	16 15	16 07
	4	17 47	17 36	17 24	17 11	17 03	16 54	16 44	16 32	16 26	16 20	16 13	16 05	15 56
	8	17 47	17 35	17 22	17 08	17 00	16 50	16 39	16 26	16 19	16 13	16 05	15 56	15 47
Dec.	12	17 48	17 35	17 21	17 05	16 56	16 46	16 34	16 20	16 13	16 06	15 57	15 48	15 37
	16	17 48	17 35	17 20	17 03	16 54	16 43	16 30	16 15	16 07	15 59	15 50	15 40	15 28
	20	17 49	17 35	17 19	17 02	16 52	16 40	16 27	16 10	16 02	15 54	15 44	15 33	15 20
	24	17 50	17 35	17 19	17 01	16 50	16 38	16 24	16 06	15 58	15 49	15 39	15 27	15 13
	28	17 52	17 36	17 19	17 00	16 49	16 36	16 21	16 03	15 54	15 45	15 34	15 21	15 07
	2	17 53	17 37	17 19	17 00	16 48	16 35	16 20	16 01	15 52	15 42	15 30	15 17	15 02
	6	17 55	17 38	17 20	17 00	16 48	16 35	16 19	15 59	15 50	15 39	15 27	15 14	14 57
	10	17 57	17 39	17 21	17 01	16 49	16 35	16 18	15 58	15 49	15 38	15 26	15 11	14 55
	14	17 58	17 41	17 23	17 02	16 49	16 35	16 19	15 58	15 48	15 37	15 25	15 10	14 53
	18	18 00	17 43	17 24	17 03	16 51	16 37	16 20	15 59	15 49	15 38	15 25	15 11	14 53
	22	18 02	17 45	17 26	17 05	16 53	16 38	16 22	16 01	15 51	15 40	15 27	15 12	14 55
	26	18 04	17 47	17 28	17 07	16 55	16 41	16 24	16 03	15 54	15 42	15 30	15 15	14 58
	30	18 06	17 49	17 31	17 10	16 58	16 44	16 27	16 07	15 57	15 46	15 34	15 19	15 02
	34	18 08	17 51	17 33	17 13	17 01	16 47	16 31	16 11	16 01	15 51	15 38	15 24	15 08

END OF EVENING TWILIGHT

		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct.	7	19 00	18 57	18 56	18 58	19 00	19 03	19 07	19 13	19 16	19 20	19 24	19 28	19 34
	15	18 59	18 53	18 50	18 49	18 49	18 51	18 53	18 56	18 58	19 00	19 03	19 06	19 10
	23	18 58	18 50	18 45	18 41	18 40	18 40	18 40	18 41	18 42	18 43	18 44	18 46	18 48
	31	18 58	18 48	18 41	18 35	18 32	18 30	18 29	18 28	18 28	18 28	18 28	18 28	18 29
Nov.	8	18 59	18 48	18 38	18 30	18 26	18 23	18 20	18 17	18 16	18 15	18 14	18 13	18 12
	16	19 01	18 48	18 36	18 26	18 21	18 17	18 12	18 08	18 06	18 04	18 03	18 01	17 59
Dec.	24	19 04	18 49	18 36	18 24	18 19	18 13	18 07	18 02	17 59	17 57	17 54	17 51	17 49
	2	19 07	18 51	18 37	18 24	18 18	18 11	18 05	17 58	17 55	17 52	17 49	17 45	17 42
	10	19 11	18 55	18 40	18 26	18 19	18 12	18 05	17 57	17 54	17 50	17 47	17 43	17 39
	18	19 15	18 58	18 43	18 29	18 22	18 14	18 07	17 59	17 55	17 51	17 48	17 44	17 39
	26	19 19	19 02	18 47	18 33	18 26	18 18	18 11	18 03	17 59	17 56	17 52	17 48	17 44
	34	19 23	19 06	18 52	18 38	18 31	18 24	18 17	18 09	18 06	18 03	17 59	17 55	17 51
	42	19 26	19 10	18 56	18 43	18 37	18 31	18 24	18 18	18 15	18 12	18 09	18 05	18 02

DURATION OF TWILIGHT, 2025
MORNING AND EVENING TWILIGHT: CIVIL (6°), NAUTICAL (12°)
AND ASTRONOMICAL (18°)

Date	Lat.	0°			10°			20°			30°			40°			
	Civ.	Nt.	Ast.	Civ.	Nt.	Ast.	Civ.	Nt.	Ast.	Civ.	Nt.	Ast.	Civ.	Nt.	Ast.		
Jan.	0	m 23	m 49	m 75	m 23	m 49	m 75	m 24	m 51	m 79	m 26	m 56	m 85	m 30	m 64	m 97	
	8	22	48	74	23	49	75	24	51	78	26	56	85	30	64	96	
	16	22	48	74	22	48	74	24	51	77	26	55	84	30	63	95	
	24	22	47	73	22	48	73	23	50	76	25	54	83	29	62	94	
Feb.	1	22	47	72	22	47	73	23	49	76	25	54	82	29	61	93	
	9	21	46	71	22	47	72	23	49	75	25	53	81	28	60	92	
	17	21	46	70	21	46	71	22	48	74	24	52	80	28	59	91	
	25	21	45	70	21	46	70	22	48	74	24	52	80	27	59	90	
Mar.	5	21	45	69	21	46	70	22	48	73	24	52	79	27	59	90	
	13	21	45	69	21	45	70	22	48	73	24	52	80	27	58	90	
	21	21	45	69	21	45	70	22	48	73	24	52	80	27	59	91	
	29	21	45	69	21	46	70	22	48	74	24	52	81	27	59	92	
Apr.	6	21	45	69	21	46	71	22	48	75	24	53	82	28	61	95	
	14	21	45	70	21	46	71	23	49	76	25	54	83	28	62	97	
	22	21	46	70	22	47	72	23	50	77	25	55	85	29	63	100	
	30	21	46	71	22	47	73	23	50	77	25	55	87	29	65	103	
May	8	22	47	72	22	48	74	23	51	79	26	57	89	30	67	108	
	16	22	47	73	22	49	75	24	52	81	26	58	91	31	69	112	
	24	22	48	74	23	49	76	24	53	82	27	59	93	32	71	116	
June	1	22	48	74	23	50	77	24	53	83	27	60	95	32	73	119	
	9	23	49	75	23	50	77	25	54	84	27	61	96	33	74	122	
	17	23	49	75	23	50	78	25	54	84	28	61	97	33	75	123	
July	25	23	49	75	23	50	78	25	54	84	27	61	97	33	75	123	
	3	23	49	75	23	50	77	24	54	84	27	60	96	33	74	122	
Aug.	11	22	48	74	23	50	77	24	53	83	27	60	95	32	73	119	
	19	22	48	74	23	49	76	24	53	82	27	59	93	32	71	115	
	27	22	47	73	22	49	75	24	52	80	26	58	91	31	69	111	
	4	22	47	72	22	48	74	23	51	79	26	56	88	30	67	106	
	12	21	46	71	22	47	73	23	50	78	25	55	86	29	65	103	
	20	21	46	70	22	47	72	23	49	76	25	54	85	29	63	99	
	28	21	45	70	21	46	71	22	49	75	25	53	83	28	61	96	
Sept.	5	21	45	69	21	46	71	22	48	74	24	53	82	28	60	94	
Oct.	13	21	45	69	21	46	70	22	48	74	24	52	81	27	59	92	
	21	21	45	69	21	45	70	22	48	73	24	52	80	27	59	91	
	29	21	45	69	21	45	70	22	48	73	24	52	79	27	58	90	
	7	21	45	69	21	46	70	22	48	73	24	52	79	27	58	90	
	15	21	45	70	21	46	70	22	48	74	24	52	80	27	59	90	
	23	21	46	70	21	46	71	22	48	74	24	52	80	28	59	91	
	31	21	46	71	22	47	72	23	49	75	25	53	81	28	60	92	
Nov.	8	22	47	72	22	47	73	23	49	76	25	54	82	29	61	93	
Dec.																	
	16	22	47	73	22	48	73	23	50	76	25	54	83	29	62	94	
	24	22	48	74	22	48	74	24	51	77	26	55	84	30	63	95	
	2	22	48	74	23	49	75	24	51	78	26	56	85	30	64	96	
	10	23	49	75	23	49	75	24	51	78	26	56	85	30	64	97	
	18	23	49	75	23	49	75	24	52	79	26	56	86	31	65	98	
	26	23	49	75	23	49	75	24	52	79	26	56	85	31	65	98	
	34	23	49	75	23	49	75	24	51	78	26	56	85	30	64	97	

DURATION OF TWILIGHT, 2025
 MORNING AND EVENING TWILIGHT: CIVIL (6°), NAUTICAL (12°)
 AND ASTRONOMICAL (18°)

Date	Lat.	Civ.	45° Nt.	Ast.	Civ.	50° Nt.	Ast.	Civ.	55° Nt.	Ast.	Civ.	60° Nt.	Ast.
		m	m	m	m	m	m	m	m	m	m	m	m
Jan.	0	34	71	106	38	80	119	45	93	137	57	113	165
	8	33	70	105	38	78	117	44	91	135	55	111	161
	16	33	69	104	37	77	116	43	88	132	52	106	156
	24	32	68	102	36	75	113	41	86	129	50	102	151
Feb.	1	31	67	101	35	74	112	40	84	126	48	98	147
	9	31	65	100	34	72	110	39	82	124	45	95	143
	17	30	64	98	33	71	108	38	80	122	44	92	140
	25	30	64	98	33	70	108	37	79	121	42	91	139
Mar.	5	29	63	98	32	70	108	36	78	121	42	90	140
	13	29	64	98	32	70	108	36	79	121	42	90	142
	21	29	64	99	32	71	110	36	80	125	42	92	147
	29	30	65	101	33	72	113	37	81	130	43	95	155
Apr.	6	30	66	104	33	74	117	38	85	137	44	100	169
	14	31	68	108	34	77	123	39	89	147	46	107	193
	22	32	70	112	35	80	130	41	94	161	50	119	**
	30	32	72	117	36	83	139	43	100	184	53	135	**
May	8	33	76	123	38	88	151	46	110	**	59	169	**
	16	35	79	130	40	93	167	49	121	**	65	**	**
	24	36	82	137	42	99	188	52	136	**	74	**	**
June	1	36	84	144	43	104	**	54	156	**	85	**	**
	9	37	86	150	44	108	**	57	194	**	96	**	**
	17	37	87	153	45	110	**	58	**	**	106	**	**
	25	37	87	153	45	110	**	58	**	**	105	**	**
July	3	37	86	150	44	107	**	57	187	**	95	**	**
	11	36	84	144	43	103	**	54	154	**	83	**	**
	19	35	81	137	41	98	186	51	134	**	73	**	**
	27	34	78	129	40	93	165	48	120	**	64	**	**
Aug.	4	33	75	123	38	87	149	45	109	**	58	165	**
	12	32	72	116	36	82	138	42	100	182	53	134	**
	20	31	69	111	35	79	129	41	93	160	49	118	**
	28	31	67	107	34	76	122	39	88	146	46	107	192
Sept.	5	30	66	104	33	74	117	38	84	136	44	100	168
	13	30	65	101	33	72	113	37	81	130	43	95	155
	21	29	64	99	32	71	110	36	79	125	42	92	147
	29	29	63	98	32	70	108	36	78	122	41	90	142
Oct.	7	29	63	97	32	70	107	36	78	121	42	90	139
	15	30	64	98	33	70	107	37	78	121	42	90	139
	23	30	64	98	33	71	108	37	80	121	43	92	140
	31	31	65	99	34	72	109	38	81	123	45	94	142
Nov.	8	31	66	101	35	74	111	40	84	126	47	98	146
	16	32	68	102	36	75	113	41	86	129	50	102	151
	24	33	69	104	37	77	116	43	88	132	52	106	156
Dec.	2	33	70	105	38	78	117	44	91	135	55	110	161
	10	34	71	106	38	80	119	45	92	137	57	113	164
	18	34	71	107	39	80	120	46	93	138	58	115	166
	26	34	71	107	38	80	119	46	93	138	58	114	166
	34	34	71	106	38	79	119	45	92	136	56	112	163

SUNRISE, SUNSET AND TWILIGHT, 2025
CORRECTION FOR SOUTHERN LATITUDES

For	Use	Add	For	Use	Add	For	Use	Add	For	Use	Add	For	Use	Add
July 1	Dec. 31	m +1	Aug. 7	Feb. 3	m -8	Sept. 12	Mar. 10	m -14	Oct. 19	Apr. 16	m -15	Nov. 26	May 25	m -10
July 2	Jan. 0	+1	8	4	8	13	11	14	20	17	15	27	26	9
3	1	0	9	5	9	14	12	14	21	18	15	28	27	9
4	2	0	10	6	9	15	13	14	22	19	15	29	28	9
			11	7	9	16	14	14	23	20	15	30	29	9
5	3	0	12	8	9	17	15	15	24	21	14	Dec. 1	May 30	8
6	4	-1	13	9	9	18	16	15	25	22	14	2	31	8
7	5	1	14	10	10	19	17	15	26	23	14	Dec. 3	June 1	8
8	6	1	15	11	10	20	18	15	27	24	14	4	2	8
9	7	1	16	12	10	21	19	15	28	25	14			
10	8	2	17	13	10	22	20	15	29	26	14			
11	9	2	18	14	10	23	21	15	30	27	14	5	3	7
12	10	2	19	15	11	24	22	15	31	28	14	6	5	7
13	11	2	20	16	11	25	23	15	Nov. 1	Apr. 29	14	7	6	7
14	12	3	21	17	11	26	24	15	2	30	14	8	7	7
15	13	3	22	18	11	27	25	15	Nov. 3	May 31	14	9	8	6
16	14	3	23	19	11	28	26	15	4			10	9	6
17	15	3	24	19	12	29	26	15	3	1	13	11	10	6
18	16	3	25	20	12	30	27	15	4	2	13	12	11	6
19	16	4	26	21	12	Oct. 1	Mar. 28	15	5	3	13	13	12	5
20	17	4	27	22	12	2	29	15	6	4	13	14	13	5
21	18	4	28	23	12	3	30	15	7	5	13	15	14	5
22	19	4	29	24	12	8		15	8	6	13	16	15	5
23	20	5	30	25	13	4	31	15	9	7	13	17	16	4
24	21	5	31	26	13	Oct. 5	Apr. 1	16	10	8	12	18	17	4
25	22	5	Sept. 1	Feb. 27	13	6	2	16	11	9	12	19	18	4
26	23	6	2	28	13	7	3	16	12	10	12	20	19	4
27	24	6				8	4	15	13	11	12	21	21	3
28	25	6							14	12	12	22	22	3
29	26	6	Sept. 3	Mar. 1	13	9	5	15	15	13	12	23	23	3
30	27	7	4	2	13	10	6	15	16	14	12	24	24	3
31	28	7	5	3	13	11	7	15	17	15	11	25	25	2
Aug. 1	Jan. 29	7	6	4	14	12	9	15	18	17	11	26	26	2
2	30	7	7	5	14	13	10	15	19	18	11	27	27	2
						14	11	15	20	19	11	28	28	2
3	30	7	8	6	14	15	12	15	21	20	11	29	29	1
4	31	8	9	7	14	16	13	15	22	21	10	30	30	1
Aug. 5	Feb. 1	8	10	8	14	17	14	15	23	22	10	Dec. 31	July 1	-1
6	2	-8	11	9	14	18	15	15	24	23	10	32	2	0
			12	10	-14	19	16	-15	25	24	-10			

To obtain the times of sunrise, sunset and twilight for southern latitudes for any date, use the tables for the same northern latitude for the corresponding date given above, and apply to the times so obtained the correction given in the column headed 'Add'.

In the case of duration of twilight, however, take only the figures for the corresponding date without correction.

**SUNRISE, SUNSET AND TWILIGHT, 2025
CORRECTION FOR SOUTHERN LATITUDES**

For	Use	Add	For	Use	Add	For	Use	Add	For	Use	Add	For	Use	Add
Jan.	July	m	Feb.	Aug.	m	Mar.	Sept.	m	Apr.	Oct.	m	May	Nov.	m
0	1	0	5	9	+9	13	15	+14	19	22	+15	25	26	+10
1	3	0	6	10	9	14	16	14	20	23	15	26	27	9
2	4	0	7	11	9	15	17	14	21	24	14	27	28	9
			8	12	9	16	18	15	22	25	14	28	29	9
3	5	0	9	13	9	17	19	15	23	26	14	29	30	9
4	6	+1	10	14	10	18	20	15	24	27	14	May	Dec.	
5	7	1	11	15	10	19	21	15	25	28	14	30	1	8
6	8	1	12	16	10	20	22	15	26	29	14	31	2	8
7	9	1	13	17	10	21	23	15	27	30	14	June	Dec.	
8	10	2	14	18	10	22	24	15	28	31	14	1	3	8
9	11	2	15	19	11	23	25	15	Apr.	Nov.		2	4	8
10	12	2	16	20	11	24	26	15	29	1	14	3	5	7
11	13	2	17	21	11	25	27	15	30	2	14	4	5	7
12	14	3	18	22	11	26	29	15	May	Nov.		5	6	7
13	15	3	19	23	11	27	30	15	1	3	13	6	7	7
14	16	3	20	25	12	Mar.	Oct.		2	4	13	7	8	7
15	17	3	21	26	12	28	1	15	3	5	13	8	9	6
16	18	4	22	27	12	29	2	15	4	6	13	9	10	6
17	19	4	23	28	12	30	3	15	5	7	13	10	11	6
18	21	4	24	29	12	31	4	16	6	8	13	11	12	6
19	22	5	25	30	13	Apr.	Oct.		7	9	13	12	13	5
20	23	5	26	31	13	1	5	16	8	10	12	13	14	5
21	24	5				2	6	16	9	11	12	14	15	5
22	25	5	Feb.	Sept.		3	7	16	10	12	12	15	16	5
23	26	6	27	1	13	4	7	15	11	13	12	16	17	4
24	27	6	28	2	13	5	8	15	12	14	12	17	18	4
25	28	6	Mar.	Sept.		6	9	15	13	15	12	18	19	4
26	29	6	1	3	13	7	10	15	14	16	12	19	20	4
27	30	7	2	4	13	8	11	15	15	16	11	20	21	3
28	31	7	3	5	13	9	12	15	16	17	11	21	21	3
Jan.	Aug.		4	6	14	10	13	15	17	18	11	22	22	3
29	1	7	5	7	14	11	14	15	18	19	11	23	23	3
30	2	7	6	8	14	12	15	15	19	20	11	24	24	3
31	3	7	7	9	14	13	16	15	20	21	11	25	25	2
Feb.	Aug.		8	10	14	14	17	15	21	22	10	26	26	2
1	5	8	9	11	14	15	18	15	22	23	10	27	27	2
2	6	8	10	12	14	16	19	15	23	24	10	28	28	1
3	7	8	11	13	14	17	20	15	24	25	10	29	29	1
4	8	+9	12	14	+14	18	21	+15	25	26	+10	30	30	+1

To obtain the times of sunrise, sunset and twilight for southern latitudes for any date, use the tables for the same northern latitude for the corresponding date given above, and apply to the times so obtained the correction given in the column headed 'Add'.

In the case of duration of twilight, however, take only the figures for the corresponding date without correction.

SUNRISE AND SUNSET, 2025
INDIAN STANDARD TIME OF SUNRISE AND SUNSET (SUN'S UPPER LIMB)
FOR CERTAIN STATIONS IN INDIA

Date	Kolkata 22° N 32'				Varanasi 25° N 18'				Chennai 13° N 00'				Delhi 28° N 35'				Mumbai 18° N 54'				
	Rise		Set		Rise		Set		Rise		Set		Rise		Set		Rise		Set		
	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	
Jan.	0	6	16.5	17	03.0	6	43.5	17	18.8	6	31.0	17	53.2	7	14.2	17	34.9	7	11.9	18	11.8
	2	6	17.1	17	04.3	6	44.0	17	20.1	6	31.7	17	54.3	7	14.7	17	36.3	7	12.6	18	13.0
	4	6	17.6	17	05.6	6	44.5	17	21.5	6	32.5	17	55.5	7	15.1	17	37.7	7	13.2	18	14.2
	6	6	18.0	17	07.0	6	44.9	17	22.9	6	33.1	17	56.6	7	15.4	17	39.2	7	13.7	18	15.4
	8	6	18.4	17	08.4	6	45.2	17	24.4	6	33.7	17	57.7	7	15.6	17	40.7	7	14.2	18	16.7
	10	6	18.7	17	09.8	6	45.4	17	25.8	6	34.2	17	58.8	7	15.7	17	42.3	7	14.5	18	18.0
	12	6	18.9	17	11.2	6	45.5	17	27.3	6	34.7	17	59.9	7	15.7	17	43.9	7	14.8	18	19.3
	14	6	19.0	17	12.6	6	45.5	17	28.8	6	35.1	18	01.0	7	15.6	17	45.5	7	15.0	18	20.5
	16	6	19.0	17	14.0	6	45.4	17	30.3	6	35.4	18	02.0	7	15.3	17	47.1	7	15.2	18	21.8
	18	6	18.9	17	15.4	6	45.2	17	31.9	6	35.7	18	03.1	7	15.0	17	48.8	7	15.2	18	23.1
Feb.	20	6	18.7	17	16.9	6	44.9	17	33.4	6	35.8	18	04.1	7	14.5	17	50.4	7	15.2	18	24.3
	22	6	18.4	17	18.3	6	44.5	17	34.9	6	35.9	18	05.1	7	14.0	17	52.1	7	15.0	18	25.6
	24	6	18.1	17	19.7	6	44.0	17	36.4	6	36.0	18	06.1	7	13.3	17	53.7	7	14.8	18	26.8
	26	6	17.6	17	21.0	6	43.4	17	37.9	6	35.9	18	07.0	7	12.5	17	55.4	7	14.5	18	28.0
	28	6	17.1	17	22.4	6	42.7	17	39.4	6	35.8	18	07.9	7	11.7	17	57.0	7	14.1	18	29.2
	30	6	16.4	17	23.7	6	41.9	17	40.9	6	35.6	18	08.8	7	10.7	17	58.6	7	13.7	18	30.4
	1	6	15.7	17	25.0	6	41.1	17	42.3	6	35.3	18	09.6	7	09.6	18	00.2	7	13.1	18	31.5
	3	6	14.9	17	26.3	6	40.1	17	43.7	6	35.0	18	10.4	7	08.5	18	01.8	7	12.5	18	32.6
	5	6	14.1	17	27.6	6	39.1	17	45.1	6	34.6	18	11.2	7	07.2	18	03.4	7	11.8	18	33.7
	7	6	13.1	17	28.8	6	37.9	17	46.5	6	34.1	18	11.9	7	05.9	18	04.9	7	11.0	18	34.7
Mar.	9	6	12.1	17	30.0	6	36.7	17	47.8	6	33.6	18	12.6	7	04.5	18	06.5	7	10.1	18	35.7
	11	6	11.0	17	31.2	6	35.4	17	49.2	6	32.9	18	13.2	7	03.0	18	08.0	7	09.2	18	36.7
	13	6	09.8	17	32.3	6	34.1	17	50.5	6	32.3	18	13.9	7	01.4	18	09.5	7	08.2	18	37.6
	15	6	08.5	17	33.4	6	32.6	17	51.7	6	31.5	18	14.4	6	59.7	18	11.0	7	07.2	18	38.5
	17	6	07.2	17	34.5	6	31.1	17	52.9	6	30.8	18	15.0	6	58.0	18	12.4	7	06.0	18	39.4
	19	6	05.9	17	35.6	6	29.6	17	54.1	6	29.9	18	15.5	6	56.2	18	13.8	7	04.8	18	40.2
	21	6	04.5	17	36.6	6	28.0	17	55.3	6	29.0	18	15.9	6	54.4	18	15.2	7	03.6	18	41.0
	23	6	03.0	17	37.5	6	26.3	17	56.4	6	28.1	18	16.3	6	52.4	18	16.6	7	02.3	18	41.8
	25	6	01.5	17	38.5	6	24.5	17	57.6	6	27.1	18	16.7	6	50.5	18	17.9	7	01.0	18	42.6
	27	5	59.9	17	39.4	6	22.8	17	58.6	6	26.0	18	17.1	6	48.4	18	19.3	6	59.6	18	43.3
Apr.	1	5	58.3	17	40.3	6	21.0	17	59.7	6	24.9	18	17.4	6	46.4	18	20.6	6	58.1	18	43.9
	3	5	56.6	17	41.2	6	19.1	18	00.7	6	23.8	18	17.7	6	44.3	18	21.9	6	56.6	18	44.6
	5	5	55.0	17	42.0	6	17.2	18	01.7	6	22.7	18	18.0	6	42.1	18	23.1	6	55.1	18	45.2
	7	5	53.2	17	42.9	6	15.3	18	02.7	6	21.5	18	18.3	6	39.9	18	24.4	6	53.6	18	45.8
	9	5	51.5	17	43.7	6	13.3	18	03.7	6	20.3	18	18.5	6	37.7	18	25.6	6	52.0	18	46.4
	11	5	49.7	17	44.4	6	11.3	18	04.7	6	19.0	18	18.7	6	35.5	18	26.8	6	50.4	18	47.0
	13	5	47.8	17	45.2	6	09.3	18	05.6	6	17.8	18	18.9	6	33.2	18	28.0	6	48.7	18	47.6
	15	5	46.0	17	46.0	6	07.3	18	06.5	6	16.5	18	19.1	6	30.9	18	29.1	6	47.1	18	48.1
	17	5	44.1	17	46.7	6	05.3	18	07.4	6	15.2	18	19.2	6	28.6	18	30.3	6	45.4	18	48.6
	19	5	42.3	17	47.4	6	03.3	18	08.3	6	13.9	18	19.4	6	26.3	18	31.4	6	43.7	18	49.1
Apr.	21	5	40.4	17	48.1	6	01.2	18	09.2	6	12.6	18	19.5	6	24.0	18	32.6	6	42.0	18	49.6
	23	5	38.5	17	48.8	5	59.2	18	10.1	6	11.3	18	19.7	6	21.7	18	33.7	6	40.4	18	50.1
	25	5	36.6	17	49.5	5	57.1	18	11.0	6	10.0	18	19.8	6	19.3	18	34.8	6	38.7	18	50.6
	27	5	34.7	17	50.2	5	55.1	18	11.9	6	08.7	18	19.9	6	17.0	18	36.0	6	37.0	18	51.1
	29	5	32.7	17	50.9	5	53.0	18	12.7	6	07.3	18	20.0	6	14.7	18	37.1	6	35.3	18	51.6
Apr.	31	5	30.8	17	51.6	5	50.9	18	13.6	6	06.0	18	20.2	6	12.4	18	38.2	6	33.6	18	52.0
	2	5	29.0	17	52.3	5	48.9	18	14.5	6	04.7	18	20.3	6	10.2	18	39.3	6	31.9	18	52.5

SUNRISE AND SUNSET, 2025
INDIAN STANDARD TIME OF SUNRISE AND SUNSET (SUN'S UPPER LIMB)
FOR CERTAIN STATIONS IN INDIA

Date	Kolkata 22° N 32'				Varanasi 25° N 18'				Chennai 13° N 00'				Delhi 28° N 35'				Mumbai 18° N 54'				
	Rise		Set		Rise		Set		Rise		Set		Rise		Set		Rise		Set		
	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	
Apr.	2	5	29.0	17	52.3	5	48.9	18	14.5	6	04.7	18	20.3	6	10.2	18	39.3	6	31.9	18	52.5
	4	5	27.1	17	53.0	5	46.9	18	15.4	6	03.5	18	20.4	6	07.9	18	40.4	6	30.3	18	53.0
	6	5	25.2	17	53.7	5	44.9	18	16.2	6	02.2	18	20.6	6	05.7	18	41.6	6	28.6	18	53.5
	8	5	23.4	17	54.4	5	42.9	18	17.1	6	00.9	18	20.7	6	03.5	18	42.7	6	27.0	18	54.0
	10	5	21.5	17	55.1	5	40.9	18	18.0	5	59.7	18	20.9	6	01.3	18	43.8	6	25.4	18	54.5
	12	5	19.8	17	55.8	5	38.9	18	18.9	5	58.5	18	21.1	5	59.2	18	45.0	6	23.8	18	55.1
	14	5	18.0	17	56.6	5	37.0	18	19.8	5	57.3	18	21.3	5	57.1	18	46.1	6	22.3	18	55.6
	16	5	16.3	17	57.3	5	35.1	18	20.8	5	56.2	18	21.5	5	55.0	18	47.3	6	20.8	18	56.1
	18	5	14.6	17	58.0	5	33.3	18	21.7	5	55.1	18	21.7	5	53.0	18	48.4	6	19.3	18	56.7
	20	5	12.9	17	58.8	5	31.5	18	22.7	5	54.0	18	22.0	5	51.0	18	49.6	6	17.9	18	57.3
	22	5	11.3	17	59.6	5	29.7	18	23.6	5	52.9	18	22.2	5	49.0	18	50.8	6	16.5	18	57.9
	24	5	09.7	18	00.4	5	28.0	18	24.6	5	51.9	18	22.5	5	47.1	18	52.0	6	15.2	18	58.5
	26	5	08.2	18	01.2	5	26.3	18	25.6	5	50.9	18	22.8	5	45.3	18	53.2	6	13.9	18	59.1
	28	5	06.7	18	02.0	5	24.7	18	26.6	5	50.0	18	23.2	5	43.5	18	54.4	6	12.7	18	59.8
May	30	5	05.3	18	02.8	5	23.1	18	27.6	5	49.1	18	23.5	5	41.7	18	55.6	6	11.5	19	00.4
	2	5	04.0	18	03.7	5	21.6	18	28.6	5	48.2	18	23.9	5	40.1	18	56.8	6	10.3	19	01.1
	4	5	02.7	18	04.5	5	20.2	18	29.6	5	47.4	18	24.3	5	38.4	18	58.1	6	09.3	19	01.8
	6	5	01.5	18	05.4	5	18.8	18	30.6	5	46.7	18	24.7	5	36.9	18	59.3	6	08.3	19	02.5
	8	5	00.3	18	06.3	5	17.5	18	31.7	5	46.0	18	25.2	5	35.4	19	00.5	6	07.3	19	03.2
	10	4	59.2	18	07.1	5	16.3	18	32.7	5	45.4	18	25.7	5	34.0	19	01.8	6	06.4	19	04.0
	12	4	58.2	18	08.0	5	15.1	18	33.8	5	44.8	18	26.1	5	32.7	19	03.0	6	05.6	19	04.7
	14	4	57.2	18	08.9	5	14.0	18	34.8	5	44.2	18	26.7	5	31.4	19	04.2	6	04.8	19	05.5
	16	4	56.3	18	09.9	5	13.0	18	35.9	5	43.8	18	27.2	5	30.3	19	05.5	6	04.1	19	06.3
	18	4	55.5	18	10.8	5	12.1	18	36.9	5	43.4	18	27.7	5	29.2	19	06.7	6	03.4	19	07.0
	20	4	54.8	18	11.7	5	11.2	18	38.0	5	43.0	18	28.3	5	28.2	19	07.9	6	02.9	19	07.8
	22	4	54.1	18	12.6	5	10.5	18	39.0	5	42.7	18	28.9	5	27.3	19	09.0	6	02.4	19	08.6
	24	4	53.6	18	13.5	5	09.8	18	40.0	5	42.4	18	29.5	5	26.5	19	10.2	6	01.9	19	09.4
	26	4	53.0	18	14.4	5	09.2	18	41.0	5	42.3	18	30.0	5	25.7	19	11.3	6	01.6	19	10.2
	28	4	52.6	18	15.3	5	08.6	18	42.0	5	42.1	18	30.7	5	25.1	19	12.4	6	01.3	19	11.0
	30	4	52.3	18	16.1	5	08.2	18	43.0	5	42.0	18	31.3	5	24.5	19	13.5	6	01.0	19	11.8
June	1	4	52.0	18	17.0	5	07.8	18	43.9	5	42.0	18	31.9	5	24.1	19	14.6	6	00.9	19	12.5
	3	4	51.8	18	17.8	5	07.6	18	44.8	5	42.1	18	32.5	5	23.7	19	15.6	6	00.8	19	13.3
	5	4	51.7	18	18.6	5	07.4	18	45.7	5	42.1	18	33.1	5	23.4	19	16.5	6	00.7	19	14.0
	7	4	51.6	18	19.3	5	07.3	18	46.5	5	42.3	18	33.7	5	23.2	19	17.4	6	00.7	19	14.7
	9	4	51.6	18	20.1	5	07.2	18	47.3	5	42.4	18	34.3	5	23.2	19	18.3	6	00.8	19	15.4
	11	4	51.7	18	20.8	5	07.3	18	48.1	5	42.7	18	34.8	5	23.1	19	19.1	6	01.0	19	16.0
	13	4	51.9	18	21.4	5	07.4	18	48.8	5	42.9	18	35.4	5	23.2	19	19.8	6	01.2	19	16.6
	15	4	52.1	18	22.0	5	07.6	18	49.4	5	43.3	18	35.9	5	23.4	19	20.5	6	01.4	19	17.2
	17	4	52.4	18	22.6	5	07.9	18	50.0	5	43.6	18	36.4	5	23.6	19	21.1	6	01.7	19	17.8
	19	4	52.8	18	23.1	5	08.2	18	50.5	5	44.0	18	36.9	5	23.9	19	21.6	6	02.1	19	18.3
	21	4	53.2	18	23.6	5	08.6	18	51.0	5	44.4	18	37.3	5	24.3	19	22.1	6	02.5	19	18.7
	23	4	53.6	18	23.9	5	09.1	18	51.4	5	44.9	18	37.8	5	24.8	19	22.5	6	02.9	19	19.1
	25	4	54.1	18	24.3	5	09.6	18	51.7	5	45.3	18	38.1	5	25.3	19	22.8	6	03.4	19	19.5
	27	4	54.7	18	24.5	5	10.2	18	51.9	5	45.8	18	38.5	5	26.0	19	23.0	6	03.9	19	19.8
	29	4	55.3	18	24.7	5	10.8	18	52.1	5	46.3	18	38.8	5	26.6	19	23.1	6	04.5	19	20.0
July	1	4	56.0	18	24.9	5	11.5	18	52.2	5	46.9	18	39.0	5	27.3	19	23.2	6	05.1	19	20.2
	3	4	56.7	18	24.9	5	12.2	18	52.2	5	47.4	18	39.2	5	28.1	19	23.1	6	05.7	19	20.3

SUNRISE AND SUNSET, 2025
INDIAN STANDARD TIME OF SUNRISE AND SUNSET (SUN'S UPPER LIMB)
FOR CERTAIN STATIONS IN INDIA

Date	Kolkata 22° N 32'				Varanasi 25° N 18'				Chennai 13° N 00'				Delhi 28° N 35'				Mumbai 18° N 54'			
	Rise		Set		Rise		Set		Rise		Set		Rise		Set		Rise		Set	
	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m
July	1	4	56.0	18 24.9	5	11.5	18 52.2	5	46.9	18 39.0	5	27.3	19 23.2	6	05.1	19 20.2				
	3	4	56.7	18 24.9	5	12.2	18 52.2	5	47.4	18 39.2	5	28.1	19 23.1	6	05.7	19 20.3				
	5	4	57.4	18 24.9	5	13.0	18 52.1	5	47.9	18 39.4	5	29.0	19 23.0	6	06.3	19 20.3				
	7	4	58.1	18 24.8	5	13.8	18 52.0	5	48.5	18 39.4	5	29.8	19 22.7	6	07.0	19 20.3				
	9	4	58.9	18 24.6	5	14.7	18 51.7	5	49.1	18 39.5	5	30.8	19 22.4	6	07.7	19 20.2				
	11	4	59.7	18 24.4	5	15.5	18 51.4	5	49.6	18 39.5	5	31.7	19 22.0	6	08.4	19 20.1				
	13	5	00.5	18 24.1	5	16.4	18 51.0	5	50.2	18 39.4	5	32.7	19 21.5	6	09.1	19 19.8				
	15	5	01.3	18 23.7	5	17.3	18 50.5	5	50.7	18 39.3	5	33.7	19 20.9	6	09.8	19 19.5				
	17	5	02.2	18 23.2	5	18.3	18 49.9	5	51.3	18 39.1	5	34.8	19 20.2	6	10.5	19 19.2				
	19	5	03.0	18 22.6	5	19.2	18 49.2	5	51.8	18 38.8	5	35.8	19 19.4	6	11.2	19 18.7				
	21	5	03.9	18 22.0	5	20.2	18 48.5	5	52.3	18 38.5	5	36.9	19 18.5	6	11.9	19 18.2				
Aug.	23	5	04.7	18 21.3	5	21.1	18 47.7	5	52.8	18 38.1	5	38.0	19 17.5	6	12.6	19 17.6				
	25	5	05.6	18 20.5	5	22.1	18 46.7	5	53.3	18 37.7	5	39.1	19 16.4	6	13.3	19 17.0				
	27	5	06.5	18 19.6	5	23.1	18 45.7	5	53.8	18 37.2	5	40.2	19 15.3	6	14.0	19 16.2				
	29	5	07.3	18 18.7	5	24.1	18 44.7	5	54.2	18 36.6	5	41.4	19 14.0	6	14.7	19 15.4				
	31	5	08.2	18 17.7	5	25.0	18 43.5	5	54.6	18 36.0	5	42.5	19 12.7	6	15.4	19 14.6				
	2	5	09.0	18 16.6	5	26.0	18 42.3	5	55.0	18 35.4	5	43.6	19 11.3	6	16.0	19 13.6				
	4	5	09.8	18 15.5	5	26.9	18 41.0	5	55.4	18 34.6	5	44.7	19 09.8	6	16.7	19 12.7				
	6	5	10.6	18 14.2	5	27.9	18 39.6	5	55.8	18 33.9	5	45.8	19 08.2	6	17.3	19 11.6				
	8	5	11.4	18 13.0	5	28.8	18 38.1	5	56.1	18 33.0	5	47.0	19 06.6	6	17.9	19 10.5				
	10	5	12.2	18 11.6	5	29.8	18 36.6	5	56.4	18 32.1	5	48.1	19 04.9	6	18.5	19 09.3				
	12	5	13.0	18 10.2	5	30.7	18 35.0	5	56.7	18 31.2	5	49.1	19 03.1	6	19.0	19 08.0				
Sept.	14	5	13.7	18 08.8	5	31.6	18 33.4	5	56.9	18 30.2	5	50.2	19 01.2	6	19.6	19 06.7				
	16	5	14.4	18 07.3	5	32.4	18 31.7	5	57.1	18 29.2	5	51.3	18 59.3	6	20.1	19 05.4				
	18	5	15.1	18 05.7	5	33.3	18 30.0	5	57.3	18 28.1	5	52.4	18 57.4	6	20.6	19 04.0				
	20	5	15.8	18 04.1	5	34.2	18 28.2	5	57.5	18 27.0	5	53.4	18 55.3	6	21.1	19 02.6				
	22	5	16.5	18 02.5	5	35.0	18 26.3	5	57.7	18 25.8	5	54.4	18 53.3	6	21.6	19 01.1				
	24	5	17.2	18 00.8	5	35.8	18 24.4	5	57.8	18 24.6	5	55.5	18 51.1	6	22.1	18 59.5				
	26	5	17.9	17 59.1	5	36.7	18 22.5	5	57.9	18 23.4	5	56.5	18 49.0	6	22.5	18 58.0				
	28	5	18.5	17 57.3	5	37.5	18 20.6	5	58.0	18 22.1	5	57.5	18 46.8	6	22.9	18 56.3				
	30	5	19.1	17 55.5	5	38.3	18 18.6	5	58.1	18 20.8	5	58.5	18 44.5	6	23.3	18 54.7				
	1	5	19.7	17 53.7	5	39.0	18 16.5	5	58.2	18 19.5	5	59.5	18 42.3	6	23.7	18 53.0				
	3	5	20.3	17 51.8	5	39.8	18 14.5	5	58.2	18 18.2	6	00.4	18 39.9	6	24.1	18 51.3				
Oct.	5	5	20.9	17 49.9	5	40.6	18 12.4	5	58.3	18 16.8	6	01.4	18 37.6	6	24.5	18 49.6				
	7	5	21.5	17 48.0	5	41.3	18 10.3	5	58.3	18 15.4	6	02.4	18 35.3	6	24.9	18 47.9				
	9	5	22.1	17 46.0	5	42.1	18 08.2	5	58.3	18 14.0	6	03.3	18 32.9	6	25.2	18 46.1				
	11	5	22.7	17 44.1	5	42.8	18 06.1	5	58.3	18 12.6	6	04.3	18 30.5	6	25.6	18 44.3				
	13	5	23.2	17 42.1	5	43.6	18 03.9	5	58.3	18 11.2	6	05.2	18 28.1	6	25.9	18 42.6				
	15	5	23.8	17 40.1	5	44.3	18 01.8	5	58.4	18 09.8	6	06.2	18 25.7	6	26.3	18 40.8				
	17	5	24.4	17 38.1	5	45.1	17 59.7	5	58.4	18 08.4	6	07.2	18 23.3	6	26.6	18 39.0				
	19	5	25.0	17 36.1	5	45.8	17 57.5	5	58.4	18 07.0	6	08.1	18 20.9	6	27.0	18 37.2				
	21	5	25.6	17 34.1	5	46.6	17 55.4	5	58.4	18 05.6	6	09.1	18 18.5	6	27.3	18 35.4				
	23	5	26.1	17 32.1	5	47.3	17 53.3	5	58.4	18 04.2	6	10.1	18 16.1	6	27.7	18 33.6				
	25	5	26.7	17 30.1	5	48.1	17 51.1	5	58.4	18 02.8	6	11.1	18 13.7	6	28.1	18 31.8				
	27	5	27.3	17 28.2	5	48.9	17 49.0	5	58.4	18 01.4	6	12.1	18 11.4	6	28.5	18 30.1				
	29	5	28.0	17 26.2	5	49.7	17 46.9	5	58.5	18 00.0	6	13.1	18 09.0	6	28.9	18 28.3				
	1	5	28.6	17 24.2	5	50.5	17 44.8	5	58.6	17 58.7	6	14.1	18 06.7	6	29.3	18 26.6				

SUNRISE AND SUNSET, 2025
INDIAN STANDARD TIME OF SUNRISE AND SUNSET (SUN'S UPPER LIMB)
FOR CERTAIN STATIONS IN INDIA

Date	Kolkata 22° N 32'				Varanasi 25° N 18'				Chennai 13° N 00'				Delhi 28° N 35'				Mumbai 18° N 54'				
	Rise		Set		Rise		Set		Rise		Set		Rise		Set		Rise		Set		
	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	
Oct.	1	5	28.6	17	24.2	5	50.5	17	44.8	5	58.6	17	58.7	6	14.1	18	06.7	6	29.3	18	26.6
	3	5	29.3	17	22.3	5	51.3	17	42.7	5	58.6	17	57.4	6	15.2	18	04.4	6	29.7	18	24.9
	5	5	29.9	17	20.4	5	52.1	17	40.6	5	58.7	17	56.1	6	16.2	18	02.2	6	30.1	18	23.2
	7	5	30.6	17	18.5	5	53.0	17	38.6	5	58.9	17	54.8	6	17.3	17	59.9	6	30.6	18	21.6
	9	5	31.3	17	16.7	5	53.9	17	36.6	5	59.0	17	53.5	6	18.5	17	57.8	6	31.1	18	20.0
	11	5	32.1	17	14.9	5	54.8	17	34.6	5	59.2	17	52.3	6	19.6	17	55.6	6	31.6	18	18.4
	13	5	32.8	17	13.1	5	55.7	17	32.7	5	59.4	17	51.2	6	20.7	17	53.5	6	32.2	18	16.9
	15	5	33.6	17	11.4	5	56.6	17	30.8	5	59.6	17	50.0	6	21.9	17	51.4	6	32.8	18	15.4
	17	5	34.4	17	09.7	5	57.6	17	29.0	5	59.9	17	48.9	6	23.1	17	49.4	6	33.4	18	14.0
	19	5	35.3	17	08.1	5	58.6	17	27.2	6	00.2	17	47.9	6	24.4	17	47.4	6	34.0	18	12.6
	21	5	36.2	17	06.5	5	59.6	17	25.4	6	00.5	17	46.9	6	25.7	17	45.5	6	34.7	18	11.3
	23	5	37.1	17	05.0	6	00.7	17	23.8	6	00.8	17	45.9	6	27.0	17	43.6	6	35.4	18	10.0
	25	5	38.0	17	03.5	6	01.8	17	22.1	6	01.2	17	45.0	6	28.3	17	41.8	6	36.1	18	08.8
	27	5	39.0	17	02.1	6	02.9	17	20.6	6	01.7	17	44.2	6	29.6	17	40.0	6	36.9	18	07.6
Nov.	29	5	40.0	17	00.8	6	04.0	17	19.1	6	02.2	17	43.4	6	31.0	17	38.4	6	37.7	18	06.5
	31	5	41.0	16	59.6	6	05.2	17	17.7	6	02.7	17	42.6	6	32.4	17	36.8	6	38.5	18	05.5
	2	5	42.1	16	58.4	6	06.4	17	16.3	6	03.2	17	42.0	6	33.9	17	35.2	6	39.4	18	04.6
	4	5	43.2	16	57.3	6	07.7	17	15.1	6	03.8	17	41.4	6	35.4	17	33.8	6	40.3	18	03.7
	6	5	44.3	16	56.3	6	09.0	17	13.9	6	04.5	17	40.9	6	36.9	17	32.4	6	41.3	18	02.9
	8	5	45.5	16	55.3	6	10.3	17	12.8	6	05.2	17	40.4	6	38.4	17	31.1	6	42.3	18	02.2
	10	5	46.6	16	54.5	6	11.6	17	11.8	6	05.9	17	40.0	6	39.9	17	30.0	6	43.3	18	01.5
	12	5	47.9	16	53.7	6	12.9	17	10.9	6	06.6	17	39.7	6	41.5	17	28.9	6	44.4	18	00.9
	14	5	49.1	16	53.0	6	14.3	17	10.1	6	07.4	17	39.5	6	43.1	17	27.9	6	45.4	18	00.4
	16	5	50.4	16	52.4	6	15.7	17	09.4	6	08.3	17	39.3	6	44.7	17	27.0	6	46.6	18	00.0
	18	5	51.6	16	51.9	6	17.1	17	08.7	6	09.2	17	39.2	6	46.3	17	26.2	6	47.7	17	59.7
	20	5	52.9	16	51.5	6	18.6	17	08.2	6	10.1	17	39.2	6	47.9	17	25.5	6	48.9	17	59.5
	22	5	54.2	16	51.2	6	20.0	17	07.8	6	11.0	17	39.3	6	49.5	17	25.0	6	50.1	17	59.3
	24	5	55.5	16	51.0	6	21.4	17	07.5	6	12.0	17	39.4	6	51.1	17	24.5	6	51.3	17	59.3
Dec.	26	5	56.9	16	50.9	6	22.9	17	07.2	6	13.0	17	39.6	6	52.7	17	24.1	6	52.5	17	59.3
	28	5	58.2	16	50.9	6	24.3	17	07.1	6	14.0	17	39.9	6	54.3	17	23.9	6	53.8	17	59.4
	30	5	59.5	16	51.0	6	25.8	17	07.1	6	15.1	17	40.3	6	55.9	17	23.8	6	55.0	17	59.6
	2	6	00.8	16	51.1	6	27.2	17	07.2	6	16.1	17	40.7	6	57.4	17	23.7	6	56.2	17	59.8
	4	6	02.1	16	51.4	6	28.6	17	07.4	6	17.2	17	41.2	6	59.0	17	23.8	6	57.5	18	00.2
	6	6	03.4	16	51.8	6	30.0	17	07.7	6	18.3	17	41.8	7	00.5	17	24.0	6	58.7	18	00.6
	8	6	04.7	16	52.2	6	31.4	17	08.1	6	19.4	17	42.4	7	01.9	17	24.3	6	60.0	18	01.1
	10	6	05.9	16	52.7	6	32.7	17	08.5	6	20.5	17	43.1	7	03.3	17	24.7	7	01.2	18	01.7
	12	6	07.2	16	53.4	6	34.0	17	09.1	6	21.6	17	43.8	7	04.7	17	25.2	7	02.4	18	02.4
	14	6	08.3	16	54.1	6	35.3	17	09.8	6	22.7	17	44.7	7	06.0	17	25.9	7	03.6	18	03.1
	16	6	09.5	16	54.9	6	36.5	17	10.5	6	23.7	17	45.5	7	07.3	17	26.6	7	04.7	18	03.9
	18	6	10.6	16	55.7	6	37.6	17	11.4	6	24.8	17	46.4	7	08.4	17	27.4	7	05.8	18	04.7
	20	6	11.7	16	56.6	6	38.7	17	12.3	6	25.8	17	47.4	7	09.5	17	28.3	7	06.9	18	05.7
	22	6	12.7	16	57.7	6	39.7	17	13.3	6	26.8	17	48.3	7	10.6	17	29.3	7	07.9	18	06.6
	24	6	13.6	16	58.7	6	40.7	17	14.4	6	27.8	17	49.4	7	11.5	17	30.4	7	08.9	18	07.7
	26	6	14.5	16	59.8	6	41.5	17	15.5	6	28.7	17	50.4	7	12.4	17	31.5	7	09.8	18	08.7
	28	6	15.3	17	01.0	6	42.3	17	16.7	6	29.6	17	51.5	7	13.1	17	32.7	7	10.6	18	09.9
	30	6	16.0	17	02.2	6	43.1	17	18.0	6	30.5	17	52.6	7	13.8	17	34.0	7	11.4	18	11.0
	32	6	16.7	17	03.5	6	43.7	17	19.3	6	31.3	17	53.7	7	14.4	17	35.4	7	12.1	18	12.2

MOONRISE, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONRISE (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.							FOR CERTAIN STATIONS IN INDIA IN I.S.T.							
Date	Lat.	0°	10°	20°	30°	40°	50°	Kolkata	Chennai	Delhi	Mumbai			
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan.	0	6 10	6 32	6 56	7 24	8 00	8 52	6 39	6 49	7 42	7 34			
	1	7 07	7 28	7 49	8 14	8 45	9 31	7 31	7 44	8 32	8 27			
	2	8 02	8 19	8 37	8 58	9 23	9 59	8 18	8 34	9 16	9 15			
	3	8 55	9 07	9 20	9 36	9 54	10 20	9 00	9 21	9 55	9 59			
	4	9 44	9 52	10 00	10 10	10 21	10 37	9 39	10 04	10 30	10 39			
	5	10 32	10 35	10 38	10 41	10 45	10 51	10 14	10 45	11 02	11 17			
	6	11 19	11 17	11 14	11 12	11 09	11 05	10 50	11 25	11 34	11 54			
	7	12 07	11 59	11 52	11 43	11 33	11 19	11 26	12 06	12 06	12 32			
	8	12 57	12 45	12 32	12 18	12 00	11 36	12 04	12 50	12 41	13 13			
	9	13 50	13 34	13 16	12 56	12 32	11 57	12 47	13 38	13 21	13 58			
	10	14 48	14 28	14 06	13 42	13 11	12 26	13 36	14 30	14 07	14 48			
	11	15 48	15 26	15 02	14 34	13 59	13 07	14 31	15 28	15 00	15 45			
	12	16 50	16 27	16 03	15 34	14 58	14 03	15 32	16 29	16 00	16 45			
	13	17 50	17 28	17 05	16 39	16 04	15 13	16 34	17 31	17 05	17 48			
	14	18 46	18 27	18 07	17 44	17 15	16 32	17 38	18 31	18 10	18 50			
	15	19 37	19 22	19 06	18 48	18 25	17 53	18 38	19 27	19 13	19 49			
	16	20 24	20 13	20 02	19 49	19 32	19 10	19 35	20 19	20 12	20 43			
	17	21 07	21 00	20 54	20 46	20 37	20 24	20 28	21 08	21 09	21 35			
	18	21 47	21 45	21 43	21 41	21 38	21 34	21 19	21 54	22 03	22 23			
	19	22 26	22 29	22 31	22 34	22 38	22 43	22 08	22 39	22 56	23 11			
	20	23 06	23 12	23 19	23 28	23 38	23 51	22 57	23 24	23 49	23 59			
	21	23 46	23 57	** **	** **	** **	** **	23 48	** **	** **	** **			
	22	** **	** **	0 08	0 22	0 38	1 01	** **	0 10	0 42	0 47			
	23	0 29	0 44	0 59	1 17	1 40	2 12	0 39	0 58	1 37	1 38			
	24	1 15	1 33	1 53	2 15	2 44	3 26	1 34	1 49	2 34	2 31			
	25	2 05	2 26	2 49	3 15	3 49	4 38	2 31	2 42	3 34	3 27			
	26	2 59	3 22	3 46	4 15	4 51	5 46	3 29	3 39	4 32	4 24			
	27	3 56	4 19	4 44	5 12	5 49	6 43	4 26	4 35	5 30	5 21			
	28	4 54	5 15	5 38	6 05	6 38	7 27	5 20	5 32	6 22	6 16			
	29	5 51	6 09	6 29	6 52	7 20	8 00	6 10	6 24	7 10	7 07			
Feb.	30	6 46	7 00	7 15	7 32	7 54	8 24	6 55	7 14	7 52	7 53			
	31	7 37	7 47	7 57	8 09	8 23	8 42	7 36	7 59	8 28	8 36			
	1	8 27	8 32	8 36	8 42	8 48	8 57	8 13	8 42	9 03	9 16			
	2	9 15	9 15	9 14	9 13	9 13	9 11	8 50	9 24	9 35	9 54			
	3	10 04	9 58	9 52	9 45	9 37	9 26	9 27	10 05	10 08	10 32			
	4	10 54	10 43	10 32	10 19	10 03	9 42	10 05	10 49	10 42	11 13			
	5	11 46	11 31	11 15	10 56	10 33	10 01	10 46	11 36	11 21	11 56			
	6	12 42	12 23	12 02	11 39	11 09	10 27	11 33	12 26	12 04	12 44			
	7	13 41	13 19	12 55	12 28	11 54	11 03	12 24	13 21	12 54	13 38			
	8	14 41	14 18	13 53	13 25	12 48	11 53	13 22	14 19	13 51	14 36			
	9	15 40	15 18	14 54	14 26	13 51	12 57	14 23	15 20	14 52	15 37			
	10	16 36	16 17	15 55	15 31	14 59	14 13	15 25	16 19	15 56	16 38			
	11	17 29	17 12	16 55	16 34	16 09	15 32	16 25	17 17	16 59	17 37			
	12	18 17	18 04	17 51	17 36	17 17	16 50	17 23	18 10	18 00	18 32			
	13	19 01	18 53	18 44	18 34	18 22	18 05	18 17	19 00	18 58	19 25			
	14	19 42	19 39	19 35	19 30	19 25	19 17	19 10	19 47	19 53	20 15			
	15	20 22	20 23	20 24	20 24	20 26	20 27	20 00	20 32	20 46	21 04			

The symbol (**) indicates that the phenomenon will occur on the next day

MOONSET, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONSET (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.							FOR CERTAIN STATIONS IN INDIA IN I.S.T.				
Date	Lat.	0°	10°	20°	30°	40°	50°	Kolkata	Chennai	Delhi	Mumbai
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan.	0	18 38	18 16	17 53	17 26	16 51	16 00	17 23	18 19	17 52	18 36
	1	19 34	19 16	18 55	18 32	18 02	17 19	18 25	19 19	18 57	19 38
	2	20 28	20 13	19 57	19 38	19 15	18 42	19 28	20 17	20 03	20 39
	3	21 18	21 08	20 57	20 44	20 28	20 06	20 30	21 14	21 08	21 39
	4	22 07	22 01	21 56	21 49	21 41	21 29	21 30	22 09	22 12	22 36
	5	22 54	22 54	22 53	22 53	22 52	22 51	22 29	23 03	23 15	23 34
	6	23 41	23 46	23 51	23 57	** **	** **	23 28	23 57	** **	** **
	7	** **	** **	** **	** **	0 04	0 13	** **	** **	0 18	0 30
	8	0 30	0 40	0 50	1 02	1 17	1 37	0 28	0 52	1 23	1 29
	9	1 22	1 36	1 52	2 09	2 32	3 04	1 32	1 50	2 29	2 30
	10	2 17	2 36	2 56	3 19	3 48	4 31	2 36	2 51	3 38	3 34
	11	3 16	3 38	4 01	4 28	5 02	5 54	3 43	3 54	4 46	4 39
	12	4 18	4 41	5 05	5 34	6 10	7 05	4 47	4 57	5 52	5 43
	13	5 19	5 41	6 05	6 33	7 08	8 00	5 48	5 58	6 50	6 42
	14	6 17	6 37	6 59	7 23	7 54	8 39	6 40	6 53	7 42	7 37
	15	7 11	7 28	7 45	8 05	8 31	9 06	7 26	7 42	8 24	8 23
	16	8 00	8 12	8 26	8 41	9 00	9 25	8 05	8 25	9 00	9 04
	17	8 45	8 53	9 02	9 12	9 24	9 40	8 40	9 05	9 32	9 41
	18	9 26	9 30	9 35	9 39	9 45	9 53	9 12	9 41	10 00	10 13
	19	10 06	10 06	10 06	10 05	10 05	10 04	9 42	10 15	10 26	10 45
	20	10 45	10 41	10 36	10 31	10 24	10 15	10 11	10 48	10 53	11 16
	21	11 25	11 16	11 07	10 57	10 44	10 27	10 41	11 23	11 20	11 48
	22	12 07	11 54	11 41	11 25	11 07	10 41	11 13	11 59	11 49	12 21
	23	12 51	12 35	12 17	11 58	11 33	10 58	11 49	12 38	12 22	12 59
	24	13 39	13 20	12 59	12 35	12 04	11 21	12 29	13 23	13 00	13 41
	25	14 31	14 09	13 46	13 19	12 44	11 53	13 15	14 11	13 44	14 28
	26	15 26	15 04	14 39	14 10	13 33	12 38	14 08	15 06	14 36	15 22
	27	16 24	16 02	15 38	15 10	14 33	13 39	15 07	16 04	15 36	16 20
	28	17 22	17 01	16 40	16 15	15 42	14 55	16 09	17 04	16 40	17 23
	29	18 17	18 01	17 43	17 22	16 56	16 19	17 14	18 05	17 48	18 25
Feb.	30	19 11	18 58	18 45	18 30	18 12	17 45	18 17	19 04	18 55	19 27
	31	20 01	19 54	19 46	19 38	19 27	19 11	19 20	20 01	20 01	20 27
	1	20 50	20 48	20 46	20 44	20 40	20 36	20 21	20 57	21 06	21 27
	2	21 38	21 42	21 45	21 49	21 54	22 00	21 22	21 52	22 10	22 25
	3	22 27	22 36	22 45	22 55	23 08	23 25	22 23	22 48	23 16	23 24
	4	23 18	23 32	23 46	** **	** **	** **	23 26	23 46	** **	** **
	5	** **	** **	** **	0 02	0 23	0 51	** **	** **	0 22	0 25
	6	0 13	0 30	0 49	1 11	1 38	2 18	0 29	0 45	1 30	1 27
	7	1 10	1 31	1 53	2 19	2 53	3 42	1 35	1 47	2 37	2 31
	8	2 09	2 32	2 57	3 25	4 02	4 56	2 39	2 48	3 43	3 34
	9	3 10	3 32	3 57	4 25	5 01	5 55	3 39	3 49	4 42	4 34
	10	4 08	4 29	4 51	5 17	5 50	6 38	4 33	4 44	5 35	5 29
	11	5 02	5 20	5 39	6 02	6 29	7 08	5 21	5 35	6 20	6 17
	12	5 52	6 06	6 22	6 39	7 00	7 30	6 02	6 20	7 08	7 00
	13	6 38	6 48	6 59	7 11	7 26	7 46	6 38	7 01	7 31	7 38
	14	7 21	7 27	7 33	7 40	7 48	7 59	7 11	7 38	8 00	8 11
	15	8 01	8 03	8 04	8 06	8 08	8 11	7 41	8 12	8 27	8 43

The symbol (**) indicates that the phenomenon will occur on the next day

MOONRISE, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONRISE (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.							FOR CERTAIN STATIONS IN INDIA IN I.S.T.										
Date	Lat.	0°		10°		20°		30°		40°		50°		Kolkata	Chennai	Delhi	Mumbai
		h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m
Feb.	15	20	22	20	23	20	24	20	24	20	26	20	27	20	00	20	04
	16	21	01	21	06	21	12	21	18	21	26	21	36	20	49	21	51
	17	21	42	21	51	22	01	22	12	22	26	22	45	21	39	22	39
	18	22	23	22	36	22	51	23	07	23	27	23	56	22	30	23	29
	19	23	08	23	24	23	43	**	**	**	**	**	**	23	24	**	**
	20	23	55	**	**	**	**	0	03	0	30	1	08	**	**	0	21
	21	**	**	0	15	0	37	1	02	1	34	2	20	0	18	1	15
	22	0	47	1	09	1	33	2	01	2	36	3	30	1	15	2	10
	23	1	41	2	04	2	29	2	58	3	35	4	31	2	12	3	07
	24	2	38	3	00	3	24	3	52	4	28	5	21	3	07	4	02
	25	3	35	3	55	4	17	4	41	5	13	5	58	3	58	4	54
	26	4	31	4	47	5	05	5	25	5	50	6	25	4	45	5	43
	27	5	24	5	36	5	49	6	03	6	21	6	45	5	28	6	27
	28	6	16	6	23	6	30	6	38	6	49	7	02	6	08	6	09
	1 Mar.	7	06	7	08	7	09	7	11	7	14	7	17	6	45	7	49
	2	7	56	7	52	7	48	7	44	7	38	7	31	7	23	8	28
	3	8	47	8	38	8	28	8	18	8	05	7	47	8	02	8	41
	4	9	40	9	26	9	11	8	55	8	34	8	06	8	43	9	19
	5	10	36	10	18	9	59	9	36	9	09	8	29	9	29	10	01
	6	11	35	11	14	10	51	10	25	9	51	9	02	10	20	10	50
	7	12	35	12	13	11	48	11	19	10	43	9	48	11	17	11	46
	8	13	35	13	12	12	48	12	19	11	43	10	48	12	17	12	46
	9	14	32	14	11	13	49	13	23	12	49	12	00	13	18	13	49
	10	15	24	15	07	14	48	14	26	13	58	13	18	14	18	14	51
	11	16	13	15	59	15	44	15	27	15	06	14	36	15	16	15	52
	12	16	58	16	48	16	38	16	26	16	11	15	51	16	11	16	50
	13	17	39	17	34	17	29	17	22	17	14	17	03	17	03	17	45
	14	18	20	18	19	18	18	18	17	18	15	18	13	17	54	18	39
	15	18	59	19	02	19	06	19	10	19	15	19	22	18	43	19	32
	16	19	39	19	46	19	54	20	04	20	16	20	32	19	33	20	24
	17	20	20	20	31	20	44	20	58	21	17	21	42	20	23	21	23
	18	21	03	21	18	21	35	21	54	22	19	22	53	21	16	22	14
	19	21	49	22	08	22	28	22	52	23	22	**	**	22	10	23	11
	20	22	39	23	00	23	23	23	50	**	**	0	06	23	05	**	**
	21	23	31	23	54	**	**	**	**	0	24	1	16	**	**	0	08
	22	**	**	**	**	0	18	0	47	1	24	2	20	0	01	1	05
	23	0	26	0	48	1	13	1	41	2	18	3	13	0	55	1	59
	24	1	21	1	42	2	05	2	31	3	05	3	54	1	47	2	49
	25	2	16	2	34	2	54	3	16	3	44	4	25	2	35	3	35
	26	3	09	3	23	3	39	3	56	4	18	4	47	3	19	4	15
	27	4	01	4	10	4	21	4	32	4	46	5	06	3	59	4	52
	28	4	51	4	56	5	00	5	06	5	12	5	21	4	37	5	27
	29	5	42	5	41	5	40	5	39	5	37	5	36	5	15	6	00
	30	6	33	6	27	6	20	6	12	6	03	5	51	5	54	6	35
	31	7	27	7	15	7	03	6	49	6	32	6	08	6	35	7	12
	1 Apr.	8	24	8	07	7	50	7	30	7	05	6	30	7	21	7	54
	2	9	24	9	04	8	42	8	17	7	46	7	00	8	12	8	42

The symbol (**) indicates that the phenomenon will occur on the next day

MOONSET, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONSET (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82° 5 E) IN L. M. T.								FOR CERTAIN STATIONS IN INDIA IN I.S.T.			
Date	Lat.	0°	10°	20°	30°	40°	50°	Kolkata	Chennai	Delhi	Mumbai
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb.	15	8 01	8 03	8 04	8 06	8 08	8 11	7 41	8 12	8 27	8 43
	16	8 41	8 38	8 35	8 32	8 28	8 22	8 10	8 46	8 53	9 15
	17	9 21	9 14	9 06	8 58	8 47	8 33	8 40	9 21	9 20	9 46
	18	10 01	9 50	9 38	9 25	9 09	8 46	9 11	9 56	9 48	10 19
	19	10 44	10 29	10 13	9 55	9 33	9 01	9 45	10 33	10 19	10 55
	20	11 30	11 12	10 52	10 30	10 02	9 21	10 23	11 15	10 54	11 34
	21	12 20	11 59	11 36	11 10	10 37	9 49	11 06	12 01	11 36	12 18
	22	13 13	12 50	12 26	11 57	11 21	10 27	11 55	12 52	12 23	13 08
Mar.	23	14 09	13 46	13 21	12 52	12 15	11 19	12 50	13 48	13 18	14 04
	24	15 05	14 44	14 21	13 54	13 19	12 28	13 50	14 46	14 20	15 04
	25	16 02	15 43	15 23	15 00	14 31	13 48	14 53	15 47	15 26	16 06
	26	16 56	16 42	16 26	16 08	15 46	15 14	15 58	16 47	16 33	17 09
	27	17 49	17 39	17 29	17 17	17 02	16 42	17 02	17 46	17 41	18 10
	28	18 40	18 35	18 30	18 25	18 18	18 09	18 05	18 43	18 48	19 11
	1	19 29	19 30	19 32	19 33	19 34	19 36	19 08	19 41	19 55	20 12
	2	20 20	20 26	20 33	20 41	20 51	21 04	20 11	20 38	21 02	21 13
	3	21 12	21 23	21 36	21 50	22 08	22 33	21 15	21 37	22 10	22 15
	4	22 07	22 23	22 40	23 01	23 26	** **	22 21	22 37	23 20	23 19
	5	23 04	23 24	23 46	** **	** **	0 03	23 28	23 40	** **	** **
	6	** **	** **	** **	0 11	0 43	1 30	** **	** **	0 29	0 24
	7	0 04	0 26	0 51	1 19	1 55	2 49	0 33	0 43	1 37	1 29
	8	1 04	1 27	1 52	2 21	2 58	3 53	1 35	1 44	2 38	2 29
	9	2 03	2 25	2 48	3 15	3 49	4 40	2 30	2 41	3 33	3 26
	10	2 58	3 17	3 37	4 01	4 31	5 13	3 19	3 32	4 19	4 15
	11	3 48	4 04	4 21	4 40	5 03	5 36	4 01	4 18	4 58	4 58
	12	4 35	4 46	4 59	5 13	5 30	5 54	4 38	4 59	5 32	5 37
	13	5 18	5 25	5 33	5 42	5 53	6 07	5 11	5 37	6 02	6 12
	14	5 59	6 02	6 05	6 09	6 13	6 19	5 42	6 12	6 29	6 44
	15	6 39	6 37	6 36	6 34	6 33	6 30	6 11	6 46	6 56	7 16
	16	7 18	7 12	7 07	7 00	6 52	6 41	6 41	7 20	7 22	7 47
	17	7 58	7 49	7 38	7 27	7 12	6 53	7 12	7 55	7 50	8 19
	18	8 40	8 27	8 12	7 56	7 35	7 07	7 44	8 31	8 19	8 53
	19	9 25	9 08	8 49	8 28	8 02	7 25	8 20	9 11	8 53	9 31
	20	10 13	9 52	9 31	9 06	8 34	7 49	9 01	9 55	9 31	10 13
	21	11 03	10 41	10 17	9 50	9 14	8 22	9 47	10 43	10 15	11 00
	22	11 57	11 34	11 09	10 40	10 03	9 07	10 38	11 36	11 06	11 52
	23	12 52	12 30	12 06	11 38	11 02	10 07	11 35	12 32	12 04	12 48
	24	13 47	13 27	13 06	12 40	12 08	11 21	12 35	13 30	13 06	13 48
	25	14 41	14 25	14 07	13 46	13 20	12 42	13 38	14 28	14 11	14 49
	26	15 34	15 22	15 09	14 53	14 34	14 08	14 40	15 27	15 18	15 50
	27	16 25	16 18	16 10	16 01	15 50	15 35	15 44	16 24	16 24	16 51
	28	17 15	17 13	17 11	17 09	17 06	17 02	16 46	17 22	17 32	17 52
	29	18 06	18 09	18 13	18 18	18 23	18 31	17 50	18 20	18 39	18 53
	30	18 58	19 07	19 17	19 28	19 42	20 02	18 56	19 20	19 49	19 57
Apr.	31	19 54	20 08	20 23	20 41	21 03	21 35	20 03	20 22	21 01	21 02
	1	20 52	21 11	21 31	21 54	22 24	23 07	21 12	21 27	22 13	22 09
	2	21 54	22 15	22 39	23 06	23 41	** **	22 21	22 32	23 24	23 17

The symbol (**) indicates that the phenomenon will occur on the next day

MOONRISE, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONRISE (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.							FOR CERTAIN STATIONS IN INDIA IN I.S.T.							
Lat. Date	0°	10°	20°	30°	40°	50°	Kolkata	Chennai	Delhi	Mumbai				
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr.	1	8 24	8 07	7 50	7 30	7 05	6 30	7 21	8 11	7 54	8 31			
	2	9 24	9 04	8 42	8 17	7 46	7 00	8 12	9 07	8 42	9 25			
	3	10 26	10 04	9 39	9 11	8 35	7 42	9 08	10 06	9 37	10 22			
	4	11 28	11 05	10 40	10 12	9 35	8 39	10 09	11 07	10 38	11 23			
	5	12 27	12 05	11 42	11 15	10 41	9 49	11 12	12 08	11 42	12 25			
	6	13 21	13 03	12 43	12 19	11 50	11 07	12 13	13 06	12 45	13 25			
	7	14 11	13 56	13 40	13 21	12 58	12 25	13 12	14 01	13 46	14 22			
	8	14 57	14 46	14 34	14 21	14 04	13 40	14 07	14 52	14 44	15 16			
	9	15 39	15 32	15 25	15 17	15 07	14 53	14 59	15 40	15 40	16 06			
	10	16 19	16 17	16 14	16 11	16 08	16 03	15 50	16 25	16 34	16 54			
	11	16 58	17 00	17 02	17 05	17 08	17 12	16 39	17 10	17 27	17 42			
	12	17 38	17 44	17 50	17 58	18 07	18 20	17 28	17 55	18 19	18 29			
	13	18 18	18 28	18 39	18 52	19 08	19 30	18 18	18 41	19 12	19 18			
	14	19 00	19 15	19 30	19 48	20 10	20 41	19 10	19 29	20 07	20 08			
	15	19 46	20 03	20 23	20 45	21 13	21 53	20 04	20 18	21 04	21 01			
	16	20 34	20 55	21 17	21 43	22 16	23 04	20 59	21 11	22 01	21 55			
	17	21 25	21 47	22 12	22 40	23 16	** **	21 54	22 04	22 58	22 49			
	18	22 18	22 41	23 06	23 35	** **	0 10	22 48	22 58	23 53	23 44			
	19	23 12	23 34	23 58	** **	0 11	1 07	23 40	23 51	** **	** **			
	20	** **	** **	** **	0 25	1 00	1 51	** **	** **	0 43	0 35			
	21	0 06	0 26	0 47	1 11	1 41	2 25	0 28	0 41	1 29	1 24			
	22	0 58	1 14	1 31	1 51	2 16	2 50	1 12	1 29	2 10	2 09			
	23	1 49	2 01	2 13	2 27	2 45	3 09	1 53	2 13	2 47	2 51			
	24	2 38	2 45	2 53	3 01	3 11	3 25	2 30	2 56	3 21	3 32			
	25	3 27	3 29	3 31	3 33	3 36	3 40	3 07	3 39	3 54	4 10			
	26	4 17	4 14	4 10	4 06	4 01	3 54	3 45	4 21	4 28	4 50			
	27	5 09	5 01	4 51	4 41	4 28	4 10	4 24	5 07	5 04	5 32			
	28	6 05	5 51	5 36	5 20	4 59	4 30	5 08	5 56	5 44	6 18			
	29	7 05	6 47	6 27	6 05	5 36	4 56	5 57	6 50	6 29	7 09			
	30	8 09	7 47	7 24	6 57	6 23	5 33	6 53	7 50	7 23	8 06			
May	1	9 13	8 50	8 26	7 57	7 20	6 25	7 54	8 52	8 23	9 09			
	2	10 16	9 54	9 30	9 02	8 26	7 33	8 59	9 56	9 28	10 13			
	3	11 14	10 54	10 33	10 08	9 37	8 51	10 03	10 57	10 34	11 16			
	4	12 07	11 51	11 33	11 13	10 48	10 11	11 04	11 55	11 38	12 15			
	5	12 54	12 42	12 29	12 14	11 55	11 29	12 01	12 48	12 38	13 11			
	6	13 38	13 30	13 22	13 12	13 00	12 43	12 55	13 37	13 36	14 03			
	7	14 19	14 15	14 11	14 07	14 01	13 54	13 46	14 23	14 29	14 52			
	8	14 58	14 59	14 59	15 00	15 01	15 03	14 35	15 08	15 22	15 40			
	9	15 37	15 42	15 47	15 53	16 01	16 11	15 25	15 53	16 14	16 27			
	10	16 17	16 26	16 36	16 47	17 01	17 20	16 14	16 38	17 07	17 15			
	11	16 59	17 12	17 26	17 42	18 02	18 30	17 06	17 26	18 01	18 04			
	12	17 43	18 00	18 18	18 38	19 05	19 42	17 59	18 14	18 57	18 56			
	13	18 31	18 50	19 12	19 36	20 08	20 54	18 53	19 06	19 55	19 50			
	14	19 21	19 43	20 07	20 34	21 09	22 02	19 49	19 59	20 52	20 44			
	15	20 14	20 37	21 01	21 30	22 07	23 02	20 44	20 53	21 48	21 39			
	16	21 08	21 30	21 54	22 22	22 57	23 50	21 37	21 47	22 39	22 31			
	17	22 01	22 22	22 43	23 08	23 40	** **	22 25	22 37	23 27	23 21			

The symbol (**) indicates that the phenomenon will occur on the next day

MOONSET, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONSET (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.								FOR CERTAIN STATIONS IN INDIA IN I.S.T.			
Date	Lat.	0°	10°	20°	30°	40°	50°	Kolkata	Chennai	Delhi	Mumbai
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr.	1	20 52	21 11	21 31	21 54	22 24	23 07	21 12	21 27	22 13	22 09
	2	21 54	22 15	22 39	23 06	23 41	** **	22 21	22 32	23 24	23 17
	3	22 56	23 19	23 44	** **	** **	0 33	23 26	23 36	** **	** **
	4	23 57	** **	** **	0 13	0 50	1 45	** **	** **	0 30	0 21
	5	** **	0 19	0 43	1 11	1 46	2 39	0 25	0 35	1 29	1 21
	6	0 54	1 14	1 35	2 00	2 31	3 16	1 17	1 30	2 18	2 13
	7	1 46	2 03	2 21	2 41	3 07	3 42	2 01	2 17	3 00	2 58
	8	2 33	2 46	3 00	3 16	3 35	4 01	2 40	3 00	3 35	3 38
	9	3 17	3 26	3 35	3 46	3 59	4 16	3 14	3 38	4 05	4 13
	10	3 58	4 03	4 08	4 13	4 19	4 28	3 45	4 13	4 33	4 46
	11	4 38	4 38	4 38	4 39	4 39	4 39	4 14	4 47	5 00	5 18
	12	5 17	5 13	5 09	5 04	4 58	4 50	4 43	5 21	5 26	5 49
	13	5 57	5 49	5 40	5 30	5 18	5 02	5 14	5 55	5 53	6 20
	14	6 38	6 26	6 13	5 58	5 40	5 15	5 45	6 31	6 21	6 54
	15	7 22	7 06	6 49	6 30	6 05	5 31	6 20	7 10	6 54	7 30
	16	8 09	7 49	7 29	7 05	6 36	5 53	6 59	7 52	7 30	8 11
	17	8 58	8 37	8 14	7 47	7 13	6 23	7 43	8 39	8 12	8 56
	18	9 51	9 28	9 03	8 35	7 58	7 03	8 32	9 30	9 01	9 46
	19	10 44	10 22	9 57	9 29	8 52	7 57	9 26	10 23	9 55	10 40
	20	11 38	11 17	10 55	10 28	9 54	9 04	10 24	11 20	10 54	11 37
	21	12 31	12 13	11 54	11 31	11 02	10 21	11 24	12 16	11 56	12 36
	22	13 23	13 08	12 53	12 36	12 13	11 42	12 24	13 13	13 00	13 35
	23	14 12	14 03	13 53	13 41	13 26	13 06	13 26	14 09	14 04	14 34
	24	15 01	14 57	14 52	14 46	14 39	14 30	14 26	15 05	15 09	15 33
	25	15 51	15 51	15 52	15 53	15 54	15 56	15 29	16 01	16 15	16 32
	26	16 41	16 48	16 54	17 02	17 11	17 24	16 32	16 59	17 24	17 35
	27	17 35	17 47	17 59	18 14	18 32	18 57	17 39	18 00	18 34	18 39
	28	18 33	18 50	19 08	19 28	19 54	20 31	18 48	19 05	19 48	19 47
	29	19 35	19 56	20 18	20 43	21 16	22 04	19 59	20 12	21 02	20 56
	30	20 40	21 02	21 27	21 55	22 32	23 26	21 09	21 19	22 13	22 04
May	1	21 44	22 07	22 31	22 59	23 36	** **	22 13	22 23	23 17	23 09
	2	22 45	23 06	23 28	23 54	** **	0 30	23 10	23 22	** **	** **
	3	23 40	23 58	** **	** **	0 27	1 15	23 58	** **	0 12	0 06
	4	** **	** **	0 17	0 39	1 07	1 45	** **	0 13	0 58	0 55
	5	0 30	0 44	0 59	1 17	1 38	2 07	0 39	0 58	1 36	1 38
	6	1 16	1 26	1 36	1 48	2 03	2 23	1 15	1 38	2 08	2 15
	7	1 58	2 04	2 10	2 17	2 25	2 36	1 48	2 14	2 37	2 48
	8	2 38	2 39	2 41	2 43	2 45	2 48	2 17	2 49	3 04	3 20
	9	3 17	3 14	3 11	3 08	3 04	2 59	2 46	3 22	3 30	3 51
	10	3 56	3 49	3 42	3 34	3 24	3 10	3 16	3 56	3 56	4 22
	11	4 37	4 26	4 14	4 01	3 45	3 23	3 47	4 31	4 24	4 55
	12	5 20	5 05	4 49	4 31	4 09	3 38	4 21	5 10	4 55	5 31
	13	6 06	5 48	5 28	5 06	4 38	3 58	4 59	5 51	5 31	6 10
	14	6 55	6 34	6 12	5 46	5 13	4 25	5 41	6 36	6 11	6 54
	15	7 47	7 24	7 00	6 32	5 56	5 03	6 29	7 26	6 58	7 43
	16	8 40	8 17	7 53	7 24	6 48	5 53	7 22	8 19	7 50	8 35
	17	9 34	9 12	8 49	8 22	7 47	6 56	8 18	9 15	8 48	9 32

The symbol (**) indicates that the phenomenon will occur on the next day

MOONRISE, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONRISE (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.											FOR CERTAIN STATIONS IN INDIA IN I.S.T.								
Date	Lat.	0°		10°		20°		30°		40°		50°		Kolkata	Chennai	Delhi	Mumbai		
		h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m
May	17	22	01	22	22	22	43	23	08	23	40	**	**	22	25	22	37	23	21
	18	22	53	23	10	23	29	23	50	**	**	0	26	23	10	23	25	**	**
	19	23	43	23	56	**	**	**	**	0	16	0	53	23	50	**	**	0	06
	20	**	**	**	**	0	10	0	26	0	46	1	13	**	**	0	09	0	45
	21	0	31	0	40	0	49	1	00	1	13	1	30	0	27	0	51	1	20
	22	1	18	1	22	1	26	1	31	1	37	1	45	1	03	1	33	1	52
	23	2	06	2	05	2	03	2	02	2	01	1	59	1	39	2	13	2	24
	24	2	55	2	49	2	42	2	35	2	26	2	13	2	16	2	56	2	57
	25	3	48	3	37	3	24	3	11	2	54	2	31	2	57	3	42	3	34
	26	4	45	4	29	4	12	3	52	3	27	2	53	3	43	4	33	4	16
	27	5	47	5	27	5	05	4	41	4	09	3	25	4	35	5	30	5	06
	28	6	52	6	30	6	06	5	38	5	02	4	09	5	35	6	32	6	04
	29	7	58	7	35	7	11	6	42	6	06	5	11	6	39	7	37	7	08
	30	9	00	8	39	8	17	7	50	7	17	6	27	7	46	8	41	8	16
	31	9	57	9	39	9	20	8	58	8	30	7	50	8	50	9	43	9	23
June	1	10	48	10	34	10	19	10	02	9	41	9	11	9	51	10	39	10	27
	2	11	34	11	25	11	14	11	03	10	49	10	29	10	47	11	31	11	27
	3	12	16	12	11	12	06	12	00	11	52	11	42	11	41	12	19	12	22
	4	12	57	12	56	12	55	12	54	12	53	12	52	12	31	13	05	13	17
	5	13	36	13	40	13	43	13	48	13	53	14	01	13	20	13	50	14	09
	6	14	16	14	23	14	32	14	41	14	53	15	09	14	10	14	35	15	02
	7	14	57	15	08	15	21	15	36	15	54	16	19	15	00	15	22	15	55
	8	15	40	15	56	16	12	16	32	16	56	17	30	15	53	16	10	16	51
	9	16	27	16	45	17	06	17	29	17	59	18	42	16	47	17	01	17	48
	10	17	16	17	38	18	01	18	27	19	02	19	52	17	43	17	54	18	45
	11	18	09	18	32	18	56	19	24	20	01	20	55	18	38	18	48	19	42
	12	19	03	19	26	19	50	20	18	20	54	21	47	19	33	19	43	20	36
	13	19	57	20	18	20	41	21	07	21	39	22	27	20	22	20	34	21	25
	14	20	50	21	08	21	27	21	50	22	17	22	57	21	09	21	23	22	08
	15	21	40	21	55	22	10	22	27	22	49	23	19	21	50	22	08	22	46
	16	22	28	22	38	22	49	23	01	23	16	23	36	22	28	22	51	23	21
	17	23	15	23	20	23	26	23	32	23	40	23	51	23	04	23	31	23	53
	18	**	**	**	**	**	**	**	**	**	**	**	**	23	38	**	**	**	**
	19	0	01	0	02	0	02	0	03	0	03	0	05	**	**	0	11	0	24
	20	0	48	0	44	0	39	0	34	0	27	0	18	0	13	0	51	0	56
July	21	1	38	1	28	1	18	1	07	0	53	0	34	0	51	1	35	1	30
	22	2	31	2	17	2	02	1	44	1	23	0	54	1	34	2	21	2	08
	23	3	29	3	11	2	51	2	28	2	00	1	20	2	21	3	14	2	53
	24	4	32	4	10	3	47	3	21	2	47	1	57	3	17	4	13	3	46
	25	5	37	5	14	4	50	4	21	3	45	2	50	4	18	5	16	4	47
	26	6	41	6	19	5	56	5	28	4	53	4	01	5	25	6	21	5	54
	27	7	42	7	22	7	02	6	38	6	07	5	22	6	31	7	26	7	03
	28	8	36	8	21	8	04	7	45	7	21	6	47	7	36	8	25	8	10
	29	9	26	9	15	9	03	8	49	8	32	8	08	8	35	9	20	9	13
	30	10	11	10	04	9	57	9	48	9	38	9	24	9	31	10	11	10	11
	1	10	52	10	50	10	48	10	45	10	42	10	37	10	23	10	59	11	07
	2	11	33	11	35	11	37	11	40	11	43	11	47	11	13	11	45	12	01

The symbol (**) indicates that the phenomenon will occur on the next day

MOONSET, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONSET (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82° 5 E) IN L. M. T.								FOR CERTAIN STATIONS IN INDIA IN I.S.T.			
Date	Lat.	0°	10°	20°	30°	40°	50°	Kolkata	Chennai	Delhi	Mumbai
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May	17	9 34	9 12	8 49	8 22	7 47	6 56	8 18	9 15	8 48	9 32
	18	10 26	10 07	9 47	9 23	8 53	8 09	9 17	10 10	9 49	10 29
	19	11 17	11 02	10 45	10 26	10 02	9 27	10 16	11 06	10 50	11 27
	20	12 06	11 55	11 43	11 29	11 12	10 48	11 15	12 00	11 53	12 24
	21	12 53	12 47	12 40	12 32	12 22	12 09	12 14	12 54	12 55	13 21
	22	13 41	13 39	13 38	13 36	13 34	13 31	13 13	13 48	13 58	14 18
	23	14 29	14 33	14 37	14 41	14 47	14 55	14 13	14 43	15 03	15 17
	24	15 20	15 29	15 38	15 49	16 03	16 22	15 17	15 42	16 10	16 18
	25	16 15	16 29	16 44	17 01	17 23	17 54	16 24	16 43	17 21	17 23
	26	17 14	17 33	17 53	18 16	18 45	19 28	17 34	17 48	18 35	18 31
	27	18 18	18 40	19 03	19 30	20 05	20 57	18 45	18 56	19 49	19 41
	28	19 24	19 47	20 11	20 40	21 16	22 11	19 54	20 03	20 58	20 49
	29	20 28	20 50	21 13	21 41	22 15	23 06	20 56	21 06	21 59	21 51
	30	21 28	21 47	22 08	22 31	23 01	23 44	21 49	22 02	22 50	22 45
	31	22 22	22 38	22 54	23 13	23 37	** **	22 34	22 52	23 32	23 32
June	1	23 10	23 22	23 34	23 48	** **	0 09	23 13	23 35	** **	** **
	2	23 55	** **	** **	** **	0 05	0 28	23 48	** **	0 07	0 12
	3	** **	0 02	0 09	0 18	0 28	0 43	** **	0 13	0 38	0 48
	4	0 36	0 39	0 42	0 45	0 49	0 55	0 18	0 49	1 06	1 21
	5	1 16	1 14	1 13	1 11	1 09	1 06	0 48	1 23	1 33	1 52
	6	1 55	1 49	1 43	1 37	1 28	1 17	1 18	1 57	1 59	2 23
	7	2 35	2 25	2 15	2 03	1 49	1 30	1 48	2 31	2 26	2 55
	8	3 17	3 04	2 49	2 33	2 12	1 44	2 21	3 08	2 56	3 30
	9	4 02	3 45	3 27	3 06	2 40	2 03	2 58	3 49	3 31	4 08
	10	4 50	4 30	4 09	3 44	3 13	2 28	3 39	4 33	4 09	4 51
	11	5 42	5 20	4 56	4 29	3 53	3 02	4 25	5 22	4 54	5 38
	12	6 35	6 12	5 48	5 20	4 43	3 48	5 17	6 14	5 46	6 30
	13	7 29	7 07	6 44	6 16	5 41	4 48	6 13	7 10	6 42	7 27
	14	8 23	8 03	7 42	7 17	6 46	5 59	7 12	8 06	7 43	8 24
	15	9 14	8 58	8 40	8 20	7 54	7 17	8 11	9 02	8 45	9 22
July	16	10 04	9 51	9 38	9 23	9 03	8 37	9 10	9 56	9 47	10 19
	17	10 51	10 43	10 35	10 25	10 13	9 56	10 08	10 50	10 48	11 16
	18	11 37	11 34	11 31	11 27	11 22	11 16	11 05	11 42	11 50	12 11
	19	12 23	12 25	12 27	12 30	12 33	12 37	12 04	12 35	12 51	13 07
	20	13 11	13 18	13 26	13 35	13 45	14 00	13 04	13 30	13 56	14 05
	21	14 03	14 15	14 28	14 42	15 01	15 27	14 07	14 28	15 03	15 07
	22	14 58	15 15	15 33	15 54	16 20	16 57	15 14	15 30	16 13	16 11
	23	15 59	16 19	16 41	17 07	17 39	18 27	16 23	16 35	17 25	17 20
	24	17 03	17 26	17 50	18 18	18 54	19 48	17 32	17 42	18 36	18 28
	25	18 08	18 31	18 55	19 23	19 59	20 52	18 37	18 47	19 41	19 33
	26	19 11	19 31	19 54	20 19	20 51	21 38	19 36	19 48	20 37	20 31
	27	20 08	20 26	20 44	21 06	21 32	22 09	20 25	20 40	21 24	21 22
	28	21 01	21 14	21 28	21 44	22 04	22 31	21 08	21 27	22 03	22 06
	29	21 48	21 57	22 06	22 17	22 30	22 47	21 45	22 08	22 36	22 44
	30	22 31	22 35	22 40	22 45	22 52	23 01	22 17	22 46	23 06	23 19
	1	23 12	23 12	23 12	23 12	23 12	23 12	22 48	23 21	23 34	23 51
	2	23 52	23 48	23 43	23 38	23 32	23 24	23 18	23 55	** **	** **

The symbol (**) indicates that the phenomenon will occur on the next day

MOONRISE, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONRISE (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.							FOR CERTAIN STATIONS IN INDIA IN I.S.T.							
Date \ Lat.	0°	10°	20°	30°	40°	50°	Kolkata	Chennai	Delhi	Mumbai				
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July	1	10 52	10 50	10 48	10 45	10 42	10 37	10 23	10 59	11 07	11 28			
	2	11 33	11 35	11 37	11 40	11 43	11 47	11 13	11 45	12 01	12 16			
	3	12 12	12 19	12 26	12 33	12 43	12 56	12 03	12 30	12 54	13 05			
	4	12 53	13 04	13 15	13 28	13 44	14 06	12 54	13 16	13 48	13 54			
	5	13 36	13 50	14 05	14 23	14 45	15 17	13 46	14 04	14 42	14 44			
	6	14 21	14 39	14 58	15 20	15 48	16 29	14 39	14 54	15 39	15 36			
	7	15 10	15 30	15 52	16 18	16 51	17 40	15 35	15 47	16 36	16 30			
	8	16 02	16 24	16 48	17 16	17 52	18 46	16 30	16 40	17 34	17 26			
	9	16 56	17 19	17 43	18 11	18 48	19 42	17 26	17 35	18 29	18 20			
	10	17 51	18 12	18 35	19 02	19 36	20 27	18 17	18 28	19 20	19 13			
	11	18 45	19 04	19 24	19 48	20 17	20 59	19 06	19 19	20 06	20 02			
	12	19 36	19 52	20 09	20 28	20 51	21 24	19 49	20 06	20 46	20 46			
	13	20 26	20 37	20 49	21 03	21 20	21 43	20 28	20 50	21 23	21 28			
	14	21 13	21 20	21 27	21 35	21 45	21 58	21 05	21 32	21 56	22 06			
	15	22 00	22 01	22 03	22 06	22 08	22 12	21 40	22 11	22 26	22 43			
	16	22 46	22 43	22 40	22 36	22 31	22 25	22 14	22 51	22 58	23 20			
	17	23 34	23 26	23 17	23 08	22 56	22 40	22 51	23 33	23 31	23 58			
	18	** **	** **	23 58	23 43	23 24	22 57	23 31	** **	** **	** **			
	19	0 25	0 12	** **	** **	23 57	23 20	** **	0 17	0 06	0 39			
	20	1 20	1 02	0 44	0 23	** **	23 52	0 14	1 06	0 48	1 26			
	21	2 19	1 58	1 36	1 11	0 38	** **	1 06	2 01	1 36	2 18			
	22	3 22	2 59	2 35	2 06	1 30	0 37	2 03	3 01	2 32	3 18			
	23	4 25	4 03	3 38	3 10	2 34	1 39	3 07	4 04	3 36	4 21			
	24	5 26	5 06	4 44	4 18	3 45	2 56	4 13	5 09	4 43	5 27			
	25	6 23	6 06	5 48	5 26	4 59	4 20	5 18	6 10	5 51	6 30			
	26	7 15	7 02	6 48	6 32	6 11	5 43	6 20	7 07	6 56	7 30			
	27	8 02	7 54	7 45	7 34	7 21	7 02	7 18	8 00	7 58	8 25			
	28	8 46	8 42	8 38	8 33	8 26	8 18	8 12	8 50	8 55	9 18			
	29	9 27	9 28	9 28	9 29	9 29	9 30	9 04	9 37	9 51	10 08			
	30	10 08	10 13	10 18	10 23	10 31	10 40	9 55	10 23	10 44	10 57			
Aug.	31	10 48	10 57	11 07	11 18	11 32	11 51	10 45	11 09	11 38	11 46			
	1	11 30	11 43	11 57	12 13	12 33	13 01	11 37	11 57	12 32	12 35			
	2	12 15	12 31	12 49	13 10	13 36	14 13	12 29	12 46	13 29	13 27			
	3	13 02	13 21	13 43	14 07	14 39	15 25	13 25	13 37	14 26	14 20			
	4	13 52	14 14	14 38	15 05	15 40	16 33	14 20	14 30	15 23	15 16			
	5	14 45	15 08	15 33	16 01	16 38	17 34	15 16	15 25	16 19	16 10			
	6	15 40	16 02	16 26	16 54	17 30	18 23	16 09	16 19	17 12	17 04			
	7	16 35	16 55	17 17	17 42	18 14	19 00	16 59	17 11	18 00	17 55			
	8	17 28	17 45	18 04	18 24	18 51	19 27	17 45	18 00	18 43	18 41			
	9	18 19	18 32	18 46	19 02	19 21	19 48	18 26	18 46	19 21	19 25			
	10	19 09	19 17	19 26	19 36	19 48	20 05	19 04	19 29	19 56	20 04			
	11	19 56	20 00	20 03	20 07	20 12	20 19	19 40	20 10	20 28	20 42			
	12	20 43	20 42	20 40	20 38	20 36	20 33	20 15	20 50	21 00	21 20			
	13	21 31	21 25	21 18	21 10	21 00	20 47	20 52	21 32	21 33	21 58			
	14	22 22	22 10	21 58	21 44	21 27	21 03	21 31	22 15	22 07	22 39			
	15	23 15	22 59	22 42	22 22	21 58	21 24	22 13	23 03	22 47	23 24			
	16	** **	23 53	23 31	23 07	22 36	21 52	23 01	23 56	23 32	** **			

The symbol (**) indicates that the phenomenon will occur on the next day

MOONSET, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONSET (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.							FOR CERTAIN STATIONS IN INDIA IN I.S.T.				
Date	Lat.	0°	10°	20°	30°	40°	50°	Kolkata	Chennai	Delhi	Mumbai
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July	1	23 12	23 12	23 12	23 12	23 12	23 12	22 48	23 21	23 34	23 51
	2	23 52	23 48	23 43	23 38	23 32	23 24	23 18	23 55	** **	** **
	3	** **	** **	** **	** **	23 52	23 36	23 48	** **	0 00	0 23
	4	0 32	0 24	0 15	0 05	** **	23 50	** **	0 30	0 27	0 55
	5	1 13	1 01	0 48	0 33	0 15	** **	0 20	1 06	0 56	1 29
	6	1 57	1 41	1 24	1 05	0 40	0 07	0 55	1 45	1 29	2 05
	7	2 44	2 25	2 05	1 41	1 11	0 29	1 35	2 28	2 06	2 46
	8	3 35	3 13	2 50	2 23	1 49	0 59	2 19	3 15	2 49	3 32
	9	4 28	4 05	3 41	3 12	2 36	1 41	3 09	4 07	3 38	4 23
	10	5 22	5 00	4 36	4 08	3 31	2 37	4 05	5 02	4 33	5 18
	11	6 17	5 56	5 34	5 08	4 35	3 46	5 03	5 59	5 34	6 16
	12	7 10	6 52	6 33	6 11	5 44	5 04	6 04	6 56	6 36	7 16
	13	8 00	7 47	7 32	7 15	6 54	6 24	7 04	7 52	7 40	8 14
	14	8 49	8 40	8 30	8 19	8 05	7 45	8 03	8 46	8 42	9 11
	15	9 35	9 31	9 26	9 21	9 15	9 06	9 01	9 39	9 44	10 07
	16	10 22	10 22	10 23	10 24	10 25	10 26	9 59	10 31	10 45	11 03
	17	11 08	11 14	11 20	11 27	11 36	11 47	10 58	11 26	11 48	12 00
	18	11 58	12 08	12 20	12 33	12 49	13 11	11 58	12 21	12 53	12 59
	19	12 50	13 06	13 22	13 41	14 05	14 39	13 02	13 20	14 00	14 01
	20	13 47	14 07	14 27	14 51	15 22	16 07	14 08	14 22	15 10	15 06
	21	14 49	15 11	15 34	16 02	16 37	17 30	15 16	15 27	16 20	16 12
	22	15 52	16 15	16 40	17 08	17 45	18 39	16 22	16 31	17 26	17 17
	23	16 55	17 17	17 40	18 07	18 41	19 31	17 22	17 33	18 25	18 17
	24	17 54	18 13	18 34	18 57	19 26	20 08	18 15	18 29	19 15	19 12
	25	18 49	19 04	19 20	19 39	20 01	20 33	19 01	19 18	19 58	19 58
	26	19 38	19 49	20 01	20 14	20 30	20 51	19 40	20 02	20 33	20 39
	27	20 24	20 30	20 37	20 44	20 53	21 06	20 14	20 41	21 05	21 16
	28	21 06	21 08	21 10	21 12	21 15	21 18	20 46	21 18	21 33	21 49
	29	21 47	21 44	21 42	21 39	21 35	21 30	21 17	21 53	22 00	22 21
	30	22 27	22 20	22 13	22 05	21 55	21 42	21 47	22 27	22 27	22 53
Aug.	31	23 08	22 57	22 46	22 33	22 17	21 55	22 18	23 03	22 56	23 27
	1	23 51	23 37	23 21	23 03	22 41	22 10	22 52	23 41	23 27	** **
	2	** **	** **	24 00	23 37	23 09	22 30	23 30	** **	** **	0 02
	3	0 37	0 19	** **	** **	23 44	22 57	** **	0 22	0 02	0 41
	4	1 26	1 05	0 43	0 17	** **	23 34	0 12	1 07	0 42	1 25
	5	2 18	1 55	1 31	1 03	0 27	** **	1 00	1 57	1 29	2 13
	6	3 12	2 49	2 24	1 56	1 19	0 24	1 53	2 51	2 22	3 07
	7	4 07	3 45	3 22	2 55	2 20	1 28	2 51	3 48	3 21	4 04
	8	5 01	4 42	4 21	3 58	3 27	2 43	3 51	4 45	4 23	5 04
	9	5 53	5 38	5 21	5 03	4 39	4 05	4 52	5 42	5 27	6 03
	10	6 43	6 32	6 21	6 07	5 51	5 27	5 53	6 38	6 31	7 02
	11	7 31	7 25	7 19	7 12	7 02	6 50	6 53	7 33	7 35	8 00
	12	8 19	8 18	8 17	8 15	8 14	8 12	7 52	8 26	8 38	8 57
	13	9 06	9 10	9 15	9 20	9 26	9 35	8 52	9 21	9 41	9 55
	14	9 55	10 04	10 14	10 25	10 40	10 59	9 53	10 16	10 46	10 53
	15	10 47	11 01	11 16	11 33	11 55	12 26	10 56	11 15	11 53	11 55
	16	11 42	12 00	12 20	12 43	13 12	13 53	12 01	12 15	13 02	12 58

The symbol (**) indicates that the phenomenon will occur on the next day

MOONRISE, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONRISE (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.							FOR CERTAIN STATIONS IN INDIA IN I.S.T.							
Date	Lat.	0°	10°	20°	30°	40°	50°	Kolkata	Chennai	Delhi	Mumbai			
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	
Aug.	16	** **	23 53	23 31	23 07	22 36	21 52	23 01	23 56	23 32	** **	** **	** **	
	17	0 12	** **	** **	23 59	23 24	22 32	23 56	** **	** **	** **	0 13	0 13	
	18	1 13	0 51	0 27	** **	** **	23 27	** **	0 53	0 25	0 25	1 10	1 10	
	19	2 15	1 52	1 28	0 59	0 22	** **	0 56	1 54	1 25	1 25	2 10	2 10	
	20	3 16	2 54	2 31	2 04	1 29	0 38	2 00	2 57	2 30	2 30	3 14	3 14	
	21	4 14	3 55	3 35	3 11	2 41	1 58	3 05	3 58	3 37	3 37	4 17	4 17	
	22	5 06	4 52	4 36	4 17	3 54	3 21	4 07	4 56	4 42	4 42	5 18	5 18	
	23	5 55	5 44	5 33	5 20	5 04	4 41	5 06	5 51	5 44	5 44	6 14	6 14	
	24	6 40	6 34	6 27	6 20	6 11	5 58	6 01	6 41	6 43	6 43	7 08	7 08	
	25	7 22	7 20	7 19	7 17	7 15	7 12	6 54	7 30	7 40	7 40	7 59	7 59	
	26	8 03	8 06	8 09	8 13	8 17	8 23	7 46	8 16	8 34	8 34	8 49	8 49	
	27	8 43	8 51	8 59	9 08	9 19	9 34	8 36	9 02	9 28	9 28	9 38	9 38	
	28	9 25	9 36	9 49	10 03	10 20	10 45	9 28	9 49	10 22	10 22	10 27	10 27	
	29	10 08	10 24	10 40	10 59	11 23	11 57	10 20	10 38	11 18	11 18	11 18	11 18	
Sept.	30	10 54	11 13	11 33	11 56	12 26	13 08	11 14	11 28	12 14	12 14	12 11	12 11	
	31	11 43	12 04	12 27	12 54	13 28	14 18	12 09	12 20	13 12	13 12	13 05	13 05	
	1	12 35	12 57	13 22	13 50	14 27	15 22	13 04	13 14	14 08	14 08	13 59	13 59	
	2	13 28	13 51	14 15	14 44	15 21	16 15	13 58	14 08	15 02	15 02	14 53	14 53	
	3	14 22	14 44	15 07	15 33	16 07	16 57	14 49	15 00	15 52	15 52	15 45	15 45	
	4	15 16	15 35	15 55	16 18	16 47	17 28	15 36	15 50	16 36	16 36	16 32	16 32	
	5	16 08	16 23	16 39	16 57	17 20	17 51	16 19	16 37	17 16	17 16	17 17	17 17	
	6	16 59	17 09	17 20	17 33	17 48	18 10	16 59	17 22	17 53	17 53	17 59	17 59	
	7	17 47	17 53	17 59	18 06	18 14	18 25	17 37	18 04	18 26	18 26	18 38	18 38	
	8	18 36	18 36	18 37	18 37	18 38	18 39	18 13	18 45	18 59	18 59	19 16	19 16	
	9	19 25	19 20	19 15	19 09	19 03	18 53	18 49	19 28	19 32	19 32	19 55	19 55	
	10	20 16	20 06	19 55	19 43	19 29	19 09	19 28	20 12	20 06	20 06	20 36	20 36	
	11	21 09	20 55	20 39	20 21	19 59	19 29	20 10	20 59	20 45	20 45	21 21	21 21	
	12	22 07	21 48	21 28	21 05	20 36	19 55	20 58	21 51	21 30	21 30	22 10	22 10	
	13	23 07	22 45	22 22	21 55	21 21	20 31	21 51	22 48	22 21	22 21	23 05	23 05	
	14	** **	23 46	23 22	22 53	22 16	21 21	22 50	23 48	23 19	** **	** **	** **	
Oct.	15	0 09	** **	** **	23 56	23 20	22 27	23 53	** **	** **	** **	0 04	0 04	
	16	1 10	0 48	0 24	** **	** **	23 44	** **	0 50	0 22	0 22	1 07	1 07	
	17	2 08	1 48	1 27	1 02	0 30	** **	0 57	1 51	1 28	1 28	2 09	2 09	
	18	3 02	2 45	2 28	2 07	1 42	1 05	1 59	2 49	2 32	2 32	3 10	3 10	
	19	3 51	3 38	3 25	3 10	2 52	2 25	2 58	3 44	3 35	3 35	4 07	4 07	
	20	4 36	4 28	4 20	4 10	3 59	3 42	3 53	4 35	4 34	4 34	5 01	5 01	
	21	5 18	5 15	5 12	5 08	5 03	4 56	4 46	5 24	5 31	5 31	5 52	5 52	
	22	5 59	6 01	6 02	6 03	6 05	6 08	5 38	6 10	6 25	6 25	6 42	6 42	
	23	6 40	6 45	6 51	6 58	7 07	7 19	6 29	6 57	7 19	7 19	7 31	7 31	
	24	7 21	7 31	7 41	7 53	8 09	8 29	7 20	7 43	8 13	8 13	8 20	8 20	
	25	8 04	8 17	8 32	8 49	9 11	9 41	8 12	8 31	9 09	9 09	9 11	9 11	
	26	8 48	9 06	9 24	9 46	10 13	10 53	9 05	9 21	10 05	10 05	10 02	10 02	
	27	9 36	9 56	10 18	10 43	11 16	12 04	10 00	10 12	11 02	11 02	10 56	10 56	
	28	10 26	10 48	11 12	11 40	12 16	13 09	10 55	11 05	11 58	11 58	11 50	11 50	
	29	11 18	11 41	12 06	12 34	13 11	14 06	11 49	11 58	12 52	12 52	12 43	12 43	
	30	12 11	12 33	12 57	13 25	14 00	14 52	12 39	12 50	13 43	13 43	13 35	13 35	
	1	13 04	13 24	13 46	14 10	14 42	15 27	13 28	13 40	14 28	14 28	14 23	14 23	

The symbol (**) indicates that the phenomenon will occur on the next day

MOONSET, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONSET (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.									FOR CERTAIN STATIONS IN INDIA IN I.S.T.			
Date	Lat.	0°	10°	20°	30°	40°	50°		Kolkata	Chennai	Delhi	Mumbai
		h m	h m	h m	h m	h m	h m		h m	h m	h m	h m
Aug.	16	11 42	12 00	12 20	12 43	13 12	13 53		12 01	12 15	13 02	12 58
	17	12 41	13 02	13 26	13 52	14 27	15 17		13 07	13 19	14 10	14 03
	18	13 43	14 06	14 30	14 59	15 36	16 31		14 12	14 22	15 17	15 08
	19	14 45	15 07	15 31	15 59	16 35	17 27		15 14	15 24	16 17	16 09
	20	15 44	16 04	16 26	16 51	17 23	18 08		16 08	16 20	17 09	17 04
	21	16 39	16 56	17 14	17 35	18 00	18 36		16 55	17 11	17 54	17 52
	22	17 30	17 43	17 56	18 12	18 30	18 56		17 36	17 56	18 31	18 34
	23	18 17	18 25	18 34	18 44	18 56	19 12		18 12	18 37	19 04	19 13
	24	19 00	19 04	19 08	19 12	19 18	19 25		18 45	19 14	19 33	19 47
	25	19 42	19 41	19 40	19 39	19 38	19 37		19 16	19 50	20 01	20 19
	26	20 22	20 17	20 12	20 06	19 58	19 48		19 46	20 24	20 28	20 52
	27	21 03	20 54	20 44	20 33	20 19	20 01		20 17	21 00	20 56	21 25
	28	21 46	21 32	21 18	21 02	20 42	20 15		20 50	21 37	21 26	21 59
	29	22 30	22 13	21 55	21 35	21 09	20 33		21 26	22 17	21 59	22 36
Sept.	30	23 17	22 57	22 36	22 12	21 41	20 56		22 06	23 00	22 36	23 18
	31	** **	23 46	23 22	22 55	22 20	21 28		22 51	23 48	23 20	** **
	1	0 08	** **	** **	23 44	23 07	22 12		23 42	** **	** **	0 04
	2	1 00	0 37	0 13	** **	** **	23 09		** **	0 39	0 10	0 55
	3	1 54	1 32	1 08	0 40	0 04	** **		0 37	1 34	1 06	1 51
	4	2 48	2 28	2 06	1 41	1 08	0 20		1 36	2 31	2 06	2 48
	5	3 41	3 24	3 06	2 45	2 17	1 39		2 36	3 28	3 10	3 48
	6	4 32	4 20	4 06	3 50	3 30	3 01		3 38	4 24	4 14	4 47
	7	5 22	5 14	5 05	4 55	4 42	4 25		4 38	5 21	5 18	5 46
	8	6 10	6 07	6 04	6 00	5 55	5 49		5 39	6 15	6 22	6 44
	9	6 59	7 01	7 03	7 06	7 09	7 13		6 39	7 11	7 28	7 44
	10	7 49	7 56	8 04	8 13	8 24	8 40		7 42	8 08	8 34	8 43
	11	8 41	8 53	9 07	9 22	9 41	10 08		8 46	9 07	9 42	9 46
	12	9 36	9 53	10 12	10 33	11 00	11 38		9 52	10 08	10 52	10 50
	13	10 35	10 56	11 18	11 44	12 17	13 06		11 00	11 12	12 02	11 56
Oct.	14	11 37	12 00	12 24	12 52	13 29	14 23		12 06	12 16	13 10	13 02
	15	12 39	13 02	13 26	13 55	14 31	15 25		13 09	13 18	14 12	14 04
	16	13 39	14 00	14 22	14 48	15 22	16 10		14 04	14 15	15 06	15 00
	17	14 34	14 52	15 12	15 34	16 01	16 40		14 53	15 07	15 52	15 50
	18	15 26	15 40	15 55	16 12	16 33	17 02		15 35	15 54	16 31	16 33
	19	16 13	16 22	16 33	16 45	16 59	17 19		16 12	16 35	17 05	17 12
	20	16 56	17 02	17 08	17 14	17 22	17 33		16 45	17 13	17 35	17 47
	21	17 38	17 39	17 40	17 41	17 43	17 45		17 17	17 49	18 02	18 19
	22	18 19	18 15	18 12	18 08	18 03	17 56		17 47	18 23	18 29	18 51
	23	18 59	18 52	18 44	18 34	18 23	18 08		18 17	18 58	18 57	19 24
	24	19 41	19 29	19 17	19 03	18 45	18 21		18 49	19 35	19 26	19 58
	25	20 25	20 09	19 53	19 34	19 10	18 38		19 24	20 13	19 58	20 34
	26	21 11	20 52	20 32	20 09	19 40	18 58		20 02	20 55	20 34	21 14
	27	22 00	21 39	21 16	20 49	20 16	19 27		20 45	21 41	21 15	21 58
	28	22 51	22 28	22 04	21 36	20 59	20 05		21 33	22 30	22 01	22 46
	29	23 44	23 21	22 56	22 28	21 51	20 56		22 25	23 23	22 54	23 39
	30	** **	** **	23 52	23 25	22 51	22 00		23 22	** **	23 51	** **
	1	0 37	0 15	** **	** **	23 57	23 14		** **	0 17	** **	0 35

The symbol (**) indicates that the phenomenon will occur on the next day

MOONRISE, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONRISE (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.							FOR CERTAIN STATIONS IN INDIA IN I.S.T.							
Lat. Date	0°	10°	20°	30°	40°	50°	Kolkata	Chennai	Delhi	Mumbai				
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct.	1	13 04	13 24	13 46	14 10	14 42	15 27	13 28	13 40	14 28	14 23			
	2	13 56	14 13	14 30	14 51	15 17	15 53	14 11	14 27	15 10	15 08			
	3	14 46	14 59	15 12	15 28	15 47	16 13	14 52	15 12	15 47	15 51			
	4	15 35	15 43	15 52	16 01	16 13	16 29	15 30	15 55	16 21	16 30			
	5	16 23	16 26	16 30	16 33	16 38	16 44	16 06	16 36	16 54	17 09			
	6	17 12	17 10	17 08	17 05	17 02	16 58	16 43	17 19	17 27	17 48			
	7	18 03	17 56	17 48	17 39	17 28	17 14	17 22	18 02	18 02	18 28			
	8	18 57	18 45	18 31	18 16	17 57	17 32	18 03	18 49	18 39	19 12			
	9	19 55	19 38	19 19	18 58	18 32	17 56	18 50	19 42	19 23	20 01			
	10	20 57	20 36	20 14	19 48	19 15	18 28	19 43	20 38	20 13	20 56			
	11	22 00	21 38	21 13	20 45	20 09	19 15	20 42	21 40	21 11	21 56			
	12	23 04	22 41	22 17	21 48	21 12	20 18	21 46	22 43	22 14	23 00			
	13	** **	23 43	23 21	22 55	22 22	21 33	22 50	23 46	23 21	** **			
	14	0 04	** **	** **	** **	23 33	22 54	23 53	** **	** **	0 03			
	15	0 59	0 41	0 22	0 01	** **	** **	** **	0 45	0 26	1 05			
	16	1 49	1 35	1 21	1 04	0 43	0 14	0 53	1 41	1 29	2 03			
	17	2 34	2 25	2 16	2 04	1 51	1 31	1 49	2 32	2 28	2 57			
	18	3 17	3 13	3 08	3 02	2 55	2 45	2 42	3 21	3 25	3 48			
	19	3 58	3 58	3 58	3 57	3 57	3 56	3 34	4 07	4 19	4 37			
	20	4 38	4 42	4 47	4 52	4 58	5 07	4 24	4 53	5 13	5 27			
	21	5 19	5 27	5 36	5 46	5 59	6 17	5 15	5 39	6 07	6 15			
	22	6 01	6 13	6 26	6 42	7 01	7 28	6 06	6 26	7 02	7 05			
	23	6 45	7 01	7 18	7 38	8 03	8 40	6 59	7 16	7 57	7 56			
	24	7 31	7 51	8 11	8 35	9 06	9 51	7 53	8 06	8 54	8 49			
	25	8 20	8 42	9 05	9 32	10 07	10 58	8 47	8 58	9 50	9 43			
	26	9 12	9 34	9 59	10 27	11 04	11 58	9 42	9 51	10 45	10 36			
	27	10 04	10 26	10 50	11 18	11 54	12 48	10 33	10 43	11 36	11 28			
	28	10 56	11 17	11 39	12 05	12 38	13 25	11 21	11 33	12 23	12 16			
	29	11 46	12 05	12 24	12 46	13 14	13 54	12 05	12 19	13 05	13 02			
	30	12 36	12 50	13 06	13 23	13 45	14 15	12 46	13 04	13 43	13 44			
Nov.	31	13 24	13 34	13 45	13 57	14 12	14 33	13 24	13 46	14 17	14 23			
	1	14 11	14 16	14 22	14 29	14 37	14 48	14 00	14 27	14 49	15 01			
	2	14 58	14 59	14 59	15 00	15 01	15 02	14 35	15 08	15 21	15 39			
	3	15 47	15 43	15 38	15 32	15 25	15 16	15 12	15 50	15 54	16 18			
	4	16 39	16 30	16 19	16 07	15 53	15 33	15 52	16 35	16 30	17 00			
	5	17 36	17 21	17 05	16 47	16 25	15 54	16 36	17 26	17 11	17 47			
	6	18 37	18 18	17 58	17 34	17 05	16 23	17 28	18 21	17 59	18 40			
	7	19 43	19 21	18 57	18 30	17 55	17 04	18 26	19 23	18 55	19 40			
	8	20 49	20 26	20 02	19 33	18 57	18 02	19 30	20 28	19 59	20 44			
	9	21 53	21 31	21 08	20 41	20 07	19 16	20 37	21 34	21 07	21 51			
	10	22 52	22 33	22 13	21 50	21 21	20 38	21 44	22 36	22 15	22 56			
	11	23 45	23 30	23 14	22 56	22 34	22 01	22 46	23 35	23 21	23 57			
	12	** **	** **	** **	23 59	23 43	23 21	23 44	** **	** **	** **			
	13	0 33	0 22	0 11	** **	** **	** **	** **	0 28	0 22	0 53			
	14	1 17	1 11	1 04	0 57	0 48	0 36	0 38	1 18	1 20	1 45			
	15	1 58	1 56	1 55	1 53	1 51	1 48	1 31	2 05	2 15	2 35			
	16	2 38	2 41	2 44	2 47	2 52	2 58	2 20	2 51	3 09	3 24			

The symbol (**) indicates that the phenomenon will occur on the next day

MOONSET, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONSET (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.							FOR CERTAIN STATIONS IN INDIA IN I.S.T.				
Date	Lat.	0°	10°	20°	30°	40°	50°	Kolkata	Chennai	Delhi	Mumbai
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct.	1	0 37	0 15	** **	** **	23 57	23 14	** **	0 17	** **	0 35
	2	1 29	1 10	0 50	0 27	** **	** **	0 20	1 14	0 52	1 33
	3	2 20	2 05	1 49	1 30	1 07	0 33	1 20	2 09	1 55	2 30
	4	3 09	2 59	2 47	2 34	2 18	1 55	2 20	3 05	2 58	3 29
	5	3 58	3 52	3 46	3 39	3 30	3 18	3 20	4 00	4 02	4 27
	6	4 46	4 46	4 45	4 45	4 44	4 43	4 21	4 55	5 07	5 26
	7	5 36	5 41	5 46	5 52	5 59	6 09	5 23	5 52	6 13	6 26
	8	6 28	6 38	6 49	7 02	7 17	7 39	6 28	6 51	7 22	7 29
	9	7 24	7 39	7 56	8 14	8 38	9 12	7 36	7 54	8 34	8 34
	10	8 24	8 43	9 04	9 28	9 59	10 44	8 45	8 59	9 47	9 43
	11	9 27	9 49	10 13	10 41	11 16	12 09	9 55	10 05	10 59	10 51
	12	10 31	10 54	11 18	11 47	12 24	13 19	11 01	11 11	12 05	11 56
	13	11 33	11 55	12 18	12 45	13 19	14 09	12 00	12 11	13 03	12 56
	14	12 31	12 50	13 10	13 33	14 03	14 44	12 51	13 05	13 52	13 48
	15	13 23	13 38	13 55	14 13	14 37	15 09	13 36	13 53	14 32	14 33
	16	14 11	14 22	14 34	14 48	15 04	15 27	14 13	14 35	15 07	15 13
	17	14 55	15 02	15 09	15 17	15 27	15 41	14 47	15 14	15 38	15 48
	18	15 37	15 39	15 42	15 45	15 48	15 53	15 19	15 49	16 06	16 21
	19	16 17	16 15	16 13	16 11	16 08	16 04	15 49	16 24	16 33	16 53
	20	16 58	16 51	16 45	16 37	16 28	16 16	16 19	16 58	17 00	17 25
	21	17 39	17 29	17 18	17 05	16 50	16 29	16 50	17 34	17 28	17 58
	22	18 22	18 08	17 52	17 35	17 14	16 44	17 24	18 12	17 59	18 33
	23	19 07	18 49	18 30	18 09	17 42	17 03	18 01	18 53	18 33	19 12
	24	19 55	19 34	19 12	18 47	18 15	17 29	18 42	19 37	19 13	19 55
	25	20 45	20 23	19 59	19 31	18 56	18 03	19 28	20 25	19 57	20 41
	26	21 37	21 14	20 50	20 21	19 44	18 50	20 18	21 16	20 47	21 32
	27	22 29	22 07	21 43	21 16	20 41	19 48	21 13	22 09	21 42	22 26
	28	23 20	23 01	22 39	22 15	21 43	20 57	22 09	23 03	22 40	23 22
	29	** **	23 54	23 36	23 15	22 49	22 12	23 07	23 58	23 40	** **
	30	0 10	** **	** **	** **	23 58	23 30	** **	** **	** **	0 18
Nov.	31	0 59	0 46	0 33	0 17	** **	** **	0 04	0 51	0 41	1 14
	1	1 46	1 38	1 29	1 20	1 07	0 50	1 03	1 45	1 43	2 10
	2	2 33	2 30	2 27	2 23	2 18	2 11	2 01	2 38	2 45	3 07
	3	3 21	3 23	3 25	3 28	3 31	3 35	3 02	3 33	3 50	4 05
	4	4 11	4 19	4 27	4 36	4 47	5 02	4 05	4 30	4 57	5 06
	5	5 06	5 18	5 32	5 47	6 07	6 34	5 11	5 32	6 07	6 11
	6	6 05	6 22	6 41	7 02	7 29	8 09	6 21	6 37	7 21	7 19
	7	7 08	7 29	7 52	8 18	8 51	9 41	7 33	7 45	8 36	8 29
	8	8 14	8 37	9 02	9 30	10 06	11 01	8 44	8 54	9 48	9 39
	9	9 20	9 42	10 06	10 34	11 09	12 02	9 49	9 59	10 52	10 44
	10	10 22	10 42	11 03	11 28	11 59	12 44	10 45	10 57	11 46	11 41
	11	11 18	11 34	11 52	12 12	12 37	13 12	11 33	11 49	12 31	12 30
	12	12 08	12 21	12 34	12 49	13 07	13 32	12 13	12 34	13 08	13 12
	13	12 54	13 02	13 11	13 20	13 32	13 48	12 49	13 14	13 41	13 50
	14	13 37	13 40	13 44	13 49	13 54	14 01	13 22	13 51	14 09	14 23
	15	14 17	14 17	14 16	14 15	14 14	14 13	13 52	14 25	14 36	14 55
	16	14 57	14 52	14 47	14 41	14 34	14 24	14 21	15 00	15 03	15 27

The symbol (**) indicates that the phenomenon will occur on the next day

MOONRISE, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONRISE (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82°.5 E) IN L. M. T.							FOR CERTAIN STATIONS IN INDIA IN I.S.T.										
Date	Lat.	0°		10°		20°		30°		40°		50°		Kolkata	Chennai	Delhi	Mumbai
		h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m
Nov.	16	2	38	2	41	2	44	2	47	2	52	2	58	2	20	2	51
	17	3	18	3	25	3	33	3	41	3	52	4	07	3	11	3	37
	18	3	59	4	11	4	22	4	36	4	53	5	17	4	02	4	23
	19	4	43	4	57	5	13	5	32	5	55	6	28	4	54	5	12
	20	5	28	5	47	6	06	6	29	6	58	7	40	5	48	6	02
	21	6	17	6	37	7	00	7	26	7	59	8	49	6	42	6	54
	22	7	07	7	30	7	54	8	22	8	58	9	51	7	37	7	47
	23	7	59	8	22	8	46	9	14	9	50	10	44	8	28	8	38
	24	8	51	9	13	9	35	10	02	10	36	11	25	9	18	9	29
	25	9	42	10	01	10	21	10	44	11	14	11	56	10	03	10	16
Dec.	26	10	31	10	46	11	03	11	22	11	46	12	19	10	44	11	01
	27	11	18	11	29	11	42	11	56	12	13	12	37	11	21	11	42
	28	12	03	12	11	12	18	12	27	12	38	12	52	11	57	12	22
	29	12	49	12	51	12	54	12	57	13	01	13	06	12	31	13	01
	30	13	35	13	33	13	30	13	28	13	24	13	20	13	06	13	41
	1	14	24	14	16	14	09	14	00	13	49	13	35	13	43	14	23
	2	15	17	15	04	14	51	14	36	14	18	13	53	14	23	15	10
	3	16	15	15	58	15	40	15	19	14	53	14	17	15	10	16	01
	4	17	18	16	57	16	35	16	10	15	38	14	52	16	05	17	00
	5	18	25	18	03	17	38	17	10	16	34	15	41	17	07	18	04
	6	19	33	19	10	18	46	18	18	17	43	16	50	18	15	19	12
	7	20	36	20	16	19	55	19	30	18	58	18	12	19	24	20	19
	8	21	34	21	18	21	00	20	40	20	15	19	38	20	31	21	22
	9	22	26	22	14	22	01	21	46	21	28	21	02	21	33	22	19
	10	23	12	23	05	22	57	22	48	22	37	22	21	22	31	23	12
	11	23	56	23	53	23	50	23	46	23	42	23	36	23	25	**	**
	12	**	**	**	**	**	**	**	**	**	**	**	**	**	**	0	01
	13	0	37	0	38	0	40	0	42	0	44	0	47	0	16	0	48
	14	1	17	1	23	1	29	1	36	1	45	1	57	1	07	1	34
	15	1	58	2	08	2	19	2	31	2	46	3	07	1	57	2	20
	16	2	40	2	54	3	09	3	26	3	48	4	18	2	49	3	08
	17	3	25	3	42	4	01	4	23	4	50	5	29	3	42	3	57
	18	4	13	4	33	4	54	5	20	5	52	6	39	4	36	4	49
	19	5	03	5	25	5	48	6	16	6	51	7	44	5	31	5	42
	20	5	55	6	17	6	42	7	10	7	46	8	40	6	24	6	34
	21	6	47	7	09	7	32	7	59	8	34	9	25	7	15	7	26
	22	7	39	7	58	8	19	8	44	9	14	9	58	8	01	8	14
	23	8	28	8	45	9	03	9	23	9	48	10	24	8	43	9	00
	24	9	16	9	28	9	42	9	58	10	17	10	43	9	22	9	42
	25	10	01	10	10	10	19	10	29	10	42	10	59	9	57	10	21
	26	10	46	10	50	10	54	10	59	11	05	11	12	10	31	11	00
	27	11	30	11	29	11	29	11	28	11	27	11	26	11	04	11	38
	28	12	16	12	10	12	05	11	58	11	50	11	40	11	39	12	18
	29	13	05	12	55	12	44	12	31	12	16	11	55	12	16	13	00
	30	13	58	13	43	13	27	13	09	12	47	12	16	12	59	13	48
	31	14	57	14	38	14	18	13	54	13	25	12	44	13	48	14	41
	32	16	01	15	39	15	16	14	49	14	14	13	24	14	45	15	42

The symbol (**) indicates that the phenomenon will occur on the next day

MOONSET, 2025
LOCAL MEAN TIME AND INDIAN STANDARD TIME OF
MOONSET (MOON'S UPPER LIMB)

FOR THE CENTRAL MERIDIAN OF INDIA (82° 5 E) IN L. M. T.								FOR CERTAIN STATIONS IN INDIA IN I.S.T.			
Date	Lat.	0°	10°	20°	30°	40°	50°	Kolkata	Chennai	Delhi	Mumbai
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov.	16	14 57	14 52	14 47	14 41	14 34	14 24	14 21	15 00	15 03	15 27
	17	15 38	15 29	15 19	15 08	14 55	14 37	14 52	15 35	15 31	15 59
	18	16 20	16 07	15 53	15 37	15 18	14 51	15 25	16 12	16 01	16 34
	19	17 04	16 48	16 30	16 10	15 45	15 09	16 01	16 51	16 34	17 12
	20	17 51	17 32	17 11	16 47	16 16	15 33	16 41	17 35	17 12	17 53
	21	18 41	18 19	17 56	17 29	16 55	16 04	17 26	18 21	17 55	18 38
	22	19 32	19 10	18 46	18 17	17 41	16 47	18 14	19 12	18 43	19 28
	23	20 24	20 02	19 39	19 11	18 35	17 42	19 08	20 04	19 37	20 21
	24	21 16	20 55	20 34	20 08	19 35	18 47	20 03	20 58	20 33	21 16
	25	22 06	21 48	21 29	21 07	20 40	20 00	21 00	21 52	21 33	22 11
Dec.	26	22 53	22 40	22 25	22 08	21 46	21 15	21 56	22 44	22 32	23 06
	27	23 40	23 30	23 20	23 08	22 53	22 32	22 52	23 36	23 31	** **
	28	** **	** **	** **	** **	** **	23 50	23 49	** **	** **	0 01
	29	0 25	0 20	0 14	0 08	0 00	** **	** **	0 27	0 31	0 55
	30	1 10	1 10	1 10	1 10	1 09	1 09	0 45	1 20	1 32	1 50
	1	1 58	2 03	2 08	2 14	2 21	2 31	1 45	2 13	2 35	2 47
	2	2 48	2 58	3 09	3 21	3 36	3 57	2 47	3 11	3 42	3 48
	3	3 43	3 58	4 14	4 33	4 56	5 29	3 55	4 13	4 52	4 53
	4	4 44	5 03	5 24	5 48	6 18	7 02	5 05	5 19	6 07	6 02
	5	5 50	6 12	6 35	7 03	7 38	8 30	6 17	6 28	7 21	7 14
	6	6 58	7 20	7 45	8 13	8 49	9 43	7 27	7 37	8 31	8 22
	7	8 04	8 25	8 48	9 14	9 47	10 35	8 29	8 41	9 32	9 25
	8	9 05	9 23	9 42	10 04	10 32	11 11	9 23	9 38	10 22	10 20
	9	9 59	10 13	10 28	10 45	11 06	11 35	10 08	10 27	11 05	11 07
	10	10 49	10 58	11 08	11 20	11 34	11 53	10 47	11 11	11 40	11 47
	11	11 33	11 38	11 44	11 50	11 57	12 07	11 22	11 50	12 10	12 23
	12	12 15	12 16	12 17	12 18	12 18	12 20	11 53	12 25	12 39	12 56
	13	12 56	12 52	12 48	12 44	12 39	12 31	12 23	13 00	13 06	13 28
	14	13 37	13 29	13 20	13 11	12 59	12 44	12 54	13 35	13 34	14 01
	15	14 18	14 06	13 54	13 39	13 22	12 58	13 26	14 11	14 03	14 34
	16	15 02	14 46	14 30	14 11	13 47	13 14	14 01	14 50	14 35	15 11
	17	15 48	15 29	15 09	14 46	14 17	13 36	14 39	15 32	15 11	15 51
	18	16 37	16 16	15 53	15 27	14 54	14 05	15 23	16 18	15 52	16 35
	19	17 28	17 06	16 42	16 14	15 38	14 44	16 10	17 08	16 39	17 24
	20	18 20	17 58	17 34	17 06	16 30	15 36	17 03	18 00	17 32	18 16
	21	19 12	18 51	18 29	18 03	17 29	16 39	17 58	18 54	18 28	19 11
	22	20 03	19 45	19 25	19 02	18 33	17 51	18 55	19 48	19 27	20 07
	23	20 51	20 37	20 21	20 02	19 39	19 06	19 52	20 41	20 26	21 02
	24	21 38	21 27	21 15	21 02	20 45	20 22	20 48	21 33	21 26	21 57
	25	22 22	22 16	22 09	22 01	21 52	21 38	21 43	22 23	22 24	22 50
	26	23 07	23 05	23 03	23 01	22 58	22 55	22 38	23 14	23 23	23 43
	27	23 52	23 55	23 58	** **	** **	** **	23 35	** **	** **	** **
	28	** **	** **	** **	0 02	0 06	0 13	** **	0 05	0 23	0 37
	29	0 39	0 47	0 55	1 05	1 17	1 34	0 33	0 59	1 26	1 35
	30	1 30	1 42	1 56	2 12	2 32	3 00	1 36	1 56	2 32	2 35
	31	2 26	2 43	3 01	3 23	3 50	4 29	2 42	2 58	3 42	3 40
	32	3 27	3 48	4 10	4 36	5 09	5 58	3 52	4 04	4 55	4 48

The symbol (**) indicates that the phenomenon will occur on the next day

MOONRISE AND MOONSET
REDUCTION OF THE L.M.T. OF RISING OR SETTING FOR THE
MERIDIAN OF 82°.5 E. LONGITUDE TO THE L.M.T. OF OTHER MERIDIANS
LONGITUDE EAST OF GREENWICH

Daily Variation in Rising or Setting	0°	30°	60°	68°	72°	76°	80°	84°	88°	92°	96°	120°	150°
m	m	m	m	m	m	m	m	m	m	m	m	m	m
28	+ 6.4	+ 4.1	+ 1.8	+ 1.1	+ 0.8	+ 0.5	+ 0.2	- 0.1	- 0.4	- 0.7	- 1.1	- 2.9	- 5.3
29	6.6	4.2	1.8	1.2	0.8	0.5	0.2	0.1	0.4	0.8	1.1	3.0	5.4
30	6.9	4.4	1.9	1.2	0.9	0.5	0.2	0.1	0.5	0.8	1.1	3.1	5.6
31	7.1	4.5	1.9	1.2	0.9	0.6	0.2	0.1	0.5	0.8	1.2	3.2	5.8
32	7.3	4.7	2.0	1.3	0.9	0.6	0.2	0.1	0.5	0.8	1.2	3.3	6.0
33	7.6	4.8	2.1	1.3	1.0	0.6	0.2	0.1	0.5	0.9	1.2	3.4	6.2
34	7.8	5.0	2.1	1.4	1.0	0.6	0.2	0.1	0.5	0.9	1.3	3.5	6.4
35	8.0	5.1	2.2	1.4	1.0	0.6	0.2	0.1	0.5	0.9	1.3	3.6	6.6
36	8.2	5.2	2.3	1.4	1.0	0.6	0.2	0.1	0.5	0.9	1.4	3.7	6.8
37	8.5	5.4	2.3	1.5	1.1	0.7	0.3	0.2	0.6	1.0	1.4	3.9	6.9
38	8.7	5.5	2.4	1.5	1.1	0.7	0.3	0.2	0.6	1.0	1.4	4.0	7.1
39	8.9	5.7	2.4	1.6	1.1	0.7	0.3	0.2	0.6	1.0	1.5	4.1	7.3
40	+ 9.2	+ 5.8	+ 2.5	+ 1.6	+ 1.2	+ 0.7	+ 0.3	- 0.2	- 0.6	- 1.1	- 1.5	- 4.2	- 7.5
41	9.4	6.0	2.6	1.7	1.2	0.7	0.3	0.2	0.6	1.1	1.5	4.3	7.7
42	9.6	6.1	2.6	1.7	1.2	0.8	0.3	0.2	0.6	1.1	1.6	4.4	7.9
43	9.9	6.3	2.7	1.7	1.3	0.8	0.3	0.2	0.7	1.1	1.6	4.5	8.1
44	10.1	6.4	2.8	1.8	1.3	0.8	0.3	0.2	0.7	1.2	1.7	4.6	8.3
45	10.3	6.6	2.8	1.8	1.3	0.8	0.3	0.2	0.7	1.2	1.7	4.7	8.4
46	10.5	6.7	2.9	1.9	1.3	0.8	0.3	0.2	0.7	1.2	1.7	4.8	8.6
47	10.8	6.9	2.9	1.9	1.4	0.8	0.3	0.2	0.7	1.2	1.8	4.9	8.8
48	11.0	7.0	3.0	1.9	1.4	0.9	0.3	0.2	0.7	1.3	1.8	5.0	9.0
49	11.2	7.1	3.1	2.0	1.4	0.9	0.3	0.2	0.7	1.3	1.8	5.1	9.2
50	+ 11.5	+ 7.3	+ 3.1	+ 2.0	+ 1.5	+ 0.9	+ 0.3	- 0.2	- 0.8	- 1.3	- 1.9	- 5.2	- 9.4
51	11.7	7.4	3.2	2.1	1.5	0.9	0.4	0.2	0.8	1.3	1.9	5.3	9.6
52	11.9	7.6	3.3	2.1	1.5	0.9	0.4	0.2	0.8	1.4	2.0	5.4	9.8
53	12.1	7.7	3.3	2.1	1.5	1.0	0.4	0.2	0.8	1.4	2.0	5.5	9.9
54	12.4	7.9	3.4	2.2	1.6	1.0	0.4	0.2	0.8	1.4	2.0	5.6	10.1
55	12.6	8.0	3.4	2.2	1.6	1.0	0.4	0.2	0.8	1.5	2.1	5.7	10.3
56	12.8	8.2	3.5	2.3	1.6	1.0	0.4	0.2	0.9	1.5	2.1	5.8	10.5
57	13.1	8.3	3.6	2.3	1.7	1.0	0.4	0.2	0.9	1.5	2.1	5.9	10.7
58	13.3	8.5	3.6	2.3	1.7	1.0	0.4	0.2	0.9	1.5	2.2	6.0	10.9
59	13.5	8.6	3.7	2.4	1.7	1.1	0.4	0.2	0.9	1.6	2.2	6.1	11.1
60	+ 13.7	+ 8.7	+ 3.8	+ 2.4	+ 1.7	+ 1.1	+ 0.4	- 0.2	- 0.9	- 1.6	- 2.3	- 6.2	- 11.3
61	14.0	8.9	3.8	2.5	1.8	1.1	0.4	0.3	0.9	1.6	2.3	6.4	11.4
62	14.2	9.0	3.9	2.5	1.8	1.1	0.4	0.3	0.9	1.6	2.3	6.5	11.6
63	14.4	9.2	3.9	2.5	1.8	1.1	0.4	0.3	1.0	1.7	2.4	6.6	11.8
64	14.7	9.3	4.0	2.6	1.9	1.2	0.4	0.3	1.0	1.7	2.4	6.7	12.0
65	14.9	9.5	4.1	2.6	1.9	1.2	0.5	0.3	1.0	1.7	2.4	6.8	12.2
66	15.1	9.6	4.1	2.7	1.9	1.2	0.5	0.3	1.0	1.7	2.5	6.9	12.4
67	15.4	9.8	4.2	2.7	2.0	1.2	0.5	0.3	1.0	1.8	2.5	7.0	12.6
68	15.6	9.9	4.3	2.7	2.0	1.2	0.5	0.3	1.0	1.8	2.6	7.1	12.8
69	15.8	10.1	4.3	2.8	2.0	1.2	0.5	0.3	1.1	1.8	2.6	7.2	12.9
70	+ 16.0	+ 10.2	+ 4.4	+ 2.8	+ 2.0	+ 1.3	+ 0.5	- 0.3	- 1.1	- 1.8	- 2.6	- 7.3	- 13.1
71	16.3	10.4	4.4	2.9	2.1	1.3	0.5	0.3	1.1	1.9	2.7	7.4	13.3
72	16.5	10.5	4.5	2.9	2.1	1.3	0.5	0.3	1.1	1.9	2.7	7.5	13.5
73	16.7	10.6	4.6	2.9	2.1	1.3	0.5	0.3	1.1	1.9	2.7	7.6	13.7
74	+ 17.0	+ 10.8	+ 4.6	+ 3.0	+ 2.2	+ 1.3	+ 0.5	- 0.3	- 1.1	- 2.0	- 2.8	- 7.7	- 13.9

SUNRISE, SUNSET AND MOONRISE, MOONSET**CORRECTION FOR LATITUDE**

VARIATION PER 10° OF LATITUDE OF THE TIMES OF SUNRISE, SUNSET AND MOONRISE,
MOONSET DISTRIBUTED OVER EACH DEGREE OF LATITUDE

Var. per 10° of Lat.	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	15'	30'	45'
m	m	m	m	m	m	m	m	m	m	m	m	m	m
5	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	0.1	0.3	0.4
6	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	0.2	0.3	0.5
7	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	7.0	0.2	0.4	0.5
8	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0	0.2	0.4	0.6
9	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9.0	0.2	0.5	0.7
10	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	0.3	0.5	0.8
11	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	11.0	0.3	0.6	0.8
12	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0	0.3	0.6	0.9
13	1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4	11.7	13.0	0.3	0.7	1.0
14	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6	14.0	0.4	0.7	1.1
15	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0	0.4	0.8	1.1
16	1.6	3.2	4.8	6.4	8.0	9.6	11.2	12.8	14.4	16.0	0.4	0.8	1.2
17	1.7	3.4	5.1	6.8	8.5	10.2	11.9	13.6	15.3	17.0	0.4	0.9	1.3
18	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.0	0.5	0.9	1.4
19	1.9	3.8	5.7	7.6	9.5	11.4	13.3	15.2	17.1	19.0	0.5	1.0	1.4
20	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	0.5	1.0	1.5
21	2.1	4.2	6.3	8.4	10.5	12.6	14.7	16.8	18.9	21.0	0.5	1.1	1.6
22	2.2	4.4	6.6	8.8	11.0	13.2	15.4	17.6	19.8	22.0	0.6	1.1	1.7
23	2.3	4.6	6.9	9.2	11.5	13.8	16.1	18.4	20.7	23.0	0.6	1.2	1.7
24	2.4	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0	0.6	1.2	1.8
25	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	0.6	1.3	1.9
26	2.6	5.2	7.8	10.4	13.0	15.6	18.2	20.8	23.4	26.0	0.7	1.3	2.0
27	2.7	5.4	8.1	10.8	13.5	16.2	18.9	21.6	24.3	27.0	0.7	1.4	2.0
28	2.8	5.6	8.4	11.2	14.0	16.8	19.6	22.4	25.2	28.0	0.7	1.4	2.1
29	2.9	5.8	8.7	11.6	14.5	17.4	20.3	23.2	26.1	29.0	0.7	1.5	2.2
30	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	0.8	1.5	2.3
31	3.1	6.2	9.3	12.4	15.5	18.6	21.7	24.8	27.9	31.0	0.8	1.6	2.3
32	3.2	6.4	9.6	12.8	16.0	19.2	22.4	25.6	28.8	32.0	0.8	1.6	2.4
33	3.3	6.6	9.9	13.2	16.5	19.8	23.1	26.4	29.7	33.0	0.8	1.7	2.5
34	3.4	6.8	10.2	13.6	17.0	20.4	23.8	27.2	30.6	34.0	0.9	1.7	2.6
35	3.5	7.0	10.5	14.0	17.5	21.0	24.5	28.0	31.5	35.0	0.9	1.8	2.6
36	3.6	7.2	10.8	14.4	18.0	21.6	25.2	28.8	32.4	36.0	0.9	1.8	2.7
37	3.7	7.4	11.1	14.8	18.5	22.2	25.9	29.6	33.3	37.0	0.9	1.9	2.8
38	3.8	7.6	11.4	15.2	19.0	22.8	26.6	30.4	34.2	38.0	1.0	1.9	2.9
39	3.9	7.8	11.7	15.6	19.5	23.4	27.3	31.2	35.1	39.0	1.0	2.0	2.9
40	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0	36.0	40.0	1.0	2.0	3.0
41	4.1	8.2	12.3	16.4	20.5	24.6	28.7	32.8	36.9	41.0	1.0	2.1	3.1
42	4.2	8.4	12.6	16.8	21.0	25.2	29.4	33.6	37.8	42.0	1.1	2.1	3.2
43	4.3	8.6	12.9	17.2	21.5	25.8	30.1	34.4	38.7	43.0	1.1	2.2	3.2
44	4.4	8.8	13.2	17.6	22.0	26.4	30.8	35.2	39.6	44.0	1.1	2.2	3.3
45	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0	40.5	45.0	1.1	2.3	3.4
46	4.6	9.2	13.8	18.4	23.0	27.6	32.2	36.8	41.4	46.0	1.2	2.3	3.5
47	4.7	9.4	14.1	18.8	23.5	28.2	32.9	37.6	42.3	47.0	1.2	2.4	3.5
48	4.8	9.6	14.4	19.2	24.0	28.8	33.6	38.4	43.2	48.0	1.2	2.4	3.6
49	4.9	9.8	14.7	19.6	24.5	29.4	34.3	39.2	44.1	49.0	1.2	2.5	3.7
50	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	1.3	2.5	3.8

REDUCTION OF TIME
REDUCTION OF LOCAL MEAN TIME OF A PLACE INTO
THE INDIAN STANDARD TIME

A-CORRECTION TO BE ADDED TO L.M.T. TO OBTAIN I.S.T.

LONGITUDE OF PLACE (EAST OF GREENWICH)																
	67°	68°	69°	70°	71°	72°	73°	74°	75°	76°	77°	78°	79°	80°	81°	82°
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0	62.0	58.0	54.0	50.0	46.0	42.0	38.0	34.0	30.0	26.0	22.0	18.0	14.0	10.0	6.0	2.0
3	61.8	57.8	53.8	49.8	45.8	41.8	37.8	33.8	29.8	25.8	21.8	17.8	13.8	9.8	5.8	1.8
6	61.6	57.6	53.6	49.6	45.6	41.6	37.6	33.6	29.6	25.6	21.6	17.6	13.6	9.6	5.6	1.6
9	61.4	57.4	53.4	49.4	45.4	41.4	37.4	33.4	29.4	25.4	21.4	17.4	13.4	9.4	5.4	1.4
12	61.2	57.2	53.2	49.2	45.2	41.2	37.2	33.2	29.2	25.2	21.2	17.2	13.2	9.2	5.2	1.2
15	61.0	57.0	53.0	49.0	45.0	41.0	37.0	33.0	29.0	25.0	21.0	17.0	13.0	9.0	5.0	1.0
18	60.8	56.8	52.8	48.8	44.8	40.8	36.8	32.8	28.8	24.8	20.8	16.8	12.8	8.8	4.8	0.8
21	60.6	56.6	52.6	48.6	44.6	40.6	36.6	32.6	28.6	24.6	20.6	16.6	12.6	8.6	4.6	0.6
24	60.4	56.4	52.4	48.4	44.4	40.4	36.4	32.4	28.4	24.4	20.4	16.4	12.4	8.4	4.4	0.4
27	60.2	56.2	52.2	48.2	44.2	40.2	36.2	32.2	28.2	24.2	20.2	16.2	12.2	8.2	4.2	0.2
30	60.0	56.0	52.0	48.0	44.0	40.0	36.0	32.0	28.0	24.0	20.0	16.0	12.0	8.0	4.0	0.0
33	59.8	55.8	51.8	47.8	43.8	39.8	35.8	31.8	27.8	23.8	19.8	15.8	11.8	7.8	3.8	
36	59.6	55.6	51.6	47.6	43.6	39.6	35.6	31.6	27.6	23.6	19.6	15.6	11.6	7.6	3.6	
39	59.4	55.4	51.4	47.4	43.4	39.4	35.4	31.4	27.4	23.4	19.4	15.4	11.4	7.4	3.4	
42	59.2	55.2	51.2	47.2	43.2	39.2	35.2	31.2	27.2	23.2	19.2	15.2	11.2	7.2	3.2	
45	59.0	55.0	51.0	47.0	43.0	39.0	35.0	31.0	27.0	23.0	19.0	15.0	11.0	7.0	3.0	
48	58.8	54.8	50.8	46.8	42.8	38.8	34.8	30.8	26.8	22.8	18.8	14.8	10.8	6.8	2.8	
51	58.6	54.6	50.6	46.6	42.6	38.6	34.6	30.6	26.6	22.6	18.6	14.6	10.6	6.6	2.6	
54	58.4	54.4	50.4	46.4	42.4	38.4	34.4	30.4	26.4	22.4	18.4	14.4	10.4	6.4	2.4	
57	58.2	54.2	50.2	46.2	42.2	38.2	34.2	30.2	26.2	22.2	18.2	14.2	10.2	6.2	2.2	
60	58.0	54.0	50.0	46.0	42.0	38.0	34.0	30.0	26.0	22.0	18.0	14.0	10.0	6.0	2.0	

B- CORRECTION TO BE SUBTRACTED FROM L.M.T. TO OBTAIN I.S.T.

LONGITUDE OF PLACE (EAST OF GREENWICH)																
	82°	83°	84°	85°	86°	87°	88°	89°	90°	91°	92°	93°	94°	95°	96°	97°
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0		2.0	6.0	10.0	14.0	18.0	22.0	26.0	30.0	34.0	38.0	42.0	46.0	50.0	54.0	58.0
3		2.2	6.2	10.2	14.2	18.2	22.2	26.2	30.2	34.2	38.2	42.2	46.2	50.2	54.2	58.2
6		2.4	6.4	10.4	14.4	18.4	22.4	26.4	30.4	34.4	38.4	42.4	46.4	50.4	54.4	58.4
9		2.6	6.6	10.6	14.6	18.6	22.6	26.6	30.6	34.6	38.6	42.6	46.6	50.6	54.6	58.6
12		2.8	6.8	10.8	14.8	18.8	22.8	26.8	30.8	34.8	38.8	42.8	46.8	50.8	54.8	58.8
15		3.0	7.0	11.0	15.0	19.0	23.0	27.0	31.0	35.0	39.0	43.0	47.0	51.0	55.0	59.0
18		3.2	7.2	11.2	15.2	19.2	23.2	27.2	31.2	35.2	39.2	43.2	47.2	51.2	55.2	59.2
21		3.4	7.4	11.4	15.4	19.4	23.4	27.4	31.4	35.4	39.4	43.4	47.4	51.4	55.4	59.4
24		3.6	7.6	11.6	15.6	19.6	23.6	27.6	31.6	35.6	39.6	43.6	47.6	51.6	55.6	59.6
27		3.8	7.8	11.8	15.8	19.8	23.8	27.8	31.8	35.8	39.8	43.8	47.8	51.8	55.8	59.8
30	0.0	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0	36.0	40.0	44.0	48.0	52.0	56.0	60.0
33	0.2	4.2	8.2	12.2	16.2	20.2	24.2	28.2	32.2	36.2	40.2	44.2	48.2	52.2	56.2	60.2
36	0.4	4.4	8.4	12.4	16.4	20.4	24.4	28.4	32.4	36.4	40.4	44.4	48.4	52.4	56.4	60.4
39	0.6	4.6	8.6	12.6	16.6	20.6	24.6	28.6	32.6	36.6	40.6	44.6	48.6	52.6	56.6	60.6
42	0.8	4.8	8.8	12.8	16.8	20.8	24.8	28.8	32.8	36.8	40.8	44.8	48.8	52.8	56.8	60.8
45	1.0	5.0	9.0	13.0	17.0	21.0	25.0	29.0	33.0	37.0	41.0	45.0	49.0	53.0	57.0	61.0
48	1.2	5.2	9.2	13.2	17.2	21.2	25.2	29.2	33.2	37.2	41.2	45.2	49.2	53.2	57.2	61.2
51	1.4	5.4	9.4	13.4	17.4	21.4	25.4	29.4	33.4	37.4	41.4	45.4	49.4	53.4	57.4	61.4
54	1.6	5.6	9.6	13.6	17.6	21.6	25.6	29.6	33.6	37.6	41.6	45.6	49.6	53.6	57.6	61.6
57	1.8	5.8	9.8	13.8	17.8	21.8	25.8	29.8	33.8	37.8	41.8	45.8	49.8	53.8	57.8	61.8
60	2.0	6.0	10.0	14.0	18.0	22.0	26.0	30.0	34.0	38.0	42.0	46.0	50.0	54.0	58.0	62.0

Sunrise and Sunset

The local mean times of Sunrise and Sunset for latitudes 0° to 60° North at intervals of 4 days during the year have been given on pages 280 to 287. The timings relate to the visibility of the upper limb of the Sun on the horizon. From these tables the L.M.T. of rise or set for any day of the year and for any latitude of place can be obtained by simple interpolation. If the place is in the southern hemisphere, the corrections given on pages 290 to 291 will then have to be applied to the timings for the corresponding northern latitude. For a station in India, the timings of Sunrise and Sunset so obtained which are in L.M.T. can be reduced to I.S.T. by applying the correction given on page 314 according to the longitude of the station.

In addition to the above details given in the publication, the timings of Sunrise and Sunset of five important cities of India, viz., Kolkata, Varanasi, Chennai, Delhi and Mumbai have been specially calculated and given in I.S.T. on pages 292 to 295.

Sunrise and Sunset for Southern Latitudes

The timings of Sunrise and Sunset for southern latitudes, which have not been tabulated separately, can be deduced from those for the corresponding northern latitudes by applying the corrections given on pages 290 and 291.

Twilight

The timings of the beginning of morning twilight and ending of evening twilight have been given for latitudes 0° to 60° North on pages 280 to 287. The timings relate to the instant when the center of the Sun is 18° below the horizon. This is now known as astronomical twilight. The period of twilight has been divided into three parts - Civil when the Sun is 6° below the horizon, Nautical when 12° and Astronomical when 18° - and their durations have been given separately on pages 288 and 289 at an interval of 8 days. The figures for any intermediate date can be worked out from the tables by simple interpolation.

Moonrise and Moonset

The local mean times of Moonrise and Moonset for latitudes 0° to 50° North at 10- degrees interval together with the timings of these events in I.S.T. for four important stations in India, Viz., Kolkata, Chennai, Delhi and Mumbai for each day of the year have been given on pages 296 to 311 along with some supplementary tables on pages 312 to 313. A detailed method of calculation for any station is given below.

To find the time of Moonrise and Moonset for any station the figure for the phenomena concerned given against the date is to be taken from the table (pages 296 to 311) for the latitude just lower than the latitude of the station, to which the following corrections will have to be applied :

- (a) Correction for difference in latitude;
- (b) Correction for longitude, if the place is not on the Central Meridian of India (i.e., $82^{\circ}.5$ E. Long);
- (c) Correction for converting L.M.T. into I.S.T., when and where necessary.

These corrections are detailed below :

- (a) Correction for difference in latitude - The timings of Moonrise and Moonset have been given for latitudes 0° , 10° , 20° , 30° , 40° and 50° North, and in local mean time. The timing for any particular latitude of place falling within the above limits can be obtained by simple interpolation between figures for the two latitudes, one below and the other above the latitude of the given place. For this purpose the table on page 313 can be conveniently used wherein corrections for latitude are shown according to the variation per 10° of latitude of the timings of Moonrise or Moonset distributed over each degree of latitude. The correction can also be calculated directly by multiplying one-tenth of the time difference between the figures for two consecutive given latitudes by the excess of the latitude of the station over the given lower latitude.

METHOD OF CALCULATION

(b) Correction for difference in longitude - The timings thus obtained are exact for the Central Meridian of India, i.e, for longitude $82^{\circ}.5$ East of Greenwich. For other longitudes the correction given on page 312 should be applied according to :

- (i) the longitude of the station, and
- (ii) the daily variation of the timings of rising or setting, as the case may be, between two consecutive dates.

If greater accuracy is not required, the daily variation may be assumed to be a constant (i.e., 50 minutes) for all dates and corrections from the following table may be applied instead of taking the corrections from the table on page 312.

Longitude of Station	Correction	Longitude of Station	Correction
(East)	m	(East)	m
0°	+ 11.5	84°	- 0.2
30°	+ 7.3	88°	- 0.8
60°	+ 3.1	92°	- 1.3
68°	+ 2.0	96°	- 1.9
72°	+ 1.5	120°	- 5.2
76°	+ 0.9	150°	- 9.4
80°	+ 0.3	180°	- 13.5

The timing thus obtained by the above two operations is in L.M.T. of the station

(c) Correction for converting L.M.T. into I.S.T. - The figures obtained by the operations (a) and (b) above would give the local mean time of Moonrise or Moonset for the given station. The local mean time can be reduced to the Indian Standard Time by the help of the reduction table on page 314. In other way to obtain the I.S.T., the L.M.T. may be increased at the rate of 4 minutes per degree of longitude if the station is to the west of $82^{\circ}.5$ East and decreased at the same rate if the station is to the east of $82^{\circ}.5$ East Longitude.

In practice, however, when dealing with the same station, it will be convenient to combine corrections (b) and (c) above, as these are constant day after day, and add this constant to the daily times corrected for latitude only.

Moonrise and Moonset for southern Latitudes

The times of Moonrise and Moonset for southern latitudes have not been given separately. The timings for a station in southern latitude can, however, be deduced from those for the corresponding northern latitude by the following formula :

Timings for a southern latitude = $2 \times$ Timing for 0° latitude - Timing for the same northern latitude.

In this case the local mean time for the same latitude north will have to be calculated first by applying the latitude correction (a) above, and the corresponding time for the southern latitude will have to be deduced by the above formula by utilising the published figure for 0° latitude. The exact L.M.T. of rising or setting for the place in question will, however, be obtained by applying the correction (b) above to the time so deduced.

If necessary, the timings thus obtained may be reduced to I.S.T. by the usual method.

PHASES OF THE MOON, 2025

(Time in I.S.T.)

		d	h	m			d	h	m
Full Moon	Dec, 24	15	14	32	Full Moon	Jul	11	02	07
Last Quarter	Dec, 24	23	03	48	Last Quarter	Jul	18	06	08
New Moon	Dec, 24	31	03	57	New Moon	Jul	25	00	41
First Quarter	Jan, 25	07	05	26	First Quarter	Aug	01	18	11
Full Moon	Jan, 25	14	03	57	Full Moon	Aug	09	13	25
Last Quarter	Jan	22	02	01	Last Quarter	Aug	16	10	42
New Moon	Jan	29	18	06	New Moon	Aug	23	11	36
First Quarter	Feb	05	13	32	First Quarter	Aug	31	11	55
Full Moon	Feb	12	19	23	Full Moon	Sep	07	23	39
Last Quarter	Feb	20	23	02	Last Quarter	Sep	14	16	03
New Moon	Feb	28	06	15	New Moon	Sep	22	01	24
First Quarter	Mar	06	22	02	First Quarter	Sep	30	05	24
Full Moon	Mar	14	12	25	Full Moon	Oct	07	09	18
Last Quarter	Mar	22	16	59	Last Quarter	Oct	13	23	43
New Moon	Mar	29	16	28	New Moon	Oct	21	17	55
First Quarter	Apr	05	07	45	First Quarter	Oct	29	21	51
Full Moon	Apr	13	05	52	Full Moon	Nov	05	18	49
Last Quarter	Apr	21	07	05	Last Quarter	Nov	12	10	58
New Moon	Apr	28	01	01	New Moon	Nov	20	12	17
First Quarter	May	04	19	22	First Quarter	Nov	28	12	29
Full Moon	May	12	22	26	Full Moon	Dec	05	04	44
Last Quarter	May	20	17	29	Last Quarter	Dec	12	02	22
New Moon	May	27	08	32	New Moon	Dec	20	07	13
First Quarter	Jun	03	09	11	First Quarter	Dec, 25	28	00	40
Full Moon	Jun	11	13	14	Full Moon	Jan, 26	03	15	33
Last Quarter	Jun	19	00	49	Last Quarter	Jan, 26	10	21	18
New Moon	Jun	25	16	02	New Moon	Jan, 26	19	01	22
First Quarter	Jul	03	01	00	First Quarter	Jan, 26	26	10	17

PART - IV

ECLIPSES AND OCCULTATIONS

ECLIPSES, 2025

In the year 2025, there are two eclipses of the Sun and two eclipses of the Moon.

I	March	14	Total eclipse of the Moon	326
II	March	29	Partial eclipse of the Sun	320-322
III	September	07	Total eclipse of the Moon	327
IV	September	21	Partial eclipse of the Sun	323-325

II-Partial eclipse of the Sun, 29 March, 2025, Saturday.

Not Visible in India

Area of Visibility

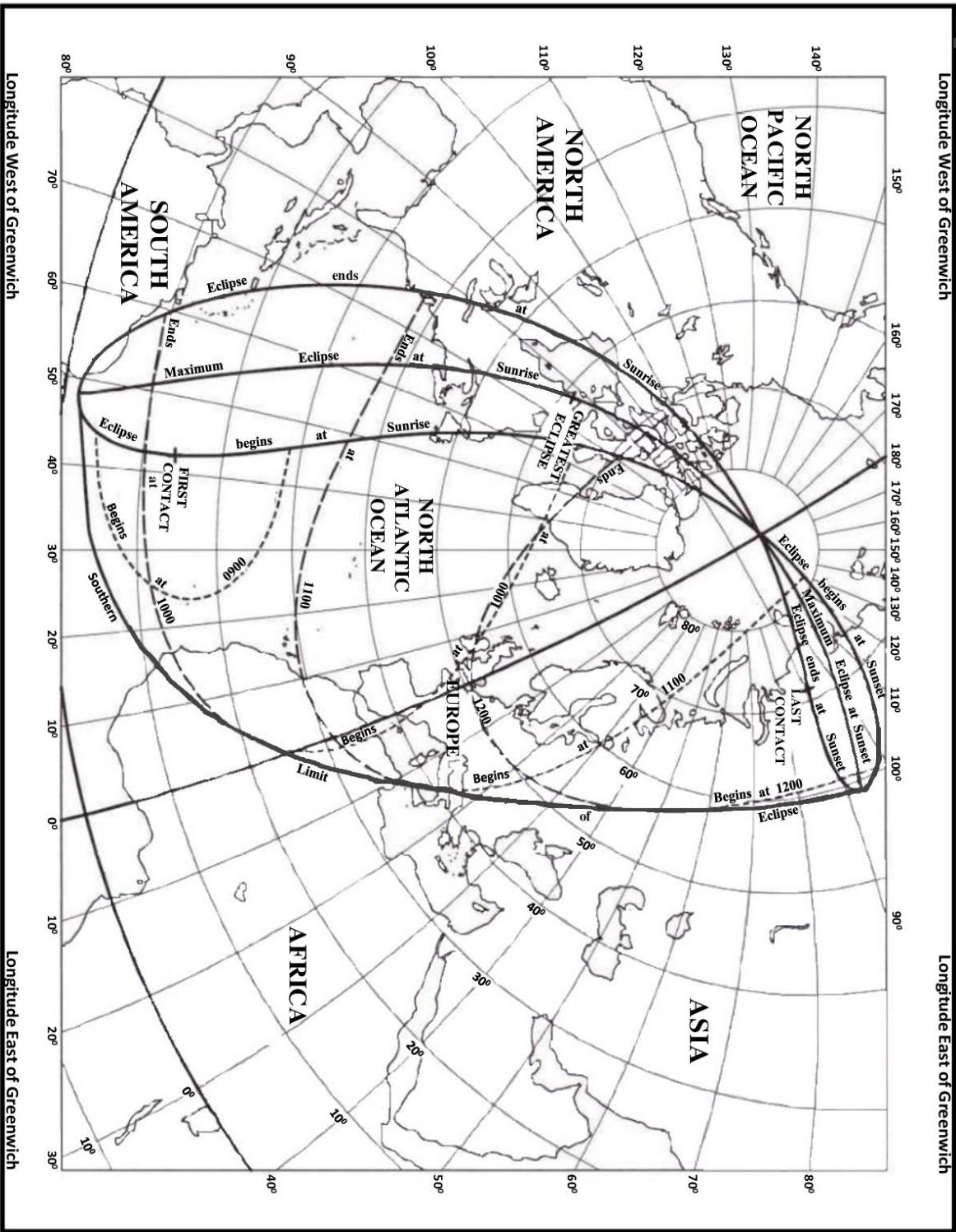
The eclipse will be visible in the region covering North-eastern North America, Greenland, Iceland, North Atlantic Ocean, most of Europe, North-western Russia.

ELEMENTS OF THE ECLIPSE						
Universal Time of Conjunction in Right Ascension : March 29 ^d 11 ^h 46 ^m 16 ^s .2						
	MOON			SUN		
	h	m	s	h	m	s
Right Ascension	0	33	12.03	0	33	12.03
Hourly Motion			133.79			09.11
	°	'	"	°	'	"
Declination	5	05	12.54	3	34	52.27
Hourly Motion		17	59.61			58.39
Equatorial Horizontal Parallax		61	08.46			08.81
True Semi-diameter		16	39.06		16	01.08

CIRCUMSTANCES OF THE ECLIPSE										
	Universal Time			Indian Standard Time			Latitude		Longitude	
	d	h	m	d	h	m	°	'	°	'
Eclipse begins	29	8	50.8	29	14	20.8	14	02.1	-42	24.8
Greatest eclipse*	29	10	47.4	29	16	17.4	61	15.6	-77	12.5
Eclipse ends	29	12	43.6	29	18	13.6	71	15.0	+90	55.1

*Magnitude of the eclipse = 0.937, Duration of eclipse = 3h. 53 m.

ECLIPSES, 2025



ECLIPSES, 2025

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN MARCH 29

Terrestrial Time (TT)		Co-ordinates of the Centre of Shadow on the Fundamental Plane		Direction of the Axis of Shadow *					Radius of Penumbra and Umbra on the Fundamental Plane
h	m	x	y	sin d	cos d	°	μ	'	''
8	30	-1.676012	+0.268233	+0.061521	+0.998106	306	19	14.6	+0.534951
	40	-1.591169	+0.314749	+0.061567	+0.998103	308	49	17.2	+0.534952
	50	-1.506320	+0.361263	+0.061612	+0.998100	311	19	19.8	+0.534953
9	00	-1.421466	+0.407774	+0.061657	+0.998097	313	49	22.4	+0.534953
	10	-1.336608	+0.454283	+0.061702	+0.998095	316	19	25.1	+0.534952
	20	-1.251744	+0.500789	+0.061747	+0.998092	318	49	27.7	+0.534951
	30	-1.166876	+0.547293	+0.061792	+0.998089	321	19	30.3	+0.534949
	40	-1.082004	+0.593793	+0.061837	+0.998086	323	49	32.9	+0.534946
	50	-0.997128	+0.640291	+0.061882	+0.998083	326	19	35.5	+0.534943
10	00	-0.912248	+0.686785	+0.061928	+0.998081	328	49	38.2	+0.534938
	10	-0.827364	+0.733277	+0.061973	+0.998078	331	19	40.8	+0.534934
	20	-0.742477	+0.779764	+0.062018	+0.998075	333	49	43.4	+0.534928
	30	-0.657587	+0.826249	+0.062063	+0.998072	336	19	46.0	+0.534922
	40	-0.572694	+0.872729	+0.062108	+0.998069	338	49	48.6	+0.534915
	50	-0.487799	+0.919206	+0.062153	+0.998067	341	19	51.2	+0.534907
11	00	-0.402901	+0.965678	+0.062198	+0.998064	343	49	53.9	+0.534899
	10	-0.318000	+1.012147	+0.062243	+0.998061	346	19	56.5	+0.534890
	20	-0.233098	+1.058611	+0.062289	+0.998058	348	49	59.1	+0.534880
	30	-0.148195	+1.105071	+0.062334	+0.998055	351	20	01.7	+0.534870
	40	-0.063289	+1.151527	+0.062379	+0.998053	353	50	04.3	+0.534859
	50	+0.021617	+1.197978	+0.062424	+0.998050	356	20	06.9	+0.534847
12	00	+0.106525	+1.244424	+0.062469	+0.998047	358	50	09.6	+0.534835
	10	+0.191433	+1.290865	+0.062514	+0.998044	361	20	12.2	+0.534821
	20	+0.276342	+1.337301	+0.062559	+0.998041	363	50	14.8	+0.534808
	30	+0.361251	+1.383732	+0.062604	+0.998038	366	20	17.4	+0.534793
	40	+0.446160	+1.430158	+0.062649	+0.998036	368	50	20.0	+0.534778
	50	+0.531069	+1.476578	+0.062695	+0.998033	371	20	22.6	+0.534762
13	00	+0.615978	+1.522993	+0.062740	+0.998030	373	50	25.3	+0.534745

tanf1= 0.00468985

tanf2= 0.00466652

TT hr	d ° ' "			Variations per minute		
				x'	y'	μ', ''
9	3	32	06	+0.008 486	+0.004 651	15 00
10	3	33	02	+0.008 488	+0.004 649	15 00
11	3	33	58	+0.008 490	+0.004 647	15 00
12	3	34	54	+0.008 491	+0.004 644	15 00

$$\xi' = 0.004364 \rho \cos \phi' \cos(\mu + \lambda) \quad \eta' = 0.004364 \xi \sin d$$

*d stands for declination and μ stands for hour angle

ECLIPSES, 2025

IV-Partial eclipse of the Sun, 21 September, 2025, Sunday.

Not Visible in India

Area of Visibility

The eclipse is visible in the region covering New Zealand, eastern Melanesia, southern Polynesia, western Antarctica.

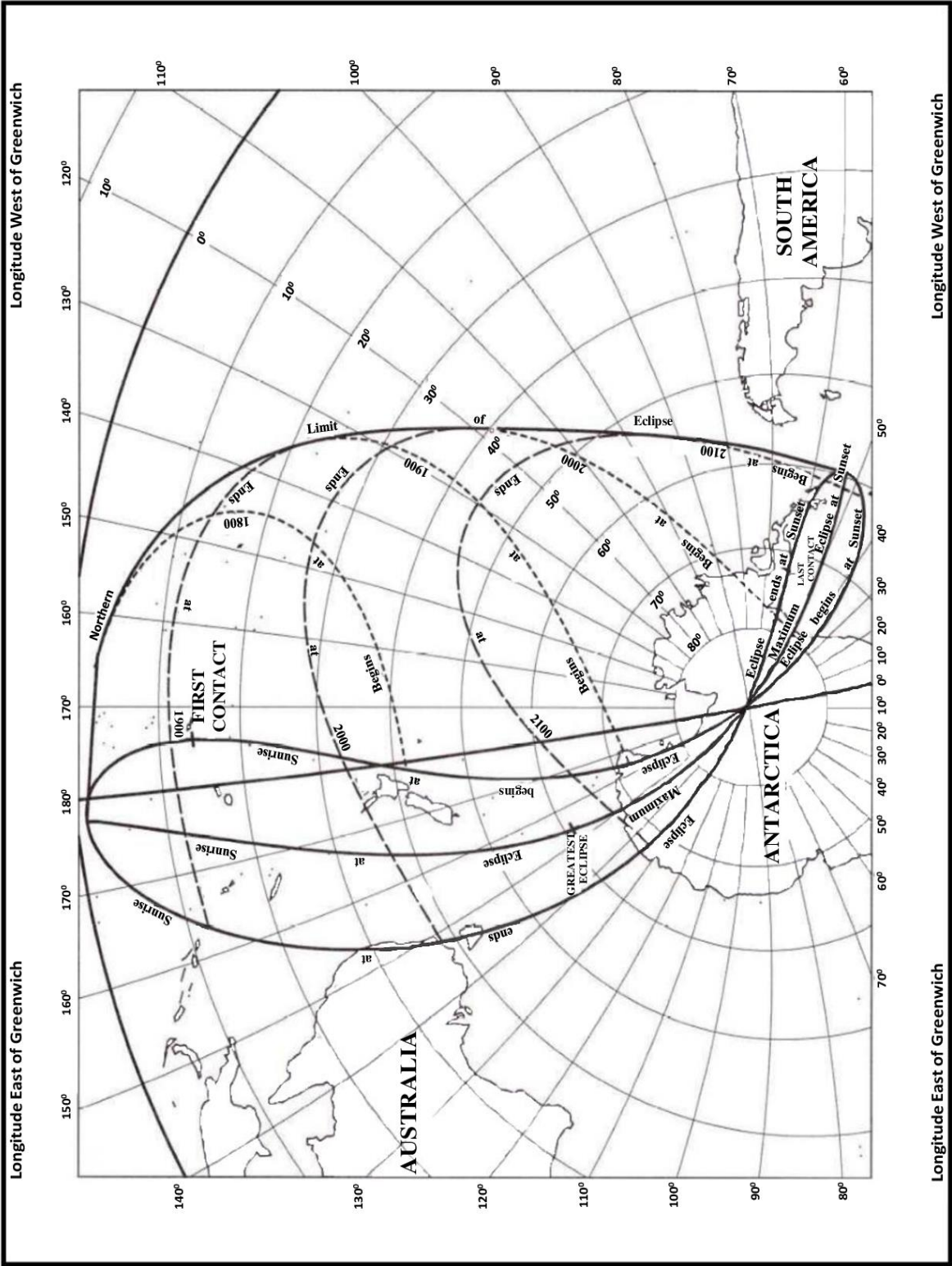
ELEMENTS OF THE ECLIPSE						
Universal Time of Conjunction in Right Ascension : September 21 ^d 20 ^h 50 ^m 29 ^s .07						
	MOON			SUN		
	h	m	s	h	m	s
Right Ascension	11	56	47.14	11	56	47.14
Hourly Motion			108.79			08.98
	°	'	"	°	'	"
Declination	-0	46	12.23	+0	20	54.02
Hourly Motion		-14	50.14			-58.37
Equatorial Horizontal Parallax		55	11.99			08.76
True Semi-diameter		15	02.15		15	55.94

CIRCUMSTANCES OF THE ECLIPSE										
	Universal Time			Indian Standard Time			Latitude		Longitude	
	d	h	m	d	h	m	°	'	°	'
Eclipse begins	21	17	29.8	21	22	59.8	-14	00.4	-174	07.8
Greatest eclipse*	21	19	41.9	22	01	11.9	-61	03.9	+153	24.7
Eclipse ends	21	21	53.6	22	03	23.6	-72	17.9	-61	14.4

*Magnitude of the eclipse = 0.855, Duration of eclipse = 4 h. 24 m.

ECLIPSES, 2025

PARTIAL SOLAR ECLIPSE OF SEPTEMBER 21, 2025



ECLIPSES, 2025

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN SEPTEMBER 21

Terrestrial Time (TT)		Co-ordinates of the Centre of Shadow on the Fundamental Plane		Direction of the Axis of Shadow *					Radius of Penumbra and Umbra on the Fundamental Plane
h	m	x	y	sin d	cos d	μ	°	'	''
17	00	-1.749374	-0.245015	+0.007182	+0.999974	76	46	03.3	+0.561171
	10	-1.673874	-0.287073	+0.007137	+0.999975	79	16	06.1	+0.561196
	20	-1.598372	-0.329129	+0.007092	+0.999975	81	46	09.0	+0.561221
	30	-1.522867	-0.371184	+0.007046	+0.999975	84	16	11.8	+0.561244
	40	-1.447360	-0.413238	+0.007001	+0.999975	86	46	14.7	+0.561268
	50	-1.371850	-0.455291	+0.006956	+0.999976	89	16	17.6	+0.561290
18	00	-1.296338	-0.497342	+0.006910	+0.999976	91	46	20.4	+0.561313
	10	-1.220824	-0.539392	+0.006865	+0.999976	94	16	23.3	+0.561334
	20	-1.145308	-0.581440	+0.006819	+0.999977	96	46	26.2	+0.561355
	30	-1.069790	-0.623486	+0.006774	+0.999977	99	16	29.0	+0.561375
	40	-0.994271	-0.665531	+0.006729	+0.999977	101	46	31.9	+0.561395
	50	-0.918750	-0.707574	+0.006683	+0.999978	104	16	34.7	+0.561414
19	00	-0.843227	-0.749614	+0.006638	+0.999978	106	46	37.6	+0.561433
	10	-0.767704	-0.791653	+0.006593	+0.999978	109	16	40.5	+0.561451
	20	-0.692179	-0.833689	+0.006547	+0.999979	111	46	43.3	+0.561468
	30	-0.616653	-0.875724	+0.006502	+0.999979	114	16	46.2	+0.561485
	40	-0.541127	-0.917755	+0.006456	+0.999979	116	46	49.0	+0.561501
	50	-0.465600	-0.959785	+0.006411	+0.999979	119	16	51.9	+0.561517
20	00	-0.390072	-1.001812	+0.006366	+0.999980	121	46	54.8	+0.561532
	10	-0.314544	-1.043836	+0.006320	+0.999980	124	16	57.6	+0.561546
	20	-0.239015	-1.085858	+0.006275	+0.999980	126	47	00.5	+0.561560
	30	-0.163487	-1.127877	+0.006230	+0.999981	129	17	03.3	+0.561574
	40	-0.087958	-1.169893	+0.006184	+0.999981	131	47	06.2	+0.561586
	50	-0.012430	-1.211906	+0.006139	+0.999981	134	17	09.0	+0.561598
21	00	+0.063098	-1.253916	+0.006093	+0.999981	136	47	11.9	+0.561610
	10	+0.138626	-1.295922	+0.006048	+0.999982	139	17	14.8	+0.561621
	20	+0.214153	-1.337926	+0.006003	+0.999982	141	47	17.6	+0.561631
	30	+0.289679	-1.379926	+0.005957	+0.999982	144	17	20.5	+0.561641
	40	+0.365204	-1.421923	+0.005912	+0.999982	146	47	23.3	+0.561650
	50	+0.440729	-1.463917	+0.005866	+0.999983	149	17	26.2	+0.561659
22	00	+0.516252	-1.505907	+0.005821	+0.999983	151	47	29.0	+0.561667

tanf1= 0.00466578

tanf2= 0.00464257

TT hr	d ° ' "			Variations per minute		
				x'	y'	μ'
17	0	24	42	+0.007 550	-0.004 206	15 00
18	0	23	45	+0.007 551	-0.004 205	15 00
19	0	22	49	+0.007 552	-0.004 204	15 00
20	0	21	53	+0.007 553	-0.004 202	15 00
21	0	20	57	+0.007 553	-0.004 201	15 00

$$\xi' = 0.004364 \quad \rho \cos \phi' \cos(\mu + \lambda) \quad \eta' = 0.004364 \quad \xi \sin d$$

*d stands for declination and μ stands for hour angle

ECLIPSES, 2025

I- Total eclipse of the Moon, 14 March, 2025, Friday

Not Visible in India

The eclipse will be visible in the region covering Pacific, Americas, West Europe, West Africa, North Atlantic Ocean and South Atlantic Ocean.

The places from where the beginning of Umbral phase is visible at the time of moonset are-South Atlantic Ocean, Nigeria, Italy, France, Western part of Poland, Norway, Sweden.

The places from where the ending of Umbral phase is visible at the time of moonrise are- New Zealand, North Pacific Ocean, Eastern part of Russia.

ELEMENTS OF THE ECLIPSE						
Universal Time of Opposition in Right Ascension: March 14 ^h 06 ^m 35 ^s 59 ^s .32						
	MOON			SUN		
	h	m	s	h	m	s
Right Ascension	11	37	42.49	23	37	42.49
Hourly Motion			106.65			09.16
	°	'	"	°	'	"
Declination	2	46	25.38	-2	24	40.45
Hourly Motion		-14	31.10			59.17
Equatorial Horizontal Parallax		54	37.05			08.85
True Semi-diameter		14	52.63		16	05.25

CIRCUMSTANCES OF THE ECLIPSE											
	Universal Time			Indian Standard Time			Position Angle measured from the North Point of Moon's Limb (N.E.S.W.)	The Moon being in the Zenith in			
								Latitude		Longitude	
	d	h	m	d	h	m	°	°	'	°	'
Moon enters penumbra	14	03	55.7	14	9	25.7	132	+3	25	-57	26
Moon enters umbra	14	05	09.3	14	10	39.3	140	+3	22	-75	47
Moon enters Totality	14	06	25.6	14	11	55.6	-10	+2	49	-93	54
Middle of the eclipse*	14	06	59.9	14	12	29.9	-	+2	41	-101	57
Moon leaves Totality	14	07	31.9	14	13	01.9	68	+2	33	-110	01
Moon leaves umbra	14	08	48.2	14	14	18.2	279	+2	14	-128	35
Moon leaves penumbra	14	10	01.8	14	15	31.8	281	+2	11	-146	56

*Magnitude of the eclipse =1.183(Moon's diam =1.0). Distance between the centers at middle 1141".7

Radius of shadow cone at Moon's distance: Penumbra 4329".5, Umbra 2360".4

EASTERN AND WESTERN LIMITS OF VISIBILITY

Eastern Limit				Western Limit			
Moonset at beginning (5h 09.3m U.T.)				Moonrise at ending (8 h 48.2 m U.T.)			
Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude
°	°	°	°	°	°	°	°
-50	+10 12	+10	+14 49	-50	+144 06	+10	+141 02
-40	+11 23	+20	+15 26	-40	+143 18	+20	+140 36
-30	+12 16	+30	+16 10	-30	+142 43	+30	+140 08
-20	+12 59	+40	+17 03	-20	+142 14	+40	+139 32
-10	+13 37	+50	+18 14	-10	+141 49	+50	+138 45
0	+14 13	+60	+20 04	0	+141 25	+60	+137 32

The eclipse is visible in the region west of the eastern limit and east of the western limit. Here, moonset and moonrise times relate to visibility of the center of the Moon on the horizon.

ECLIPSES, 2025

III- Total eclipse of the Moon, 07 September, 2025, Sunday.

Visible in India

The eclipse will be visible in the region covering parts of Antarctica, western Pacific Ocean, Australasia, Asia, Indian Ocean, Europe, eastern Atlantic Ocean.

The places from where the beginning of the umbral phase will be visible at the time of moonset are parts of Russia and Pacific Ocean.

The places from where the ending of the umbral phase will be visible at the time of moonrise are parts of Iceland, western parts of Africa and Atlantic Ocean.

ELEMENTS OF THE ECLIPSE						
Universal Time of Opposition Right Ascension :Sept 7 ^d 17 ^h 55 ^m 52 ^s .83						
	MOON			SUN		
	h	m	s	h	m	s
Right Ascension	23	06	06.73	11	06	06.73
Hourly Motion			126.76			08.99
	°	'	"	°	'	"
Declination	-6	04	35.99	5	46	03.61
Hourly Motion		16	45.36			-56.29
Equatorial Horizontal Parallax		59	18.67			08.73
True Semi-diameter		16	09.33		15	52.43

CIRCUMSTANCES OF THE ECLIPSE											
	Universal Time			Indian Standard Time			Position Angle measured from the North Point of Moon's Limb (N.E.S.W.)	The Moon being in the Zenith in			
								Latitude		Longitude	
	d	h	m	d	h	m	°	°	'	°	'
Moon enters penumbra	7	15	27.1	7	20	57.1	51	-6	29	+127	18
Moon enters umbra	7	16	26.8	7	21	56.8	46	-6	13	+112	51
Moon enters Totality	7	17	30.4	7	23	00.4	26	-5	38	+98	00
Middle of the eclipse*	7	18	11.8	7	23	41.8	-	-5	43	+87	27
Moon leaves Totality	7	18	53.3	8	00	23.3	277	-5	15	+77	58
Moon leaves umbra	7	19	56.8	8	01	26.8	257	-4	57	+62	35
Moon leaves penumbra	7	20	56.5	8	02	26.5	252	-4	40	+48	08

*Magnitude of the eclipse =1.368(Moon's diam =1.0). Distance between the centers at middle 979".6

Radius of shadow cone at Moon's distance: Penumbra 4606".0, Umbra 2663".0

EASTERN AND WESTERN LIMITS OF VISIBILITY

Eastern Limit Moonset at beginning (16h 26.8m U.T.)				Western Limit Moonrise at ending (19h 56.8m U.T.)			
Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude
°	°	°	°	°	°	°	°
-50	-149 42	+10	-158 15	-50	-33 20	+10	-26 32
-40	-151 55	+20	-159 25	-40	-31 35	+20	-25 36
-30	-153 33	+30	-160 45	-30	-30 16	+30	-24 33
-20	-154 53	+40	-162 24	-20	-29 13	+40	-23 15
-10	-156 03	+50	-164 36	-10	-28 17	+50	-21 29
0	-157 09	+60	-168 01	0	-27 25	+60	-18 47

The eclipse is visible in the region west of the eastern limit and east of the western limit. Here, moonset and moonrise times relate to visibility of the center of the Moon on the horizon.

OCCULTATIONS, 2025

PLANETS BY THE MOON

Sl. No.	Date and Ingress - Egress Times (U.T.)		Planet	Magnitude of Planet	Area of Visibility
		h -- h			
1	Jan 1	11.7 13.9	Pluto	14.5	Most of Antarctica except easternmost
2	Jan 4	15.0 18.7	Saturn	1.1	N.W. South America, S. half of Central America, S.E. tip of USA, Cape Verde Is. N.W. Africa, most of Europe, N.E. Greenland
3	Jan 5	13.1 15.6	Neptune	7.9	Azores, north-westernmost Africa, Europe except S.E., Iceland, most of Greenland, Severnaya Zemlya
4	Jan 14	01.8 05.9	Mars	-1.4	North America except N.W., Azores, Cape Verde Is., N.W. Africa
5	Feb 1	02.7 05.4	Saturn	1.1	Northern parts of S.E., Asia, China, Japan, E. Russia
6	Feb 1	21.3 22.0	Neptune	7.9	Extreme W. tip of Alaska, extreme E. tip of Russia.
7	Feb 9	18.2 21.5	Mars	-0.8	N.E. tip of USA, N. Canada, Greenland, Iceland, most of Scandinavia, most of Russia, E. Kazakhstan, Mongolia, most of China
8	Feb 25	09.2 12.1	Pluto	14.5	Most of Antarctica, Kergulen Is.
9	Mar 1	02.1 06.6	Mercury	-1.0	Kergulen Is., Australia, MelanAsia, most of Micronesia, N.W. Polynesia.
10	Mar 24	20.1 23.2	Pluto	14.5	Antarctica, south-easternmost Polynesia.
11	Apr 21	04.5 08.3	Pluto	14.5	S. tip of South America, most of Antarctica, Kergulen Is., S. half of Madagascar
12	May 18	10.5 14.7	Pluto	14.4	New Zealand, Easter Is., most of South America.
13	Jun 14	15.3 19.7	Pluto	14.4	Most of Australia, MelanAsia, south-easternmost Micronesia, N.E. Polynesia
14	Jun 29/30	23.0 03.6	Mars	1.5	N.E. tip of Russia, Hawaii, Galapagos Is., N.W. tip of South America
15	Jul 11	20.5 24.9	Pluto	14.4	St. Helena Is., southern Africa, Madagascar, India.
16	Jul 28	17.9 19.2	Mars	1.6	Westernmost Antarctica
17	Aug 8	03.3 07.6	Pluto	14.4	E. Polynesia, N.W. South America, S. Caribbean region.
18	Sep 4	11.5 15.9	Pluto	14.4	Madagascar, most of Australia, south-easternmost S.E. Asia, MelanAsia, most of Micronesia.
19	Sep 19	10.6 14.5	Venus	-3.9	N.W. Canada, Greenland, Iceland, Europe, W. Russia, parts of the Middle East, N.E. Africa.
20	Oct 1	20.3 24.7	Pluto	14.5	Easter Is., most of southern South America, St. Helena Is., W. and middle Africa.
21	Oct 29	04.4 08.9	Pluto	14.5	S. parts of S.E. Asia, most of Australia, most of MelanAsia, W. Polynesia (except New Zealand)
22	Nov 25	11.5 15.9	Pluto	14.5	Cape Verde Is., Africa except N. and S. parts, most of Arabian Peninsula, S. Asia, parts of Kazakhstan.
23	Dec 22	18.6 22.5	Pluto	14.5	Hawaii, most of central America, most of USA, N. Caribbean, E. Canada.

OCCULTATIONS, 2025

ELEMENTS OF OCCULTATIONS OF PLANETS

Sl. No.	T0 (U.T. of Conj. in R.A.)			H ₀		Y	x'	y'	Body Occulted					
									Right Ascension			Declination		
	d	h	m	h	m				h	m	s	°	'	"
1	Jan - 1	12	18.6	-1	11.0	-1.1371	0.5635	0.1560	20	16	19.6	-23	-06	-39.8
2	Jan - 4	17	23.8	1	16.1	0.6958	0.5234	0.2743	23	7	08.1	-7	-47	-48.3
3	Jan - 5	15	17.1	-1	32.2	1.1653	0.5227	0.2833	23	52	22.7	-2	-13	-25.7
4	Jan - 14	3	43.2	3	20.0	0.2376	0.5852	-0.1436	7	59	46.6	24	56	12.9
5	Feb - 1	4	52.5	-9	36.5	1.0959	0.5286	0.2821	23	16	49.8	-6	-43	-56.1
6	Feb - 1	22	45.5	7	41.6	1.4312	0.5289	0.2881	23	54	39.7	-1	-57	-42.7
7	Feb - 9	19	36.0	21	35.9	0.8180	0.5815	-0.0990	7	21	52.0	26	13	54.2
8	Feb - 25	10	08.8	0	08.4	-0.9994	0.5639	0.1683	20	23	37.6	-22	-48	-15.4
9	Mar - 1	4	02.0	-9	06.9	-0.3861	0.4811	0.2601	23	46	57.0	-1	-07	-30.0
10	Mar - 24	21	11.1	12	56.2	-0.9250	0.5557	0.1691	20	26	24.3	-22	-43	-15.7
11	Apr - 21	6	01.5	0	27.0	-0.7202	0.5474	0.1679	20	27	56.0	-22	-43	-05.2
12	May - 18	12	23.2	7	42.2	-0.4131	0.5440	0.1671	20	28	00.8	-22	-47	-60.0
13	Jun - 14	17	23.7	14	31.2	-0.1278	0.5464	0.1678	20	26	44.1	-22	-57	-05.3
14	Jun - 30	1	04.6	9	02.0	0.2227	0.4836	-0.2455	10	37	14.8	9	48	52.5
15	Jul - 11	22	42.1	21	39.1	0.0188	0.5515	0.1690	20	24	28.4	-23	-08	-26.1
16	Jul - 28	19	44.7	28	32.5	-1.3923	0.4689	-0.2571	11	40	17.4	2	50	43.3
17	Aug - 8	5	25.9	6	13.2	0.0096	0.5545	0.1690	20	21	49.7	-23	-19	-33.3
18	Sep - 4	13	38.9	16	16.3	-0.0618	0.5522	0.1667	20	19	30.9	-23	-28	-01.7
19	Sep - 19	11	45.8	25	32.0	0.8675	0.4645	-0.2299	10	9	31.9	12	21	51.5
20	Oct - 1	22	27.7	2	54.3	-0.0552	0.5451	0.1631	20	18	11.3	-23	-32	-07.6
21	Oct - 29	6	41.8	-11	03.8	0.1133	0.5370	0.1607	20	18	15.6	-23	-31	-11.0
22	Nov - 25	13	54.8	-2	04.8	0.4023	0.5330	0.1618	20	19	49.0	-23	-25	-36.0
23	Dec - 22	20	53.9	6	39.1	0.6759	0.5340	0.1667	20	22	36.8	-23	-16	-38.2

ELEMENTS OF OCCULTATIONS OF PLANETS

Sl. No.	<i>l</i>	<i>a</i>	Sl. No.	<i>l</i>	<i>a</i>	Sl. No.	<i>l</i>	<i>a</i>
1.	0.2725	1.00	10.	0.2725	1.00	19.	0.2730	1.00
2.	0.2726	1.00	11.	0.2725	1.00	20.	0.2725	1.00
3.	0.2725	1.00	12.	0.2725	1.00	21.	0.2725	1.00
4.	0.2736	1.00	13.	0.2725	1.00	22.	0.2725	1.00
5.	0.2726	1.00	14.	0.2729	1.00	23.	0.2725	1.00
6.	0.2725	1.00	15.	0.2725	1.00			
7.	0.2735	1.00	16.	0.2728	1.00			
8.	0.2725	1.00	17.	0.2725	1.00			
9.	0.2731	1.00	18.	0.2725	1.00			

OCCULTATIONS, 2025

BRIGHT STARS BY THE MOON

Sl. No.	Date and Ingress - Egress Times (U.T.)		Star	Area of Visibility
		h -- h		
1	Jan - 21	02.2 06.8	Spica	Cape Verde Is., parts of western and southern Africa, S. half of Madagascar.
2	Jan - 24/25	21.9 02.4	Antares	Most of Madagascar, S. Australia, S. Polynesia(including New Zealand).
3	Feb - 17	10.2 14.7	Spica	E. Micronesia, E. Melanesia, central Polynesia, S. part of South America.
4	Feb - 21	06.8 11.0	Antares	Easter Is., southern South America, easternmost Antarctica, S. tip of Africa.
5	Mar - 16	17.5 21.9	Spica	E. central parts of Africa, Madagascar, S. tips of Australia, S. New Zealand, E. tip of Antarctica
6	Mar - 20	14.4 18.6	Antares	S.E. Indonesia, most of Australia, S. New Zealand, westernmost Antarctica, S. tip of South America.
7	Apr -12/13	23.9 04.3	Spica	Central America, most of South America, South Georgia & the South Sandwich Is., southernmost tip of Africa.
8	Apr -16/17	20.7 01.1	Antares	S. part of Africa, Kerguelen Is., E. Antarctica, southern and central Australia.
9	May - 10	05.9 10.4	Spica	Micronesia, Melanesia, S.W. Polynesia, tip of Antarctic Peninsula, extreme southern tip of South America.
10	May - 14	02.6 07.0	Antares	Easternmost Polynesia, southern South America, tip of Antarctic Peninsula, S.E. edge of Africa.
11	Jun - 06	12.4 16.6	Spica	S. half of Africa, Madagascar, Kerguelen Is., E. Antarctica, southernmost New Zealand.
12	Jun - 10	08.8 13.3	Antares	Indonesia, W. Melanesia,Australia, New Zealand, Easter Is.
13	Jul - 03	19.9 23.5	Spica	Easternmost Polynesia, S. part of South America, most of Antarctica.
14	Jul - 07	16.1 20.4	Antares	S. tip of Africa, Kerguelen Is., easternmost Antarctica, S.W. Australia.
15	Jul - 26	21.2 21.7	Regulus	S.E. Iceland, Faroe Is.
16	Jul - 31	04.2 07.0	Spica	Extreme S.W. tip of Australia, Kerguelen Is., most Antarctica.
17	Aug - 04	00.2 04.2	Antares	S. Polynesia (including New Zealand), S. tip of South America, parts of Antarctica.
18	Aug - 27	12.7 14.7	Spica	S. tip of South America, W. Antarctica.
19	Aug - 31	08.5 12.4	Antares	S.E. edge of southern Africa, S. Madagascar, KerguelenIs., most of Antarctica, S. New Zealand.
20	Sep - 19	12.6 13.2	Regulus	Urals region of Russia.
21	Sep - 23	20.2 22.3	Spica	S. New Zealand, Tasmania, parts of Antarctica, Kerguelen Is., Marion Is.

OCCULTATIONS, 2025

BRIGHT STARS BY THE MOON

Sl. No.	Date and Ingress - Egress Times (U.T.)		Star	Area of Visibility
		h -- h		
22	Sep - 27	16.2 20.0	Antares	Easter Is., S. part of South America, most of Antarctica, Kerguelen Is., Marion Is.
23	Oct - 16	17.9 19.4	Regulus	Greenland, N.E. Canada, extreme N.E. tip of USA.
24	Oct - 24/25	22.7 02.9	Antares	Australia, New Zealand, W. Antarctica, S. tip of South America.
25	Nov- 12/13	23.0 01.8	Regulus	N.Greenland, N.E. Russia, most of Alaska, N.E. tip of China, N. Japan.
26	Nov -17	09.0 10.8	Spica	Southernmost tip of South America, W. Antarctica.
27	Dec -10	06.0 09.7	Regulus	Most of Canada, E. Alaska, Greenland, Iceland, Europe, Azores, most of N. Africa.
28	Dec -18	10.9 15.2	Antares	Easter Is., southern South America, easternmost Antarctica, S. tip of Africa.

OCCULTATIONS, 2025

ELEMENTS OF OCCULTATIONS OF STARS

Sl. No.	T0 (U.T. of Conj. in R.A.)				H ₀		Y	x'	y'	Body Occulted					
										Right Ascension			Declination		
	d	h	m	s	°	'				''					
1	Jan - 21	04	37.5	0	44.7	-0.1409	0.4886	-0.2420	13	26	31.1	-11	-17	-32.7	
2	Jan - 25	00	14.0	-7	57.5	-0.2886	0.5505	-0.1004	16	30	56.0	-26	-29	-12.8	
3	Feb - 17	12	45.9	9	11.5	-0.3627	0.4896	-0.2430	13	26	31.9	-11	-17	-38.0	
4	Feb - 21	09	02.2	2	38.6	-0.4779	0.5448	-0.0986	16	30	57.0	-26	-29	-15.0	
5	Mar - 16	20	00.9	18	14.2	-0.4146	0.4911	-0.2442	13	26	32.5	-11	-17	-41.9	
6	Mar - 20	16	40.0	12	04.1	-0.5372	0.5413	-0.0978	16	30	57.9	-26	-29	-17.3	
7	Apr - 13	02	23.4	2	24.1	-0.3855	0.4918	-0.2439	13	26	32.9	-11	-17	-44.2	
8	Apr - 16	23	02.0	20	13.6	-0.4579	0.5416	-0.0974	16	30	58.7	-26	-29	-19.1	
9	May - 10	08	28.1	10	16.3	-0.4226	0.4914	-0.2421	13	26	33.0	-11	-17	-45.0	
10	May - 14	04	51.5	3	50.4	-0.3478	0.5442	-0.0963	16	30	59.4	-26	-29	-20.6	
11	Jun - 06	14	59.8	18	35.5	-0.6032	0.4909	-0.2400	13	26	32.9	-11	-17	-44.7	
12	Jun - 10	11	07.6	11	54.0	-0.3276	0.5463	-0.0945	16	30	59.8	-26	-29	-21.8	
13	Jul - 03	22	23.4	27	46.8	-0.8818	0.4913	-0.2392	13	26	32.7	-11	-17	-43.6	
14	Jul - 07	18	19.4	20	53.4	-0.4354	0.5461	-0.0924	16	30	59.9	-26	-29	-22.7	
15	Jul - 26	20	23.9	30	34.5	1.3986	0.5206	-0.2476	10	09	43.1	11	50	37.7	
16	Jul - 31	06	29.5	13	40.7	-1.1372	0.4929	-0.2400	13	26	32.4	-11	-17	-42.1	
17	Aug - 04	02	22.4	6	44.2	-0.6063	0.5437	-0.0907	16	30	59.7	-26	-29	-23.2	
18	Aug - 27	14	40.3	23	39.3	-1.2662	0.4951	-0.2414	13	26	32.2	-11	-17	-40.5	
19	Aug - 31	10	37.8	16	47.5	-0.7240	0.5404	-0.0897	16	30	59.3	-26	-29	-23.0	
20	Sep - 19	11	51.7	25	37.7	1.3971	0.5149	-0.2468	10	09	43.5	11	50	35.3	
21	Sep - 23	22	14.4	9	01.1	-1.2617	0.4968	-0.2422	13	26	32.0	-11	-17	-39.4	
22	Sep - 27	18	17.5	2	14.8	-0.7062	0.5386	-0.0893	16	30	58.9	-26	-29	-22.0	
23	Oct - 16	17	36.7	9	10.1	1.3305	0.5113	-0.2444	10	09	44.1	11	50	31.9	
24	Oct - 25	00	58.3	-13	16.8	-0.5770	0.5394	-0.0886	16	30	58.5	-26	-29	-20.6	
25	Nov - 13	-01	32.0	-7	07.2	1.0963	0.5129	-0.2444	10	09	44.9	11	50	27.1	
26	Nov - 17	10	55.4	1	17.0	-1.3043	0.4956	-0.2383	13	26	32.6	-11	-17	-41.6	
27	Dec - 10	07	13.1	2	21.6	0.7629	0.5201	-0.2482	10	09	45.9	11	50	21.6	
28	Dec - 18	13	12.2	2	32.0	-0.4746	0.5425	-0.0847	16	30	59.0	-26	-29	-19.2	

$$l = 0.2725^* \text{ and } a = 1.00^*$$

*Elements l and a have identical values correct upto last significant digit (as reported) in each 28 occultations of the bright stars.

PART - V

ASTRONOMICAL PHENOMENA AND MISCELLANEOUS TABLES

PHENOMENA, 2025
ELONGATIONS AND MAGNITUDES OF PLANETS AT 0^h U.T.

Date		Mercury		Venus		Date		Mercury		Venus						
		Elong.	Mag.	Elong.	Mag.			Elong.	Mag.	Elong.	Mag.					
Jan.	0	W	21	-0.4	E	47	-4.5	July	9	E	25	0.7	W	42	-4.1	
	5		20	-0.3		47	-4.5		14		23	1.2		41	-4.1	
	10		18	-0.3		47	-4.6		19		19	1.9		41	-4.1	
	15		16	-0.4		47	-4.6		24		14	3.1		40	-4.0	
	20		13	-0.5		47	-4.7		29		7	4.7		39	-4.0	
Feb.	25	W	10	-0.6	E	46	-4.7	Aug.	3	W	6	5.0	W	38	-4.0	
	30		8	-0.9		46	-4.8		8		12	3.0		37	-4.0	
	4		4	-1.2		44	-4.8		13		16	1.3		36	-3.9	
	9	W	2	-1.6		43	-4.8		18		18	0.1		34	-3.9	
	14	E	4	-1.6		41	-4.9		23		18	-0.6		33	-3.9	
Mar.	19	E	8	-1.4	E	38	-4.9	Sept	28	W	15	-1.0	W	32	-3.9	
	24		12	-1.2		35	-4.8			2		11	-1.3		31	-3.9
	1		16	-1.0		31	-4.8			7		6	-1.5		30	-3.9
	6		18	-0.7		26	-4.7			12	W	2	-1.8		29	-3.9
	11		18	0.1		20	-4.5			17	E	3	-1.5		27	-3.9
Apr.	16	E	14	1.6	E	14	-4.3	Oct.	22	E	7	-1.0	W	26	-3.9	
	21	E	8	4.0			27			11	-0.7		25	-3.9		
	26	W	4	----			2			14	-0.5		24	-3.9		
	31		11	3.4			7			16	-0.3		23	-3.9		
	5		18	1.9			12			19	-0.2		21	-3.9		
	10	W	23	1.1	W	26	-4.6	Nov.	17	E	21	-0.2	W	20	-3.9	
	15		26	0.7		31	-4.7			22		23	-0.2		19	-3.9
	20		27	0.4		35	-4.7			27		24	-0.2		18	-3.9
	25		27	0.2		38	-4.7			1		24	-0.2		16	-3.9
	30		26	0.0		40	-4.7			6		22	0.0		15	-3.9
May	5	W	24	-0.1	W	42	-4.7	Dec.	11	E	18	0.6	W	14	-3.9	
	10		21	-0.4		44	-4.7			16	E	10	2.6		13	-3.9
	15		17	-0.7		45	-4.6			21	W	2	----		11	-3.9
	20		12	-1.1		45	-4.6			26		12	1.7		10	-3.9
	25		6	-1.6		46	-4.5			1	W	18	0.0		9	-3.9
June	30	W	1	----	W	46	-4.5		6	W	21	-0.5	W	8	-3.9	
	4	E	6	-1.7		46	-4.4			11		20	-0.5		6	-3.9
	9		12	-1.2		46	-4.4			16		19	-0.5		5	-3.9
	14		17	-0.7		45	-4.3			21		17	-0.5		4	-3.9
	19		21	-0.4		45	-4.3			26		15	-0.5		3	-4.0
July	24	E	23	-0.1	W	44	-4.2		31	W	12	-0.5	W	2	-4.0	
	29		25	0.1		44	-4.2			36		10	-0.6	W	1	----
	4	E	26	0.4	W	43	-4.1			41	W	7	-0.8	E	1	----
Conjunction-		d	h	d	h	d		h	d	h	d	h	d		h	
Inferior:		.....		Mar.	24 20	Mar.		23 01	July		31 24	Nov.		20 09	...
Superior:		Feb.	9 12	May 30 04		...			Sept.		13 11	....			...

N.B.- E. means that the planet is in the east of the Sun and W. means that it is in the west of the Sun by the amount of the arc stated.

PHENOMENA, 2025
ELONGATIONS AND MAGNITUDES OF PLANETS AT 0^h UT

Date	Mars				Jupiter				Saturn				Uranus		Neptune		Pluto			
	Elong.		Mag.		Elong.		Mag.		Elong.		Mag.		Elong.		Elong.		Elong.			
Jan.	-5	W	151	-1.1	E	159	-2.8	E	69	1.1	E	139	E	83	E	26				
	5		164	-1.3		148	-2.7		60	1.1		129		72		17				
	15	W	175	-1.4		137	-2.7		51	1.1		118		62	E	7				
	25	E	167	-1.2		126	-2.6		41	1.1		108		53	W	5				
Feb.	4		154	-1.0		116	-2.5		32	1.1		98		43		14				
Mar.	14	E	142	-0.7	E	106	-2.4	E	23	1.1	E	88	E	33	W	23				
	24		131	-0.4		96	-2.4		15	1.1		78		23		33				
	6		122	-0.2		87	-2.3	E	6	1.1		68		13		43				
	16		114	0.1		78	-2.2	W	4	1.2		58	E	4		52				
	26		106	0.3		70	-2.2		12	1.2		49	W	6		62				
	Apr.	5	E	99	0.5	E	61	-2.1	W	21	1.2	E	39	W	15	W	72			
May	15		93	0.7		53	-2.0		29	1.2		30		25		82				
	25		88	0.9		45	-2.0		38	1.2		21		34		91				
	5		83	1.0		37	-2.0		47	1.2		12		44		101				
June	15		78	1.1		30	-1.9		55	1.2	E	3		53		111				
	25	E	73	1.2	E	22	-1.9	W	64	1.1	W	6	W	62	W	120				
	4		69	1.3		15	-1.9		73	1.1		15		72		130				
	14		65	1.4		8	-1.9		82	1.1		24		81		140				
July	24		61	1.4	E	0	-1.9		91	1.0		33		91		149				
	4		57	1.5	W	7	-1.9		100	1.0		42		100		159				
Aug.	14	E	54	1.5	W	14	-1.9	W	110	0.9	W	52	W	110	W	168				
	24		50	1.6		21	-1.9		120	0.9		61		119	W	176				
	3		47	1.6		29	-1.9		129	0.8		70		129	E	171				
	13		43	1.6		36	-1.9		139	0.8		79		139		161				
	23		40	1.6		44	-2.0		149	0.7		89		149		152				
Sept	2	E	37	1.6	W	52	-2.0	W	160	0.7	W	98	W	158	E	142				
Oct.	12		34	1.6		60	-2.0		170	0.6		108		168		132				
	22		31	1.6		68	-2.1	W	177	0.6		118	W	178		122				
	2		27	1.6		76	-2.1	E	168	0.7		128	E	171		112				
Nov.	12		24	1.5		85	-2.2		158	0.7		138		161		102				
	22	E	22	1.5	W	94	-2.3	E	147	0.8	W	148	E	151	E	93				
	1		19	1.5		104	-2.3		137	0.9		159		141		83				
	11		16	1.4		114	-2.4		127	0.9		169		131		73				
	21		13	1.4		124	-2.5		116	1.0	W	179		121		63				
Dec.	1		10	1.3		135	-2.5		106	1.0	E	170		110		53				
	11	E	8	1.3	W	145	-2.6	E	96	1.1	E	159	E	100	E	43				
	21		5	1.2		157	-2.6		86	1.1		149		90		33				
	31		3	1.2		168	-2.7		77	1.1		138		80		23				
	41	W	1	1.2	W	180	-2.7	E	67	1.1	E	128	E	70	E	14				
	Conjunction:	d h				d h				d h				d h				d h		
Opposition:				June 24 15				Mar. 12 10				May 17 24				Mar. 19 23			
	Jan. 16 03							Sept. 21 06				Nov. 21 12				Sept. 23 13			
																	July 25 07			

Magnitudes at opposition: Uranus +5.6; Neptune +7.8; Pluto +14.4

N.B. - E. means that the planet is in the east of the Sun and W. means that it is in the west of the Sun by the amount of the arc stated.

PHENOMENA, 2025**CONJUNCTIONS, OPPOSITIONS ETC. OF PLANETS WITH THE SUN (IN LONGITUDE)****UNIVERSAL TIME****MERCURY**

		d	h	m		d	h	m
Heliacal setting W.	Jan.	20	10	51	Sept.	2	23	46
Superior conjunction	Feb.	9	12	05	Sept.	13	10	52
Heliacal rising E.	Feb.	21	16	51	Oct.	3	14	34
Greatest elongation E.	Mar.	8	06	09 (18°.2)	Oct.	29	22	02 (23°.9)
Retrograde	Mar.	15	06	50	Nov.	09	18	47
Heliacal setting E.	Mar.	19	00	24	Nov.	14	02	55
Inferior conjunction	Mar.	24	19	47	Nov.	20	09	24
Heliacal rising W.	Apr.	1	03	07	Nov.	24	20	13
Direct	Apr.	7	11	10	Nov.	29	17	51
Greatest elongation W	Apr.	21	18	49 (27°.4)	Dec.	7	21	03 (20°.7)
Heliacal setting W.	May	16	17	59	...	...	...	...
Superior conjunction	May	30	04	13	...	...	...	...
Heliacal rising E.	Jun	7	16	44	...	...	...	...
Greatest elongation E.	July	4	04	39 (25°.9)	...	...	...	...
Retrograde	July	18	04	43	...	...	...	...
Heliacal setting E.	July	21	05	01	...	...	...	...
Inferior conjunction	July	31	23	41	...	...	...	...
Heliacal rising W.	Aug.	8	00	23	...	...	...	...
Direct	Aug.	11	07	24	...	...	...	...
Greatest elongation W	Aug.	19	09	48 (18°.6)	...	...	...	...

VENUS

		d	h	m		d	h	m
Greatest elongation E.	Jan	10	05	01 (47°.2)				
Retrograde	Mar	2	00	33				
Heliacal setting E	Mar	19	07	35	...	...	...	...
Inferior conjunction	Mar	23	01	08	...	...	...	...
Heliacal rising W.	Mar	22	21	31	...	...	...	...
Direct	Apr	13	01	06	...	...	...	...
Greatest elongation W.	Jun	1	03	28 (45°.9)	...	...	...	...
Heliacal setting W.	Dec	11	18	38				

EARTH

		d	h	m		d	h	m		d	h	m	
Perihelion	Jan.	4	13	35	Equinoxes	Mar.	20	09	02	Sept.	22	18	19
Aphelion	July	3	19	59	Solstices	June	21	02	42	Dec.	21	15	03

SUPERIOR PLANETS**MARS**

		d	h	m
Opposition	Jan.	16	02	39
Direct	Feb.	24	02	03
Heliacal setting E.	Nov.	3	00	56
Conjunction	...	...	...	...
Heliacal rising W.	...	...	...	...
Retrograde	...	...	...	...
Opposition	...	...	...	...
Direct	...	...	...	...

JUPITER

		d	h	m

Feb.	Feb.	4	09	40
Jun	Jun	11	13	25
Jun	Jun	24	15	17
Jul	Jul	7	09	33
Nov.	Nov.	11	16	41

SATURN

		d	h	m

Feb	Feb	26	18	39
Mar	Mar	12	10	29
Apr	Apr	4	01	07
Jul	Jul	13	04	07
Sept.	Sept.	21	05	46
Nov	Nov	28	03	50

PHENOMENA, 2025**CONJUNCTIONS, OPPOSITIONS ETC. OF PLANETS WITH THE SUN (IN LONGITUDE)**UNIVERSAL TIME
SUPERIOR PLANETS

	URANUS				NEPTUNE				PLUTO			
		d	h	m		d	h	m		d	h	m
Conjunction	May	17	23	32	Mar.	19	23	26	Jan.	21	12	29
Retrograde	Sept.	6	04	48	July	4	21	40	May	4	15	20
Opposition	Nov.	21	12	25	Sept.	23	12	55	July	25	06	33
Direct	Jan.	30	16	22	Dec.	10	12	23	Oct.	14	02	49

N.B.- The heliacal risings and settings have been calculated for 23° 11' north latitude. Here E. means east of the Sun (i.e. western horizon) and W. means west of the Sun (i.e. eastern horizon).

PHENOMENA, 2025**CONJUNCTION OF PLANETS WITH THE MOON AND OTHER PLANETS (IN LONGITUDE)**

UNIVERSAL TIME

	d	h	m		d	h	m		d	h	m	
Jan.	3	16	21	Moon Conj. With Venus	25	02	57	Moon Conj. With Venus				
	4	16	56	Moon Conj. With Saturn	25	22	04	Moon Conj. With Mercury				
	10	22	01	Moon Conj. With Jupiter	30	16	58	Moon Conj. With Jupiter				
	14	03	48	Moon Conj. With Mars	May	4	00	13	Moon Conj. With Mars			
	19	01	26	<i>Venus Conj. with Saturn</i>		22	16	06	Moon Conj. With Saturn			
Feb.	28	21	45	Moon Conj. With Mercury		23	21	13	Moon Conj. With Venus			
	1	04	09	Moon Conj. With Saturn		26	20	05	Moon Conj. With Mercury			
	1	22	06	Moon Conj. With Venus		28	13	00	Moon Conj. With Jupiter			
	7	02	16	Moon Conj. With Jupiter	Jun.	1	10	41	Moon Conj. With Mars			
	9	19	48	Moon Conj. With Mars		8	20	12	<i>Mercury Conj. With Jupiter</i>			
Mar.	25	12	02	<i>Mercury Conj. With Saturn</i>	Jun.	19	01	38	Moon Conj. With Saturn			
	28	18	42	Moon Conj. With Saturn		22	05	01	Moon Conj. With Venus			
	1	04	18	Moon Conj. With Mercury		25	09	32	Moon Conj. With Jupiter			
	2	03	25	Moon Conj. With Venus		27	07	13	Moon Conj. With Mercury			
	6	10	17	Moon Conj. With Jupiter	Jul.	30	01	14	Moon Conj. With Mars			
	9	00	52	Moon Conj. With Mars		16	07	53	Moon Conj. With Saturn			
	11	22	55	<i>Mercury Conj. With Venus</i>		21	18	23	Moon Conj. With Venus			
	28	11	03	Moon Conj. With Saturn		23	04	56	Moon Conj. With Jupiter			
	28	19	16	Moon Conj. With Venus		25	14	58	Moon Conj. With Mercury			
	28	22	02	Moon Conj. With Mercury		28	18	43	Moon Conj. With Mars			
Apr.	2	23	25	Moon Conj. With Jupiter	Aug.	12	05	30	<i>Venus Conj. with Jupiter</i>			
	5	19	49	Moon Conj. With Mars		12	12	34	Moon Conj. With Saturn			
	7	11	01	<i>Venus Conj. with Saturn</i>		19	22	02	Moon Conj. With Jupiter			
	25	00	02	<i>Venus Conj. with Saturn</i>		20	12	27	Moon Conj. With Venus			
	25	02	53	Moon Conj. With Saturn		21	18	13	Moon Conj. With Mercury			

PHENOMENA, 2025 --- contd.**CONJUNCTION OF PLANETS WITH THE MOON AND OTHER PLANETS (IN LONGITUDE)**

UNIVERSAL TIME

d	h	m		d	h	m	
Aug. 26	14	26	Moon Conj. With Mars	10 09	09		Moon Conj. With Jupiter
Sept. 8	17	44	Moon Conj. With Saturn	12 23	16		<i>Mercury Conj. With Mars</i>
16	12	18	Moon Conj. With Jupiter	19 04	49		Moon Conj. With Venus
19	12	22	Moon Conj. With Venus	20 07	15		Moon Conj. With Mercury
22	11	36	Moon Conj. With Mercury	21 11	13		Moon Conj. With Mars
24	11	56	Moon Conj. With Mars	25 01	51		<i>Mercury Conj. With Venus</i>
Oct. 6	00	30	Moon Conj. With Saturn	29 16	42		Moon Conj. With Saturn
13	23	49	Moon Conj. With Jupiter	Dec. 7	16	51	Moon Conj. With Jupiter
19	18	26	Moon Conj. With Venus	18 10	02		Moon Conj. With Mercury
20	06	51	<i>Mercury Conj. With Mars</i>	19 16	19		Moon Conj. With Venus
23	10	56	Moon Conj. With Mars	20 12	43		Moon Conj. With Mars
23	14	57	Moon Conj. With Mercury	27 00	42		Moon Conj. With Saturn
Nov. 2	08	30	Moon Conj. With Saturn				

CONJUNCTIONS OF PLANETS WITH BRIGHT STARS (IN R.A.)

d	h	m		d	h	m	
Jan. 21	17	29	Mars 2°.40 S. of <i>Pollux</i>	Sep. 19	12	45	Venus 0°.50 N. of <i>Regulus</i>
Apr. 3	03	11	Mars 4°.14 S. of <i>Pollux</i>	Oct. 2	11	02	Mercury 1°.92 N. of <i>Spica</i>
May. 31	01	59	Mercury 6°.25 N. of <i>Aldebaran</i>	Oct. 27	14	50	Jupiter 6°.72 S. of <i>Pollux</i>
Jun. 17	04	22	Mars 0°.79 N. of <i>Regulus</i>	Nov. 1	04	23	Venus 3°.80 N. of <i>Spica</i>
Jun. 22	20	20	Mercury 5°.12 S. of <i>Pollux</i>	Nov. 17	16	35	Mars 4°.07 N. of <i>Antares</i>
Jul. 14	03	54	Venus 3°.21 N. of <i>Aldebaran</i>	Nov. 26	19	07	Jupiter 6°.64 S. of <i>Pollux</i>
Aug. 21	08	57	Venus 7°.23 S. of <i>Pollux</i>	Dec. 8	06	46	Venus 5°.06 N. of <i>Antares</i>
Sep. 2	10	11	Mercury 1°.23 N. of <i>Regulus</i>	Dec. 18	21	12	Mercury 5°.68 N. of <i>Antares</i>
Sep. 12	07	39	Mars 2°.35 N. of <i>Spica</i>				

ASTRONOMICAL DIARY, 2025

UNIVERSAL TIME

	d	h	m			d	h	m	
Jan.	3	15	23	Venus 1°.4 N of Moon	Feb.	9	19	36	Mars 0°.8 S of Moon
	4	13	35	Earth at perihelion					<i>Occultation</i>
	4	17	24	Saturn 0°.7 S of Moon		11	19	30	Uranus in Square with Sun
				<i>Occultation</i>		12	13	53	FULL MOON
	5	15	17	Neptune 1°.1 S of Moon		15	06	54	Moon in descending node
				<i>Occultation</i>		18	01	12	Moon at apogee
	5	19	46	Moon in ascending node		19	19	59	Venus at perihelion
	6	23	56	FIRST QUARTER		20	17	32	LAST QUARTER
	7	23	59	Moon at perigee		22	09	12	Moon greatest lat. S 5° 12'
	9	05	12	Mercury in descending node		24	02	02	Mars in Direct
	9	15	54	Uranus 4°.5 S of Moon		24	09	37	Mars stationary in RA
	10	05	01	Venus greatest elongation E (47°.2)		25	21	27	Mercury 1°.6 N of Saturn
	10	23	13	Jupiter 5°.4 S of Moon		27	21	38	Mercury in ascending node
	11	14	13	Moon greatest lat. N 4° 59'		28	00	45	NEW MOON
	12	13	36	Mars nearest to Earth		28	03	23	Venus stationary in RA
	13	22	27	FULL MOON		28	19	39	Saturn 1°.5 S of Moon
	14	03	43	Mars 0°.2 S of Moon	Mar.	1	04	01	Mercury 0°.4 N of Moon
				<i>Occultation</i>					<i>Occultation</i>
	16	02	39	Mars in opposition with Sun		1	05	38	Moon in ascending node
	16	19	48	Venus in ascending node		1	09	07	Neptune 1°.6 S of Moon
	19	01	48	Moon in descending node		1	21	22	Moon at perigee
	19	14	01	Mercury at aphelion		1	23	19	Venus 6°.4 N of Moon
	20	05	20	Venus 2°.5 N of Saturn		2	00	32	Venus in Retrograde
	21	04	55	Moon at apogee		2	18	19	Jupiter in Square with Sun
	21	12	29	Pluto in conjunction with Sun		3	06	26	Mercury 2°.2 N of Neptune
	21	17	29	Mars 2°.4 S of <i>Pollux</i>		4	13	39	Mercury at perihelion
	21	20	31	LAST QUARTER		5	03	58	Uranus 4°.8 S of Moon
	25	17	41	Moon greatest lat. S 5° 03'		6	11	31	Jupiter 5°.5 S of Moon
	28	20	38	Mercury 2°.5 N of Moon		6	16	32	FIRST QUARTER
	29	12	36	NEW MOON		7	06	01	Moon greatest lat. N 5° 13'
	30	16	22	Uranus in Direct		8	06	09	Mercury Greatest Elongation E (18°.2)
	30	19	03	Uranus stationary in RA		9	00	27	Mars 1°.7 S of Moon
Feb.	1	04	53	Saturn 1°.1 S of Moon		9	10	51	Mercury 6°.3 S of Venus
				<i>Occultation</i>		12	10	29	Saturn in conjunction with Sun
	1	20	27	Venus 2°.3 N of Moon		13	07	49	Venus greatest helio. lat N
	1	22	05	Moon in ascending node		14	06	55	FULL MOON, <i>Lunar Eclipse</i>
	1	22	46	Neptune 1°.4 S of Moon		14	13	46	Moon in descending node
				<i>Occultation</i>		14	18	55	Mercury greatest helio. lat N
	2	02	46	Moon at perigee		14	20	46	Mercury stationary in RA
	3	19	54	Venus 3°.9 N of Neptune		15	06	50	Mercury in Retrograde
	4	09	40	Jupiter in Direct		17	16	38	Moon at apogee
	4	13	06	Jupiter stationary in RA		19	23	26	Neptune in conjunction with Sun
	5	08	02	FIRST QUARTER		20	09	02	<i>Vernal Equinox</i>
	5	21	12	Uranus 4°.7 S of Moon		21	13	04	Moon greatest lat. S 5° 16'
	7	03	35	Jupiter 5°.5 S of Moon		22	11	29	LAST QUARTER
	7	15	52	Moon greatest lat. N 5° 07'		23	01	08	Venus in inferior conjunction
	8	19	49	Mercury greatest helio lat. S					8° 25' N of Sun
	9	12	05	Mercury in superior conjunction		24	19	47	Mercury in inferior conjunction
				2° 03' S of Sun					3° 11' N of Sun

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	d	h	m			d	h	m	
Mar.	28	12	15	Saturn 1°.8 S of Moon	May	14	17	31	Moon greatest lat. S 5° 01'
	28	13	56	Venus 8°.7 N of Moon		17	23	32	Uranus in conjunction with Sun
	28	16	29	Moon in ascending node		20	11	59	LAST QUARTER
	28	21	35	Neptune 1°.7 S of Moon		22	08	03	Moon in ascending node
	29	10	58	NEW MOON, <i>Solar Eclipse</i>		22	18	00	Saturn 2°.8 S of Moon
	30	05	25	Moon at perigee		22	20	40	Neptune 2°.1 S of Moon
	30	06	07	Venus 10°.3 N of Saturn		23	23	51	Venus 4°.0 S of Moon
Apr.	1	13	51	Uranus 4°.9 S of Moon		24	22	54	Mercury 0°.1 S of Uranus
	3	00	23	Jupiter 5°.5 S of Moon		26	01	35	Moon at perigee
	3	03	11	Mars 4°.1 S of <i>Pollux</i>		26	15	37	Uranus 4°.9 S of Moon
	3	09	14	Moon greatest lat. N 5° 13'		26	20	58	Mercury in ascending node
	5	02	15	FIRST QUARTER		26	21	52	Mercury 4°.8 S of Moon
	5	19	04	Mars 2°.2 S of Moon		27	03	02	NEW MOON
	6	06	25	Mercury stationary in RA		27	16	18	Moon greatest lat. N 4° 57'
	7	04	24	Mercury in descending node		28	13	12	Jupiter 5°.2 S of Moon
	7	11	09	Mercury in Direct		30	04	13	Mercury in superior conjunction
	10	15	01	Venus stationary in RA					0° 34' N of Sun
	10	19	57	Moon in descending node		31	01	59	Mercury 6°.3 N of <i>Aldebaran</i>
	13	00	22	FULL MOON		31	12	55	Mercury at perihelion
	13	01	06	Venus in Direct	June	1	03	28	Venus greatest elongation W (45°.9)
	13	22	48	Moon at apogee		1	09	49	Mars 1°.4 S of Moon
	16	18	33	Mercury 0° 7' S of Neptune		3	03	41	FIRST QUARTER
	16	22	18	Mars at aphelion		4	01	33	Moon in descending node
	17	13	17	Mercury at aphelion		7	10	44	Moon at apogee
	17	16	01	Moon greatest lat. S 5° 09'		8	20	15	Mercury 2°.0 N of Jupiter
	21	01	34	Mars in Square with Sun		10	18	10	Mercury greatest helio. lat N
	21	01	35	LAST QUARTER		11	06	10	Moon greatest lat. S 4° 56'
	21	18	49	Mercury greatest elongation W (27°.4)		11	07	44	FULL MOON
	23	17	06	Pluto in Square with Sun		12	02	15	Venus at aphelion
	25	01	21	Venus 2°.4 N of Moon		17	04	22	Mars 0°.8 N of <i>Regulus</i>
	25	02	21	Moon in ascending node		18	09	40	Moon in ascending node
	25	04	23	Saturn 2°.3 S of Moon		18	19	19	LAST QUARTER
	25	10	06	Neptune 1°.9 S of Moon		19	03	58	Saturn 3°.4 S of Moon
	26	01	04	Mercury 4°.4 S of Moon		19	04	27	Neptune 2°.5 S of Moon
	27	16	18	Moon at perigee		21	02	42	<i>Summer Solstice</i>
	27	19	31	NEW MOON		22	08	35	Venus 7°.2 S of Moon
	29	02	22	Uranus 4°.9 S of Moon		22	18	36	Saturn in Square with Sun
	29	02	25	Venus 3°.7 N of Saturn		22	20	20	Mercury 5°.1 S of <i>Pollux</i>
	30	12	55	Moon greatest lat. N 5° 08'		23	03	36	Uranus 5°.0 S of Moon
	30	17	33	Jupiter 5°.4 S of Moon		23	04	45	Moon at perigee
May	3	23	12	Mars 2°.1 S of Moon		23	08	30	Neptune in Square with Sun
	4	02	51	Venus 2°.1 N of Neptune		24	07	10	Moon greatest lat. N 4° 56'
	4	13	52	FIRST QUARTER		24	15	17	Jupiter in conjunction with Sun
	4	15	20	Pluto in Retrograde		25	09	20	Jupiter 5°.1 S of Moon
	6	05	50	Pluto Stationary in RA		25	10	32	NEW MOON
	7	19	06	Mercury greatest helio lat. S		27	06	02	Mercury 2°.8 S of Moon
	7	23	44	Moon in descending node		29	08	45	Saturn 1°.0 S of Neptune
	8	09	15	Venus in descending node		30	01	05	Mars 0°.2 S of Moon
	11	00	47	Moon at apogee					<i>Occultation</i>
	12	16	56	FULL MOON	July	1	03	45	Moon in descending node

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	d	h	m			d	h	m	
July	2	19	30	FIRST QUARTER	Aug.	19	09	48	Mercury Greatest Elongation W (18°.6)
	3	19	59	Earth at aphelion		19	21	04	Jupiter 4°.8 S of Moon
	4	01	03	Venus 2°.4 S of Uranus		20	10	51	Venus 4°.9 S of Moon
	4	03	31	Mercury in descending node		21	08	57	Venus 7°.2 S of <i>Pollux</i>
	4	04	39	Mercury greatest elongation E (25°.9)		21	16	16	Mercury 3°.7 S of Moon
	4	05	36	Venus greatest helio lat. S		22	20	15	Mercury in ascending node
	4	21	39	Neptune in Retrograde		23	06	06	NEW MOON
	5	02	30	Moon at apogee		24	07	14	Uranus in Square with Sun
	5	14	28	Neptune Stationary in RA		24	15	42	Moon in descending node
	8	07	15	Moon greatest lat. S 5° 00'		26	16	41	Mars 2°.8 N of Moon
	10	20	37	FULL MOON		27	12	10	Mercury at perihelion
	13	04	07	Saturn in Retrograde		29	12	51	Venus in ascending node
	14	03	54	Venus 3°.2 N of <i>Aldebaran</i>		29	15	33	Moon at apogee
	14	07	56	Saturn stationary in RA		31	06	25	FIRST QUARTER
	14	12	32	Mercury at aphelion		31	13	21	Moon greatest lat. S 5° 15'
	15	10	40	Moon in ascending node	Sept.	2	10	11	Mercury 1°.2 N of <i>Regulus</i>
	16	10	09	Neptune 2°.8 S of Moon		6	04	48	Uranus in Retrograde
	16	10	31	Saturn 3°.8 S of Moon		6	04	52	Uranus stationary in RA
	17	07	22	Mercury stationary in RA		6	17	23	Mercury greatest helio. lat N
	18	00	38	LAST QUARTER		7	18	09	FULL MOON, <i>Lunar Eclipse</i>
	18	04	43	Mercury in Retrograde		7	23	08	Moon in ascending node
	20	13	04	Uranus 5°.2 S of Moon		8	20	21	Saturn 4°.0 S of Moon
	20	13	56	Moon at perigee		8	22	27	Neptune 2°.9 S of Moon
	21	09	31	Moon greatest lat. N 5° 04'		10	12	10	Moon at perigee
	21	19	25	Venus 7°.1 S of Moon		12	07	39	Mars 2°.3 N of <i>Spica</i>
	23	04	19	Jupiter 4°.9 S of Moon		13	01	53	Uranus 5°.4 S of Moon
	24	19	11	NEW MOON		13	10	52	Mercury in superior conjunction
	25	06	33	Pluto in opposition with Sun					1° 36' N of Sun
	25	11	07	Mercury 8°.1 S of Moon		13	14	19	Moon greatest lat. N 5° 14'
	28	08	30	Moon in descending node		14	10	33	LAST QUARTER
	28	19	45	Mars 1°.3 N of Moon		16	11	04	Jupiter 4°.6 S of Moon
				<i>Occultation</i>		19	11	46	Venus 0°.8 S of Moon
	31	23	41	Mercury in inferior conjunction					<i>Occultation</i>
				4° 56' S of Sun		19	12	45	Venus 0°.50 N of <i>Regulus</i>
Aug.	1	12	41	FIRST QUARTER		19	20	46	Jupiter in ascending node
	1	20	37	Moon at apogee		20	23	13	Moon in descending node
	3	18	22	Mercury greatest helio lat. S		21	05	46	Saturn in opposition with Sun
	4	09	41	Moon greatest lat. S 5° 09'		21	19	54	NEW MOON, <i>Solar Eclipse</i>
	6	09	27	Saturn 1°.1 S of Neptune		22	14	12	Mercury 2°.9 N of Moon
	9	07	55	FULL MOON		22	18	19	<i>Autumnal Equinox</i>
	10	17	55	Mercury stationary in RA		23	12	55	Neptune in opposition with Sun
	11	07	24	Mercury in Direct		23	15	20	Mars in descending node
	11	14	52	Moon in ascending node		24	14	50	Mars 3°.9 N of Moon
	12	07	44	Venus 0°.9 S of Jupiter		26	09	46	Moon at apogee
	12	15	18	Saturn 4°.1 S of Moon		27	17	08	Moon greatest lat. S 5° 12'
	12	15	34	Neptune 2°.9 S of Moon		29	23	54	FIRST QUARTER
	14	17	58	Moon at perigee		30	02	53	Mercury in descending node
	16	05	12	LAST QUARTER	Oct.	2	08	54	Venus at perihelion
	16	20	02	Uranus 5°.3 S of Moon		2	11	02	Mercury 1°.9 N of <i>Spica</i>
	17	11	46	Moon greatest lat. N 5° 14'		5	09	18	Moon in ascending node

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	d	h	m			d	h	m	
Oct.	6	02	58	Saturn 3°.8 S of Moon	Nov.	20	09	28	Mercury 5°.5 N of Moon
	6	07	18	Neptune 2°.8 S of Moon		21	08	27	Moon greatest lat. S 4° 57'
	7	03	48	FULL MOON		21	12	25	Uranus in opposition with Sun
	8	12	39	Moon at perigee		21	12	29	Mars 4°.5 N of Moon
	10	08	34	Uranus 5°.3 S of Moon		23	11	25	Mercury at perihelion
	10	11	47	Mercury at aphelion		25	04	51	Mercury 1°.0 N of Venus
	10	17	18	Moon greatest lat. N 5° 08'		26	19	07	Jupiter 6°.6 S of <i>Pollux</i>
	13	18	13	LAST QUARTER		28	03	50	Saturn in Direct
	13	22	30	Jupiter 4°.3 S of Moon		28	06	59	FIRST QUARTER
	14	02	48	Pluto in Direct		28	21	33	Moon in ascending node
	14	07	53	Pluto Stationary in RA		29	00	34	Saturn stationary in RA
	17	05	43	Jupiter in Square with Sun		29	15	26	Mercury stationary in RA
	18	04	34	Moon in descending node		29	17	51	Mercury in Direct
	19	21	39	Venus 3°.7 N of Moon		29	19	19	Saturn 3°.8 S of Moon
Nov.	21	06	16	Mercury 2°.1 S of Mars		30	01	59	Neptune 3°.0 S of Moon
	21	12	25	NEW MOON	Dec.	3	16	37	Mercury greatest helio. lat N
	23	13	28	Mars 4°.5 N of Moon		4	02	53	Uranus 5°.2 S of Moon
	23	16	14	Mercury 2°.3 N of Moon		4	11	08	Moon at perigee
	23	23	30	Moon at apogee		4	12	09	Moon greatest lat. N 4° 59'
	24	00	35	Venus greatest helio. lat N		4	23	14	FULL MOON
	24	13	21	Pluto in Square with Sun		7	15	47	Jupiter 3°.7 S of Moon
	25	07	36	Moon greatest lat. S 5° 05'		7	21	03	Mercury Greatest Elongation W (20°.7)
	27	14	50	Jupiter 6°.7 S of <i>Pollux</i>		8	06	46	Venus 5°.1 N of <i>Antares</i>
	29	16	21	FIRST QUARTER		10	12	23	Neptune in Direct
	29	22	02	Mercury greatest elongation E (23°.9)		11	00	16	Neptune Stationary in RA
	30	17	38	Mercury greatest helio lat. S		11	07	34	Moon in descending node
	1	04	23	Venus 3°.8 N of <i>Spica</i>		11	11	59	Pluto in aphelion
	1	17	44	Moon in ascending node		11	11	59	Pluto greatest helio lat. S
	2	10	57	Saturn 3°.7 S of Moon		11	20	52	LAST QUARTER
	2	17	08	Neptune 2°.8 S of Moon		17	04	34	Saturn in Square with Sun
	5	13	19	FULL MOON		17	06	10	Moon at apogee
	5	22	29	Moon at perigee		18	08	40	Moon greatest lat. S 4° 57'
	6	17	10	Uranus 5°.2 S of Moon		18	12	12	Mercury 6°.2 N of Moon
	7	08	46	Moon greatest lat. N 5° 00'		18	21	12	Mercury 5°.7 N of <i>Antares</i>
	9	18	47	Mercury in Retrograde		19	02	06	Venus in descending node
	9	23	06	Mercury stationary in RA		19	16	50	Venus 4°.9 N of Moon
	10	07	55	Jupiter 3°.9 S of Moon		20	01	43	NEW MOON
	11	16	41	Jupiter in Retrograde		20	12	28	Mars 3°.8 N of Moon
	11	19	53	Jupiter stationary in RA		21	01	03	Neptune in Square with Sun
	12	05	28	LAST QUARTER		21	15	03	<i>Winter Solstice</i>
	12	18	46	Mercury 1°.3 S of Mars		25	22	03	Moon in ascending node
	14	06	38	Moon in descending node		27	02	12	Mercury in descending node
	17	16	35	Mars 4°.1 N of <i>Antares</i>		27	03	34	Saturn 4°.0 S of Moon
	18	19	22	Mercury in ascending node		27	09	24	Neptune 3°.3 S of Moon
	19	08	35	Venus 5°.7 N of Moon		27	19	10	FIRST QUARTER
	20	02	47	Moon at apogee		31	11	51	Uranus 5°.3 S of Moon
	20	06	47	NEW MOON		31	15	18	Moon greatest lat. N 5° 00'
	20	09	24	Mercury in inferior conjunction					
				0° 32' N of Sun					

TABLE-I
CONVERSION OF MEAN SOLAR INTO SIDEREAL TIME
 CORRECTION TO BE *ADDED* TO A MEAN TIME INTERVAL

HOURS			MINUTES				SECONDS				
Mean Time	Correction		Mean Time	Correction		Mean Time	Correction		Mean Time	Correction	
h	m	s	m	s	m	s	s	s	s	s	s
1	0	09.856	1	0.164	31	5.093	1	.003	31	.085	
2	0	19.713	2	0.329	32	5.257	2	.005	32	.088	
3	0	29.569	3	0.493	33	5.421	3	.008	33	.090	
4	0	39.426	4	0.657	34	5.585	4	.011	34	.093	
5	0	49.282	5	0.821	35	5.750	5	.014	35	.096	
6	0	59.139	6	0.986	36	5.914	6	.016	36	.099	
7	1	08.995	7	1.150	37	6.078	7	.019	37	.101	
8	1	18.852	8	1.314	38	6.242	8	.022	38	.104	
9	1	28.708	9	1.478	39	6.407	9	.025	39	.107	
10	1	38.565	10	1.643	40	6.571	10	.027	40	.110	
11	1	48.421	11	1.807	41	6.735	11	.030	41	.112	
12	1	58.278	12	1.971	42	6.900	12	.033	42	.115	
13	2	08.134	13	2.136	43	7.064	13	.036	43	.118	
14	2	17.991	14	2.300	44	7.228	14	.038	44	.120	
15	2	27.847	15	2.464	45	7.392	15	.041	45	.123	
16	2	37.704	16	2.628	46	7.557	16	.044	46	.126	
17	2	47.560	17	2.793	47	7.721	17	.047	47	.129	
18	2	57.417	18	2.957	48	7.885	18	.049	48	.131	
19	3	07.273	19	3.121	49	8.049	19	.052	49	.134	
20	3	17.129	20	3.285	50	8.214	20	.055	50	.137	
21	3	26.986	21	3.450	51	8.378	21	.057	51	.140	
22	3	36.842	22	3.614	52	8.542	22	.060	52	.142	
23	3	46.699	23	3.778	53	8.707	23	.063	53	.145	
24	3	56.555	24	3.943	54	8.871	24	.066	54	.148	
			25	4.107	55	9.035	25	.068	55	.151	
			26	4.271	56	9.199	26	.071	56	.153	
			27	4.435	57	9.364	27	.074	57	.156	
			28	4.600	58	9.528	28	.077	58	.159	
			29	4.764	59	9.692	29	.079	59	.162	
			30	4.928	60	9.856	30	.082	60	.164	

Local Apparent Sidereal time for any given local mean time

= mean Sid. Time for 0^h U.T. (Pages 13 to 16)

— reduction for longitude of place

+ local mean time reckoned from midnight

+ correction for local mean time added (Table-I)

+ Equation of Equinoxes.

Local apparent Sidereal Time for any hour of Universal Time.

= Sid. Time for 0^h U.T. (Pages 13 to 16)

+ longitude of place (in time)

+ Universal Time

+ correction for U.T. added (Table-I)

+ Equation of Equinoxes.

N.B. The longitude of place is to be taken in time and regarded *positive* for places East of Greenwich. The reduction of Sidereal Time for the longitude of place may be taken from the above table and with the same sign as that of longitude. The correction for the L.M.T. or U.T. added should also be taken from the above table. For details, see the examples given under the EXPLANATION.

TABLE-II
CONVERSION OF SIDEREAL INTO MEAN SOLAR TIME
 CORRECTION TO BE *SUBTRACTED* FROM A SIDEREAL TIME INTERVAL

<u>HOURS</u>			<u>MINUTES</u>				<u>SECONDS</u>				
Sidereal Time	Correction		Sidereal Time	Correction		Sidereal Time	Correction		Sidereal Time	Correction	
h	m	s	m	s	m	s	s	s	s	s	s
1	0	09.830	1	0.164	31	5.079	1	.003	31	.085	
2	0	19.659	2	0.328	32	5.242	2	.005	32	.087	
3	0	29.489	3	0.491	33	5.406	3	.008	33	.090	
4	0	39.318	4	0.655	34	5.570	4	.011	34	.093	
5	0	49.148	5	0.819	35	5.734	5	.014	35	.096	
6	0	58.977	6	0.983	36	5.898	6	.016	36	.098	
7	1	08.807	7	1.147	37	6.062	7	.019	37	.101	
8	1	18.636	8	1.311	38	6.225	8	.022`	38	.104	
9	1	28.466	9	1.474	39	6.389	9	.025	39	.106	
10	1	38.296	10	1.638	40	6.553	10	.027	40	.109	
11	1	48.125	11	1.802	41	6.717	11	.030	41	.112	
12	1	57.955	12	1.966	42	6.881	12	.033	42	.115	
13	2	07.784	13	2.130	43	7.045	13	.035	43	.117	
14	2	17.614	14	2.294	44	7.208	14	.038	44	.120	
15	2	27.443	15	2.457	45	7.372	15	.041	45	.123	
16	2	37.273	16	2.621	46	7.536	16	.044	46	.126	
17	2	47.103	17	2.785	47	7.700	17	.046	47	.128	
18	2	56.932	18	2.949	48	7.864	18	.049	48	.131	
19	3	06.762	19	3.113	49	8.027	19	.052	49	.134	
20	3	16.591	20	3.277	50	8.191	20	.055	50	.137	
21	3	26.421	21	3.440	51	8.355	21	.057	51	.139	
22	3	36.250	22	3.604	52	8.519	22	.060	52	.142	
23	3	46.080	23	3.768	53	8.683	23	.063	53	.145	
24	3	55.909	24	3.932	54	8.847	24	.066	54	.147	
			25	4.096	55	9.010	25	.068	55	.150	
			26	4.259	56	9.174	26	.071	56	.153	
			27	4.423	57	9.338	27	.074	57	.156	
			28	4.587	58	9.502	28	.076	58	.158	
			29	4.751	59	9.666	29	.079	59	.161	
			30	4.915	60	9.830	30	.082	60	.164	

Local Mean Time for any given local apparent Sidereal Time
 = Time of preceding transit of First Point of Aries (pages 13 to 16)
 + reduction for longitude of place
 + given local apparent Sidereal Time — Equation of Equinoxes
 — correction for Sidereal Time added (Table-II).
 or, Universal Time for any given Sidereal Time may be obtained as follows:-
 Given Sidereal Time — longitude of place — Sidereal Time for 0^h U.T. = Sidereal interval since 0^h U.T.
 This interval converted into Mean Solar Time by the above table gives the Universal Time required.

Otherwise, L.M.T. for any given Sidereal Time may be obtained as follows:-

Given Sidereal Time
 — Sidereal Time for 0^h U.T. (pages 13 to 16)

+ reduction for longitude of place
 = Sidereal interval since 0^h L.M.T.
 This Sidereal interval corrected by the above table gives the required local mean time.

N.B. The reduction for longitude of place is of the same sign as that of the longitude, i.e. *positive* for places East of Greenwich and *negative* for West. See Example under EXPLANATION.

TABLE-III
CONVERSION OF ARC TO TIME

DEGREES						MINUTES		SECONDS					
°	h	m	°	h	m	°	h	m	s	"	s	"	s
0	0	00	49	3	16	98	6	32	0	0	000	0.00	0.000
1	0	04	50	3	20	99	6	36	1	0	067	.01	.001
2	0	08	51	3	24	100	6	40	2	0	133	.02	.001
3	0	12	52	3	28	101	6	44	3	0	200	.03	.002
4	0	16	53	3	32	102	6	48	4	0	267	.04	.003
5	0	20	54	3	36	103	6	52	5	0	333	.05	.003
6	0	24	55	3	40	104	6	56	6	0	400	.06	.004
7	0	28	56	3	44	105	7	00	7	0	467	.07	.005
8	0	32	57	3	48	106	7	04	8	0	533	.08	.005
9	0	36	58	3	52	107	7	08	9	0	600	.09	.006
10	0	40	59	3	56	108	7	12	10	0	667	0.10	0.007
11	0	44	60	4	00	109	7	16	11	0	733	.11	.007
12	0	48	61	4	04	110	7	20	12	0	800	.12	.008
13	0	52	62	4	08	111	7	24	13	0	867	.13	.009
14	0	56	63	4	12	112	7	28	14	0	933	.14	.009
15	1	00	64	4	16	113	7	32	15	1	000	.15	.010
16	1	04	65	4	20	114	7	36	16	1	067	.16	.011
17	1	08	66	4	24	115	7	40	17	1	133	.17	.011
18	1	12	67	4	28	116	7	44	18	1	200	.18	.012
19	1	16	68	4	32	117	7	48	19	1	267	.19	.013
20	1	20	69	4	36	118	7	52	20	1	333	0.20	0.013
21	1	24	70	4	40	119	7	56	21	1	400	.21	.014
22	1	28	71	4	44	120	8	00	22	1	467	.22	.015
23	1	32	72	4	48	121	8	04	23	1	533	.23	.015
24	1	36	73	4	52	122	8	08	24	1	600	.24	.016
25	1	40	74	4	56	123	8	12	25	1	667	.25	.017
26	1	44	75	5	00	124	8	16	26	1	733	.26	.017
27	1	48	76	5	04	125	8	20	27	1	800	.27	.018
28	1	52	77	5	08	126	8	24	28	1	867	.28	.019
29	1	56	78	5	12	127	8	28	29	1	933	.29	.019
30	2	00	79	5	16	128	8	32	30	2	000	0.30	0.020
31	2	04	80	5	20	129	8	36	31	2	067	.31	.021
32	2	08	81	5	24	130	8	40	32	2	133	.32	.021
33	2	12	82	5	28	131	8	44	33	2	200	.33	.022
34	2	16	83	5	32	132	8	48	34	2	267	.34	.023
35	2	20	84	5	36	133	8	52	35	2	333	.35	.023
36	2	24	85	5	40	134	8	56	36	2	400	.36	.024
37	2	28	86	5	44	135	9	00	37	2	467	.37	.025
38	2	32	87	5	48	136	9	04	38	2	533	.38	.025
39	2	36	88	5	52	137	9	08	39	2	600	.39	.026
40	2	40	89	5	56	138	9	12	40	2	667	0.40	0.027
41	2	44	90	6	00	139	9	16	41	2	733	.41	.027
42	2	48	91	6	04	140	9	20	42	2	800	.42	.028
43	2	52	92	6	08	141	9	24	43	2	867	.43	.029
44	2	56	93	6	12	142	9	28	44	2	933	.44	.029
45	3	00	94	6	16	143	9	32	45	3	000	.45	.030
46	3	04	95	6	20	144	9	36	46	3	067	.46	.031
47	3	08	96	6	24	145	9	40	47	3	133	.47	.031
48	3	12	97	6	28	146	9	44	48	3	200	.48	.032

TABLE-III ---- contd.
CONVERSION OF ARC TO TIME

DEGREES						MINUTES		SECONDS					
°	h	m	°	h	m	°	h	m	s	°	h	m	s
147	9	48	158	10	32	169	11	16	49	3.267	0.49	0.033	0.99
148	9	52	159	10	36	170	11	20	50	3.333	0.50	0.033	1.00
149	9	56	160	10	40	171	11	24	51	3.400			
150	10	00	161	10	44	172	11	28	52	3.467			
151	10	04	162	10	48	173	11	32	53	3.533			
152	10	08	163	10	52	174	11	36	54	3.600			
153	10	12	164	10	56	175	11	40	55	3.667			
154	10	16	165	11	00	176	11	44	56	3.733			
155	10	20	166	11	04	177	11	48	57	3.800			
156	10	24	167	11	08	178	11	52	58	3.867			
157	10	28	168	11	12	179	11	56	59	3.933			

TABLE-IV
CONVERSION OF TIME TO ARC

	0 ^h		1 ^h		2 ^h		3 ^h		4 ^h		5 ^h		SECONDS						
m	°	'	°	'	°	'	°	'	°	'	°	'	s	'	"	s	"	s	"
0	0	00	15	00	30	00	45	00	60	00	75	00	0	0	00	0.00	0.00	0.50	7.50
1	0	15	15	15	30	15	45	15	60	15	75	15	1	0	15	.01	0.15	.51	7.65
2	0	30	15	30	30	30	45	30	60	30	75	30	2	0	30	.02	0.30	.52	7.80
3	0	45	15	45	30	45	45	45	60	45	75	45	3	0	45	.03	0.45	.53	7.95
4	1	00	16	00	31	00	46	00	61	00	76	00	4	1	00	.04	0.60	.54	8.10
5	1	15	16	15	31	15	46	15	61	15	76	15	5	1	15	.05	0.75	.55	8.25
6	1	30	16	30	31	30	46	30	61	30	76	30	6	1	30	.06	0.90	.56	8.40
7	1	45	16	45	31	45	46	45	61	45	76	45	7	1	45	.07	1.05	.57	8.55
8	2	00	17	00	32	00	47	00	62	00	77	00	8	2	00	.08	1.20	.58	8.70
9	2	15	17	15	32	15	47	15	62	15	77	15	9	2	15	.09	1.35	.59	8.85
10	2	30	17	30	32	30	47	30	62	30	77	30	10	2	30	0.10	1.50	0.60	9.00
11	2	45	17	45	32	45	47	45	62	45	77	45	11	2	45	.11	1.65	.61	9.15
12	3	00	18	00	33	00	48	00	63	00	78	00	12	3	00	.12	1.80	.62	9.30
13	3	15	18	15	33	15	48	15	63	15	78	15	13	3	15	.13	1.95	.63	9.45
14	3	30	18	30	33	30	48	30	63	30	78	30	14	3	30	.14	2.10	.64	9.60
15	3	45	18	45	33	45	48	45	63	45	78	45	15	3	45	.15	2.25	.65	9.75
16	4	00	19	00	34	00	49	00	64	00	79	00	16	4	00	.16	2.40	.66	9.90
17	4	15	19	15	34	15	49	15	64	15	79	15	17	4	15	.17	2.55	.67	10.05
18	4	30	19	30	34	30	49	30	64	30	79	30	18	4	30	.18	2.70	.68	10.20
19	4	45	19	45	34	45	49	45	64	45	79	45	19	4	45	.19	2.85	.69	10.35
20	5	00	20	00	35	00	50	00	65	00	80	00	20	5	00	.20	3.00	0.70	10.50
21	5	15	20	15	35	15	50	15	65	15	80	15	21	5	15	.21	3.15	.71	10.65
22	5	30	20	30	35	30	50	30	65	30	80	30	22	5	30	.22	3.30	.72	10.80
23	5	45	20	45	35	45	50	45	65	45	80	45	23	5	45	.23	3.45	.73	10.95
24	6	00	21	00	36	00	51	00	66	00	81	00	24	6	00	.24	3.60	.74	11.10
25	6	15	21	15	36	15	51	15	66	15	81	15	25	6	15	.25	3.75	.75	11.25
26	6	30	21	30	36	30	51	30	66	30	81	30	26	6	30	.26	3.90	.76	11.40
27	6	45	21	45	36	45	51	45	66	45	81	45	27	6	45	.27	4.05	.77	11.55
28	7	00	22	00	37	00	52	00	67	00	82	00	28	7	00	.28	4.20	.78	11.70
29	7	15	22	15	37	15	52	15	67	15	82	15	29	7	15	.29	4.35	.79	11.85
30	7	30	22	30	37	30	52	30	67	30	82	30	30	7	30	.30	4.50	0.80	12.00

TABLE-IV ---- contd.
CONVERSION OF TIME TO ARC

	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	SECONDS					
m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	s	' "	s	"	s	"
31	7 45	22 45	37 45	52 45	67 45	82 45	31	7 45	0.31	4.65	0.81	12.15
32	8 00	23 00	38 00	53 00	68 00	83 00	32	8 00	.32	4.80	.82	12.30
33	8 15	23 15	38 15	53 15	68 15	83 15	33	8 15	.33	4.95	.83	12.45
34	8 30	23 30	38 30	53 30	68 30	83 30	34	8 30	.34	5.10	.84	12.60
35	8 45	23 45	38 45	53 45	68 45	83 45	35	8 45	.35	5.25	.85	12.75
36	9 00	24 00	39 00	54 00	69 00	84 00	36	9 00	.36	5.40	.86	12.90
37	9 15	24 15	39 15	54 15	69 15	84 15	37	9 15	.37	5.55	.87	13.05
38	9 30	24 30	39 30	54 30	69 30	84 30	38	9 30	.38	5.70	.88	13.20
39	9 45	24 45	39 45	54 45	69 45	84 45	39	9 45	.39	5.85	.89	13.35
40	10 00	25 00	40 00	55 00	70 00	85 00	40	10 00	.40	6.00	.90	13.50
41	10 15	25 15	40 15	55 15	70 15	85 15	41	10 15	.41	6.15	.91	13.65
42	10 30	25 30	40 30	55 30	70 30	85 30	42	10 30	.42	6.30	.92	13.80
43	10 45	25 45	40 45	55 45	70 45	85 45	43	10 45	.43	6.45	.93	13.95
44	11 00	26 00	41 00	56 00	71 00	86 00	44	11 00	.44	6.60	.94	14.10
45	11 15	26 15	41 15	56 15	71 15	86 15	45	11 15	.45	6.75	.95	14.25
46	11 30	26 30	41 30	56 30	71 30	86 30	46	11 30	.46	6.90	.96	14.40
47	11 45	26 45	41 45	56 45	71 45	86 45	47	11 45	.47	7.05	.97	14.55
48	12 00	27 00	42 00	57 00	72 00	87 00	48	12 00	.48	7.20	.98	14.70
49	12 15	27 15	42 15	57 15	72 15	87 15	49	12 15	.49	7.35	0.99	14.85
50	12 30	27 30	42 30	57 30	72 30	87 30	50	12 30	0.50	7.50	1.00	15.00
51	12 45	27 45	42 45	57 45	72 45	87 45	51	12 45				
52	13 00	28 00	43 00	58 00	73 00	88 00	52	13 00				
53	13 15	28 15	43 15	58 15	73 15	88 15	53	13 15				
54	13 30	28 30	43 30	58 30	73 30	88 30	54	13 30		h	°	
55	13 45	28 45	43 45	58 45	73 45	88 45	55	13 45		6 =	90	
56	14 00	29 00	44 00	59 00	74 00	89 00	56	14 00		12 =	180	
57	14 15	29 15	44 15	59 15	74 15	89 15	57	14 15		18 =	270	
58	14 30	29 30	44 30	59 30	74 30	89 30	58	14 30				
59	14 45	29 45	44 45	59 45	74 45	89 45	59	14 45				

TABLE - V
CONVERSION OF HOURS, MINUTES AND SECONDS TO DECIMALS OF A DAY

	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	SECONDS	
m	d	d	d	d	d	d	s	d
0	0.000 000	0.041 667	0.083 333	0.125 000	0.166 667	0.208 333	0	0.000 000
1	.000 694	.042 361	.084 028	.125 694	.167 361	.209 028	1	.000 012
2	.001 389	.043 056	.084 722	.126 389	.168 056	.209 722	2	.000 023
3	.002 083	.043 750	.085 417	.127 083	.168 750	.210 417	3	.000 035
4	.002 778	.044 444	.086 111	.127 778	.169 444	.211 111	4	.000 046
5	.003 472	.045 139	.086 806	.128 472	.170 139	.211 806	5	.000 058
6	.004 167	.045 833	.087 500	.129 167	.170 833	.212 500	6	.000 069
7	.004 861	.046 528	.088 194	.129 861	.171 528	.213 194	7	.000 081
8	.005 556	.047 222	.088 889	.130 556	.172 222	.213 889	8	.000 093
9	.006 250	.047 917	.089 583	.131 250	.172 917	.214 583	9	.000 104
10	0.006 944	0.048 611	0.090 278	0.131 944	0.173 611	0.215 278	10	0.000 116
11	.007 639	.049 306	.090 972	0.132 639	.174 306	.215 972	11	.000 127

TABLE - V ---- contd.
CONVERSION OF HOURS, MINUTES AND SECONDS TO DECIMALS OF A DAY

	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	SECONDS	
m	d	d	d	d	d	d	s	d
12	0.008 333	0.050 000	0.091 667	0.133 333	0.175 000	0.216 667	12	0.000 139
13	.009 028	.050 694	.092 361	.134 028	.175 694	.217 361	13	.000 150
14	.009 722	.051 389	.093 056	.134 722	.176 389	.218 056	14	.000 162
15	.010 417	.052 083	.093 750	.135 417	.177 083	.218 750	15	.000 174
16	.011 111	.052 778	.094 444	.136 111	.177 778	.219 444	16	.000 185
17	.011 806	.053 472	.095 139	.136 806	.178 472	.220 139	17	.000 197
18	.012 500	.054 167	.095 833	.137 500	.179 167	.220 833	18	.000 208
19	.013 194	.054 861	.096 528	.138 194	.179 861	.221 528	19	.000 220
20	0.013 889	0.055 556	0.097 222	0.138 889	0.180 556	0.222 222	20	0.000 231
21	.014 583	.056 250	.097 917	.139 583	.181 250	.222 917	21	.000 243
22	.015 278	.056 944	.098 611	.140 278	.181 944	.223 611	22	.000 255
23	.015 972	.057 639	.099 306	.140 972	.182 639	.224 306	23	.000 266
24	.016 667	.058 333	.100 000	.141 667	.183 333	.225 000	24	.000 278
25	.017 361	.059 028	.100 694	.142 361	.184 028	.225 694	25	.000 289
26	.018 056	.059 722	.101 389	.143 056	.184 722	.226 389	26	.000 301
27	.018 750	.060 417	.102 083	.143 750	.185 417	.227 083	27	.000 312
28	.019 444	.061 111	.102 778	.144 444	.186 111	.227 778	28	.000 324
29	.020 139	.061 806	.103 472	.145 139	.186 806	.228 472	29	.000 336
30	0.020 833	0.062 500	0.104 167	0.145 833	0.187 500	0.229 167	30	0.000 347
31	.021 528	.063 194	.104 861	.146 528	.188 194	.229 861	31	.000 359
32	.022 222	.063 889	.105 556	.147 222	.188 889	.230 556	32	.000 370
33	.022 917	.064 583	.106 250	.147 917	.189 583	.231 250	33	.000 382
34	.023 611	.065 278	.106 944	.148 611	.190 278	.231 944	34	.000 394
35	.024 306	.065 972	.107 639	.149 306	.190 972	.232 639	35	.000 405
36	.025 000	.066 667	.108 333	.150 000	.191 667	.233 333	36	.000 417
37	.025 694	.067 361	.109 028	.150 694	.192 361	.234 028	37	.000 428
38	.026 389	.068 056	.109 722	.151 389	.193 056	.234 722	38	.000 440
39	.027 083	.068 750	.110 417	.152 083	.193 750	.235 417	39	.000 451
40	0.027 778	0.069 444	0.111 111	0.152 778	0.194 444	0.236 111	40	0.000 463
41	.028 472	.070 139	.111 806	.153 472	.195 139	.236 806	41	.000 475
42	.029 167	.070 833	.112 500	.154 167	.195 833	.237 500	42	.000 486
43	.029 861	.071 528	.113 194	.154 861	.196 528	.238 194	43	.000 498
44	.030 556	.072 222	.113 889	.155 556	.197 222	.238 889	44	.000 509
45	.031 250	.072 917	.114 583	.156 250	.197 917	.239 583	45	.000 521
46	.031 944	.073 611	.115 278	.156 944	.198 611	.240 278	46	.000 532
47	.032 639	.074 306	.115 972	.157 639	.199 306	.240 972	47	.000 544
48	.033 333	.075 000	.116 667	.158 333	.200 000	.241 667	48	.000 556
49	.034 028	.075 694	.117 361	.159 028	.200 694	.242 361	49	.000 567
50	0.034 722	0.076 389	0.118 056	0.159 722	0.201 389	0.243 056	50	0.000 579
51	.035 417	.077 083	.118 750	.160 417	.202 083	.243 750	51	.000 590
52	.036 111	.077 778	.119 444	.161 111	.202 778	.244 444	52	.000 602
53	.036 806	.078 472	.120 139	.161 806	.203 472	.245 139	53	.000 613
54	.037 500	.079 167	.120 833	.162 500	.204 167	.245 833	54	.000 625
55	.038 194	.079 861	.121 528	.163 194	.204 861	.246 528	55	.000 637
56	.038 889	.080 556	.122 222	.163 889	.205 556	.247 222	56	.000 648
57	.039 583	.081 250	.122 917	.164 583	.206 250	.247 917	57	.000 660
58	.040 278	.081 944	.123 611	.165 278	.206 944	.248 611	58	.000 671
59	0.040 972	0.082 639	0.124 306	0.165 972	0.207 639	0.249 306	59	0.000 683

TABLE - V ---- contd.
CONVERSION OF HOURS, MINUTES AND SECONDS TO DECIMALS OF A DAY

	6 ^h	7 ^h	8 ^h	9 ^h	10 ^h	11 ^h	SECONDS	
m	d	d	d	d	d	d	s	d
0	0.250 000	0.291 667	0.333 333	0.375 000	0.416 667	0.458 333	0	0.000 000
1	.250 694	.292 361	.334 028	.375 694	.417 361	.459 028	1	.000 012
2	.251 389	.293 056	.334 722	.376 389	.418 056	.459 722	2	.000 023
3	.252 083	.293 750	.335 417	.377 083	.418 750	.460 417	3	.000 035
4	.252 778	.294 444	.336 111	.377 778	.419 444	.461 111	4	.000 046
5	.253 472	.295 139	.336 806	.378 472	.420 139	.461 806	5	.000 058
6	.254 167	.295 833	.337 500	.379 167	.420 833	.462 500	6	.000 069
7	.254 861	.296 528	.338 194	.379 861	.421 528	.463 194	7	.000 081
8	.255 556	.297 222	.338 889	.380 556	.422 222	.463 889	8	.000 093
9	.256 250	.297 917	.339 583	.381 250	.422 917	.464 583	9	.000 104
10	0.256 944	0.298 611	0.340 278	0.381 944	0.423 611	0.465 278	10	0.000 116
11	.257 639	.299 306	.340 972	.382 639	.424 306	.465 972	11	.000 127
12	.258 333	.300 000	.341 667	.383 333	.425 000	.466 667	12	.000 139
13	.259 028	.300 694	.342 361	.384 028	.425 694	.467 361	13	.000 150
14	.259 722	.301 389	.343 056	.384 722	.426 389	.468 056	14	.000 162
15	.260 417	.302 083	.343 750	.385 417	.427 083	.468 750	15	.000 174
16	.261 111	.302 778	.344 444	.386 111	.427 778	.469 444	16	.000 185
17	.261 806	.303 472	.345 139	.386 806	.428 472	.470 139	17	.000 197
18	.262 500	.304 167	.345 833	.387 500	.429 167	.470 833	18	.000 208
19	.263 194	.304 861	.346 528	.388 194	.429 861	.471 528	19	.000 220
20	0.263 889	0.305 556	0.347 222	0.388 889	0.430 556	0.472 222	20	0.000 231
21	.264 583	.306 250	.347 917	.389 583	.431 250	.472 917	21	.000 243
22	.265 278	.306 944	.348 611	.390 278	.431 944	.473 661	22	.000 255
23	.265 972	.307 639	.349 306	.390 972	.432 639	.474 306	23	.000 266
24	.266 667	.308 383	.350 000	.391 667	.433 333	.475 000	24	.000 278
25	.267 361	.309 028	.350 694	.392 361	.434 028	.475 694	25	.000289
26	.268 056	.309 722	.351 389	.393 056	.434 722	.476 389	26	.000 301
27	.268 750	.310 417	.352 083	.393 750	.435 417	.477 083	27	.000 312
28	.269 444	.311 111	.352 778	.394 444	.436 111	.477 778	28	.000 324
29	.270 139	.311 806	.353 472	.395 139	.436 806	.478 472	29	.000 336
30	0.270 833	0.312 500	0.354 167	0.395 833	0.437 500	0.479 167	30	0.000 347
31	.271 528	.313 194	.354 861	.396 528	.438 194	.479 861	31	.000 359
32	.272 222	.313 889	.355 556	.397 222	.438 889	.480 556	32	.000 370
33	.272 917	.314 583	.356 250	.397 917	.439 583	.481 250	33	.000 382
34	.273 611	.315 278	.356 944	.398 611	.440 278	.481 944	34	.000 394
35	.274 306	.315 972	.357 639	.399 306	.440 972	.482 639	35	.000 405
36	.275 000	.316 667	.358 333	.400 000	.441 667	.483 333	36	.000 417
37	.275 694	.317 361	.359 028	.400 694	.442 361	.484 028	37	.000 428
38	.276 389	.318 056	.359 722	.401 389	.443 056	.484 722	38	.000 440
39	.277 083	.318 750	.360 417	.402 083	.443 750	.485 417	39	.000 451
40	0.277 778	0.319 444	0.361 111	0.402 778	0.444 444	0.486 111	40	0.000 463
41	.278 472	.320 139	.361 806	.403 472	.445 139	.486 806	41	.000 475
42	.279 167	.320 833	.362 500	.404 167	.445 833	.487 500	42	.000 486
43	.279 861	.321 528	.363 194	.404 861	.446 528	.488 194	43	.000 498
44	.280 556	.322 222	.363 889	.405 556	.447 222	.488 889	44	.000 509
45	.281 250	.322 917	.364 583	.406 250	.447 917	.489 583	45	.000 521
46	0.281 944	0.323 611	0.365 278	0.406 944	0.448 611	0.490 278	46	0.000 532

TABLE - V ---- contd.
CONVERSION OF HOURS, MINUTES AND SECONDS TO DECIMALS OF A DAY

	6 ^h	7 ^h	8 ^h	9 ^h	10 ^h	11 ^h	SECONDS	
m	d	d	d	d	d	d	s	d
47	0.282 639	0.324 306	0.365 972	0.407 639	0.449 306	0.490 972	47	0.000 544
48	.283 333	.325 000	.366 667	.408 333	.450 000	.491 667	48	.000 556
49	.284 028	.325 694	.367 361	.409 028	.450 694	.492 361	49	.000 567
50	0.284 722	0.326 389	0.368 056	0.409 722	0.451 389	0.493 056	50	0.000 579
51	.285 417	.327 083	.368 750	.410 417	.452 083	.493 750	51	.000 590
52	.286 111	.327 778	.369 444	.411 111	.452 778	.494 444	52	.000 602
53	.286 806	.328 472	.370 139	.411 806	.453 472	.495 139	53	.000 613
54	.287 500	.329 167	.370 833	.412 500	.454 167	.495 833	54	.000 625
55	.288 194	.329 861	.371 528	.413 194	.454 861	.496 528	55	.000 637
56	.288 889	.330 556	.372 222	.413 889	.455 556	.497 222	56	.000 648
57	.289 583	.331 250	.372 917	.414 583	.456 250	.497 917	57	.000 660
58	.290 278	.331 944	.373 611	.415 278	.456 944	.498 611	58	.000 671
59	0.290 972	0.332 639	0.374 306	0.415 972	0.457 639	0.499 306	59	0.000 683

TABLE - VI
CONVERSION OF MINUTES AND SECONDS TO DECIMALS OF A DEGREE

	0'	1'	2'	3'	4'	5'		
"	°	°	°	°	°	°	"	°
0	0.00000	0.01667	0.03333	0.05000	0.06667	0.08333	0	0.0
1	0028	1694	3361	5028		8361	6	0.1
2	0056	1722	3389	5056	6722	8389	12	0.2
3	0083	1750	3417	5083	6750	8417	18	0.3
4	0111	1778	3444	5111	6778	8444	24	0.4
5	0139	1806	3472	5139	6806	8472	30	0.5
6	0167	1833	3500	5167	6833	8500	36	0.6
7	0194	1861	3528	5194	6861	8528	42	0.7
8	0222	1889	3556	5222	6889	8556	48	0.8
9	0250	1917	3583	5250	6917	8583	54	0.9
10	0.00278	0.01944	0.03611	0.05278	0.06944	0.08611		
11	0306	1972	3639	5306	6972	8639		
12	0333	2000	3667	5333	7000	8667		
13	0361	2028	3694	5361	7028	8694		
14	0389	2056	3722	5389	7056	8722		
15	0417	2083	3750	5417	7083	8750		
16	0444	2111	3778	5444	7111	8778		
17	0472	2139	3806	5472	7139	8806		
18	0500	2167	3833	5500	7167	8833		
19	0528	2194	3861	5528	7194	8861		
20	0.00556	0.02222	0.03889	0.05556	0.07222	0.08889		
21	0583	2250	3917	5583	7250	8917		
22	0611	2278	3944	5611	7278	8944		
23	0639	2306	3972	5639	7306	8972		
24	0667	2333	4000	5667	7333	9000		
25	0.00694	0.02361	0.04028	0.05694	0.07361	0.09028		

TABLE - VI ---- contd.
CONVERSION OF MINUTES AND SECONDS TO DECIMALS OF A DEGREE

	0'	1'	2'	3'	4'	5'	In units of the fifth decimal of a Degree.	
"	°	°	°	°	°	°	"	°
26	0.00722	0.02389	0.04056	0.05722	0.07389	0.09056	0.00	0
27	0750	2417	4083	5750	7417	9083	.01	1
28	0778	2444	4111	5778	7444	9111	.05	2
29	0806	2472	4139	5806	7472	9139	.09	3
30	0.00833	0.02500	0.04167	0.05833	0.07500	0.09167	.12	4
31	0861	2528	4194	5861	7528	9194	.16	5
32	0889	2556	4222	5889	7556	9222	.19	6
33	0917	2583	4250	5917	7583	9250	.23	7
34	0944	2611	4278	5944	7611	9278	.26	8
35	0972	2639	4306	5972	7639	9306	.30	9
36	1000	2667	4333	6000	7667	9333	.34	10
37	1028	2694	4361	6028	7694	9361	.37	11
38	1056	2722	4389	6056	7722	9389	.41	12
39	1083	2750	4417	6083	7750	9417	.45	13
40	0.01111	0.02778	0.04444	0.06111	0.07778	0.09444	.48	14
41	1139	2806	4472	6139	7806	9472	.52	15
42	1167	2833	4500	6167	7833	9500	.55	16
43	1194	2861	4528	6194	7861	9528	.59	17
44	1222	2889	4556	6222	7889	9556	.62	18
45	1250	2917	4583	6250	7917	9583	.66	19
46	1278	2944	4611	6278	7944	9611	.70	20
47	1306	2972	4639	6306	7972	9639	.73	21
48	1333	3000	4667	6333	8000	9667	.77	22
49	1361	3028	4694	6361	8028	9694	.81	23
50	0.01389	0.03056	0.04722	0.06389	0.08056	0.09722	.84	24
51	1417	3083	4750	6417	8083	9750	.88	25
52	1444	3111	4778	6444	8111	9778	.91	26
53	1472	3139	4806	6472	8139	9806	.95	27
54	1500	3167	4833	6500	8167	9833	0.98	28
55	1528	3194	4861	6528	8194	9861	1.00	
56	1556	3222	4889	6556	8222	9889		
57	1583	3250	4917	6583	8250	9917		
58	1611	3278	4944	6611	8278	9944		
59	0.01639	0.03306	0.04972	0.06639	0.08306	0.09972		

*In critical
cases ascend*

TABLE - VII
INTERPOLATION COEFFICIENTS

n	B''	E_0''	E_1''	n	B''	E_0''	E_1''
0.00	0.00000	0.00000	0.00000	0.05	0.01188	0.01544	0.00831
.01	.00248	.00328	.00167	.06	0.01410	0.01824	0.00996
.02	.00490	.00647	.00333	.07	.01628	.02094	.01161
.03	.00728	.00955	.00500	.08	.01840	.02355	.01325
.04	.00960	.01254	.00666	.09	.02048	.02607	.01488
0.05	0.01188	0.01544	0.00831	0.10	0.02250	0.02850	0.01650

TABLE - VII ---- contd.
INTERPOLATION COEFFICIENTS

n	B''	E_0''	E_1''	n	B''	E_0''	E_1''
0.10	0.02250	0.02850	0.01650	0.55	0.06188	0.05981	0.06394
.11	.02448	.03084	.01811	.56	0.06160	0.05914	0.06406
.12	.02640	.03309	.01971	.57	.06128	.05842	.06413
.13	.02828	.03525	.02130	.58	.06090	.05765	.06415
.14	.03010	.03732	.02288	.59	.06048	.05685	.06410
.15	.03188	.03931	.02444	0.60	0.06000	0.05600	0.06400
.16	.03360	.04122	.02598	.61	.05948	.05511	.06384
.17	.03528	.04304	.02751	.62	.05890	.05419	.06361
.18	.03690	.04477	.02903	.63	.05828	.05322	.06333
.19	.03848	.04643	.03052	.64	.05760	.05222	.06298
0.20	0.04000	0.04800	0.03200	.65	.05688	.05119	.06256
.21	.04148	.04949	.03346	.66	.05610	.05012	.06208
.22	.04290	.05091	.03489	.67	.05528	.04901	.06154
.23	.04428	.05224	.03631	.68	.05440	.04787	.06093
.24	.04560	.05350	.03770	.69	.05348	.04670	.06025
.25	.04688	.05469	.03906	0.70	0.05250	0.04550	0.05950
.26	.04810	.05580	.04040	.71	.05148	.04427	.05868
.27	.04928	.05683	.04172	.72	.05040	.04301	.05779
.28	.05040	.05779	.04301	.73	.04928	.04172	.05683
.29	.05148	.05868	.04427	.74	.04810	.04040	.05580
0.30	0.05250	0.05950	0.04550	.75	.04688	.03906	.05469
.31	.05348	.06025	.04670	.76	.04560	.03770	.05350
.32	.05440	.06093	.04787	.77	.04428	.03631	.05224
.33	.05528	.06154	.04901	.78	.04290	.03489	.05091
.34	.05610	.06208	.05012	.79	.04148	.03346	.04949
.35	.05688	.06256	.05119	0.80	0.04000	0.03200	0.04800
.36	.05760	.06298	.05222	.81	.03848	.03052	.04643
.37	.05828	.06333	.05322	.82	.03690	.02903	.04477
.38	.05890	.06361	.05419	.83	.03528	.02751	.04304
.39	.05948	.06384	.05511	.84	.03360	.02598	.04122
0.40	0.06000	0.06400	0.05600	.85	.03188	.02444	.03931
.41	.06048	.06410	.05685	.86	.03010	.02288	.03732
.42	.06090	.06415	.05765	.87	.02828	.02130	.03525
.43	.06128	.06413	.05842	.88	.02640	.01971	.03309
.44	.06160	.06406	.05914	.89	.02448	.01811	.03084
.45	.06188	.06394	.05981	0.90	0.02250	0.01650	0.02850
.46	.06210	.06376	.06044	.91	.02048	.01488	.02607
.47	.06228	.06352	.06103	.92	.01840	.01325	.02355
.48	.06240	.06323	.06157	.93	.01628	.01161	.02094
.49	.06248	.06289	.06206	.94	.01410	.00996	.01824
0.50	0.06250	0.06250	0.06250	.95	.01188	.00831	.01544
.51	.06248	.06206	.06289	.96	.00960	.00666	.01254
.52	.06240	.06157	.06323	.97	.00728	.00500	.00955
.53	.06228	.06103	.06352	.98	.00490	.00333	.00647
.54	.06210	.06044	.06376	0.99	.00248	.00167	.00328
0.55	0.06188	0.05981	0.06394	1.00	0.00000	0.00000	0.00000

N.B. – The coefficients are all *negative*. For details about Bessel's and Everett's interpolation formula, please *see* Explanation

TABLE - VIII
EVERETT COEFFICIENTS OF THE SECOND DIFFERENCES

(The coefficients are all negative)

n	E_0''	E_1''		n	E_0''	E_1''		n	E_0''	E_1''	
0.000	0.0002	0.0001	1.000	0.050	0.0156	0.0084	0.950	0.100	0.0286	0.0166	0.900
.001	.0005	.0002	0.999	.051	.0159	.0086	.949	.101	.0289	.0167	.899
.002	.0008	.0004	.998	.052	.0161	.0087	.948	.102	.0291	.0169	.898
.003	.0012	.0006	.997	.053	.0164	.0089	.947	.103	.0293	.0171	.897
.004	.0015	.0007	.996	.054	.0167	.0091	.946	.104	.0296	.0172	.896
.005	.0018	.0009	.995	.055	.0170	.0092	.945	.105	.0298	.0174	.895
.006	.0021	.0011	.994	.056	.0173	.0094	.944	.106	.0300	.0175	.894
.007	.0025	.0012	.993	.057	.0175	.0096	.943	.107	.0303	.0177	.893
.008	.0028	.0014	.992	.058	.0178	.0097	.942	.108	.0305	.0179	.892
.009	.0031	.0016	.991	.059	.0181	.0099	.941	.109	.0307	.0180	.891
.010	.0034	.0017	.990	.060	.0184	.0100	.940	.110	.0310	.0182	.890
.011	.0038	.0019	.989	.061	.0186	.0102	.939	.111	.0312	.0184	.889
.012	.0041	.0021	.988	.062	.0189	.0104	.938	.112	.0314	.0185	.888
.013	.0044	.0022	.987	.063	.0192	.0105	.937	.113	.0316	.0187	.887
.014	.0047	.0024	.986	.064	.0195	.0107	.936	.114	.0319	.0188	.886
.015	.0050	.0026	.985	.065	.0197	.0109	.935	.115	.0321	.0190	.885
.016	.0054	.0027	.984	.066	.0200	.0110	.934	.116	.0323	.0192	.884
.017	.0057	.0029	.983	.067	.0203	.0112	.933	.117	.0325	.0193	.883
.018	.0060	.0031	.982	.068	.0205	.0114	.932	.118	.0328	.0195	.882
.019	.0063	.0032	.981	.069	.0208	.0115	.931	.119	.0330	.0196	.881
.020	.0066	.0034	.980	.070	.0211	.0117	.930	.120	.0332	.0198	.880
.021	.0069	.0036	.979	.071	.0213	.0119	.929	.121	.0334	.0200	.879
.022	.0072	.0037	.978	.072	.0216	.0120	.928	.122	.0336	.0201	.878
.023	.0076	.0039	.977	.073	.0219	.0122	.927	.123	.0339	.0203	.877
.024	.0079	.0041	.976	.074	.0221	.0123	.926	.124	.0341	.0204	.876
.025	.0082	.0042	.975	.075	.0224	.0125	.925	.125	.0343	.0206	.875
.026	.0085	.0044	.974	.076	.0226	.0127	.924	.126	.0345	.0207	.874
.027	.0088	.0046	.973	.077	.0229	.0128	.923	.127	.0347	.0209	.873
.028	.0091	.0047	.972	.078	.0232	.0130	.922	.128	.0349	.0211	.872
.029	.0094	.0049	.971	.079	.0234	.0132	.921	.129	.0351	.0212	.871
.030	.0097	.0051	.970	.080	.0237	.0133	.920	.130	.0354	.0214	.870
.031	.0100	.0052	.969	.081	.0239	.0135	.919	.131	.0356	.0215	.869
.032	.0103	.0054	.968	.082	.0242	.0137	.918	.132	.0358	.0217	.868
.033	.0106	.0056	.967	.083	.0244	.0138	.917	.133	.0360	.0219	.867
.034	.0109	.0057	.966	.084	.0247	.0140	.916	.134	.0362	.0220	.866
.035	.0112	.0059	.965	.085	.0249	.0141	.915	.135	.0364	.0222	.865
.036	.0115	.0061	.964	.086	.0252	.0143	.914	.136	.0366	.0223	.864
.037	.0118	.0062	.963	.087	.0255	.0145	.913	.137	.0368	.0225	.863
.038	.0121	.0064	.962	.088	.0257	.0146	.912	.138	.0370	.0226	.862
.039	.0124	.0066	.961	.089	.0259	.0148	.911	.139	.0372	.0228	.861
.040	.0127	.0067	.960	.090	.0262	.0150	.910	.140	.0374	.0230	.860
.041	.0130	.0069	.959	.091	.0264	.0151	.909	.141	.0376	.0231	.859
.042	.0133	.0071	.958	.092	.0267	.0153	.908	.142	.0378	.0233	.858
.043	.0136	.0072	.957	.093	.0269	.0154	.907	.143	.0380	.0234	.857
.044	.0139	.0074	.956	.094	.0272	.0156	.906	.144	.0382	.0236	.856
.045	.0141	.0076	.955	.095	.0274	.0158	.905	.145	.0384	.0237	.855
.046	.0144	.0077	.954	.096	.0277	.0159	.904	.146	.0386	.0239	.854
.047	.0147	.0079	.953	.097	.0279	.0161	.903	.147	.0388	.0240	.853
.048	.0150	.0081	.952	.098	.0281	.0163	.902	.148	.0390	.0242	.852
.049	.0153	.0082	.951	.099	.0284	.0164	.901	.149	.0392	.0244	.851
0.050			0.950	0.100			0.900	0.150			0.850
	E_1''	E_0''	n		E_1''	E_0''	n		E_1''	E_0''	n

$$\text{Formula : } f_n = f_0 + n \Delta_{1/2}' + E_0'' \Delta_0'' + E_1'' \Delta_1''$$

TABLE - VIII ---- contd.
EVERETT COEFFICIENTS OF THE SECOND DIFFERENCES
(The coefficients are all negative)

n	E_0''	E_1''		n	E_0''	E_1''		n	E_0''	E_1''	
0.150	0.0394	0.0245	0.850	0.200	0.0482	0.0321	0.800	0.300	0.0597	0.0457	0.700
.151	.0396	.0247	.849	.202	.0485	.0324	.798	.304	.0600	.0462	.696
.152	.0398	.0248	.848	.204	.0488	.0327	.796	.308	.0602	.0467	.692
.153	.0400	.0250	.847	.206	.0491	.0330	.794	.312	.0605	.0472	.688
.154	.0402	.0251	.846	.208	.0493	.0333	.792	.316	.0608	.0476	.684
.155	.0404	.0253	.845	.210	.0496	.0336	.790	.320	.0611	.0481	.680
.156	.0406	.0254	.844	.212	.0499	.0339	.788	.324	.0613	.0486	.676
.157	.0407	.0256	.843	.214	.0502	.0342	.786	.328	.0615	.0490	.672
.158	.0409	.0258	.842	.216	.0505	.0345	.784	.332	.0618	.0495	.668
.159	.0411	.0259	.841	.218	.0508	.0347	.782	.336	.0620	.0499	.664
.160	.0413	.0261	.840	.220	.0510	.0350	.780	.340	.0622	.0503	.660
.161	.0415	.0262	.839	.222	.0513	.0353	.778	.344	.0624	.0508	.656
.162	.0417	.0264	.838	.224	.0516	.0356	.776	.348	.0626	.0512	.652
.163	.0419	.0265	.837	.226	.0519	.0359	.774	.352	.0627	.0516	.648
.164	.0420	.0267	.836	.228	.0521	.0362	.772	.356	.0629	.0520	.644
.165	.0422	.0268	.835	.230	.0524	.0364	.770	.360	.0631	.0524	.640
.166	.0424	.0270	.834	.232	.0526	.0367	.768	.364	.0632	.0528	.636
.167	.0426	.0271	.833	.234	.0529	.0370	.766	.368	.0633	.0532	.632
.168	.0428	.0273	.832	.236	.0531	.0373	.764	.372	.0634	.0536	.628
.169	.0429	.0274	.831	.238	.0534	.0376	.762	.376	.0636	.0540	.624
.170	.0431	.0276	.830	.240	.0536	.0378	.760	.380	.0637	.0544	.620
.171	.0433	.0277	.829	.242	.0539	.0381	.758	.384	.0638	.0547	.616
.172	.0435	.0279	.828	.244	.0541	.0384	.756	.388	.0638	.0551	.612
.173	.0437	.0280	.827	.246	.0543	.0387	.754	.392	.0639	.0555	.608
.174	.0438	.0282	.826	.248	.0546	.0389	.752	.396	.0640	.0558	.604
.175	.0440	.0283	.825	.250	.0548	.0392	.750	.400	.0640	.0562	.600
.176	.0442	.0285	.824	.252	.0550	.0395	.748	.404	.0641	.0565	.596
.177	.0443	.0287	.823	.254	.0553	.0397	.746	.408	.0641	.0568	.592
.178	.0445	.0288	.822	.256	.0555	.0400	.744	.412	.0641	.0572	.588
.179	.0447	.0290	.821	.258	.0557	.0403	.742	.416	.0641	.0575	.584
.180	.0449	.0291	.820	.260	.0559	.0405	.740	.420	.0641	.0578	.580
.181	.0450	.0293	.819	.262	.0561	.0408	.738	.424	.0641	.0581	.576
.182	.0452	.0294	.818	.264	.0563	.0411	.736	.428	.0641	.0584	.572
.183	.0454	.0296	.817	.266	.0565	.0413	.734	.432	.0641	.0587	.568
.184	.0455	.0297	.816	.268	.0567	.0416	.732	.436	.0641	.0590	.564
.185	.0457	.0299	.815	.270	.0569	.0418	.730	.440	.0640	.0593	.560
.186	.0459	.0300	.814	.272	.0571	.0421	.728	.444	.0640	.0595	.556
.187	.0460	.0302	.813	.274	.0573	.0424	.726	.448	.0639	.0598	.552
.188	.0462	.0303	.812	.276	.0575	.0426	.724	.452	.0639	.0601	.548
.189	.0463	.0304	.811	.278	.0577	.0429	.722	.456	.0638	.0603	.544
.190	.0465	.0306	.810	.280	.0579	.0431	.720	.460	.0637	.0606	.540
.191	.0467	.0307	.809	.282	.0581	.0434	.718	.464	.0636	.0608	.536
.192	.0468	.0309	.808	.284	.0582	.0436	.716	.468	.0635	.0610	.532
.193	.0470	.0310	.807	.286	.0584	.0439	.714	.472	.0634	.0613	.528
.194	.0471	.0312	.806	.288	.0586	.0441	.712	.476	.0633	.0615	.524
.195	.0473	.0313	.805	.290	.0588	.0444	.710	.480	.0632	.0617	.520
.196	.0475	.0315	.804	.292	.0589	.0446	.708	.484	.0630	.0619	.516
.197	.0476	.0316	.803	.294	.0591	.0449	.706	.488	.0629	.0621	.512
.198	.0478	.0318	.802	.296	.0593	.0451	.704	.492	.0627	.0622	.508
.199	0.0479	0.0319	.801	.298	0.0594	0.0454	.702	.496	0.0626	0.0624	.504
0.200			0.800	0.300			0.700	0.500			0.500
	E_1''	E_0''	n		E_1''	E_0''	n		E_1''	E_0''	n

N. B. -- The table is to be used like a critical table without interpolation

TABLE - IX
JULIAN DAY NUMBER
 DAYS ELAPSED AT GREENWICH NOON OF JANUARY 0

Yr. A.D.	100	200	300	400	500	600	700	800	900	1000
0	175 7582	179 4107	183 0632	186 7157	190 3682	194 0207	197 6732	201 3257	204 9782	208 6307
20	176 4887	180 1412	183 7937	187 4462	191 0987	194 7512	198 4037	202 0562	205 7087	209 3612
40	177 2192	180 8717	184 5242	188 1767	191 8292	195 4817	199 1342	202 7867	206 4392	210 0917
60	177 9497	181 6022	185 2547	188 9072	192 5597	196 2122	199 8647	203 5172	207 1697	210 8222
80	178 6802	182 3327	185 9852	189 6377	193 2902	196 9427	200 5952	204 2477	207 9002	211 5527
Yr. A.D.	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
0	212 2832	215 9357	219 5882	223 2407	226 8932	230 5447	234 1971	237 8495	241 5020	245 1544
20	213 0137	216 6662	220 3187	223 9712	227 6237	231 2752	234 9276	238 5806	242 2324	245 8849
40	213 7442	217 3967	221 0492	224 7017	228 3542	232 0057	235 6581	239 3105	242 9629	246 6154
60	214 4747	218 1272	221 7797	225 4322	229 0847	232 7362	236 3886	240 0410	243 6934	247 3459
80	215 2052	218 8577	222 5102	226 1627	229 8152	233 4667	237 1191	240 7715	244 4239	248 0764
100	215 9357	219 5882	223 2407	226 8932	230 5447	234 1971	237 8495	241 5020	245 1544	248 8069

NUMBER OF DAYS TO BE ADDED TO REDUCE TO THE BEGINNING OF EACH MONTH

Year	Jan. 0	Feb. 0	Mar. 0	Apr. 0	May 0	Jun. 0	July 0	Aug. 0	Sept. 0	Oct. 0	Nov. 0	Dec. 0
0	*	*										
1	0	31	60	91	121	152	182	213	244	274	305	335
2	366	397	425	456	486	517	547	578	609	639	670	700
3	731	762	790	821	851	882	912	943	974	1004	1035	1065
4	1096	1127	1155	1186	1216	1247	1277	1308	1339	1369	1400	1430
5	1461	1492	1521	1552	1582	1613	1643	1674	1705	1735	1766	1796
6	1827	1858	1886	1917	1947	1978	2008	2039	2070	2100	2131	2161
7	2192	2223	2251	2282	2312	2343	2373	2404	2435	2465	2496	2526
8	2557	2588	2616	2647	2677	2708	2738	2769	2800	2830	2861	2891
9	2922	2953	2982	3013	3043	3074	3104	3135	3166	3196	3227	3257
10	3288	3319	3347	3378	3408	3439	3469	3500	3531	3561	3592	3622
11	3622	3653	3684	3712	3743	3773	3804	3834	3865	3896	3926	3957
12	3987	4018	4049	4077	4108	4138	4169	4199	4230	4261	4291	4322
13	4352	4383	4414	4443	4474	4504	4535	4565	4596	4627	4657	4688
14	4718	4749	4780	4808	4839	4869	4900	4930	4961	4992	5022	5053
15	5083	5114	5145	5173	5204	5234	5265	5295	5326	5357	5387	5418
16	5448	5479	5510	5538	5569	5599	5630	5660	5691	5722	5752	5783
17	5813	5844	5875	5904	5935	5965	5996	6026	6057	6088	6118	6149
18	6179	6210	6241	6269	6300	6330	6361	6391	6422	6453	6483	6514
19	6544	6575	6606	6634	6665	6695	6726	6756	6787	6818	6848	6879
20	6909	6940	6971	6999	7030	7060	7091	7121	7152	7183	7213	7244

† From 1582 October 15 to 1599 December 31 inclusive, Gregorian calendar, the numbers given by the above tables must be diminished by 10.

* The numbers given for the years 1700, 1800 and 1900 which are not leap years, are for January - 1 and consequently the numbers 0 and 31 for January 0 and February 0 of these years must be increased by 1 and read as 1 and 32 respectively.

N.B. To find the Julian Day Number for a B.C. date, first express the year astronomically, i.e. diminish it by 1 and put a negative sign before it. Then make the number positive by adding the smallest multiple of 1000. The Julian Day Number for the date thus obtained diminished by 365250 for each multiple of 1000 added will give the required Julian Day Number for the B.C. date in question.

The Julian Day is completed at noon. In order to obtain the Julian Day Number for 0^h U.T., diminish the figure obtained from the above tables by 0.5.

The tables give the Day Numbers upto 1582, Oct. 4 for the Julian calendar and from 1582, Oct. 15 onward for the Gregorian calendar.

TABLE – X
ATMOSPHERIC REFRACTION
 MEAN REFRACTION FOR TEMPERATURE 25° C AND PRESSURE 1000 mb

Apparent Altitude	Mean Refraction	Apparent Altitude	Mean Refraction	Apparent Altitude	Mean Refraction	Apparent Altitude	Mean Refraction
° ' "	' "	° ' "	' "	° ' "	' "	° ' "	' "
-1 00	46 17.5	6 10	7 39.0	17 30	2 49.6	53	0 40.8
0 00	30 59.6	20	7 28.5	18 00	2 44.7	54	39.3
+0 10	29 09.3	30	7 18.5	18 30	2 40.0	55	37.9
20	27 28.9	40	7 08.9	19 00	2 35.6	56	36.5
30	25 57.8	6 50	6 59.7	19 30	2 31.4	57	35.1
0 40	24 34.6	7 00	6 50.8	20 00	2 27.3	58	33.8
0 50	23 18.3	7 10	6 42.3	21 00	2 19.8	59	0 32.6
1 00	22 07.9	20	6 34.1	22 00	2 12.9	60	31.2
10	21 02.6	30	6 26.3	23 00	2 06.6	61	30.0
20	20 02.4	40	6 18.7	24 00	2 00.8	62	28.8
30	19 07.0	7 50	6 11.4	25 00	1 55.4	63	27.6
1 40	18 15.6	8 00	6 04.4	26 00	1 50.4	64	26.4
1 50	17 28.2	8 10	5 57.6	27 00	1 45.7	65	0 25.2
2 00	16 44.0	20	5 51.2	28 00	1 41.3	66	24.1
10	16 02.6	30	5 44.7	29 00	1 37.2	67	23.0
20	15 24.0	40	5 38.6	30 00	1 33.4	68	21.9
30	14 48.0	8 50	5 32.6	31 00	1 29.8	69	20.8
2 40	14 14.4	9 00	5 26.8	32 00	1 26.3	70	19.7
2 50	13 42.9	9 10	5 21.3	33 00	1 23.1	71	0 18.6
3 00	13 13.5	20	5 15.9	34 00	1 20.0	72	17.6
10	12 45.8	30	5 10.6	35 00	1 17.1	73	16.5
20	12 19.6	40	5 05.5	36 00	1 14.3	74	15.5
30	11 55.0	9 50	5 00.6	37 00	1 11.7	75	14.5
3 40	11 31.9	10 00	4 55.9	38 00	1 09.1	76	13.5
3 50	11 10.0	10 30	4 42.4	39 00	1 06.8	77	0 12.5
4 00	10 49.5	11 00	4 30.0	40 00	1 04.4	78	11.5
10	10 30.1	11 30	4 18.7	41 00	1 02.2	79	10.5
20	10 11.7	12 00	4 08.1	42 00	1 00.0	80	09.5
30	9 54.2	12 30	3 58.4	43 00	0 57.9	81	08.6
4 40	9 37.5	13 00	3 49.3	44 00	0 56.0	82	07.6
4 50	9 21.6	13 30	3 40.8	45 00	0 54.1	83	0 06.6
5 00	9 06.5	14 00	3 32.9	46 00	0 52.2	84	05.7
10	8 52.1	14 30	3 25.6	47 00	0 50.4	85	04.7
20	8 38.6	15 00	3 18.6	48 00	0 48.7	86	03.8
30	8 25.5	15 30	3 12.1	49 00	0 47.0	87	02.8
5 40	8 13.0	16 00	3 06.0	50 00	0 45.4	88	01.9
5 50	8 01.2	16 30	3 00.2	51 00	0 43.8	89	0 00.9
6 00	7 49.8	17 00	2 54.8	52 00	0 42.2	90	0 00.0
6 10	7 39.0	17 30	2 49.6	53 00	0 40.8		

Rule: True altitude of a celestial object = Its apparent or observed altitude - refraction.

N.B.—The figures of mean refraction given in the above table are for temperature 25° C and pressure 1000 mb. (750.06 mm. Or 29.530 inches of mercury barometer). For other values of temperature and pressure, corrections from the tables on the following two pages are to be taken and applied to the mean refraction.

TABLE - Xa
ATMOSPHERIC REFRACTION
CORRECTION OF MEAN REFRACTION FOR DIFFERENT VALUES OF TEMPERATURE

Apparent Altitude	- 10° C (14° F)	0° C (32° F)	10° C (50° F)	20° C (68° F)	25° C (77° F)	30° C (86° F)	40° C (104° F)	50° C (122° F)
° ' "	' "	' "	' "	' "	' "	' "	' "	' "
- 1 00	+ 13 31.7	+ 9 17.8	+ 5 13.4	+ 1 37.7	0 00.0	- 1 32.6	- 4 22.5	- 6 54.8
0 00	7 16.3	5 04.8	2 53.4	0 54.8	0 00.0	0 52.1	2 29.6	3 58.2
+ 0 30	5 39.4	3 57.4	2 15.6	0 42.8	0 00.0	0 41.2	1 58.4	3 09.1
1 00	4 27.7	3 07.8	1 47.8	0 34.7	0 00.0	0 32.1	1 33.8	2 30.7
1 30	3 38.4	2 33.1	1 27.9	0 27.8	0 00.0	0 27.1	1 18.1	2 05.2
2 00	3 00.9	2 07.0	1 13.1	0 23.4	0 00.0	0 22.4	1 05.0	1 44.5
2 30	+ 2 32.9	+ 1 48.1	+ 1 02.1	+ 0 19.6	0 00.0	- 0 19.5	- 0 56.0	- 1 29.9
3 00	2 12.7	1 33.2	0 53.8	0 17.2	0 00.0	0 16.7	0 48.2	1 17.5
3 30	1 56.6	1 21.9	0 47.3	0 15.1	0 00.0	0 14.6	0 42.4	1 08.3
4 00	1 43.2	1 12.5	0 42.0	0 13.5	0 00.0	0 12.9	0 37.6	1 00.6
4 30	1 32.5	1 05.0	0 37.9	0 12.0	0 00.0	0 11.7	0 33.9	0 54.5
5 00	1 23.7	0 58.9	0 35.0	0 10.9	0 00.0	0 10.6	0 30.7	0 49.5
6 00	+ 1 10.2	+ 0 49.4	+ 0 30.0	+ 0 09.1	0 00.0	- 0 09.0	- 0 25.8	- 0 41.5
7 00	1 00.3	0 42.5	0 25.6	0 07.9	0 00.0	0 07.6	0 22.1	0 35.7
8 00	0 52.7	0 37.1	0 21.4	0 06.9	0 00.0	0 06.6	0 19.4	0 31.3
9 00	0 46.8	0 32.9	0 19.1	0 06.1	0 00.0	0 05.9	0 17.2	0 27.8
10 00	0 43.0	0 29.6	0 17.1	0 05.4	0 00.0	0 05.3	0 15.5	0 25.0
11 00	0 39.4	0 26.9	0 15.6	0 05.0	0 00.0	0 04.8	0 14.1	0 22.8
12 00	+ 0 35.7	+ 0 24.3	+ 0 14.2	+ 0 04.6	0 00.0	- 0 04.4	- 0 12.8	- 0 20.7
13 00	0 33.1	0 22.6	0 13.2	0 04.2	0 00.0	0 04.0	0 11.9	0 19.2
14 00	0 30.4	0 21.0	0 12.1	0 03.9	0 00.0	0 03.7	0 11.0	0 17.7
15 00	0 28.4	0 19.6	0 11.3	0 03.6	0 00.0	0 03.5	0 10.2	0 16.5
16 00	0 26.4	0 18.2	0 10.3	0 03.4	0 00.0	0 03.3	0 09.5	0 15.4
17 00	0 24.8	0 17.2	0 09.9	0 03.2	0 00.0	0 03.1	0 08.9	0 14.4
18 00	+ 0 23.3	+ 0 16.2	+ 0 09.3	+ 0 03.0	0 00.0	- 0 02.9	- 0 08.4	- 0 13.5
19 00	0 22.1	0 15.2	0 08.8	0 02.7	0 00.0	0 02.7	0 07.9	0 12.8
20 00	0 20.9	0 14.3	0 08.3	0 02.5	0 00.0	0 02.6	0 07.5	0 12.1
25 00	0 16.3	0 11.2	0 06.5	0 02.1	0 00.0	0 02.0	0 05.9	0 09.4
30 00	0 13.1	0 09.0	0 05.2	0 01.7	0 00.0	0 01.6	0 04.7	0 07.6
35 00	0 10.8	0 07.4	0 04.3	0 01.4	0 00.0	0 01.3	0 03.9	0 06.3
40 00	+ 0 09.0	+ 0 06.2	+ 0 03.6	+ 0 01.2	0 00.0	- 0 01.1	- 0 03.2	- 0 05.2
45 00	0 07.5	0 05.2	0 03.0	0 01.0	0 00.0	0 00.9	0 02.7	0 04.4
50 00	0 06.0	0 04.4	0 02.5	0 00.8	0 00.0	0 00.8	0 02.3	0 03.7
55 00	0 05.3	0 03.6	0 02.1	0 00.7	0 00.0	0 00.7	0 02.0	0 03.1
60 00	0 04.4	0 03.0	0 01.8	0 00.6	0 00.0	0 00.6	0 01.6	0 02.5
65 00	0 03.6	0 02.4	0 01.4	0 00.5	0 00.0	0 00.5	0 01.3	0 02.1
70 00	+ 0 02.8	+ 0 01.9	+ 0 01.1	+ 0 00.4	0 00.0	- 0 00.4	- 0 01.0	- 0 01.6
75 00	0 02.0	0 01.4	0 00.8	0 00.3	0 00.0	0 00.3	0 00.7	0 01.2
80 00	0 01.4	0 00.9	0 00.5	0 00.2	0 00.0	0 00.2	0 00.4	0 00.8
85 00	0 00.7	0 00.4	0 00.2	0 00.1	0 00.0	0 00.1	0 00.2	0 00.4
90 00	+ 0 00.0	+ 0 00.0	+ 0 00.0	+ 0 00.0	0 00.0	- 0 00.0	- 0 00.0	- 0 00.0

TABLE - Xb
ATMOSPHERIC REFRACTION
 PRESSURE CORRECTION OF REFRACTION FOR DIFFERENT VALUES OF PRESSURE

PRESSURE			AMOUNT OF REFRACTION CORRECTED FOR PRESSURE							
			1'	2'	3'	5'	10'	20'	30'	60'
mb	mm	Inch	"	"	"	' "	' "	' "	' "	' "
660	495.0	19.49	- 20.4	- 40.8	- 61.3	- 1 42.3	- 3 26.5	- 7 04.9	- 10 59.1	- 24 19
670	502.5	19.79	19.8	39.7	59.5	1 39.3	3 20.4	6 52.5	10 39.8	23 36
680	510.0	20.08	19.2	38.4	57.7	1 36.3	3 14.3	6 39.8	10 20.2	22 53
690	517.5	20.38	18.6	37.2	55.9	1 33.3	3 08.2	6 27.4	10 00.9	22 10
700	525.0	20.67	18.0	36.0	54.1	1 30.3	3 02.2	6 14.9	9 41.5	21 27
710	532.5	20.97	17.4	34.8	52.3	1 27.3	2 56.1	6 02.5	9 22.2	20 45
720	540.0	21.26	- 16.8	- 33.5	- 50.6	- 1 24.3	- 2 50.0	- 5 50.0	- 9 02.8	- 20 01
730	547.5	21.56	16.2	32.4	48.7	1 21.2	2 43.9	5 37.4	8 43.3	19 18
740	555.0	21.85	15.6	31.2	46.9	1 18.2	2 37.8	5 24.9	8 23.9	18 35
750	562.6	22.15	15.0	30.0	45.1	1 15.2	2 31.8	5 12.4	8 04.6	17 53
760	570.1	22.44	14.4	28.9	43.3	1 12.3	2 25.8	5 00.2	7 45.6	17 21
770	577.6	22.74	13.8	27.6	41.5	1 09.2	2 19.7	4 47.5	7 25.9	16 27
780	585.1	23.03	- 13.2	- 26.4	- 39.7	- 1 06.2	- 2 13.6	- 4 35.0	- 7 06.5	- 15 44
790	592.6	23.33	12.6	25.2	37.9	1 03.2	2 07.6	4 22.5	6 47.2	15 01
800	600.1	23.62	12.0	24.0	36.0	1 00.2	2 01.4	4 09.9	6 27.6	14 18
810	607.6	23.92	11.4	22.8	34.3	0 57.2	1 55.4	3 57.5	6 08.3	13 35
820	615.1	24.22	10.8	21.6	32.4	0 54.2	1 49.3	3 44.9	5 48.9	12 52
830	622.6	24.51	10.2	20.4	30.7	0 51.2	1 43.3	3 32.5	5 29.6	12 10
840	630.1	24.81	- 9.6	- 19.2	- 28.9	- 0 48.2	- 1 37.2	- 3 20.0	- 5 10.2	- 11 27
850	637.6	25.10	9.0	18.0	27.0	0 45.1	1 31.1	3 07.4	4 50.7	10 43
860	645.1	25.40	8.4	16.8	25.2	0 42.1	1 25.0	2 54.9	4 31.3	10 01
870	652.6	25.69	7.8	15.6	23.4	0 39.1	1 19.0	2 42.5	4 12.0	9 18
880	660.1	25.99	7.2	14.4	21.6	0 36.1	1 12.9	2 30.0	3 52.6	8 35
890	667.6	26.28	6.6	13.2	19.8	0 33.1	1 06.8	2 17.5	3 33.3	7 52
900	675.1	26.58	- 6.0	- 12.0	- 18.0	- 0 30.1	- 1 00.7	- 2 04.9	- 3 13.7	- 7 09
910	682.6	26.87	5.4	10.8	16.2	0 27.1	0 54.7	1 52.5	2 54.3	6 26
920	690.1	27.17	4.8	9.6	14.4	0 24.1	0 48.6	1 39.9	2 35.0	5 43
930	697.6	27.46	4.2	8.4	12.6	0 21.1	0 42.5	1 27.5	2 15.7	5 01
940	705.1	27.76	3.6	7.2	10.8	0 18.1	0 36.4	1 15.0	1 50.3	4 17
950	712.6	28.05	3.0	6.0	9.0	0 15.0	0 30.3	1 02.4	1 36.9	3 34
960	720.1	28.35	- 2.4	- 4.8	- 7.2	- 0 12.0	- 0 24.3	- 0 49.9	- 1 17.4	- 2 51
970	727.6	28.64	1.8	3.6	5.4	0 09.0	0 18.2	0 37.5	0 58.2	2 09
980	735.1	28.94	1.2	2.4	3.6	0 06.0	0 12.1	0 25.0	0 38.7	1 26
990	742.6	29.24	- 0.6	- 1.2	- 1.8	- 0 03.0	- 0 06.1	- 0 12.5	- 0 19.4	- 0 43
1000	750.1	29.53	0.0	0.0	0.0	0 00.0	0 00.0	0 00.0	0 00.0	0 00
1010	757.6	29.83	+ 0.6	+ 1.2	+ 1.8	+ 0 03.1	+ 0 06.1	+ 0 12.5	+ 0 19.5	+ 0 43
1020	765.1	30.12	1.2	2.4	3.6	0 06.0	0 12.2	0 25.1	0 38.9	1 26
1030	772.6	30.42	1.8	3.6	5.4	0 09.0	0 18.2	0 37.5	0 58.2	2 09
1040	780.1	30.71	2.4	4.8	7.2	0 12.0	0 24.3	0 50.0	0 77.6	2 52
1050	787.6	31.01	+ 3.0	+ 6.0	+ 9.0	+ 0 15.0	+ 0 30.3	+ 0 62.4	+ 0 96.9	+ 3 24

TABLE - XI
FACTORS FOR COMPUTING THE GEOCENTRIC COORDINATES OF A PLACE

ϕ °	S	C	ϕ °	S	C
0	0.993306	1.000000	45	0.994972	1.001678
1	0.993307	1.000001	46	0.995031	1.001737
2	0.993310	1.000004	47	0.995089	1.001795
3	0.993315	1.000009	48	0.995147	1.001854
4	0.993322	1.000016	49	0.995205	1.001912
5	0.993331	1.000025	50	0.995262	1.001970
6	0.993342	1.000037	51	0.995320	1.002028
7	0.993355	1.000050	52	0.995377	1.002085
8	0.993370	1.000065	53	0.995433	1.002142
9	0.993387	1.000082	54	0.995489	1.002198
10	0.993406	1.000101	55	0.995544	1.002254
11	0.993427	1.000122	56	0.995599	1.002309
12	0.993449	1.000145	57	0.995652	1.002363
13	0.993474	1.000169	58	0.995705	1.002416
14	0.993500	1.000196	59	0.995758	1.002468
15	0.993528	1.000224	60	0.995809	1.002520
16	0.993558	1.000254	61	0.995859	1.002570
17	0.993590	1.000286	62	0.995908	1.002620
18	0.993623	1.000320	63	0.995956	1.002668
19	0.993658	1.000355	64	0.996002	1.002715
20	0.993695	1.000392	65	0.996048	1.002761
21	0.993733	1.000430	66	0.996092	1.002805
22	0.993773	1.000470	67	0.996135	1.002848
23	0.993814	1.000511	68	0.996176	1.002890
24	0.993856	1.000554	69	0.996216	1.002930
25	0.993900	1.000598	70	0.996255	1.002969
26	0.993945	1.000644	71	0.996291	1.003006
27	0.993992	1.000691	72	0.996327	1.003041
28	0.994039	1.000739	73	0.996360	1.003075
29	0.994088	1.000788	74	0.996392	1.003107
30	0.994138	1.000838	75	0.996422	1.003138
31	0.994189	1.000889	76	0.996451	1.003166
32	0.994241	1.000941	77	0.996477	1.003193
33	0.994293	1.000994	78	0.996502	1.003218
34	0.994347	1.001048	79	0.996525	1.003241
35	0.994401	1.001103	80	0.996546	1.003262
36	0.994456	1.001158	81	0.996565	1.003281
37	0.994512	1.001214	82	0.996582	1.003299
38	0.994568	1.001271	83	0.996597	1.003314
39	0.994625	1.001328	84	0.996610	1.003327
40	0.994682	1.001386	85	0.996622	1.003338
41	0.994740	1.001444	86	0.996631	1.003348
42	0.994798	1.001502	87	0.996638	1.003355
43	0.994856	1.001560	88	0.996643	1.003360
44	0.994914	1.001619	89	0.996646	1.003363
45	0.994972	1.001678	90	0.996647	1.003364

$$\rho \sin \phi' = (S+H) \sin \phi$$

$$H = 0.156779 \times \text{elevation in meters} \times 10^{-6}$$

$$\rho \cos \phi' = (C+H) \cos \phi$$

$$H = 0.047786 \times \text{elevation in feet} \times 10^{-6}$$

TABLE - XII
CONVERSION OF GEOGRAPHIC TO GEOCENTRIC COORDINATES

ϕ	$\phi' - \phi$	ρ	ONE DEGREE OF		ϕ	$\phi' - \phi$	ρ	ONE DEGREE OF	
			Latitude	Longitude				Latitude	Longitude
$^{\circ}$	' "		Kilometers	Kilometers	$^{\circ}$	' "		Kilometers	Kilometers
0	0 00.0	1.000000	110.57	111.32	45	- 11 32.7	0.998331	111.13	78.85
1	- 0 24.1	0.999999	110.58	111.30	46	11 32.4	0.998272	111.15	77.46
2	0 48.2	0.999996	110.58	111.25	47	11 31.2	0.998214	111.17	76.06
3	1 12.2	0.999991	110.58	111.17	48	11 29.2	0.998155	111.19	74.63
4	1 36.1	0.999984	110.58	111.05	49	11 26.3	0.998097	111.21	73.17
5	1 59.9	0.999975	110.58	110.90	50	11 22.6	0.998039	111.23	71.70
6	2 23.6	0.999964	110.59	110.71	51	11 18.1	0.997982	111.25	70.20
7	2 47.0	0.999951	110.59	110.50	52	11 12.7	0.997925	111.27	68.68
8	3 10.3	0.999936	110.60	110.24	53	11 06.5	0.997868	111.29	67.14
9	3 33.4	0.999919	110.60	109.96	54	10 59.5	0.997812	111.31	65.58
10	- 3 56.2	0.999900	110.61	109.64	55	- 10 51.7	0.997756	111.32	63.99
11	4 18.7	0.999879	110.62	109.29	56	10 43.1	0.997702	111.34	62.39
12	4 40.9	0.999856	110.62	108.90	57	10 33.7	0.997648	111.36	60.77
13	5 02.8	0.999832	110.63	108.49	58	10 23.5	0.997594	111.38	59.13
14	5 24.3	0.999805	110.64	108.03	59	10 12.6	0.997542	111.40	57.48
15	5 45.4	0.999777	110.65	107.55	60	10 00.9	0.997491	111.41	55.80
16	6 06.0	0.999747	110.66	107.03	61	9 48.5	0.997440	111.43	54.11
17	6 26.3	0.999716	110.67	106.49	62	9 35.4	0.997391	111.45	52.40
18	6 46.1	0.999682	110.68	105.91	63	9 21.5	0.997343	111.46	50.67
19	7 05.4	0.999647	110.69	105.29	64	9 07.0	0.997296	111.48	48.93
20	- 7 24.1	0.999611	110.70	104.65	65	- 8 51.8	0.997250	111.49	47.18
21	7 42.4	0.999573	110.72	103.97	66	8 36.0	0.997206	111.51	45.40
22	8 00.0	0.999533	110.73	103.26	67	8 19.5	0.997163	111.52	43.62
23	8 17.1	0.999492	110.74	102.52	68	8 02.4	0.997121	111.54	41.82
24	8 33.6	0.999449	110.76	101.75	69	7 44.7	0.997081	111.55	40.01
25	8 49.5	0.999405	110.77	100.95	70	7 26.4	0.997042	111.56	38.19
26	9 04.7	0.999360	110.79	100.12	71	7 07.6	0.997005	111.57	36.35
27	9 19.3	0.999314	110.80	99.26	72	6 48.3	0.996970	111.59	34.50
28	9 33.2	0.999266	110.82	98.36	73	6 28.4	0.996936	111.60	32.65
29	9 46.4	0.999217	110.84	97.44	74	6 08.1	0.996904	111.61	30.78
30	- 9 58.9	0.999167	110.85	96.49	75	- 5 47.4	0.996874	111.61	28.90
31	10 10.7	0.999116	110.87	95.50	76	5 26.2	0.996845	111.62	27.02
32	10 21.7	0.999064	110.89	94.49	77	5 04.6	0.996818	111.63	25.12
33	10 32.0	0.999011	110.90	93.45	78	4 42.6	0.996793	111.64	23.22
34	10 41.5	0.998958	110.92	92.39	79	4 20.3	0.996770	111.65	21.31
35	10 50.2	0.998903	110.94	91.29	80	3 57.7	0.996749	111.66	19.39
36	10 58.1	0.998848	110.96	90.16	81	3 34.7	0.996730	111.67	17.47
37	11 05.3	0.998792	110.98	89.01	82	3 11.6	0.996713	111.67	15.54
38	11 11.6	0.998736	111.00	87.83	83	2 48.1	0.996697	111.68	13.61
39	11 17.1	0.998679	111.02	86.63	84	2 24.5	0.996684	111.68	11.67
40	-11 21.8	0.998622	111.03	85.39	85	- 2 00.7	0.996673	111.69	9.73
41	11 25.7	0.998564	111.05	84.14	86	1 36.7	0.996664	111.69	7.79
42	11 28.7	0.998506	111.07	82.85	87	1 12.7	0.996656	111.69	5.85
43	11 30.9	0.998447	111.09	81.54	88	0 48.5	0.996651	111.69	3.90
44	11 32.2	0.998389	111.11	80.21	89	- 0 24.3	0.996648	111.69	1.95
45	-11 32.7	0.998331	111.13	78.85	90	0 00.0	0.996647	111.69	0.00

ϕ and ϕ' are the geographic and geocentric latitude respectively

ρ = radius of the earth.

1 kilometre = 0.621372 miles.

LATITUDE AND LONGITUDE OF PLACES

Place	Altitude (Metre)	Latitude	Longitude			Reduction of Greenwich Sid. Time	Reduction of L.M.T. to Indian Standard Time	$\rho \sin \phi'$	$\rho \cos \phi'$		
			In arc	In time							
		$^{\circ}$ $'$	$^{\circ}$ $'$	h	m	s	s	m	s		
Agartala	16	+23 31.8	+ 91 09.0	+6	04	36	+59.89	-34 36	+0.39677	0.91734	
Agra	160	+27 05.6	+ 77 34.8	+5	10	19	+50.98	+19 51	+0.45272	0.89091	
Ahmedabad	49	+23 03.0	+ 72 40.2	+4	50	41	+47.75	+39 19	+0.38912	0.92064	
Aizawl	1097	+23 26.4	+ 92 43.2	+6	10	53	+60.93	-40 53	+0.39540	0.91812	
Ajmer	486	+26 16.2	+ 74 22.2	+4	57	29	+48.87	+32 31	+0.43996	0.89738	
Alibag (Obs.) Mumbai,	7	+19 00.0	+ 72 30.6	+4	50	02	+47.65	+39 58	+0.33350	0.94586	
Aligarh	187	+27 31.8	+ 78 2.44	+5	12	10	+51.28	+17 47	+0.45946	0.88743	
Allahabad	96	+25 16.2	+ 81 26.4	+5	25	46	+53.51	+04 14	+0.42429	0.90487	
Amritsar	231	+31 22.8	+ 74 31.2	+4	58	05	+48.97	+31 55	+0.51771	0.85454	
Bangalore	921	+12 34.8	+ 77 21.0	+5	09	24	+50.83	+20 36	+0.21641	0.97629	
Bangkok, Thailand	16	+13 25.0	+100 18.0	+6	41	12	+65.91	- 71 12	+0.23052	0.97289	
Baroda	35	+22 12.0	+ 73 9.6	+4	52	38	+48.07	+37 22	+0.37549	0.92632	
Bhopal	506	+23 10.2	+ 77 12.6	+5	08	50	+50.73	+21 10	+0.39106	0.91989	
Bhuj	105	+23 09.0	+ 69 24.0	+4	37	36	+45.60	+52 24	+0.39072	0.91997	
Bhubaneswar	46	+20 00.0	+ 85 30.0	+5	42	00	+56.18	- 12 00	+0.33987	0.94007	
Bikaner	224	+28 01.0	+ 73 10.8	+4	52	43	+48.09	+37 17	+0.46695	0.88349	
Bilaspur, (H.P)	502	+31 11.4	+ 76 30.0	+5	06	00	+50.27	+24 00	+0.51491	0.85629	
Buenos Aires (Naval Obs.), Argentina	6	-34 21.0	- 58 12.0	- 3	52	48	-38.24	.. ..	-0.56107	0.82649
Cairo	68	+30 01.0	+ 31 09.0	+2	04	36	+20.47	.. ..	+0.49733	0.86662
Canberra (Mount Stromlo), Australia	767	-35 10.2	+149 10.5	+9	56	42	+98.02	.. ..	-0.57285	0.81845
Cape Town (Ast. Obs.), S. Africa	18	-33 33.6	+ 18 15.0	+1	13	00	+11.99	.. ..	-0.54967	0.83416
Chandigarh	347	+30 25.2	+ 76 32.0	+5	06	08	+50.29	+23 52	+0.50340	0.86312	
Chennai (or Madras) Obs.	7	+13 00.0	+ 80 06.6	+5	20	26	+52.64	+ 9 34	+0.22348	0.97454	
Chittagong, Bangladesh	27	+22 12.6	+ 91 31.8	+6	06	07	+60.14	- 36 07	+0.37565	0.92625	
Colaba Obs. Mumbai, (Bombay)	14	+19 04.2	+ 72 31.0	+4	50	04	+47.65	+39 56	+0.32465	0.94546	
Colombo (Obs.), Srilanka	6	+ 6 33.6	+ 79 33.6	+5	18	14	+52.28	+11 46	+0.11348	0.99350	
Cuttack	26	+20 16.8	+ 85 33.6	+5	42	14	+56.42	- 12 14	+0.34443	0.93839	
Dacca, Bangladesh	7	+23 25.8	+ 90 15.6	+6	01	02	+59.31	- 31 02	+0.39518	0.91803	
Darjeeling	2128	+27 02.0	+ 88 10.8	+5	52	43	+57.94	- 22 43	+0.45193	0.89166	
Dehra Dun	682	+30 11.3	+ 78 01.2	+5	12	05	+51.27	+17 55	+0.49995	0.86520	
Delhi	220	+28 21.0	+ 77 07.2	+5	08	29	+50.68	+21 31	+0.47205	0.88076	
Dibrugarh	106	+27 17.4	+ 94 06.0	+6	16	24	+61.83	- 46 24	+0.45575	0.88734	
Gangtok	1768	+27 12.0	+ 88 22.2	+5	53	29	+58.07	- 23 29	+0.45448	0.89029	
Guwahati	55	+26 3.6.0	+ 91 21.0	+6	05	24	+60.03	- 35 24	+0.43666	0.89892	
Gauribidanur (Radio Astr. Obs.)	686	+13 36.2	+ 77 26.1	+5	09	44	+50.88	+20 16	+0.23369	0.97223	
Gaya	111	+24 27.0	+ 84 34.2	+5	38	17	+55.57	- 8 17	+0.41137	0.91086	

1 metre = 3.2808 feet

LATITUDE AND LONGITUDE OF PLACES

Place	Altitude (Metre)	Latitude	Longitude		Reduction of Greenwich Sid. Time	Reduction of L.M.T. to Indian Standard Time	$\rho \sin \phi'$	$\rho \cos \phi'$
			In arc	In time				
Geneva (Obs.), Switzerland	465	$^{\circ} \quad '$ +46 07.8	$^{\circ} \quad '$ + 6 04.2	$^h \quad ^m \quad ^s$ +0 24 17	s + 3.99	$^m \quad ^s$	+0.71739	0.69428
Greenwich (Royal Obs.).	47	+51 28.6	0 00	0 00 00.0	0.00	.. ..	+0.77872	0.62412
Hanle/ Mt.Saraswati (Indian Ast. Obs.)	4467	+32 46.8	+ 78 57.9	+5 15 51.6	+51.89	+14 8.4	+0.53870	0.84217
Haridwar	274	+29 34.8	+ 78 08.0	+5 12 32.0	+51.34	+ 17 28	+0.49076	0.87041
Heidelberg Obs., Germany	570	+49 14.0	+ 8 25.2	+0 33 41.0	+ 5.53	.. ..	+0.75382	0.65430
Helwan (Obs.), Egypt	116	+29 51.5	+ 31 22.8	+2 05 31.2	+20.62	.. ..	+0.49494	0.86800
Herstmonceux (Royal Obs.), Sussex, U.K.	31	+50 52.0	+ 0 20.3	+0 01 21.0	+ 0.22	.. ..	+0.77205	0.63241
Hyderabad (Nizamiah Obs.)	554	+17 25.9	+ 78 27.2	+5 13 49.0	+51.55	+ 16 11	+0.29768	0.95444
Imphal	801	+24 26.4	+ 93 34.8	+6 14 19.0	+61.49	- 44 19	+0.41126	0.91103
India, Central Station of	-	+23 11.0	+ 82 30.0	+5 30 00.0	+54.21	0 00	+0.39124	0.91973
Indore	556	+22 26.4	+ 75 30.0	+5 02 00.0	+49.61	+ 28 00	+0.37938	0.92481
Istambul (Univ. Obs.), Turkey	65	+41 00.7	+ 28 57.9	+1 55 51.6	+19.03	.. ..	+0.65277	0.75567
IUCAA Giravali Obs., Pune	1000	+18 19.2	+ 73 30.6	+4 54 02.0	+48.3	+35 58	+0.31237	0.94978
Jabalpur	393	+23 07.2	+ 79 34.2	+5 18 17.0	+52.29	+ 11 43	+0.39026	0.92022
Jaipur	436	+26 33.0	+ 75 31.2	+5 02 05.0	+49.62	+ 27 55	+0.44431	0.89520
Jakarta, Indonesia	23	- 6 07.2	+106 30.0	+7 06 00.0	+69.98	.. ..	-0.10590	0.99434
Jamshedpur	152	+22 29.4	+ 86 06.6	+5 44 26.0	+56.58	- 14 26	+0.38016	0.92442
Japal Rangapur (Obs.),	695	+17 05.9	+ 78 43.7	+5 14 55.0	+51.73	+ 15 05	+0.29216	0.95618
Jodhpur	224	+26 10.8	+ 73 00.6	+4 52 02.0	+47.97	+ 37 58	+0.43854	0.89803
Johannesberg, South Africa	1806	- 26 10.9	+ 28 04.5	+1 52 18.0	+18.45	.. ..	-0.43868	0.89824
Kabul, Afghanistan	1766	+34 18.0	+ 69 10.8	+4 36 43.0	+45.46	+ 53 17	+0.56051	0.82721
Kanchipuram	76	+12 30.0	+ 79 27.0	+5 17 48.0	+52.21	+ 12 12	+0.21503	0.97646
Kanpur	126	+26 15.6	+ 80 13.2	+5 20 53.0	+52.71	+ 9 07	+0.43978	0.89740
Karachi, Pakistan	4	+24 53.6	+ 67 02.4	+4 28 10.0	+44.05	+ 61 50	+0.41836	0.90763
Kathmandu, Nepal	1324	+27 23.2	+ 85 07.2	+5 40 29.0	+55.93	- 10 29	+0.45733	0.88874
Kavalur (Vainu Bappu Obs.),	725	+12 34.6	+ 78 49.6	+5 15 18.0	+51.80	+ 14 42	+0.21635	0.97627
Kodaikanal (Solar Obs.)	2343	+10 13.8	+ 77 28.1	+5 09 52.0	+50.90	+ 20 08	+0.17649	0.98457
Kohima	1405	+25 24.0	+ 94 04.8	+6 16 19.0	+61.82	- 46 19	+0.42642	0.90409
Kolkata (Alipore Obs.), (Calcutta)	6	+22 19.2	+ 88 12.0	+5 52 48.0	+57.96	- 22 48	+0.37742	0.92553
Kolkata (Presi. Coll. Obs.)	12	+22 23.4	+ 88 16.2	+5 53 05.0	+58.00	- 23 05	+0.37854	0.92506
Kurnool	281	+15 30.0	+ 78 03.0	+5 12 12.0	+51.29	+ 17 48	+0.26552	0.96390

1 metre = 3.2808 feet

LATITUDE AND LONGITUDE OF PLACES

Place	Altitude (Metre)	Latitude	Longitude			Reduction of Greenwich Sid. Time	Reduction of L.M.T. to Indian Standard Time	$\rho \sin \phi'$	$\rho \cos \phi'$
			In arc	In time					
		$^{\circ}$ $'$	$^{\circ}$ $'$	h m s	s	m s			
Kyoto (Univ. Ast. Dept. Obs.), Japan	86	+35 00.6	+135 20.4	+9 1 22.0	+88.93	.. ..	+0.57052	0.81997
Lahore, Pakistan	214	+31 22.2	+ 74 15.6	+4 57 02.0	+48.80	+ 32 58	+0.51756	0.85269	
Lucknow	113	+26 31.2	+ 80 33.6	+5 22 14.0	+52.94	+ 7 46	+0.44383	0.89539	
Maitri (Indian base station at Antarctica)	132	-70 46.0	+ 11 45.0	+0 47 00.0	+ 7.72	.. ..	-0.94069	0.33041
Mangalore	22	+12 33.0	+ 74 31.8	+4 58 07.0	+48.97	+ 31 53	+0.21587	0.97626	
Moscow (Sternberg State Ast. Inst.), Russia	195	+55 27.0	+ 37 22.2	+2 29 29.0	+24.56	.. ..	+0.82001	0.56843
Mount Abu (Gurushikhar Obs.)	1700	+24 23.4	+ 72 25.8	+4 49 43.0	+47.59	+40 17	+0.41053	0.91152	
Mount Palomar (Obs.), U.S.A.	1706	+33 21.4	-116 51.8	- 7 47 27.2	-76.79	.. ..	+0.54687	0.83633
Mount Wilson (Obs.), U.S.A.	1742	+34 13.0	-118 03.6	- 7 52 14.4	-77.58	.. ..	+0.55931	0.82802
Mysore	767	+12 10.8	+ 76 25.2	+5 05 41.0	+50.22	+ 24 19	+0.20963	0.97775	
Nagpur	312	+21 05.4	+ 79 04.2	+5 16 17.0	+51.96	+ 13 43	+0.35760	0.93347	
Nainital (Aryabhatta Res. Inst. Of Obs. Sci.)	1927	+29 13.8	+ 79 18.0	+5 17 12.0	+52.11	+ 12 48	+0.48558	0.87363	
New York (Rutherford Obs.), U.S.A.	25	+40 25.8	- 74 00.6	- 4 56 02.0	-48.63	.. ..	+0.64509	0.76228
Ottawa, Canada	87	+45 16.2	- 75 22.2	- 5 01 29.0	-49.53	.. ..	+0.70688	0.70497
Panaji	56	+15 18.0	+ 73 33.0	+4 54 12.0	+48.33	+ 35 48	+0.26217	0.96479	
Paris (Obs.), France	67	+48 30.0	+ 2 12.0	+0 08 49.0	+ 1.45	.. ..	+0.74535	0.66387
Patiala	251	+30 12.0	+ 76 15.0	+5 05 00.0	+50.10	+ 25 00	+0.50010	0.86504	
Patna	53	+25 21.6	+ 85 03.6	+5 40 14.0	+55.89	- 10 14	+0.42570	0.90420	
Peshawar, Pakistan	358	+34 01.0	+ 71 34.0	+4 46 15.0	+47.03	+ 43 45	+0.55630	0.82979	
Pondicherry	6	+11 34.8	+ 79 29.4	+5 17 58.0	+52.23	+ 12 02	+0.19942	0.97978	
Pune	559	+18 19.0	+ 73 30.0	+4 54 00.0	+48.30	+ 36 00	+0.31230	0.94973	
Porbandar	7	+21 22.2	+ 69 29.4	+4 37 58.0	+45.66	+ 52 02	+0.36211	0.93166	
Port Blair	79	+11 24.0	+ 92 25.8	+6 09 43.0	+60.74	- 39 43	+0.19636	0.98041	
Puri	6	+19 28.8	+ 85 29.4	+5 41 58.0	+56.18	- 11 58	+0.33137	0.94311	
Quetta, Pakistan	1673	+30 07.2	+ 67 00.0	+4 28 00.0	+44.03	+ 62 00	+0.49901	0.86593	
Rajkot	132	+22 10.8	+ 70 33.6	+4 42 14.0	+46.36	+ 47 46	+0.37518	0.92646	
Rawalpindi, Pakistan	510	+33 22.2	+ 73 03.6	+4 52 14.0	+48.01	+ 37 46	+0.54696	0.83605	
Rome (Obs.), Italy	152	+41 33.0	+ 12 16.8	+0 49 07.2	+ 8.07	.. ..	+0.65982	0.74950
San Fernando (Naval Obs.), Spain	27	+36 28.0	- 6 12.2	-0 24 48.8	- 4.08	.. ..	+0.59108	0.80516
Shillong	1500	+25 20.4	+ 91 33.6	+6 06 14.0	+61.16	- 36 14	+0.42549	0.90455	

1 metre = 3.2808 feet

LATITUDE AND LONGITUDE OF PLACES

Place	Altitude (Metre)	Latitude	Longitude		Reduction of Greenwich Sid. Time	Reduction of L.M.T. to Indian Standard Time	$\rho \sin \phi'$	$\rho \cos \phi'$
			In arc	In time				
		$^{\circ}$ $'$	$^{\circ}$ $'$	h m s	s	m s		
Sholapur	476	+17 24.0	+ 75 33.6	+5 02 14	+49.65	+ 27 46	+0.29715	0.95460
Siliguri	127	+26 24.0	+ 88 13.2	+5 52 53	+57.97	- 22 53	+0.44196	0.89632
Simla	2202	+31 03.6	+ 77 07.8	+5 08 31	+50.68	+ 21 29	+0.51312	0.85769
Singapore	18	+ 1 10.2	+103 30.6	+6 54 02	+68.02	.. ..	+0.02028	0.99980
Srinagar	1586	+34 03.6	+ 74 30.6	+4 58 02	+48.96	+ 31 58	+0.55704	0.82953
St. Petersburg Univ. Obs., Russia	3	+59 56.5	+ 30 17.7	+2 01 11	+19.91	.. ..	+0.86189	0.50214
Tehran, Iran	1200	+35 24.6	+ 51 15.0	+3 25 00	+33.68	.. ..	+0.57630	0.81610
Tokyo (Hydrographic Obs.), Japan	41	+35 24.0	+138 27.0	+9 13 48	+90.98	.. ..	+0.57605	0.81605
Thiruvananthapuram	61	+ 8 17.4	+ 76 34.2	+5 06 17	+50.31	+ 23 43	+0.14323	0.98963
Udaipur (Solar Obs.)	301	+24 21.0	+ 73 25.2	+4 53 41	+48.24	+ 36 19	+0.40980	0.91161
Udhagamandalam (Ooty) (Rad. Astr. Centre)	2150	+11 22.9	+ 76 40.0	+5 06 40	+50.38	+ 23 20	+0.19611	0.98079
Ujjain	496	+23 06.3	+ 75 28.2	+5 01 53	+49.59	+ 28 07	+0.39002	0.92033
Varanasi	76	+25 10.8	+ 83 00.0	+5 32 00	+54.54	- 2 00	+0.42288	0.90554
Visakhapatnam	38	+17 25.8	+ 83 08.4	+5 32 34	+54.63	- 2 34	+0.29763	0.95438
Washington (U. S. Naval Obs.), U.S.A.	92	+38 33.0	- 77 02.4	- 5 08 10	-50.62	.. ..	+0.61984	0.78309
Yangon, Myanmar	28	+16 27.0	+ 96 7.20	+6 24 29	+63.16	- 54 29	+0.28136	0.95933

1 metre = 3.2808 feet

When the latitude of the place and the declination of the heavenly body are of the same sign then the figure represent semi-diurnal arc, when of opposite signs then semi-nocturnal arc.

(FOR TRUE ALTITUDE = 0)

The amplitude of rising and setting points of a heavenly body is measured from the East or the West point of the horizon towards the northern or southern direction as the case may be. The amplitude is of the same sign as that of declination of the body.

Note - If true zenith distance of the heavenly body at the time of rising or setting be $90^\circ + h$, then the figures of the above two tables would require some correction according to the value of h (vide Explanation).

Moon 's Apparent Altitude

The visible or apparent semi-diameter of the moon is augmented over the tabulated value due to moon's altitude above the horizon.

NATURAL TRIGONOMETRIC FUNCTIONS

ANGLE		Sin	Cos	Tan	Cot	Sec	Cosec		
Arc	Time								
°	h m							h m	°
0	0 00	0.00000	1.00000	0.00000	Infinity	1.00000	Infinity	6 00	90
1	0 04	.01745	0.99985	.01746	57.28996	.00015	57.29869	5 56	89
2	0 08	.03490	.99939	.03492	28.63625	.00061	28.65371	5 52	88
3	0 12	.05234	.99863	.05241	19.08114	.00137	19.10732	5 48	87
4	0 16	.06976	.99756	.06993	14.30067	.00244	14.33559	5 44	86
5	0 20	.08716	.99619	.08749	11.43005	.00382	11.47371	5 40	85
6	0 24	.10453	.99452	.10510	9.51436	.00551	9.56667	5 36	84
7	0 28	.12187	.99255	.12278	8.14435	.00751	8.20551	5 32	83
8	0 32	.13917	.99027	.14054	7.11537	.00983	7.18530	5 28	82
9	0 36	.15643	.98769	.15838	6.31375	.01247	6.39245	5 24	81
10	0 40	.17365	.98481	.17633	5.67128	.01543	5.75877	5 20	80
11	0 44	0.19081	0.98163	0.19438	5.14455	1.01872	5.24084	5 16	79
12	0 48	.20791	.97815	.21256	4.70463	.02234	4.80973	5 12	78
13	0 52	.22495	.97437	.23087	4.33148	.02630	4.44541	5 08	77
14	0 56	.24192	.97030	.24933	4.01078	.03061	4.13357	5 04	76
15	1 00	.25882	.96593	.26795	3.73205	.03528	3.86370	5 00	75
16	1 04	.27564	.96126	.28675	3.48741	.04030	3.62796	4 56	74
17	1 08	.29237	.95630	.30573	3.27085	.04569	3.42030	4 52	73
18	1 12	.30902	.95106	.32492	3.07768	.05146	3.23607	4 48	72
19	1 16	.32557	.94552	.34433	2.90421	.05762	3.07155	4 44	71
20	1 20	.34202	.93969	.36397	2.74748	.06418	2.92380	4 40	70
21	1 24	0.35837	0.93358	0.38386	2.60509	1.07115	2.79043	4 36	69
22	1 28	.37461	.92718	.40403	2.47509	.07853	2.66947	4 32	68
23	1 32	.39073	.92050	.42447	2.35585	.08636	2.55930	4 28	67
24	1 36	.40674	.91355	.44523	2.24604	.09464	2.45859	4 24	66
25	1 40	.42262	.90631	.46631	2.14451	.10338	2.36620	4 20	65
26	1 44	.43837	.89879	.48773	2.05030	.11260	2.28117	4 16	64
27	1 48	.45399	.89101	.50953	1.96261	.12233	2.20269	4 12	63
28	1 52	.46947	.88295	.53171	1.88073	.13257	2.13005	4 08	62
29	1 56	.48481	.87462	.55431	1.80405	.14335	2.06267	4 04	61
30	2 00	.50000	.86603	.57735	1.73205	.15470	2.00000	4 00	60
31	2 04	0.51504	0.85717	0.60086	1.66428	1.16663	1.94160	3 56	59
32	2 08	.52992	.84805	.62487	1.60033	.17918	1.88708	3 52	58
33	2 12	.54464	.83867	.64941	1.53987	.19236	1.83608	3 48	57
34	2 16	.55919	.82904	.67451	1.48256	.20622	1.78829	3 44	56
35	2 20	.57358	.81915	.70021	1.42815	.22077	1.74345	3 40	55
36	2 24	.58779	.80902	.72654	1.37638	.23607	1.70130	3 36	54
37	2 28	.60182	.79864	.75355	1.32704	.25214	1.66164	3 32	53
38	2 32	.61566	.78801	.78129	1.27994	.26902	1.62427	3 28	52
39	2 36	.62932	.77715	.80978	1.23490	.28676	1.58902	3 24	51
40	2 40	.64279	.76604	.83910	1.19175	.30541	1.55572	3 20	50
41	2 44	0.65606	0.75471	0.86929	1.15037	1.32501	1.52425	3 16	49
42	2 48	.66913	.74314	.90040	1.11061	.34563	1.49448	3 12	48
43	2 52	.68200	.73135	.93252	1.07237	.36733	1.46628	3 08	47
44	2 56	.69446	.71934	0.96569	1.03553	.39016	1.43956	3 04	46
45	3 00	0.70711	0.70711	1.00000	1.00000	1.41421	1.41421	3 00	45
		Cos	Sin	Cot	Tan	Cosec	Sec	Time	Arc
		ANGLE							

STANDARD TIMES
LOCAL STANDARD TIME FOR EACH COUNTRY OR AREA
THE AHEAD OF (+) OR BEHIND (-) U.T. OR G.M.T

Country or Area	Standard Time	L.S.T at 12h U.T or 17-30 I.S.T.	Country or Area	Standard Time	L.S.T at 12h U.T or 17-30 I.S.T.
	h	h m		h	h m
Aden	+ 3	15 00	Belgium	+ 1	13 00
Afghanistan	+ 4 1/2	16 30	Belize	- 6Ψ	06 00Ψ
Alaska	-9	03 00	Bermuda	- 4	08 00
- Day light Saving Time	- 8	04 00	Bhutan	+ 6	18 00
Albania	+ 1	13 00	Bolivia	- 4	08 00
- Day light Saving Time	+ 2	14 00	Brazil-		
Aleutian Islands	- 10	02 00	Eastern (including coast)	- 3*	09 00*
Algeria	0	12 00	Western	- 3*	09 00*
Angola	+ 1	13 00	Territory of Acre	- 4*	08 00*
Argentina	- 3	09 00	Bulgaria	+ 2	14 00
Ascension Islands	0	12 00	Cambodia	+ 7	19 00
Australia-			Cameroon	+ 1	13 00
Capital Territory (Canberra), Victoria, New South Wales, Queensland, Tasmania.	+ 10	22 00	Canada-		
South Australia, Northern Territory, Broken Hill Area	+ 9 1/2	21 30	Newfoundland	- 3 1/2*	08 30*
- Day light Saving Time	+ 10 1/2	22 30	East of Long. 63° W	- 4*	08 00*
Western Australia	+ 8	20 00	N W Territories (East of Long. 68° W),		
- Day light Saving Time	+ 9	21 00	New Brunswick		
			Nova Scotia,		
			Prince Edward Island		
			Quebec (West of Long.63°W),	- 5*	07 00*
			Ontario (East of Long 90° W)		
			(Ottawa), Nunavut (East) and NW Territories (Long.. W 68°-85°)		
			Ontario (West of Long. 90° W),	- 6*	06 00*
			Manitoba, NW Territories (Long. W 85°-102°),		
			East Saskatchewan,		
			Nunavut (Central)		
			Alberta	- 7*	05 00*
			Yukon Time	- 8	04 00
Austria	+ 1	13 00	Canary Island	+ 1	13 00
Azores	- 1	11 00	Cape Verde Islands	- 1	11 00
Bahrain	+ 3	15 00			
Bangladesh	+ 6	18 00			

STANDARD TIMES
LOCAL STANDARD TIME FOR EACH COUNTRY OR AREA
THE AHEAD OF (+) OR BEHIND (-) U.T. OR G.M.T

Country or Area	Standard Time	L.S.T at 12h U.T or 17-30 I.S.T.	Country or Area	Standard Time	L.S.T at 12h U.T or 17-30 I.S.T.
	h	h m		h	h m
Caroline Islands- Truk, Ponape	+ 11	23 00	Ghana	0	12 00
	+ 11	23 00	Gibraltar	+ 1↓	13 00↓
Central African Republic	+ 1	13 00	Greece	+ 2	14 00
Chile	- 4*	08 00*	Greenland		
China, People's Republic of	+ 8	20 00	Angmagssalik, W. Coast	- 3	09 00
Cocos-keeling Islands	+ 6 1/2	18 30	Thule Area	- 4	08 00
Colombia	- 5	07 00	Guam	+ 10	22 00
Congo Republic	+ 1	13 00	Guatemala	- 6	06 00
Cook Islands	- 10	02 00	Guiana		
			Dutch (Surinam)	- 3	09 00
Corsica	+ 1↓	13 00↓	French	- 3	09 00
Costa Rica	- 6	06 00	Guyana Republic	- 4	08 00
Croatia	+ 1	13 00	Haiti	- 5	07 00
Cuba	- 5*	07 00*	Hawaiian Islands	- 10	02 00
Czech Republic	+ 1	13 00	Honduras	- 6	06 00
Cyprus	+ 2	14 00	Hong Kong	+ 8*	20 00*
Dahomey Republic (Africa)	+ 1	13 00	Hungary	+ 1	13 00
Denmark	+ 1	13 00	Iceland	0	12 00
Ecuador	- 5	07 00	India	+ 5 1/2	17 30
Egypt	+ 2*	14 00*	Indonesia, Republic of-	--	--
Estonia	+ 2	14 00	Sumatra, Java, West & Central Kalimantan	+ 7	19 00
El Salvador	- 6	06 00	Bali, South & East Kalimantan	+ 8	20 00
Ethiopia	+ 3	15 00	Irian Jaya, Maluku	+ 9	21 00
Falkland Islands	- 4	08 00	Iran	+ 3 1/2	15 30
Fiji	+ 12	24 00	Iraq	+ 3	15 00
Finland	+ 2	14 00	Ireland, Republic of	0	12 00
France	+ 1↓	13 00↓	Israel	+ 2	14 00
Germany	+ 1	13 00	Italy	+ 1*	13 00*

STANDARD TIMES
LOCAL STANDARD TIME FOR EACH COUNTRY OR AREA
THE AHEAD OF (+) OR BEHIND (-) U.T. OR G.M.T

Country or Area	Standard Time	L.S.T at 12h U.T or 17-30 I.S.T.	Country or Area	Standard Time	L.S.T at 12h U.T or 17-30 I.S.T.
	h	h m		h	h m
Ivory Coast	0	12 00	Monaco	+ 1	13 00
Japan (and Japan Is.)	+ 9	21 00	Mongolia	+ 8	20 00
Jordan	+ 2	14 00	Morocco	0*	12 00*
Kenya	+ 3	15 00	Mozambique	+ 2	14 00
Korea (North & South)	+ 9	21 00	Nepal	+ 5 3/4	17 45
Kuwait	+ 3	15 00	Netherlands (Holland)	+ 1	13 00
Laos	+ 7	19 00	New Caledonia	+ 11	23 00
Latvia	+ 2	14 00	New Hebrides	+ 11	23 00
Lebanon	+ 2*	14 00*	New Zealand	+ 12	24 00
Liberia	0	12 00	Nicaragua	- 6	06 00
Libya	+ 2	14 00	Niger	+ 1	13 00
Lithuania	+ 3	15 00	Nigeria	+ 1	13 00
Luxembourg	+ 1↓	13 00↓	Norfolk Island	+ 11 1/2	23 30
Madagascar	+ 3	15 00	Norway	+ 1*	13 00*
Madeira	- 1*	11 00*	Oman (Masira, Muscat, Salalah)	+ 4	16 00
Malawi	+ 2	14 00	Pakistan	+ 5	17 00
Malaysia	+ 8	20 00	Papua New Guinea	+ 10	22 00
Maldives Island	+ 5	17 00	Paraguay	- 4	08 00
Malta	+ 1	13 00	Peru	- 5	07 00
Manchuria (China)	+ 8	20 00	Philippines	+ 8	20 00
Mariana Island	+ 10	22 00	Poland	+ 1*	13 00*
Marquesas Islands	- 9 1/2	02 30	Portugal	+ 1	13 00
Marshall Islands	+ 12	24 00	Puerto Rico	- 4	08 00
Mauritania	0	12 00	Reunion	+ 4	16 00
Mauritius	+ 4	16 00	Romania	+ 2	14 00
Mayanmar	+ 6 1/2	18 30	Sakhalin	+ 11	23 00
Mexico-			Samoa	- 11	01 00
Mexico City	- 6	06 00	Sardinia	+ 1	13 00
Sonora, Sinaloa,	- 7	05 00			
Nayarit, Baja					
California Sur					
Baja California	- 8	04 00			

STANDARD TIMES
LOCAL STANDARD TIME FOR EACH COUNTRY OR AREA
THE AHEAD OF (+) OR BEHIND (-) U.T. OR G.M.T

Country or Area	Standard Time	L.S.T at 12h U.T or 17-30 I.S.T.	Country or Area	Standard Time	L.S.T at 12h U.T or 17-30 I.S.T.
	h	h m		h	h m
Saudi Arabia- Jeddah Dhahran	+ 3 + 4	15 00 16 00	Tangier	0	12 00
			Thailand	+ 7	19 00
			Uganda	+ 3	15 00
Senegal	0	12 00	Ukraine	+ 2	14 00
Serbia	+ 1	13 00	United Arab Emirates	+ 4	16 00
Sierra Leone	0	12 00	USA Aleutian	- 10*	02 00*
Singapore	+ 8	20 30	USA Hawaii	- 10*	02 00*
Solomon Islands	+ 11	23 00	USA Pacific	- 8*	04 00*
Somalia	+ 3	15 00	USA Mountain	- 7*	05 00*
South Africa	+ 2	14 00	USA Arizona	- 7*	05 00*
Spain	+ 1↓	13 00↓	USA Central	- 6*	06 00*
Sri Lanka	+ 5 1/2	17 30	USA Eastern	- 5*	07 00*
Sudan	+ 2	14 00	Uruguay	- 3	09 00
Sweden	+ 1	13 00	Uzbekistan	+ 5	17 00
Switzerland	+ 1	13 00	Zambia	+ 2	14 00
Syria	+ 2*	14 00*	Zimbabwe	+ 2	14 00
Tanzania	+ 3	15 00			

* During summer seasons clock time differs from Standard time.

Ψ Winter time may be kept in these countries.

↓ This time is used throughout the year, but may differ from legal time.

PART - VI

INDIAN CALENDAR
AND
EXPLANATION

INDIAN CALENDAR EXPLANATORY NOTE

The astronomical data included in this section on Indian Calendar have been calculated in accordance with the recommendations of the Calendar Reform Committee, as outlined in its report, and the calculations have been done on the basis of the positions of the Sun, Moon and Planets, as contained in the main tables of the Ephemeris. However, the information on Luni- Solar Calendar in this section have been calculated on the basis of traditional Nirayana Calendric system following the Government's decision not to disturb the traditional procedure in fixing the days of religious festivals. Certain additional data, which are required for the compilation of an Indian Panchang (Almanac), have also been furnished to meet the requirements of the numerous Panchang makers of this country. The tables of this section have been extended beyond December, 2025 and materials up to April 20, 2026 have been furnished in order to facilitate preparation of Almanacs for one complete Indian year. The longitudes of the Sun, Moon and Planets and certain other data relating to their positions for the period of 2025 covered by this calendar have also been given in separate table for the same purpose.

All calculations contained in this section have been done for an adopted Central Station of India situated at $82^{\circ}30'$ longitude East of Greenwich and $23^{\circ}11'$ latitude North (latitude of Ujjain) and accordingly the timings have been expressed in the local mean time of this Central Station, which is also the Indian Standard Time. This time (I.S.T.) is $5^h 30^m$ ahead on the Universal Time or Greenwich Mean Time.

The Calendar used in this section is the 'National Calendar' of India as recommended by the Calendar Reform Committee and introduced by the Government of India with effect from the 22nd March 1957, corresponding to the 1st of Chaitra, 1879 Saka Era. Thereafter, Govt. of India has decided to introduce an all India Nirayana Solar Calendar in addition to the existing National Calendar. This new Calendar has been introduced with effect from 14th April, 2004 corresponding to 1st Vaisakha of 5105 Kali, Kali Era being the Era of this new Calendar and this Calendar have fixed number of days for its months. Dates of the Nirayana Calendar have been indicated in addition to the existing National Calendar. The months of these Calendars, the number of days assigned to each month of the two Calendars, and the dates of the Gregorian calendar corresponding to the first day of each month of both the Calendars are as follows :-

<u>Months of the</u> <u>National Calendar</u>	<u>Gregorian date for</u> <u>1st of the month</u>	<u>Months of the</u> <u>Nirayana Calendar</u>	<u>Gregorian date for</u> <u>1st of the month</u>
Chaitra (30 days ; 31 days in a leap-year)	March 22 (March 21 in a leap-year)	Vaisakha (31 days)	April 14
Vaisakha (31 days)	April 21	Jyaishtha (31 days)	May 15
Jyaishtha (31 days)	May 22	Ashadha (31 days)	June 15
Ashadha (31 days)	June 22	Sravana (31 days)	July 16
Sravana (31 days)	July 23	Bhadra (31 days)	August 16
Bhadra (31 days)	August 23	Asvina (30 days)	September 16
Asvina (30 days)	September 23	Kartika (30 days)	October 16
Kartika (30 days)	October 23	Agrahayana (30 days)	November 15
Agrahayana (30 days)	November 22	Pausha (30 days)	December 15
Pausha (30 days)	December 22	Magha (30 days)	January 14
Magha (30 days)	January 21	Phalguna (30 days ; 31 days in a leap-year)	February 13
Phalguna (30 days)	February 20	Chaitra (30 days)	March 15

Different items included in this section are elaborated below :-

The Sunrise and Sunset times, calculated for the Central Station, relate respectively to the appearance and disappearance of the upper limb of the Sun on the horizon. The amount of horizontal refraction taken for this purpose is $31'$ and the semi-diameter of the Sun as $16'$, so that at the given times of Sunrise and Sunset, the centre of the Sun actually $47'$ below the horizon.

The apparent noon is the local mean time of the sun's meridian passage, i.e., the mid-day reduced to the above standard meridian of India ($82\frac{1}{2}^{\circ}$ E. Longitude).

The ending moments of tithis, nakshatras and yogas have been given in Indian Standard Time and shown against their ordinal numbers. The phenomena being geocentric ones, their timings in I.S.T. are applicable for the whole of India without any modification. These timings reduced by a deduction of $5^h 30^m$ would give the G.M.T. applicable for all places on the earth.

The tithi is based on the difference of longitude of the Moon and that of the Sun. A tithi is completed when the longitude of the Moon gains exactly 12° or its integral multiple on that of the Sun and as such there are 30 tithis in lunar month. A difference in longitude of 12° indicates the ending of the 1st tithi, 24° that of the 2nd tithi and so on. The number of tithis have been shown from Sukla 1 to Sukla 15 (full-moon) and again from Krishna 1 to Krishna 14 and Krishna 30 (new moon), using the symbols S and K for Sukla paksha (waxing Moon) and Krishna paksha (waning Moon) respectively.

A nakshatra is completed when the nirayana longitude of the Moon as measured from the initial point attains a value of $13^\circ 20'$ or an integral multiple thereof. When this longitude is $13^\circ 20'$ the 1st nakshatra ends and so on. There are thus 27 nakshatras in a sidereal month and the nakshatra divisions occupy fixed positions in the sphere of stars. In the case of the Sun the calculation also has been done on the same basis. But in this case, the time of Sun's entry into a nakshatra-division has been stated, whereas in the case of the Moon, the time of its exit from the division has been given.

Like nakshatras, there are 27 yogas. Yoga is calculated from the sum of nirayana longitudes of the Sun and the Moon. When the sum amounts to $13^\circ 20'$, the first yoga ends; when it amounts to $26^\circ 40'$, the second yoga ends, and so on. Thus, in all 27 yogas cover 360° . Names of the nakshatras and yogas have been given at the bottom of the table. It will be seen that two of the names Vyatipata and Vaidhriti occur also under Phenomena, where they have been treated as special yogas and calculated by a somewhat different rule. The 27 yogas which have got very little astronomical significance have been included in this publication only to meet the needs of Panchang where the yoga is also one of the components.

For the purpose of calculation of rasis, nakshatras and yogas, an initial point which occupies a fixed position on the ecliptic has been adopted as the origin for the measurement of longitudes. The position of this initial point coincides with the vernal equinoctial point of vernal equinox day of 285 A.D. For the purpose of assigning a precise position to it, the tropical longitude of this initial point has been adopted as $23^\circ 15' 00''$ for 0^h on 21st March, 1956. The tropical longitude of this fixed initial point for any day is known as ayanamsa. The longitude of a celestial body measured from this initial point is known as nirayana longitude.

The entry into different rasis of the Moon and of the Sun have been shown at the bottom of the relevant pages of the calendar and the calculations have been done on the same basis as in the case of nakshatras, utilising the nirayana longitudes. Rasis, which cover arc of 30° of the zodiac belt, are measured along the ecliptic from the above-mentioned initial point.

The tithi, nakshatra and yoga as are current at Sunrise at the Central Station, have been shown against the date with their ending moments in I. S. T. When the time of these or any other phenomena falls after midnight and before the next Sunrise, the time has been expressed after adding 24^h to the I.S.T. without changing the date after midnight in order to maintain continuity of time-reckoning from one Sunrise to the next, in conformity with the system followed in Indian religious calendars.

The solar months recommended for the religious calendar, such as, Saura Vaisakha, Saura Jyaishta, etc., by the Calendar Reform Committee in 1955 have been reckoned from the moments when the apparent longitude of the Sun equals $23^\circ 15'$, $53^\circ 15'$ and so on. The calculation for this purpose thus has not been done with a variable ayanamsa, as in the case of rasis and nakshatras, but with a fixed ayanamsa of $23^\circ 15'$. These months are shown for purpose of illustration only, but are not used in practice for actual luni-solar adjustment.

INDIAN CALENDAR

The lunar months for determining the dates of religious festivals are reckoned from one New-Moon to the next (Sukladi system or mukhya mana). The lunar month for this purpose is named after the Nirayana or Sidereal solar month in which the initial New-Moon from which the month starts, falls.

Phenomena mentioned in the table include New-Moon, Full-Moon, Sayana Vyatipata (when the sum of the tropical longitudes of the Sun and the Moon equals 180°), Sayana Vaidhriti (when the above sum amounts to 360°), eclipses, heliacal rising and setting of Venus, Mars and Jupiter and Jupiter's transit into rasis.

The principal festivals of different states have been fixed on the basis of the criterion stated here, but in doing so, the rules and conventions of the states concerned have been followed as far as practicable.

LIST OF HOLIDAYS

The list of holidays for the Government of India as well as for the State Governments have been prepared in a consolidated form and the dates fixed for them, have been shown in a separate table under the head 'Principal Festivals for Holidays'. The principal festivals of Moslems, Parsis, Jewish and Christians have also been shown separately.

AYANAMSA

The value of ayanamsa has been given in the calendar for the first day of the month and also in a separate table at the end at interval of three days. The ayanamsa value has been calculated from the polynomial of precession in longitude published by N.Capitaine et. al. (2003) in journal Astronomy and Astrophysics. The polynomial for ayanamsa has been introduced in this publication from the year 2021. The polynomial used is as given below.

$$\text{Mean Ayanamsa} = 23^\circ 51' 25''.53 + 5028''.796195 * T + 1''.1054348 * T^2 + 0''.00007964 * T^3 - 0''.00023857 * T^4 - 0''.0000000383 * T^5$$

Where $T = (\text{JD} - 2451545) / 36525$

Ayanamsha for J2000.0 is taken as $23^\circ 51' 25''.53$

The Sayana Vyatipata and Sayana Vaidhriti, reported under the column "Phenomena", are calculated on the basis of definition given in the report of Calendar Reform Committee. These are classified as the Calendar Reform Committee view and no way related to the 'mahapata yoga' defined in some Indian traditional texts (siddhantic treatises).

HELIACAL RISING AND SETTING OF PLANETS, 2026 (JANUARY TO APRIL)

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Planet	National Date		Nirayana Date		Gregorian Date	Time (I.S.T)	
						h	m
Mercury setting West	Pausha	11, 1947 Saka	Pausha	18, 5126 Kali	Jan 02, 2026	04	39
Mercury rising East	Magha	15, 1947 Saka	Magha	22, 5126 Kali	Feb 04, 2026	21	56
Mercury setting East	Phalguna	11, 1947 Saka	Phalguna	18, 5126 Kali	Mar. 02, 2026	06	28
Mercury rising West	Phalguna	22, 1947 Saka	Phalguna	29, 5126 Kali	Mar. 13, 2026	15	35
Venus rising East	Magha	12, 1947 Saka	Magha	19, 5126 Kali	Feb. 01, 2026	18	05
Mars rising West	Chaitra	27, 1948 Saka	Vaisakha	04, 5127 Kali	Apr. 18, 2026	01	49
Saturn setting East	Phalguna	20, 1947 Saka	Phalguna	27, 5126 Kali	Mar. 11, 2026	19	55
Saturn rising West	Chaitra	27, 1948 Saka	Vaisakha	04, 5127 Kali	Apr. 17, 2026	13	58

N.B.- Here East means east of the Sun (i.e. Western Horizon) and West means west of the Sun (i.e. Eastern Horizon).

RETROGRESSION OF PLANETS, 2026 (JANUARY TO APRIL)

Planet		National Date		Nirayana Date		Gregorian Date	Time (I.S.T)	
							h	m
Mercury	Retrograde	Phalguna	07, 1947 Saka	Phalguna	14, 5126 Kali	Feb. 26, 2026	12	20
Mercury	Direct	Phalguna	29, 1947 Saka	Chaitra	06, 5126 Kali	Mar. 20, 2026	25	11
Jupiter	Direct	Phalguna	20, 1947 Saka	Phalguna	27, 5126 Kali	Mar. 11, 2026	09	00
Uranus	Direct	Magha	15, 1947 Saka	Magha	22, 5126 Kali	Feb. 04, 2026	07	58

MEAN RAHU, 2026

Date	Longitude		Date	Longitude		Date	Longitude	
	0	/ //		0	/ //		0	/ //
Jan. -2	318	06 29	Feb. 7	315	59 18	Mar. 19	313	52 07
8	317	34 41	17	315	27 30	29	313	20 19
18	317	02 53	27	314	55 42	Apr. 8	312	48 32
Jan. 28	316	31 05	Mar. 9	314	23 55	18	312	16 44
						28	311	44 56

ECLIPSES, 2026 (JANUARY TO APRIL)

Annular Solar Eclipse **Not visible in India**
28, Magha 1947 SE, 05 Phalguna, 5126 KE, 17 February, 2026
Total Lunar eclipse **Visible in India**
12, Phalguna 1947 SE, 19 Phalguna, 5126 KE, 03 March, 2026

INDIAN CALENDAR

SAKA ERA 1946

Month of PAUSHA (30 days)

Makara : Tapas

Winter (Sisira), 1st Month

(Nirayana) 8 Pausha, 5125 Kali Era to (Nirayana) 7 Magha, 5125 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
			h	m	h	m	h	m	No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
		2024 A.D.												
1	Sun	Dec. 22	6	37.7	11	58.3	17	19.5	K 7	14 32.4	12	--- ----	3	19 00.0
2	Mon	23	6	38.2	11	58.8	17	20.0	8	17 08.2	12	9 09.2	4	19 54.2
3	Tue	24	6	38.6	11	59.3	17	20.6	9	19 52.8	13	12 17.2	5	20 53.5
4	Wed	25	6	39.1	11	59.8	17	21.1	K 10	22 29.6	14	15 22.2	6	21 46.5
5	Thu	26	6	39.5	12	00.3	17	21.7	11	24 44.3	15	18 09.6	7	22 23.4
6	Fri	27	6	39.9	12	00.8	17	22.2	12	26 27.0	16	20 28.6	8	22 37.0
7	Sat	28	6	40.3	12	01.3	17	22.8	13	27 33.1	17	22 13.3	9	22 23.2
8	Sun	29	6	40.7	12	01.8	17	23.4	14	28 02.0	18	23 22.2	10	21 41.1
9	Mon	30	6	41.0	12	02.2	17	24.0	K 30	27 56.8	19	23 57.5	11	20 32.1
10	Tue	31	6	41.3	12	02.7	17	24.6	S 1	27 22.4	20	24 03.7	12	18 59.2
		2025 A.D.												
11	Wed	Jan. 1	6	41.6	12	03.2	17	25.3	2	26 24.6	21	23 46.2	13	17 06.4
12	Thu	2	6	41.9	12	03.7	17	25.9	3	25 08.9	22	23 10.7	14	14 57.9
13	Fri	3	6	42.2	12	04.1	17	26.6	4	23 40.1	23	22 22.0	15	12 37.4
14	Sat	4	6	42.5	12	04.6	17	27.2	S 5	22 01.6	24	21 23.6	16	10 08.0
15	Sun	5	6	42.7	12	05.1	17	27.9	6	20 15.8	25	20 18.0	17	7 32.0
													(18	28 50.8)
16	Mon	6	6	42.9	12	05.5	17	28.6	7	18 24.1	26	19 06.5	19	26 05.1
17	Tue	7	6	43.1	12	05.9	17	29.3	8	16 27.3	27	17 50.1	20	23 15.5
18	Wed	8	6	43.2	12	06.4	17	30.0	9	14 26.3	1	16 29.7	21	20 23.1
19	Thu	9	6	43.4	12	06.8	17	30.7	S 10	12 23.0	2	15 07.1	22	17 29.2
20	Fri	10	6	43.5	12	07.2	17	31.4	11	10 20.1	3	13 45.5	23	14 36.5
21	Sat	11	6	43.6	12	07.6	17	32.1	12	8 22.0	4	12 29.4	24	11 48.3
									(13	30 34.2)				
22	Sun	12	6	43.6	12	08.0	17	32.8	14	29 03.4	5	11 24.6	25	9 09.2
23	Mon	13	6	43.7	12	08.4	17	33.5	S 15	27 56.9	6	10 38.1	26	6 48.3
													(27	28 38.9)
24	Tue	14	6	43.7	12	08.8	17	34.2	K 1	27 21.7	7	10 17.0	1	26 58.3
25	Wed	15	6	43.7	12	09.1	17	34.9	2	27 23.7	8	10 28.2	2	25 46.5
26	Thu	16	6	43.6	12	09.5	17	35.6	3	28 06.7	9	11 16.7	3	25 06.0
27	Fri	17	6	43.6	12	09.8	17	36.3	4	29 30.6	10	12 45.0	4	24 56.8
28	Sat	18	6	43.5	12	10.2	17	37.1	K 5	--- ----	11	14 51.6	5	25 16.0
29	Sun	19	6	43.4	12	10.5	17	37.8	K 5	7 31.2	12	17 30.3	6	25 57.4
30	Mon	20	6	43.3	12	10.8	17	38.5	K 6	9 59.0	13	20 30.1	7	26 52.1

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

INDIAN CALENDAR

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Uttarayana
Dakshina Gola

SAKA ERA 1946

Month of PAUSHA (30 days)

Ayanamsa on 1st : 24° 12' 21''

(Nirayana) 8 Pausha, 5125 Kali Era to (Nirayana) 7 Magha, 5125 Kali Era

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun	Phenomena	Festivals
1	2024 A.D. Dec. 22	P A U S H A	C H A N D R A M A R G A S I R S H A	7- Sun enters Purvashadha nak.(24 ^h 25 ^m .8)	8- Sayana Vyatipata (18 ^h 36 ^m .0) 9- New Moon (27 ^h 56 ^m .8)	2- Ashtaka (Pupashtaka).
2	23					4- Birthday of Parsvanath(Jain), Birthday of Sadhu T.L Vaswani(Sindhi)
3	24					5- Jor Mela-3 days (Punjab), Saphala Ekadasi
4	25					
5	26					
6	27					
7	28					
8	29					9- Vakula Amavasya (Odisha).
9	30					
10	31					
11	2025 A.D. Jan. 1	S A U R A	P A U S H A	20- Sun enters Uttarashadha nak.(26 ^h 22 ^m .5)	20- Sayana Vaidhriti (22 ^h 26 ^m .1) 23- Full Moon (27 ^h 56 ^m .9)	16- Guru Gobind Singh's Birthday
12	2					19- Samba Dasami(Odisha).
13	3					20- Vaikuntha Ekadasi(S.India), Putrada Ekadasi
14	4					
15	5					
16	6					
17	7					
18	8					
19	9					
20	10					
21	11	S A U R A M A G H A	C H A N D R A P A U S H A	23- Saura Maghadi (10 ^h 22 ^m .2)	23- Full Moon (27 ^h 56 ^m .9)	23- Paushi Purnima, Arudra Darsanam (Purvarunodaya) (S.India), Lohri (Punjab, Jammu & Kashmir), Bhogi (S. India), Pushyabhisheka Yatra
22	12					24- Makara Samkranti(N. India), Birthday of Sant Parmanand (Sindhi). Pongal(S.India), Makara Snana, Tila Samkranti , Tai Pongal (Kerala), Makara Samkranti (Bengal), Magha Bihu(Assam).
23	13					25- Mattu Pongal or Kanumu (S. India).
24	14					27- Ganesha Sankastha Chaturthi
25	15					
26	16					
27	17					
28	18					
29	19					
30	Jan. 20			29- Sun Enters Trop. Aquarius (25 ^h 30 ^m .1)		

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Moon enters :- Kanya 1, 12^h 55^m.8; Tula 3, 25^h 51^m.1; Vrischika 6, 13^h 56^m.9; Dhanus 8, 23^h 22^m.2; Makara 10, 30^h 01^m.3;
Kumbha 13, 10^h 47^m.8; Mina 15, 14^h 35^m.0; Mesha 17, 17^h 50^m.1; Vrisha 19, 20^h 46^m.5; Mithuna 21, 23^h 55^m.2; Karkata 23,
28^h 19^m.5; Simha 26, 11^h 16^m.7; Kanya 28, 21^h 28^m.7;
Sun enters :- Nirayana Makara 24, 8^h 55^m.7.

INDIAN CALENDAR

SAKA ERA 1946

Kumbha : Tapasya

Month of MAGHA (30 days)

Winter (Sisira), 2nd Month

(Nirayana) 8 Magha, 5125 Kali Era to (Nirayana) 7 Phalguna, 5125 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
									No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
			h	m	h	m	h	m						
		2025 A.D.												
1	Tue	Jan. 21	6	43.2	12	11.3	17	39.7	K 7	12 40.2	14	23 36.7	8	27 49.3
2	Wed	22	6	43.0	12	11.6	17	40.4	8	15 18.5	15	26 34.2	9	28 37.5
3	Thu	23	6	42.8	12	11.8	17	41.1	9	17 38.0	16	29 08.3	10	29 06.5
4	Fri	24	6	42.6	12	12.1	17	41.8	K 10	19 25.5	17	---	11	29 08.2
5	Sat	25	6	42.3	12	12.3	17	42.5	11	20 32.4	17	7 07.7	12	28 37.9
6	Sun	26	6	42.1	12	12.5	17	43.2	12	20 55.2	18	8 26.2	13	27 33.7
7	Mon	27	6	41.8	12	12.7	17	43.9	13	20 35.1	19	9 02.3	14	25 57.1
8	Tue	28	6	41.5	12	12.9	17	44.6	14	19 36.5	20	8 58.6	15	23 51.4
9	Wed	29	6	41.2	12	13.1	17	45.3	K 30	18 05.9	21	8 20.6	16	21 21.5
10	Thu	30	6	40.8	12	13.3	17	46.0	S 1	16 11.1	22	7 15.4	17	18 33.3
											(23	29 50.9)		
11	Fri	31	6	40.5	12	13.4	17	46.7	2	13 59.6	24	28 14.5	18	15 32.5
12	Sat	Feb. 1	6	40.1	12	13.6	17	47.3	3	11 38.8	25	26 33.1	19	12 24.5
13	Sun	2	6	39.7	12	13.7	17	48.0	4	9 15.0	26	24 52.5	20	9 14.4
													(21	30 05.9)
14	Mon	3	6	39.2	12	13.8	17	48.6	S 5	6 53.3	27	23 16.9	22	27 02.5
									(6	28 37.7)				
15	Tue	4	6	38.8	12	13.9	17	49.3	7	26 31.3	1	21 49.7	23	24 06.2
16	Wed	5	6	38.3	12	14.0	17	49.9	8	24 36.1	2	20 33.3	24	21 18.9
17	Thu	6	6	37.8	12	14.0	17	50.6	9	22 54.0	3	19 29.5	25	18 41.9
18	Fri	7	6	37.3	12	14.1	17	51.2	S 10	21 26.7	4	18 40.1	26	16 16.5
19	Sat	8	6	36.7	12	14.1	17	51.8	11	20 16.4	5	18 07.1	27	14 04.3
20	Sun	9	6	36.2	12	14.2	17	52.4	12	19 25.8	6	17 53.0	1	12 06.9
21	Mon	10	6	35.6	12	14.2	17	53.0	13	18 57.8	7	18 00.9	2	10 26.6
22	Tue	11	6	35.0	12	14.2	17	53.6	14	18 56.0	8	18 34.1	3	9 05.8
23	Wed	12	6	34.4	12	14.2	17	54.2	S 15	19 23.4	9	19 35.6	4	8 06.7
24	Thu	13	6	33.8	12	14.2	17	54.8	K 1	20 22.3	10	21 07.4	5	7 31.3
25	Fri	14	6	33.1	12	14.1	17	55.3	2	21 52.9	11	23 09.6	6	7 20.1
26	Sat	15	6	32.5	12	14.1	17	55.9	3	23 52.9	12	25 39.5	7	7 32.6
27	Sun	16	6	31.8	12	13.9	17	56.5	4	26 16.4	13	28 31.4	8	8 05.8
28	Mon	17	6	31.1	12	13.9	17	57.0	K 5	28 53.9	14	---	9	8 54.6
29	Tue	18	6	30.4	12	13.9	17	57.6	K 6	---	14	7 35.6	10	9 51.8
30	Wed	Feb. 19	6	29.7	12	13.8	17	58.1	K 6	7 32.7	15	10 39.8	11	10 48.1

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Ashlesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

INDIAN CALENDAR

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Uttarayana
Dakshina Gola

SAKA ERA 1946

Month of MAGHA (30 days)

Ayanamsa on 1st : 24° 12' 27"

(Nirayana) 8 Magha, 5125 Kali Era to (Nirayana) 7 Phalgun, 5125 Kali Era

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun Date	Phenomena	Festivals
1	2025 A.D. Jan. 21	MAGHA	CHANDRA PAUSHA	3- Sun enters Srawana nak. (28 ^h 44 ^m .9)	3- Sayana Vyatipata (25 ^h 53 ^m .1)	1- Birthday of Swami Vivekanda (According to tithi), Astaka (Mamsastaka), Martyrdom day of Hemu Kalani (Sindhi).
2	22					3- Netaji's Birthday.
3	23					
4	24					5- Sattila Ekadasi.
5	25					
6	26					6- Republic Day
7	27					7- Meru Trayodasi (Jain),
8	28					8- Ratanti Kalika Puja,
9	29				9- New Moon (18 ^h 05 ^m .9)	9- Birthday of Lala Lajpat Rai.
10	30					9- Mauni Amavasya, Tai Amavasya, Makara Vavu (Kerala), Maha Kumbha (Prayag).
11	31	SAURAMA	CHANDRA	17- Sun enters Dhanishtha Nak. (7 ^h 49 ^m .9)	16- Sayana Vaidhriti (7 ^h 54 ^m .9)	10- Magha Sukladi, Martyr's day (Mahatma Gandhi Commemoration Day)
12	1					12- Tila Chaturthi, Kunda Chaturthi, Varada Chaturthi.
13	2					13- Ganesha Puja (Bengal), Sri Panchami, Saraswati Puja Vasanta Panchami.
14	3					15- Ratha Saptami (Purvarunodaya), Vidhana Saptami, Arogya Saptami
15	4					
16	5					16- Bhismashtami.
17	6					19- Jaya Ekadasi, Bhaimi Ekadasi (Bengal)
18	7					
19	8					20- Bhisma Dvadasi
20	9					21- Desert Festival-3 days (Jaisalmer)
21	10	SAURAPHALGUNA	CHANDRA	22- Saura Phalgunadi (23 ^h 10 ^m .8)	23- Full Moon (19 ^h 23 ^m .4)	22- Floating Festival/ Tai Poosam
22	11					23- Guru Rabi Das's Birthday, Maghi Purnima
23	12					
24	13					29- Sun enters Trop. Pisces (15 ^h 36 ^m .5)
25	14					
26	15					29- Sayana Vyatipata (6 ^h 34 ^m .9)
27	16					
28	17					30- Shivaji Jayanti.
29	18					
30	19			30- Sun enters Satabhisaj nak. (12 ^h 26 ^m .4)		

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Moon enters :- Tula 1, 10^h 03^m.5; Vrischika 3, 22^h 32^m.6; Dhanus 6, 8^h 26^m.2; Makara 8, 14^h 52^m.0; Kumbha 10, 18^h 35^m.1; Mina 12, 20^h 58^m.6; Mesha 14, 23^h 16^m.9; Vrisha 16, 26^h 16^m.1; Mithuna 18, 30^h 21^m.4; Karkata 21, 11^h 56^m.7; Simha 23, 19^h 35^m.6; Kanya 25, 29^h 44^m.6; Tula 28, 18^h 02^m.7;
Sun enters :- Nirayana Kumbha 23, 21^h 56^m.2.

INDIAN CALENDAR

SAKA ERA 1946

Mina : Madhu

Month of PHALGUNA (30 days)

Spring (Vasanta), 1st Month

(Nirayana) 8 Phalguna, 5125 Kali Era to (Nirayana) 7 Chaitra, 5125 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
			h	m	h	m	h	m	No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
		2025 A.D.												
1	Thu	Feb. 20	6	28.9	12	13.7	17	58.6	K 7	9 58.7	16	13 30.3	12	11 33.7
2	Fri	21	6	28.2	12	13.6	17	59.1	8	11 58.1	17	15 54.0	13	11 59.0
3	Sat	22	6	27.4	12	13.4	17	59.7	9	13 19.7	18	17 40.3	14	11 55.9
4	Sun	23	6	26.7	12	13.3	18	00.2	K 10	13 56.3	19	18 42.7	15	11 18.8
5	Mon	24	6	25.9	12	13.1	18	00.7	11	13 45.2	20	18 59.0	16	10 05.1
6	Tue	25	6	25.1	12	13.0	18	01.2	12	12 47.9	21	18 30.8	17	8 14.8
7	Wed	26	6	24.2	12	12.8	18	01.6	13	11 08.8	22	17 23.3	18	29 50.8
8	Thu	27	6	23.4	12	12.7	18	02.1	14	8 55.1	23	15 43.7	19	26 57.4
9	Fri	28	6	22.6	12	12.5	18	02.6	(K 30 30 14.8)					
10	Sat	Mar. 1	6	21.7	12	12.3	18	03.1	S 1	27 16.7	24	13 40.4	20	23 40.8
11	Sun	2	6	20.9	12	12.1	18	03.5	2	24 09.8	25	11 22.7	21	20 07.6
12	Mon	3	6	20.0	12	11.9	18	04.0	3	21 02.5	26	8 59.5	22	16 24.8
13	Tue	4	6	19.1	12	11.7	18	04.4	4	18 02.7	27	6 39.2	23	12 39.1
14	Wed	5	6	18.2	12	11.4	18	04.9	(1 28 29.8)					
15	Thu	6	6	17.3	12	11.2	18	05.3	S 5	15 17.2	2	26 37.8	24	8 57.1
16	Fri	7	6	16.4	12	11.0	18	05.7	6	12 51.9	3	25 08.5	25	29 24.6
17	Sat	8	6	15.5	12	10.7	18	06.2	7	10 51.4	4	24 05.8	26	26 06.6
18	Sun	9	6	14.6	12	10.5	18	06.6	8	9 19.1	5	23 32.1	27	23 07.2
19	Mon	10	6	13.7	12	10.2	18	07.0	9	8 17.0	6	23 28.7	1	20 29.2
20	Tue	11	6	12.7	12	10.0	18	07.4	S 10	7 45.7	7	23 55.4	2	18 14.6
21	Wed	12	6	11.8	12	09.7	18	07.8	11	7 45.2	8	24 51.5	3	16 24.3
22	Thu	13	6	10.8	12	09.4	18	08.2	12	8 14.5	9	26 15.5	4	14 58.4
23	Fri	14	6	09.9	12	09.2	18	08.6	13	9 12.2	10	28 05.7	5	13 56.5
24	Sat	15	6	08.9	12	08.9	18	09.0	14	10 36.4	11	---	6	13 17.5
25	Sun	16	6	08.0	12	08.6	18	09.4	S 15	12 24.6	12	6 19.6	7	13 00.1
26	Mon	17	6	07.0	12	08.3	18	09.8	K 1	14 33.7	13	8 54.3	8	13 02.7
27	Tue	18	6	06.0	12	08.0	18	10.2	2	16 58.8	14	11 45.4	9	13 23.5
28	Wed	19	6	05.1	12	07.7	18	10.6	3	19 33.6	15	14 47.2	10	13 59.9
29	Thu	20	6	04.1	12	07.4	18	10.9	4	22 09.8	16	17 51.9	11	14 48.5
30	Fri	Mar. 21	6	03.1	12	07.1	18	11.3	K 5	24 37.5	17	20 50.3	12	15 45.0
									6	26 45.9	18	23 31.7	13	16 43.7
									K 7	28 24.3	19	25 45.9	14	17 37.7

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

INDIAN CALENDAR

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Uttarayana
Dakshina Gola

SAKA ERA 1946
Month of PHALGUNA (30 days)

Ayanamsa on 1st : 24° 12' 31"

(Nirayana) 8 Phalgun, 5125 Kali Era to (Nirayana) 7 Chaitra, 5125 Kali Era

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun	Phenomena	Festivals		
1	2025 A.D. Feb. 20	S A U R A P H A L G U N A	C H A N D R A M A G H A			1- Astaka(Sakashtaka), Janaki Janma, Vaikkatashtami (Kerala)		
2	21							
3	22							
4	23					4- Birthday of Swami Dayananda Saraswati (Founder of Arya Samaj).		
5	24					5- Vijaya Ekadasi.		
6	25					6- Maha Shivaratri (Kashmir).		
7	26					7- Maha Shivaratri, Shivaratri (S. India)		
8	27							
9	28	S A U R A P H A L G U N A	C H A N D R A M A G H A	13- Sun enters Purva Bhadrapada nak. (18 ^h 40 ^m .7)	8- New Moon (30 ^h 14 ^m .8)			
10	Mar. 1					10- Birthday of Sri Ramakrishna Paramahansa Deva.		
11	2							
12	3					12- SayanaVaidhriti (26 ^h 17 ^m .1)		
13	4							
14	5							
15	6					15- Holastaka.		
16	7							
17	8							
18	9							
19	10					19- Govinda Dvadasi, Amalaki Ekadasi.		
20	11							
21	12	S A U R A P H A L G U N A	C H A N D R A M A G H A	22- Saura Chaitradi (19 ^h 44 ^m .5)	23- Total Lunar Eclipse (Not Visible in India) 23- Full Moon (12 ^h 24 ^m .6) 24- Sayana Vyatipata (10 ^h 45 ^m .7)	21- Masi Magham.		
22	13					22- Holikadahan.		
23	14					23- Holi, Dolayatra, Birthday of Sri Chaitanya.		
24	15					24- Hola, Vasantatsava.		
25	16							
26	17					26- Sun enters Uttara Bhadrapada nak. (27 ^h 12 ^m .1)		
27	18							
28	19					28- Venus sets in the West (13 ^h 05 ^m)		
29	20					29- Sun enters Trop. Aries (14 ^h 31 ^m .4)		28- Ranga Panchami, Bijoy Gavindaji Holangkar (Manipur)
30	Mar. 21							29- Mahavisuva Day.
				30- Indian Year Ending Day.				

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Moon enters :- Vrischika 1, 6^h 49^m.7; Dhanus 3, 17^h 40^m.3; Makara 5, 24^h 56^m.0; Kumbha 7, 28^h 37^m.0; Mina 9, 29^h 58^m.0; Mesha 12, 6^h 39^m.2; Vrisha 14, 8^h 13^m.1; Mithuna 16, 11^h 45^m.2; Karkata 18, 17^h 45^m.9; Simha 20, 26^h 15^m.5; Kanya 23, 12^h 56^m.5; Tula 25, 25^h 15^m.4; Vrischika 28, 14^h 06^m.8; Dhanus 30, 25^h 45^m.9; Sun enters: Nirayana Mina 23, 18^h 50^m.7.

INDIAN CALENDAR

SAKA ERA 1947

Mesha : Madhava

Month of CHAITRA (30 days)

Spring (Vasanta), 2nd Month

(Nirayana) 8 Chaitra, 5125 Kali Era to (Nirayana) 7 Vaisakha, 5126 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
			h	m	h	m	h	m	No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
		2025 A.D.												
1	Sat	Mar 22	6	02.2	12	06.8	18	11.7	K 8	29 23.9	19	27 23.6	17	18 36.3
2	Sun	23	6	01.2	12	06.5	18	12.1	9	29 38.6	20	28 18.4	18	17 58.6
3	Mon	24	6	00.2	12	06.2	18	12.4	K 10	29 05.7	21	28 26.9	19	16 44.5
4	Tue	25	5	59.2	12	05.9	18	12.8	11	27 45.9	22	27 49.5	20	14 53.1
5	Wed	26	5	58.3	12	05.6	18	13.2	12	25 43.2	23	26 29.7	21	12 25.4
6	Thu	27	5	57.3	12	05.3	18	13.6	13	23 03.8	24	24 33.7	22	9 24.8
7	Fri	28	5	56.3	12	05.0	18	13.9	14	19 55.6	25	22 09.5	23	5 56.5
8	Sat	29	5	55.3	12	04.7	18	14.3	K 30	16 27.8	26	19 26.6	(24) 26 06.9)	25 22 03.3
9	Sun	30	5	54.4	12	04.4	18	14.7	S 1	12 49.8	27	16 35.0	26	17 53.7
10	Mon	31	5	53.4	12	04.1	18	15.1	2	9 11.6	1	13 45.1	27	13 46.0
									(3	29 42.8)				
11	Tue	Apr. 1	5	52.4	12	03.8	18	15.4	4	26 32.9	2	11 06.8	1	9 48.0
12	Wed	2	5	51.5	12	03.5	18	15.8	S 5	23 50.3	3	8 49.8	2	6 07.1
													(3	26 49.8)
13	Thu	3	5	50.5	12	03.2	18	16.2	6	21 42.0	4	7 02.4	4	24 01.4
14	Fri	4	5	49.6	12	03.0	18	16.5	7	20 13.3	5	5 51.2	5	21 45.3
											(6	29 20.6)		
15	Sat	5	5	48.6	12	02.7	18	16.9	8	19 27.0	7	29 32.1	6	20 03.3
16	Sun	6	5	47.7	12	02.4	18	17.3	9	19 23.6	8	— —	7	18 55.1
17	Mon	7	5	46.7	12	02.1	18	17.7	S 10	20 00.6	8	6 24.9	8	18 18.7
18	Tue	8	5	45.8	12	01.8	18	18.1	11	21 13.5	9	7 55.1	9	18 10.3
19	Wed	9	5	44.9	12	01.5	18	18.4	12	22 56.0	10	9 57.3	10	18 25.3
20	Thu	10	5	43.9	12	01.3	18	18.8	13	25 01.2	11	12 24.7	11	18 58.7
21	Fri	11	5	43.0	12	01.0	18	19.2	14	27 22.1	12	15 10.4	12	19 45.2
22	Sat	12	5	42.1	12	00.8	18	19.6	S 15	— —	13	18 07.8	13	20 40.2
23	Sun	13	5	41.2	12	00.5	18	20.0	S 15	5 52.2	14	21 10.8	14	21 39.2
24	Mon	14	5	40.3	12	00.2	18	20.4	K 1	8 25.5	15	24 13.7	15	22 38.0
25	Tue	15	5	39.5	12	00.0	18	20.8	2	10 56.0	16	27 10.5	16	23 32.5
26	Wed	16	5	38.6	11	59.8	18	21.2	3	13 17.6	17	— —	17	24 18.2
27	Thu	17	5	37.7	11	59.5	18	21.6	4	15 23.9	17	5 55.2	18	24 50.1
28	Fri	18	5	36.9	11	59.3	18	22.0	K 5	17 07.9	18	8 21.1	19	25 03.3
29	Sat	19	5	36.0	11	59.1	18	22.4	6	18 22.5	19	10 21.1	20	24 52.3
30	Sun	20	5	35.2	11	58.9	18	22.8	K 7	19 01.2	20	11 48.5	21	24 12.5

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Ashlesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

INDIAN CALENDAR

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Uttarayana
Uttara Gola

SAKA ERA 1947

Month of CHAITRA (31 days)

Ayanamsa on 1st : 24^h 12' 35"

(Nirayana) 8 Chaitra, 5125 Kali Era to (Nirayana) 7 Vaisakha, 5126 Kali Era

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun	Phenomena	Festivals
1	2025 A.D. Mar. 22	A	C H A N D R A P H A L G U N A		1- Venus rises in the East (27 ^h 01 ^m .0)	1- Indian New Year Day, Varsitaparambha(Jain), Sitalashtami
2	23	R				
3	24					
4	25	T				4- Papamochini Ekadasi(Smarta)
5	26					5- Papamochini Ekadasi(Vaishnava & Vidhava)
6	27		C H A N D R A P H A L G U N A			6- Varuni(Trayodasi upto 23 ^h 03 ^m .8), Satabhisaj nak. Upto 24 ^h 33 ^m .7), Subha yoga from 09 ^h 24 ^m .8), Madhu Krishna Trayodasi.
7	28	I			7- Sayana Vaidhriti (13 ^h 22 ^m .8)	
8	29				8- New Moon (16 ^h 27 ^m .8)	
9	30	A			8- Partial solar Eclipse(Not visible in India)	9- Chaitra Sukladi(Gudi Padava, Ugadi), Vasanta Navaratrambha, Cheti Chand (Sindhi New Year's day), Telugu new year's day
10	31	H				10- Gauri Tritiya(Gangaur), Andolana Tritiya, Sarhul(Bihar)
11	Apr. 1	C	C H A N D R A P H A L G U N A	10-Sun enters Revati nak. (13 ^h 59 ^m .6)		12- Sri (Lakshmi Panchami)
12	2					13- Skanda Sasthi
13	3					14- Vasanti Pujarambha
14	4	A				15- Annapurna Puja, Asokashtami(Astami upto 19 ^h 27 ^m .0); Punarvasu nak. Upto 29 ^h 32 ^m .1), Mela Bahu Fort(Jammu), Birthday Anniversary of Swami Leela Shah(Sindhi), Oli Begins(Jain)
15	5					16- Rama Navami
16	6		C H A N D R A P H A L G U N A			18- Kamada Ekadasi
17	7	R				
18	8					
19	9				19-Sayana Vyatipata (15 ^h 14 ^m .5)	20- Mahavira Jayanti (Jain), Ananga Trayodasi
20	10	U				21- Damanaka Chaturdasi (Vishnu damanaka & Shiva Damanaka), Panguni Uttiram, Trivandrum Arat(Kerala)
21	11		C H A N D R A P H A L G U N A			22- Chaitri Purnima, Hanumat Jayanti (S. India)
22	12	A			22- Saura Vaisakhadi (27 ^h 49 ^m .9)	23- Oli ends(Jain), Vaishakhi (Punjab, Haryana, H.P., Delhi, Odisha), Mesa Samkranti (Odisha), Visu(Kerala)
23	13				23- Sun enters Asvini nak. (27 ^h 21 ^m .4)	24- Dr B R Ambedkar Jayanti, Meshadi(Tamilnadu), Chaitra Samkranti, Chadaka Puja (Bengal), Cheiraoba (Manipur), Tamil New Year's Day, Beginning of 5126 Kali Era
24	14	S				25- Vaisakhadi(Bengal), Bahag Bihu (Assam), Shilhenba (Manipur)
25	15					
26	16	A	C H A N D R A P H A L G U N A			
27	17					
28	18	R				
29	19					
30	Apr. 20	A			29- Sun enters trop. Taurus (25 ^h 26 ^m .0)	

N.B: All the timings are given in I.S.T. or the local mean time of the meridian of 82½° E long. Moon enters: Makara 3, 10h 24.9m; Kumbha 5, 15h 14.5m; Mina 7, 16h 47.7m; Mesha 9, 16h 35.0m; Vrisha 11, 16h 30.3m; Mithuna 13, 18h 22.1m; Karkata 15, 23h 25.4m; Simha 18, 7h 55.1m; Kanya 20, 19h 04.7m; Tula 23, 7h 39.0m; Vrischika 25, 20h 27.2m; Dhanus 28, 8h 21.1m; Makara 30, 18h 04.5m

Sun enters :-Nirayana Mesha 23, 27^h 21^m.4.

INDIAN CALENDAR

SAKA ERA 1947

Vrisha : Sukra

Month of VAISAKHA (31 days)

Summer (Grishma), 1st Month

(Nirayana) 8 Vaisakha, 5126 Kali Era to (Nirayana) 7 Jyaishtha, 5126 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
									No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
			h m		h m		h m			h m		h m		h m
		2025 A.D.												
1	Mon	Apr. 21	5	34.4	11	58.7	18	23.2	K 8	18 59.1	21	12 37.4	22	23 00.2
2	Tue	22	5	33.6	11	58.5	18	23.6	9	18 13.4	22	12 44.2	23	21 13.1
3	Wed	23	5	32.8	11	58.3	18	24.0	K 10	16 43.7	23	12 07.6	24	18 51.0
4	Thu	24	5	32.0	11	58.1	18	24.5	11	14 32.6	24	10 49.3	25	15 55.5
5	Fri	25	5	31.2	11	57.9	18	24.9	12	11 45.1	25	8 53.6	26	12 30.5
6	Sat	26	5	30.5	11	57.8	18	25.3	13	8 28.1	26	6 27.2	27	8 41.4
									(14	28 50.2)	(27	27 38.9)	(1	28 35.0)
7	Sun	27	5	29.7	11	57.6	18	25.8	K 30	25 01.1	1	24 38.7	2	24 19.1
8	Mon	28	5	29.0	11	57.5	18	26.2	S 1	21 11.4	2	21 37.8	3	20 02.4
9	Tue	29	5	28.3	11	57.3	18	26.6	2	17 31.7	3	18 47.2	4	15 53.6
10	Wed	30	5	27.6	11	57.2	18	27.1	3	14 12.6	4	16 18.2	5	12 01.5
11	Thu	May 1	5	26.9	11	57.1	18	27.5	4	11 24.2	5	14 20.9	6	8 34.1
12	Fri	2	5	26.2	11	57.0	18	28.0	S 5	9 15.2	6	13 04.2	7	5 38.5
													(8	27 19.8)
13	Sat	3	5	25.5	11	56.9	18	28.4	6	7 52.4	7	12 34.2	9	25 40.8
14	Sun	4	5	24.9	11	56.8	18	28.9	7	7 19.4	8	12 53.6	10	24 41.6
15	Mon	5	5	24.3	11	56.7	18	29.3	8	7 36.2	9	14 01.3	11	24 19.7
16	Tue	6	5	23.7	11	56.6	18	29.8	9	8 39.0	10	15 52.0	12	24 29.8
17	Wed	7	5	23.1	11	56.5	18	30.3	S 10	10 20.2	11	18 17.2	13	25 04.8
18	Thu	8	5	22.5	11	56.5	18	30.7	11	12 29.7	12	21 06.5	14	25 56.7
19	Fri	9	5	21.9	11	56.4	18	31.2	12	14 56.6	13	24 09.1	15	26 57.7
20	Sat	10	5	21.4	11	56.4	18	31.7	13	17 30.4	14	27 15.3	16	28 00.9
21	Sun	11	5	20.8	11	56.4	18	32.1	14	20 02.4	15	— —	17	29 00.6
22	Mon	12	5	20.3	11	56.3	18	32.6	S 15	22 25.9	15	6 17.3	18	— —
23	Tue	13	5	19.8	11	56.3	18	33.1	K 1	24 36.2	16	9 09.3	18	5 52.6
24	Wed	14	5	19.4	11	56.3	18	33.5	2	26 29.7	17	11 47.2	19	6 33.9
25	Thu	15	5	18.9	11	56.3	18	34.0	3	28 03.4	18	14 07.7	20	7 01.9
26	Fri	16	5	18.5	11	56.4	18	34.5	4	29 14.1	19	16 07.8	21	7 14.4
27	Sat	17	5	18.0	11	56.4	18	35.0	K 5	— —	20	17 44.0	22	7 08.8
28	Sun	18	5	17.6	11	56.4	18	35.4	K 5	5 58.2	21	18 52.7	23	6 42.5
29	Mon	19	5	17.3	11	56.5	18	35.9	6	6 12.1	22	19 29.9	24	5 52.5
													(25	28 35.8)
30	Tue	20	5	16.9	11	56.5	18	36.4	7	5 52.2	23	19 32.4	26	26 50.2
									(8	28 56.0)				
31	Wed	21	5	16.6	11	56.6	18	36.8	K 9	27 22.4	24	18 58.2	27	24 34.5

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

INDIAN CALENDAR

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Uttarayana
Uttara Gola

SAKA ERA 1947

Month of VAISAKHA (31 days)

Ayanamsa on 1st : 24⁰ 12' 38"

(Nirayana) 8 Vaisakha, 5126 Kali Era to (Nirayana) 7 Jyaishtha, 5126 Kali Era

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun	Phenomena	Festivals
1	2025 A.D. Apr. 21	S	CHANDRA CHAITRA	7- Sun enters Bharani nak. (19 ^h 10 ^m .1)	2- Sayana Vaidhriti (29 ^h 15 ^m .1)	3- Babu Kuer Singh Day(Bihar) 4- Shri Vallabhacharya Jayanti Varuthini Ekadasi
2	22					
3	23					
4	24	A				
5	25					
6	26	U				
7	27					
8	28	R	CHANDRA CHAITRA	7- Sun enters Bharani nak. (19 ^h 10 ^m .1)	7- New Moon (25 ^h 01 ^m .1)	8- Tithi of Deva Damodara (Assam) 9- Parasurama Jayanti 10- Akshaya Tritiya (Rohini Nakshatra upto 16 ^h 18 ^m .2), Varsitapa Samapana(Jain), Kedar Badri Yatra
9	29					
10	30	A				
11	May 1		CHANDRA CHAITRA	21- Sun enters Krittika nak. (13 ^h 18 ^m .0)	14- Sayana Vyatipata (21 ^h 42 ^m .2)	11- May Day 12- Sri Sankaracharya Jayanti, Sri Ramanujacharya Jayanti(South India) 13- Sri Ramanujacharya Jayanti, Gangotpatti, Birthday Anniversary of Dada Chellaram(Sindhi) 15- Sita Navami 16- Trichur Pooram(Kerala) 18- Minakshi Kalyanam, Mohini Ekadasi 19- Birthday of Ravindranath Tagore
12	2					
13	3					
14	4	V				
15	5	A				
16	6	I				
17	7					
18	8	S	CHANDRA CHAITRA	21- Sun enters Krittika nak. (13 ^h 18 ^m .0)	22- Full Moon (22 ^h 25 ^m .9)	22- Vaisakhi Purnima, Buddha Purnima
19	9	A				
20	10	K				
21	11					
22	12	H				
23	13	A				
24	14					
25	15		CHANDRA CHAITRA	23- Saura Jyaishthadi (24 ^h 16 ^m .5)	24- Jupiter enters Nir. Mithuna (22 ^h 36 ^m .5)	
26	16					
27	17					
28	18					
29	19					
30	20					
31	21					
			CHANDRA CHAITRA	30- Sun enters Trop.Gemini (24 ^h 24 ^m .6)	28- Sayana Vaidhriti (15 ^h 13 ^m .9)	
			CHANDRA CHAITRA			

N.B: All the timings are given in I.S.T. or the local mean time of the meridian of 82½ U E long.

Moon enters:Kumbha 2,24h31.3m;Mina 4,27h25.7m;Mesha 6,27h38.9m;Vrisha 8,26h53.7m;Mithuna 10,27h14.9m;Karkata 13, 6h 37.1m;Simha 15,14h 01.3m;Kanya 17,24h57.7m;Tula 20,13h42.3m;Vrischika 22,26h27.5m;Dhanus 25,14h 07.7m;

Makara 27,24h 03.9m;Kumbha 30,7h35.7m

Sun enters:-Nir. Vrisha 24, 24^h 12^m.0.

INDIAN CALENDAR

SAKA ERA 1947

Mithuna :Suchi

Month of JYAISHTHA (31 days)

Summer (Grishma), 2nd Month

(Nirayana) 8 Jyaishtha, 5126 Kali Era to (Nirayana) 7 Ashadha, 5126 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
									No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
			h	m	h	m	h	m						
		2025 A.D.												
1	Thu	May 22	5	16.2	11	56.7	18	37.3	K 10	25 12.6	25	17 47.3	1	21 49.2
2	Fri	23	5	15.9	11	56.7	18	37.8	11	22 30.1	26	16 02.4	2	18 36.4
3	Sat	24	5	15.6	11	56.8	18	38.3	12	19 20.6	27	13 48.3	3	15 00.2
4	Sun	25	5	15.4	11	56.9	18	38.7	13	15 51.6	1	11 12.4	4	11 06.3
5	Mon	26	5	15.1	11	57.0	18	39.2	14	12 12.1	2	8 23.7	5	7 01.8
													(6	26 54.8)
6	Tue	27	5	14.9	11	57.2	18	39.6	K 30	8 32.3	3	5 32.7	7	22 54.1
									(S 1	29 02.9)	(4	26 50.7)		
7	Wed	28	5	14.7	11	57.3	18	40.1	2	25 55.0	5	24 29.2	8	19 08.6
8	Thu	29	5	14.5	11	57.4	18	40.5	3	23 18.7	6	22 38.9	9	15 46.9
9	Fri	30	5	14.3	11	57.6	18	41.0	4	21 23.4	7	21 29.4	10	12 56.5
10	Sat	31	5	14.2	11	57.7	18	41.4	S 5	20 15.9	8	21 07.5	11	10 43.4
11	Sun	June 1	5	14.1	11	57.8	18	41.8	6	20 00.1	9	21 36.7	12	9 11.2
12	Mon	2	5	14.0	11	58.0	18	42.3	7	20 35.5	10	22 55.7	13	8 20.4
13	Tue	3	5	13.9	11	58.2	18	42.7	8	21 56.9	11	24 58.8	14	8 08.2
14	Wed	4	5	13.8	11	58.3	18	43.1	9	23 54.7	12	27 35.7	15	8 28.7
15	Thu	5	5	13.7	11	58.5	18	43.5	S 10	26 16.5	13	----	16	9 13.5
16	Fri	6	5	13.7	11	58.7	18	43.9	11	28 48.5	13	6 33.9	17	10 12.9
17	Sat	7	5	13.7	11	58.9	18	44.3	12	----	14	9 39.9	18	11 17.2
18	Sun	8	5	13.7	11	59.1	18	44.7	12	7 18.4	15	12 42.0	19	12 17.9
19	Mon	9	5	13.7	11	59.3	18	45.0	13	9 36.4	16	15 31.3	20	13 08.5
20	Tue	10	5	13.7	11	59.5	18	45.4	14	11 36.1	17	18 01.9	21	13 44.6
21	Wed	11	5	13.8	11	59.7	18	45.7	S 15	13 13.8	18	20 10.8	22	14 03.7
22	Thu	12	5	13.8	11	59.9	18	46.0	K 1	14 28.3	19	21 57.2	23	14 04.9
23	Fri	13	5	13.9	12	00.1	18	46.4	2	15 19.4	20	23 20.9	24	13 47.9
24	Sat	14	5	14.0	12	00.3	18	46.7	3	15 47.3	21	24 22.0	25	13 12.8
25	Sun	15	5	14.2	12	00.5	18	47.0	4	15 51.8	22	25 00.0	26	12 19.3
26	Mon	16	5	14.3	12	00.7	18	47.3	K 5	15 32.2	23	25 13.8	27	11 06.8
27	Tue	17	5	14.4	12	00.9	18	47.5	6	14 47.1	24	25 01.9	1	9 34.2
28	Wed	18	5	14.6	12	01.1	18	47.8	7	13 35.2	25	24 23.0	2	7 40.3
29	Thu	19	5	14.8	12	01.4	18	48.0	8	11 56.0	26	23 17.0	3	5 24.3
													(4	26 46.0)
30	Fri	20	5	15.0	12	01.6	18	48.3	9	9 49.9	27	21 45.0	5	23 46.7
31	Sat	21	5	15.2	12	01.8	18	48.5	K 10	7 19.2	1	19 50.3	6	20 29.0
									(K 11	28 28.1)				

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

INDIAN CALENDAR

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Uttarayana
Uttara Gola

SAKA ERA 1947

Month of JYAISHTHA (31 days)

Ayanamsa on 1st : 24^o 12' 43^o

(Nirayana) 8 Jyaishtha, 5126 Kali Era to (Nirayana) 7 Ashadha, 5126 Kali Era

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun	Phenomena	Festivals
1	2025A.D. May	22	S A U R A C H A N D R A V A I S A K H A	4- Sun enters Rohini nak. (9 ^h 31 ^m .3)		2- Aparā Ekadasi, Bhadrakali Ekadasi(Punjab)
2		23				4- Savitri Chaturdasi
3		24				5- Phalaharini Kalika Puja, Vata Savitri Vrata (Amavasya Paksha)
4		25				6- New Moon (8 ^h 32 ^m .3)
5		26				8- Rambha tritiya, Pratap Jayanti(Rajasthan)
6		27				9- Sayana Vyatipata (10 ^h 10 ^m .0)
7		28				9- Guru Arjan Dev’s Martyardom Day (Sikh)
8		29				11- Vindhya Vasini Puja, Aranya Shashthi or Jamatri Shashthi (Bengal)
9		30				13- Mela Kshir Bhawani(Kashmir)
10		31				15- Ganga Dasahara
11	June	1	J Y A I S H T H A	18- Sun enters Mrigasiras nak. (7 ^h 18 ^m .3)		16- Nirjala Ekadasi
12		2				17- Champaka Dvadasi, Vanjuli Mahadvadasi, Nirjala Ekadasi(Vaishnava)
13		3				20- Vata Savitri Vrata (Purnima Paksha)
14		4				21- Deva Snana Purnima
15		5				21- Full Moon (13 ^h 13 ^m .8)
16		6				21- Jupiter sets in the West (18 ^h 55 ^m .0)
17		7				22- Sayana Vaidhriti (22 ^h 48 ^m .6)
18		8				22- Guru Hargobind’s Birthday
19		9				25- Rajas Samkranti(Odisha)
20		10				25- Rajas Samkranti(Odisha)
21	11	S A U R A A S H A D H A	H T H A S H A D H A	24- Saura Ashadhadi (6 ^h 32 ^m .2)		21- Deva Snana Purnima
22	12					22- Guru Hargobind’s Birthday
23	13					25- Rajas Samkranti(Odisha)
24	14					25- Rajas Samkranti(Odisha)
25	15					25- Rajas Samkranti(Odisha)
26	16					25- Rajas Samkranti(Odisha)
27	17					25- Rajas Samkranti(Odisha)
28	18					25- Rajas Samkranti(Odisha)
29	19					25- Rajas Samkranti(Odisha)
30	20					25- Rajas Samkranti(Odisha)
31	June 21		A	31- Sun enters Trop. Cancer (8 ^h 12.2 ^m)		31- Dakshinayan Day, Yogini Ekadasi(Smarta)

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Moon enters: Mina 1, 12h 08.4m, Mesha 3, 13h 48.3m, Vrisha 5, 13h 40.8m, Mithuna 7, 13h 36.7m, Karkata 9, 15h 42.5m, Simha 11, 21h 36.7m, Kanya 14, 7h 35.3m, Tula 16, 20h 06.7m, Vrischika 19, 8h 50.6m, Dhanus 21, 20h 10.8m, Makara 24, 5h 38.3m, Kumbha 26, 13h 10.0m, Mina 28, 18h 35.3m, Mesha 30, 21h 45.0m Sun enters :-Nir. Mithuna 25, 6^h 44^m.4.

INDIAN CALENDAR

SAKA ERA 1947

Karkata : Nabhas

Month of ASHADHA (31 days)

Rains (Varsa), 1st Month

(Nirayana 8 Ashadha, 5126 Kali Era to (Nirayana) 7 Sravana, 5126 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
									No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
			h	m	h	m	h	m						
		2025 A.D.												
1	Sun	June 22	5	15.4	12	02.0	18	48.7	K 12	25 22.5	2	17 38.5	7	16 57.3
2	Mon	23	5	15.7	12	02.2	18	48.9	13	22 10.2	3	15 16.9	8	13 17.2
3	Tue	24	5	15.9	12	02.5	18	49.0	14	19 00.0	4	12 54.3	9	9 35.6
4	Wed	25	5	16.2	12	02.7	18	49.2	K 30	16 01.7	5	10 40.8	10	6 00.2
5	Thu	26	5	16.5	12	02.9	18	49.3	S 1	13 25.1	6	8 46.6	(11 12	26 39.1)
6	Fri	27	5	16.8	12	03.1	18	49.5	2	11 19.9	7	7 22.0	13	21 10.3
7	Sat	28	5	17.1	12	03.3	18	49.6	3	9 54.5	8	6 35.8	14	19 15.4
8	Sun	29	5	17.4	12	03.5	18	49.6	4	9 15.0	9	6 34.3	15	17 58.7
9	Mon	30	5	17.7	12	03.7	18	49.7	S 5	9 24.4	10	7 20.9	16	17 20.7
10	Tue	Jul. 1	5	18.0	12	03.9	18	49.8	6	10 21.1	11	8 54.0	17	17 18.6
11	Wed	2	5	18.4	12	04.1	18	49.8	7	11 59.0	12	11 07.5	18	17 46.5
12	Thu	3	5	18.7	12	04.3	18	49.8	8	14 07.3	13	13 50.7	19	18 35.6
13	Fri	4	5	19.1	12	04.5	18	49.8	9	16 32.3	14	16 50.1	20	19 35.5
14	Sat	5	5	19.5	12	04.6	18	49.8	S 10	18 59.4	15	19 51.5	21	20 35.8
15	Sun	6	5	19.8	12	04.8	18	49.7	11	21 15.5	16	22 42.0	22	21 27.2
16	Mon	7	5	20.2	12	05.0	18	49.6	12	23 10.7	17	25 11.8	23	22 02.5
17	Tue	8	5	20.6	12	05.1	18	49.6	13	24 38.8	18	27 15.3	24	22 17.1
18	Wed	9	5	21.0	12	05.3	18	49.4	14	25 37.4	19	28 49.9	25	22 08.8
19	Thu	10	5	21.4	12	05.4	18	49.3	S 15	26 06.8	20	---	26	21 37.5
20	Fri	11	5	21.8	12	05.5	18	49.2	K 1	26 09.0	20	5 56.3	27	20 44.4
21	Sat	12	5	22.2	12	05.7	18	49.0	2	25 46.8	21	6 36.4	1	19 31.5
22	Sun	13	5	22.6	12	05.8	18	48.8	3	25 03.2	22	6 53.2	2	18 00.7
23	Mon	14	5	23.1	12	05.9	18	48.6	4	24 00.2	23	6 49.1	3	16 13.9
24	Tue	15	5	23.5	12	06.0	18	48.4	K 5	22 39.6	24	6 26.5	4	14 12.4
25	Wed	16	5	23.9	12	06.1	18	48.1	6	21 02.4	25	5 46.6	5	11 57.2
26	Thu	17	5	24.3	12	06.2	18	47.9	7	19 09.5	(26 27	28 50.6)	6	9 28.9
27	Fri	18	5	24.8	12	06.3	18	47.6	8	17 02.3	1	26 14.0	7	6 48.2
28	Sat	19	5	25.2	12	06.3	18	47.3	9	14 42.5	2	24 37.5	(8 9	27 56.3)
29	Sun	20	5	25.6	12	06.4	18	47.0	K 10	12 13.5	3	22 53.5	10	21 48.1
30	Mon	21	5	26.1	12	06.4	18	46.6	K 11	9 39.4	4	21 07.1	11	18 38.7
31	Tue	22	5	26.5	12	06.5	18	46.3	12	7 06.0	5	19 25.0	12	15 32.2
									(K 13	28 40.1)				

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

Avanamsa on 1st : $24^0 12' 49''$

Niravana) 8 Ashadha, 5126 Kali Era to (*Niravana*) 7 Sravana, 5126 Kali Era

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.
Moon enters:-Vrisha 1,23h03.7m,Mithuna 3,23h45.8m,Karkata 5,25h40.0m,Simha 8,6h34.3m,Kanya 10,15h23.9m,Tula 12, 27h 19.3m, Vrishchika 15,16h 00.9m,Dhanus 17,27h15.3m,Makara 20,12h 08.7m,Kumbha 22,18h53.6m,Mina 24, 23h58.2m. Mesha 26,27h39.2m,Vrisha 29,6h12.1m.Mithuna 31,8h15.1m Sun enters : Nir. Karkata 25. 17h 32.4m

INDIAN CALENDAR

SAKA ERA 1947

Simha : Nabhasya

Month of SRAVANA (31 days)

Rains (Varsa), 2nd Month

(Nirayana) 8 Sravana, 5126 Kali Era to (Nirayana) 7 Bhadra, 5126 Kali Era

Date	Week Day	Gregorian Date	Sunrise	Apparent Noon	Sunset	Tithi				Nakshatra				Yoga			
						No.		Ending Moment		No.		Ending Moment		No.		Ending Moment	
						h	m	h	m	h	m	h	m	h	m	h	m
		2025 A.D.															
1	Wed	July 23	5 26.9	12 06.5	18 45.9	K 14	26 29.3	6	17 54.6	13	12 34.1						
2	Thu	24	5 27.4	12 06.5	18 45.5	K 30	24 41.2	7	16 43.9	14	9 50.7						
3	Fri	25	5 27.8	12 06.6	18 45.0	S 1	23 23.5	8	16 00.9	15	7 28.1						
4	Sat	26	5 28.3	12 06.6	18 44.6	2	22 42.5	9	15 52.4	16	5 31.7						
5	Sun	27	5 28.7	12 06.6	18 44.1	3	22 42.6	10	16 23.3	18	27 13.4	(17	28 06.0)				
6	Mon	28	5 29.1	12 06.5	18 43.7	4	23 25.0	11	17 35.8	19	26 53.9						
7	Tue	29	5 29.6	12 06.5	18 43.2	S 5	24 47.1	12	19 27.8	20	27 04.8						
8	Wed	30	5 30.0	12 06.5	18 42.7	6	26 42.1	13	21 53.2	21	27 40.3						
9	Thu	31	5 30.4	12 06.4	18 42.1	7	28 58.9	14	24 41.9	22	28 32.1						
10	Fri	Aug. 1	5 30.9	12 06.4	18 41.6	8	--- ----	15	27 40.6	23	29 30.2						
11	Sat	2	5 31.3	12 06.3	18 41.0	8	7 23.9	16	--- ----	24	--- ----						
12	Sun	3	5 31.7	12 06.2	18 40.4	9	9 42.6	16	6 35.2	24	6 24.3						
13	Mon	4	5 32.1	12 06.1	18 39.8	S 10	11 42.2	17	9 12.7	25	7 04.9						
14	Tue	5	5 32.5	12 06.0	18 39.2	11	13 12.8	18	11 23.0	26	7 24.3						
15	Wed	6	5 33.0	12 05.9	18 38.5	12	14 08.8	19	13 00.0	27	7 17.6						
16	Thu	7	5 33.4	12 05.8	18 37.9	13	14 28.3	20	14 01.4	1	6 42.4						
17	Fri	8	5 33.8	12 05.7	18 37.2	14	14 12.5	21	14 28.2	2	5 38.8						
18	Sat	9	5 34.2	12 05.5	18 36.5	S 15	13 25.0	22	14 23.7	(3	28 08.7)						
19	Sun	10	5 34.6	12 05.4	18 35.8	K 1	12 10.5	23	13 52.8	4	26 15.3						
20	Mon	11	5 35.0	12 05.2	18 35.1	2	10 34.2	24	13 00.5	5	24 02.3						
21	Tue	12	5 35.4	12 05.1	18 34.3	3	8 41.3	25	11 52.2	6	21 33.8						
22	Wed	13	5 35.8	12 04.9	18 33.6	4	6 36.6	26	10 32.7	7	18 53.7						
23	Thu	14	5 36.1	12 04.7	18 32.8	(K 5	28 24.1)	27	9 06.1	8	16 05.5						
24	Fri	15	5 36.5	12 04.5	18 32.1	6	26 07.7	27	9 06.1	9	13 12.2						
25	Sat	16	5 36.9	12 04.3	18 31.3	7	23 50.3	1	7 36.1	10	10 16.6						
26	Sun	17	5 37.3	12 04.1	18 30.5	8	21 35.0	2	6 06.0	11	7 21.2						
27	Mon	18	5 37.6	12 03.9	18 29.6	9	19 24.9	(3	28 38.8)	(12	28 28.3)						
28	Tue	19	5 38.0	12 03.6	18 28.8	K 10	17 23.0	4	27 17.7	13	25 40.3						
29	Wed	20	5 38.4	12 03.4	18 28.0	11	15 33.1	5	26 06.1	14	22 59.9						
30	Thu	21	5 38.7	12 03.2	18 27.1	12	13 59.1	6	25 07.9	15	20 29.9						
31	Fri	22	5 39.1	12 02.9	18 26.3	13	12 45.4	7	24 27.2	16	18 13.5						
						K 14	11 56.5	8	24 08.8	17	16 14.2						
								9	24 16.8	18	14 35.3						

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

Dakshinayana
Uttara Gola

INDIAN CALENDAR

SAKA ERA 1947

Month of SRAVANA (31 days)

Ayanamsa on 1st : 24° 12' 55''

(Nirayana) 8 Sravana, 5126 Kali Era to (Nirayana) 7 Bhadra, 5126 Kali Era

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Date	Gergorian	Solar	Lunar	Transit of the Sun	Phenomena	Festivals
1	2025 A.D. July 23		CHANDRA ASHADHA			
2	24	S			2- New moon (24 ^h 41 ^m .2)	2- Chitalagi Amavasya (Odisha), Adi Amavasya (Tamilnadu), Karkataka Vavu(Kerala)
3	25	A				
4	26					
5	27	U	C			5- Madhusrava Tritiya(Teej), Adi Puram(S.India)
6	28					
7	29	R	H			7- Naga Panchami
8	30					
9	31					9- Goswami Tulasidas Jayanti
10	Aug. 1	A	A			10- Tilak Commemoration Day
11	2			11- Sun enters Aslesha nak. (28 ^h 08 ^m .8)	11- Sayana Vaidhriti (14 ^h 39 ^m .2)	
12	3		N			13- Jhulana Yatrarambha
13	4					14- Pavitra Ekadasi
14	5		D			
15	6					
16	7		R			
17	8		A			17- Vara Maha Lakshmi Vrata (S.India), Jhulana Yatra Samapana(Prodosa), Naroli Purnima
18	9	S			18- Full Moon (13 ^h 25 ^m .0)	18- Raksha Bandhana, Jhulana Yatra Samapana (Purvahna), Amarnath Yatra, Balabhadra Puja(Odisha), Solono (Rakhi Bandhan), Avani Avittam(S.India), Yaju Upakarma, Rik Upakarma, Sravani Purnima
19	10					19- Gayatri Japam
20	11	V				
21	12	A	S			21- Bahula Chaturthi (Sankashta Chaturthi), Teejri(Sindhi)
22	13	N				22- Raksha Panchami (Odisha)
23	14		R			
24	15	A	A	24- Saura Bhadrapadadi (25 ^h 45 ^m .5)	24- Sayana Vyatipata (7 ^h 29 ^m .3)	24- Janmashtami(Smarta), Gokulashtami, Vadi Thadri (Sindhi), Independence Day
25	16		V	25- Sun enters Magha nak. (25 ^h 52 ^m .9)		25- Janmashtami(Vaishnava) , Gokulashtami (Nandotsava)
26	17					26- Manasa puja Ends(Bengal), Simhadi(Kerala), Beginning of Kollam Era
27	18	SAURA BHADRAPADA	A			
28	19		N			28- Aja Ekadasi
29	20		A			29- Paryusana Parvarambha (Chaturthi Paksha- Jain), Paryusana Parvarambha (Panchami Paksha-Jain)
30	21					30- Aghora Chaturdasi, Kailas Yatra(2 days)
31	Aug. 22			31- Sun enters trop. Virgo (26 ^h 03 ^m .8)		31- Saptapuri Amavasya(Odisha), Pithori

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.
Moon enters : Karkata 2,10h59.3m,Simha 4,15h52.4m,Kanya 6,24h00.2m,Tula 9,11h15.4m,Vrischika 11,23h 52.7m,Dhanus 14, 11h 23.0m,Makara 16,20h11.2m,Kumbha 18,26h11.3m,Mina 21,6h10.5m,Mesha 23,9h06.1m,Vrisha 25,11h43.8m,Mithuna 27,14h40.5m,Karkata 29,18h35.5m,Simha 31, 24h 16.8m
Sun enters : Nir. Simha 25, 25h 52.9m

INDIAN CALENDAR

SAKA ERA 1947

Month of BHADRA (31 days)

Kanya: Isha
Autumn (Sarat), 1st Month

(Nirayana) 8 Bhadra, 5126 Kali Era to (Nirayana) 7 Asvina, 5126 Kali Era

Date	Week Day	Gregorian Date	Sunrise	Apparent Noon	Sunset	Tithi			Nakshatra			Yoga		
						No.	Ending Moment		No.	Ending Moment		No.	Ending Moment	
			h	m	h	m	h	m		h	m		h	m
		2025 A.D.												
1	Sat	Aug. 23	5 39.4	12 02.6	18 25.4	K 30	11 36.5	10	24 55.1	19	13 19.7			
2	Sun	24	5 39.8	12 02.4	18 24.5	S 1	11 48.9	11	26 06.0	20	12 29.7			
3	Mon	25	5 40.1	12 02.1	18 23.6	2	12 35.3	12	27 49.9	21	12 06.3			
4	Tue	26	5 40.5	12 01.8	18 22.7	3	13 55.2	13	---	22	12 08.8			
5	Wed	27	5 40.8	12 01.5	18 21.8	4	15 44.9	13	6 04.5	23	12 34.5			
6	Thu	28	5 41.2	12 01.2	18 20.9	S 5	17 57.4	14	8 43.5	24	13 18.3			
7	Fri	29	5 41.5	12 00.9	18 19.9	6	20 22.4	15	11 38.7	25	14 12.9			
8	Sat	30	5 41.8	12 00.6	18 19.0	7	22 47.1	16	14 37.6	26	15 09.7			
9	Sun	31	5 42.1	12 00.3	18 18.0	8	24 58.2	17	17 27.2	27	15 59.0			
10	Mon	Sept. 1	5 42.5	12 00.0	18 17.1	9	26 43.5	18	19 55.2	1	16 31.5			
11	Tue	2	5 42.8	11 59.7	18 16.1	S 10	27 53.4	19	21 51.2	2	16 39.4			
12	Wed	3	5 43.1	11 59.4	18 15.1	11	28 22.4	20	23 08.5	3	16 17.2			
13	Thu	4	5 43.4	11 59.0	18 14.2	12	28 08.6	21	23 44.0	4	15 21.7			
14	Fri	5	5 43.7	11 58.7	18 13.2	13	27 13.6	22	23 38.5	5	13 52.6			
15	Sat	6	5 44.0	11 58.4	18 12.2	14	25 41.6	23	22 55.8	6	11 51.7			
16	Sun	7	5 44.4	11 58.0	18 11.2	S 15	23 38.8	24	21 41.5	7	9 22.6			
17	Mon	8	5 44.7	11 57.7	18 10.2	K 1	21 12.3	25	20 02.8	8	6 30.2			
18	Tue	9	5 45.0	11 57.3	18 09.2	2	18 29.6	26	18 07.4	(9 10	27 20.2)			
19	Wed	10	5 45.3	11 57.0	18 08.2	3	15 38.5	27	16 03.4	11	23 58.7			
20	Thu	11	5 45.6	11 56.6	18 07.2	4	12 46.0	1	13 58.2	12	20 31.6			
21	Fri	12	5 45.9	11 56.3	18 06.2	K 5	9 59.1	2	11 58.8	13	17 04.8			
22	Sat	13	5 46.2	11 55.9	18 05.1	6	7 23.7	3	10 11.5	14	13 43.6			
23	Sun	14	5 46.5	11 55.6	18 04.1	(7 8	29 04.9)	4	8 41.1	15	10 32.5			
24	Mon	15	5 46.8	11 55.2	18 03.1	9	25 31.8	5	7 31.8	(16 17	28 55.4)			
25	Tue	16	5 47.1	11 54.8	18 02.1	K 10	24 22.6	6	6 46.3	18	26 34.5			
26	Wed	17	5 47.4	11 54.5	18 01.1	11	23 40.2	7	6 26.2	19	24 34.1			
27	Thu	18	5 47.7	11 54.1	18 00.0	12	23 25.0	8	6 32.6	20	22 55.0			
28	Fri	19	5 48.0	11 53.8	17 59.0	13	23 37.5	9	7 05.8	21	21 37.4			
29	Sat	20	5 48.3	11 53.4	17 58.0	14	24 17.4	10	8 05.9	22	20 41.4			
30	Sun	21	5 48.7	11 53.1	17 57.0	K 30	25 24.1	11	9 32.3	23	20 06.8			
31	Mon	22	5 49.0	11 52.7	17 56.0	S 1	26 56.5	12	11 24.4	24	19 52.9			
											19 58.8			

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun	Phenomena	Festivals
1	2025 A.D. Aug. 23	S	CHANDRA SARAVANA	8- Sun enters Purva Phalguni nak. (21 ^h 44 ^m .6)	1- New Moon (11 ^h 36 ^m .5)	1- Kusotpatini, Jain festival
2	24	A	C		5- Sayana Vaidhriti (21 ^h 39 ^m .6)	3- Tithi of Sri Sankara Deva(Assam)
3	25	U	H			4- Samaveda Upakarna, Haritalika Gauri Tritiya (Hasta Nak.Available/ Ahoratra), Haritalika Chaturthi
4	26	R	A			5- Samvatsari (Chaturthi Paksha - Jain), Ganesha Chaturthi, Vinayaka Chaturthi (Tamil Nadu), Samvatsari (Panchami Paksha-Jain)
5	27	A	N			6- Rishi Panchami, Melapat-3days (Jammu & Kashmir)
6	28		D			7- Surya Shashthi
7	29					
8	30					
9	31	B	R			9- Radhashtami, Durvashtami (Bengal), Maha Lakashmi Vratarambha
10	Sept. 1	H	A			12- Keil Muhurth(Coorg), Dolgyaras(Madhya Pradesh), Heikru Hidongba(Manipur), Parsvaparivarfani Ekadasi
11	2	A		22- Sun enters UttaraPhalguni nak. (15 ^h 41 ^m .5)	16- Full Moon (23 ^h 38 ^m .8) 16- Total Lunar Eclipse (Visible in India) 18- Sayana Vyatipata (21 ^h 14 ^m .3)	13-First Onam Day, Sravana Dvadasi, Vamana Jayanti, Sakrotthana
12	3	D				14- Onam or Thiru Onam day(Kerala)
13	4	R	B			15- Third Onam Day, Ananta Chaturdasi
14	5	A	H			16- Sri Narayan Guru Deva's Birthday (Kerala), Fourth Onam Day, Indra Purnima
15	6	P	A			17- Pitri Paksha Tarpana begins or Mahalaya Paksha begins(S. India)
16	7	A	D			20- Tithi of Sri Madhava Deva(Assam)
17	8	D	R			23- Sri Krishna Jayanti(Tamilnadu, Kerala and Assam), Sri Jayanti (Ramanuja), Maha Lakshmi Vrata Sampana
18	9	A	A			24- Matri Navami
19	10		P			26- Visvakarma Puja, Indira Ekadasi
20	11		A			28- Magha Trayodasi (Magha after 7 ^h 05 ^m .8)
21	12		D	24- Saura Asvinadi (25 ^h 59 ^m .2)	30- New Moon (25 ^h 24 ^m .1) 30- Partial Solar Eclipse (Not Visible in India) 30- Sayana Vaidhriti (28 ^h 42 ^m .2)	30- Samadhi Day of Narayan Guru (Kerala), Mahalaya Amavasya, Sarva Pitri Amavasya, Tarpana Layba(Manipur)
22	13		A			
23	14					
24	15					
25	16					
26	17					
27	18					
28	19					
29	20					
30	21					
31	Sept. 22	SAURA ASVINA	CHANDRA ASVINA	31- Sun enters trop. Libra (23 ^h 42 ^m .3)		31- Saradiya Navaratrambha, Maharaja Agrasen's Jayanti, Jalavisuva Day

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.
Moon enters :Kanya 3,8h28.9m,Tula 5,19h21.5m,Vrischika 8,7h53.2m,Dhanus 10,19h55.2m,Makara 12,29h21.4m,Kumbha 15, 11h 21.5m,Mina 17,14h29.3m,Mesha 19,16h 03.4m,Vrisha 21,17h30.7m,Mithuna 23,20h 03.7m,Karkata 25,24h28.8m,Simha 28, 7h05.8m,Kanya 30,15h58.0m
Sun enters : Nir. Kanya 25, 25h 47.6m

INDIAN CALENDAR

SAKA ERA 1947

Tula : Urja

Month of ASVINA (30 days)

Autumn (Sarat), 2nd Month

(Nirayana) 8 Asvina, 5126 Kali Era to (Nirayana) 7 Kartika, 5126 Kali Era

Date	Week Day	Gregorian Date	Sunrise	Apparent Noon	Sunset	Tithi				Nakshatra			Yoga		
						No.	Ending Moment		No.	Ending Moment		No.	Ending Moment		
							h	m		h	m		h	m	h	m
			h	m	h	m	h	m		h	m		h	m	
		2025 A.D.													
1	Tue	Sep.	23	5 49.3	11 52.4	17 54.9	S 2	28 52.1	13	13 40.2	25 20 23.0				
2	Wed		24	5 49.6	11 52.0	17 53.9	3	---	14	16 16.8	26 21 02.6				
3	Thu		25	5 49.9	11 51.7	17 52.9	3	7 06.6	15	19 08.9	27 21 53.6				
4	Fri		26	5 50.2	11 51.3	17 51.9	4	9 33.6	16	22 09.3	1 22 50.4				
5	Sat		27	5 50.6	11 51.0	17 50.9	S 5	12 04.2	17	25 08.3	2 23 45.9				
6	Sun	Oct.	28	5 50.9	11 50.7	17 49.9	6	14 27.7	18	27 55.0	3 24 32.0				
7	Mon		29	5 51.2	11 50.3	17 48.9	7	16 32.2	19	---	4 25 00.3				
8	Tue		30	5 51.6	11 50.0	17 47.9	8	18 06.6	19	6 17.7	5 25 03.0				
9	Wed		1	5 51.9	11 49.7	17 46.9	9	19 01.6	20	8 06.4	6 24 33.8				
10	Thu		2	5 52.3	11 49.3	17 46.0	S 10	19 11.4	21	9 13.4	7 23 28.6				
11	Fri		3	5 52.6	11 49.0	17 45.0	11	18 33.6	22	9 34.5	8 21 45.8				
12	Sat		4	5 53.0	11 48.7	17 44.0	12	17 09.8	23	9 09.5	9 19 26.6				
13	Sun		5	5 53.3	11 48.4	17 43.0	13	15 04.4	24	8 01.4	10 16 34.1				
14	Mon		6	5 53.7	11 48.1	17 42.1	14	12 24.2	25	6 16.2	11 13 13.5				
15	Tue		7	5 54.0	11 47.8	17 41.1	S 15	9 17.6	26	28 02.0	12 9 31.4				
16	Wed	8	5 54.4	11 47.5	17 40.2	(K 1 29 53.9)	2	26 23.1	1	22 45.0	(13 29 35.3)				
17	Thu	9	5 54.8	11 47.3	17 39.3	3	22 55.0	2	20 02.8	14 25 32.9					
18	Fri	10	5 55.2	11 47.0	17 38.4	4	19 39.1	3	17 31.5	15 21 32.4					
19	Sat	11	5 55.6	11 46.7	17 37.4	K 5	16 44.1	4	15 20.2	16 17 41.5					
20	Sun	12	5 56.0	11 46.5	17 36.5	6	14 17.5	5	13 36.8	17 14 07.1					
21	Mon	13	5 56.4	11 46.2	17 35.7	7	12 24.9	6	12 27.1	18 10 55.2					
22	Tue	14	5 56.8	11 46.0	17 34.8	8	11 10.1	7	11 54.5	19 8 10.4					
23	Wed	15	5 57.2	11 45.8	17 33.9	9	10 34.2	8	11 54.5	(20 29 55.4)					
24	Thu	16	5 57.6	11 45.6	17 33.1	K 10	10 36.1	9	12 42.3	21 28 11.2					
25	Fri	17	5 58.1	11 45.3	17 32.2	11	11 12.7	10	12 00.1	22 26 57.0					
26	Sat	18	5 58.5	11 45.2	17 31.4	12	12 19.6	11	12 42.3	23 26 10.7					
27	Sun	19	5 59.0	11 45.0	17 30.6	13	13 52.1	12	13 57.7	24 25 48.9					
28	Mon	20	5 59.4	11 44.8	17 29.8	14	15 45.4	13	15 41.9	25 25 48.0					
29	Tue	21	5 59.9	11 44.6	17 29.0	K 30	17 55.2	14	17 49.8	26 26 04.5					
30	Wed	22	6 00.4	11 44.5	17 28.2	S 1	20 17.2	15	20 16.9	27 26 34.9					
									22 58.9	1 27 16.2					
									25 51.8	2 28 05.6					

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

Dakshinayana
Dakshina Gola

INDIAN CALENDAR

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SAKA ERA 1947

Month of ASVINA (30 days)

Ayanamsa on 1st : 24° 13' 03"

(Nirayana) 8 Asvina, 5126 Kali Era to (Nirayana) 7 Kartika, 5126 Kali Era

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun	Phenomena	Festivals
1	2025 A.D. Sep. 23	S	C	5- Sun enters Hasta nak. (7 ^h 07 ^m .1)		4- Upanga Lalita Vrata
2	24					
3	25					
4	26	A				
5	27		H			
6	28	U				
7	29		A			
8	30	A		18- Sun enters Chitra nak. (20 ^h 12 ^m .1)	13- Sayana Vyatipata (13 ^h 44 ^m .3) 15- Full Moon (9 ^h 17 ^m .6)	7- Durga Puja Begins(Saptami), Oli Begins(Jain), Saraswati Avahana
9	Oct. 1		N			8- Mahastami
10	2					9- Maha Navami, Ayudha Puja
						10- Vijaya Dasami(Dussehara or Dasahara), Vijaya Dasami(Bengal), Vijaya Dasami(Kerala), Vijaya Dasami(Mysore), Madhavacharya Jayanti, Mahatma Gandhi's Birthday, Saraswati Visarjana
		A	D			
11	3	S	R			11- Bharat Milap, Papankusa Ekadasi (Pasankusa)
12	4					
13	5					
14	6	V	A			14- Kojagari Lakshmi Puja(Bengal), Kumara Purnima (Odisha), Sarat Purnima, Kojagar (Lakshmindra Puja)
15	7					15- Maharshi Valmiki's Birthday, Oli Ends(Jain)
16	8	I	A			
17	9					
18	10	N	S			18- Karaka Chaturthi, Dasaratha Chaturthi
19	11					
20	12					
21	13	A		24- Saura Kartikadi (14 ^h 20 ^m .9)	25- Sayana Vaidhriti (10 ^h 50 ^m .3) 26- Jupiter enters Nir. Karkata (19 ^h 47 ^m .9)	21- Ahoyi Ashtami, Karashtami, Ahoyi Ashtami(Punjab)
22	14		V			
23	15					
24	16					
25	17		I			25- Govatsa Dvadasi, Kaveri Samkramana Snana, Rama Ekadasi
26	18	SAURA KARTIKA				26- Dhana Trayodasi
27	19		N			27- Kali Chaturdasi
28	20					28- Naraka Chaturdasi (Purvarunodaya), Lakshmi Puja, Lakshmi Dipam, Kali Puja, Dipavali, Dipavali (S.India), Hanumajjanma(N.India) (Purvarunodaya), Mahavira Nirvana(Jain)
29	21		A			29- Kaumudi Dipam, Kedar Gauri Vrata
30	22		CHANDRA KARTIKA			30- Kartika Sukladi, Govardhana Puja, Bali Puja, Annakuta

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Moon enters :- Tula 1, 26h56.2m; Vrischika 4, 15h23.9m; Dhanus 6, 27h55.0m; Makara 9, 14h27.3m; Kumbha 11, 21h27.6m; Mina 13, 24h 45.5m; Mesha 15, 25h28.2m; Vrissha 17, 25h23.5m; Mithuna 19, 26h24.6m; Karkata 22, 5h59.1m; Simha 24, 12h42.3m; Kanya 26, 22h11.8m; Tula 29, 9h36.3m

Sun enters : Nir. Tula 25, 13h 46.3m

INDIAN CALENDAR

SAKA ERA 1947

Vrischika : Sahas

Month of KARTIKA (30 days)

Hemanta, 1st Month

(Nirayana) 8 Kartika, 5126 Kali Era to (Nirayana) 7 Agrahayana, 5126 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
									No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
			h	m	h	m	h	m						
		2025 A.D.												
1	Thu	Oct. 23	6	00.8	11	44.3	17	27.5	S 2	22 47.2	16	28 51.2	3	28 59.7
2	Fri	24	6	01.3	11	44.2	17	26.7	3	25 20.0	17	--- ----	4	29 54.6
3	Sat	25	6	01.8	11	44.1	17	26.0	4	27 48.8	17	7 51.8	5	--- ----
4	Sun	26	6	02.3	11	44.0	17	25.3	S 5	--- ----	18	10 46.8	5	6 45.5
5	Mon	27	6	02.8	11	43.9	17	24.6	S 5	6 05.4	19	13 27.7	6	7 26.5
6	Tue	28	6	03.4	11	43.8	17	23.9	6	8 00.3	20	15 45.3	7	7 50.6
7	Wed	29	6	03.9	11	43.7	17	23.2	7	9 23.7	21	17 29.9	8	7 50.9
8	Thu	30	6	04.4	11	43.7	17	22.6	8	10 07.0	22	18 33.7	9	7 20.9
9	Fri	31	6	05.0	11	43.6	17	22.0	9	10 04.1	23	18 51.2	10	6 15.5
10	Sat	Nov. 1	6	05.5	11	43.6	17	21.4	S 10	9 12.2	24	18 20.6	(11) 28 31.9)	
11	Sun	2	6	06.1	11	43.6	17	20.8	11	7 32.0	25	17 03.7	13	23 10.4
12	Mon	3	6	06.6	11	43.6	17	20.2	(12) 13	29 07.8)	26	15 05.7	14	19 39.4
13	Tue	4	6	07.2	11	43.6	17	19.7	14	26 06.3	27	12 34.6	15	15 42.7
14	Wed	5	6	07.8	11	43.6	17	19.1	S 15	18 49.2	1	9 40.3	16	11 28.2
15	Thu	6	6	08.4	11	43.6	17	18.6	K 1	14 55.2	2	6 34.1	17	7 04.7
											(3) 27 27.9)	(18) 26 41.4)		
16	Fri	7	6	09.0	11	43.7	17	18.1	2	11 05.9	4	24 33.7	19	22 27.5
17	Sat	8	6	09.6	11	43.7	17	17.7	3	7 32.6	5	22 02.7	20	18 31.9
									(4) 28 26.1)					
18	Sun	9	6	10.2	11	43.8	17	17.2	K 5	25 55.8	6	20 05.0	21	15 02.4
19	Mon	10	6	10.8	11	43.9	17	16.8	6	24 08.8	7	18 48.5	22	12 05.2
20	Tue	11	6	11.4	11	44.0	17	16.4	7	23 09.5	8	18 18.2	23	9 44.6
21	Wed	12	6	12.1	11	44.1	17	16.0	8	22 59.0	9	18 35.6	24	8 02.5
22	Thu	13	6	12.7	11	44.3	17	15.7	9	23 34.6	10	19 38.4	25	6 57.9
23	Fri	14	6	13.4	11	44.4	17	15.3	K 10	24 50.3	11	21 20.7	26	6 27.4
24	Sat	15	6	14.0	11	44.6	17	15.0	11	26 37.8	12	23 34.6	27	6 25.7
25	Sun	16	6	14.7	11	44.8	17	14.7	12	28 48.1	13	26 11.1	1	6 46.3
26	Mon	17	6	15.3	11	45.0	17	14.5	13	--- ----	14	29 01.7	2	7 22.8
27	Tue	18	6	16.0	11	45.2	17	14.2	13	7 12.6	15	--- ----	3	8 09.1
28	Wed	19	6	16.7	11	45.4	17	14.0	14	9 44.1	15	7 59.4	4	9 00.3
29	Thu	20	6	17.3	11	45.6	17	13.8	K 30	12 17.2	16	10 58.9	5	9 52.8
30	Fri	21	6	18.0	11	45.9	17	13.6	S 1	14 47.8	17	13 56.0	6	10 43.4

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

INDIAN CALENDAR

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Dakshinayana
Dakshina Gola

SAKA ERA 1947

Month of KARTIKA (30 days)

Ayanamsa on 1st : 24° 13' 06"

(Nirayana) 8 Kartika, 5126 Kali Era to (Nirayana) 7 Agrahayana, 5126 Kali Era

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun	Phenomena	Festivals		
1	2025 A.D. Oct. 23	KARTIKA	VINAVASA	1- Sun enters trop. Scorpio (9 ^h 20 ^m .9)	8- Sayana Vyatipata (27 ^h 12 ^m .8)	1- Dwat Puja(Bihar), Bhratri Dvitiya(Bengal), Yama Dvitiya, Visvakarma day		
2	24			2- Sun enters Svati nak. (6 ^h 40 ^m .5)				
3	25							
4	26							
5	27					5- Jnana Panchami(Jain)		
6	28					6- Pratihara Shashthi or Surya Shashthi(Chhat-Bihar)		
7	29					8- Trivandrum Arat(Kerala), Gopashtami Or Gosthashtami		
8	30					9- Jagaddhatri Puja, Akshaya Navami		
9	31					10- Martyrdom Day of Bhagat Kanwar Ram(Sindhi), Utthana or Deva Probodhani Ekadasi (Smarta)		
10	Nov. 1					11- Tulsi Vivaha, Utthana or Deva Probodhani Ekadasi (Vaishnava & Vidhava), Trisprisa Mahadvadasi		
11	2					12- Mars sets in the West (6 ^h 26 ^m .0)		
12	3					13- Vaikuntha Chaturdasi, Vaikuntha Chaturdasi (Prodosa), Rasayatra(Smarta), Ratha Yatra (Jain)		
13	4					14- Rasayatra(Vaishnava), Tripurotsava, Kartiki Purnima, Guru Nanak's Birtyhday, Pushkar Fair		
14	5			SAURAMARGASIRSHA	CHANDRAMARGASIRSHA	15- Sun enters Visakha nak. (14 ^h 52 ^m .4)	14- Full Moon (18 ^h 49 ^m .2)	
15	6							
16	7							
17	8							
18	9							
19	10							
20	11		20- Sayana Vaidhriti (17 ^h 56 ^m .7)					
21	12		21- Kalashtami,Prathamashtami (Odisha)					
22	13		23- Children's Day(Nehru's Birthday)					
23	14		24- Utpanna Ekadasi					
24	15		25- Kartika Puja					
25	16		26- Death Anniversary of Lala Lajpat Rai					
26	17		28- Sun enters Anuradha nak. (20 ^h 56 ^m .4)			29 - New moon (12 ^h 17 ^m .2)	29- Birthday celebration of Sri Prof Ram Panjwani(Sindhi)	
27	18							
28	19							
29	20							
30	Nov. 21							

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Moon enters : Vrischika 1,22h06.0m;Dhanus 4,10h46.8m;Makara 6,22h14.9m;Kumbha 9,6h48.5m;Mina 11,11h27.1m;

Mesha 13,12h34.6m;Vrissha 15,11h47.1m; Mithuna 17,11h14.6m;Karkata 19,13h 03.3m;Simha 21,18h35.6m;Kanya 23,

27h51.6m;Tula 26,15h35.1m;Vrischika 28,28h14.1m

Sun enters : Nir. Vrischika 25, 13h 37.6m

INDIAN CALENDAR

SAKA ERA 1947

Month of AGRAHAYANA (30 days)

Dhanus : Sahasya

Hemanta, 2nd Month

(Nirayana) 8 Agrahayana, 5126 Kali Era to (Nirayana) 7 Pausha, 5126 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
									No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
			h	m	h	m	h	m						
		2025 A.D.												
1	Sat	Nov. 22	6	18.7	11	46.1	17	13.5	S 2	17 11.9	18	16 47.1	7	11 29.7
2	Sun	23	6	19.4	11	46.4	17	13.4	3	19 25.3	19	19 28.0	8	12 08.6
3	Mon	24	6	20.1	11	46.7	17	13.3	4	21 22.7	20	21 53.8	9	12 36.8
4	Tue	25	6	20.7	11	47.0	17	13.2	S 5	22 57.5	21	23 57.8	10	12 49.8
5	Wed	26	6	21.4	11	47.3	17	13.1	6	24 02.5	22	25 33.0	11	12 42.4
6	Thu	27	6	22.1	11	47.6	17	13.1	7	24 30.5	23	26 32.2	12	12 09.3
7	Fri	28	6	22.8	11	48.0	17	13.1	8	24 15.9	24	26 49.7	13	11 05.4
8	Sat	29	6	23.5	11	48.3	17	13.1	9	23 15.5	25	26 22.6	14	9 27.0
9	Sun	30	6	24.2	11	48.7	17	13.2	S 10	21 29.6	26	25 10.9	15	7 12.3
10	Mon	Dec. 1	6	24.8	11	49.0	17	13.2	11	19 01.5	27	23 18.4	(16) 17	28 22.0)
11	Tue	2	6	25.5	11	49.4	17	13.3	12	15 57.5	1	20 51.7	18	21 08.3
12	Wed	3	6	26.2	11	49.8	17	13.4	13	12 26.3	2	18 00.0	19	16 57.3
13	Thu	4	6	26.9	11	50.2	17	13.6	14	8 38.1	3	14 54.3	20	12 34.2
14	Fri	5	6	27.5	11	50.6	17	13.7	(S15) K 1	28 44.1)	4	11 46.4	21	8 08.2
15	Sat	6	6	28.2	11	51.0	17	13.9	2	21 26.3	5	8 48.8	(22) 23	27 48.9)
16	Sun	7	6	28.8	11	51.4	17	14.1	3	18 25.5	7	28 11.9	24	20 07.5
17	Mon	8	6	29.5	11	51.9	17	14.4	4	16 03.9	8	26 52.9	25	17 01.5
18	Tue	9	6	30.1	11	52.3	17	14.6	K 5	14 29.5	9	26 23.0	26	14 33.3
19	Wed	10	6	30.8	11	52.8	17	14.9	6	13 47.1	10	26 44.6	27	12 46.2
20	Thu	11	6	31.4	11	53.2	17	15.2	7	13 57.6	11	27 55.8	1	11 40.1
21	Fri	12	6	32.0	11	53.7	17	15.5	8	14 57.3	12	29 50.4	2	11 12.1
22	Sat	13	6	32.6	11	54.2	17	15.8	9	16 38.5	13	— ———	3	11 16.4
23	Sun	14	6	33.2	11	54.6	17	16.2	K 10	18 50.2	13	8 18.6	4	11 45.3
24	Mon	15	6	33.8	11	55.1	17	16.6	11	21 20.5	14	11 08.8	5	12 30.2
25	Tue	16	6	34.4	11	55.6	17	17.0	12	23 57.8	15	14 09.7	6	13 23.0
26	Wed	17	6	35.0	11	56.1	17	17.4	13	26 33.1	16	17 11.5	7	14 16.7
27	Thu	18	6	35.5	11	56.6	17	17.8	14	28 59.7	17	20 07.0	8	15 05.8
28	Fri	19	6	36.0	11	57.1	17	18.3	K 30	— ———	18	22 51.4	9	15 46.8
29	Sat	20	6	36.6	11	57.6	17	18.8	K 30	7 13.3	19	25 21.8	10	16 17.3
30	Sun	21	6	37.1	11	58.1	17	19.3	S 1	9 11.5	20	27 36.2	11	16 35.7

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

SAKA ERA 1947

Month of AGRAHAYANA (30 days)

Ayanamsa on 1st : $24^{\circ} 13' 11''$

(Nirayana) 8 Agrahayana, 5126 Kali Era to (Nirayana) 7 Pausha, 5126 Kali Era

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun	Phenomena	Festivals
1	2025 A.D. Nov. 22	MARGASHIRSHA	ASHWIN	1- Sun enters trop. Sagittarius (7 ^h 05 ^m .5)	4- Sayana Vyatipata (9 ^h 36 ^m .2)	3- Guru Tegh Bahadur’s Martyrdom Day 5- Champa Shashthi (Maharastra), Mulakarupini Shashthi(Bengal), Subrahmanya Shashthi (S.India), Guha Shashthi 6- Mitra Saptami 10- Mauna Ekadasi(Jain), Mokshada Ekadasi, Gita Jayanti 11- Akhanda Dvadasi 12- Bharani Dipam, Krittika Dipam 13- Huthri-3Days(Coorg), Margi Purnima, Shri Datta Jayanti(Maharastra), Datta Treya Jayanti
2	23					
3	24					
4	25					
5	26					
6	27					
7	28					
8	29					
9	30					
10	Dec. 1					
11	2	SAURAMAAS	CHANDRA PAUSHA	11-Sun enters Jyeshtha nak. (25 ^h 14 ^m .7)	13- Full Moon (28 ^h 44 ^m .1) 14- Jupiter enters Nir. Mithuna (17 ^h 25 ^m .9) 16- Sayana Vaidhriti (7 ^h 11 ^m .7) 20- Venus sets in the East (24 ^h 08 ^m .0)	20- Ashtaka(Pupashtaka) 21- Vaikkatashtami (Kerala) 23- Birthday of Parsvanath(Jain) 24- Saphala Ekadasi
12	3					
13	4					
14	5					
15	6					
16	7					
17	8					
18	9					
19	10					
20	11					
21	12	SAURAMAAS	CHANDRA PAUSHA	23- Saura Paushadi (29 ^h 25 ^m .9) 24- Sun enters Mula nak.(28 ^h 20 ^m .1)	29- New Moon (7 ^h 13 ^m .3) 29- Sayana Vyatipata (13 ^h 00 ^m .9)	28- Vakula Amavasya(Odisha)
22	13					
23	14					
24	15					
25	16					
26	17					
27	18					
28	19					
29	20					
30	Dec. 21						CHANDRA PAUSHA	30- Sun enters trop. Capicron (20^{h} 33^{m}.0)

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.
Moon enters :- SDhanus 1,16h47.1m; Makara 3,28h27.1m; Kumbha 6,14h07.5m; Mina 8,20h33.6m; Mesha 10,23h18.4m; Vrisha 12,23h14.4m; Mithuna 14,22h15.6m; Karkata 16,22h38.7m; Simha 18,26h23.0m; Kanya 21,10h20.7m; Tula 23,21h41.7m; Vrischika 26,10h26.4m; Dhanus 28,22h51.4m Sun enters: Nir. Dhanus 24, 28h 20.1m

INDIAN CALENDAR

SAKA ERA 1947

Makara : Tapas

Month of PAUSHA (30 days)

Winter (Sisira), 1st Month

(Nirayana) 8 Pausha, 5126 Kali Era to (Nirayana) 7 Magha, 5126 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
									No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
			h	m	h	m	h	m						
		2025 A.D.												
1	Mon	Dec. 22	6	37.6	11	58.6	17	19.8	S 2	10 52.3	21	29 32.4	12	16 40.7
2	Tue	23	6	38.1	11	59.1	17	20.3	3	12 13.3	22	--- ----	13	16 30.3
3	Wed	24	6	38.5	11	59.6	17	20.8	4	13 11.6	22	7 07.8	14	16 02.3
4	Thu	25	6	39.0	12	00.1	17	21.4	S 5	13 43.2	23	8 18.6	15	15 13.6
5	Fri	26	6	39.4	12	00.6	17	22.0	6	13 44.0	24	9 00.6	16	14 01.0
6	Sat	27	6	39.8	12	01.0	17	22.5	7	13 10.3	25	9 09.8	17	12 21.6
7	Sun	28	6	40.2	12	01.5	17	23.1	8	11 59.9	26	8 43.5	18	10 13.5
8	Mon	29	6	40.6	12	02.0	17	23.7	9	10 12.9	27	7 41.1	19	7 36.3
9	Tue	30	6	40.9	12	02.5	17	24.3	S 10	7 51.6	(1 2	30 04.5) 27 58.5	(20 21	28 31.4) 25 02.0
10	Wed	31	6	41.3	12	03.0	17	25.0	(11 12	29 01.0) 25 48.4	3	25 30.1	22	21 13.5
11	Thu	2026 A.D. Jan 1	6	41.6	12	03.5	17	25.6	13	22 22.7	4	22 48.5	23	17 12.6
12	Fri	2	6	41.9	12	03.9	17	26.3	14	18 54.0	5	20 04.1	24	13 07.1
13	Sat	3	6	42.1	12	04.4	17	26.9	S 15	15 33.0	6	17 28.1	25	9 05.3
14	Sun	4	6	42.4	12	04.8	17	27.6	K 1	12 30.5	7	15 11.6	(26 27	29 16.0) 25 47.5
15	Mon	5	6	42.6	12	05.3	17	28.2	2	9 57.1	8	13 25.1	1	22 47.4
16	Tue	6	6	42.8	12	05.7	17	28.9	3	8 02.1	9	12 17.9	2	20 21.5
17	Wed	7	6	43.0	12	06.2	17	29.6	4	6 53.0	10	11 56.7	3	18 33.9
18	Thu	8	6	43.2	12	06.6	17	30.3	(K5 6	30 34.1) --- ----	11	12 24.6	4	17 25.9
19	Fri	9	6	43.3	12	07.0	17	31.0	6	7 05.9	12	13 40.9	5	16 55.7
20	Sat	10	6	43.4	12	07.4	17	31.7	7	8 24.2	13	15 40.0	6	16 58.5
21	Sun	11	6	43.5	12	07.8	17	32.4	8	10 20.6	14	18 12.3	7	17 27.1
22	Mon	12	6	43.6	12	08.2	17	33.1	9	12 43.2	15	21 05.5	8	18 12.3
23	Tue	13	6	43.6	12	08.6	17	33.8	K 10	15 18.4	16	24 06.7	9	19 04.8
24	Wed	14	6	43.7	12	09.0	17	34.5	11	17 53.2	17	27 03.9	10	19 55.8
25	Thu	15	6	43.7	12	09.3	17	35.3	12	20 17.0	18	29 47.9	11	20 38.1
26	Fri	16	6	43.7	12	09.7	17	36.0	13	22 22.1	19	--- ----	12	21 06.6
27	Sat	17	6	43.6	12	10.0	17	36.7	14	24 04.4	19	8 12.4	13	21 18.1
28	Sun	18	6	43.5	12	10.3	17	37.4	K 30	25 22.0	20	10 14.3	14	21 11.1
29	Mon	19	6	43.4	12	10.6	17	38.1	S 1	26 14.6	21	11 52.5	15	20 45.4
30	Tue	20	6	43.3	12	10.9	17	38.8	S 2	26 43.0	22	13 07.0	16	20 01.1

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

INDIAN CALENDAR

401

Uttarayana
Dakshina Gola

SAKA ERA 1947

Month of PAUSHA (30 days)

Ayanamsa on 1st : 24° 13' 17"

(Nirayana) 8 Pausha, 5126 Kali Era to (Nirayana) 7 Magha, 5126 Kali Era

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun	Phenomena	Festivals	
1	2025A.D. Dec.	A	A	7- Sun enters Purvashadha nak. (30 ^h 30 ^m .8)		1- Uttarayana Day	
2						23	
3						24	
4						25	4- Birthday of Sadhu T. L. Vaswani(Sindhi)
5						26	5- Jor Mela-3 days(Punjab)
6						27	6- Guru Gobind Singh’s Birthday
7						28	
8						29	9- Samba Dasami(Odisha), Vaikuntha Ekadasi(S.India)(Smarta), Putrada Ekadasi(Smarta)
9						30	10- Vaikuntha Ekadasi(S.India) (Vaishnava & Vidhava), Putrada Ekadasi(Vaishnava & Vidhava)
10						31	U	A
11	2026A.D. Jan.	A	P	21- Sun enters Uttarashadha nak.(8 ^h 36 ^m .2) 23- Saura Maghadi (16 ^h 12 ^m .8)	11- Sayana Vaidhriti (24 ^h 30 ^m .8) 13- Full Moon (15 ^h 33 ^m .0) 24- Sayana Vyatipata (16 ^h 36 ^m .0) 28- New Moon (25 ^h 22 ^m .0)		
12		2					
13		3	P			13- Paushi Purnima, Pushyabhisheka Yatra, Arudra Darsanam (Purvarunodaya) (S.India)	
14		4					
15		5	A			16- Ganesha Sankastha Chaturthi	
16		6					
17		7	A				
18		8	R				
19		9					
20		10	R			20- Birthday of Swami Vivekananda(According to tithi), Astaka (Mamsastaka)	
21	11	U	N	21- Sun enters Uttarashadha nak.(8 ^h 36 ^m .2)			
22	12						
23	13	A	A	23- Saura Maghadi (16 ^h 12 ^m .8)		23- Lohri (Punjab, Jammu & Kashmir), Bhogi(S.India)	
24	14	S	H			24- Sattila Ekadasi, Birthday of Sant Parmanand (Sindhi), Makara Samkranti(Bengal), Magha Bihu (Assam), Makara Samkranti(N. India), Pongal(S.India), Makara Snana, Tila Samkranti	
25	15	C				25- Tai Pongal(Kerala), Mattu Pongal or Kanumu (S.India)	
26	16	S A U R A M A G H A				26- Meru Trayodasi(Jain)	
27	17					27- Ratanti Kalika Puja	
28	18					28- Mauni Amavasya, Tai Amavasya, Makara Vavu (Kerala)	
29	19					29- Magha Sukladi	
30	Jan. 20	CHANDRA MAGHA		30- Sun Enters Trop.Aquarius (7 ^h 14 ^m .9)			

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.
Moon enters :- Makara 1,10h07.0m;Kumbha 3,19h46.6m;Mina 5,27h10.7m;Mesha 8,7h41.1m;Vrisha 10,9h23.1m;Mithuna 12,9h26.0m;Karkata 14,9h43.2m;Simha 16,12h17.9m;Kanya 18,18h39.4m;Tula 20,28h52.7m;Vrischika 23,17h21.3m;Dhanus 25,29h47.9m;Makara 28,16h41.1m;Kumbha 30,25h35.6m
Sun enters : Nir. Makara 24, 15h 07.3m

INDIAN CALENDAR

SAKA ERA 1947

Kumbha : Tapasya

Month of MAGHA (30 days)

Winter (Sisira), 2nd Month

(Nirayana) 8 Magha, 5126 Kali Era to (Nirayana) 7 Phalguna, 5126 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
									No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
			h	m	h	m	h	m						
		2026 A.D.												
1	Wed	Jan. 21	6	43.2	12	11.2	17	39.6	S 3	26 47.6	23	13 58.4	17	18 58.5
2	Thu	22	6	43.0	12	11.5	17	40.3	4	26 28.9	24	14 27.2	18	17 37.9
3	Fri	23	6	42.9	12	11.8	17	41.0	S 5	25 46.5	25	14 33.1	19	15 59.1
4	Sat	24	6	42.6	12	12.0	17	41.7	6	24 40.4	26	14 16.1	20	14 01.8
5	Sun	25	6	42.4	12	12.2	17	42.4	7	23 10.8	27	13 35.9	21	11 45.9
6	Mon	26	6	42.2	12	12.5	17	43.1	8	21 18.5	1	12 33.0	22	9 11.5
7	Tue	27	6	41.9	12	12.7	17	43.8	9	19 05.8	2	11 09.0	(23) 24	30 19.9
8	Wed	28	6	41.6	12	12.9	17	44.5	K 10	16 36.5	3	9 27.1	25	27 13.0
9	Thu	29	6	41.3	12	13.1	17	45.1	11	13 55.6	4	7 31.8	26	23 54.0
10	Fri	30	6	40.9	12	13.2	17	45.8	12	11 09.6	(5) 6	29 29.5	27	20 27.5
11	Sat	31	6	40.5	12	13.4	17	46.5	13	8 26.0	7	25 34.2	1	16 58.6
12	Sun	Feb. 1	6	40.2	12	13.5	17	47.2	(14) 15	29 53.1	8	23 58.2	3	13 33.5
13	Mon	2	6	39.7	12	13.6	17	47.8	S 15	27 39.3	9	22 48.0	4	10 18.7
14	Tue	3	6	39.3	12	13.7	17	48.5	K 1	25 52.8	10	22 10.9	5	7 20.8
15	Wed	4	6	38.9	12	13.8	17	49.1	2	24 41.2	11	22 13.0	(4) 28	26 39.2
16	Thu	5	6	38.4	12	13.9	17	49.8	3	24 10.1	12	22 57.5	6	25 04.8
17	Fri	6	6	37.9	12	14.0	17	50.4	4	24 22.8	13	22 24.1	7	24 04.3
18	Sat	7	6	37.4	12	14.1	17	51.0	K 5	25 19.1	14	26 28.6	8	23 37.4
19	Sun	8	6	36.9	12	14.1	17	51.6	6	26 54.8	15	29 02.9	9	23 40.7
20	Mon	9	6	36.3	12	14.1	17	52.2	7	29 01.6	16	--- ----	10	24 08.2
21	Tue	10	6	35.7	12	14.2	17	52.9	8	--- ----	17	7 55.4	11	24 52.0
22	Wed	11	6	35.2	12	14.2	17	53.5	9	7 27.7	18	10 53.0	12	25 42.4
23	Thu	12	6	34.6	12	14.2	17	54.0	10	9 59.2	19	13 42.5	13	26 30.0
24	Fri	13	6	33.9	12	14.1	17	54.6	K 11	12 22.6	20	16 12.9	14	27 06.0
25	Sat	14	6	33.3	12	14.1	17	55.2	12	14 26.4	21	18 16.4	15	27 23.5
26	Sun	15	6	32.6	12	14.1	17	55.8	13	16 02.1	22	19 48.4	16	27 17.9
27	Mon	16	6	32.0	12	14.0	17	56.3	14	17 05.3	23	20 47.9	17	26 46.9
28	Tue	17	6	31.3	12	14.0	17	56.9	15	17 34.5	24	21 16.2	18	25 50.1
29	Wed	18	6	30.6	12	13.9	17	57.4	K 30	17 31.1	25	21 16.3	19	24 28.8
30	Thu	19	6	29.9	12	13.8	17	58.0	S 1	16 58.0	26	20 52.0	20	22 45.3
									S 2	15 59.2	27	20 52.0	21	20 42.5

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

INDIAN CALENDAR

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Uttarayana
Dakshina Gola

SAKA ERA 1947

Month of MAGHA (30 days)

Ayanamsa on 1st : 24° 13' 23"

(Nirayana) 8 Magha, 5126 Kali Era to (Nirayana) 7 Phalguna, 5126 Kali Era

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun Date	Phenomena	Festivals
1	2026A.D. Jan. 21					1- Martyrdom day of Hemu Kalani (Sindhi)
2	22	A				2- Tila Chaturthi, Kunda Chaturthi, Varada Chaturthi, Ganesha Puja (Bengal)
3	23	H	A			3- Sri Panchami, Saraswati Puja, Vasanta Panchami, Netaji's Birthday
4	24	H		4- Sun enters Sravana nak. (10 ^h 50 ^m .4)		5- Ratha Saptami (Purvarunodaya), Vidhana Saptami, Arogya Saptami
5	25	G	H			6- Republic Day, Bhismashtami
6	26	A	G			8- Birthday of Lala Lajpat Rai
7	27				7- Sayana Vaidhriti (13 ^h 59 ^m .2)	9- Jaya Ekadasi, Bhaimi Ekadasi (Bengal)
8	28	M	A			10- Martyr's day (Mahatma Gandhi Commemoration Day), Desert Festival-3 days (Jaisalmer), Bhisma Dvadasi
9	29					12- Full Moon (27 ^h 39 ^m .3)
10	30		M			12- Venus rises in the West (18 ^h 05 ^m .0)
11	31					17- Sun enters Dhanistha nak. (14 ^h 05 ^m .1)
12	Feb. 1	A	A			19- Sayana Vyatipata (20 ^h 52 ^m .8)
13	2					20- Astaka (Sakashtaka), Janaki Janma
14	3	R	R			23- Birthday of Swami Dayananda Saraswati (Founder of Arya Samaj)
15	4		A			24- Vijaya Ekadasi
16	5	U				25- Maha Shivaratri (Kashmir)
17	6					26- Maha Shivaratri, Shivaratri (S.India)
18	7	A	D			28- New Moon (17 ^h 31 ^m .1)
19	8					28- Annular solar eclipse (Not visible in India)
20	9	S	N			30- Birthday of Sri Ramakrishna Paramahansa Deva, Shivaji Jayanti
21	10		A			
22	11			22- Saura Phalgunadi (29 ^h 02 ^m .4)		
23	12					
24	13					
25	14					
26	15					
27	16					
28	17					
29	18					
30	Feb. 19					

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Moon enters :- Mina 3, 8h33.8m; Mesha 5, 13h35.9m; Vrisha 7, 16h45.0m; Mithuna 9, 18h31.1m; Karkata 11, 20h01.3m; Simha 13, 22h48.0m; Kanya 15, 28h20.1m; Tula 18, 13h22.0m; Vrishika 20, 25h11.3m; Dhanus 23, 13h42.5m; Makara 25, 24h42.4m; Kumbha 28, 9h05.8m; Mina 30, 15h00.1m

Sun enters : Nir. Kumbha 23, 28h 09.0m

INDIAN CALENDAR

SAKA ERA 1947

Mina : Madhu

Month of PHALGUNA (30 days)

Spring (Vasanta), 1st Month

(Nirayana) 8 Phalguna, 5126 Kali Era to (Nirayana) 7 Chaitra, 5126 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
									No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
			h	m	h	m	h	m						
		2026 A.D.												
1	Fri	Feb. 20	6	29.1	12	13.7	17	58.5	S 3	14 38.9	26	20 07.6	22	18 23.4
2	Sat	21	6	28.4	12	13.6	17	59.0	4	13 01.3	27	19 07.2	23	15 51.2
3	Sun	22	6	27.6	12	13.5	17	59.5	S 5	11 10.4	1	17 54.8	24	13 08.8
4	Mon	23	6	26.8	12	13.3	18	00.1	6	9 09.8	2	16 33.7	25	10 18.8
5	Tue	24	6	26.1	12	13.2	18	00.6	7	7 02.6	3	15 07.4	26	7 23.9
									(8	28 52.1)			(27	28 26.4)
6	Wed	25	6	25.3	12	13.0	18	01.0	9	26 41.4	4	13 38.9	1	25 28.7
7	Thu	26	6	24.4	12	12.9	18	01.5	S 10	24 33.9	5	12 11.6	2	22 33.6
8	Fri	27	6	23.6	12	12.7	18	02.0	11	22 33.3	6	10 49.0	3	19 43.7
9	Sat	28	6	22.8	12	12.5	18	02.5	12	20 43.7	7	9 35.2	4	17 02.4
10	Sun	Mar. 1	6	21.9	12	12.3	18	03.0	13	19 09.7	8	8 34.5	5	14 33.0
11	Mon	2	6	21.1	12	12.1	18	03.4	14	17 56.2	9	7 51.7	6	12 19.2
12	Tue	3	6	20.2	12	11.9	18	03.9	S 15	17 07.9	10	7 31.7	7	10 24.6
13	Wed	4	6	19.3	12	11.7	18	04.3	K 1	16 49.4	11	7 39.1	8	8 52.6
14	Thu	5	6	18.4	12	11.5	18	04.8	2	17 04.2	12	8 17.8	9	7 45.7
15	Fri	6	6	17.5	12	11.3	18	05.2	3	17 53.9	13	9 30.1	10	7 05.7
16	Sat	7	6	16.6	12	11.0	18	05.6	4	19 17.8	14	11 15.8	11	6 52.5
17	Sun	8	6	15.7	12	10.8	18	06.0	K 5	21 11.6	15	13 31.9	12	7 04.0
18	Mon	9	6	14.8	12	10.5	18	06.5	6	23 27.6	16	16 11.7	13	7 35.8
19	Tue	10	6	13.9	12	10.3	18	06.9	7	25 54.8	17	19 05.3	14	8 21.4
20	Wed	11	6	12.9	12	10.0	18	07.3	8	28 19.9	18	22 00.4	15	9 12.2
21	Thu	12	6	12.0	12	09.8	18	07.7	9	— ———	19	24 43.8	16	9 58.8
22	Fri	13	6	11.1	12	09.5	18	08.1	9	6 29.5	20	27 03.2	17	10 31.7
23	Sat	14	6	10.1	12	09.2	18	08.5	K 10	8 11.4	21	28 49.4	18	10 42.6
24	Sun	15	6	09.2	12	08.9	18	08.9	11	9 17.0	22	29 56.3	19	10 25.5
25	Mon	16	6	08.2	12	08.7	18	09.3	12	9 41.3	23	— ———	20	9 36.7
26	Tue	17	6	07.2	12	08.4	18	09.7	13	9 23.4	23	6 22.4	21	8 15.2
27	Wed	18	6	06.3	12	08.1	18	10.1	14	8 25.9	24	6 09.2	22	6 22.3
											(25	29 21.3)	(23	28 01.3)
28	Thu	19	6	05.3	12	07.8	18	10.5	K 30	6 53.4	26	28 05.0	24	25 17.0
									(S 1	28 52.8)				
29	Fri	20	6	04.3	12	07.5	18	10.9	2	26 31.3	27	26 27.9	25	22 14.9
30	Sat	21	6	03.4	12	07.2	18	11.2	S 3	23 56.9	1	24 37.9	26	19 01.2

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Aslesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

INDIAN CALENDAR

405

Uttarayana
Dakshina Gola

SAKA ERA 1947

Month of PHALGUNA (30 days)

Ayanamsa on 1st : 24° 13' 27"

(Nirayana) 8 Phalguna, 5126 Kali Era to (Nirayana) 7 Chaitra, 5126 Kali Era

Date	Gregorian Date	Solar Month	Lunar Month	Transit of the Sun Date	Phenomena	Festivals
1	2026 A.D. Feb. 20	P H A L G U N A	N A		2- Sayana Vaidhriti (23 ^h 39 ^m .1)	5- Holastaka
2	21					
3	22					
4	23					
5	24					
6	25					
7	26					
8	27					
9	28					
10	Mar. 1					
11	2					
12	3					
13	4	S A U R A	P H A L G U N A	13- Sun enters Purva Bhadrapada nak. (24 ^h 54 ^m .1)	12- Full Moon (17 ^h 07 ^m .9) 12- Total Lunar Eclipse (Visible in India)	12- Holikadahana, Dolayatra, Birthday of Sri Chaitanya, Masi Magham 13- Holi, Hola, Vasantatsava
14	5					
15	6					
16	7					
17	8					
18	9					
19	10					
20	11					
21	12					
22	13					
23	14					
24	15					
25	16	S A U R A C H A I T R A	C H A N D R A C H A I T R A	22- Saura Chaitradi (25 ^h 35 ^m .3)	14- Sayana Vyatipata (27 ^h 58 ^m .1) 28- New Moon (6 ^h 53 ^m .4) 28- Sayana Vaidhriti (11 ^h 48 ^m .4)	24- Papamochini Ekadasi 26- Varuni (Trayodasi upto 9 ^h 23 ^m .4, Satabhisaj starts from 6 ^h 22 ^m .4), Madhu Krishna Trayodasi 28- Cheti Chand (Sindhi New Year's day), Chaitra Sukladi (Gudi Padava, Ugadi), Vasanta Navaratrambha (or Sthapana Navaratrambha), Telugu New year's day 29- Mahavisuva Day 30- Gauri Tritiya (Gangaur), Andolana Tritiya, Sarhul (Bihar), Indian year ending day
26	17					
27	18					
28	19					
29	20					
30	Mar. 21					

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.
Moon enters :- Mesha 2, 19h 07.2m; Vrisha 4, 22h 12.5m; Mithuna 6, 24h 54.9m; Karkata 8, 27h 52.6m; Simha 11, 7h 51.7m;
Kanya 13, 13h 45.8m; Tula 15, 22h 18.9m; Vrischika 18, 9h 30.0m; Dhanus 20, 22h 00.4m; Makara 23, 9h 33.2m; Kumbha 25,
18h 14.4m; Mina 27, 23h 36.2m; Mesha 29, 26h 27.9m
Sun enters : Nir. Mina 23, 25h 03.1m

PRINCIPAL FESTIVALS AND ANNIVERSARIES FOR HOLIDAYS (2025-26 A.D.)

Festivals	Criterion	Date
<u>1946 S.E./ 5125 K.E./ 2025 A.D.</u>		
62. Guru Gobind Singh's Birthday	Pausha S7	Pausha 16/Pausha 23/Jan 6
63. Vaikuntha Ekadasi (S.India)	S11 of Saura Pausha	Pausha 20/Pausha 27/Jan 10
64. Bhogi (S.India)	Day before Pongal	Pausha 23/Pausha 30/Jan 13
65. Makara Samkranti (Bengal)	The Day of Saura Maghadi	Pausha 24/ Magha1/Jan 14
Magha Bihu (Assam)	The Day of Saura Maghadi	Pausha 24/ Magha1/Jan 14
Makara Snana, Tila Samkranti,	The Day of Saura Maghadi	Pausha 24/ Magha1/Jan 14
Pongal (S.India),	The Day of Saura Maghadi	Pausha 24/ Magha1/Jan 14
Tai Pongal (Kerala)	The Day of Saura Maghadi (18 Ghatika rule)	Pausha 24/ Magha1/Jan 14
66. Mattu Pongal or Kanumu	The Day after Pongal	Pausha 25/Magha 2/Jan 15
67. Netaji's Birthday	Fixed	Magha 3/Magha 10/Jan 23
68. Republic Day	Fixed	Magha 6/Magha 13/Jan 26
69. Sri Panchami, Vasanta Panchami	Magha S5	Magha 13/Magha 20/Feb 2
70. Guru Ravi Das's Birthday	Magha S15	Magha 23/Magha 30/Feb 12
71. Shivaji Jayanti	Fixed	Magha 30/Phalguna 7/Feb 19
72. Birthday of Swami Dayananda Saraswati (Founder of Arya Samaj)	Phalguna K10 (Purnimanta)	Phalguna 4/ Phalguna 11/Feb 23
73. Maha Shivaratri	Magha K14	Phalguna 7/ Phalguna 14/Feb 26
74. Holikadahana	Phalguna S15(Night)	Phalguna 22/ Phalguna 29/Mar 13
75. Holi,	Day after Holikadahana	Phalguna 23/ Phalguna 30/Mar 14
Dolayatra	Phalguna S15	Phalguna 23/ Phalguna 30/Mar 14
76. Holi, Vasantatsava	Phalguna K1	Phalguna 24/ Chaitra 1/Mar 15
77. Mahavisuva Day	Day of Sun's entry into Trop. Aries (Midnight rule)	Phalguna 29/Chaitra 6/Mar 20
<u>1947 S.E./ 5125 K.E./ 2025 A.D.</u>		
1. Indian New Year's Day	Fixed	Chaitra 1/Chaitra 8/ March 22
2. Chaitra Sukladi(GudiPadava,Ugadi), Cheti Chand (Sindhi New Year's Day),Telugu New Year's Day, Vasanta Navaratrarambha	Chaitra S1 Chaitra S1 Chaitra S1 Chaitra S1	Chaitra 9/Chaitra 16/ March 30 Chaitra 9/Chaitra 16/ March 30 Chaitra 9/Chaitra 16/ March 30 Chaitra 9/Chaitra 16/ March 30
3. Sarhul (Bihar)	Chaitra S3	Chaitra 10/Chaitra 17/ March 31
4. Vasanti Pujarambha	Chaitra S7	Chaitra 14/Chaitra 21/ Apr 4
5. Oli Begins (Jain)	Eight days before Oli ends	Chaitra 15/Chaitra 22/ Apr 5
6. Rama Navami	Chaitra S9	Chaitra 16/Chaitra 23/ Apr 6
7. Mahavira Jayanti	Chaitra S13	Chaitra 20/Chaitra 27/ Apr 10
8. Vaisakhi(Punjab,Hariyana,H.P. Delhi & Odisha),Visu(Kerala), Oli Ends(Jain)	SauraVaisakhadi (Sunrise Rule) SauraVaisakhadi (Sunrise Rule) Chaitra S15(Udayavyapini)	Chaitra 23/Chaitra 30/ Apr 13 Chaitra 23/Chaitra 30/ Apr 13 Chaitra 23/Chaitra 30/ Apr 13
<u>1947 S.E./ 5126 K.E./ 2025 A.D.</u>		
9. Chaitra Samkranti, Chadak Puja (Bengal), Cheiraoba(Manipur), Meshadi (T.N), Tamil New Year's Day, Dr.B.R.Ambedkar Jayanti, Beginning of 5126 K.E.	SauraVaisakhadi (Midnight Rule) SauraVaisakhadi (Midnight Rule) SauraVaisakhadi (Sunset Rule) Fixed	Chaitra 24/Vaisakha 1/ Apr 14 Chaitra 24/ Vaisakha 1/ Apr 14 Chaitra 24/ Vaisakha 1/ Apr 14 Chaitra 24/ Vaisakha 1/ Apr 14
10. Vaisakhadi (Bengal),Bhag Bihu (Assam), Shilhenba (Manipur),	Day following SauraVaisakhadi (Midnight Rule)	Chaitra 25 / Vaisakha 2 / Apr 15 Chaitra 25 / Vaisakha 2 / Apr 15 Chaitra 25 / Vaisakha 2 / Apr 15
11. Babu Kuer Singh Day(Bihar)	Fixed	Vaisakha 3/ Vaisakha 10/ Apr 23
12. Tithi of Deva Damodara (Assam)	S1 of Saura Vaisakha	Vaisakha 8/ Vaisakha 15/ Apr 28
13. Akshaya Tritiya	Vaisakha S3	Vaisakha 10/ Vaisakha 17/ Apr 30
14. May Day	Fixed	Vaisakha 11/ Vaisakha 18/ May 1
15. Birthday of Rabindranath Tagore	25 Vaisakha of Beng. Calendar	Vaisakha 19/ Vaisakha 26/ May 9
16. Buddha Purnima	Vaisakha S15	Vaisakha 22/ Vaisakha 29/ May 12
17. Pratap Jayanti (Rajasthan)	Jyaishtha S3	Jyaishtha 8/ Jyaishtha 15/ May 29
18. Guru Arjan Dev's Martyrdom Day	Jyaishtha S4	Jyaishtha 9/ Jyaishtha 16/ May 30
19. Rajas Samkranti (Odisha)	Saura Ashadhadi (Sunrise rule)	Jyaishtha 25/ Ashadha 1/ June 15
20. Rathayatra	Ashadha S2	Ashadha 6/ Ashadha 13/ June 27
21. Kharchi Puja (Tripura)	Ashadha S8	Ashadha 12/ Ashadha 19/ July 3
22. Ultaratha (Odisha),Bahudha Yatra Punaryatra	9 th day from Rathayatra Ashadha S10	Ashadha 14/ Ashadha 21/July 5 Ashadha 14/ Ashadha 21/July 5

PRINCIPAL FESTIVALS AND ANNIVERSARIES FOR HOLIDAYS

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Festivals	Criterion	Date
<u>1947 S.E./ 5126 K.E./ 2025 A.D</u>		
23. Ker Puja (Tripura)	First Tuesday or Saturday after 14 days from Kharchi Puja not falling on K10	Ashadha 31/ Sravana 7/July 22
24. Karkataka Vavu (Kerala)	K30 of Saura Sravana	Sravana 2/ Sravana 9/July 24
25. Tilak Commemoration Day	Fixed	Sravana 10/ Sravana 17/Aug 1
26. Jhulana Yatrarambha	Sravana S11	Sravana 13/ Sravana 20/Aug 4
27. Naroli Purnima	Sravana S15 (Aparahna&Sayahna)	Sarvana 17/ Sravana 24/Aug 8
28. Rik Upakarma	Sravana Nak. of Chandra Sravana	Sarvana 18/ Sravana 25/Aug 9
Raksha Bandhan	Sravana S15 (Pradosa)	Sarvana 18/ Sravana 25/Aug 9
Avani Avittam (S.India)	Sravana S15	Sarvana 18/ Sravana 25/Aug 9
Solono (Rakhi Bandhan)	Sravana S15(Udayavyapini)	Sarvana 18/ Sravana 25/Aug 9
Jhulana Yatra Samapanna	Sravana S15 (Purvahna)	Sarvana 18/ Sravana 25/Aug 9
29. Independence Day	Fixed	Sarvana 24/ Sravana 31/Aug 15
Janmashtami (Smarta)	Sravana K8	Sarvana 24/ Sravana 31/Aug 15
30. Janmashtami (Vaishnava)	Sravana K8	Sarvana 25/ Bhadra 1/Aug 16
Gokulashtami (Nandotsava)	Day after Janmashtami	Sarvana 25/ Bhadra 1/Aug 16
31. Paryusana Parvarambha(Chaturthi Paksha-Jain)	7 Days before Samvatsari (Chaturthi Paksha)	Sravana 29/ Bhadra 5/Aug 20
ParyusanaParvarambha (Panchami Paksha-Jain)	7 Days before Samvatsari (Panchami Paksha)	Sravana 29/ Bhadra 5/Aug 20
32. Jain Festival	Sravana K30 (Udayavyapini)	Bhadra 1/ Bhadra 8/Aug 23
33. Tithi of Sri Sankara Deva(Assam)	S2 of Saura Bhadra	Bhadra 3/ Bhadra 10/Aug 25
34. Vinayak Chaturthi (Tamilnadu)	S4 of Saura Bhadra	Bhadra 5/ Bhadra 12/Aug 27
Ganesha Chaturthi	Bhadra S4	Bhadra 5/ Bhadra 12/Aug 27
Samvatsari (Chaturthi Paksha-Jain)	Bhadra S4 (Udayavyapini)	Bhadra 5/ Bhadra 12/Aug 27
Samvatsari (Panchami Paksha-Jain)	Bhadra S5 (Current at Sunset)	Bhadra 5/ Bhadra 12/Aug 27
35. Radhashtami	Bhadra S8	Bhadra 9/ Bhadra 16/Aug 31
36. First Onam Day	Day before Thiru Onam Day	Bhadra 13/ Bhadra 20/Sep 4
37. Onam or Thiru Onam Day	Sravana Nak. of Saura Bhadra	Bhadra 14/ Bhadra 21/Sep 5
38. Third Onam Day	Day after Thiru Onam Day	Bhadra 15/ Bhadra 22/Sep 6
Ananta Chaturdasi	Bhadra S14	Bhadra 15/ Bhadra 22/Sep 6
39. Fourth Onam Day	Two Days after Thiru Onam Day	Bhadra 16/ Bhadra 23/Sep 7
40. Tithi of Sri Madhava Deva (Assam)	K5 of Saura Bhadra	Bhadra 20/ Bhadra 27/Sep 11
41. Sri Jayanti (Ramanuja)	Rohini Nakshatra of Saura Bhadra	Bhadra 23/ Bhadra 30/Sep 14
42. Samadhi Day of Narayana Guru (Kerala)	Fixed	Bhadra 30/ Asvina 6/Sep 21
Mahalaya Amavasya, Sarvapitri Amavasya, Tarpana Layba(Manipur)	Bhadra K30	Bhadra 30/ Asvina 6/Sep 21
43. Saradiya Navaratrarambha	Asvina S1	Bhadra 31/ Asvina 7/Sep 22
44. Oli Begins (Jain)	Eight Days before Oli Ends	Asvina 7/Asvina 14/Sep 29
Durga Puja Begins (Saptami)	Asvina S7	Asvina 7/Asvina 14/Sep 29
45. Durga Puja (Mahashtami)	Asvina S8	Asvina 8/Asvina 15/Sep 30
46. Durga Puja (Mahanavami)	Asvina S9	Asvina 9/Asvina 16/Oct 1
Ayudha Puja	Day before Dussehara	Asvina 9/Asvina 16/Oct 1
47. Mahatma Gandhi's Birthday	Fixed	Asvina 10/Asvina 17/Oct 2
Vijaya Dasami (Dussehara or Dasahara)	Asvina S10 (Aparahna)	Asvina 10/Asvina 17/Oct 2
Vijaya Dasami (Bengal & Kerala)	Asvina S10 (Purvahna)	Asvina 10/Asvina 17/Oct 2
48. Kumara Purnima (Odisha)	Asvina S15 (Pradosa)	Asvina 14/Asvina 21/Oct 6
Kojagori Lakshmi Puja (Bengal)	Asvina S15 (Pradosa)	Asvina 14/Asvina 21/Oct 6
49. Maharshi Valmiki's Birthday, Oli Ends (Jain)	Asvina S15(Udayavyapini)	Asvina 15/Asvina 22/Oct 7
50. Kaveri Samkramana Snana	Asvina S15 (Udayavyapini)	Asvina 15/Asvina 22/Oct 7
51. Naraka Chaturdasi(Purvarunodaya), Hanumajjanma, Dipavali (S.India), Kali Puja, Dipavali	Saura Kartikadi (Midnight Rule)	Asvina 25/Kartika 2/Oct 17
	AsvinaK14(Purvarunodaya)	Asvina 28/Kartika 5/Oct 20
	AsvinaK14(Udayavyapini)	Asvina 28/Kartika 5/Oct 20
	Asvina K14	Asvina 28/Kartika 5/Oct 20
	Asvina K30	Asvina 28/Kartika 5/Oct 20
52. Govardhana Puja	KartikaS1	Asvina 30/Kartika 7/Oct 22
Bali Puja	KartikaS1	Asvina 30/Kartika 7/Oct 22
Kartika Sukladi	KartikaS1	Asvina 30/Kartika 7/Oct 22

PRINCIPAL FESTIVALS AND ANNIVERSARIES FOR HOLIDAYS

Festivals		Criterion	National / Nirayana / Gregorian 1947 S.E./ 5126 K.E./ 2025 A.D.
54.	Bhratri Dvitiya, Tikka Ceremony, Bhai Du	Kartika S2 (Aparahna)	Kartika 1/Kartika 8/Oct 23
	Dwat Puja (Bihar)	Kartika S2 (Purvahna)	Kartika 1/Kartika 8/Oct 23
55.	Pratihara Shashthi or Surya Shashthi (Chhat - Bihar)	Kartika S6	Kartika 6/Kartika 13/Oct 28
56.	Jagaddhatri Puja	Kartika S9	Kartika 9/Kartika 16/Oct 31
57.	Rathayatra (Jain)	Kartika S15 (Udayavyapini)	Kartika 13/ Kartika 20/ Nov 4
	Rasayatra	Kartika S15	Kartika 13/ Kartika 20/ Nov 4
58.	Kartiki Purnima, Guru Nanak's Birthday, Puskar Fair	Kartika S15 Kartika S15 (Udayavyapini) Kartika S15	Kartika 14/ Kartika 21/ Nov 5 Kartika 14/ Kartika 21/ Nov 5 Kartika 14/ Kartika 21/ Nov 5
59.	Prathamashstami (Odisha)	Kartika K8	Kartika 21/Kartika 28/Nov 12
60.	Guru Tegh Bahadur's Martyrdom Day	Fixed	Agrahayana 3/Agrahayana10/Nov24
61.	Huthri-3 Days (Coorg)	S15 to K2 of Saura Margasirsha	Agrahayana13/Agrahayana20/Dec 4
62.	Jor Mela-3 Days (Punjab)	Fixed	Pausha 5/Pausha 12/Dec 26
63.	Guru Gobind Singh's Birthday	Pausha S7	Pausha 6/Pausha 13/Dec 27
64.	Vaikuntha Ekadasi (S.India)	S11 of Saura Pausha	Pausha 9/Pausha 16/Dec 30
			1947 S.E/ 5126 K.E./ 2026 A.D.
65.	Bhogi (S.India)	Day before Pongal	Pausha 23/Pausha 30/Jan 13
66.	Makara Samkranti (Bengal)	The Day of Saura Maghadi	Pausha 24/ Magha1/Jan 14
	Magha Bihu (Assam)	The Day of Saura Maghadi	Pausha 24/ Magha1/Jan 14
	Makara Snana, Tila Samkranti, Pongal (S.India)	The Day of Saura Maghadi	Pausha 24/ Magha1/Jan 14
67.	Tai Pongal (Kerala)	The Day of Saura Maghadi (18 Ghatika rule)	Pausha 24/ Magha1/Jan 14
	Mattu Pongal or Kanumu	The Day after Pongal	Pausha 25/Magha 2/Jan 15
68.	Netaji's Birthday	Fixed	Magha 3/Magha10/Jan 23
	Sri Panchami, Vasanta Panchami	Magha S5	Magha 3/Magha10/Jan 23
69.	Republic Day	Fixed	Magha 6/Magha13/Jan 26
70.	Guru Ravi Das's Birthday	Magha S15	Magha 12/Magha 19/Feb 1
71.	Birthday of Swami Dayananda Saraswati (Founder of Arya Samaj)	Phalguna K10 (Purnimanta)	Magha 23/Magha 30/Feb 12
72.	Maha Shivaratri	Magha K14	Magha 26/ Phalguna 3/Feb 15
73.	Shivaji Jayanti	Fixed	Magha 30/Phalguna 7/Feb 19
74.	Holikadahana	Phalguna S15(Night)	Phalguna 12/ Phalguna 19/Mar 3
	Dolayatra	Phalguna S15	Phalguna 12/ Phalguna 19/Mar 3
75.	Holi, Hola, Vasantatsava	Day after Holikadahana Phalguna K1	Phalguna 13/ Phalguna 20/Mar 4 Phalguna 13/ Phalguna 20/Mar 4
76.	Chaitra Sukladi (Gudi Padava, Ugadi), Cheti Chand (Sindhi New Year's Day), Telugu New Year's Day, Vasanta Navaratnarambha	Chaitra S1 Chaitra S1 Chaitra S1 Chaitra S1	Phalguna 28/Chaitra 5/Mar 19 Phalguna 28/Chaitra 5/Mar 19 Phalguna 28/Chaitra 5/Mar 19 Phalguna 28/Chaitra 5/Mar 19
77.	Mahavisuva Day	Day of Sun's entry into Trop. Aries (Midnight rule)	Phalguna 29/Chaitra 6/Mar 20
78.	Sarhul (Bihar)	Chaitra S3	Phalguna 30/Chaitra 7/Mar 21

Special Festivals for Jammu and Kashmir (2025-2026 A.D.)

Festivals		Criterion	National / Nirayana / Gregorian
7.	Lohri	Day before Saura Maghadi (Sunrise Rule)	Saka 1946/ Kali 5125/ 2025 A.D. Pausha 23/ Pausha 30/ Jan 13
1.	Mela Bahu Fort	Chaitra S 8	Saka 1947/ Kali 5125/ 2025 A.D. Chaitra 15/ Chaitra 22/ Apr 5
2.	Mela Kshir Bhawani	Jyaishtha S 8	Saka 1947/ Kali 5126/ 2025 A.D. Jyaishtha 13/ Jyaishtha 20/ June 3
3.	Guru Hargobind's Birthday	Jyaishtha K 1	Jyaishtha 22/ Jyaishtha 29/ June 12
4.	Martyr's Day	Fixed	Ashadha 22/ Ashadha 29/ July 13
5.	Kailas Yatra-2days	Sravana K 13 & K 14	Sravana 30/ Bhadra 06/ Aug 21
6.	Mela Pat -3days	Bhadra S 5 to S 7	Bhadra 6/ Bhadra 13/ Aug 28
7.	Lohri	Day before Saura Maghadi (Sunrise Rule)	Saka 1947/ Kali 5126/ 2026 A.D. Pausha 23/ Pausha 30/ Jan 13
8.	Mela Bahu Fort	Chaitra S 8	Saka 1948/ Kali 5126/ 2026 A.D. Chaitra 5/ Chaitra 12/ Mar 26

Festivals		Criterion	National/Nirayana/Gregorian
			<u>Saka 1947/Kali 5125/2025 A.D.</u>
1.	Shahadat-e-Hazrat Ali	21 Ramadan	Chaitra 1/Chaitra 8/Mar 22
2.	Jumatul Vida	Last Friday of Ramadan	Chaitra 7/Chaitra 14/Mar 28
3.	Sab-e-Qadr*	27 Ramadan	Chaitra 7/Chaitra 14/Mar 28
4.	Id-ul-Fitr	1 Shawwal	Chaitra 10/Chaitra 17/Mar 31
			<u>Saka 1947/ Kali 5126/ 2025 A.D.</u>
5.	Id-uz-Zuha (Bakrid)	10 Zulhijja	Jyaishtha 17/Jyaishtha 24/June 7
6.	Muharram	10 Muharram	Ashadha 15/Ashadha 22/July 6
7.	Chelhum	Fortieth Day from (39 days after) 10 Muharram	Sravana 23/ Sravana 30/Aug 14
8.	Akheri Chahar Shumba	Last Wednesday of Safar	Sravana 29/ Bhadra 5/Aug 20
9.	Shahadat-e-Iman Hasan	28 Safar	Bhadra 1/ Bhadra 8/Aug 23
10.	Milad-un-Nabi or Id-e-Milad (Birthday of Prophet), Fateha Dwaz Daham or Bara Wafat	12 Rabiul'lawwal	Bhadra 14/ Bhadra 21/Sep 5
11.	Id-e-Maulad	17 Rabiul'lawwal	Bhadra 19/ Bhadra 26/Sep 10
12.	Fateha Yazdaham (Giarhween Sharif)	11 Rabiul'ssani	Asvina 12/ Asvina 19/Oct 4
			<u>Saka 1947/ Kali 5126/ 2026 A.D.</u>
13.	Hazrat Ali's Birthday	13 Rajab	Pausha 13/ Pausha 20/Jan 3
14.	Sab-e-Miraj*	27 Rajab	Pausha 27/ Magha 4/Jan 17
15.	Sab-e-Barat*	15 Shaban	Magha 15/ Magha 22/Feb 4
16.	First Day of Ramadan	1 Ramadan	Magha 30/ Phalguna 7/Feb 19
			<u>Saka 1947/ Kali 5126/ 2026 A.D.</u>
1.	Shahadat-e-Hazrat Ali	21 Ramadan	Phalguna 20/ Phalguna 27/Mar 11
2.	Sab-e-Qadr*	27 Ramadan	Phalguna 26/ Chaitra 3/Mar 17
3.	Jumatul Vida	Last Friday of Ramadan	Phalguna 29/ Chaitra 6/Mar 20
4.	Id-ul-Fitr	1 Shawwal	Phalguna 30/ Chaitra 7/Mar 21

*The festival is observed in the preceeding night

The Islamic Calendar (2025-26 A.D.)(Hejira: 1446-1447 A.H.)

The beginning dates of the different months of the Islamic Calendar for the year 2025-26 A.D. determined on the basis of the first visibility of the lunar crescent after the New-Moon day calculated for the Central Station of India are as follows:-

Rajab	1446 A.H.	Jan. 02	2025 A.D (29)	Rabiul'awwal	1447 A.H.	Aug. 25	2025 A.D. (30)
Shaban	"	Jan. 31	" (30)	Rabiul'sani	"	Sept. 24	" (30)
Ramadan	"	Mar. 12	" (29)	Jumadu'l awwal	"	Oct. 24	" (30)
Shawwal	"	Mar. 31	" (30)	Jumadu'sani	"	Nov. 23	" (29)
Zu'lqada	"	April 30	" (29)	Rajab	"	Dec. 22	" (30)
Zulhijja	"	May 29	" (29)	Shaban	"	Jan. 21	2026 A.D. (29)
MUHARRAM	1447 A.H.	July 27	" (30)	Ramadan	"	Feb. 19	" (30)
Safar	"	July 27	" (29)	Shawwal	"	Mar. 21	" (30)

N.B.-Actually the months begin from sunset of the preceding day when the Moon becomes first visible.

Fixed Calendar

According to the Fixed Calendar the beginning dates of different months are as follows : Jan. 1 (2025 A.D.), Jan. 31, Mar. 1, Mar. 31, Apr. 29, May 29, June 27, July 27, Aug. 25, Sept. 24, Oct. 23, Nov. 22, Dec. 21, Jan. 20 (2026 A.D.) Feb. 18, Mar. 20.

THE PARSI (SHAHENSHAH) CALENDAR, 2025 - 2026 A.D.

(As used by the Indian Parsis)

Yazdejardi Era : 1394 - 1395

The beginning dates of different months of the Parsi Shahenshahi Calendar are as follows :

As regards the Parsi Kadmi Calendar, the months are the same but they begin 30 days earlier.

Shahrivar	1394	Jan. 12	2025 A.D	(30)	Ardibehesht	1395	Sept. 14	2025 A.D	(30)
Meher	"	Feb. 11	"	(30)	Khordad	"	Oct. 14	"	(30)
Avan	"	Mar. 13	"	(30)	Tir	"	Nov. 13	"	(30)
Adar	"	Apr. 12	"	(30)	Amardad	"	Dec. 13	"	(30)
Dei	"	May 12	"	(30)	Shahrivar	"	Jan. 12	2026 A.D	(30)
Bahman	"	June 11	"	(30)	Meher	"	Feb. 11	"	(30)
Aspandad	"	July 11	"	(30)	Avan	"	Mar. 13	"	(30)
<i>Gathas(I-V)</i>	"	Aug. 10	"	(5)	Adar	"	Apr. 12	"	(30)
FARVARDIN	1395	Aug. 15	"	(30)	Dei	"	May 12	"	(30)

PARSI FESTIVALS

Festivals	Criterion	Shahenshahi		Kadmi	
		<u>National / Niravana / Gregorian</u> <u>Saka 1947/ Kali 5125/ 2025 A.D.</u>		<u>National / Niravana / Gregorian</u> <u>Saka 1947/ Kali 5126/ 2025 A.D.</u>	
Zarthost-no-Diso	11 Dei	Jyaishtha 1 / Jyaishtha 8 / May 22		Vaisakha 2/ Vaisakha 9/ Apr. 22	
Gatha Gahambar	Gatha III	Sravana 21 / Sravana 28 / Aug. 12		Ashadha 22/ Ashadha 29/ July 13	
Parsi New Year Eve	Gatha V	Sravana 23 / Sravana 30 / Aug. 14		Ashadha 24/ Ashadha 31/ July 15	
Parsi New Year's Day	1 Farvardin	Sravana 24 / Sravana 31 / Aug. 15		Ashadha 25/ Sravana 1/ July 16	
Khordad Sal (Birthday of Prophet Zarthost)	6 Farvardin	Shravana 29 / Bhadra 5/ Aug. 20		Ashadha 30/ Sravana 6/ July 21	

N.B.- Jamshedi Naoroj falls on March 21 every year

THE JEWISH CALENDAR, 2025 - 2026 A.D.**Jewish Era : 5785 - 86 A.M.**

To beginning dates of different months of the Jewish Calendar are as follows:

Tebeth	5785 A.M.	Jan. 01	2025 A.D.	(29)	Ellul	5785 A.M.	Aug. 25	2025 A.D	(29)
Shebat	"	Jan. 30	"	(30)	TISHRI	5786 A.M.	Sept. 23	"	(30)
Adar	"	Mar. 01	"	(29)	Heshvan	"	Oct. 23	"	(29)
Nisan	"	Mar. 30	"	(30)	Kislev	"	Nov. 21	"	(30)
Iyar	"	April 29	"	(29)	Tebeth	"	Dec. 21	"	(29)
Sivan	"	May 28	"	(30)	Shebat	"	Jan. 19	2026 A.D	(30)
Tammuz	"	June 27	"	(29)	Adar	"	Feb. 18	"	(29)
Ab	"	July 26	"	(30)	Nisan	"	Mar. 19	"	(30)

JEWISH FESTIVALS 2025-2026 A.D.

Festivals	Criterion	Date
First day of Passover (Pesach)	15 Nisan	<u>Saka 1947 / Kali 5125 / 2025 A.D.</u> Chaitra 23/ Chaitra 30/ April 13
Feast of Weeks (Shebuoth)	6 Sivan	<u>Saka 1947 / Kali 5126 / 2025 A.D.</u> Jyaishtha 12/ Jyaishtha 19/ June 2
Tishabeab	9 Ab	Sravana 12/ Sravana 19/ Aug. 3
Jewish New Year (Rosh Hashanah)	1 Tishri	Asvina 1/ Asvina 8/ Sept. 23
Day of Atonement (Yom Kippur)	10 Tishri	Asvina 10/ Asvina 17/ Oct. 2
First day of Tabernacles (Succoth)	15 Tishri	Asvina 15/ Asvina 22/ Oct. 7
Last day of Succoth (Simhath Torah)	23 Tishri	Asvina 23/ Asvina 30/ Oct. 15
Hanukah	25 Kislev	Agrahayana 24/ Pausha 1/ Dec. 15
		<u>Saka 1947 / Kali 5126 / 2026 A.D.</u>
Purim	14 Adar	Phalguna 12/ Phalguna 19/ Mar. 3
First day of Passover (Pesach)	15 Nisan	<u>Saka 1948 / Kali 5126 / 2026 A.D.</u> Chaitra 12/ Chaitra 19/ Apr. 2

Festivals	Criterion	Date
<u>National/Nirayana/Gregorian Saka 1946 / Kali 5125/ 2025 A.D.</u>		
1. Christian (English) New Year's Day	Fixed	Pausha 11/Pausha 18/Jan 01
2. Epiphany	Fixed	Pausha 16/Pausha 23/Jan 06
3. Septuagesima Sunday	63 days before Easter Sunday	Magha 27/Phalguna 4/Feb 16
4. Quinquagesima (Shrove) Sunday	49 days before Easter Sunday	Phalguna 11 / Phalguna 18/Mar 2
5. Ash Wednesday	46 days before Easter Sunday	Phalguna 14/Phalguna 21/Mar 5
<u>Saka 1947 / Kali 5125/ 2025 A.D.</u>		
6. Palm Sunday	7 days before Easter Sunday	Chaitra 23/Chaitra 30/ April 13
<u>Saka 1947 / Kali 5126/ 2025 A.D.</u>		
7. Good Friday	2 days before Easter Sunday	Chaitra 28/ Vaisakha 5/ April 18
8. Easter (Holy) Saturday	Day before Easter Sunday	Chaitra 29/ Vaisakha 6/ April 19
9. Easter Sunday	First Sunday after the 14 th day of the Moon (nearly Full Moon) occurring on or immediately after March 21	Chaitra 30/ Vaisakha 7/ April 20
10. Low Sunday	7 days after Easter Sunday	Vaisakha 7/ Vaisakha 14/ April 27
11. Rogation Sunday	35 days after Easter Sunday	Jyaishtha 4/ Jyaishtha 11/May 25
12. Ascension Day-Holy Thursday	39 days after Easter Sunday	Jyaishtha 8/ Jyaishtha 15/May 29
13. Ascension Sunday	3 days after Ascension day	Jyaishtha 11/ Jyaishtha 18/June 1
14. Whit Sunday-Pentecost	49 days after Easter Sunday	Jyaishtha 18/ Jyaishtha 25/June 8
15. Trinity Sunday	56 days after Easter Sunday	Jyaishtha 25/ Ashadha 1/ June 15
16. Corpus Christi (Thursday)	60 days after Easter Sunday	Jyaishtha 29/ Ashadha 5 / June 19
17. First Sunday in Advent	Fourth Sunday before Christmas, i.e., Sunday nearest to Nov.,30.	Agrahayana 9/Agrahayana 16/Nov 30
18. Christmas Eve	Day before Christmas	Pausha 3/Pausha 10/Dec 24
19. Christmas Day	Fixed	Pausha 4/Pausha 11/Dec 25
20. New Year Eve	Fixed	Pausha 10/Pausha 17/Dec 31
<u>Saka 1947 / Kali 5126/ 2026 A.D.</u>		
1. Christian (English) New Year's Day	Fixed	Pausha 11/Pausha 18/Jan 01
2. Epiphany	Fixed	Pausha 16/Pausha 23/Jan 06
3. Septuagesima Sunday	63 days before Easter Sunday	Magha 12/Magha 19/Feb 1
4. Quinquagesima (Shrove) Sunday	49 days before Easter Sunday	Magha 26/ Phalguna 3/Feb 15
5. Ash Wednesday	46 days before Easter Sunday	Magha 29/Phalguna 6/Feb 18
<u>Saka 1948 / Kali 5126/ 2026 A.D.</u>		
6. Palm Sunday	7 days before Easter Sunday	Chaitra 8/Chaitra 15/ Mar 29
7. Good Friday	2 days before Easter Sunday	Chaitra 13/ Chaitra 20/ April 3
8. Easter (Holy) Saturday	Day before Easter Sunday	Chaitra 14/ Chaitra 21/ April 4
9. Easter Sunday	First Sunday after the 14 th day of the Moon (nearly Full Moon) occurring on or immediately after March 21	Chaitra 15/ Chaitra 22/ April 5
10. Low Sunday	7 days after Easter Sunday	Chaitra 22/ Chaitra 29/April 12

THE INDIAN LUNAR CALENDAR
TIME OF NEW MOON(IN I.S.T.) MARKING THE
COMMENCEMENT OF LUNAR MONTHS

2007 (1928-29 S.E.)					2010 (1931-32 S.E.)					2013 (1934-35 S.E.)				
		d	h	m			d	h	m			d	h	m
Pausha		---					---			Jan.		11	25	14
Magha	Jan.	19	09	31	Jan.	15	12	41	Feb.		10	12	50	
Phalguna	Feb.	17	21	44	Feb.	14	08	21	Mar.		11	25	21	
Chaitra	Mar.	19	08	13	Mar.	15	26	31	Apr.		10	15	05	
Vaisakha	Apr.	17	17	06	Apr.	14	17	59	May		10	05	58	
					May	14	06	34						
Jyaishtha	May	16	24	57	June	12	16	45	June		8	21	26	
	June	15	08	43										
Ashadha	July	14	17	34	July	11	25	10	July		8	12	44	
Sravana	Aug.	12	28	33	Aug.	10	08	38	Aug.		6	27	21	
Bhadra	Sept.	11	18	14	Sept.	8	16	00	Sept.		5	17	06	
Asvina	Oct.	11	10	31	Oct.	7	24	15	Oct.		5	06	05	
Kartika	Nov.	09	28	33	Nov.	6	10	22	Nov.		3	18	20	
Margasirsha	Dec.	09	23	10	Dec.	5	23	06	Dec.		2	29	52	
Pausha		---					---							
2008 (1929-30 S.E.)					2011 (1932-33 S.E.)					2014 (1935-36 S.E.)				
		d	h	m			d	h	m			d	h	m
Pausha	Jan.	08	17	17	Jan.	4	14	33	Jan.		1	16	44	
Magha	Feb.	07	09	14	Feb.	3	08	01	Jan.		30	27	09	
Phalguna	Mar.	07	22	44	Mar.	4	26	16	Feb.		1	13	30	
Chaitra	Apr.	06	09	25	Apr.	3	20	02	Mar.		30	24	15	
Vaisakha	May	05	17	48	May	3	12	21	Apr.		29	11	44	
Jyaishtha	June	03	24	53	June	1	26	33	May		28	24	10	
Ashadha	July	03	07	49	July	1	14	24	June		27	13	39	
Sravana	Aug.	01	15	43	July	30	24	10	July		26	28	12	
Bhadra	Aug.	30	25	28	Aug.	29	08	34	Aug.		25	19	43	
Asvina	Sept.	29	13	42	Sept.	27	16	39	Sept.		24	11	44	
Kartika	Oct.	28	28	44	Oct.	26	25	26	Oct.		23	27	27	
Margasirsha	Nov.	27	22	25	Nov.	25	11	40	Nov.		22	18	02	
Pausha	Dec.	27	17	52	Dec.	24	23	36	Dec.		22	07	06	

2009 (1930-31 S.E.)					2012 (1933-34 S.E.)					2015 (1936-37 S.E.)				
		d	h	m			d	h	m			d	h	m
Pausha		---					---					---		
Magha	Jan.	26	13	25	Jan.	23	13	09	Jan.		20	18	44	
Phalguna	Feb.	25	07	05	Feb.	21	28	05	Feb.		18	29	17	
Chaitra	Mar.	26	21	36	Mar.	22	20	07	Mar.		20	15	06	
Vaisakha	Apr.	25	08	53	Apr.	21	12	48	Apr.		18	24	27	
Jyaishtha	May	24	17	41	May	20	05	17	May		18	09	43	
Ashadha	June	22	25	05	June	19	20	32	June		16	19	35	
									July		16	06	54	
Sravana	July	22	08	05	July	19	09	54	Aug.		14	20	23	
Bhadra	Aug.	20	15	32	Aug.	17	21	24	Sept.		13	12	11	
					Sept.	16	07	41						
Asvina	Sept.	18	24	14	Oct.	15	17	33	Oct.		12	29	36	
Kartika	Oct.	18	11	03	Nov.	13	27	38	Nov.		11	23	17	
Margasirsha	Nov.	16	24	44	Dec.	13	14	12	Dec.		11	15	59	
Pausha	Dec.	17	17	32								---		

N.B.-The figures in the italics show the beginning of the intercalary (*mala or adhika*) month followed by the normal (*suddha or nija*) month of the same name.

THE INDIAN LUNAR CALENDAR
TIME OF NEW MOON(IN I.S.T.) MARKING THE
COMMENCEMENT OF LUNAR MONTHS

	2016 (1937-38 S.E.)				2019 (1940-41 S.E.)				2022 (1943-44 S.E.)				2025 (1946-47 S.E.)			
	d	h	m		d	h	m		d	h	m		d	h	m	
Pausha	Jan.	10	07	01	Jan.	6	06	58	Jan.	02	24	04		---		
Magha	Feb.	8	20	09	Feb.	4	26	34	Feb.	01	11	16	Jan.	29	18	06
Phalgun	Mar.	9	07	25	Mar.	6	21	34	Mar.	02	23	05	Feb.	27	30	15
Chaitra	Apr.	7	16	54	Apr.	5	14	21	Apr.	01	11	54	Mar.	29	16	28
Vaisakha	May	6	25	00	May	4	28	16	Apr.	30	25	58	Apr.	27	25	01
Jyaishtha	June	5	08	30	June	3	15	32	May	30	17	00	May	27	8	32
Ashadha	July	4	16	31	July	2	24	46	June	29	08	22	June	25	16	02
Shravana	Aug.	2	26	15	Aug.	1	08	42	July	28	23	25	July	24	24	41
Bhadra	Sept.	1	14	33	Aug.	30	16	7	Aug.	27	13	47	Aug.	23	11	37
Asvina	Sept.	30	29	41	Sept.	28	23	56	Sept.	25	27	25	Sept.	21	25	24
Kartika	Oct.	30	23	08	Oct.	28	09	9	Oct.	25	16	19	Oct.	21	17	55
Margashirsha	Nov.	29	17	48	Nov.	26	20	36	Nov.	23	28	27	Nov.	20	12	17
Pausha	Dec.	29	12	23	Dec.	26	10	43	Dec.	23	15	47	Dec.	20	07	13
	2017 (1938-39 S.E.)				2020 (1941-42 S.E.)				2023 (1944-45 S.E.)				2026 (1947-48 S.E.)			
	d	h	m		d	h	m		d	h	m		d	h	m	
Pausha		---				---				---				---		
Magha	Jan.	27	29	37	Jan.	24	27	12	Jan.	21	26	23	Jan.	18	25	22
Phalgun	Feb.	26	20	28	Feb.	23	21	2	Feb.	20	12	36	Feb.	17	17	31
Chaitra	Mar.	28	08	27	Mar.	24	14	58	Mar.	21	22	53	Mar.	19	06	53
Vaisakha	Apr.	26	17	46	Apr.	23	07	56	Apr.	20	09	43	Apr.	17	17	22
Jyaishtha	May	25	25	14	May	22	23	9	May	19	21	23	<i>May</i>	<i>16</i>	<i>25</i>	<i>31</i>
													June	15	08	24
Ashadha	June	24	08	01	June	21	12	11	June	18	10	07	July	14	15	14
Shravana	July	23	15	16	July	20	23	3	July	17	24	02	Aug.	12	23	07
									Aug.	16	15	08				
Bhadra	Aug.	21	24	00	Aug.	19	08	12	Sept.	15	07	10	Sept.	11	08	57
Asvina	Sept.	20	11	00	Sept.	17	16	30	Oct.	14	23	25	Oct.	10	21	20
					Oct.	16	25	1								
Kartika	Oct.	19	24	42	Nov.	15	10	37	Nov.	13	14	57	Nov.	9	12	32
Margashirsha	Nov.	18	17	12	Dec.	14	21	47	Dec.	12	29	02	Dec.	8	30	22
Pausha	Dec.	18	12	00		---				---				---		
	2018 (1939-40 S.E.)				2021 (1942-43 S.E.)				2024 (1945-46 S.E.)				2027 (1948-49 S.E.)			
	d	h	m		d	h	m		d	h	m		d	h	m	
Pausha		---			Jan.	13	10	30	Jan.	11	17	27	Jan.	7	25	54
Magha	Jan.	17	07	47	Feb.	11	24	36	Feb.	09	28	29	Feb.	6	21	26
Phalgun	Feb.	15	26	35	Mar.	13	15	51	Mar.	10	14	30	Mar.	8	14	59
Chaitra	Mar.	17	18	42	Apr.	12	08	01	Apr.	08	23	51	Apr.	6	29	21
Vaisakha	Apr.	16	07	27	May	11	24	30	May	08	08	52	May	6	16	29
Jyaishtha	<i>May</i>	<i>15</i>	<i>17</i>	<i>18</i>	June	10	16	23	June	06	18	08	June	4	25	10
	June	13	25	13												
Ashadha	July	13	08	18	July	10	06	47	July	05	28	27	July	4	08	32
Shravana	Aug.	11	15	28	Aug.	08	19	20	Aug.	04	16	43	Aug.	2	15	35
Bhadra	Sept.	9	23	32	Sept.	07	06	22	Sept.	03	07	26	Aug.	31	23	11
Asvina	Oct.	9	09	17	Oct.	06	16	35	Oct.	02	24	19	Sept.	30	08	06
Kartika	Nov.	7	21	32	Nov.	04	26	45	Nov.	01	17	18	Oct.	29	19	07
Margashirsha	Dec.	7	12	50	Dec.	04	13	13	Dec.	01	11	51	Nov.	28	08	54
Pausha		---				---			Dec.	30	27	57	Dec.	27	25	42

N.B.-The figures in the italics show the beginning of the intercalary(*mala or adhika*) month followed by the normal (*suddha or nija*) month of the same name.

INDIAN CALENDAR

SAKA ERA 1948

Mesha : Madhava

Month of CHAITRA (30 days)

Spring (Vasanta), 2nd Month

(Nirayana) 8 Chaitra, 5126 Kali Era to (Nirayana) 7 Vaisakha, 5127 Kali Era

Date	Week Day	Gregorian Date	Sunrise		Apparent Noon		Sunset		Tithi		Nakshatra		Yoga	
			h	m	h	m	h	m	No.	Ending Moment	No.	Ending Moment	No.	Ending Moment
		2026A.D.												
1	Sun	Mar. 22	6	02.4	12	06.9	18	11.6	S 4	21 17.1	2	22 42.8	27	15 41.7
2	Mon	23	6	01.4	12	06.6	18	12.0	S 5	18 38.9	3	20 49.8	1	12 22.1
3	Tue	24	6	00.4	12	06.3	18	12.4	6	16 08.4	4	19 05.1	2	9 07.6
4	Wed	25	5	59.5	12	06.0	18	12.7	7	13 50.6	5	17 33.7	3	6 02.3
5	Thu	26	5	58.5	12	05.7	18	13.1	8	11 49.4	6	16 19.3	(4 5	27 31.7)
6	Fri	27	5	57.5	12	05.4	18	13.5	9	10 07.4	7	15 24.3	6	22 10.3
7	Sat	28	5	56.5	12	05.1	18	13.9	S 10	8 46.2	8	14 50.4	7	20 06.1
8	Sun	29	5	55.6	12	04.8	18	14.2	11	7 46.9	9	14 38.1	8	18 19.7
9	Mon	30	5	54.6	12	04.5	18	14.6	12	7 10.1	10	14 48.1	9	16 51.3
10	Tue	31	5	53.6	12	04.2	18	15.0	13	6 56.4	11	15 21.0	10	15 41.5
11	Wed	Apr. 1	5	52.7	12	03.9	18	15.3	14	7 06.7	12	16 17.7	11	14 50.8
12	Thu	2	5	51.7	12	03.6	18	15.7	S 15	7 41.9	13	17 38.9	12	14 19.7
13	Fri	3	5	50.7	12	03.3	18	16.1	K 1	8 42.9	14	19 25.1	13	14 08.7
14	Sat	4	5	49.8	12	03.0	18	16.4	2	10 09.5	15	21 35.7	14	14 17.2
15	Sun	5	5	48.8	12	02.7	18	16.8	3	12 00.3	16	24 08.0	15	14 43.9
16	Mon	6	5	47.9	12	02.4	18	17.2	4	14 11.1	17	26 56.9	16	15 25.4
17	Tue	7	5	46.9	12	02.2	18	17.6	K 5	16 35.1	18	— ———	17	16 16.6
18	Wed	8	5	46.0	12	01.9	18	17.9	6	19 02.2	18	5 54.0	18	17 10.4
19	Thu	9	5	45.1	12	01.6	18	18.3	7	21 20.1	19	8 48.6	19	17 58.2
20	Fri	10	5	44.2	12	01.3	18	18.7	8	23 16.0	20	11 28.0	20	18 30.6
21	Sat	11	5	43.2	12	01.1	18	19.1	9	24 38.1	21	13 40.0	21	18 39.0
22	Sun	12	5	42.3	12	00.8	18	19.5	K 10	25 17.4	22	15 14.2	22	18 15.9
23	Mon	13	5	41.4	12	00.6	18	19.9	11	25 09.1	23	16 03.7	23	17 16.7
24	Tue	14	5	40.6	12	00.3	18	20.3	12	24 12.8	24	16 06.0	24	15 39.4
25	Wed	15	5	39.7	12	00.1	18	20.7	13	22 31.5	25	15 22.7	25	13 25.2
26	Thu	16	5	38.8	11	59.8	18	21.1	14	20 11.7	26	13 58.9	26	10 37.5
27	Fri	17	5	37.9	11	59.6	18	21.5	K 30	17 21.7	27	12 02.4	27	7 21.9
28	Sat	18	5	37.1	11	59.4	18	21.9	S 1	14 11.0	1	9 42.7	(1 2	27 56.1)
29	Sun	19	5	36.2	11	59.1	18	22.3	2	10 49.8	2	7 10.1	3	20 02.1
30	Mon	Apr. 20	5	35.4	11	58.9	18	22.7	3	7 28.0	(3 4	28 35.4)	4	16 11.3
									(S 4	28 15.3)				

N.B. - All timings are given in I.S.T. or the local mean time of the meridian of 82½° E. Long.

Names of Nakshatras:- 1.Asvini 2.Bharani 3.Krittika 4.Rohini 5.Mrigasiras 6.Ardra 7.Punarvasu 8.Pushya 9.Ashlesha 10.Magha 11.Purva Phalguni 12.Uttara Phalguni 13.Hasta 14.Chitra 15.Svati 16.Visakha 17.Anuradha 18.Jyestha 19.Mula 20.Purvasadha 21.Uttarasadha 22.Sravana 23.Dhanistha 24.Satabhisaj 25.Purva Bhadrapada 26.Uttara Bhadrapada 27.Revati

Names of Yogas:- 1.Viskumbha 2.Priti 3.Ayusman 4.Saubhagya 5.Sobhana 6.Atiganda 7.Sukarma 8.Dhriti 9.Sula 10.Ganda 11.Vridhhi 12.Dhruva 13.Vyaghata 14.Harshana 15.Vajra 16.Siddhi (Asrik) 17.Vyatipata 18.Variyan 19.Parigha 20.Siva 21.Siddha 22.Sadhya 23.Subha 24.Sukla (Sukra) 25.Brahma 26.Indra 27.Vaidhriti

AYANAMSA, 2025
TRUE AYANAMSA FOR 5^h 29^m

Date 2025	Ayanamsa			Date 2025	Ayanamsa			Date 2025	Ayanamsa			Date 2025-26	Ayanamsa		
	°	'	"		°	'	"		°	'	"		°	'	"
Jan. 1	24	12	23.0	May 1	24	12	39.7	Aug. 29	24	12	59.7	Dec. 27	24	13	17.7
4	24	12	23.7	4	24	12	40.4	Sept. 1	24	13	00.2	30	24	13	18.0
7	24	12	23.9	7	24	12	40.8	4	24	13	00.8	Jan. 2	24	13	18.9
10	24	12	24.4	10	24	12	40.9	7	24	13	01.2	5	24	13	19.9
13	24	12	25.4	13	24	12	41.2	10	24	13	01.2	8	24	13	20.3
16	24	12	26.1	16	24	12	41.9	13	24	13	01.5	11	24	13	20.6
19	24	12	26.4	19	24	12	42.7	16	24	13	02.2	14	24	13	21.1
22	24	12	26.6	22	24	12	43.0	19	24	13	02.7	17	24	13	21.8
25	24	12	27.2	25	24	12	43.2	22	24	13	02.7	20	24	13	22.5
28	24	12	28.0	28	24	12	44.0	25	24	13	02.8	23	24	13	22.9
31	24	12	28.6	31	24	12	45.0	28	24	13	03.2	26	24	13	23.1
Feb. 3	24	12	28.7	June 3	24	12	45.4	Oct. 1	24	13	03.8	29	24	13	23.8
6	24	12	29.1	6	24	12	45.7	4	24	13	04.1	Feb. 1	24	13	24.7
9	24	12	29.9	9	24	12	46.1	7	24	13	04.2	4	24	13	25.1
12	24	12	30.5	12	24	12	46.8	10	24	13	04.4	7	24	13	25.2
15	24	12	30.7	15	24	12	47.6	13	24	13	05.2	10	24	13	25.5
18	24	12	30.8	18	24	12	48.1	16	24	13	05.7	13	24	13	26.2
21	24	12	31.2	21	24	12	48.3	19	24	13	05.8	16	24	13	26.8
24	24	12	31.8	24	24	12	49.1	22	24	13	05.9	19	24	13	27.0
27	24	12	32.4	27	24	12	50.1	25	24	13	06.4	22	24	13	27.1
Mar. 2	24	12	32.4	30	24	12	50.6	28	24	13	07.0	25	24	13	27.6
5	24	12	32.6	July 3	24	12	50.9	31	24	13	07.5	28	24	13	28.4
8	24	12	33.3	6	24	12	51.3	Nov. 3	24	13	07.7	Mar. 3	24	13	28.7
11	24	12	33.9	9	24	12	52.0	6	24	13	08.0	6	24	13	28.7
14	24	12	34.0	12	24	12	52.8	9	24	13	08.8	9	24	13	28.9
17	24	12	34.0	15	24	12	53.2	12	24	13	09.6	12	24	13	29.4
20	24	12	34.3	18	24	12	53.4	15	24	13	09.8	15	24	13	30.0
23	24	12	34.8	21	24	12	54.0	18	24	13	10.0	18	24	13	30.2
26	24	12	35.4	24	24	12	55.0	21	24	13	10.5	21	24	13	30.2
29	24	12	35.4	27	24	12	55.5	24	24	13	11.3	24	24	13	30.6
1	24	12	35.6	30	24	12	55.7	27	24	13	12.0	27	24	13	31.3
Apr. 4	24	12	36.3	Aug. 2	24	12	56.0	30	24	13	12.3	30	24	13	31.7
7	24	12	36.9	5	24	12	56.6	Dec. 3	24	13	12.6	Apr. 2	24	13	31.7
10	24	12	37.0	8	24	12	57.3	6	24	13	13.6	5	24	13	31.8
13	24	12	37.1	11	24	12	57.7	9	24	13	14.5	8	24	13	32.3
16	24	12	37.3	14	24	12	57.8	12	24	13	14.9	11	24	13	32.9
19	24	12	38.0	17	24	12	58.2	15	24	13	15.2	14	24	13	33.2
22	24	12	38.6	20	24	12	59.0	18	24	13	15.7	17	24	13	33.2
25	24	12	38.8	23	24	12	59.5	21	24	13	16.6	20	24	13	33.7
28	24	12	38.9	26	24	12	59.6	24	24	13	17.3	23	24	13	34.5
May 1	24	12	39.7	Aug. 29	24	12	59.7	Dec. 27	24	13	17.7	Apr. 26	24	13	35.0

Mean Ayanamsa= 23°51'25".53 for J2000.0

Mean Ayanamsa= 24°12'22".70+ precession from 2025.0 to date

Mean Ayanamsa= 24°13'12".96+ precession from 2026.0 to date

True Ayanamsa= Mean Ayanamsa+ nutation in longitude

LONGITUDE OF SUN, MOON AND PLANETS, 2026
 APPARENT GEOCENTRIC LONGITUDE FOR 5^h 28^m.8 I.S.T.

Date	Sun	Moon	Mercury	Venus	Mars	Jupiter	Saturn
	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "
Jan. 0	279 32 56	51 48 51	267 07 41	277 56 50	281 55 18	111 29 16	356 06 35
1	280 34 04	66 42 13	268 39 02	279 12 20	282 41 15	111 21 28	356 10 02
2	281 35 12	81 44 29	270 10 44	280 27 50	283 27 15	111 13 36	356 13 35
3	282 36 20	96 46 15	271 42 47	281 43 19	284 13 18	111 05 42	356 17 13
4	283 37 28	111 37 38	273 15 12	282 58 49	284 59 23	110 57 45	356 20 57
5	284 38 36	126 10 05	274 47 58	284 14 18	285 45 30	110 49 45	356 24 46
6	285 39 43	140 17 37	276 21 07	285 29 47	286 31 39	110 41 44	356 28 40
7	286 40 51	153 57 22	277 54 38	286 45 16	287 17 51	110 33 40	356 32 40
8	287 41 59	167 09 28	279 28 32	288 00 45	288 04 05	110 25 36	356 36 45
9	288 43 07	179 56 22	281 02 50	289 16 13	288 50 21	110 17 31	356 40 55
10	289 44 15	192 22 05	282 37 33	290 31 42	289 36 40	110 09 25	356 45 10
11	290 45 23	204 31 29	284 12 41	291 47 10	290 23 01	110 01 19	356 49 30
12	291 46 31	216 29 44	285 48 15	293 02 38	291 09 24	109 53 13	356 53 55
13	292 47 40	228 21 49	287 24 17	294 18 06	291 55 49	109 45 08	356 58 26
14	293 48 48	240 12 22	289 00 47	295 33 34	292 42 17	109 37 04	357 03 01
15	294 49 56	252 05 18	290 37 45	296 49 02	293 28 47	109 29 02	357 07 41
16	295 51 03	264 03 48	292 15 14	298 04 29	294 15 18	109 21 01	357 12 26
17	296 52 11	276 10 14	293 53 13	299 19 57	295 01 52	109 13 02	357 17 16
18	297 53 18	288 26 13	295 31 43	300 35 23	295 48 28	109 05 06	357 22 11
19	298 54 24	300 52 40	297 10 46	301 50 50	296 35 06	108 57 12	357 27 10
20	299 55 30	313 30 03	298 50 21	303 06 16	297 21 45	108 49 22	357 32 14
21	300 56 35	326 18 39	300 30 30	304 21 41	298 08 26	108 41 35	357 37 22
22	301 57 39	339 18 43	302 11 13	305 37 06	298 55 09	108 33 53	357 42 34
23	302 58 43	352 30 45	303 52 29	306 52 30	299 41 53	108 26 14	357 47 51
24	303 59 45	5 55 25	305 34 21	308 07 53	300 28 39	108 18 40	357 53 12
25	305 00 47	19 33 30	307 16 46	309 23 16	301 15 26	108 11 12	357 58 37
26	306 01 47	33 25 35	308 59 46	310 38 38	302 02 15	108 03 48	358 04 07
27	307 02 46	47 31 35	310 43 18	311 53 60	302 49 06	107 56 31	358 09 40
28	308 03 45	61 50 15	312 27 23	313 09 21	303 35 57	107 49 19	358 15 18
29	309 04 42	76 18 51	314 11 58	314 24 40	304 22 50	107 42 14	358 20 59
30	310 05 38	90 52 59	315 57 01	315 39 60	305 09 45	107 35 15	358 26 45
31	311 06 32	105 26 50	317 42 30	316 55 18	305 56 41	107 28 23	358 32 34

LONGITUDE OF SUN, MOON AND PLANETS, 2026
 APPARENT GEOCENTRIC LONGITUDE FOR 5^h 28^m.8 I.S.T.

Date		Sun			Moon			Mercury			Venus			Mars			Jupiter			Saturn		
		°	'	"	°	'	"	°	'	"	°	'	"	°	'	"	°	'	"	°	'	"
Feb.	1	312	07	26	119	53	58	319	28	21	318	10	36	306	43	38	107	21	38	358	38	26
	2	313	08	18	134	08	06	321	14	28	319	25	52	307	30	36	107	15	01	358	44	23
	3	314	09	10	148	04	10	323	00	47	320	41	08	308	17	36	107	08	31	358	50	22
	4	315	10	00	161	38	48	324	47	10	321	56	23	309	04	36	107	02	08	358	56	26
	5	316	10	49	174	50	44	326	33	29	323	11	38	309	51	38	106	55	54	359	02	32
	6	317	11	37	187	40	37	328	19	33	324	26	51	310	38	41	106	49	48	359	08	42
	7	318	12	25	200	10	42	330	05	11	325	42	04	311	25	45	106	43	51	359	14	56
	8	319	13	11	212	24	31	331	50	07	326	57	16	312	12	51	106	38	02	359	21	12
	9	320	13	57	224	26	21	333	34	05	328	12	28	312	59	57	106	32	23	359	27	32
	10	321	14	41	236	20	54	335	16	46	329	27	39	313	47	05	106	26	52	359	33	55
	11	322	15	24	248	12	59	336	57	47	330	42	49	314	34	14	106	21	32	359	40	21
	12	323	16	07	260	07	16	338	36	41	331	57	58	315	21	24	106	16	20	359	46	50
	13	324	16	48	272	07	59	340	13	01	333	13	07	316	08	34	106	11	19	359	53	22
	14	325	17	28	284	18	46	341	46	16	334	28	14	316	55	46	106	06	28	359	59	57
	15	326	18	07	296	42	29	343	15	49	335	43	21	317	42	58	106	01	47	0	06	34
	16	327	18	45	309	21	02	344	41	04	336	58	26	318	30	11	105	57	16	0	13	14
	17	328	19	21	322	15	22	346	01	21	338	13	31	319	17	25	105	52	56	0	19	57
	18	329	19	55	335	25	26	347	16	00	339	28	35	320	04	39	105	48	46	0	26	42
	19	330	20	28	348	50	20	348	24	19	340	43	37	320	51	53	105	44	47	0	33	30
	20	331	20	60	2	28	30	349	25	37	341	58	38	321	39	09	105	40	59	0	40	20
	21	332	21	29	16	17	54	350	19	14	343	13	38	322	26	24	105	37	23	0	47	12
	22	333	21	57	30	16	19	351	04	33	344	28	37	323	13	40	105	33	57	0	54	07
	23	334	22	23	44	21	32	351	41	02	345	43	34	324	00	56	105	30	43	1	01	04
	24	335	22	47	58	31	16	352	08	13	346	58	30	324	48	12	105	27	40	1	08	03
	25	336	23	10	72	43	21	352	25	47	348	13	25	325	35	29	105	24	49	1	15	04
	26	337	23	30	86	55	28	352	33	31	349	28	18	326	22	45	105	22	10	1	22	07
	27	338	23	48	101	05	08	352	31	24	350	43	10	327	10	02	105	19	42	1	29	12
	28	339	24	05	115	09	43	352	19	35	351	57	60	327	57	19	105	17	25	1	36	18

LONGITUDE OF SUN, MOON AND PLANETS, 2026
 APPARENT GEOCENTRIC LONGITUDE FOR 5^h 28^m.8 I.S.T.

Date	Sun	Moon	Mercury	Venus	Mars	Jupiter	Saturn
	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "
Mar. 1	340 24 19	129 06 21	351 58 25	353 12 48	328 44 35	105 15 20	1 43 26
2	341 24 31	142 52 15	351 28 28	354 27 35	329 31 52	105 13 27	1 50 36
3	342 24 41	156 24 50	350 50 29	355 42 21	330 19 08	105 11 45	1 57 48
4	343 24 50	169 42 08	350 05 29	356 57 05	331 06 25	105 10 15	2 05 01
5	344 24 57	182 42 56	349 14 35	358 11 47	331 53 41	105 08 57	2 12 15
6	345 25 02	195 27 03	348 19 05	359 26 28	332 40 58	105 07 50	2 19 31
7	346 25 05	207 55 22	347 20 24	0 41 07	333 28 14	105 06 56	2 26 48
8	347 25 07	220 09 47	346 19 58	1 55 45	334 15 30	105 06 13	2 34 06
9	348 25 07	232 13 10	345 19 12	3 10 21	335 02 46	105 05 41	2 41 26
10	349 25 05	244 09 11	344 19 28	4 24 56	335 50 02	105 05 22	2 48 46
11	350 25 02	256 02 03	343 22 00	5 39 30	336 37 18	105 05 14	2 56 08
12	351 24 57	267 56 21	342 27 55	6 54 02	337 24 33	105 05 19	3 03 31
13	352 24 51	279 56 49	341 38 08	8 08 32	338 11 48	105 05 34	3 10 55
14	353 24 42	292 08 02	340 53 24	9 23 01	338 59 03	105 06 02	3 18 20
15	354 24 33	304 34 11	340 14 16	10 37 28	339 46 17	105 06 41	3 25 46
16	355 24 21	317 18 41	339 41 07	11 51 54	340 33 30	105 07 32	3 33 12
17	356 24 07	330 23 52	339 14 13	13 06 18	341 20 43	105 08 35	3 40 39
18	357 23 52	343 50 33	338 53 39	14 20 40	342 07 55	105 09 49	3 48 06
19	358 23 35	357 37 52	338 39 25	15 35 01	342 55 07	105 11 14	3 55 34
20	359 23 15	11 43 06	338 31 26	16 49 19	343 42 17	105 12 52	4 03 02
21	0 22 54	26 01 58	338 29 33	18 03 36	344 29 27	105 14 40	4 10 31
22	1 22 30	40 29 04	338 33 33	19 17 51	345 16 36	105 16 40	4 18 00
23	2 22 05	54 58 37	338 43 12	20 32 04	346 03 44	105 18 52	4 25 29
24	3 21 37	69 25 16	338 58 15	21 46 15	346 50 51	105 21 15	4 32 59
25	4 21 07	83 44 41	339 18 26	23 00 25	347 37 57	105 23 49	4 40 29
26	5 20 34	97 53 51	339 43 29	24 14 31	348 25 01	105 26 34	4 47 58
27	6 19 59	111 51 01	340 13 08	25 28 36	349 12 05	105 29 30	4 55 28
28	7 19 22	125 35 29	340 47 07	26 42 39	349 59 07	105 32 37	5 02 57
29	8 18 43	139 07 13	341 25 12	27 56 39	350 46 08	105 35 54	5 10 26
30	9 18 01	152 26 26	342 07 09	29 10 37	351 33 07	105 39 23	5 17 55
31	10 17 17	165 33 24	342 52 45	30 24 32	352 20 05	105 43 01	5 25 23

LONGITUDE OF SUN, MOON AND PLANETS, 2026
 APPARENT GEOCENTRIC LONGITUDE FOR 5^h 28^m.8 I.S.T.

Date	Sun	Moon	Mercury	Venus	Mars	Jupiter	Saturn
	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "
Apr. 1	11 16 30	178 28 18	343 41 48	31 38 25	353 07 02	105 46 51	5 32 51
2	12 15 42	191 11 14	344 34 06	32 52 16	353 53 57	105 50 50	5 40 19
3	13 14 52	203 42 28	345 29 29	34 06 05	354 40 52	105 55 00	5 47 46
4	14 13 59	216 02 29	346 27 48	35 19 52	355 27 44	105 59 20	5 55 13
5	15 13 05	228 12 19	347 28 53	36 33 36	356 14 36	106 03 51	6 02 39
6	16 12 09	240 13 37	348 32 36	37 47 19	357 01 26	106 08 31	6 10 04
7	17 11 11	252 08 48	349 38 51	39 00 59	357 48 14	106 13 22	6 17 29
8	18 10 11	264 01 04	350 47 30	40 14 37	358 35 02	106 18 22	6 24 53
9	19 09 10	275 54 17	351 58 27	41 28 13	359 21 47	106 23 32	6 32 16
10	20 08 07	287 52 53	353 11 37	42 41 47	0 08 31	106 28 51	6 39 38
11	21 07 01	300 01 43	354 26 55	43 55 18	0 55 14	106 34 21	6 46 59
12	22 05 55	312 25 42	355 44 17	45 08 47	1 41 55	106 39 59	6 54 19
13	23 04 46	325 09 27	357 03 39	46 22 14	2 28 34	106 45 47	7 01 38
14	24 03 36	338 16 51	358 24 57	47 35 39	3 15 11	106 51 44	7 08 56
15	25 02 24	351 50 17	359 48 09	48 49 02	4 01 47	106 57 51	7 16 12
16	26 01 10	5 50 04	1 13 11	50 02 22	4 48 20	107 04 06	7 23 27
17	26 59 54	20 13 53	2 40 03	51 15 40	5 34 52	107 10 30	7 30 40
18	27 58 36	34 56 33	4 08 42	52 28 55	6 21 22	107 17 04	7 37 53
19	28 57 17	49 50 29	5 39 07	53 42 09	7 07 49	107 23 46	7 45 03
20	29 55 55	64 46 47	7 11 16	54 55 20	7 54 15	107 30 37	7 52 12

SUN AND MOON, 2026

DECLINATION OF SUN, LATITUDE AND DECLINATION OF MOON FOR 5^h 28^m.8 I.S.T.

Date	Declination of Sun		Latitude of Moon		Declination of Moon		Date	Declination of Sun		Latitude of Moon		Declination of Moon				
	°	'	°	'	°	'		°	'	°	'	°	'			
Jan.	0	-23	05.7	+4	47.0	+22	50.0	Feb.	1	-17	09.5	+3	18.2	+23	23.8	
	1	23	01.0	5	02.9	26	24.1		2	16	52.4	2	12.4	18	41.9	
	2	22	56.0	4	58.3	28	08.6		3	16	34.9	+0	59.9	13	04.8	
	3	22	50.4	4	33.2	27	48.7		4	16	17.2	-0	14.4	6	58.4	
	4	22	44.5	3	49.7	25	28.8		5	15	59.2	1	25.9	+0	44.0	
	5	22	38.0	2	52.0	21	30.3		6	15	40.9	2	31.1	-5	21.6	
	6	22	31.1	1	45.0	16	22.8		7	15	22.3	3	27.5	11	05.2	
	7	22	23.8	+0	33.9	10	35.1		8	15	03.5	4	13.0	16	15.9	
	8	22	16.0	-0	36.9	+4	30.4		9	14	44.4	4	46.7	20	43.7	
	9	22	07.8	1	43.6	-1	33.6		10	14	25.1	5	07.6	24	19.0	
	10	21	59.2	2	43.7	7	23.9		11	14	05.5	5	15.3	26	51.7	
	11	21	50.1	3	35.0	12	50.0		12	13	45.7	5	09.6	28	12.9	
	12	21	40.6	4	16.0	17	42.5		13	13	25.7	4	50.3	28	15.6	
	13	21	30.7	4	45.6	21	51.8		14	13	05.4	4	17.8	26	56.5	
	14	21	20.4	5	03.0	25	07.5		15	12	45.0	3	32.8	24	17.5	
	15	21	09.6	5	07.3	27	18.9		16	12	24.3	2	36.5	20	25.6	
	16	20	58.5	4	58.3	28	16.3		17	12	03.4	1	31.0	15	31.6	
	17	20	46.9	4	35.9	27	53.2		18	11	42.3	-0	19.5	9	49.4	
	18	20	35.0	4	00.5	26	08.3		19	11	21.1	+0	54.6	-3	34.7	
	19	20	22.6	3	13.1	23	06.1		20	10	59.7	2	06.7	+2	55.3	
	20	20	09.9	2	15.6	18	56.0		21	10	38.1	3	12.5	9	22.2	
	21	19	56.8	1	10.3	13	50.8		22	10	16.3	4	07.6	15	25.6	
	22	19	43.3	-0	00.2	8	04.8		23	9	54.4	4	48.2	20	43.8	
	23	19	29.5	+1	11.1	-1	52.9		24	9	32.3	5	11.7	24	53.5	
	24	19	15.3	2	19.7	+4	29.4		25	9	10.1	5	16.2	27	32.9	
	25	19	00.7	3	21.6	10	45.7		26	8	47.7	5	01.6	28	25.6	
	26	18	45.8	4	12.9	16	37.0		27	8	25.3	4	28.7	27	26.2	
	27	18	30.6	4	49.9	21	41.5		28	-8	02.7	+3	39.7	+24	42.1	
	28	18	15.0	5	09.5	25	34.7									
	29	17	59.1	5	09.9	27	52.3									
	30	17	42.9	4	50.4	28	16.6									
31	-17	26.4	+4	12.2	+26	43.2										

SUN AND MOON, 2026

DECLINATION OF SUN, LATITUDE AND DECLINATION OF MOON FOR 5^h 28^m.8 I.S.T.

Date	Declination of Sun	Latitude of Moon	Declination of Moon	Date	Declination of Sun	Latitude of Moon	Declination of Moon
	° ' "	° ' "	° ' "		° ' "	° ' "	° ' "
Mar. 1	-7 39.9	+2 38.2	+20 31.2	Apr. 1	+4 27.6	-1 45.4	-1 00.2
2	7 17.1	1 28.2	15 16.8	2	4 50.7	2 47.4	6 59.6
3	6 54.2	+0 14.2	9 22.7	3	5 13.8	3 40.3	12 36.7
4	6 31.2	-0 59.1	+3 10.3	4	5 36.7	4 21.9	17 38.9
5	6 08.1	2 07.8	-3 02.0	5	5 59.6	4 50.9	21 54.2
6	5 44.9	3 08.5	8 58.9	6	6 22.3	5 06.7	25 11.4
7	5 21.6	3 59.0	14 27.0	7	6 45.0	5 09.0	27 21.1
8	4 58.2	4 37.5	19 15.0	8	7 07.5	4 58.1	28 15.9
9	4 34.8	5 03.1	23 12.0	9	7 29.9	4 34.3	27 52.4
10	4 11.3	5 15.2	26 08.1	10	7 52.2	3 58.4	26 10.8
11	3 47.8	5 13.9	27 54.4	11	8 14.3	3 11.3	23 15.5
12	3 24.2	4 59.1	28 24.4	12	8 36.4	2 14.5	19 13.4
13	3 00.6	4 31.2	27 34.3	13	8 58.2	-1 09.6	14 13.6
14	2 36.9	3 50.7	25 24.8	14	9 20.0	+0 00.8	8 27.1
15	2 13.3	2 58.8	22 00.6	15	9 41.5	1 13.3	-2 06.9
16	1 49.6	1 56.8	17 30.0	16	10 02.9	2 23.6	+4 30.9
17	1 25.8	-0 47.2	12 04.1	17	10 24.2	3 26.7	11 05.7
18	1 02.1	+0 26.8	-5 56.6	18	10 45.3	4 17.4	17 12.4
19	0 38.3	1 41.0	+0 36.2	19	11 06.1	4 51.4	22 22.1
20	-0 14.6	2 50.6	7 15.0	20	+11 26.9	+5 05.6	+26 05.8
21	+0 09.1	3 50.6	13 37.9				
22	0 32.8	4 36.5	19 20.2				
23	0 56.5	5 04.8	23 56.1				
24	1 20.2	5 13.8	27 01.8				
25	1 43.8	5 03.2	28 20.2				
26	2 07.4	4 34.2	27 45.9				
27	2 30.9	3 49.3	25 26.2				
28	2 54.4	2 51.9	21 38.9				
29	3 17.8	1 45.7	16 45.7				
30	3 41.1	+0 34.7	11 08.7				
31	+4 04.4	-0 36.9	+5 07.6				

PLANETS, 2026

GEOCENTRIC LATITUDE AND DECLINATION FOR 5^h 28^m.8 I.S.T.

Date	Mercury		Venus		Mars		Jupiter		Saturn	
	Latitude	Declination	Latitude	Declination	Latitude	Declination	Latitude	Declination	Latitude	Declination
	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "
Jan. 0	-0 27.5	-23 51.9	-0 28.1	-23 40.0	-0 53.1	-23 47.1	+0 14.2	+21 57.4	-2 15.7	-3 37.3
2	0 40.7	24 07.0	0 32.5	23 34.0	0 53.8	23 39.1	0 14.5	22 00.1	2 15.3	3 34.2
4	0 53.3	24 17.1	0 36.9	23 25.0	0 54.6	23 30.0	0 14.8	22 02.9	2 14.9	3 30.9
6	1 05.1	24 22.1	0 41.2	23 13.2	0 55.3	23 19.8	0 15.1	22 05.6	2 14.6	3 27.5
8	1 16.0	24 21.8	0 45.3	22 58.5	0 56.0	23 08.6	0 15.4	22 08.3	2 14.2	3 23.9
10	1 26.1	24 16.1	0 49.4	22 41.0	0 56.7	22 56.4	0 15.6	22 11.0	2 13.8	3 20.3
12	1 35.3	24 04.8	0 53.2	22 20.7	0 57.3	22 43.1	0 15.9	22 13.6	2 13.5	3 16.5
14	1 43.4	23 47.7	0 56.9	21 57.7	0 57.9	22 28.7	0 16.2	22 16.2	2 13.1	3 12.5
16	1 50.4	23 24.9	1 00.5	21 32.0	0 58.5	22 13.4	0 16.4	22 18.8	2 12.8	3 08.5
18	1 56.1	22 56.2	1 03.8	21 03.7	0 59.1	21 57.1	0 16.7	22 21.3	2 12.4	3 04.3
20	2 00.6	22 21.5	1 07.0	20 33.0	0 59.7	21 39.7	0 16.9	22 23.7	2 12.1	3 00.0
22	2 03.6	21 40.7	1 10.0	19 59.8	1 00.2	21 21.4	0 17.2	22 26.1	2 11.8	2 55.6
24	2 05.1	20 53.9	1 12.8	19 24.2	1 00.7	21 02.2	0 17.4	22 28.4	2 11.5	2 51.1
26	2 05.0	20 00.9	1 15.3	18 46.5	1 01.2	20 42.0	0 17.7	22 30.7	2 11.2	2 46.5
28	2 03.0	19 01.9	1 17.7	18 06.5	1 01.7	20 20.9	0 17.9	22 32.8	2 10.9	2 41.8
30	1 59.0	17 56.9	1 19.8	17 24.5	1 02.1	19 58.9	0 18.1	22 34.9	2 10.7	2 37.0
Feb. 1	1 52.9	16 46.0	1 21.7	16 40.6	1 02.6	19 36.0	0 18.3	22 36.8	2 10.4	2 32.1
3	1 44.5	15 29.5	1 23.3	15 54.8	1 03.0	19 12.2	0 18.5	22 38.7	2 10.1	2 27.1
5	1 33.6	14 07.7	1 24.7	15 07.2	1 03.3	18 47.7	0 18.7	22 40.5	2 09.9	2 22.0
7	1 20.0	12 41.4	1 25.9	14 18.0	1 03.7	18 22.3	0 18.9	22 42.2	2 09.7	2 16.9
9	1 03.6	11 11.2	1 26.8	13 27.2	1 04.0	17 56.1	0 19.1	22 43.8	2 09.4	2 11.7
11	0 44.3	9 38.4	1 27.5	12 35.0	1 04.3	17 29.1	0 19.3	22 45.3	2 09.2	2 06.4
13	-0 22.1	8 04.7	1 27.8	11 41.4	1 04.5	17 01.4	0 19.5	22 46.7	2 09.0	2 01.0
15	+0 02.9	6 32.0	1 28.0	10 46.5	1 04.8	16 33.0	0 19.6	22 48.0	2 08.8	1 55.6
17	0 30.3	5 02.8	1 27.8	9 50.6	1 05.0	16 03.9	0 19.8	22 49.3	2 08.7	1 50.1
19	0 59.7	3 40.2	1 27.4	8 53.5	1 05.2	15 34.1	0 20.0	22 50.4	2 08.5	1 44.6
21	1 30.2	2 27.1	1 26.8	7 55.6	1 05.3	15 03.7	0 20.1	22 51.4	2 08.3	1 39.0
23	2 00.7	1 27.0	1 25.8	6 56.8	1 05.5	14 32.7	0 20.3	22 52.3	2 08.2	1 33.3
25	2 29.9	0 42.5	1 24.7	5 57.3	1 05.6	14 01.1	0 20.4	22 53.1	2 08.1	1 27.7
27	+2 56.1	-0 16.2	-1 23.2	-4 57.2	-1 05.6	-13 28.9	+0 20.5	+22 53.9	-2 08.0	-1 21.9

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GEOCENTRIC LATITUDE AND DECLINATION FOR 5^h 28^m.8 I.S.T.

Date	Mercury		Venus		Mars		Jupiter		Saturn	
	Latitude	Declination	Latitude	Declination	Latitude	Declination	Latitude	Declination	Latitude	Declination
	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "
Mar. 1	+3 17.7	-0 09.4	-1 21.5	-3 56.5	-1 05.7	-12 56.2	+0 20.7	+22 54.5	-2 07.8	-1 16.2
3	3 32.9	0 22.0	1 19.6	2 55.4	1 05.7	12 23.0	0 20.8	22 55.0	2 07.8	1 10.4
5	3 40.4	0 52.6	1 17.4	1 54.0	1 05.7	11 49.3	0 20.9	22 55.5	2 07.7	1 04.6
7	3 39.5	1 37.8	1 14.9	-0 52.4	1 05.6	11 15.2	0 21.0	22 55.8	2 07.6	0 58.7
9	3 30.4	2 33.0	1 12.3	+0 09.4	1 05.6	10 40.6	0 21.2	22 56.1	2 07.5	0 52.8
11	3 13.8	3 33.2	1 09.3	1 11.2	1 05.5	10 05.7	0 21.3	22 56.2	2 07.5	0 47.0
13	2 51.4	4 33.4	1 06.2	2 12.9	1 05.3	9 30.3	0 21.4	22 56.3	2 07.5	0 41.1
15	2 24.8	5 29.6	1 02.8	3 14.5	1 05.2	8 54.7	0 21.5	22 56.3	2 07.4	0 35.1
17	1 55.9	6 18.9	0 59.2	4 15.9	1 05.0	8 18.7	0 21.6	22 56.2	2 07.4	0 29.2
19	1 26.1	6 59.6	0 55.5	5 16.9	1 04.8	7 42.4	0 21.7	22 56.0	2 07.4	0 23.3
21	0 56.5	7 30.7	0 51.5	6 17.4	1 04.5	7 05.8	0 21.8	22 55.7	2 07.4	0 17.4
23	0 27.8	7 52.2	0 47.3	7 17.4	1 04.2	6 29.1	0 21.9	22 55.3	2 07.5	0 11.5
25	+0 00.8	8 04.1	0 43.0	8 16.7	1 03.9	5 52.1	0 22.0	22 54.8	2 07.5	-0 05.6
27	-0 24.5	8 06.8	0 38.5	9 15.2	1 03.6	5 14.9	0 22.1	22 54.2	2 07.5	+0 00.3
29	0 47.6	8 00.9	0 33.8	10 12.9	1 03.2	4 37.6	0 22.1	22 53.6	2 07.6	0 06.2
31	1 08.6	7 46.8	0 29.0	11 09.7	1 02.8	4 00.2	0 22.2	22 52.8	2 07.7	0 12.0
Apr. 2	1 27.3	7 25.1	0 24.1	12 05.4	1 02.4	3 22.7	0 22.3	22 52.0	2 07.8	0 17.9
4	1 43.9	6 56.2	0 19.1	12 59.9	1 02.0	2 45.1	0 22.4	22 51.1	2 07.8	0 23.7
6	1 58.1	6 20.6	0 13.9	13 53.2	1 01.5	2 07.4	0 22.5	22 50.1	2 08.0	0 29.4
8	2 10.2	5 38.6	0 08.7	14 45.2	1 01.0	1 29.8	0 22.6	22 49.0	2 08.1	0 35.2
10	2 20.1	4 50.8	-0 03.3	15 35.7	1 00.5	0 52.1	0 22.6	22 47.8	2 08.2	0 40.9
12	2 27.8	3 57.3	+0 02.1	16 24.7	0 59.9	-0 14.4	0 22.7	22 46.5	2 08.4	0 46.6
14	2 33.3	2 58.5	0 07.5	17 12.0	0 59.3	+0 23.2	0 22.8	22 45.1	2 08.5	0 52.2
16	2 36.8	1 54.7	0 13.0	17 57.6	0 58.7	1 00.7	0 22.9	22 43.6	2 08.7	0 57.7
18	2 38.0	-0 46.2	0 18.5	18 41.3	0 58.0	1 38.1	0 22.9	22 42.0	2 08.9	1 03.3
20	2 37.2	+0 26.7	0 24.1	19 23.1	0 57.4	2 15.4	0 23.0	22 40.4	2 09.0	1 08.7
22	-2 34.3	+1 43.8	+0 29.6	+20 02.9	-0 56.7	+2 52.6	+0 23.1	+22 38.6	-2 09.2	+1 14.2

URANUS, NEPTUNE AND PLUTO, 2026

APPARENT GEOCENTRIC LONGITUDE FOR 5^h 28^m.8 I.S.T.

Date	Uranus	Neptune	Pluto	Date	Uranus	Neptune	Pluto
	° ' "	° ' "	° ' "		° ' "	° ' "	° ' "
Jan. 0	57 58 38	359 29 41	302 41 19	Feb. 25	57 39 09	0 54 06	304 25 24
2	57 55 20	359 31 10	302 44 56	27	57 41 27	0 58 21	304 28 44
4	57 52 12	359 32 48	302 48 36	Mar. 1	57 43 57	1 2 38	304 32 01
6	57 49 14	359 34 33	302 52 17	3	57 46 38	1 6 58	304 35 14
8	57 46 26	359 36 26	302 56 00	5	57 49 30	1 11 20	304 38 22
10	57 43 49	359 38 26	302 59 45	7	57 52 35	1 15 45	304 41 27
12	57 41 23	359 40 34	303 3 31	9	57 55 50	1 20 11	304 44 27
14	57 39 07	359 42 50	303 7 19	11	57 59 17	1 24 39	304 47 23
16	57 37 04	359 45 13	303 11 08	13	58 2 54	1 29 09	304 50 14
18	57 35 12	359 47 44	303 14 58	15	58 6 43	1 33 40	304 53 01
20	57 33 32	359 50 21	303 18 48	17	58 10 41	1 38 12	304 55 42
22	57 32 04	359 53 05	303 22 39	19	58 14 50	1 42 44	304 58 18
24	57 30 48	359 55 56	303 26 29	21	58 19 09	1 47 17	305 0 49
26	57 29 45	359 58 53	303 30 20	23	58 23 37	1 51 50	305 3 14
28	57 28 54	0 1 57	303 34 10	25	58 28 16	1 56 23	305 5 35
30	57 28 16	0 5 07	303 38 00	27	58 33 03	2 0 56	305 7 49
Feb. 1	57 27 50	0 8 23	303 41 50	29	58 37 59	2 5 28	305 9 58
3	57 27 37	0 11 45	303 45 38	31	58 43 04	2 9 59	305 12 00
5	57 27 37	0 15 12	303 49 25	Apr. 2	58 48 16	2 14 29	305 13 57
7	57 27 49	0 18 45	303 53 10	4	58 53 37	2 18 58	305 15 47
9	57 28 14	0 22 22	303 56 54	6	58 59 06	2 23 26	305 17 31
11	57 28 51	0 26 05	304 0 36	8	59 4 42	2 27 52	305 19 10
13	57 29 42	0 29 53	304 4 17	10	59 10 25	2 32 16	305 20 42
15	57 30 45	0 33 45	304 7 55	12	59 16 15	2 36 38	305 22 07
17	57 32 01	0 37 42	304 11 30	14	59 22 12	2 40 57	305 23 26
19	57 33 29	0 41 42	304 15 03	16	59 28 15	2 45 14	305 24 39
21	57 35 10	0 45 46	304 18 33	18	59 34 23	2 49 27	305 25 44
23	57 37 03	0 49 54	304 21 60	20	59 40 38	2 53 38	305 26 43
25	57 39 09	0 54 06	304 25 24	22	59 46 58	2 57 46	305 27 36

In the following pages, a short explanation of the terms used in this Ephemeris has been given and the scope and limitations of the information furnished have been stated in a concise form. The values of the different constants and other data upon which the tabulated quantities are based have also been given in some cases in order to facilitate the use of this Ephemeris. It is not intended to furnish here any detailed explanation about the compilation of the tabular matter for which the reader is referred to the relevant literature.

Many changes have been incorporated in this publication from time to time including several recommendations of IAU at its General Assembly.

THE STANDARD EPOCH AND TIME SCALES

There are two classes of time scales used in Astronomy, one based on the Systeme International (SI) - the atomic second, the other based on the rotation of the Earth. Time scales based on the SI second include TAI and TT for practical applications. Time scale based on the rotation of the Earth include mean and apparent sidereal time and UT1. Because of irregularities in the Earth's rotation and its tidal deceleration, Earth's rotation based time scales do not advance at a uniform rate, and they increasingly lag behind the SI-second-based time scales. The widely disseminated time scale UTC is a hybrid, it advances by SI seconds but is subject to one-second corrections (leap seconds) to keep it within 0^s.9 of UT1.

The standard epoch J 2000.0 corresponds to 2000 January 1, 12^h TT (JD 245 1545.0 TT). A date may be expressed in years as a Julian epoch or for some purposes as a Besselian epoch.

$$\text{Julian epoch} = J [2000.0 + (JD - 245\,1545.0) / 365.25]$$

Where the quantity in the denominator is the Julian year.

$$\text{Besselian epoch} = B [1900.0 + (JD - 241\,5020.313\,52) / 365.242\,198\,781]$$

Where the quantity in the denominator is the length of tropical year.

Prefixes J and B stand for the Julian and Besselian epochs respectively.

Various time systems used in this publication and their inter-relationships are described below :

Sidereal time system is derived from the Earth's rotation with respect to the stars. Local sidereal time is defined as the local hour angle of the vernal equinox. It is 0^h at the instant when the vernal equinox is at the upper transit of the local meridian. It is determined from observation of meridian transits of known stars. As the equinox oscillates about its mean position due to the effect of nutation, it gives rise to two kinds of sidereal time : the apparent sidereal time which is the hour angle of the true equinox of date and the mean sidereal time which is the hour angle of the mean equinox of date. The relation between the two is:

$$\text{Apparent sidereal time} = \text{Mean sidereal time} + \text{Equation of Equinoxes}$$

Equation of equinoxes is the total nutation in longitude multiplied by the cosine of the obliquity of the ecliptic. Its value varies within ± 1.2 seconds of time in a period of about 18.6 years.

Sidereal time on the geographic meridian of Greenwich is known as Greenwich sidereal time. Local sidereal time is related to Greenwich sidereal time (mean or apparent as appropriate) as follows:

Local sidereal time = Greenwich sidereal time + λ , where λ is the observer's longitude measured positively to the east (from 1985 onwards the sign convention for east terrestrial longitude to be positive has been adopted).

International Atomic Time (TAI) is a highly precise time scale given by atomic clocks. It is now being used as a standard in astronomy as it is independent of the Earth's rotation. Its fundamental unit, the SI second, is

defined as the duration of 9 192 631 770 cycles of the radiation corresponding to the transition between two hyperfine levels of the ground state of the Cesium 133 atom. This time scale results from analysis of data from atomic time standards of many countries carried out at the Bureau International de l'Heure in Paris.

Universal Time (UT) is used for civil time keeping. It is an outgrowth of the mean solar time system derived from the Earth's rotation with respect to the Sun. It has been formally defined through a strict relationship with the Greenwich mean sidereal time and is, therefore, determined from observation of star transits. The universal time directly derived from observation is designated UT_0 . It contains nonuniformities due to variations in the rotation of the Earth and is peculiar to the observer's geographic location because of polar motion. When UT_0 is corrected for Earth's polar motion, it is called UT1. When UT1 is further corrected for seasonal variation in the Earth's rotation, it is called UT2. Both UT_0 and UT2 are not for general usage. Instead, the national time services provide what is known as co-ordinated universal time (UTC). It is a smoothed version of UT2 and differs from TAI by an integral number of seconds. It contains step adjustments of exactly one second (leap seconds) in order to keep it always within 0.90 seconds of UT1. Beginning with 1972, the step adjustments are usually inserted after the 60th second of the last minute of December 31 or June 30. In this publication, UT1 has been used in computations relating to hour angles, etc., unless otherwise stated.

Dynamical Time replaces ephemeris time (ET) as argument of ephemerides with effect from 1985 in this publication. The concept of different dynamical times for observers in different frames of reference arises out of general theory of relativity. In this publication, terrestrial time (TT) is the tabular argument of the fundamental geocentric ephemerides and barycentric dynamical time (TDB) is the arguments of ephemerides referred to the barycentre of the solar system. The former corresponds to proper time and the latter to co-ordinate time in terms of the general theory of relativity. Both TT and TDB are independent of the Earth's rotation. These scales are so defined that the difference between them is purely periodic. Their difference is given by:-

$TDB = TT + 0^s.001\,657 \sin g + 0^s.000\,022 \sin (L - L_J)$, where higher order terms have been neglected. Here g is the mean anomaly of the Earth in its orbit around the Sun and is given by:-

$$\begin{aligned} g &= 357^\circ.53 + 0^\circ.985\,600\,28 (JD - 245\,1545.0) \\ L - L_J &= 246^\circ.11 + 0.902\,517\,92 (JD - 245\,1545.0) \end{aligned}$$

Where $L - L_J$ is the difference in the mean longitude of the Sun and Jupiter.

Relationship Between universal time and sidereal time

Universal time is defined in terms of Greenwich mean sidereal time by:

$$\text{GMST at } 0^h \text{ UT1} = 6^h 41^m 50^s.549\,377 + 864\,018\,4^s.704\,478 T_u + 0^s.092\,772 T_u^2 - 2^s.93 \times 10^{-8} T_u^3 - 1^s.997 \times 10^{-6} T_u^4 - 2^s.5 \times 10^{-9} T_u^5$$

where T_u is the number of Julian centuries of 36525 days of universal time elapsed since 1 January, 2000, 12^h UT (JD 245 154 5.0). In other words,

$$T_u = (JD - 245\,1545.0) / 36525$$

The above expression implies that the ratio of UT1 to GMST at the epoch J2000.0 is 0.997 269 566 329 084 and its inverse is 1.002 737 909 350 795.

The following relationship holds during 2025:

$$\text{On day of year } d \text{ at } t^h \text{ UT1 GMST} = 6^h.011\,108 + 0^h.065\,709\,8246d + 1^h.002\,737\,91t$$

where day of the year d is tabulated on pages 4 to 12.

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In 2025 :

- 1 mean solar day = 1.002 737 909 35 mean sidereal days
 = $24^{\text{h}} 03^{\text{m}} 56^{\text{s}}.555\ 37$ of mean sidereal time
 1 mean sidereal day = 0.997 269 566 33 mean solar days
 = $23^{\text{h}} 56^{\text{m}} 04^{\text{s}}.090\ 53$ of mean solar time

Conversion of local mean time to local sidereal time

Calculate local sidereal time at $15^{\text{h}} 54^{\text{m}} 42^{\text{s}}$ L.M.T. on 2025 January 1, for Delhi longitude,

$\lambda = 77^{\circ} 13' 00''$ East ($5^{\text{h}} 08^{\text{m}} 52^{\text{s}}$)

		h	m	s
1.	Universal time = Local mean time $-\lambda$	10	45	50
2.	Greenwich mean sidereal time at 0 ^h U.T. on January 1, 2024 (Page 13).	6	43	35.893
3.	Add equivalent mean sidereal time for $10\ 45\ 50$ (UT $\times 1.002\ 737\ 9093$).	10	47	36.094
4.	Greenwich mean sidereal time at desired L.M.T.	17	31	11.987
5.	Add equation of equinoxes at UT=0 ^d . 45 (second order interpolation may be used).			0.0755
6.	Greenwich apparent sidereal time	17	31	12.062
7.	Add longitude (east positive)	5	08	52.000
8.	Local apparent sidereal time	22	40	4.062

For local mean sidereal time, the above process may be repeated by neglecting the equation of equinoxes.

Conversion of local sidereal time to local mean time

Calculate local mean time at $22^{\text{h}} 40^{\text{m}} 4.062^{\text{s}}$ local apparent sidereal time on 2025 January 1, for Delhi longitude, $\lambda = 77^{\circ} 13' 00''$ East ($5^{\text{h}} 08^{\text{m}} 52^{\text{s}}$)

		h	m	s
1.	Local apparent sidereal time	22	40	4.062
2.	Subtract longitude (east positive)	5	08	52.000
3.	Greenwich apparent sidereal time	17	31	12.062
4.	Subtract equation of equinox at 0 ^h U.T.			0.1210
5.	Greenwich mean sidereal time (provisional)	17	31	11.941
6.	Subtract Greenwich mean sidereal time at 0 ^h U.T.	6	43	35.893
7.	Mean sidereal time interval (provisional) M.S.T. (P)	10	47	36.048

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7.	Mean sidereal time interval (provisional) M.S.T. (P)	10	47	36.048
8.	Mean time interval in days corresponding to (7) above = (M.S.T. (P) \times 0.997 269 566) = 0 ^d .45 (UT). Subtract the increment to equation of equinoxes for 0 ^d .45 UT (using second order interpolation)	(-)		0.1012
9.	Mean sidereal time	10	47	36.150
10.	Equivalent UT (MST \times 0.997 269 566)	10	45	50.055
11.	Local mean time = UT + λ	15	54	42.055

The mean time from the local mean sidereal time may be worked out on similar lines as above by neglecting the equation of equinoxes.

Notation for time-scales and related quantities

UT1	Universal time (also UT); counted from 0 ^h (mid night); unit is second of mean solar time, affected by irregularities in the Earth's rate of rotation.
UT0	local approximation to universal time; not corrected for polar motion (rarely used).
GMST	Greenwich mean sidereal time; GHA of mean equinox of date.
GAST	Greenwich apparent sidereal time; GHA of true Eqinox of date.
TAI	international atomic time; unit is the SI second of geoid.
UTC	coordinated universal time; differs from TAI by an integral number of seconds, and is the basis of most radio time signals and national and/ or legal time systems.
Δ UT	= UT1 – UTC; increment to be applied to UTC to give UT1
TDB	barycentric dynamical time; used as time-scale of ephemerides, referred to the barycentre of the solar system.
T_{eph}	the independent variable of the equations of motion used by the JPL ephemerides, in particular DE405/LE405. T_{eph} and TDB may be considered to be equivalent.
TT	terrestrial time; used as time-scale of ephemerides for observations from the Earth's surface (geoid).
TT	= TAI + 32 ^s .184.
Δ T	= TT – UT1; increment to be applied to UT1 to give TT. = TAI + 32 ^s .184 – UT1
Δ AT	= TAI – UT1; increment to be applied to UTC to give TAI; an integral number of seconds.
Δ TT	= TT – UTC = Δ AT + 32 ^s .184; increment to be applied to UTC to give TT.
UT1 - UT0	= – (x sin λ + y cos λ) tan ϕ / 15 where λ and ϕ are usual geodetic longitude and latitude of the place, and x and y are the co-ordinates of the pole with respect to the geodetic system, in arcseconds.
GAST	= GMST + $\epsilon_{\gamma}/15$, ϵ_{γ} is equation of equinox.
In order to convert the tabulations for 0 ^h TT to 0 ^h UT, one may interpolate to $\Delta T \delta_{1/2}/h$ where h is the tabular interval and $\delta_{1/2}$ is the first difference of the tabular values.	

REDUCTION OF TIME SCALES, 1620-1644

$$\Delta T = ET - UT$$

Year	ΔT s	Year	ΔT s	Year	ΔT s	Year	ΔT s	Year	ΔT s
1620.0	+124	1625.0	+102	1630.0	+85	1635.0	+72	1640.0	+62
1621	119	1626	98	1631	82	1636	70	1641	60
1622	115	1627	95	1632	79	1637	67	1642	58
1623	110	1628	91	1633	77	1638	65	1643	57
1624	+ 106	1629	+ 88	1634	+74	1639	+63	1644	+55

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REDUCTION OF TIME SCALES, 1645-1819

$$\Delta T = ET - UT$$

Year	ΔT	Year	ΔT	Year	ΔT	Year	ΔT	Year	ΔT
	s		s		s		s		s
1645.0	+ 54	1680.0	+ 16	1715.0	+ 10	1750.0	+ 13	1785.0	+ 17
1646	53	1681	15	1716	10	1751	14	1786	17
1647	51	1682	14	1717	11	1752	14	1787	17
1648	50	1683	14	1718	11	1753	14	1788	17
1649	49	1684	13	1719	11	1754	14	1789	17
1650.0	+ 48	1685.0	+ 12	1720.0	+ 11	1755.0	+ 14	1790.0	+ 17
1651	47	1686	12	1721	11	1756	14	1791	17
1652	46	1687	11	1722	11	1757	14	1792	16
1653	45	1688	11	1723	11	1758	15	1793	16
1654	44	1689	10	1724	11	1759	15	1794	16
1655.0	+ 43	1690.0	+ 10	1725.0	+ 11	1760.0	+ 15	1795.0	+ 16
1656	42	1691	10	1726	11	1761	15	1796	15
1657	41	1692	9	1727	11	1762	15	1797	15
1658	40	1693	9	1728	11	1763	15	1798	14
1659	38	1694	9	1729	11	1764	15	1799	14
1660.0	+ 37	1695.0	+ 9	1730.0	+ 11	1765.0	+ 16	1800.0	+ 13.7
1661	36	1696	9	1731	11	1766	16	1801	13.4
1662	35	1697	9	1732	11	1767	16	1802	13.1
1663	34	1698	9	1733	11	1768	16	1803	12.9
1664	33	1699	9	1734	12	1769	16	1804	12.7
1665.0	+ 32	1700.0	+ 9	1735.0	+ 12	1770.0	+ 16	1805.0	+ 12.6
1666	31	1701	9	1736	12	1771	16	1806	12.5
1667	30	1702	9	1737	12	1772	16	1807	12.5
1668	28	1703	9	1738	12	1773	16	1808	12.5
1669	27	1704	9	1739	12	1774	16	1809	12.5
1670.0	+ 26	1705.0	+ 9	1740.0	+ 12	1775.0	+ 17	1810.0	+ 12.5
1671	25	1706	9	1741	12	1776	17	1811	12.5
1672	24	1707	9	1742	12	1777	17	1812	12.5
1673	23	1708	10	1743	12	1778	17	1813	12.5
1674	22	1709	10	1744	13	1779	17	1814	12.5
1675.0	+ 21	1710.0	+ 10	1745.0	+ 13	1780.0	+ 17	1815.0	+ 12.5
1676	20	1711	10	1746	13	1781	17	1816	12.5
1677	19	1712	10	1747	13	1782	17	1817	12.4
1678	18	1713	10	1748	13	1783	17	1818	12.3
1679	+ 17	1714	+ 10	1749	+ 13	1784	+ 17	1819	+ 12.2

This table is based on an adopted value of $-26''/\text{cy}^2$ for the tidal term ($\dot{\mathbf{n}}$) in the mean motion of the Moon from the results of analyses of observations of lunar occultations of stars, eclipses of the Sun and transits of Mercury. (see F.R. Stephenson and L.V. Morrison, 1984 *PhD Trans*, R. Soc. London, Ser A, 313, 47-70).

To calculate the values of ΔT for a different value of the tidal term ($\dot{\mathbf{n}}'$), add $-0.000\,091\,(\dot{\mathbf{n}}' + 26)$ (year -1955)² seconds to the tabulated values of ΔT .

EXPLANATION

REDUCTION OF TIME SCALES FROM 1820

1820 - 1983, $\Delta T = ET - UT$.				From 1984, $\Delta T = TDT - UT$. 2001, $\Delta T = TT - UT$.					
Year	ΔT	Year	ΔT	Year	ΔT	Year	ΔT	Year	ΔT
	s		s		s		s		s
1820.0	+ 12.0	1863	6.97	1906	5.37	1949	28.71	1992	58.31
1821	11.7	1864	6.40	1907	6.14	1950.0	+ 29.15	1993	58.12
1822	11.4	1865.0	6.02	1908	7.75	1951	29.57	1994	59.98
1823	11.1	1866	5.41	1909	9.13	1952	29.97	1995.0	60.78
1824	10.6	1867	4.10	1910.0	+ 10.46	1953	30.36	1996	61.63
1825.0	10.2	1868	2.92	1911	11.53	1954	30.72	1997	62.29
1826	9.60	1869	1.82	1912	13.36	1955.0	31.07	1998	62.97
1827	9.10	1870.0	+ 1.61	1913	14.65	1956	31.35	1999	63.47
1828	8.60	1871	+ 0.10	1914	16.01	1957	31.68	2000.0	+ 63.83
1829	8.00	1872	− 1.02	1915.0	17.20	1958	32.18	2001	64.09
1830.0	+ 7.50	1873	1.28	1916	18.24	1959	32.68	2002	64.30
1831	7.00	1874	2.69	1917	19.06	1960.0	+ 33.15	2003	64.47
1832	6.60	1875.0	3.24	1918	20.25	1961	33.59	2004	64.57
1833	6.30	1876	3.64	1919	20.95	1962	34.00	2005.0	+ 64.69
1834	6.00	1877	4.54	1920.0	+ 21.16	1963	34.47	2006	64.85
1835.0	5.80	1878	4.71	1921	22.25	1964	35.03	2007	65.15
1836	5.70	1879	5.11	1922	22.41	1965.0	35.73	2008	65.46
1837	5.60	1880.0	− 5.40	1923	23.03	1966	36.54	2009	65.78
1838	5.60	1881	5.42	1924	23.49	1967	37.43	2010.0	+ 66.07
1839	5.60	1882	5.20	1925.0	23.62	1968	38.29	2011	66.32
1840.0	+ 5.70	1883	5.46	1926	23.86	1969	39.20	2012	66.60
1841	5.80	1884	5.46	1927	24.49	1970.0	+ 40.18	2013	66.91
1842	5.90	1885.0	5.79	1928	24.34	1971	41.17	2014	67.28
1843	6.10	1886	5.63	1929	24.08	1972	42.23	2015.0	67.64
1844	6.20	1887	5.64	1930.0	+ 24.02	1973	43.37	2016	68.10
1845.0	6.30	1888	5.80	1931	24.00	1974	44.49	2017	68.59
1846	6.50	1889	5.66	1932	23.87	1975.0	45.48	2018	68.97
1847	6.60	1890.0	− 5.87	1933	23.95	1976	46.46	2019	69.22
1848	6.80	1891	6.01	1934	23.86	1977	47.52	2020.0	+ 69.36
1849	6.90	1892	6.19	1935.0	23.93	1978	48.53	2021	69.36
1850.0	+ 7.10	1893	6.64	1936	23.73	1979	49.59	2022	69.29
1851	7.20	1894	6.44	1937	23.92	1980.0	+ 50.54	2023	69.20
1852	7.30	1895.0	6.47	1938	23.96	1981	51.38		
1853	7.40	1896	6.09	1939	24.02	1982	52.17		
1854	7.50	1897	5.76	1940.0	+ 24.33	1983	52.96		
1855.0	7.60	1898	4.66	1941	24.83	1984	53.79		
1856	7.70	1899	3.74	1942	25.30	1985.0	54.34		
1857	7.70	1900.0	− 2.72	1943	25.70	1986	54.87		
1858	7.80	1901	1.54	1944	26.24	1987	55.32		
1859	7.80	1902	− 0.02	1945.0	26.77	1988	55.82		
1860.0	+ 7.88	1903	+ 1.24	1946	27.28	1989	56.30		
1861	7.82	1904	2.64	1947	27.78	1990.0	+ 56.86		
1862	7.54	1905.0	3.86	1948	28.25	1991	57.57		
Extrapolated Values									
2024	+ 69.10	2026	+ 69	2028	+ 69				
2025	+ 69.00	2027	+ 69						

Difference TAI – UTC = ΔT							
Date	ΔT s	Date	ΔT s	Date	ΔT s	Date	ΔT s
1972 Jul.1	+ 11.00	1979 Jan.1	+ 18.00	1990 Jan.1	+ 25.00	1999 Jan. 1	+ 32.00
1973 Jan.1	+ 12.00	1980 Jan.1	+ 19.00	1991 Jan.1	+ 26.00	2006 Jan. 1	+ 33.00
1974 Jan.1	+ 13.00	1981 Jul.1	+ 20.00	1992 Jul.1	+ 27.00	2009 Jan. 1	+ 34.00
1975 Jan.1	+ 14.00	1982 Jul.1	+ 21.00	1993 Jul.1	+ 28.00	2012 Jul. 1	+ 35.00
1976 Jan.1	+ 15.00	1983 Jul.1	+ 22.00	1994 Jul.1	+ 29.00	2015 Jul. 1	+ 36.00
1977 Jan.1	+ 16.00	1985 Jul.1	+ 23.00	1996 Jan.1	+ 30.00	2017 Jan. 1	+ 37.00
1978 Jan.1	+ 17.00	1988 Jan.1	+ 24.00	1997 Jul.1	+ 31.00	In critical cases descend	
1979 Jan.1		1990 Jan.1		1999 Jan.1		ΔT	
						$= \Delta AT + 32^s.184$	
						ΔTT	

From 1990 onwards, ΔT is for Jan. 1 0^h UTC.

See page 2 for a summary of the notation for time-scales.

Astronomical Reference System and Reference Frames

A reference system is the complete specification of how a celestial coordinate system is to be formed. Both the origin and the orientation of the fundamental planes (or axes) are defined. A reference system also incorporates a specification of the fundamental models needed to construct the system; that is, the basis for the algorithms used to transform between observable quantities and reference data in the system. A reference frame, on the other hand, consists of a set of identifiable fiducial points on the sky along with their coordinates, which serves as the practical realization of a reference system.

For example, the fundamental plane of an astronomical reference system has conventionally been the extension of the Earth's equatorial plane, at some date, to infinity. Declination is the angular distance north or south of this plane, and right ascension is the angular distance measured eastward along the equator from some defined reference point. This reference point, the right ascension origin, has traditionally been the Equinox: the point at which the Sun, in its yearly circuit of the celestial sphere, crosses the equatorial plane moving from south to north. The Sun's apparent yearly motion lies in the ecliptic, the plane of the Earth's orbit. The equinox, therefore, is a direction in the space along the nodal line defined by the intersection of the ecliptic and equatorial planes; equivalently, on the celestial sphere, the equinox is at one of the two intersections of the great circles representing these planes. Because both of these planes are moving, the coordinate systems that they define must have a date associated with them; such a reference system must therefore be specified as "the equator and equinox of (some date)".

Of course, such a reference system is an idealization, because the theories of motion of the Earth that define how the two planes move are imperfect. In fact, the very definitions of these planes are problematic for high precession work. Even if the fundamental planes of a reference system are defined without any reference to the motions of the Earth, there is no way magically to paint them on the celestial sphere at any particular time. Therefore, in practice, we use a specific reference frame - a set of fiducial objects with assigned coordinates - as the practical representation of an astronomical reference system. The scheme is completely analogous to how terrestrial reference systems are established using survey control stations (geodetic reference point) on the Earth's surface.

Most commonly, a reference frame consists of a catalog of precise positions (and motions, if measurable) of stars or extragalactic objects as seen from the solar system barycenter at a specific epoch (now usually "J2000.0", which is 12h TT on January 2000). Each object's instantaneous position, expressed as right ascension and declination, indicates the object's angular distance from the catalog's equator and origin of right ascension. Any two such objects in the catalog (if they are not coincident or antipodal) therefore uniquely orient a spherical coordinate system on the sky - a reference frame.

A modern astrometric catalog contains data on a large number of objects (N), so the coordinate system is vastly overdetermined. The quality of the reference frame defined by a catalog depends on the extent to which the coordinates of all possible pairs of objects ($N^2/2$) serve to the identical equator and right ascension origin, within the expected random errors. Typically, every catalog contains systematic errors, that is, errors in position that are similar for objects that are in the same area of the sky, or are of the same magnitude (flux) or color (spectral index). Systematic errors mean that the reference frame is warped, or is effectively different for different classes of objects. Obviously, minimizing systematic errors when a catalog is constructed is at least as important as minimizing the random errors.

To be useful, a reference frame must be implemented at the time of actual observations, and this requires the computation of the apparent coordinates of the catalog objects at arbitrary dates and times. The accuracy with which we know the motions of the objects across the sky is an essential factor in this computation. Astrometric star catalogs list proper motions, which are the projection of each star's space motion onto the celestial sphere, expressed as an angular rate in right ascension and declination per unit time. Because the tabulated proper motions are never perfect, any celestial reference frame deteriorates with time. Moreover, systematic errors in the proper motions can produce time-dependent warpings and spurious rotations of the frame. Therefore, the accuracy and consistency of the proper motions are critical to the overall quality, utility, and longevity of reference frames defined by stars. Even reference frames defined by extragalactic objects, which are usually considered to have zero proper motion, may deteriorate, because many of these objects show small apparent motions that are artifacts of their emission mechanisms.

The position of solar system objects can also be used to define a reference frame. For each solar system body involved, an ephemeris is used, which is simply a table of the celestial coordinates of the body as a function of time (or an algorithm that yields such a table). A reference frame defined by the ephemerides of one or more solar system bodies is called a dynamical reference frame. Because the ephemerides used incorporate the motion of the Earth as well as that of the other solar system bodies, dynamical reference frames embody in a very fundamental way the moving equator and ecliptic, hence the equinox. They have therefore been used to correct the orientation of star catalog reference frames (the star positions were systematically adjusted) on the basis of simultaneous observations of star and planets. In a sense, the solar system is used as a gyrocompass. However, dynamical reference frames are not very practical for establishing a coordinate system for day to day astronomical observations.

Descriptions of reference frames and reference systems often refer to three coordinate axes, which are simply the set of right-handed cartesian axes that correspond to the usual celestial spherical coordinate system. The xy -plane is the equator, the z -axis points toward the north celestial pole, and the x -axis points toward the origin of right ascension. Although in principle this allows us to specify the position of any celestial object in rectangular coordinates, the distance scale (based on stellar parallaxes) is not established to high precision beyond the solar system. What a reference system actually defines is the way in which the two conventional astronomical angular coordinates, right ascension and declination, overlay real observable points in the sky.

The fundamental celestial reference system for astronomical application is now the International Celestial Reference System (ICRS) as provided in resolution B2 of 1997. The "realization" of the ICRS, called the International Celestial Reference Frame (ICRF), is a set of high accuracy positions of extragalactic radio sources measured by very long baseline interferometry.

The IAU Working Group on nomenclature for Fundamental Astronomy has recommended the following definitions for ICRS and ICRF:

International Celestial Reference System (ICRS): The idealized barycentric co-ordinate system to which celestial positions are referred. It is kinematically non-rotating with respect to the ensemble of distant extragalactic objects. It has no intrinsic orientation but was aligned close to the mean equator and dynamical equinox of J2000.0 for continuity with previous fundamental reference systems. Its orientation is independent of epoch, ecliptic or equator and is realized by a list of adopted coordinates of extragalactic sources.

International Celestial Reference Frame (ICRF): A set of extragalactic objects whose adopted positions and uncertainties realize the ICRS axes and give the uncertainties of the axes. It is also the name of radio catalogue whose 212 defining sources are currently the most accurate realization of the ICRS. The orientation of the ICRF catalogue was carried over from earlier IERS radio catalogs and was within the errors of the standard stellar and dynamical frames at the time of adoption. Successive revision of the ICRF are intended to minimize rotation from its original orientation.

Some important reference systems and their designations as per IAU 2000 resolution B1.6, B1.7 and B1.8, and IAU 2006 resolutions 1 and 2 are listed below:

(i) Barycentric Celestial Reference System (BCRS): a system of barycentric space-time coordinates for the solar system within the framework of General Relativity. For all practical applications, the BCRS is assumed to be oriented according to the ICRS axes, the directions of which are realized by the International Celestial Reference Frame. The ICRS is not identical to the system defined by the dynamical mean equator and equinox of J2000.0, although the difference in orientation is only about $0''.02$.

(ii) The Geocentric Celestial Reference System (GCRS): is a system of geocentric space-time coordinates within the framework of General Relativity. The directions of the GCRS axes are obtained from those of the BCRS (ICRS) by a relativistic transformation. Positions of stars obtained from ICRS reference data, corrected for proper motion, parallax, light-bending, and aberration (for a geocentric observer) are with respect to the GCRS. The same is true for planetary positions, although the corrections are somewhat different.

(iii) The J2000.0 dynamical reference system: mean equator and equinox of J2000.0; a geocentric system where the origin of right ascension is the intersection of the mean ecliptic and equator of J2000.0; the system in which the IAU 2000 precession-nutation is defined. For precise applications a small rotation (frame bias) should be made to GCRS positions before precession and nutation are applied. The J2000.0 system may also be barycentric, for example as the reference system for catalogues.

(iv) The true system of date (t); true equator and equinox of date: a geocentric system of date, the pole of which is the celestial intermediate pole (CIP), with the origin of right ascension at the equinox on the true equator of date (intermediate equator). It is a system “between” the GCRS and the Terrestrial Intermediate Reference System that separates the components labelled precession-nutation and polar motion.

(v) The Celestial Intermediate Reference System (i): the IAU recommended geocentric system of date, the pole of which is the celestial intermediate pole (CIP), with the origin of right ascension at the celestial intermediate origin (CIO) which is located on the intermediate equator (true equator of date). It is a system “between” (intermediate) the GCRS and the Terrestrial Intermediate Reference System that separates the components labelled precession-nutation and polar motion.

Precession and Nutation

The algorithms for precession were based on the IAU (1976) value for the rate of general precession in ecliptic longitude. Nutation was given by the 1980 IAU Theory of Nutation. However, IAU (1976) rate of precession had been overestimated by approximately 3 milliarcseconds per year. Further observations also revealed periodic errors of a few milliarcseconds in the 1980 IAU Theory of Nutation.

As part of the 2000 IAU resolutions, the IAU 2000A precession-nutation model was introduced, based on an updated value for the rate of precession and a completely new nutation theory. As before, the model actually consists of two parts, a precession algorithm describing the smooth secular motion of the celestial pole and a nutation algorithm describing the small periodic variations in the pole’s position. The precession algorithm consists of short polynomial series for the values of certain angles. The sines and cosines of these angles, in combination, then define the elements of a precession matrix, **P**. The nutation algorithm consists of a rather long series expansion in Fourier terms for the angular offsets, in ecliptic longitude and latitude, of the actual celestial pole (as modeled) from the precession-only pole (true pole - mean pole). The sines and cosines of these offsets, in combination, then define the elements of a nutation matrix, **N**. The **P** and **N** matrices are applied to the coordinates of celestial objects, expressed as 3-vectors, to transform them from the equator and equinox of one epoch to the equator and equinox of another.

EXPLANATION

A precession transformation is applied to celestial coordinates to convert them from the mean equator and equinox of J2000.0 to the mean equator and equinox of another date, t . Nutation is applied to the resulting coordinates to transform them to the true equator and equinox of t . Generally we will start with celestial coordinates in the GCRS, which are obtained from basic ICRS data by applying the usual algorithms for proper place. Therefore before we apply precession and nutation - we must first apply the frame bias correction to transform the GCRS coordinates to the dynamical mean equator and equinox of J2000.0. Schematically,

GCRS => frame bias = mean equator & equinox of J2000.0 = precession =>

mean equator & equinox of t = nutation => true equator & equinox of t .

The reduction from a geocentric position \mathbf{r} with respect to the Geocentric Celestial Reference System (GCRS) to a position \mathbf{r}_t with respect to equator and equinox of date, and vice versa, is given by;

$$\mathbf{r}_t = \mathbf{M} \mathbf{r} \quad \text{and} \quad \mathbf{r} = \mathbf{M}^{-1} \mathbf{r}_t$$

Using the 4-rotation Fukushima-Williams (F-W) method, the rotation matrix \mathbf{M} may be written as

$$\mathbf{M} = \mathbf{N} \mathbf{P} \mathbf{B}$$

Since the rotation to orient the GCRS to J2000.0 system are small the following approximate matrix \mathbf{B} is called frame bias matrix, accurate to $2'' \times 10^{-9}$ (1×10^{-14} radians), may be used:

$$\mathbf{B} = \begin{bmatrix} 1 & d\alpha_0 & -\xi_0 \\ -d\alpha_0 & 1 & -\eta_0 \\ \xi_0 & \eta_0 & 1 \end{bmatrix}$$

where $d\alpha_0 = -14.6$ mas, $\xi_0 = -16.6170$ mas, and $\eta_0 = -6.8192$ mas, all converted to radians (divide by 206 264 806.247).

Precession

The time argument T is given by

$$T = (t - 2000.0)/100 = (\text{JD}_{\text{TT}} - 2451545.0)/36525, \text{ which is a function of TT.}$$

The Capitine *et al.* method, the formulation of which separates precession of the equator from precession of the ecliptic, is via the precession angles χ_A , ω_A , ψ_A , which are

$$\psi_A = 5038''.481\,507\,T - 1''.079\,0069\,T^2 - 0''.001\,140\,45\,T^3 + 0''.000\,132\,851\,T^4 - 9''.51 \times 10^{-8}\,T^5$$

$$\omega_A = \varepsilon_0 - 0''.025\,754\,T + 0''.051\,2623\,T^2 - 0''.007\,725\,03\,T^3 - 0''.000\,000\,467\,T^4 + 33''.37 \times 10^{-8}\,T^5$$

$$\chi_A = 10''.556\,403\,T - 2''.381\,4292\,T^2 - 0''.001\,211\,97\,T^3 + 0''.000\,170\,663\,T^4 - 5''.60 \times 10^{-8}\,T^5$$

The mean obliquity of the ecliptic at J2000.0 (or the equivalent TDB date) is $\varepsilon_0 = 84381''.406$

(i) A rotation from the mean equator and equinox of J2000.0 to the mean ecliptic and equinox of J2000.0. This is simply a rotation around the x-axis (the direction toward the mean equinox of J2000.0) by the angle ε_0 , the mean obliquity of J2000.0. After the rotation, the fundamental plane is the ecliptic of J2000.0

(ii) A rotation around the new z-axis (the direction toward the ecliptic pole of J2000.0) by the angle $-\psi_A$, the amount of precession of the equator from J2000.0 to t .

(iii) A rotation around the new x-axis (the direction along the intersection of the mean equator of t with the ecliptic of J2000.0) by the angle $-\omega_A$, the obliquity of the mean equator of t with respect to the ecliptic of J2000.0. After the rotation, the fundamental plane is the mean equator of t .

(iv) A rotation around the new z-axis (the direction toward the mean celestial pole of t) by the angle χ_A , accounting for the precession of the ecliptic along the mean equator of t. After the rotation, the new x-axis is in the direction of the mean equinox of date.

$$\mathbf{P} = \begin{bmatrix} C_4 C_2 - S_2 S_4 C_3 & C_4 S_2 C_1 + S_4 C_3 C_2 C_1 - S_1 S_4 S_3 & C_4 S_2 S_1 + S_4 C_3 C_2 S_1 + C_1 S_4 S_3 \\ -S_4 C_2 - S_2 C_4 C_3 & -S_4 S_2 C_1 + C_4 C_3 C_2 C_1 - S_1 C_4 S_3 & -S_4 S_2 S_1 + C_4 C_3 C_2 S_1 + C_1 C_4 S_3 \\ S_2 S_3 & -S_3 C_2 C_1 - S_1 C_3 & -S_3 C_2 S_1 + C_3 C_1 \end{bmatrix}$$

where

$$\begin{array}{llll} S_1 = \sin \varepsilon_0 & S_2 = \sin (-\psi_A) & S_3 = \sin (-\omega_A) & S_4 = \sin \chi_A \\ C_1 = \cos \varepsilon_0 & C_2 = \cos (-\psi_A) & C_3 = \cos (-\omega_A) & C_4 = \cos \chi_A \end{array}$$

Existing applications that use the 3-angle precession formulation of Newcomb and Lieske can be easily modified for the IAU 2000A precession, by replacing the current polynomials for the angles ζ_A , Z_A and θ_A with the following:

$$\zeta_A = 2''.650545 + 2306''.083227 T + 0''.2988499 T^2 + 0''.01801828 T^3 - 0''.000005971 T^4 - 0''.0000003173 T^5$$

$$Z_A = -2''.650545 + 2306''.077181 T + 1''.0927348 T^2 + 0''.01826837 T^3 - 0''.000028596 T^4 - 0''.0000002904 T^5$$

$$\theta_A = 2004''.191903 T - 0''.4294934 T^2 - 0''.04182264 T^3 - 0''.000007089 T^4 - 0''.0000001274 T^5$$

The centennial (per Julian century) rates of general precession in right ascension and declination are given by :

$$m = 4612''.60408 + 2''.7831694 T + 0''.10885995 T^2 - 0''.000138268 T^3 \text{ and}$$

$$n = 2004''.191903 - 0''.8589868 T - 0''.12546792 T^2 - 0''.000028356 T^3$$

The elements of the matrix \mathbf{P} given in terms of ζ_A , Z_A , θ_A are as follows:

$$\mathbf{P} = \begin{bmatrix} \cos \zeta_A \cos \theta_A \cos Z_A - \sin \zeta_A \sin Z_A & -\sin \zeta_A \cos \theta_A \cos Z_A - \cos \zeta_A \sin Z_A & -\sin \theta_A \cos Z_A \\ \cos \zeta_A \cos \theta_A \sin Z_A + \sin \zeta_A \cos Z_A & -\sin \zeta_A \cos \theta_A \sin Z_A + \cos \zeta_A \cos Z_A & -\sin \theta_A \sin Z_A \\ \cos \zeta_A \sin \theta_A & -\sin \zeta_A \sin \theta_A & \cos \theta_A \end{bmatrix}$$

The formula for reduction of precession in right ascension and declination are as follows :

$$\begin{aligned} \sin (\alpha - Z_A) \cos \delta &= \sin (\alpha_o + \zeta_A) \cos \delta_o. \\ \cos (\alpha - Z_A) \cos \delta &= \cos (\alpha_o + \zeta_A) \cos \theta_A \cos \delta_o - \sin \theta_A \sin \delta_o \\ \sin \delta &= \cos (\alpha_o + \zeta_A) \sin \theta_A \cos \delta_o + \cos \theta_A \sin \delta_o \end{aligned}$$

$$\begin{aligned} \sin (\alpha_o + \zeta_A) \cos \delta_o &= \sin (\alpha - Z_A) \cos \delta \\ \cos (\alpha_o + \zeta_A) \cos \delta_o &= \cos (\alpha - Z_A) \cos \theta_A \cos \delta + \sin \theta_A \sin \delta \\ \sin \delta_o &= -\cos (\alpha - Z_A) \sin \theta_A \cos \delta + \cos \theta_A \sin \delta \end{aligned}$$

EXPLANATION

Values of the angles ζ_A, Z_A, θ_A and of the elements of the matrix P for reduction from the standard epoch J 2000.0 to epoch of year are as follows:

Epoch J 2025.5	Rotation matrix P for reduction to epoch J 2025.5
$\zeta_A = +590''.721 = +0^\circ.164089$ $Z_A = +585''.470 = +0^\circ.162631$ $\theta_A = +511''.040 = +0^\circ.141956$	$\mathbf{P} = \begin{bmatrix} +0.999\,980\,67 & -0.005\,702\,30 & -0.002\,477\,58 \\ +0.005\,702\,30 & +0.999\,983\,74 & -0.000\,007\,03 \\ +0.002\,477\,58 & -0.000\,007\,10 & +0.999\,996\,93 \end{bmatrix}$

The obliquity of the ecliptic of date (with respect to the mean equator of date) is given by:

$$\varepsilon = \varepsilon_0 - 46''.836\,769\,T - 0''.000\,183\,1\,T^2 + 0''.002\,003\,4\,T^3 - 0''.000\,000\,576\,T^4 - 0''.000\,000\,043\,4\,T^5$$

where $\varepsilon_0 = 84381''.406$

The precessional motion of the ecliptic specified by the inclination (π_A) and longitude of the node (Π_A) of the ecliptic of date with respect to the ecliptic and equinox of J 2000.0 are given by:

$$\begin{aligned} \sin \pi_A \sin \Pi_A &= +4''.199\,094\,T + 0''.193\,987\,T^2 - 0''.000\,224\,66\,T^3 \\ \sin \pi_A \cos \Pi_A &= -46''.811\,015\,T + 0''.051\,028\,T^2 + 0''.000\,524\,13\,T^3 \end{aligned}$$

For epoch J 2025.5

$$\begin{aligned} \varepsilon &= 23^\circ 26' 9''.46 &= 23^\circ.435\,962 \\ \pi_A &= +11''.983 &= 0^\circ.003\,328\,5 \\ \Pi_A &= 174^\circ 48'.8 &= 174^\circ.813 \end{aligned}$$

Approximate formulae for the reduction of precession in co-ordinates and orbital elements referred to the mean equinox and equator or ecliptic of date (t) are as follows :

Reduction to J 2000.0	Reduction from J 2000.0
$\alpha_o = \alpha - M - N \sin \alpha_m \tan \delta_m$	$\alpha = \alpha_o + M + N \sin \alpha_m \tan \delta_m$
$\delta_o = \delta - N \cos \alpha_m$	$\delta = \delta_o + N \cos \alpha_m$
$\lambda_o = \lambda - a + b \cos (\lambda + c') \tan \beta_o$	$\lambda = \lambda_o + a - b \cos (\lambda_o + c) \tan \beta$
$\beta_o = \beta - b \sin (\lambda + c')$	$\beta = \beta_o + b \sin (\lambda_o + c)$
$\Omega_o = \Omega - a + b \sin (\Omega + c') \cot i_o$	$\Omega = \Omega_o + a - b \sin (\Omega_o + c) \cot i$
$i_o = i - b \cos (\Omega + c')$	$i = i_o + b \cos (\Omega_o + c)$
$\omega_o = \omega - b \sin (\Omega + c') \operatorname{cosec} i_o$	$\omega = \omega_o + b \sin (\Omega_o + c) \operatorname{cosec} i$

The precessional constants M, N etc. are given by :

$$\begin{aligned} M &= 1^\circ.281\,155\,668\,9\,T + 0^\circ.000\,386\,551\,31\,T^2 + 0^\circ.000\,010\,079\,T^3 \\ N &= 0^\circ.556\,719\,973\,1\,T - 0^\circ.000\,119\,303\,72\,T^2 - 0^\circ.000\,011\,617\,4\,T^3 \\ a &= 1^\circ.396\,887\,83\,T + 0^\circ.000\,307\,065\,22\,T^2 \\ b &= 0^\circ.013\,055\,270\,3\,T - 0^\circ.000\,009\,303\,50\,T^2 \\ c &= 5^\circ.125\,890\,67 + 0^\circ.818\,993\,58\,T + 0^\circ.000\,104\,256\,09\,T^2 - 0^\circ.000\,104\,155\,607\,T^3 \\ c' &= 5^\circ.125\,890\,67 - 0^\circ.577\,894\,252\,T - 0^\circ.000\,164\,504\,28\,T^2 - 0^\circ.000\,104\,177\,728\,T^3 \end{aligned}$$

where $T = (t - 2000.0) / 100 = (JD_{TT} - 245\,1545.0) / 36525$

Formulae for the reduction from the mean equinox and equator or ecliptic of the middle of year (t_1) to date (t) are as follows :

$$\begin{aligned}\alpha &= \alpha_1 + \tau (m + n \sin \alpha_1 \tan \delta_1) & \delta &= \delta_1 + \tau n \cos \alpha_1 \\ \lambda &= \lambda_1 + \tau \{p - \pi \cos (\lambda_1 + 6^\circ) \tan \beta\} & \beta &= \beta_1 + \tau \pi \sin (\lambda_1 + 6^\circ) \\ \Omega &= \Omega_1 + \tau \{\rho - \pi \sin (\Omega_1 + 6^\circ) \cot i\} & i &= i_1 + \tau \pi \cos (\Omega_1 + 6^\circ) \\ \omega &= \omega_1 + \tau \pi \sin (\Omega_1 + 6^\circ) \operatorname{cosec} i\end{aligned}$$

where $\tau = t - t_1$ and π is the annual rate of rotation of the ecliptic. The precessional constants p , m , etc. are as follows :

	Epoch J 2025.5
Annual general precession	$p = + 0^\circ.013\,971\,29$
Annual precession in R.A.	$m = + 0^\circ.012\,814\,30$
Annual precession in Dec.	$n = + 0^\circ.005\,566\,93$
Annual rate of rotation	$\pi = + 0^\circ.000\,130\,52$
Longitude of axis	$\Pi = + 175^\circ.1094$
$\gamma = 180^\circ - \Pi = + 4^\circ.8906$	

where Π is the longitude of the instantaneous rotation axis of the ecliptic, measured from the mean equinox of date.

Nutation

The changes in the amplitudes of the nutation components are also not directly taken from the observations; instead a new nutation theory is developed and fit to observations by allowing a small number of geophysical constants to be free parameters. These parameters are constants in a “transfer function” that modifies the amplitudes of the terms from a rigid- Earth nutation development. Since there are fewer solved-for geophysical constants than the number of terms with observed amplitudes, the fit cannot be perfect. For the IAU 2000A model, 7 geophysical parameters were determined based on the observed amplitudes of 21 nutation terms (prograde and retrograde amplitudes for each) together with the apparent change in the rate of precession in longitude. Note that the number of free parameters in the model are both quite small compared to the 1365 terms in the new, full nutation series.

Nutation is conventionally expressed as two small angles, $\Delta\psi$ the nutation in longitude, and $\Delta\epsilon$, the nutation in obliquity. These angles are measured in the Ecliptic system of date, which is developed as a part of precession formulation. The angle $\Delta\psi$ is the small change in the position of the equinox along the ecliptic due to nutation, so effect of nutation on the ecliptic coordinates of a fixed point in the sky is simply to add $\Delta\psi$ to its ecliptic longitude. The angle $\Delta\epsilon$ is the small change in the obliquity of the ecliptic due to nutation. The true obliquity of date is $\epsilon' = \epsilon + \Delta\epsilon$. Nutation in obliquity reflects the orientation of the equator in space and does not affect the ecliptic coordinates of a fixed point on the sky.

Formulas for Nutation

l	is the mean anomaly of the Moon.
l'	is the mean anomaly of the Sun (Earth).
Ω	is the longitude of the ascending node of the Moon's mean orbit on the ecliptic, measured from the mean equinox of date.
D	is the mean elongation of the Moon from the Sun.
F	is the difference $L - \Omega$, where L is the mean longitude of the Moon.
ϵ	$= \epsilon_0 - 46''.836\,769\,T - 0''.000\,183\,1\,T^2 + 0''.002\,003\,4\,T^3 - 0''.000\,000\,576\,T^4 - 0''.000\,000\,043\,4\,T^5$
where $\epsilon_0 = 84381''.406$	

EXPLANATION

The fundamental arguments are given by:

The five arguments are the same fundamental luni - solar arguments used in previous nutation theories, but with updated expressions.

$$l = 485\,868''.249\,036 + (1325^{\circ} + 715\,923''.2178)T + 31''.8792\,T^2 + 0''.051\,635\,T^3 - 0''.000\,244\,70\,T^4$$

$$l' = 128\,7104''.793\,04 + (99^{\circ} + 129\,2581''.048)T - 0''.5532\,T^2 - 0''.000\,136\,T^3 - 0''.000\,011\,49\,T^4$$

$$F = 335\,779''.526\,232 + (1342^{\circ} + 295\,262''.8478)T - 12''.7512\,T^2 - 0''.001\,037\,T^3 + 0''.000\,004\,17\,T^4$$

$$D = 107\,2260''.703\,69 + (1236^{\circ} + 110\,5601''.209)T - 6''.3706\,T^2 + 0''.006\,593\,T^3 - 0''.000\,031\,69\,T^4$$

$$\Omega = 450\,160''.398\,036 - (5^{\circ} + 482\,890''.5431)T + 7''.722\,T^2 + 0''.007\,702\,T^3 - 0''.000\,059\,39\,T^4$$

$$\text{where } l^{\circ} = 360^{\circ} = 129\,6000''$$

Reduction for nutation - rigorous formulae

Nutation in longitude ($\Delta\psi$) and obliquity ($\Delta\varepsilon$) have been calculated using IAU 2000A series definitions (order of 1 μas) with the following adjustments which are required for use at the highest precession with the IAU 2006 precession, viz:

$$\Delta\psi = \Delta\psi_{2000A} + (0.4697 \times 10^{-6} - 2.7774 \times 10^{-6}T) \Delta\psi_{2000A}$$

$$\Delta\varepsilon = \Delta\varepsilon_{2000A} - 2.7774 \times 10^{-6}T \Delta\varepsilon_{2000A}$$

where T is measured in Julian centuries from 245 1545.0 TT. $\Delta\psi$ and $\Delta\varepsilon$ together with the true obliquity of the ecliptic (ε') are tabulated daily at 0^h TT, on page 18 to 32.

Once the nutation series has been evaluated and the values of $\Delta\psi$ and $\Delta\varepsilon$ are available, the nutation matrix can be constructed.

A mean place (\mathbf{r}_m) may be transformed to a true place (\mathbf{r}_t) and vice versa, as follows:

$$\mathbf{r}_t = \mathbf{N} \mathbf{r}_m \quad \mathbf{r}_m = \mathbf{N}^{-1} \mathbf{r}_t$$

$$\text{where } \mathbf{N} = \mathbf{R}_1(-\varepsilon') \mathbf{R}_3(-\Delta\psi) \mathbf{R}_1(+\varepsilon)$$

$$\varepsilon' = \varepsilon + \Delta\varepsilon$$

\mathbf{R}_1 and \mathbf{R}_3 are the standard rotations about the x and z axes respectively.

(i) A rotation from the mean equator and equinox of t to the mean ecliptic and equinox of t. This is simply a rotation around the x - axis (the direction toward the mean equinox of t) by the angle ε , the mean obliquity of t.

(ii) A rotation around the new z-axis (the direction toward the ecliptic pole of t) by the angle $-\Delta\psi$, the amount of nutation in longitude at t. After the rotation, the new x- axis is in the direction of true equinox of t.

(iii) A rotation around the new x-axis (the direction toward true equinox of t by the angle $-\varepsilon'$, the true obliquity of t. After the rotation, the fundamental plane is the true equator of t, orthogonal to the computed position of the CIP at t.

The nutation matrix can be written:

$$\mathbf{N} = \begin{bmatrix} C_2 & S_2C_1 & S_2S_1 \\ -S_2C_3 & C_3C_2C_1 - S_1S_3 & C_3C_2S_1 + C_1S_3 \\ S_2S_3 & -S_3C_2C_1 - S_1C_3 & -S_3C_2S_1 + C_3C_1 \end{bmatrix}$$

$$\begin{array}{lll} \text{where} & S_1 = \sin(\varepsilon) & S_2 = \sin(-\Delta\psi) & S_3 = \sin(-\varepsilon - \Delta\varepsilon) \\ & C_1 = \cos(\varepsilon) & C_2 = \cos(-\Delta\psi) & C_3 = \cos(-\varepsilon - \Delta\varepsilon) \end{array}$$

Approximate reduction for nutation for converting mean place to true place can be done with the help of the following formulae:

$$\Delta\alpha = (\cos \varepsilon + \sin \varepsilon \sin \alpha \tan \delta) \Delta\psi - \cos \alpha \tan \delta \Delta\varepsilon$$

$$\Delta\delta = \sin \varepsilon \cos \alpha \Delta\psi + \sin \alpha \Delta\varepsilon$$

$$\Delta\lambda = \Delta\psi; \quad \Delta\beta = 0$$

where $\Delta\psi$ and $\Delta\varepsilon$ are nutations in longitude and obliquity respectively. Mean rectangular coordinates (x, y, z) can be converted to true rectangular co-ordinates with the help of the following :

$$\Delta x = -(y \cos \varepsilon + z \sin \varepsilon) \Delta\psi$$

$$\Delta y = +x \Delta\psi \cos \varepsilon - z \Delta\varepsilon$$

$$\Delta z = +x \Delta\psi \sin \varepsilon + y \Delta\varepsilon$$

where both $\Delta\psi$ and $\Delta\varepsilon$ are in radians.

The elements of the corresponding rotation matrix are:

$$\mathbf{N} = \begin{bmatrix} 1 & -\Delta\psi \cos \varepsilon & -\Delta\psi \sin \varepsilon \\ +\Delta\psi \cos \varepsilon & 1 & -\Delta\varepsilon \\ +\Delta\psi \sin \varepsilon & +\Delta\varepsilon & 1 \end{bmatrix}$$

Daily values of $\Delta\psi$ and $\Delta\varepsilon$ during 2025 are tabulated on pages 18 to 32.

Approximate reduction for precession and nutation in right ascension and declination from the standard equinox and equator of J 2000.0 to the true equinox and equator of date during 2025 can be done using the following formulae and table :

$$\alpha = \alpha_0 + f + g \sin (G + \alpha_0) \tan \delta_0$$

$$\delta = \delta_0 + g \cos (G + \alpha_0)$$

where the units of the correction to α_0 and δ_0 are in second of time and minutes of arc respectively.

where the units of the correction to ϕ_0 and ϕ_0' are in seconds of time and minutes of arc respectively.													
Date		f	g	g'	G		Date		f	g	g'	G	
2025		s	s	'	h	m	2025		s	s	'	h	m
Jan.	- 5	+76.8	33.4	8.34	23	57	July	4*	+78.6	34.2	8.54	23	57
	5*	+76.9	33.4	8.36	23	57		14	+78.7	34.2	8.55	23	57
	15	+77.1	33.5	8.37	23	57		24	+78.8	34.3	8.57	23	57
	25	+77.1	33.5	8.38	23	57	Aug.	3	+78.9	34.3	8.57	23	57
Feb	4*	+77.2	33.6	8.39	23	56		13*	+79.0	34.3	8.58	23	57
	14	+77.4	33.6	8.40	23	56	Sept.	23	+79.1	34.4	8.60	23	57
Mar.	24	+77.4	33.6	8.41	23	56		2	+79.2	34.4	8.60	23	57
	6*	+77.5	33.7	8.42	23	56		12	+79.2	34.4	8.61	23	56
	16	+77.6	33.7	8.43	23	56	22*	+79.3	34.5	8.62	23	56	
	26	+77.6	33.7	8.44	23	56	Oct.	2	+79.4	34.5	8.62	23	57
Apr.	5	+77.7	33.8	8.44	23	56	Nov.	12	+79.5	34.5	8.63	23	57
	15*	+77.8	33.8	8.45	23	56		22	+79.5	34.6	8.64	23	57
	25	+77.9	33.8	8.46	23	56		1*	+79.6	34.6	8.65	23	57
May	5†	+78.0	33.9	8.47	23	57		11	+79.7	34.6	8.66	23	57
	15	+78.0	33.9	8.48	23	57	21	+79.8	34.7	8.67	23	57	
June	25*	+78.1	33.9	8.49	23	57	Dec.	1	+79.9	34.7	8.68	23	57
	4	+78.3	34.0	8.50	23	57		11*	+80.1	34.8	8.70	23	57
	14	+78.4	34.1	8.51	23	57		21	+80.2	34.8	8.71	23	57
	24	+78.5	34.1	8.53	23	57		31	+80.3	34.9	8.72	23	57
July	4*	+78.6	34.2	8.54	23	57		41	+80.4	34.9	8.73	23	57

* 40 - day date

† 400 day date for osculation epoch

EXPLANATION

Differential Precession and Nutation can be applied to obtain the differences in the mean place of an object relative to a comparison star for a standard epoch (J 2000.0) using the following formulae:

correction to R.A. : $e \tan \delta \Delta\alpha - f \sec^2 \delta \Delta\delta$

correction to declination : $f \Delta\alpha$

where $\Delta\alpha$ and $\Delta\delta$ are the observed differences in right ascension and declination of the object relative to the comparison star and

$$e = -\cos \alpha (n t + \sin \epsilon \Delta\psi) - \sin \alpha \Delta\epsilon$$

$$f = +\sin \alpha (n t + \sin \epsilon \Delta\psi) - \cos \alpha \Delta\epsilon$$

$$\epsilon = 23^\circ.44, \sin \epsilon = 0.398$$

$$n = 0.000\,0972 \text{ radian for epoch J 2025.5}$$

t is the time in years from the standard epoch to the time of observation.

$\Delta\psi, \Delta\epsilon$ are nutations in longitude and obliquity at the time of observation expressed in radians, ($1'' = 0.000\,004\,8481 \text{ rad}$).

Aberration

Aberration is the displacement of the position of a celestial object due to finite speed of light. The actual velocity of light in space c is the vectorial sum of its velocity relative to the observer c_r and the velocity V of the observer. Although the special theory of relativity has no provision of breaking up aberration of light into components, total effects of aberration in astronomy are broken into stellar, annual, elliptic, secular and planetary aberration for convenience of computation. In case of stars, all that can be determined is the displacement in their positions caused by the motion of the observer alone. It is calculated on the basis of the actual instantaneous motion of the Earth round the barycentre of the solar system.

Earlier, the practice was to resolve the stellar aberration into two components; one contributed by the circular motion of the Earth moving with a constant mean velocity round the Sun, and the other, a nearly constant displacement perpendicular to the major axis of the orbit arising due to ellipticity of the orbit of the Earth. The latter, known as the E-terms of aberration was included in the mean position of the stars as given in star catalogues and was omitted in the computation of day numbers. As a result, the mean places of stars differed from the catalogue mean places. This procedure was adopted to minimise the computation work for the user of star catalogues. However, this practice has caused much confusion lately because the accurate total velocity of the Earth referred to the barycentre of the solar system could not be used in computing stellar aberration. In accordance with a decision of the IAU in 1976, this occasion has been used to simplify this procedure by removing the E terms of aberration from the mean places and to include them in the reduction from mean to apparent place so that the apparent places remain unchanged. Thus, the mean places of FK5 are free from E terms. In other words, they will be the positions of the stars at epoch J 2000.0 as viewed from the barycentre of the solar system, in the co-ordinate system defined by the Earth's mean equator and equinox of J 2000.0.

The conversion of 1950.0 star catalogue positions (α, δ) to actual mean places $(\alpha + \Delta\alpha, \delta + \Delta\delta)$ can be accomplished by :

$$\Delta\alpha = 0^s.0227 \sin(\alpha + 11^h.25) \sec \delta$$

$$\Delta\delta = 0''.341 \cos(\alpha + 11^h.25) \sin \delta + 0''.029 \cos \delta$$

For solar system objects, the displacement of the light source during the time (Δt) taken by light to travel from it to the Earth combined with the effect of relative motion of the Earth and the light is known as planetary aberration. Its computation requires a knowledge of the distance and motion of the light source and can be accomplished as follows. First, the barycentric position of the body at time $t - \Delta t$ is combined with the barycentric position of the Earth at time t and then the correction for annual aberration is applied. Planetary aberration may also be

computed by interpolating the geometric (geocentric) ephemeris of the body to the time $t - \Delta t$. The light time Δt is given by:

$$\Delta t \text{ (in days)} = 0.005\,7755 \times \text{distance in a.u.}$$

Annual aberration for reduction from a geometric place (α_0, δ_0) to an apparent geocentric place (α, δ) is given by :

$$\alpha = \alpha_0 + (-\dot{X} \sin \alpha_0 + \dot{Y} \cos \alpha_0) / (c \cos \delta_0)$$

$\delta = \delta_0 + (-\dot{X} \cos \alpha_0 \sin \delta_0 - \dot{Y} \sin \alpha_0 \sin \delta_0 + \dot{Z} \cos \delta_0) / c$, where $c = 173.14$ a.u./day and $\dot{X}, \dot{Y}, \dot{Z}$ are the velocity components of the Earth (pages 256 to 270).

The reduction of observations of the radial velocity to a common origin at the barycentre is given by adding the component of the Earth's velocity in the direction (α_0, δ_0) of the object :

$$\dot{X} \cos \alpha_0 \cos \delta_0 + \dot{Y} \sin \alpha_0 \cos \delta_0 + \dot{Z} \sin \delta_0$$

Differential annual aberration corrections to be added to the observed differences of right ascension and declination (in the sense moving object minus star) to give true differences are:

$$(\text{R.A.}) a \Delta\alpha + b \Delta\delta \text{ (in units of } 0^{\text{s}}.001) ; \quad (\text{declination}) c \Delta\alpha + d \Delta\delta \text{ (in units of } 0'' .01)$$

Here $\Delta\alpha$ is to be taken in units of 1^{m} and $\Delta\delta$ in units of $1'$. The coefficients a, b, c and d are defined by:

$$a = -5.701 \cos(H+\alpha) \sec \delta$$

$$b = -0.380 \sin(H+\alpha) \sec \delta \tan \delta$$

$$c = +8.552 \sin(H+\alpha) \sin \delta$$

$$d = -0.570 \cos(H+\alpha) \cos \delta$$

$$H^{\text{h}} = 23.4 - (\text{day of year}/15.2)$$

(The day of year is tabulated on pages 4 to 12)

Annual parallax correction can be calculated approximately for reduction from the catalogue place (α_0, δ_0) to the geocentric place (α, δ) using the following formulae;

$$\alpha = \alpha_0 + (\pi / 15 \cos \delta_0) (X \sin \alpha_0 - Y \cos \alpha_0) \text{ and } \delta = \delta_0 + \pi (X \cos \alpha_0 \sin \delta_0 + Y \sin \alpha_0 \sin \delta_0 - Z \cos \delta_0)$$

where π is the annual parallax and X, Y, Z, are the coordinates of the Earth as given on pages 256 to 270.

Deflection of light in the gravitational field of the Sun may significantly affect the apparent direction of a star or of a body in the solar system. The elongation (E) from the centre of the Sun is increased by an amount that, for a star, depends on the elongation in the following manner:

$$\Delta E = 0''.004\,07 / \tan(E/2)$$

E	0°.25	0°.5	1°	2°	5°	10°	20°	50°	90°
ΔE	1''.866	0''.933	0''.466	0''.233	0''.093	0''.047	0''.023	0''.009	0''.004

The body disappears behind the Sun when E is less than the limiting grazing value of about $8^{\circ}.25$. The effects in right ascension and declination may be calculated approximately from;

$$\cos E = \sin \delta \sin \delta_0 + \cos \delta \cos \delta_0 \cos(\alpha - \alpha_0)$$

$$\Delta\alpha = 0^{\text{s}}.000\,271 \cos \delta_0 \sin(\alpha - \alpha_0) / (1 - \cos E) \cos \delta$$

$$\Delta\delta = 0''.004\,07 [(\sin \delta \cos \delta_0 \cos(\alpha - \alpha_0) - \cos \delta \sin \delta_0] / (1 - \cos E)$$

where α, δ refer to the star, and α_0, δ_0 to the Sun.

EXPLANATION

TABULAR DATA

PART-I-TIME SCALES AND EPHEMERIDES

Dates of year beginning in 2025 of various Indian and important foreign chronological eras are listed on page 3 followed by Gregorian calendar for the current year (pages 4 to 12). The calendar contains, besides the usual information, a count of Julian Day (JD) number for each date. The system of Julian day numbers maintains a continuous count of astronomical days, beginning with JD = 0 on 1 January 4713 B.C., Julian proleptic calendar. Julian Day numbers for other years can be found from the table on page 355. Various time scales used in this publication, their inter-relationships (as given on page 2) and the basis for computation of sidereal time as tabulated on pages 13 to 16; have been discussed above under the section on time scales. The concept of equation of time defined as the difference between local apparent solar time and local mean solar time (in the sense apparent minus mean) is no longer used in astronomy and therefore, it is no more tabulated in this publication. It can, however, be obtained to a precision of about 1 second using the following relation :

Equation of time at 12^h U.T. = 12^h – tabulated value of TT of Sun's ephemeris transit (pages 19 to 33).

In this publication, the ephemerides of the Sun and planets were reported earlier based on computation jointly made by USNO and JPL by simultaneous numerical integration designated as DE 200/ LE 200. A more recent JPL ephemeris, DE 405/ LE 405 has now come into widespread use, provide barycentric equatorial rectangular coordinates for the period 1600 to 2201. The reference frame for basic ephemerides is the ICRF; the alignment onto this frame has an estimated accuracy of 1 - 2 arcseconds. The JPL DE 405/ LE 405 ephemerides have been developed in a barycentric reference system using a barycentric coordinate time scale T_{eph} . The present edition use the DE 405/ LE 405 ephemerides data on the positions of the Sun, Moon and planets. The value of some astronomical constants based on previously used DE200/ LE200 ephemerides and currently used DE 405/ LE 405 ephemerides are given below.

Constant	DE 405 Value	DE 200/ LE 200 Value
Light-time for unit distance, τ_A	499.004 783 84 s	499.004 7837.....s
Geocentric gravitational constant, GE	$3.986\,004\,418 \times 10^{14} \text{ m}^3 \text{ s}^{-2}$	$3.986\,004\,48..... \times 10^{14} \text{ m}^3 \text{ s}^{-2}$
Heliocentric gravitational constant, GS	$1.327\,124\,42\,099 \times 10^{20} \text{ m}^3 \text{ s}^{-2}$	$1.327\,124\,40..... \times 10^{20} \text{ m}^3 \text{ s}^{-2}$
Ratio of mass of Sun to that of Earth, (GS)/(GE)	332 946.0487	332 946.038.....
Ratio of mass of Moon to that of Earth, μ	0.012 300 0371	0.012 300 034
Obliquity of the ecliptic at J2000.0, ε	$23^\circ 26' 21''.406$	$23^\circ 26' 21''.4119....$
Unit distance, A	$1.495\,978\,707 \times 10^{11} \text{ m}$	$1.495\,978\,7066 \times 10^{11} \text{ m}$
Ratio of mass of Sun to that of Earth + Moon	328 900.5596	328 900.55
Ratio of mass of Sun to mass of each planet :		
Jupiter	1047.348 644	1047.350
Saturn	3497.9018	3498.0
Uranus	229 02.98	229 60
Pluto	$1.365\,66 \times 10^8$	1.3×10^8
Pallas	9.709×10^9	9.247×10^9
Vesta	7.407×10^9	7.253×10^9

The Sun

Mean elements of the orbit of the Sun can be calculated with the help of the following expressions for use during 2025 only :

Geometric mean longitude	: $L = 279^{\circ}.919\,669\,76 + 0.985\,647\,36\,d$
Mean longitude of perigee	: $\Gamma = 283^{\circ}.367\,198\,28 + 0.000\,047\,08\,d$
Mean anomaly	: $g = 356^{\circ}.552\,472\,48 + 0.985\,600\,28\,d$
Eccentricity	: $e = 0^{\circ}.016\,698\,10 - 0.000\,000\,001\,d$
Obliquity of the ecliptic w.r.t. mean equator of date	: $\varepsilon = 23^{\circ}.436\,026\,24 - 0.000\,000\,36\,d$
where d is the interval in days from 2025 January 0 at 0 ^h TT and is given by	

$$d = \text{JD} - 246\,0675.5 = \text{day of the year (pages 4 to 12)} + \text{fraction of day from } 0^{\text{h}} \text{ TT.}$$

The above angular elements are referred to the mean equinox and ecliptic of date. The position of ecliptic of date with respect to the ecliptic of the standard epoch J 2000.0 is given by the formulae given under *Precession*.

The length of the principal years at 2025.0 as derived from the Sun's mean motion are given on page 2.

Geometric longitude of the Sun with respect to the mean equinox of date is tabulated on even numbered pages 18 to 32. Apparent longitude and latitude are with respect to the true equinox and ecliptic of date respectively. The two longitudes are related as follows :

$$\text{Apparent longitude} = \text{Geometric longitude} + \text{nutations in longitude} - 20''.4955/R.$$

Aberration has been computed by dividing $20''.4955$ by the true distance to the Sun. Precession in longitude is the total precessional displacement of a point along the ecliptic since the epoch J 2025.5. Revised value of the annual general precession $p = 0^{\circ}.013\,970\,41$ (for J 2025.5) has been used to compute this quantity. Components of nutation are the results of summation of the revised series of nutation. The sum of the terms with period shorter than 35 days is separately tabulated under Besselian Day numbers (pages 244 to 251).

Apparent Right Ascension and true distance (radius vector), declination (tabulated on odd numbered pages 19 to 33) of the Sun have been computed from the original barycentric rectangular co-ordinates. Although the apparent right ascension and declination have been corrected for light time, the radius vector or the true geocentric distance in astronomical units is the geometric distance at the tabular time.

The Semidiameter is based on a value of $16' 01''.18$ at unit distance being inclusive of an allowance for irradiation of $1''.55$. The tabular value is obtained by dividing $16' 01''.18$ by the radius vector.

Ephemeris Transit is the TT of the transit of the Sun over the ephemeris meridian which according to its definition, is $1.002\,7379\,\Delta T$ east of the Greenwich meridian. Here ΔT is the difference $\text{TT} - \text{UT}$. This transit time. This transit time can be interpolated to other meridians with an interpolating factor p , as follows:

$$p = -\lambda/360 + 1.002\,7379 \times \Delta T/86400$$

where λ is the longitude (east positive). The interpolated TT can be converted into UT by subtracting ΔT from TT.

Equatorial rectangular co-ordinates (geocentric) of the Sun, referred to the ICRS axes, are given in a.u. on pages 34 to 41. The direction of these axes have been defined by the IAU and realized in practice by the coordinates of several hundred extra galactic radio sources.

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Horizontal parallax (page 17) of the Sun is the angle subtended at the Sun by the equatorial radius of the Earth. The new value of the Solar parallax $\Pi_{\odot} = 8''.794\ 148$ has been used to compute the horizontal parallax.

Mean longitude and mean anomaly (page 17) of the Sun have been computed using revised expressions for the mean motion of the Earth around the Sun as given on page 443.

Heliographic co-ordinates given on pages 42 to 45 for 0^h UT include the position angle P of the northern extremity of the axis of rotation measured eastward from the north point of the disc and the heliographic latitude B_{\odot} and longitude L_{\odot} of the central point of the disc.

The observed angular distance ρ_1 from the centre of the disc of the Sun of a feature on the Sun's surface, as seen from the Earth, can be converted into its heliocentric angular distance ρ from the centre of the Sun's disc as follows :

$$\sin(\rho + \rho_1) = \rho_1 / S, \quad \text{where } S \text{ is the semi diameter of the Sun.}$$

The observed position (ρ, θ) of a feature (Sunspot, etc.) with respect to the centre of Sun's disc can be converted into heliographic co-ordinates (L, B) as follows :

$$\begin{aligned} \sin B &= \sin B_{\odot} \cos \rho + \cos B_{\odot} \sin \rho \cos(P - \theta) \\ \cos B \sin(L - L_{\odot}) &= \sin \rho \sin(P - \theta) \\ \cos B \cos(L - L_{\odot}) &= \cos \rho \cos B_{\odot} - \sin B_{\odot} \sin \rho \cos(P - \theta) \end{aligned}$$

The physical ephemeris of the Sun has been calculated from the elements determined by R. C. Carrington (observation of the spots on the Sun, 1863).

The Synodic rotation numbers are given below according to R. C. Carrington's Greenwich photoheliographic series which commenced on 9 November, 1853 with number 1. The standard solar meridian from which heliographic longitudes on the surface of the Sun are measured (positive towards the west) is that which passes through the ascending node of the solar equator on the ecliptic on 1854 January 1, Greenwich mean noon. The beginning of each synodic rotation is the instant at which the standard solar meridian passes through the central point of the apparent disc of the Sun, i.e., when the heliographic longitude L_{\odot} of this central point is zero.

SYNODIC ROTATION NUMBERS, 2025

Number	Date of		Number	Date of		Number	Date of	
	Commencement			Commencement			Commencement	
2292	2024	Dec. 10.49	2297	Apr. 26.08		2301	Sept. 9.18	
2293	2025	Jan. 6.82	2298	May 23.31		2302	Oct. 6.45	
2294		Feb. 3.16	2299	June 19.51		2303	Nov. 2.75	
2295		Mar. 2.50	2300	2025 July 16.71		2304	Nov. 30.05	
2296		Mar. 29.81	2301	Aug. 12.93		2305	Dec. 27.38	
						2306	2026 Jan. 23.72	

At the date of commencement of each synodic rotation period, the value of L_{\odot} is zero ; that is, the prime meridian passes through the central point of the disk.

The mean rotational elements of the Sun during 2025 are as follows :

Longitude of the ascending node of the solar equator on the ecliptic of date is $76^{\circ}.01$, and on the mean equator of date $16^{\circ}.16$. Inclination of the solar equator on the ecliptic of date is $7^{\circ}.25$, and on the mean equator of date $26^{\circ}.10$. The mean position of the pole on the solar equator is at right ascension $286^{\circ}.16$ and declination $63^{\circ}.90$. Sidereal period of rotation of the prime meridian is $14^{\circ}.18\ 44$ per day and its mean synodic period of rotation is 27.2753 days.

The Moon

The ephemerides of the Moon reported in this publication are based on the fundamental arguments developed by Simon et. al (1994). The angular elements are referred to the mean equinox and ecliptic of date. Mean elements of the mean equator and of the orbit of the Moon (page 47) can be computed during 2025 with the help of the following expressions :-

The inclination i of the mean equator of the Moon to the true equator of the Earth is given by :

$$i = 22^{\circ}.717\,436\,36 + 0.004\,440\,920\,d + 0.000\,006\,81\,d^2$$

The arc of the mean equator of the Moon from its ascending node on the true equator of the Earth to its ascending node on the ecliptic of date :

$$\Lambda = 181^{\circ}.651\,688\,94 - 0.056\,524\,82\,d - 0.000\,000\,385\,d^2$$

The arc of the true equator of the Earth from the true equinox of date to the ascending node of the mean equator of the Moon :

$$\Omega' = 359^{\circ}.889\,643\,828 + 0.003\,872\,316\,d + 0.000\,000\,413\,d^2$$

The inclination (I) of the mean equator of the Moon to the ecliptic = $1^{\circ}\,32'\,33''.6$.

The ascending node of the mean lunar equator on the ecliptic is at the descending node of the mean lunar orbit on the ecliptic that is at longitude $\Omega + 180^{\circ}$.

The above expressions give the mean elements with respect to the true equator of the Earth to a precision of about $0^{\circ}.001$.

The following expressions for the mean elements of the orbit of the Moon Γ' , Ω mean longitude of the Moon L' and elongation D are referred to the mean equinox and ecliptic of date.

Mean longitude of the Moon, measured along the ecliptic to the mean ascending node and then along the mean orbit :

$$L' = 285^{\circ}.404\,553\,7 + 13.176\,396\,45\,d$$

Mean longitude of the Moon's perigee measured in the same way as L' :

$$\Gamma' = 380^{\circ}.522\,456\,74 + 0.111\,403\,39\,d$$

Mean longitude of the mean ascending node of the lunar orbit on the ecliptic :

$$\Omega = 1^{\circ}.550\,333\,16 - 0.052\,953\,74\,d$$

Mean elongation of the Moon from the Sun :

$$D = L' - L = 365^{\circ}.484\,883\,94 + 12.190\,749\,09\,d$$

Mean inclination of the lunar orbit to the ecliptic = $5^{\circ}.1566898$

The above expressions are valid for use in 2025 only.

In all the above expressions, the time argument d is the interval in days since 0^{h} TT January 0, 2025 and is given by $d = \text{JD} - 246\,0675.5$

The length of the principal mean months at 2025.0 as derived from the above mean orbital elements of the Moon are given on page 2.

The apparent geocentric longitude and latitude of the Moon (pages 48 to 63) are referred to the true equinox and ecliptic of date. The true distance between the centres of the Earth and the Moon is given in a.u. Semi-diameter is derived from the horizontal parallax by $S = \text{Sin}^{-1}(k \sin \pi)$ where $k = 0.272\,5076$. The semi-diameter at mean distance is taken to be $15'\,32''.58$ without making any correction for irradiation.

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The right ascension and declination given on pages 64 to 79 for 0 hour & 12 hour of TT are referred to the true equator and equinox of date.

Horizontal parallax is tabulated at twelve hourly intervals on pages 64 to 79. It is derived from $\sin^{-1}(1/r)$ where r is the true distance in units of the Earth's equatorial radius. The tabulated R.A. and declination have been corrected for light time while the horizontal parallax is the geometric value for the tabular time.

The times of New Moon, First Quarter, Full Moon and Last Quarter are the moments at which the excess of the Moon's apparent longitude over that of the Sun is 0° , 90° , 180° and 270° respectively. Moon at Apogee and Perigee are the times when the Moon is at the greatest and least distance from the Earth. The timings are given in U.T. The corresponding timings in U.T. of the phases of the Moon are also given in the calendar portion on pages 4 to 12. For more precise values of the moments of New Moon and Full Moon, a reference may be made to Part VI - Indian Calendar where the times are given in I.S.T.

Moon's Age, given for 0^h TT, is the number of days elapsed since the preceding New Moon (conjunction). The times of Moon's upper and lower transit are given in TT for the ephemeris meridian. Interpolation to any other meridian by means of differences given and with the help of the ephemeris longitude will yield the local mean time of transit. The apparent geocentric declination given for the time of ephemeris transit can also be similarly interpolated.

Physical ephemeris of the Moon (pages 88 to 95) has been computed using the formulae and constants of D. Eckhardt (*The Moon and the Planets*, 253, 1981; *High precision Earth Rotation and Earth-Moon Dynamics*, ed. O. Calame, pages 193-198, 1982) with inclination I as given above (IAU value).

In case of the Moon, selenographic longitudes are measured for a point on the surface of the Moon from the lunar meridian that passes through the mean central point of the visible disc positive towards the west towards Mare Crisium. Selenographic latitudes are reckoned positive towards the north limb. The mean central point of the disc is defined as the point on the lunar surface intersected by the radius of the Moon directed towards the Earth, when the Moon is simultaneously at the ascending node and coincident with the mean longitude.

The Moon presents roughly the same hemisphere to the Earth. However, due to non uniformity of the revolution of the Moon around the Earth (optical libration) and an oscillation of the actual rotational motion of the Moon about its mean rotation (physical libration), about 59% of the Moon's surface can be seen from the Earth. The contribution to the Earth's selenographic longitude and latitude due to physical libration has been tabulated separately. These are geocentric values.

The tabular selenographic longitude and latitude of the Earth are the selenographic co-ordinates of the apparent central point of the Moon from which point the Earth is in selenographic zenith. These co-ordinates are the total librations (sums of optical and physical librations) in longitude and latitude respectively. When the libration in longitude, i.e. the selenographic longitude of the Earth, is positive, the mean central point of the disc is displaced eastward exposing to view a region on the west limb. When the libration in latitude, i.e. the selenographic latitude of the Earth, is positive, a region on the north limb is exposed to view.

The selenographic co-ordinates of the point on the lunar surface where the Sun is in the Zenith are the selenographic co-ordinates of the Sun. The selenographic co-longitude of the Sun tabulated in the ephemeris is obtained by subtracting the selenographic longitude of the Sun from 90° or 450° ; it is approximately 270° , 0° , 90° and 180° at new-moon, first quarter, full-moon and last quarter respectively.

The position angle of the axis is the angle that the lunar meridian through the apparent central point of the disc towards the north lunar pole forms with the declination circle through the central point, reckoned counter clockwise from the north point of the disc.

The position angle of the bright limb is the position angle of the mid point of the illuminated limb, reckoned eastward from the north point of the disc. The position angle of the two cusps may be obtained by adding $\pm 90^\circ$ to that of the bright limb.

The expression for calculating the selenographic altitude (a) of the Sun (above the lunar horizon) at a point at selenographic longitude l and latitude b is as follows :

$\sin a = \sin b_o \sin b + \cos b_o \cos b \sin (c_o + l)$, where (c_o, b_o) are the Sun's co-longitude and latitude at the time.

The following expressions can be used to compute the differential corrections to be applied to the tabular geocentric librations to form the topocentric librations :

$$\Delta l = -\pi' \sin (Q - C) \sec b$$

$$\Delta b = +\pi' \cos (Q - C)$$

$\Delta C = +\sin (b + \Delta b) \Delta l - \pi' \sin Q \tan \delta$, where Q is the geocentric parallactic angle of the Moon and π' is the topocentric horizontal parallax. The latter is obtained from the geocentric horizontal parallax (π) (pages 64 to 79) by using :

$$\pi' = \pi (\sin z + 0.0084 \sin 2z)$$

where z is the geocentric zenith distance of the Moon. The values of z and Q may be calculated from the geocentric R.A. (α) and declination (δ) of the Moon by using :

$$\sin z \sin Q = \cos \phi \sin h$$

$$\sin z \cos Q = \cos \delta \sin \phi - \sin \delta \cos \phi \cos h$$

$$\cos z = \sin \delta \sin \phi + \cos \delta \cos \phi \cos h$$

where ϕ is the geocentric latitude of the observer and h is the local hour angle of the Moon given by :

$$h = \text{local apparent sidereal time} - \alpha$$

Second differences in the tabular values of the geocentric librations must be taken into account in interpolation for the time of observation.

Major Planets

The heliocentric and geocentric positions of the major planets given on pages 96 to 197 have been derived directly from the numerical integration mentioned on page 440.

The heliocentric longitude and latitude are referred to the mean equinox and ecliptic of date. The tabular argument of heliocentric ephemeris is barycentric dynamical time (TDB).

The apparent geocentric longitude and latitude are referred to the true equinox and ecliptic of date and are planetary aberration. The apparent right ascension and declination are also corrected for planetary aberration and referred to the true equinox and equator of date. The tabular argument for both the terrestrial dynamical time (TDT). The TDT of transit over the ephemeris meridian has been furnished, which may be interpolated to any other meridian to obtain the LMT of transit.

As regards Pluto, in addition to the usual data, figures have been furnished for reduction of the apparent right ascension and apparent declination to the corresponding astrometric places referred to the mean equinox and equator of J 2000.0. The astrometric ephemeris is obtained by first adding the usual planetary aberration to the

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planet's true geocentric places referred to the standard equinox J 2000.0 and then subtracting the stellar aberration pertinent to the position occupied by the planet. The astrometric place is thus affected by the amount of the terms in the aberration dependent on the longitude of the Earth's perihelion as are the catalogue mean places of stars in the neighbourhood. The astrometric ephemeris is, therefore, rigorously comparable with photographic observations that are referred to catalogue mean places J 2000.0 of neighbouring stars, it being only necessary to correct the observations for geocentric parallax in case of the planets and proper motion in case of the stars.

The tabular true distance from the Earth is the actual geocentric distance at the tabulated time and not at the instant when the light left the planet.

The horizontal parallax of planets is $8''.794\,143$ divided by the geocentric distance. As regards the semi-diameter, the tabulated value is the value at unit distance divided by the geocentric distance. The semi-diameters at unit distance are as follows : Mercury $3''.36$, Venus $8''.34$, Mars $4''.68$, Jupiter $98''.57$ (Equatorial) and $92''.12$ (Polar), Saturn $83''.13$ (Equatorial) and $74''.96$ (Polar), Uranus $35''.24$, Neptune $34''.14$ and Pluto $2''.07$.

The heliocentric osculating elements of the orbits of the major planets, including Pluto, are given at intervals of 40 days on pages 200 to 201. The osculating elements are the elements of the instantaneous ecliptic orbit of the planet around the Sun determined by its actual position and velocity components for the instant, and as such the elements are affected by the attractions of other planets. The true place of a planet deduced from these elements is thus inclusive of the planetary perturbations, which need not, therefore, be considered separately in such a deduction.

The osculating elements for the Earth refer to the Earth/Moon barycentre. The correction in ecliptic rectangular co-ordinates in conversion from the Earth/Moon barycentre to the Earth's centre is given by :

$$\begin{aligned} \text{Earth's Centre} = (\text{Earth / Moon barycentre}) - & (0.000\,0312 \cos L, 0.000\,2865 \sin L, 0.0000124 \sin L, \\ & -0.00000718 \sin L, 0.00000657 \cos L, 0.00000285 \cos L) \end{aligned}$$

where $L = 218^\circ + 481\,268^\circ T$, with T measured in Julian centuries from JD 245 1545.0 to 5 decimals; the co-ordinates are in a.u. with reference to mean equinox and ecliptic of date.

PART II - STARS

The mean places of 482 stars, apparent places of 68 stars at 10-day intervals. daily apparent place of *Polaris* and tables for finding latitude of place from altitude of *Polaris* and azimuth of *Polaris* are given in this section. The ecliptic co-ordinates (mean longitude and latitude) of 451 stars have also been given. To facilitate reduction from mean to apparent place of a star, Besselian Day Numbers as well as the barycentric position and velocity components of the Earth alongwith rotation matrix elements for precession and nutation have been tabulated.

Mean Places of Stars (pages 215 to 226)

Beginning with the issue for 1988, calculation of the mean and apparent places are based directly on the basic-FK5 compiled by the A.R.I., Heidelberg.

The table for mean places of stars includes all stars of magnitude upto 3.9 as well as the component stars of the different lunar asterisms of the Hindus, Chinese and Arabian even when those are fainter than magnitude 3.9.

In case double or multiple stars, m denotes the mean position of the centre of gravity (*c.g.*) of the system; p the preceding component having less right ascension, f the following component and A the brighter component of the system. The magnitude of the binary stars is the integrated value for the two components.

The mean longitude and latitude of 445 important stars have been computed using the conversion from equatorial mean positions to ecliptic co-ordinates. Similarly, annual variations in longitude and latitude, etc., are the differentials of the conversion formulae. All quantities relate to the middle of the current Julian year.

Apparent Places of Stars (pages 227 to 243)

The apparent places of 68 selected stars are reported under this section. These positions are completely based on the FK5 beginning with the issue for 1988.

Smaller aberration has been computed from the total velocity of the Earth referred to the barycentre of the solar system. The E-terms of aberration are no longer included in the mean places in the FK5, but rather in the reduction from mean to apparent places.

Reductions to apparent places have been computed rigorously and directly without the intermediary of the mean place for the beginning of the year. The rigorous computation also includes effects of relativistic light deflection. Because of this, the apparent places of a star when approaching very closely the Sun cannot be interpolated by the user, but these cases are of no practical interest in normal applications.

Apparent places of 68 bright stars with annual variation and annual proper motion at 10-day interval have been given on pages 227 to 243. The number, name, are taken generally from the FK5, magnitude and spectrum are taken from SIMBAD data base. Corrections for parallax have been applied where appreciable.

The right ascension and declination are referred to the true equator and equinox of date but with the omission of the short period terms of nutation. After interpolating the given apparent places to date and longitude of the station, the following corrections for the effect of short period terms of nutation are to be applied :

$$\begin{aligned}\Delta\alpha &= a d\psi + b d\epsilon && \text{seconds of time} \\ \Delta\delta &= a' d\psi + b' d\epsilon && \text{seconds of arc}\end{aligned}$$

where $d\psi$ and $d\epsilon$ are short period terms of nutation as tabulated on pages 244 to 251. The values of a , b , a' and b' are given for each star under the apparent place.

The Apparent places of Polaris for each day of the year (pages 272 to 274) have been computed rigorously.

Besselian Day Numbers (pages 244 to 251)

All stellar data tabulations are now for the standard epoch at the middle of the current Julian year rather than the beginning of the Besselian year and accordingly the Besselian Day Numbers and second order day numbers are referred to the mean equator and equinox of the epoch, J 2025.5. Although for full precision the reduction to the apparent place has to be computed rigorously as described below, Besselian Day Numbers can still be used for less precision.

In the tabulated data, τ is the fraction of the Julian year since the standard epoch J 2025.5 A, B and E are Besselian Day Numbers designed to incorporate corrections to the position of a star on account of precession and nutation. In this case, the correction due to precession is measured from the middle of the year, and this is secured by incorporating in A the value of the precession corresponding to τ . The terms of short-period in nutation are included in A and B, which are also shown separately on pages 244 to 251.

The Besselian Day Numbers C and D, designed to include the effect of aberration, are now computed based on the total velocity of the Earth.

Second order day numbers, needed only for high declination stars for high accuracy, have been tabulated on pages 252 to 255.

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The barycentric position and velocity components of the Earth and rotation matrix elements for rigorous reduction of precession and nutation have been tabulated on pages 256 to 270. Use of these data with examples is discussed below :-

Apparent place reduction with full precision (rigorous method)

Conversion of the barycentric co-ordinates of a star for the standard equinox and equator of J 2000.0 (TDB) to its apparent geocentric co-ordinates referred to the true equinox and equator of date (TT) can be done rigorously as follows:

The geocentric vector **P** of the star at the required epoch (ignoring the distinction between TDB and TT for the stellar case) is given by:

$$\mathbf{P} = \mathbf{q} + T\mathbf{m} - \pi\mathbf{E}_B \dots\dots\dots(1)$$

Here **q** is the barycentric direction of the star at epoch J 2000.0 referred to the standard equinox and equator of J2000.0 and is given by :-

$$\mathbf{q} = (\cos \alpha_0 \cos \delta_0, \sin \alpha_0 \cos \delta_0, \sin \delta_0)$$

where α_0 and δ_0 are the right ascension and declination for the equator, equinox and epoch of J 2000.0.

The space motion vector $\mathbf{m} = (m_x, m_y, m_z)$ of the star in equation (1), expressed in radians/century, is given by :

$$\begin{aligned} m_x &= -\mu_\alpha \cos \delta_0 \sin \alpha_0 - \mu_\delta \sin \delta_0 \cos \alpha_0 + v\pi \cos \delta_0 \cos \alpha_0 \\ m_y &= \mu_\alpha \cos \delta_0 \cos \alpha_0 - \mu_\delta \sin \delta_0 \sin \alpha_0 + v\pi \cos \delta_0 \sin \alpha_0 \\ m_z &= \mu_\delta \cos \delta_0 + v\pi \sin \delta_0 \end{aligned}$$

where these expressions take into account the radial velocity (v) in au/century (1 km/s = 21.094 952 75 a.u./ century), measured positively away from the Earth as well as proper motion(μ_α, μ_δ) in right ascension and declination in radian/century and π is the parallax in radians.

T is the interval in Julian centuries from J2000.0, given by $T = (JD - 245 1545.0) / 36525$; \mathbf{E}_B and $\dot{\mathbf{E}}_B$ in a.u. per day are Earth's barycentric position and velocity vectors at co-ordinate time $t = \text{TDB}$ referred to the equator and equinox of J 2000.0 (pages 256 to 270).

The heliocentric position of the Earth **E** is given by

$$\mathbf{E} = \mathbf{E}_B - \mathbf{S}_B \dots\dots\dots(2)$$

Where \mathbf{S}_B is the barycentric position of the Sun at time t . This can be obtained from the heliocentric position of the barycentre tabulated on page 202 by reversing the sign of the respective x , y , and z .

The geocentric direction **p** of the star and the unit vector **e** can be computed from $\mathbf{p} = \mathbf{P} / |\mathbf{P}|$ and $\mathbf{e} = \mathbf{E} / |\mathbf{E}|$

The geocentric direction \mathbf{p}_1 of the star after applying the correction for light deflection in the natural frame is obtained as follows:

$$\mathbf{p}_1 = \mathbf{p} + (2 \mu/c^2 E) (\mathbf{e} - (\mathbf{p} \cdot \mathbf{e}) \mathbf{p}) / (1 + \mathbf{p} \cdot \mathbf{e}) \dots\dots\dots(3)$$

Where $\mu/c^2 = 9.87 \times 10^{-9}$ a.u and $E = |\mathbf{E}|$, the vector \mathbf{p}_1 is a unit vector to the order of μ/c^2 and dot (.) indicates scalar product.

The proper direction \mathbf{p}_2 in the geocentric inertial frame, that is moving with the instantaneous velocity \mathbf{V} of the Earth relative to the natural frame, is given by:

$$\mathbf{p}_2 = (\beta^{-1} \mathbf{p}_1 + (1 + \mathbf{p}_1 \cdot \mathbf{V}) / (1 + \beta^{-1})) \mathbf{V} / (1 + \mathbf{p}_1 \cdot \mathbf{V}) \dots \dots \dots (4)$$

Where $\mathbf{V} = \dot{\mathbf{E}}_{\mathbf{B}} / c = 0.0057755 \dot{\mathbf{E}}_{\mathbf{B}}$ and $\beta = (1 - V^2)^{-1/2}$; the velocity \mathbf{V} expressed in units of velocity of light and is equal to the Earth's velocity in the barycentric frame to the order of V^2 .

The apparent geocentric direction \mathbf{p}_3 is obtained by applying precession and nutation to the proper direction \mathbf{p}_2 by multiplying it row by column with the rotation matrix $M = \text{NPB}$ (given on pages 257 to 271) as follows:

$$\mathbf{p}_3 = M \mathbf{p}_2 \dots \dots \dots (5)$$

The above direction \mathbf{p}_3 is in rectangular co- ordinates (ξ, η, ζ) . It can be converted into spherical co- ordinates (α, δ) using :

$$\alpha = \tan^{-1} (\eta/\xi) \text{ and } \delta = \tan^{-1} (\zeta/\beta) \dots \dots \dots (6)$$

$$\text{Where } \beta = (\xi^2 + \eta^2)^{1/2}$$

where the quadrant of α can be determined by the signs of ξ and η .

Correction for polar motion :

The apparent geocentric direction \mathbf{p}_3 , given by equation (5) above, is for the true equator and equinox with the z axis pointing towards the celestial ephemeris pole. A further correction for polar motion may be applied to \mathbf{p}_3 to obtain \mathbf{p}_4 i.e. the direction relative to the conventional terrestrial reference system in which the z-axis is in the direction of the adopted mean position of the pole, as follows :

$$\mathbf{p}_4 = \mathbf{R}_2(-x) \mathbf{R}_1(-y) \mathbf{R}_3(\text{GAST}) \mathbf{p}_3$$

where GAST is the Greenwich apparent sidereal time at the corresponding instant of UT and

$$\mathbf{R}_1(\theta) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos \theta & \sin \theta \\ 0 & -\sin \theta & \cos \theta \end{bmatrix} \quad \mathbf{R}_2(\theta) = \begin{bmatrix} \cos \theta & 0 & -\sin \theta \\ 0 & 1 & 0 \\ \sin \theta & 0 & \cos \theta \end{bmatrix}$$

$$\mathbf{R}_3(\theta) = \begin{bmatrix} \cos \theta & \sin \theta & 0 \\ -\sin \theta & \cos \theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

are the standard matrices that produce rotations through an angle θ about the x, y and z - axes respectively.

Polar motion is described by x and y, the co- ordinates of the celestial ephemeris pole with respect to the adopted origin; x and y are measured in seconds of arc from the origin along the meridians at longitudes 0° and 270° . Current values for the reduction of observations are published by the International Polar Motion Service and the Bureau International de l' Heure.

EXPLANATION

Example of stellar reduction :

Calculation of apparent position of a fictitious star on 2025, January 1 at 0^h TT from the catalogue data, mean right ascension (α_0), declination (δ_0), centennial proper motion (μ_α , μ_δ) in right ascension and declination, parallax (π) and radial velocity (v) of a fictitious star for the standard equinox and equator of J 2000.0 (TDB) as given below:

$$\begin{aligned}\alpha_0 &= 14^{\text{h}} 39^{\text{m}} 36^{\text{s}}.087 & \mu_\alpha &= -49.486 \text{ s/century} \\ & & &= -0.00359872 \text{ rad/century} \\ \delta_0 &= -60^\circ 50' 07''.14 & \mu_\delta &= +69''.60 \text{ s/century} \\ & & &= +0.0003374 \text{ rad/century} \\ \pi &= 0''.752 & v &= -22.2 \text{ km/s} \\ &= 3.646 \times 10^{-6} \text{ rad} & v\pi &= -0.0017074 \text{ rad/century}\end{aligned}$$

The barycentric position vector of the Sun and the position and velocity vectors of the Earth referred to J2000.0 on 2025 January 1, 0^h TDB (pages 202, 256 to 270) are :

Vector	Julian date	Barycentric Rectangular Components		
		x	y	z
\mathbf{E}_B	2460676.5	-0.184 413 350	+ 0.882 633 257	+ 0.382 808 223
$\dot{\mathbf{E}}_B$	2460676.5	-0.017 197 578	-0.002 933 328	-0.001 271 876
\mathbf{S}_B	246 0676.5	-0.005 729 904	-0.004 576 439	-0.001 788 558

In order to calculate the geocentric vector \mathbf{P} of the star at J 2000.0, using equation (1), the vectors \mathbf{q} and \mathbf{m} may be computed using positional data of the star.

$$\begin{aligned}\mathbf{q} &= (-0.373\,854\,098, \quad -0.312\,594\,565, \quad -0.873\,222\,624) \\ \mathbf{m} &= (-0.000\,712\,684, \quad +0.001\,690\,102, \quad +0.001\,655\,340) \\ \mathbf{T} &= (246\,0676.5 - 245\,1545.0)/36525 = +0.25\end{aligned}$$

The geocentric vector \mathbf{P} may be computed from equation (1) by substituting the vectors \mathbf{q} , \mathbf{m} and \mathbf{E}_B and time \mathbf{T} .

$$\mathbf{P} = (-0.374\,031\,602, \quad -0.312\,172\,027, \quad -0.872\,808\,778) \text{ and } |\mathbf{P}| = 0.999\,572\,997$$

The heliocentric position vector \mathbf{E} of earth may be obtained using equation (2)

$$\mathbf{E} = (-0.178\,683\,446, \quad +0.887\,209\,696, \quad +0.384\,596\,781) \text{ and } |\mathbf{E}| = 0.983\,353\,193$$

The unit vectors \mathbf{p} and \mathbf{e} in the direction of \mathbf{P} and \mathbf{E} respectively are as follows :

$$\begin{aligned}\mathbf{p} &= (-0.374\,191\,382, \quad -0.312\,305\,383, \quad -0.873\,181\,629) \\ \mathbf{e} &= (-0.181\,708\,309, \quad +0.902\,228\,927, \quad +0.391\,107\,472)\end{aligned}$$

The scalar product $\mathbf{p} \cdot \mathbf{e} = -0.555\,285\,126$ and $2\mu/c^2 = 1.974 \times 10^{-8}$ a. u. The second term in the equation (3) represents the correction for the light deflection in the natural frame, and is given by the following vector :

$$(2\mu/c^2 \mathbf{E})(\mathbf{e} - (\mathbf{p} \cdot \mathbf{e})\mathbf{p})/(1 + \mathbf{p} \cdot \mathbf{e}) = (-0.000\,000\,017, \quad +0.000\,000\,032, \quad -0.000\,000\,004)$$

Addition of the above correction to the unit vector \mathbf{p} gives geocentric direction \mathbf{p}_1 of the star :

$$\mathbf{p}_1 = (-0.374\ 191\ 400, \quad -0.312\ 305\ 350, \quad -0.873\ 181\ 633)$$

The velocity vector $\mathbf{V} = 0.000\ 1010\ \dot{\mathbf{E}}_{\mathbf{B}}$ and $\beta^{-1} = (1 - V^2)^{1/2}$ are as follows:

$$\mathbf{V} = (-0.000\ 099\ 325, \quad -0.000\ 016\ 941, \quad -0.000\ 007\ 346)$$

$$\beta^{-1} = 0.999\ 999\ 995$$

The scalar product $\mathbf{p}_1 \cdot \mathbf{V} = +0.000\ 048\ 872$

Now substituting quantities computed above in the equation (4), the proper direction is obtained as:

$$\mathbf{p}_2 = (-0.374\ 272\ 434, -0.312\ 307\ 028, -0.873\ 146\ 303)$$

The precession and nutation matrix (\mathbf{M}) from page 257 is as follows:

$$\mathbf{M} = \begin{bmatrix} +0.999\ 981\ 416 & -0.005\ 591\ 585 & -0.002\ 429\ 371 \\ +0.005\ 591\ 485 & +0.999\ 984\ 366 & -0.000\ 047\ 956 \\ +0.002\ 429\ 601 & +0.000\ 034\ 371 & +0.999\ 997\ 048 \end{bmatrix}$$

Finally the apparent geocentric direction \mathbf{p}_3 is obtained by multiplying the proper direction \mathbf{p}_2 to the precession and nutation matrix as given by the equation (5).

Thus $\mathbf{p}_3 = (-0.370\ 397\ 991, -0.314\ 353\ 012, -0.874\ 063\ 792)$ and the apparent right ascension and declination:

$$\alpha = \tan^{-1}(\eta/\xi) = 14^{\text{h}}\ 41^{\text{m}}\ 17^{\text{s}}.023; \quad \delta = \tan^{-1}(\zeta/\beta) = -60^{\circ}\ 56'\ 3''.73$$

EXPLANATION

PART III - Tables of Sunrise, Sunset, Twilight and Moonrise, Moonset

The times of Sunrise, Sunset and Twilight, which can be obtained immediately from the given tables by simple interpolation for the desired latitude within the scope of the tables, are in local mean time of the place. Strictly speaking, the timings of these events are for places on the meridian of Greenwich. By simple interpolation for longitude, the correct time (L.M.T.) for the station can be obtained, which can thereafter be reduced to the zonal standard time by applying correction of time pertinent to the place.

At the given times of Sunrise and Sunset, the upper limb of the Sun is on the horizon; the true zenith distance of the Sun's center is then taken as $90^\circ 50'$, allowing $16'$ for semi-diameter and $34'$ for horizontal refraction.

The timings of the beginning of morning twilight and ending of evening twilight relate to the instants when the center of the Sun is 18° below the horizon. This is now known as astronomical twilight. The period of twilight has been divided into three parts – Civil when the Sun is 6° below the horizon, Nautical when 12° and Astronomical when 18° and their duration have been given.

The timings of rising and setting in U.T. of a body with right ascension α , declination δ and zenith distance z at latitude ϕ and east longitude λ may be computed from

$$UT = 0.99727 [\alpha - \lambda \pm \cos^{-1} \{(\cos z - \sin \phi \sin \delta) / (\cos \phi \cos \delta)\}] - \text{GAST at } 0^h \text{ UT},$$

where each term is expressed in time measure and GAST at 0^h UT as tabulated on page 13. The negative sign in the expression corresponds to rising and positive sign to setting. If the quantity $\{(\cos z - \sin \phi \sin \delta) / (\cos \phi \cos \delta)\}$ is numerically greater than one, there is no phenomenon. However, the tabulated timings of Moonrise and Moonset have been computed by inverse by interpolation for the zenith distance at $z = 90^\circ 34'.001 - 0.72755 \pi$, where π is the horizontal parallax of the Moon at the time of phenomena. The above value includes semi-diameter and the effect of refraction.

The Sunrise and Sunset times for certain stations in India (Kolkata, Varanasi, Chennai, Delhi, Mumbai) have been separately computed and given in Indian Standard Time. In these calculations the amount of horizontal refraction has been taken as $31'$, the value derived from consideration of the atmospheric conditions in India, and consequently the zenith distance of the Sun's center is $90^\circ 47'$ at the times given. In the section on Indian Calendar, the Sunrise and Sunset times which have been given for latitude $23^\circ 11'$ North and Central Meridian of India, also relates to the times when upper limb of the Sun is on the horizon as in the general tables.

The Moonrise and Moonset times given for certain latitudes relate to the local mean time calculated for the Central Meridian of India. By simple interpolation with the help of a table given on page 313, the local mean time for any other latitude can easily be obtained. At the time given, the Moon's upper limb is on the horizon and so the true geocentric zenith distance of the Moon's center is $90^\circ 34'$ *plus* semi-diameter of the Moon *minus* the horizontal parallax, where $34'$ has been allowed for horizontal refraction. Taking the mean values of the semi-diameter and the parallax, the zenith distance of the Moon at the moment is about $89^\circ 52'$, which varies from $89^\circ 55'$ to $89^\circ 49'$ as the parallax increases from $53'.6$ to $61'.9$.

The times of Moonrise and Moonset for certain stations in India (Kolkata, Chennai, Delhi and Mumbai) are separately calculated and given in I.S.T.

The times of Sunrise, Sunset and Moonrise, Moonset given are for an observer on the surface of the Earth considered to be a flat surface around that point without any obstruction in the directions of rising or setting. For an observer stationed at some elevation above the surface, the rising will be further accelerated and the setting retarded according to the height of the observer. The additional arc of depression to be considered on this account is $2'.10\sqrt{h}$ where h is the height of the observer in meters above the ground level. The dip of the sensible horizon is however $1'.77\sqrt{h}$. The effect of atmospheric refraction is included in the above results, without which both the terms would have got reduced to the same value of $1'.93\sqrt{h}$.

EXPLANATION

The values of the arc of depression according to height of the observer are given below:

Height	Depression	Height	Depression	Height	Depression	Height	Depression
Meters	'	Meters	'	Meters	'	Meters	'
0	0.0	40	13.3	300	36	2000	94
2	3.0	50	14.8	400	42	3000	115
5	4.7	75	18.2	500	47	4000	133
10	6.6	100	21.0	750	58	5000	148
20	9.4	150	25.7	1000	66	6000	163
30	11.5	200	29.7	1500	81	7000	176
40	13.3	300	36.4	2000	94	8000	188

The correction to the rising and setting times due to the above height of the observer may be obtained by multiplying the arc of depression given in the table by the figures from the table below:

Latitude of Station

Decl. of Sun	0°	10°	20°	30°	35°	40°	45°	50°	52°	54°	56°	58°	60°
° ' m	m	m	m	m	m	m	m	m	m	m	m	m	m
0	.067	.068	.071	.077	.082	.087	.094	.104	.108	.113	.119	.126	.133
5	.067	.068	.071	.077	.082	.088	.095	.105	.109	.115	.121	.127	.135
10	.068	.069	.072	.079	.083	.089	.097	.108	.113	.119	.126	.133	.142
15	.069	.070	.074	.081	.086	.093	.101	.113	.119	.127	.134	.144	.156
20	.071	.072	.076	.084	.090	.097	.108	.123	.130	.139	.151	.165	.183
23 27	.073	.074	.078	.087	.093	.102	.114	.132	.142	.155	.171	.192	.223

The deviation of the rising or the setting point on the horizon (i.e., amplitude) on account of the above arc of depression h (obtained after adding to it the normal depression at rising or setting) may be found as $h \tan \phi \sec A$, deviation being towards the north in the northern hemisphere and south in the southern hemisphere. Here A , the amplitude of the rising or setting point measured from the east or west point of the horizon, is obtained from $\sin A = \sin \delta \sec \phi$. The values of the amplitude for certain latitudes and declinations are given in a table on page 365.

PART IV — ECLIPSES AND OCCULTATIONS

Eclipses and Occultations have been calculated on the basis of the tabulated positions of the Sun and the Moon. The semi-diameters of the Sun and the Moon used in these calculations exclude irradiation. The Sun's tabular semi-diameter which includes irradiation is diminished by 1."55 for this purpose.

The semi-diameter of the Moon given by $\sin s = k \sin \pi$, where π is the Moon's horizontal parallax is based on the adopted constant $k = 0.272\ 5076$ to account for the irregularities of the lunar limb. It corresponds to the mean radius of Watt's datum as determined by observations of occultations and to the adopted radius of the Earth, introduced in 1982 and is consistent with the IAU system of Astronomical constants (1976). It is used with effect from 1986 in this publication. Refraction is neglected in calculation of eclipses of both the Sun and the Moon.

EXPLANATION

The circumstances of the phenomena are given provisionally in Universal Time, using $\Delta T (A) = + 70^s.0$ and the points on the Earth's surface are also expressed in terms of geographic longitude measured positively to the east.

Lunar Eclipses

In the calculation of lunar eclipses, the semi-diameter of the shadow -cone has been increased by one-fiftieth to take account of the influence of the atmosphere in absorbing Sun's rays passing through it . In the calculation of rising and setting limits, the time when the centre of the Moon becomes visible on the horizon has been considered as rising or setting. Elsewhere in this book the upper limb visible on the horizon is taken as the criterion for rising or setting. The horizontal refraction used in these calculations of rising and setting is $31'$.

The method of computation of a lunar eclipse is detailed below :

Let α, δ be the right ascension and declination of the Moon at an instant T_0 at or very near to the moment of opposition, and let α', δ' be the corresponding co-ordinates of the centre of the Earth's shadow ($\alpha' =$ R. A. of Sun $+ 12^h$, $\delta' =$ Sun's declination). Let π, s be parallax and semi-diameter of the Moon and π', s' be parallax and semi-diameter of the Sun.

As the Earth is not a perfect sphere, its shadow will differ slightly from a cone. It would however, be sufficient for our purpose if we use a mean radius for the Earth, which is equivalent to submitting for π a parallax π_1 , reduced to latitude 45° , so that $\pi_1 = 0.9983\ 33\ \pi$.

The radius of the shadow-cone at Moon's distance is $1.02 (\pi_1 + \pi' - s')$ for umbra, and $1.02 (\pi_1 + \pi' + s')$ for penumbra.

Let L be the angle between the centre of the Moon and that of the shadow-cone at the desired circumstance of the eclipse, so that

$$L_1 = 1.02 (\pi_1 + \pi' - s') + s \quad . \quad . \quad . \quad . \quad . \quad \text{for first and last contacts}$$

$$L_2 = 1.02 (\pi_1 + \pi' - s') - s \quad . \quad . \quad . \quad . \quad . \quad \text{for second and third contacts}$$

For the penumbral eclipse,

$$L' = 1.02 (\pi_1 + \pi' + s') + s \quad . \quad . \quad . \quad . \quad . \quad \text{for first and last contacts}$$

The Besselian elements x, y may be computed with sufficient accuracy with the following :

$$x = (\alpha - \alpha') \cos \delta \quad x' = \text{hourly variation of } (\alpha - \alpha') \cos \delta$$

$$y = (\delta - \delta') \quad y' = \text{hourly variation of } (\delta - \delta')$$

Let $m \sin M = x$, and $m \cos M = y$, so that $\tan M = x/y$, and $m^2 = x^2 + y^2$. The quantity m , taken always positive at all times, represents the angular distance between the centre of the Moon and of the shadow cone. The angle M may take any value from 0° to 360° .

Again, let $n \sin N = x'$, and $n \cos N = y'$, so that $n^2 = x'^2 + y'^2$, and $\tan N = x'/y'$. The angle N lies in the first or the second quadrant according as y' is positive or negative. The value of n is positive.

The time of greatest obscuration or middle of the eclipse is given by

$$T_0 - 1/n \{ m \cos (M - N) \} \quad \text{or} \quad T_0 - (x x' + y y') / n^2 \quad (\text{hours})$$

EXPLANATION

The auxiliary angle ψ is given by :

$\sin \psi = \{ m \sin (M - N) \} / L = (x y' - y x') / nL$. The value of either L_1 , L_2 or L' should be used or L according to the circumstances of the eclipse under consideration.

Then, time of the beginning or ending = time of middle + $(1/n) (L \cos \psi)$.

The value of ψ should be so taken that $\cos \psi$ may be negative for the beginning and positive for the ending of the phase. In other words, when $\sin \psi$ is positive, i.e., when $(M - N)$ falls in the 1st or the 2nd quadrant, ψ would be in the second quadrant for the beginning and in the first quadrant for the ending; and when $\sin \psi$ is negative, i.e., when $(M - N)$ is in the 3rd or the 4th quadrant, ψ would be in the third quadrant for the beginning and fourth quadrant for the ending.

If greater accuracy is desired, the computations may be repeated using the times obtained above as initial times.

The magnitude of the eclipse, the Moon's diameter being unity, is $(L_1 - \Delta) / 2s$,

where $\Delta = m \sin (M - N)$ is taken positive. When the computations are repeated for greater accuracy, the average values of L_1 , Δ and s for the first and last umbral contacts or those corresponding to the time of greatest obscurations should be used.

When Δ becomes less than L_2 , the eclipse is a total one. The computations of the beginning and ending of the total phase may be done in the same way as above using the value of L_2 .

The position angle of contact P on the Moon's limb, measured from the north point in the direction N.E.S.W. is $180^\circ + N + \psi$ for the first and last contacts both with umbra and penumbra as the case may be, and is $N + \psi$ for the second and third contacts in case of a total eclipse.

When M is calculated for the exact time of the phenomena, i.e., beginning or ending, then P may be obtained by considering $N + \psi = M$, i.e., $P = M + 180^\circ$ or $P = M$ as the case may be.

Solar Eclipses

Computation of the elements and circumstances of solar eclipses has been done following the method of Bessel. The geometric position of the shadow of the Moon relative to the Earth is described by the Besselian elements in a system of geocentric rectangular co-ordinates. In this system, the geocentric plane perpendicular to the axis of the shadow is taken as the xy plane and called the fundamental plane. The x -axis is the intersection of the fundamental plane with the plane of equator and is positive towards east. The y -axis is positive towards the north. The z -axis is parallel to the axis of the shadow and is positive towards the Moon. The tabular values of x and y are the co-ordinates of the axis of the shadow on the fundamental plane in units of the Earth's equatorial radius. The quantities d and μ specify the declination and hour angle of the point on the celestial sphere towards which the axis of the shadow is directed.

The elements l_1 and l_2 are the radii of the penumbral and umbral cones on the fundamental plane. The elements l_2 is regarded as positive for an annular eclipse and negative for a total eclipse. The elements f_1 and f_2 are the angles between the axis of the shadow and the generators of the penumbral and umbral cones respectively.

The Besselian elements x , y , $\sin d$, $\cos d$, μ , l_1 and l_2 are computed and tabulated at an interval of 10 minutes to facilitate the accurate computation of the circumstances of the eclipse. The given eclipse maps show the path of the eclipse, beginning and ending times of the eclipse, the area of visibility and rising and setting limits of the eclipse.

EXPLANATION

The method of computation of the local circumstances of the solar eclipse is given below :

The approximate time (U.T.) of the beginning and ending of a solar eclipse may be obtained from the corresponding eclipse map and used as estimated initial time. To obtain the geocentric rectangular co-ordinates, ξ , η , ζ of the observer located on the surface of the Earth in geographic longitude λ (measured east positive) and latitude ϕ in terms of the Besselian elements, we have;

$$\xi = \rho \cos \phi' \sin H$$

$$\eta = \rho \sin \phi' \cos d - \rho \cos \phi' \sin d \cos H$$

$$\zeta = \rho \sin \phi' \sin d + \rho \cos \phi' \cos d \cos H$$

and their variations per minute as :

$$\xi' = \mu' \rho \cos \phi' \cos H$$

$$\eta' = \mu' \xi \sin d - \zeta d'$$

where $H = \mu + \lambda$ and μ' is variation per minute in hour angle. In most of the cases, the variation ζ' is not needed and may be neglected. The values of $\rho \cos \phi'$ and $\rho \sin \phi'$ used above may be found for the observer's latitude ϕ using Table – XI.

The eclipse begins or ends at the station when $(x - \xi)^2 + (y - \eta)^2 = (l_1 - \zeta \tan f_1)^2$.

Now let $m \sin M = x - \xi$, $m \cos M = y - \eta$ so that $\tan M = (x - \xi)/(y - \eta)$ and $m^2 = (x - \xi)^2 + (y - \eta)^2$. The angle M may have any value from 0° to 360° and m is always positive.

Again let $n \sin N = x' - \xi'$, $n \cos N = y' - \eta'$ so that $\tan N = (x' - \xi')/(y' - \eta')$ and $n^2 = (x' - \xi')^2 + (y' - \eta')^2$. The angle N is in the first two quadrants and n is positive.

The radius of the shadow at a height ζ above the fundamental plane may be determined by $L_1 = l_1 - \zeta \tan f_1$ or $L_2 = l_2 - \zeta \tan f_2$ as the case may be.

Now the required time of the event will be obtained by applying a correction τ to the adopted initial time concerned, given by

$$\tau = - \{m \cos (M - N)\}/n + (L \cos \psi)/n \text{ (in minutes), where } \sin \psi = \{m \sin (M - N)\}/L$$

The value of ψ for which $\cos \psi$ is negative should be taken for the beginning of the eclipse for the beginning of the annular phase or the end of the total phase, and the value of ψ for which $\cos \psi$ is positive is to be taken for the end of the eclipse, for the end of the annular phase or the beginning of the total phase. When $M - N$ falls within 0° to 180° , ψ is in the 2nd or the 1st quadrant according to the required phase of the eclipse, for the other half it is in the 3rd or the 4th quadrant according to the phase.

If the correction τ obtained above exceeds 3 or 4 minutes and greater accuracy is desired, the computation should be repeated using the new times now obtained as initial times.

For finding the time of greatest phase, the calculations should be started adopting a new assumed time midway between the beginning and ending times. The correction to this adopted time is given by:

$$\tau = - \{m \cos (M - N)\}/n \text{ (in minutes).}$$

EXPLANATION

The magnitude of greatest partial eclipse is the fraction of the Sun's diameter obscured by the Moon at the time of greatest phase, and is given by : $M_1 = (L_1 - \Delta) / (2 L_1 - 0.5459)$ where Δ , the minimum distance between the centres of the two bodies, is given by $m \sin (M - N)$ and is to be taken positive.

The magnitude of the central phase, in the same units, is $M_2 = (0.5459) / (2 L_1 - 0.5459)$.

The position angle of the point of contact measured from the north point of the Sun in the direction N. E. S. W. (i.e. clockwise direction) may be obtained from $P = N + \psi$ or if, measured from the vertex, from $V = P - C$ where C , the parallactic angle, is given by $\tan C = (\xi/\eta)$.

Occultations

The occultations of visible planets and certain bright stars (*Aldebaran*, *Regulus*, *Spica* and *Antares*) by the Moon are given whenever they occur, together with the time, area of visibility and the Besselian elements. The area of visibility includes also the regions from which the occultations is visible even during day light hours. The two times given in the first table for the occultations are the times of first and last contact of the shadow cylinder with the Earth and as such the occultation may be expected to be visible only within the period between these times.

The elements are similar to those for solar eclipses and are given for T_0 , the instant of conjunction in R.A. when $x = 0$. The common geocentric hour angle of the bodies, or more precisely of the line passing through the center of the Earth parallel to the line joining the center of the two bodies for the Greenwich meridians is H_0 and its hourly variation is about $60^m.16$ or $15^\circ.04$. Y is the value of y for the instant of conjunction and x' , y' are the hourly variations of x and y . For a place where an occultation is visible, the times of immersion and emersion can be computed with the help of these elements by a method similar to that used in computing the local circumstances of a solar eclipse as explained below:

Let ϕ and λ be respectively the latitude and longitude of the place. The longitude of place is to be taken in hours and minutes and as usual measured positively towards east of Greenwich.

For night visibility of an occultation, the necessary conditions are as follows:

- (1) The Sun must not be much more than an hour above the horizon at the local mean time $T_0 + \lambda$ (and it must be below the horizon at time $T_0 + \lambda + t$).
- (2) The Moon must be above the horizon by an appreciable amount, i.e., the quantity $H_0 + \lambda$, taken without regard to sign for this purpose, must be less than the semidiurnal arc of the star of planet by at least one hour.

For prediction of an occultation, find the approximate time (U.T.) of local apparent conjunction by applying to the given T_0 a correction t (in hours) taken from the following table*:

$$H_0 + \lambda$$

ϕ	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
	0-00	0-30	1-00	1-30	2-00	2-30	3-00	3-30	4-00	4-30	5-00	5-30	6-00
	h	h	h	h	h	h	h	h	h	h	h	h	h
0°	0.00	0.41	0.77	1.08	1.32	1.50	1.62	1.69	1.72	1.73	1.71	1.65	1.58
10°	0.00	0.40	0.75	1.06	1.29	1.47	1.59	1.66	1.70	1.70	1.69	1.63	1.56
20°	0.00	0.37	0.70	0.99	1.21	1.38	1.51	1.58	1.62	1.63	1.61	1.56	1.50
30°	0.00	0.32	0.62	0.87	1.08	1.24	1.36	1.44	1.49	1.50	1.50	1.45	1.40
40°	0.00	0.26	0.51	0.73	0.92	1.07	1.18	1.26	1.30	1.32	1.32	1.30	1.26
50°	0.00	0.20	0.40	0.58	0.73	0.86	0.96	1.03	1.08	1.11	1.11	1.10	1.07
60°	0.00	0.15	0.29	0.42	0.53	0.63	0.72	0.78	0.83	0.85	0.87	0.86	0.85

*The value of t has the same sign as that of $\sin (H_0 + \lambda)$.

The Besselian elements x and y at the time of local conjunctions $T_0 + t$ may be calculated as follows :

$$x = x' t, \text{ and } y = Y + y' t.$$

EXPLANATION

Occultations for which $y - \eta$ for the time local conjunction is not within ± 0.35 will not be visible at the place. In order to decide this, an estimated value of η may be used as an approximation for which the following tables are given indicating the minimum and maximum values of η .

Limiting value of η (when on meridian i.e., when $H_0 + \lambda = 0$)

$\phi - d$	0°	10°	20°	30°	40°	50°	60°
η	0.00	0.17	0.34	0.50	0.64	0.76	0.86

The values of η has the same sign as that of $\phi - d$.

(* The table has been constructed taking $x' = 0.5773$; for other values of x' the figures will vary inversely. For this purpose the figures of the table may be multiplied by 1.15 for $x' = 0.50$, by 1.05 for $x' = 0.55$, by 0.95 or $x' = 0.60$ and by 0.89 for $x' = 0.65$)

Limiting value of η (when rising or setting i.e. when $H_0 + \lambda + t = S.D. \text{ arc}$)

	Latitude (ϕ)						
d	0°	10°	20°	30°	40°	50°	60°
0°	0.00	0.17	0.34	0.50	0.64	0.76	0.86
± 9	0.00	0.17	0.34	0.50	0.65	0.77	0.87
± 18	0.00	0.18	0.36	0.52	0.67	0.80	0.91
± 27	0.00	0.19	0.38	0.56	0.72	0.86	0.97

The value of η has the same sign that of ϕ

For the instant $T_0 + t$, compute the following quantities in addition to x and y :

Let $H = (H + \lambda) + at$ (converted into arc). The value of a has been given for planets under elements; it is 1.027 for stars. The observer's position on the fundamental plane is given by:

$$\xi = \rho \cos \phi' \sin H \text{ and } \eta = \rho \sin \phi' \cos d - \rho \cos \phi' \sin d \cos H$$

and the hourly variations;

$$\xi' = 0.2618 a \rho \cos \phi' \cos H, \quad \eta' = 0.2618 a \xi \sin d.$$

The value of the co-efficient 0.2618 a is 0.2625 for stars.

$$\text{Let } u = x - \xi, \quad v = y - \eta, \quad u' = x' - \xi', \quad v' = y' - \eta' \text{ so that } n^2 = u'^2 + v'^2.$$

Now $\sin \psi = (uv' - vu') / nl$, where $l = 0.2725$, for stars, and for planets, it will be found under elements.

The correction τ to the time of immersion and emersion is given by:

$$\tau = - (60/n^2) (uu' + vv') \mp (60l/n) \cos \psi$$

The negative sign in the second term is to be taken for immersion or the first contact and the positive sign for emersion or the last contact.

$$\text{Instant of immersion or emersion} = T_0 + t + \tau.$$

If greater accuracy is desired, a second set of calculations may be done in the following way using the new times now obtained as initial times. For the revised time of immersion or emersion T , compute $H = (H + \lambda + at) + a\tau$, $x, y, \xi, \eta, \xi', \eta'; u, v, u', v'$ and $D = uu' + vv'$. The second correction t' is given by: $t' = (30/D)x [l^2 - (u^2 + v^2)]$ in mins. of time.

$$\text{The final time of immersion or emersion} = T + t'.$$

The angles of contact on the Moon's limb:

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$$P = M + 180^\circ, \text{ where } \tan M = (u + u't') / (v + v't'),$$

$$V = P - C, \text{ where } \tan C = (\xi + \xi't') / (\eta + \eta't'),$$

where t' is to be taken in hours.

PART V – Miscellaneous Tables

Phenomena

The stellar magnitudes of planets together with their elongations from the Sun have been given under 'phenomena' at suitable intervals of days. The computation in the next portion of the phenomena has been based on longitude and that in the Astronomical Diary mainly on right ascension, with the exception that the conjunctions, squares and oppositions of planets with the Sun included in the latter have been calculated on the basis of longitudes. In the case of conjunctions in right ascension, the differences in declination between the planets or the Moon and the planet have also been given. The dates of heliacal visibility of planets (Mercury to Saturn) have also been given and these are based on the method given on page 463.

Interpolation

Interpolation Coefficients have been given on pages 351 to 354 according to the formula of both Bessel and Everett, for each hundredth part of the time-interval.

Let the tabular value of a function given at equal intervals be represented by f and the first and second differences by Δ with relevant dashes and subscripts as shown below. It is required to determine the value of the function at some intermediate point.

Function	First difference	Second difference
f_{-1}		
	$\Delta'_{-1/2}$	
f_0		Δ''_0
	$\Delta'_{1/2}$	
f_1		Δ''_1
	$\Delta'_{1 1/2}$	
f_2		

The epochs for which the values of the function are to be taken should be so chosen that the time for which the value of the function is required may fall within the interval f_0 and f_2 and let n be the time interval from f_0 up to the moment for which the value of the function is required. It is expressed as a fraction of the interval at which the given values of the function are tabulated. Let f_n be the value of the function for the desired time which is now required to be determined.

The two formulae for interpolation which are generally used for the purpose are as follows :

$$f_n = f_0 + n \Delta'_{1/2} + B''(\Delta''_0 + \Delta''_1) \dots \dots \dots \text{Bessel}$$

$$f_n = f_0 + n \Delta'_{1/2} + E_0'' \Delta''_0 + E_1'' \Delta''_1 \dots \dots \dots \text{Everett}$$

in which $f_0 + n \Delta'_{1/2}$ may be replaced by $(1-n)f_0 + nf_1$, if necessary, and where

$$B'' = n(n-1)/4, \quad E_0'' = -n(n-1)(n-2)/6 \quad \text{and} \quad E_1'' = n(n+1)(n-1)/6$$

It will be noted that in Bessel's formula the value of $\Delta''_0 + \Delta''_1$ is the same as $\Delta'_{1/2} - \Delta'_{-1/2}$. The value of the coefficients B'' , E_0'' and E_1'' , all of which are negative within the range f_0 to f_1 , will be obtained from the table on page 351 to 354 for the given value of n .

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Bessel's method of interpolation is more simple, but greater accuracy is yielded by Everett's formula on account of the fact that it includes the effect of third differences also.

The more complete formula of Bessel is as follows :

$$f_n = f_0 + n\Delta'_{1/2} + \{n(n-1)(\Delta''_0 + \Delta''_1)\}/4 + \{n(n-1)(n-1/2)\Delta'''_{1/2}\}/6 + \dots\dots\dots$$

The rate of variation of the function at a point, i.e., the instantaneous motion per unit of time interval may be obtained by the following formula :

$$\text{Motion} = \Delta'_{1/2} + C\Delta''_0 + D\Delta''_1, \quad \text{where } C = -(3n^2 - 6n + 2)/6 \text{ and } D = (3n^2 - 1)/6$$

$$\begin{aligned} \text{When } n = 0, \text{ the motion } f'_0 &= \{(\Delta'_{-1/2} + \Delta'_{1/2})/2\} - (\Delta''_1 - \Delta''_0)/6, \\ \text{when } n = 1/2, \quad f'_{1/2} &= \Delta'_{1/2} - \{(\Delta''_1 - \Delta''_0)/24\} \quad \text{and} \quad \text{when } n = 1, \quad f'_1 = \{(\Delta'_{1/2} + \Delta'_{3/2})/2\} - (\Delta''_1 - \Delta''_0)/6 \end{aligned}$$

The stationary point (i.e., when $f' = 0$) occurs when $n = 1/2 - (\Delta'_{1/2}/\Delta''_1)$ or $1/2 - (\Delta'_{1/2}/\Delta''_0)$.

Geocentric Co-ordinates and other Constants

The tables given on pages 359 and 360 are for computing the geocentric co-ordinates of a place for which the geodetic, i.e., geographic or common latitude ϕ is known. From the first table, the values of $\rho \sin \phi'$ and $\rho \cos \phi'$ can be directly obtained, while the second table gives the values of the geocentric latitude ϕ' and the radius of the Earth ρ separately

The constants used for these tables and the others given below are the 1976 I.A.U. System of astronomical constants introduced in this publication with effect from the 1985 issue.

$$\begin{aligned} \text{Equatorial radius } (a) &= 637\,8140 \text{ m} = 3963.20 \text{ miles.} \\ \text{Polar radius } (b) &= 635\,6755 \text{ m} = 3949.91 \text{ miles.} \\ \text{Flattening of the Earth } (f) &= (a-b)/a = 1/298.257 = 0.003\,353\,64. \\ \text{Ellipticity or eccentricity } (e) &= 0.081\,8192, \quad e^2 = 0.006\,694\,39. \end{aligned}$$

The following expressions are obtained from the above values of flattening and radius of the Earth.

$$\begin{aligned} S &= 0.994\,9743 - 0.001\,6708 \cos 2\phi + 0.000\,0021 \cos 4\phi \\ C &= 1.001\,6799 - 0.001\,6820 \cos 2\phi + 0.000\,0021 \cos 4\phi \\ \rho &= 0.998\,3271 + 0.001\,6764 \cos 2\phi - 0.000\,0035 \cos 4\phi \\ \phi' &= \phi - 11' 32''.726 \sin 2\phi + 1''.163 \sin 4\phi - 0''.003 \sin 6\phi \\ \text{One degree of longitude (in km.)} &= 111.4133 \cos \phi - 0.0935 \cos 3\phi \\ \text{One degree of latitude (in km.)} &= 111.1334 - 0.5598 \cos 2\phi + 0.0012 \cos 4\phi \\ g \text{ (cm/sec}^2\text{)} &= 978.031 + 5.1859 \sin^2 \phi - 0.0057 \sin^2 2\phi - 0.000\,308H, \text{ where } H \text{ is the} \\ &\quad \text{elevation in meters above sea level.} \end{aligned}$$

Period of Earth satellite of negligible mass = $84.489\,09\,d^{3/2}$ mins., where d is the mean distance of the satellite from the Earth's center measured in units of 6378140 m (Earth's equatorial radius).

$$\text{Invariable plane of the solar system; } \Omega = 106^\circ 35' 01'' + 3452''T, \quad I = 1^\circ 34' 59'' - 18''T$$

$$\text{Pole of galactic plane (1950); } \alpha = 12^h 49^m.0, \quad \delta = +27^\circ 24'$$

$$\text{Solar apex (1950).. } \alpha = 18^h 06^m, \quad \delta = +30^\circ$$

$$\text{Solar motion} \quad = 20.0 \text{ km. or } 12.4 \text{ miles per sec.}$$

$$\text{Speed of the Earth moving around the Sun} = 29.79 \text{ km. or } 18.51 \text{ miles per sec.}$$

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Heliacal Rising and Setting of Planets

The planets Mercury to Saturn (as well as the Moon) remain invisible to the naked eyes for some days at the time of conjunction with the Sun. This phenomenon of planet's invisibility due to its proximity to the Sun is known as combust or heliacal setting of the planets, and it plays an important part in Indian Calendar. The dates of heliacal setting and rising of the planets marking the period of invisibility have been calculated assuming that the phenomenon occurs when, at the given station, the Sun attains a Zenith distance of $90^\circ + h$ at the time when the zenith distance of the planet is 90° . The values of h for different planets adopted for the purpose are as follows :

Mercury 10° (Direct) and 11° (Retrograde)
 Venus 6° , Mars 14° , Jupiter $8^\circ.5$, and Saturn 12°

The day of the first visibility of the lunar crescent after a new-moon day has also been determined in a somewhat similar way on the basis of the following values of the limiting altitude of the Moon above the horizon corresponding to its azimuth difference from the Sun, when the zenith distance of the Sun is 90° .

Azimuth difference	0°	5°	10°	15°	20°
Altitude	$10^\circ.4$	$10^\circ.0$	$9^\circ.3$	$8^\circ.0$	$6^\circ.2$

When the altitude of the Moon at sunset exceeds the above limit, the Moon is likely to be visible in that evening and when the excess is more than a degree, the Moon is sure to be visible. The beginning dates of the months of the Islamic Calendar have been determined on the basis of the above calculations and indicated on the date following that of the first visibility of the Moon.

In the above calculations, the atmospheric refraction and the horizontal parallax of the Moon are neglected.

The computations of heliacal rising and setting of planets and determination of the dates of first visibility of the Moon have been done for the central station of India.

ASTRONOMICAL CONSTANTS*

Units : The units meter (m), kilogram (kg.) and second (s) are the units of length, mass and time in the International System of Unit (SI).

The astronomical unit of time is a time interval of one (D) of 86400 seconds. An interval of 36525 days is one Julian century.

The astronomical unit of mass is the mass of the Sun (S).

The astronomical unit of length is that length (A) for which the Gaussian gravitational constant (k) takes the value of 0.01720209895 when the units of measurement are the astronomical unit of length, mass and time. The dimensions of k^2 are those of the constant of gravitational (G), i.e. $L^3M^{-1}T^{-2}$. The term "unit distance" is also used for the length A .

Defining Constants :

- | | |
|------------------------------------|-------------------------------------|
| 1. Gaussian gravitational constant | $k = 0.017\ 202\ 098\ 95$ |
| 2. Speed of light | $c = 299\ 792\ 458\ \text{ms}^{-1}$ |

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Primary Constants :

3. Light-time for unit distance	$\tau_A = 499.004\ 78384\ \text{s}$
4. Equatorial radius for Earth	$a_e = 637\ 8136.6\ \text{m}$
[IUGG value	$a_e = 637\ 8137\ \text{m}]$
5. Dynamical form-factor for Earth	$J_2 = 0.001\ 082\ 6359$
6. Geocentric gravitational constant	$GE = 3.986\ 004\ 418 \times 10^{14}\ \text{m}^3\ \text{s}^{-2}$
7. Constant of Gravitation	$G = 6.674\ 28 \times 10^{-11}\ \text{m}^3\ \text{kg}^{-1}\ \text{s}^{-2}$
8. Ratio of mass of Moon to that of Earth	$\mu = 0.012\ 300\ 0371$
9. General precession in longitude, per Julian century, at standard epoch J 2000.0	$P = 5028''.796195$
10. Obliquity of the ecliptic, at standard epoch J2000.0	$\varepsilon = 23^\circ\ 26'\ 21''.406$

Derived Constants

11. Constant of nutation at standard epoch J2000.0	$N = 9''.2052\ 331$
12. Unit distance	$c\tau_A = A = 1.495\ 978\ 707 \times 10^{11}\ \text{m}$
13. Solar parallax	$\text{arc sin } (a_e/A) = \pi_\odot = 8''.794143$
14. Constant of aberration for standard Epoch J2000.0	$k = 20''.49551$
15. Flattening factor for the Earth	$f = 0.003\ 352\ 82 = 1/298.25642$
16. Heliocentric gravitational constant	$A^3 k^2/D^2 = GS = 1.327\ 124\ 42099 \times 10^{20}\ \text{m}^3\ \text{s}^{-2}$
17. Ratio of mass of Sun to that of the Earth	$(GS)/(GE) = S/E = 332\ 946.0487$
18. Ratio of mass of Sun to that of Earth + Moon	$(S/E)/(1+\mu) = 328\ 900.5596$
19. Mass of the Sun	$(GS)/G = S = 1.9884 \times 10^{30}\ \text{kg}$
20. System of planetary masses : (Ratios of mass of Sun to those of the planets etc.)	

Mercury	6023600	Jupiter	1047.348644
Venus	408523.719	Saturn	3497.9018
Earth + Moon	328900.5596	Uranus	22902.98
Mars	3098703.59	Neptune	19412.26
		Pluto	136566000

Other quantities for use in the preparation of ephemerides :

It is recommended that the values given in the following list should normally be used in the preparation of new ephemerides.

21. Masses of minor planets in unit of the solar mass :

(1) Ceres	4.72×10^{-10}
(2) Pallas	1.03×10^{-10}
(3) Vesta	1.35×10^{-10}

*See page 442 also for some of the constants actually used in preparation of the ephemerides reported in the publication.

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22. Masses of satellites in unit of the planet's mass :

Jupiter	Io	4.704×10^{-5}
	Europa	2.528×10^{-5}
	Ganymede	7.805×10^{-5}
	Callisto	5.667×10^{-5}
Saturn	Titan	2.366×10^{-4}
Neptune	Triton	2.089×10^{-4}

23. Equatorial radii in km.

Mercury	2439.7	Jupiter	71492	Pluto	1195
Venus	6051.8	Saturn	60268		
Earth	6378.1366	Uranus	25559	Moon	1737.4
Mars	3396.19	Neptune	24764	Sun	696000

24. Gravity fields of the planets.

	J_2	J_3	J_4
Earth	$+ 1.08263 \times 10^{-3}$	$- 2.54 \times 10^{-6}$	$- 1.61 \times 10^{-6}$
Mars	$+ 1.964 \times 10^{-3}$	$+ 36 \times 10^{-6}$	
Jupiter	$+ 14.75 \times 10^{-3}$		$- 580 \times 10^{-6}$
Saturn	$+ 16.45 \times 10^{-3}$		$- 1000 \times 10^{-6}$
Uranus	$+ 12 \times 10^{-3}$		
Neptune	$+ 4 \times 10^{-3}$		

25. Gravity field of the Moon.

$\gamma = (B-A)/C = 0.000\ 2278$		$C/MR^2 = 0''.392$
$\beta = (C-B)/B = 0.000\ 6313$		$I = 5552''.7 = 1^\circ\ 32'\ 32.7''$
$C_{20} = -0.000\ 2027$	$C_{30} = -0.000\ 006$	$C_{32} = +0.000\ 0048$
$C_{22} = +0.000\ 0223$	$C_{31} = +0.000\ 029$	$S_{32} = +0.000\ 0017$
	$S_{31} = +0.000\ 004$	$C_{33} = +0.000\ 0018$
		$S_{33} = -0.000\ 001$

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