

Topocentric ephemeris of the Moon

Times are given in UT for Aveiro (8° 37' 48" W, 40° 36' 7" N, zone Z).

	Date	Hour	R. A. (2000.0)	Decl. (2000.0)	Const.	Dist. E.	Age	Magn.	Diam.	Illum.	Elong.	Separ.	Rise	Transit	Set	Elevation	Azimuth	Azimuth
	yyyy mm dd	hh:mm	topocentric	topocentric		km	days	mV	"	%	°	°	hh:mm	hh:mm	hh:mm	(max.)	at rise	at set
1	2028 01 01	00:00	21h 44m 57,6s	-11° 37' 53"	Cap	409129	4d 3h 48m	-9,82	1752	14,7	44,9° E	44,9°	10:31	16:09	21:56	41,1°	281,7°	81,5°
2	2028 01 02	00:00	22h 28m 0,0s	-6° 39' 34"	Aqr	407734	5d 3h 48m	-10,19	1758	21,8	55,5° E	55,6°	10:52	16:49	22:55	46,5°	274,8°	88,7°
3	2028 01 03	00:00	23h 10m 22,5s	-1° 26' 36"	Psc	405119	6d 3h 48m	-10,53	1770	30,1	66,3° E	66,3°	11:13	17:29	23:54	52,0°	267,7°	96,0°
4	2028 01 04	00:00	23h 53m 2,8s	+3° 52' 18"	Psc	401251	7d 3h 48m	-10,85	1787	39,1	77,2° E	77,2°	11:34	18:09		52,0°	260,6°	96,0°
5	2028 01 05	00:00	0h 37m 3,8s	+9° 8' 2"	Psc	396185	8d 3h 48m	-11,15	1810	48,7	88,3° E	88,3°	11:57	18:53	00:55	57,5°	253,7°	103,2°
6	2028 01 06	00:00	1h 23m 31,7s	+14° 9' 48"	Psc	390083	9d 3h 48m	-11,43	1838	58,6	99,8° E	99,8°	12:24	19:39	01:59	62,8°	247,1°	110,2°
7	2028 01 07	00:00	2h 13m 32,2s	+18° 43' 38"	Ari	383229	10d 3h 48m	-11,70	1871	68,5	111,7° E	111,6°	12:57	20:31	03:06	67,6°	241,3°	116,5°
8	2028 01 08	00:00	3h 7m 58,7s	+22° 31' 18"	Ari	376030	11d 3h 48m	-11,95	1907	77,9	124,0° E	123,8°	13:37	21:27	04:15	71,7°	236,8°	121,6°
9	2028 01 09	00:00	4h 7m 11,5s	+25° 10' 37"	Tau	369001	12d 3h 48m	-12,20	1943	86,4	136,8° E	136,6°	14:28	22:28	05:24	74,5°	234,3°	125,0°
10	2028 01 10	00:00	5h 10m 31,5s	+26° 18' 30"	Tau	362719	13d 3h 48m	-12,42	1977	93,3	150,1° E	149,9°	15:32	23:31	06:29	75,8°	234,4°	126,0°
11	2028 01 11	00:00	6h 16m 9,1s	+25° 37' 34"	Gem	357762	14d 3h 48m	-12,64	2004	98,0	163,8° E	163,6°	16:45		07:26	72,3°	237,4°	124,0°
12	2028 01 12	00:00	7h 21m 33,8s	+23° 3' 41"	Gem	354614	15d 3h 48m	-12,84	2022	100,0	177,8° E	177,6°	18:05	00:35	08:14	67,8°	243,0°	119,4°
13	2028 01 13	00:00	8h 24m 34,2s	+18° 49' 1"	Cnc	353579	16d 3h 48m	-12,73	2028	98,9	168,0° W	168,0°	19:25	01:35	08:53	62,0°	250,5°	112,8°
14	2028 01 14	00:00	9h 24m 4,8s	+13° 18' 18"	Leo	354720	17d 3h 48m	-12,54	2021	94,8	153,7° W	153,7°	20:43	02:32	09:25	55,4°	259,1°	104,8°
15	2028 01 15	00:00	10h 20m 8,1s	+7° 1' 36"	Leo	357847	18d 3h 48m	-12,32	2003	88,1	139,7° W	139,6°	21:59	03:25	09:54	48,5°	268,2°	96,2°
16	2028 01 16	00:00	11h 13m 31,4s	+0° 27' 58"	Leo	362572	19d 3h 48m	-12,08	1977	79,3	125,8° W	125,7°	23:12	04:15	10:20	41,9°	277,1°	87,4°
17	2028 01 17	00:00	12h 5m 20,3s	-5° 57' 39"	Vir	368388	20d 3h 48m	-11,82	1946	69,1	112,4° W	112,3°		05:05	10:47	35,8°	285,4°	79,0°
18	2028 01 18	00:00	12h 56m 41,2s	-11° 55' 2"	Vir	374772	21d 3h 48m	-11,53	1913	58,2	99,4° W	99,3°	00:24	05:54	11:14	35,8°	285,4°	71,3°
19	2028 01 19	00:00	13h 48m 29,6s	-17° 7' 53"	Vir	381250	22d 3h 48m	-11,21	1881	47,3	86,7° W	86,8°	01:35	06:43	11:44	30,6°	292,8°	64,6°
20	2028 01 20	00:00	14h 41m 21,9s	-21° 22' 57"	Lib	387449	23d 3h 48m	-10,87	1850	36,8	74,5° W	74,6°	02:44	07:35	12:19	26,4°	298,9°	59,2°
21	2028 01 21	00:00	15h 35m 27,7s	-24° 29' 33"	Lib	393105	24d 3h 48m	-10,50	1824	27,2	62,7° W	62,8°	03:51	08:28	13:01	23,5°	303,3°	55,5°
22	2028 01 22	00:00	16h 30m 25,7s	-26° 20' 13"	Sco	398061	25d 3h 48m	-10,10	1801	18,8	51,1° W	51,2°	04:52	09:21	13:49	22,1°	305,8°	53,8°
23	2028 01 23	00:00	17h 25m 27,5s	-26° 51' 33"	Oph	402243	26d 3h 48m	-9,67	1782	11,7	39,8° W	39,9°	05:47	10:14	14:43	22,1°	306,2°	54,2°
24	2028 01 24	00:00	18h 19m 31,8s	-26° 5' 11"	Sgr	405633	27d 3h 48m	-9,20	1767	6,2	28,7° W	28,8°	06:34	11:06	15:42	23,5°	304,5°	56,6°
25	2028 01 25	00:00	19h 11m 43,5s	-24° 7' 34"	Sgr	408241	28d 3h 48m	-8,69	1756	2,4	17,8° W	17,9°	07:12	11:56	16:44	26,2°	301,1°	60,7°
26	2028 01 26	00:00	20h 1m 29,5s	-21° 8' 38"	Sgr	410078	29d 3h 48m	-8,14	1748	0,4	7,0° W	7,0°	07:44	12:42	17:46	29,8°	296,3°	66,0°
27	2028 01 27	00:00	20h 48m 43,1s	-17° 20' 8"	Cap	411140	0d 8h 48m	-7,98	1744	0,1	3,7° E	3,7°	08:12	13:26	18:48	34,3°	290,5°	72,2°
28	2028 01 28	00:00	21h 33m 41,2s	-12° 54' 0"	Cap	411398	1d 8h 48m	-8,52	1743	1,6	14,4° E	14,4°	08:35	14:07	19:48	39,2°	284,1°	79,0°
29	2028 01 29	00:00	22h 16m 57,3s	-8° 1' 27"	Aqr	410795	2d 8h 48m	-9,02	1745	4,8	25,0° E	25,1°	08:57	14:47	20:47	44,6°	277,3°	86,1°
30	2028 01 30	00:00	22h 59m 14,9s	-2° 52' 42"	Psc	409255	3d 8h 48m	-9,47	1752	9,5	35,7° E	35,8°	09:18	15:27	21:46	50,1°	270,2°	93,4°
31	2028 01 31	00:00	23h 41m 24,3s	+2° 22' 49"	Psc	406703	4d 8h 48m	-9,88	1763	15,7	46,4° E	46,6°	09:39	16:07	22:45	55,6°	263,1°	100,6°
32	2028 02 01	00:00	0h 24m 20,2s	+7° 35' 49"	Psc	403082	5d 8h 48m	-10,27	1779	23,2	57,3° E	57,5°	10:01	16:48	23:47	60,9°	256,2°	107,6°
33	2028 02 02	00:00	1h 9m 1,0s	+12° 36' 20"	Psc	398380	6d 8h 48m	-10,62	1800	31,8	68,5° E	68,5°	10:25	17:32		60,9°	249,6°	107,6°
34	2028 02 03	00:00	1h 56m 26,1s	+17° 12' 40"	Ari	392659	7d 8h 48m	-10,96	1826	41,3	79,8° E	79,9°	10:54	18:20	00:51	65,8°	243,6°	114,0°
35	2028 02 04	00:00	2h 47m 29,7s	+21° 10' 21"	Ari	386081	8d 8h 48m	-11,27	1857	51,5	91,5° E	91,5°	11:30	19:13	01:57	70,1°	238,6°	119,6°
36	2028 02 05	00:00	3h 42m 48,4s	+24° 11' 35"	Tau	378925	9d 8h 48m	-11,56	1892	61,9	103,7° E	103,6°	12:14	20:10	03:04	73,4°	235,2°	123,7°
37	2028 02 06	00:00	4h 42m 21,2s	+25° 56' 17"	Tau	371596	10d 8h 48m	-11,84	1929	72,2	116,3° E	116,2°	13:10	21:10	04:09	75,4°	234,0°	125,8°
38	2028 02 07	00:00	5h 45m 11,7s	+26° 5' 32"	Tau	364614	11d 8h 48m	-12,10	1966	81,7	129,3° E	129,3°	14:16	22:12	05:09	75,7°	235,4°	125,4°
39	2028 02 08	00:00	6h 49m 31,5s	+24° 27' 23"	Gem	358571	12d 8h 48m	-12,34	1999	89,9	142,9° E	142,9°	15:32	23:14	06:00	74,0°	239,6°	122,3°
40	2028 02 09	00:00	7h 53m 14,9s	+21° 2' 21"	Gem	354060	13d 8h 48m	-12,56	2025	96,0	156,9° E	156,9°	16:52		06:44	70,5°	246,2°	116,7°

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Times are given in UT for Aveiro (8° 37' 48" W, 40° 36' 7" N, zone Z).

	Date	Hour	R. A. (2000.0)	Decl. (2000.0)	Const.	Dist. E.	Age	Magn.	Diam.	Illum.	Elong.	Separ.	Rise	Transit	Set	Elevation	Azimuth	Azimuth
	yyyy mm dd	hh:mm	topocentric	topocentric		km	days	mV	"	%	°	°	hh:mm	hh:mm	hh:mm	(max.)	at rise	at set
41	2028 02 10	00:00	8h 54m 47,0s	+16° 4' 59"	Cnc	351574	14d 8h 48m	-12,77	2039	99,4	171,2° E	171,1°	18:13	00:13	07:20	59,0°	254,4°	109,3°
42	2028 02 11	00:00	9h 53m 30,9s	+10° 0' 39"	Leo	351408	15d 8h 48m	-12,82	2040	99,7	174,3° W	173,7°	19:32	01:09	07:51	52,0°	263,5°	100,8°
43	2028 02 12	00:00	10h 49m 43,0s	+3° 19' 46"	Sex	353587	16d 8h 48m	-12,62	2028	96,9	159,9° W	159,5°	20:49	02:02	08:19	45,0°	272,8°	91,8°
44	2028 02 13	00:00	11h 44m 11,2s	-3° 27' 17"	Vir	357861	17d 8h 48m	-12,40	2003	91,2	145,7° W	145,4°	22:05	02:54	08:47	38,3°	281,8°	82,8°
45	2028 02 14	00:00	12h 37m 53,5s	-9° 53' 38"	Vir	363765	18d 8h 48m	-12,16	1971	83,3	131,8° W	131,6°	23:19	03:45	09:15	32,5°	290,0°	74,4°
46	2028 02 15	00:00	13h 31m 42,7s	-15° 37' 13"	Vir	370712	19d 8h 48m	-11,91	1934	73,8	118,5° W	118,3°		04:36	09:45	27,8°	296,8°	67,0°
47	2028 02 16	00:00	14h 26m 14,4s	-20° 21' 0"	Lib	378101	20d 8h 48m	-11,63	1896	63,5	105,6° W	105,5°	00:32	05:29	10:19	27,8°	296,8°	60,9°
48	2028 02 17	00:00	15h 21m 38,5s	-23° 52' 43"	Lib	385394	21d 8h 48m	-11,33	1860	53,0	93,3° W	93,2°	01:41	06:22	10:59	24,4°	302,0°	56,6°
49	2028 02 18	00:00	16h 17m 35,2s	-26° 4' 52"	Sco	392160	22d 8h 48m	-11,01	1828	42,7	81,4° W	81,4°	02:46	07:17	11:45	22,4°	305,2°	54,2°
50	2028 02 19	00:00	17h 13m 19,7s	-26° 54' 54"	Oph	398099	23d 8h 48m	-10,67	1801	33,0	69,9° W	69,9°	03:43	08:11	12:38	22,0°	306,2°	53,9°
51	2028 02 20	00:00	18h 7m 55,5s	-26° 25' 23"	Sgr	403030	24d 8h 48m	-10,31	1779	24,2	58,7° W	58,7°	04:32	09:03	13:36	23,0°	305,2°	55,7°
52	2028 02 21	00:00	19h 0m 32,7s	-24° 43' 10"	Sgr	406874	25d 8h 48m	-9,92	1762	16,5	47,7° W	47,8°	05:13	09:53	14:37	25,2°	302,3°	59,2°
53	2028 02 22	00:00	19h 50m 41,9s	-21° 58' 8"	Sgr	409630	26d 8h 48m	-9,50	1750	10,1	37,0° W	37,0°	05:47	10:40	15:39	28,6°	297,9°	64,1°
54	2028 02 23	00:00	20h 38m 18,1s	-18° 21' 32"	Cap	411344	27d 8h 48m	-9,04	1743	5,2	26,3° W	26,3°	06:16	11:24	16:40	32,7°	292,5°	70,1°
55	2028 02 24	00:00	21h 23m 37,7s	-14° 4' 48"	Aqr	412088	28d 8h 48m	-8,55	1740	1,9	15,7° W	15,7°	06:40	12:06	17:40	37,5°	286,3°	76,7°
56	2028 02 25	00:00	22h 7m 12,1s	-9° 18' 54"	Aqr	411931	29d 8h 48m	-8,03	1740	0,2	5,0° W	5,4°	07:03	12:47	18:40	42,7°	279,6°	83,7°
57	2028 02 26	00:00	22h 49m 41,6s	-4° 14' 6"	Aqr	410929	0d 13h 23m	-8,11	1745	0,3	5,7° E	6,4°	07:24	13:27	19:39	48,2°	272,6°	91,0°
58	2028 02 27	00:00	23h 31m 52,0s	+0° 59' 42"	Psc	409114	1d 13h 23m	-8,64	1752	2,1	16,4° E	16,8°	07:45	14:06	20:38	53,7°	265,5°	98,2°
59	2028 02 28	00:00	0h 14m 32,1s	+6° 12' 44"	Psc	406492	2d 13h 23m	-9,13	1764	5,7	27,3° E	27,6°	08:06	14:47	21:39	59,1°	258,5°	105,3°
60	2028 02 29	00:00	0h 58m 32,8s	+11° 14' 42"	Psc	403056	3d 13h 23m	-9,59	1779	10,9	38,3° E	38,5°	08:30	15:30	22:42	64,1°	251,8°	111,9°
61	2028 03 01	00:00	1h 44m 45,1s	+15° 54' 10"	Psc	398802	4d 13h 23m	-10,02	1798	17,7	49,5° E	49,6°	08:57	16:17	23:46	68,6°	245,6°	117,7°
62	2028 03 02	00:00	2h 33m 55,3s	+19° 57' 59"	Ari	393750	5d 13h 23m	-10,41	1821	25,9	60,9° E	61,0°	09:30	17:06		68,6°	240,4°	117,7°
63	2028 03 03	00:00	3h 26m 36,8s	+23° 10' 59"	Ari	387975	6d 13h 23m	-10,78	1848	35,2	72,6° E	72,6°	10:10	17:59	00:51	72,2°	236,5°	122,3°
64	2028 03 04	00:00	4h 22m 56,9s	+25° 16' 31"	Tau	381632	7d 13h 23m	-11,12	1879	45,4	84,6° E	84,6°	10:59	18:57	01:56	74,7°	234,4°	125,1°
65	2028 03 05	00:00	5h 22m 24,1s	+25° 58' 23"	Tau	374977	8d 13h 23m	-11,43	1912	56,2	97,0° E	97,0°	11:58	19:56	02:56	75,6°	234,6°	125,8°
66	2028 03 06	00:00	6h 23m 45,8s	+25° 4' 23"	Gem	368378	9d 13h 23m	-11,73	1946	67,1	109,8° E	109,8°	13:07	20:56	03:49	74,9°	237,4°	123,9°
67	2028 03 07	00:00	7h 25m 27,2s	+22° 30' 10"	Gem	362305	10d 13h 23m	-12,00	1979	77,4	123,1° E	123,1°	14:23	21:54	04:35	72,4°	242,7°	119,6°
68	2028 03 08	00:00	8h 26m 3,9s	+18° 21' 45"	Cnc	357291	11d 13h 23m	-12,24	2007	86,5	136,8° E	136,8°	15:41	22:50	05:13	68,1°	249,9°	113,3°
69	2028 03 09	00:00	9h 24m 49,7s	+12° 55' 8"	Leo	353857	12d 13h 23m	-12,47	2026	93,7	150,9° E	150,9°	17:00	23:45	05:46	62,5°	258,4°	105,5°
70	2028 03 10	00:00	10h 21m 43,2s	+6° 33' 59"	Leo	352426	13d 13h 23m	-12,67	2034	98,3	165,3° E	164,9°	18:19		06:16	48,8°	267,7°	96,8°
71	2028 03 11	00:00	11h 17m 16,7s	-0° 13' 38"	Leo	353225	14d 13h 23m	-12,82	2030	99,9	179,7° E	175,6°	19:36	00:37	06:44	41,8°	277,0°	87,7°
72	2028 03 12	00:00	12h 12m 19,7s	-6° 58' 35"	Vir	356229	15d 13h 23m	-12,67	2013	98,3	165,9° W	165,0°	20:53	01:30	07:12	35,4°	285,8°	78,9°
73	2028 03 13	00:00	13h 7m 41,6s	-13° 13' 22"	Vir	361159	16d 13h 23m	-12,46	1985	93,9	151,9° W	151,4°	22:09	02:22	07:42	30,0°	293,6°	70,7°
74	2028 03 14	00:00	14h 3m 57,7s	-18° 34' 22"	Vir	367537	17d 13h 23m	-12,23	1951	87,2	138,3° W	138,0°	23:23	03:16	08:16	25,8°	299,7°	63,7°
75	2028 03 15	00:00	15h 1m 16,8s	-22° 43' 24"	Lib	374779	18d 13h 23m	-11,98	1913	78,8	125,2° W	125,0°		04:12	08:54	23,2°	303,9°	58,4°
76	2028 03 16	00:00	15h 59m 14,9s	-25° 28' 54"	Sco	382286	19d 13h 23m	-11,72	1875	69,3	112,6° W	112,5°	00:32	05:07	09:40	23,2°	303,9°	55,1°
77	2028 03 17	00:00	16h 56m 58,8s	-26° 46' 30"	Oph	389519	20d 13h 23m	-11,45	1841	59,3	100,6° W	100,6°	01:34	06:03	10:32	22,2°	305,8°	54,0°
78	2028 03 18	00:00	17h 53m 22,5s	-26° 38' 45"	Sgr	396044	21d 13h 23m	-11,16	1810	49,3	89,0° W	89,0°	02:27	06:57	11:29	22,6°	305,5°	55,1°
79	2028 03 19	00:00	18h 47m 29,3s	-25° 13' 40"	Sgr	401553	22d 13h 23m	-10,85	1785	39,6	77,8° W	77,8°	03:12	07:49	12:29	24,5°	303,2°	58,1°
80	2028 03 20	00:00	19h 38m 47,4s	-22° 42' 32"	Sgr	405860	23d 13h 23m	-10,52	1766	30,5	66,8° W	66,8°	03:48	08:37	13:31	27,5°	299,3°	62,6°

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	Date	Hour	R. A. (2000.0)	Decl. (2000.0)	Const.	Dist. E.	Age	Magn.	Diam.	Illum.	Elong.	Separ.	Rise	Transit	Set	Elevation	Azimuth	Azimuth
	yyyy mm dd	hh:mm	topocentric	topocentric		km	days	mV	"	%	°	°	hh:mm	hh:mm	hh:mm	(max.)	at rise	at set
81	2028 03 21	00:00	20h 27m 13,5s	-19° 17' 37"	Cap	408887	24d 13h 23m	-10,17	1753	22,2	56,1° W	56,1°	04:19	09:22	14:32	31,4°	294,2°	68,2°
82	2028 03 22	00:00	21h 13m 8,0s	-15° 10' 44"	Cap	410647	25d 13h 23m	-9,79	1746	15,0	45,4° W	45,4°	04:45	10:05	15:33	35,9°	288,3°	74,5°
83	2028 03 23	00:00	21h 57m 6,0s	-10° 32' 42"	Cap	411221	26d 13h 23m	-9,38	1743	9,0	34,8° W	34,8°	05:08	10:46	16:32	41,0°	281,8°	81,4°
84	2028 03 24	00:00	22h 39m 51,0s	-5° 33' 27"	Aqr	410727	27d 13h 23m	-8,93	1746	4,4	24,1° W	24,2°	05:29	11:26	17:32	46,4°	274,9°	88,5°
85	2028 03 25	00:00	23h 22m 10,2s	-0° 22' 29"	Psc	409304	28d 13h 23m	-8,45	1752	1,4	13,3° W	13,7°	05:50	12:06	18:31	51,9°	267,9°	95,8°
86	2028 03 26	00:00	0h 4m 52,5s	+4° 50' 32"	Psc	407089	29d 13h 23m	-8,02	1761	0,2	2,4° W	4,6°	06:12	12:47	19:32	57,3°	260,8°	102,9°
87	2028 03 27	00:00	0h 48m 47,0s	+9° 55' 11"	Psc	404199	0d 19h 29m	-8,30	1774	0,7	8,6° E	9,6°	06:35	13:29	20:34	62,5°	254,0°	109,7°
88	2028 03 28	00:00	1h 34m 41,1s	+14° 39' 47"	Psc	400727	1d 19h 29m	-8,82	1789	3,1	19,8° E	20,3°	07:02	14:15	21:38	67,2°	247,7°	115,8°
89	2028 03 29	00:00	2h 23m 16,2s	+18° 51' 0"	Ari	396743	2d 19h 29m	-9,33	1807	7,4	31,2° E	31,5°	07:33	15:03	22:44	71,0°	242,1°	120,8°
90	2028 03 30	00:00	3h 14m 59,8s	+22° 14' 0"	Ari	392299	3d 19h 29m	-9,80	1828	13,5	42,9° E	43,0°	08:10	15:56	23:48	73,8°	237,8°	124,1°
91	2028 03 31	00:00	4h 9m 55,6s	+24° 33' 12"	Tau	387451	4d 19h 29m	-10,23	1850	21,2	54,7° E	54,8°	08:56	16:51		73,8°	235,1°	124,1°
92	2028 04 01	00:00	5h 7m 33,5s	+25° 34' 9"	Tau	382282	5d 19h 29m	-10,62	1875	30,4	66,8° E	66,8°	09:51	17:49	00:48	75,3°	234,6°	125,5°
93	2028 04 02	00:00	6h 6m 50,0s	+25° 6' 17"	Gem	376925	6d 19h 29m	-10,99	1902	40,7	79,2° E	79,2°	10:55	18:46	01:43	75,1°	236,5°	124,5°
94	2028 04 03	00:00	7h 6m 24,0s	+23° 5' 37"	Gem	371588	7d 19h 29m	-11,32	1929	51,8	91,9° E	91,9°	12:06	19:43	02:30	73,3°	240,7°	121,2°
95	2028 04 04	00:00	8h 5m 4,1s	+19° 36' 6"	Cnc	366559	8d 19h 29m	-11,62	1956	63,0	104,9° E	104,9°	13:21	20:38	03:09	69,8°	246,9°	115,8°
96	2028 04 05	00:00	9h 2m 10,4s	+14° 49' 11"	Cnc	362199	9d 19h 29m	-11,90	1979	73,8	118,3° E	118,3°	14:36	21:31	03:43	64,9°	254,5°	108,9°
97	2028 04 06	00:00	9h 57m 42,0s	+9° 2' 17"	Leo	358909	10d 19h 29m	-12,15	1998	83,5	132,1° E	132,0°	15:52	22:23	04:13	59,0°	263,2°	100,9°
98	2028 04 07	00:00	10h 52m 9,4s	+2° 37' 5"	Leo	357072	11d 19h 29m	-12,36	2008	91,4	146,1° E	145,8°	17:08	23:14	04:41	52,3°	272,3°	92,2°
99	2028 04 08	00:00	11h 46m 21,9s	-4° 1' 47"	Vir	356975	12d 19h 29m	-12,56	2008	96,9	160,2° E	159,6°	18:24		05:09	45,4°	281,3°	83,4°
100	2028 04 09	00:00	12h 41m 13,2s	-10° 28' 10"	Vir	358748	13d 19h 29m	-12,72	1998	99,5	174,3° E	172,1°	19:41	00:06	05:38	32,8°	289,6°	74,9°
101	2028 04 10	00:00	13h 37m 27,0s	-16° 16' 4"	Vir	362319	14d 19h 29m	-12,68	1979	99,2	171,8° W	170,0°	20:57	00:59	06:10	27,9°	296,6°	67,3°
102	2028 04 11	00:00	14h 35m 22,6s	-21° 1' 58"	Lib	367416	15d 19h 29m	-12,49	1951	96,2	158,2° W	157,5°	22:10	01:55	06:47	24,4°	301,9°	61,1°
103	2028 04 12	00:00	15h 34m 42,0s	-24° 27' 36"	Lib	373610	16d 19h 29m	-12,27	1919	90,8	145,0° W	144,7°	23:18	02:53	07:30	22,7°	304,9°	56,7°
104	2028 04 13	00:00	16h 34m 27,5s	-26° 22' 33"	Sco	380387	17d 19h 29m	-12,05	1885	83,6	132,3° W	132,2°		03:50	08:21	22,5°	305,6°	54,6°
105	2028 04 14	00:00	17h 33m 16,6s	-26° 45' 31"	Oph	387216	18d 19h 29m	-11,81	1852	75,2	120,2° W	120,1°	00:17	04:46	09:17	22,5°	305,6°	54,8°
106	2028 04 15	00:00	18h 29m 50,1s	-25° 43' 30"	Sgr	393613	19d 19h 29m	-11,56	1821	65,9	108,4° W	108,4°	01:06	05:40	10:18	23,8°	304,0°	57,1°
107	2028 04 16	00:00	19h 23m 17,2s	-23° 28' 49"	Sgr	399182	20d 19h 29m	-11,30	1796	56,3	97,1° W	97,1°	01:46	06:31	11:21	26,5°	300,6°	61,1°
108	2028 04 17	00:00	20h 13m 24,9s	-20° 15' 42"	Cap	403631	21d 19h 29m	-11,02	1776	46,7	86,1° W	86,1°	02:19	07:18	12:23	30,1°	295,9°	66,3°
109	2028 04 18	00:00	21h 0m 31,6s	-16° 17' 48"	Cap	406785	22d 19h 29m	-10,73	1762	37,4	75,2° W	75,2°	02:47	08:02	13:24	34,4°	290,3°	72,4°
110	2028 04 19	00:00	21h 45m 15,6s	-11° 47' 1"	Cap	408576	23d 19h 29m	-10,41	1755	28,6	64,5° W	64,5°	03:11	08:43	14:24	39,3°	284,0°	79,1°
111	2028 04 20	00:00	22h 28m 25,5s	-6° 53' 32"	Aqr	409034	24d 19h 29m	-10,07	1753	20,6	53,8° W	53,8°	03:33	09:23	15:23	44,5°	277,3°	86,1°
112	2028 04 21	00:00	23h 10m 53,8s	-1° 46' 30"	Psc	408265	25d 19h 29m	-9,69	1756	13,6	43,0° W	43,1°	03:54	10:03	16:22	50,0°	270,3°	93,3°
113	2028 04 22	00:00	23h 53m 34,1s	+3° 25' 4"	Psc	406437	26d 19h 29m	-9,28	1764	7,8	32,1° W	32,3°	04:16	10:44	17:22	55,4°	263,3°	100,4°
114	2028 04 23	00:00	0h 37m 19,3s	+8° 31' 28"	Psc	403752	27d 19h 29m	-8,82	1776	3,5	21,0° W	21,4°	04:39	11:26	18:24	60,7°	256,4°	107,4°
115	2028 04 24	00:00	1h 23m 0,2s	+13° 21' 25"	Psc	400424	28d 19h 29m	-8,33	1790	0,9	9,8° W	10,7°	05:05	12:11	19:28	65,6°	249,9°	113,7°
116	2028 04 25	00:00	2h 11m 20,8s	+17° 41' 39"	Ari	396660	0d 4h 13m	-8,07	1807	0,2	1,7° E	4,5°	05:34	12:59	20:34	69,7°	244,0°	119,1°
117	2028 04 26	00:00	3h 2m 50,5s	+21° 16' 50"	Ari	392641	1d 4h 13m	-8,55	1826	1,5	13,4° E	13,9°	06:10	13:51	21:40	72,9°	239,2°	123,0°
118	2028 04 27	00:00	3h 57m 33,2s	+23° 50' 41"	Tau	388510	2d 4h 13m	-9,10	1845	4,9	25,3° E	25,5°	06:54	14:47	22:42	74,8°	236,0°	125,0°
119	2028 04 28	00:00	4h 54m 56,9s	+25° 8' 6"	Tau	384375	3d 4h 13m	-9,61	1865	10,4	37,5° E	37,5°	07:47	15:44	23:39	75,1°	234,8°	124,7°
120	2028 04 29	00:00	5h 53m 53,7s	+24° 58' 19"	Tau	380314	4d 4h 13m	-10,08	1885	17,8	49,8° E	49,8°	08:49	16:42		75,1°	236,0°	124,7°

Topocentric ephemeris of the Moon (following)

Times are given in UT for Aveiro (8° 37' 48" W, 40° 36' 7" N, zone Z).

	Date	Hour	R. A. (2000.0)	Decl. (2000.0)	Const.	Dist. E.	Age	Magn.	Diam.	Illum.	Elong.	Separ.	Rise	Transit	Set	Elevation	Azimuth	Azimuth
	yyyy mm dd	hh:mm	topocentric	topocentric		km	days	mV	"	%	°	°	hh:mm	hh:mm	hh:mm	(max.)	at rise	at set
121	2028 04 30	00:00	6h 52m 57,4s	+23° 17' 44"	Gem	376397	5d 4h 13m	-10,50	1905	26,9	62,4° E	62,4°	09:58	17:38	00:28	73,7°	239,5°	122,1°
122	2028 05 01	00:00	7h 50m 52,0s	+20° 10' 52"	Gem	372706	6d 4h 13m	-10,89	1924	37,3	75,1° E	75,1°	11:10	18:33	01:09	70,8°	245,0°	117,4°
123	2028 05 02	00:00	8h 46m 55,5s	+15° 49' 6"	Cnc	369358	7d 4h 13m	-11,23	1941	48,5	88,1° E	88,1°	12:23	19:25	01:44	66,4°	252,1°	111,1°
124	2028 05 03	00:00	9h 41m 6,4s	+10° 28' 28"	Leo	366514	8d 4h 13m	-11,54	1956	59,9	101,3° E	101,3°	13:37	20:15	02:14	60,9°	260,1°	103,6°
125	2028 05 04	00:00	10h 33m 56,8s	+4° 27' 34"	Sex	364380	9d 4h 13m	-11,81	1968	71,0	114,8° E	114,7°	14:50	21:05	02:42	54,7°	268,8°	95,4°
126	2028 05 05	00:00	11h 26m 19,1s	-1° 53' 18"	Leo	363181	10d 4h 13m	-12,05	1974	81,0	128,4° E	128,2°	16:03	21:55	03:09	48,1°	277,5°	86,9°
127	2028 05 06	00:00	12h 19m 13,4s	-8° 12' 29"	Vir	363131	11d 4h 13m	-12,26	1974	89,3	142,1° E	141,7°	17:18	22:47	03:36	41,6°	285,9°	78,6°
128	2028 05 07	00:00	13h 13m 35,9s	-14° 7' 6"	Vir	364374	12d 4h 13m	-12,44	1968	95,4	155,8° E	155,1°	18:33	23:40	04:06	35,4°	293,4°	70,7°
129	2028 05 08	00:00	14h 10m 4,3s	-19° 14' 2"	Vir	366951	13d 4h 13m	-12,60	1954	98,9	169,3° E	167,9°	19:47		04:40	26,0°	299,5°	63,9°
130	2028 05 09	00:00	15h 8m 43,1s	-23° 11' 57"	Lib	370766	14d 4h 13m	-12,68	1934	99,7	177,4° W	174,0°	20:57	00:36	05:21	23,4°	303,6°	58,7°
131	2028 05 10	00:00	16h 8m 51,4s	-25° 44' 36"	Sco	375588	15d 4h 13m	-12,51	1909	98,0	164,4° W	163,7°	22:01	01:34	06:08	22,5°	305,3°	55,5°
132	2028 05 11	00:00	17h 9m 6,8s	-26° 44' 4"	Oph	381077	16d 4h 13m	-12,31	1881	94,0	151,8° W	151,6°	22:55	02:32	07:03	23,3°	304,7°	54,7°
133	2028 05 12	00:00	18h 7m 51,2s	-26° 12' 20"	Sgr	386826	17d 4h 13m	-12,11	1853	88,1	139,6° W	139,6°	23:40	03:28	08:03	25,4°	302,0°	56,1°
134	2028 05 13	00:00	19h 3m 44,5s	-24° 19' 47"	Sgr	392408	18d 4h 13m	-11,89	1827	80,8	127,9° W	127,9°		04:21	09:07	28,7°	297,7°	59,5°
135	2028 05 14	00:00	19h 56m 7,9s	-21° 21' 21"	Sgr	397425	19d 4h 13m	-11,67	1804	72,4	116,5° W	116,5°	00:17	05:10	10:10	28,7°	297,7°	64,3°
136	2028 05 15	00:00	20h 45m 4,3s	-17° 32' 43"	Cap	401540	20d 4h 13m	-11,44	1785	63,3	105,3° W	105,3°	00:47	05:56	11:12	32,8°	292,4°	70,2°
137	2028 05 16	00:00	21h 31m 6,2s	-13° 7' 55"	Cap	404503	21d 4h 13m	-11,19	1772	54,0	94,4° W	94,4°	01:13	06:39	12:13	37,5°	286,3°	76,7°
138	2028 05 17	00:00	22h 15m 2,6s	-8° 18' 40"	Aqr	406159	22d 4h 13m	-10,93	1765	44,5	83,6° W	83,6°	01:36	07:20	13:12	42,7°	279,7°	83,6°
139	2028 05 18	00:00	22h 57m 49,4s	-3° 14' 42"	Psc	406459	23d 4h 13m	-10,64	1764	35,3	72,8° W	72,8°	01:57	07:59	14:11	48,0°	272,8°	90,7°
140	2028 05 19	00:00	23h 40m 24,6s	+1° 55' 16"	Psc	405450	24d 4h 13m	-10,33	1768	26,6	61,9° W	61,9°	02:19	08:40	15:10	53,4°	265,9°	97,8°
141	2028 05 20	00:00	0h 23m 46,4s	+7° 2' 21"	Psc	403268	25d 4h 13m	-9,98	1778	18,6	50,9° W	51,0°	02:41	09:21	16:12	58,7°	259,0°	104,8°
142	2028 05 21	00:00	1h 8m 51,4s	+11° 56' 30"	Psc	400125	26d 4h 13m	-9,59	1792	11,7	39,7° W	39,8°	03:06	10:05	17:15	63,8°	252,3°	111,3°
143	2028 05 22	00:00	1h 56m 31,6s	+16° 25' 31"	Ari	396286	27d 4h 13m	-9,15	1809	6,1	28,2° W	28,5°	03:34	10:52	18:20	68,2°	246,1°	117,1°
144	2028 05 23	00:00	2h 47m 26,4s	+20° 14' 33"	Ari	392045	28d 4h 13m	-8,66	1829	2,2	16,5° W	16,9°	04:08	11:43	19:27	71,8°	240,9°	121,7°
145	2028 05 24	00:00	3h 41m 51,1s	+23° 6' 43"	Tau	387694	29d 4h 13m	-8,13	1849	0,2	4,5° W	5,6°	04:49	12:38	20:32	74,2°	237,0°	124,4°
146	2028 05 25	00:00	4h 39m 22,8s	+24° 45' 6"	Tau	383497	0d 15h 44m	-8,30	1869	0,5	7,8° E	8,2°	05:40	13:36	21:32	75,1°	235,1°	124,9°
147	2028 05 26	00:00	5h 38m 55,3s	+24° 56' 23"	Tau	379664	1d 15h 44m	-8,90	1888	3,1	20,3° E	20,4°	06:40	14:35	22:24	74,2°	235,5°	122,9°
148	2028 05 27	00:00	6h 38m 52,6s	+23° 34' 43"	Gem	376337	2d 15h 44m	-9,46	1905	8,1	33,1° E	33,1°	07:48	15:33	23:09	71,7°	238,4°	118,8°
149	2028 05 28	00:00	7h 37m 41,5s	+20° 43' 49"	Gem	373591	3d 15h 44m	-9,97	1919	15,3	45,9° E	46,0°	09:01	16:29	23:46	67,7°	243,4°	112,8°
150	2028 05 29	00:00	8h 34m 22,4s	+16° 35' 44"	Cnc	371442	4d 15h 44m	-10,42	1930	24,3	59,0° E	59,0°	10:15	17:22		67,7°	250,1°	112,8°
151	2028 05 30	00:00	9h 28m 42,1s	+11° 27' 46"	Leo	369880	5d 15h 44m	-10,81	1938	34,8	72,1° E	72,1°	11:28	18:13	00:17	62,4°	257,9°	105,6°
152	2028 05 31	00:00	10h 21m 7,0s	+5° 39' 21"	Sex	368886	6d 15h 44m	-11,16	1944	46,1	85,3° E	85,4°	12:40	19:02	00:45	56,4°	266,3°	97,7°
153	2028 06 01	00:00	11h 12m 28,4s	-0° 29' 52"	Leo	368463	7d 15h 44m	-11,46	1946	57,6	98,6° E	98,6°	13:52	19:50	01:12	50,0°	274,9°	89,4°
154	2028 06 02	00:00	12h 3m 49,2s	-6° 40' 19"	Vir	368640	8d 15h 44m	-11,72	1945	68,7	111,9° E	111,8°	15:04	20:40	01:38	43,6°	283,2°	81,2°
155	2028 06 03	00:00	12h 56m 12,1s	-12° 32' 23"	Crv	369473	9d 15h 44m	-11,95	1940	78,8	125,2° E	125,0°	16:16	21:31	02:06	37,4°	290,8°	73,4°
156	2028 06 04	00:00	13h 50m 28,7s	-17° 46' 3"	Vir	371022	10d 15h 44m	-12,15	1932	87,3	138,4° E	138,1°	17:29	22:25	02:38	31,9°	297,3°	66,3°
157	2028 06 05	00:00	14h 47m 5,4s	-22° 1' 36"	Lib	373325	11d 15h 44m	-12,33	1920	93,8	151,5° E	151,0°	18:40	23:21	03:15	27,5°	302,1°	60,6°
158	2028 06 06	00:00	15h 45m 48,9s	-25° 1' 31"	Lib	376369	12d 15h 44m	-12,48	1905	98,0	164,4° E	163,6°	19:46		03:59	24,3°	304,8°	56,6°
159	2028 06 07	00:00	16h 45m 40,0s	-26° 33' 42"	Sco	380068	13d 15h 44m	-12,62	1886	99,8	177,0° E	174,8°	20:44	00:19	04:50	22,8°	305,1°	54,8°
160	2028 06 08	00:00	17h 45m 5,7s	-26° 34' 24"	Sgr	384254	14d 15h 44m	-12,53	1866	99,3	170,7° W	170,2°	21:33	01:16	05:48	24,4°	303,3°	55,3°

Topocentric ephemeris of the Moon (following)

Times are given in UT for Aveiro (8° 37' 48" W, 40° 36' 7" N, zone Z).

	Date	Hour	R. A. (2000.0)	Decl. (2000.0)	Const.	Dist. E.	Age	Magn.	Diam.	Illum.	Elong.	Separ.	Rise	Transit	Set	Elevation	Azimuth	Azimuth
	yyyy mm dd	hh:mm	topocentric	topocentric		km	days	mV	"	%	°	°	hh:mm	hh:mm	hh:mm	(max.)	at rise	at set
161	2028 06 09	00:00	18h 42m 30,4s	-25° 9' 8"	Sgr	388687	15d 15h 44m	-12,35	1845	96,6	158,7° W	158,6°	22:13	02:10	06:51	27,3°	299,6°	58,0°
162	2028 06 10	00:00	19h 36m 48,2s	-22° 30' 31"	Sgr	393077	16d 15h 44m	-12,17	1824	92,0	147,0° W	147,0°	22:46	03:01	07:55	31,1°	294,6°	62,3°
163	2028 06 11	00:00	20h 27m 37,0s	-18° 54' 28"	Cap	397110	17d 15h 44m	-11,97	1805	85,8	135,6° W	135,6°	23:14	03:49	08:59	35,7°	288,7°	67,8°
164	2028 06 12	00:00	21h 15m 12,5s	-14° 36' 41"	Cap	400481	18d 15h 44m	-11,78	1790	78,4	124,4° W	124,4°	23:38	04:33	10:00	40,7°	282,2°	74,1°
165	2028 06 13	00:00	22h 0m 15,0s	-9° 50' 53"	Aqr	402924	19d 15h 44m	-11,57	1779	70,0	113,4° W	113,4°	23:59	05:15	11:00	46,0°	275,4°	80,9°
166	2028 06 14	00:00	22h 43m 37,4s	-4° 48' 23"	Aqr	404237	20d 15h 44m	-11,35	1774	61,0	102,5° W	102,5°		05:55	11:59	51,4°	268,5°	88,0°
167	2028 06 15	00:00	23h 26m 17,5s	+0° 21' 17"	Psc	404296	21d 15h 44m	-11,11	1773	51,6	91,6° W	91,6°	00:21	06:35	12:58	51,4°	268,5°	95,1°
168	2028 06 16	00:00	0h 9m 14,9s	+5° 29' 26"	Psc	403075	22d 15h 44m	-10,85	1779	42,1	80,7° W	80,7°	00:43	07:15	13:58	56,7°	261,6°	102,1°
169	2028 06 17	00:00	0h 53m 29,5s	+10° 26' 57"	Psc	400640	23d 15h 44m	-10,57	1790	32,7	69,6° W	69,6°	01:06	07:58	14:59	61,8°	254,9°	108,8°
170	2028 06 18	00:00	1h 39m 58,8s	+15° 3' 14"	Psc	397158	24d 15h 44m	-10,25	1805	23,9	58,3° W	58,4°	01:33	08:43	16:04	66,5°	248,6°	114,9°
171	2028 06 19	00:00	2h 29m 33,0s	+19° 5' 10"	Ari	392884	25d 15h 44m	-9,88	1825	15,9	46,7° W	46,8°	02:04	09:32	17:10	70,4°	242,9°	120,0°
172	2028 06 20	00:00	3h 22m 44,0s	+22° 16' 52"	Ari	388142	26d 15h 44m	-9,46	1847	9,1	34,8° W	34,9°	02:42	10:25	18:16	73,4°	238,5°	123,5°
173	2028 06 21	00:00	4h 19m 30,7s	+24° 20' 48"	Tau	383298	27d 15h 44m	-8,96	1870	3,9	22,5° W	22,7°	03:29	11:23	19:19	74,9°	235,7°	125,0°
174	2028 06 22	00:00	5h 19m 5,9s	+25° 0' 49"	Tau	378723	28d 15h 44m	-8,40	1893	0,8	10,0° W	10,2°	04:26	12:22	20:16	74,8°	235,1°	124,0°
175	2028 06 23	00:00	6h 19m 59,1s	+24° 6' 36"	Gem	374751	0d 5h 33m	-8,06	1913	0,1	2,9° E	3,0°	05:32	13:22	21:04	72,9°	237,0°	120,5°
176	2028 06 24	00:00	7h 20m 23,5s	+21° 37' 39"	Gem	371634	1d 5h 33m	-8,72	1929	1,9	16,0° E	16,0°	06:45	14:21	21:45	69,2°	241,4°	115,0°
177	2028 06 25	00:00	8h 18m 54,5s	+17° 43' 57"	Cnc	369520	2d 5h 33m	-9,33	1940	6,4	29,3° E	29,4°	08:01	15:16	22:19	64,3°	247,7°	108,1°
178	2028 06 26	00:00	9h 14m 53,9s	+12° 43' 24"	Cnc	368437	3d 5h 33m	-9,87	1946	13,4	42,7° E	42,8°	09:16	16:09	22:48	58,3°	255,4°	100,2°
179	2028 06 27	00:00	10h 8m 31,0s	+6° 57' 32"	Leo	368312	4d 5h 33m	-10,34	1947	22,3	56,1° E	56,2°	10:30	16:59	23:16	51,9°	263,8°	91,8°
180	2028 06 28	00:00	11h 0m 28,0s	+0° 48' 24"	Leo	369003	5d 5h 33m	-10,74	1943	32,7	69,5° E	69,6°	11:43	17:48	23:42	45,4°	272,4°	83,5°
181	2028 06 29	00:00	11h 51m 44,5s	-5° 23' 8"	Vir	370337	6d 5h 33m	-11,09	1936	43,9	82,9° E	82,9°	12:55	18:37		45,4°	280,9°	83,5°
182	2028 06 30	00:00	12h 43m 23,6s	-11° 17' 38"	Vir	372156	7d 5h 33m	-11,38	1926	55,4	96,1° E	96,0°	14:07	19:28	00:10	39,1°	288,7°	75,5°
183	2028 07 01	00:00	13h 36m 21,7s	-16° 36' 44"	Vir	374334	8d 5h 33m	-11,64	1915	66,4	109,1° E	109,0°	15:18	20:20	00:40	33,5°	295,5°	68,3°
184	2028 07 02	00:00	14h 31m 16,6s	-21° 2' 55"	Lib	376793	9d 5h 33m	-11,86	1903	76,4	121,9° E	121,7°	16:29	21:14	01:14	28,7°	300,8°	62,2°
185	2028 07 03	00:00	15h 28m 14,9s	-24° 20' 14"	Lib	379490	10d 5h 33m	-12,05	1889	85,0	134,6° E	134,3°	17:36	22:10	01:55	25,2°	304,2°	57,7°
186	2028 07 04	00:00	16h 26m 42,7s	-26° 16' 16"	Sco	382404	11d 5h 33m	-12,21	1875	91,8	147,0° E	146,7°	18:36	23:06	02:43	23,1°	305,3°	55,2°
187	2028 07 05	00:00	17h 25m 28,2s	-26° 44' 36"	Oph	385509	12d 5h 33m	-12,37	1860	96,7	159,2° E	158,9°	19:27		03:38	22,6°	304,2°	54,8°
188	2028 07 06	00:00	18h 23m 2,8s	-25° 46' 41"	Sgr	388752	13d 5h 33m	-12,51	1844	99,4	171,1° E	170,8°	20:10	00:01	04:38	26,0°	301,2°	56,7°
189	2028 07 07	00:00	19h 18m 11,3s	-23° 31' 25"	Sgr	392038	14d 5h 33m	-12,57	1829	99,9	177,1° W	176,9°	20:46	00:54	05:42	29,5°	296,7°	60,4°
190	2028 07 08	00:00	20h 10m 12,7s	-20° 12' 35"	Cap	395224	15d 5h 33m	-12,40	1814	98,4	165,6° W	165,6°	21:15	01:43	06:46	33,8°	291,0°	65,5°
191	2028 07 09	00:00	20h 59m 4,1s	-16° 5' 40"	Cap	398128	16d 5h 33m	-12,23	1801	95,1	154,3° W	154,3°	21:41	02:28	07:48	38,7°	284,7°	71,6°
192	2028 07 10	00:00	21h 45m 11,9s	-11° 25' 27"	Cap	400540	17d 5h 33m	-12,06	1790	90,1	143,2° W	143,2°	22:03	03:11	08:49	43,9°	278,1°	78,3°
193	2028 07 11	00:00	22h 29m 19,6s	-6° 24' 47"	Aqr	402247	18d 5h 33m	-11,88	1782	83,6	132,2° W	132,1°	22:25	03:52	09:49	49,3°	271,2°	85,3°
194	2028 07 12	00:00	23h 12m 19,7s	-1° 14' 36"	Psc	403053	19d 5h 33m	-11,70	1779	76,0	121,2° W	121,2°	22:46	04:31	10:47	54,6°	264,3°	92,3°
195	2028 07 13	00:00	23h 55m 8,2s	+3° 55' 36"	Psc	402805	20d 5h 33m	-11,50	1780	67,4	110,3° W	110,2°	23:08	05:11	11:46	59,8°	257,5°	99,4°
196	2028 07 14	00:00	0h 38m 42,5s	+8° 56' 42"	Psc	401413	21d 5h 33m	-11,29	1786	58,2	99,3° W	99,3°	23:33	05:52	12:46	64,6°	251,1°	106,1°
197	2028 07 15	00:00	1h 24m 0,1s	+13° 39' 3"	Psc	398874	22d 5h 33m	-11,05	1797	48,5	88,1° W	88,2°		06:36	13:49	68,9°	245,2°	112,4°
198	2028 07 16	00:00	2h 11m 54,5s	+17° 51' 17"	Ari	395274	23d 5h 33m	-10,79	1814	38,7	76,8° W	76,8°	00:01	07:22	14:53	68,9°	245,2°	117,9°
199	2028 07 17	00:00	3h 3m 8,4s	+21° 19' 42"	Ari	390807	24d 5h 33m	-10,49	1835	29,2	65,2° W	65,2°	00:35	08:12	15:58	72,2°	240,3°	122,2°
200	2028 07 18	00:00	3h 58m 1,1s	+23° 48' 16"	Tau	385760	25d 5h 33m	-10,14	1859	20,2	53,2° W	53,3°	01:17	09:07	17:02	74,4°	236,7°	124,6°

Topocentric ephemeris of the Moon (following)

Times are given in UT for Aveiro (8° 37' 48" W, 40° 36' 7" N, zone Z).

	Date	Hour	R. A. (2000.0)	Decl. (2000.0)	Const.	Dist. E.	Age	Magn.	Diam.	Illum.	Elong.	Separ.	Rise	Transit	Set	Elevation	Azimuth	Azimuth
	yyyy mm dd	hh:mm	topocentric	topocentric		km	days	mV	"	%	°	°	hh:mm	hh:mm	hh:mm	(max.)	at rise	at set
201	2028 07 19	00:00	4h 56m 13,7s	+25° 0' 19"	Tau	380506	26d 5h 33m	-9,74	1884	12,3	40,9° W	40,9°	02:09	10:05	18:01	75,1°	235,0°	124,8°
202	2028 07 20	00:00	5h 56m 41,6s	+24° 42' 10"	Tau	375468	27d 5h 33m	-9,25	1909	6,0	28,2° W	28,2°	03:11	11:05	18:54	74,0°	235,7°	122,5°
203	2028 07 21	00:00	6h 57m 47,3s	+22° 47' 31"	Gem	371074	28d 5h 33m	-8,68	1932	1,7	15,1° W	15,1°	04:22	12:05	19:39	71,1°	239,0°	117,8°
204	2028 07 22	00:00	7h 57m 52,9s	+19° 20' 32"	Cnc	367697	29d 5h 33m	-8,02	1950	0,0	1,7° W	2,1°	05:38	13:04	20:16	66,6°	244,6°	111,3°
205	2028 07 23	00:00	8h 55m 54,3s	+14° 35' 39"	Cnc	365604	0d 20h 59m	-8,57	1961	1,1	12,0° E	12,3°	06:56	13:59	20:49	60,9°	252,0°	103,5°
206	2028 07 24	00:00	9h 51m 35,0s	+8° 54' 14"	Leo	364910	1d 20h 59m	-9,22	1965	5,1	25,8° E	26,0°	08:13	14:52	21:18	54,5°	260,4°	95,0°
207	2028 07 25	00:00	10h 45m 18,9s	+2° 40' 39"	Sex	365568	2d 20h 59m	-9,78	1961	11,6	39,6° E	39,8°	09:29	15:43	21:45	47,7°	269,3°	86,4°
208	2028 07 26	00:00	11h 37m 54,7s	-3° 40' 53"	Vir	367390	3d 20h 59m	-10,26	1951	20,3	53,2° E	53,4°	10:43	16:33	22:13	41,1°	278,1°	78,1°
209	2028 07 27	00:00	12h 30m 20,5s	-9° 48' 2"	Vir	370098	4d 20h 59m	-10,67	1937	30,5	66,7° E	66,9°	11:57	17:24	22:43	35,1°	286,3°	70,4°
210	2028 07 28	00:00	13h 23m 31,0s	-15° 20' 48"	Vir	373381	5d 20h 59m	-11,01	1920	41,5	80,0° E	80,0°	13:09	18:16	23:16	30,0°	293,6°	63,9°
211	2028 07 29	00:00	14h 18m 6,2s	-20° 1' 35"	Vir	376948	6d 20h 59m	-11,30	1902	52,6	92,9° E	92,9°	14:21	19:10	23:54	26,1°	299,4°	58,9°
212	2028 07 30	00:00	15h 14m 20,5s	-23° 35' 20"	Lib	380563	7d 20h 59m	-11,54	1884	63,4	105,5° E	105,4°	15:28	20:06		26,1°	303,4°	58,9°
213	2028 07 31	00:00	16h 11m 53,8s	-25° 50' 35"	Sco	384064	8d 20h 59m	-11,75	1867	73,4	117,8° E	117,7°	16:30	21:01	00:40	23,6°	305,2°	55,7°
214	2028 08 01	00:00	17h 9m 52,0s	-26° 40' 59"	Oph	387356	9d 20h 59m	-11,94	1851	82,1	129,9° E	129,8°	17:24	21:56	01:32	22,6°	304,8°	54,7°
215	2028 08 02	00:00	18h 7m 1,0s	-26° 6' 37"	Sgr	390396	10d 20h 59m	-12,10	1836	89,3	141,7° E	141,7°	18:09	22:49	02:30	23,1°	302,4°	55,9°
216	2028 08 03	00:00	19h 2m 11,1s	-24° 14' 3"	Sgr	393172	11d 20h 59m	-12,25	1823	94,7	153,4° E	153,3°	18:46	23:38	03:32	25,1°	298,4°	58,9°
217	2028 08 04	00:00	19h 54m 37,6s	-21° 14' 47"	Sgr	395674	12d 20h 59m	-12,39	1812	98,3	164,8° E	164,8°	19:18		04:36	32,2°	293,2°	63,6°
218	2028 08 05	00:00	20h 44m 8,4s	-17° 22' 45"	Cap	397882	13d 20h 59m	-12,52	1802	99,9	176,1° E	176,0°	19:44	00:24	05:38	36,9°	287,1°	69,3°
219	2028 08 06	00:00	21h 30m 59,4s	-12° 52' 13"	Cap	399741	14d 20h 59m	-12,46	1794	99,6	172,7° W	172,5°	20:08	01:08	06:40	42,0°	280,6°	75,8°
220	2028 08 07	00:00	22h 15m 45,5s	-7° 56' 27"	Aqr	401167	15d 20h 59m	-12,31	1787	97,4	161,7° W	161,5°	20:30	01:49	07:40	47,3°	273,7°	82,7°
221	2028 08 08	00:00	22h 59m 11,7s	-2° 47' 18"	Psc	402044	16d 20h 59m	-12,15	1783	93,5	150,7° W	150,5°	20:51	02:29	08:38	52,7°	266,8°	89,7°
222	2028 08 09	00:00	23h 42m 8,0s	+2° 24' 40"	Psc	402241	17d 20h 59m	-11,99	1782	88,1	139,7° W	139,5°	21:13	03:09	09:37	57,9°	260,0°	96,8°
223	2028 08 10	00:00	0h 25m 26,6s	+7° 29' 37"	Psc	401629	18d 20h 59m	-11,83	1785	81,3	128,7° W	128,6°	21:36	03:49	10:36	62,8°	253,5°	103,6°
224	2028 08 11	00:00	1h 9m 60,0s	+12° 17' 43"	Psc	400104	19d 20h 59m	-11,65	1792	73,2	117,6° W	117,6°	22:02	04:31	11:37	67,2°	247,5°	110,0°
225	2028 08 12	00:00	1h 56m 38,4s	+16° 38' 22"	Ari	397608	20d 20h 59m	-11,46	1803	64,3	106,5° W	106,4°	22:33	05:16	12:39	70,9°	242,2°	115,8°
226	2028 08 13	00:00	2h 46m 5,1s	+20° 19' 26"	Ari	394155	21d 20h 59m	-11,24	1819	54,6	95,1° W	95,1°	23:11	06:03	13:42	73,6°	238,1°	120,5°
227	2028 08 14	00:00	3h 38m 47,5s	+23° 7' 5"	Tau	389849	22d 20h 59m	-11,00	1839	44,5	83,5° W	83,5°	23:56	06:55	14:45	74,9°	235,6°	123,7°
228	2028 08 15	00:00	4h 34m 45,7s	+24° 46' 21"	Tau	384892	23d 20h 59m	-10,72	1863	34,3	71,6° W	71,6°	07:50	07:50	15:46	74,7°	235,1°	125,0°
229	2028 08 16	00:00	5h 33m 22,4s	+25° 3' 23"	Tau	379591	24d 20h 59m	-10,39	1889	24,6	59,3° W	59,3°	00:52	08:48	16:41	74,7°	235,1°	123,9°
230	2028 08 17	00:00	6h 33m 25,6s	+23° 48' 45"	Gem	374340	25d 20h 59m	-9,99	1915	15,7	46,6° W	46,6°	01:58	09:47	17:29	72,8°	237,1°	120,4°
231	2028 08 18	00:00	7h 33m 28,5s	+21° 0' 48"	Gem	369586	26d 20h 59m	-9,52	1940	8,3	33,5° W	33,5°	03:11	10:46	18:09	69,1°	241,6°	114,8°
232	2028 08 19	00:00	8h 32m 19,6s	+16° 47' 29"	Cnc	365775	27d 20h 59m	-8,96	1960	3,0	19,9° W	20,0°	04:28	11:43	18:45	64,0°	248,1°	107,6°
233	2028 08 20	00:00	9h 29m 23,5s	+11° 25' 22"	Leo	363286	28d 20h 59m	-8,33	1974	0,4	6,1° W	6,9°	05:47	12:38	19:16	57,7°	256,1°	99,3°
234	2028 08 21	00:00	10h 24m 44,5s	+5° 17' 4"	Sex	362361	0d 13h 16m	-8,43	1979	0,6	7,9° E	9,0°	07:05	13:31	19:45	50,9°	265,0°	90,4°
235	2028 08 22	00:00	11h 18m 56,8s	-1° 11' 51"	Leo	363060	1d 13h 16m	-9,09	1975	3,8	22,0° E	22,6°	08:22	14:23	20:13	44,0°	274,1°	81,7°
236	2028 08 23	00:00	12h 12m 49,1s	-7° 35' 40"	Vir	365251	2d 13h 16m	-9,66	1963	9,8	36,0° E	36,4°	09:38	15:16	20:43	37,5°	282,9°	73,5°
237	2028 08 24	00:00	13h 7m 11,1s	-13° 30' 22"	Vir	368645	3d 13h 16m	-10,15	1945	17,9	49,7° E	49,9°	10:54	16:09	21:16	31,9°	290,9°	66,3°
238	2028 08 25	00:00	14h 2m 40,6s	-18° 34' 57"	Vir	372857	4d 13h 16m	-10,56	1923	27,5	63,0° E	63,2°	12:08	17:04	21:54	27,4°	297,4°	60,5°
239	2028 08 26	00:00	14h 59m 31,8s	-22° 32' 20"	Lib	377479	5d 13h 16m	-10,90	1899	38,1	76,0° E	76,1°	13:19	18:00	22:38	24,3°	302,1°	56,7°
240	2028 08 27	00:00	15h 57m 26,8s	-25° 10' 17"	Sco	382136	6d 13h 16m	-11,18	1876	48,9	88,6° E	88,6°	14:24	18:57	23:28	22,9°	304,7°	54,9°

Topocentric ephemeris of the Moon (following)

Times are given in UT for Aveiro (8° 37' 48" W, 40° 36' 7" N, zone Z).

	Date	Hour	R. A. (2000.0)	Decl. (2000.0)	Const.	Dist. E.	Age	Magn.	Diam.	Illum.	Elong.	Separ.	Rise	Transit	Set	Elevation	Azimuth	Azimuth
	yyyy mm dd	hh:mm	topocentric	topocentric		km	days	mV	"	%	°	°	hh:mm	hh:mm	hh:mm	(max.)	at rise	at set
241	2028 08 28	00:00	16h 55m 36,4s	-26° 22' 33"	Oph	386529	7d 13h 16m	-11,43	1855	59,4	100,8° E	100,7°	15:20	19:52		22,9°	305,0°	54,9°
242	2028 08 29	00:00	17h 52m 53,0s	-26° 9' 24"	Sgr	390452	8d 13h 16m	-11,64	1836	69,3	112,6° E	112,6°	16:08	20:45	00:25	22,9°	303,2°	55,4°
243	2028 08 30	00:00	18h 48m 12,4s	-24° 37' 12"	Sgr	393789	9d 13h 16m	-11,82	1821	78,2	124,2° E	124,2°	16:48	21:35	01:26	24,4°	299,7°	57,9°
244	2028 08 31	00:00	19h 40m 52,9s	-21° 56' 43"	Sgr	396500	10d 13h 16m	-11,99	1808	85,8	135,6° E	135,6°	17:20	22:22	02:28	27,1°	294,9°	62,1°
245	2028 09 01	00:00	20h 30m 42,5s	-18° 20' 55"	Cap	398598	11d 13h 16m	-12,14	1799	91,9	146,8° E	146,8°	17:48	23:06	03:31	30,9°	289,1°	67,4°
246	2028 09 02	00:00	21h 17m 55,5s	-14° 3' 7"	Aqr	400124	12d 13h 16m	-12,28	1792	96,3	157,9° E	157,8°	18:13	23:48	04:32	35,3°	282,8°	73,6°
247	2028 09 03	00:00	22h 3m 3,9s	-9° 16' 1"	Aqr	401123	13d 13h 16m	-12,42	1787	99,0	168,9° E	168,6°	18:35		05:32	45,5°	276,1°	80,3°
248	2028 09 04	00:00	22h 46m 49,4s	-4° 11' 20"	Aqr	401628	14d 13h 16m	-12,51	1785	99,9	179,9° E	176,7°	18:57	00:29	06:31	50,8°	269,2°	87,3°
249	2028 09 05	00:00	23h 29m 58,6s	+1° 0' 3"	Psc	401642	15d 13h 16m	-12,41	1785	99,0	169,1° W	168,4°	19:18	01:09	07:30	56,1°	262,4°	94,3°
250	2028 09 06	00:00	0h 13m 19,4s	+6° 7' 43"	Psc	401140	16d 13h 16m	-12,27	1787	96,3	158,0° W	157,6°	19:41	01:49	08:29	61,1°	255,8°	101,2°
251	2028 09 07	00:00	0h 57m 39,5s	+11° 1' 14"	Psc	400070	17d 13h 16m	-12,12	1792	91,8	147,0° W	146,7°	20:06	02:30	09:29	65,7°	249,6°	107,8°
252	2028 09 08	00:00	1h 43m 44,2s	+15° 29' 40"	Psc	398367	18d 13h 16m	-11,97	1800	85,8	135,8° W	135,7°	20:35	03:13	10:30	69,6°	244,1°	113,7°
253	2028 09 09	00:00	2h 32m 12,1s	+19° 21' 13"	Ari	395973	19d 13h 16m	-11,80	1811	78,4	124,6° W	124,5°	21:10	03:59	11:32	72,6°	239,6°	118,8°
254	2028 09 10	00:00	3h 23m 29,0s	+22° 23' 2"	Ari	392858	20d 13h 16m	-11,62	1825	69,8	113,2° W	113,2°	21:51	04:48	12:34	74,4°	236,5°	122,5°
255	2028 09 11	00:00	4h 17m 38,7s	+24° 21' 49"	Tau	389048	21d 13h 16m	-11,42	1843	60,2	101,6° W	101,6°	22:42	05:41	13:34	74,8°	235,3°	124,5°
256	2028 09 12	00:00	5h 14m 16,1s	+25° 5' 10"	Tau	384646	22d 13h 16m	-11,19	1864	49,9	89,7° W	89,7°	23:41	06:36	14:30	73,7°	236,2°	124,4°
257	2028 09 13	00:00	6h 12m 27,5s	+24° 23' 51"	Gem	379844	23d 13h 16m	-10,92	1887	39,3	77,5° W	77,5°		07:33	15:19	70,9°	239,4°	122,1°
258	2028 09 14	00:00	7h 11m 3,7s	+22° 14' 12"	Gem	374934	24d 13h 16m	-10,60	1912	28,9	64,9° W	64,9°	00:49	08:30	16:02	70,9°	239,4°	117,6°
259	2028 09 15	00:00	8h 9m 2,4s	+18° 39' 43"	Cnc	370291	25d 13h 16m	-10,22	1936	19,2	51,9° W	51,9°	02:02	09:26	16:39	66,6°	244,8°	111,3°
260	2028 09 16	00:00	9h 5m 47,2s	+13° 51' 15"	Cnc	366338	26d 13h 16m	-9,77	1957	10,9	38,5° W	38,6°	03:18	10:21	17:11	61,0°	251,9°	103,7°
261	2028 09 17	00:00	10h 1m 15,4s	+8° 6' 0"	Leo	363492	27d 13h 16m	-9,22	1972	4,7	24,7° W	25,0°	04:35	11:15	17:41	54,6°	260,2°	95,1°
262	2028 09 18	00:00	10h 55m 52,3s	+1° 45' 55"	Leo	362089	28d 13h 16m	-8,60	1980	1,0	10,7° W	11,6°	05:53	12:08	18:10	47,7°	269,3°	86,3°
263	2028 09 19	00:00	11h 50m 20,9s	-4° 44' 1"	Vir	362322	0d 5h 36m	-8,30	1979	0,3	3,5° E	6,3°	07:11	13:01	18:40	40,8°	278,4°	77,6°
264	2028 09 20	00:00	12h 45m 28,6s	-10° 57' 40"	Vir	364190	1d 5h 36m	-8,91	1969	2,6	17,6° E	18,4°	08:29	13:56	19:13	34,6°	287,0°	69,7°
265	2028 09 21	00:00	13h 41m 53,1s	-16° 29' 55"	Vir	367498	2d 5h 36m	-9,49	1951	7,6	31,4° E	31,9°	09:47	14:52	19:50	29,4°	294,4°	63,1°
266	2028 09 22	00:00	14h 39m 49,7s	-20° 58' 52"	Lib	371899	3d 5h 36m	-9,98	1928	14,8	44,9° E	45,2°	11:02	15:50	20:32	25,6°	300,1°	58,2°
267	2028 09 23	00:00	15h 38m 59,2s	-24° 8' 8"	Lib	376955	4d 5h 36m	-10,40	1902	23,7	58,0° E	58,1°	12:11	16:48	21:22	23,4°	303,7°	55,6°
268	2028 09 24	00:00	16h 38m 28,0s	-25° 48' 41"	Sco	382213	5d 5h 36m	-10,74	1876	33,5	70,6° E	70,7°	13:13	17:45	22:18	22,9°	304,8°	55,3°
269	2028 09 25	00:00	17h 37m 1,1s	-25° 59' 47"	Oph	387261	6d 5h 36m	-11,03	1851	43,8	82,8° E	82,8°	14:05	18:40	23:19	24,0°	303,7°	57,2°
270	2028 09 26	00:00	18h 33m 27,3s	-24° 48' 4"	Sgr	391776	7d 5h 36m	-11,28	1830	54,1	94,6° E	94,6°	14:47	19:32		24,0°	300,7°	57,2°
271	2028 09 27	00:00	19h 27m 0,8s	-22° 25' 4"	Sgr	395534	8d 5h 36m	-11,50	1813	63,9	106,0° E	106,0°	15:22	20:20	00:21	26,3°	296,3°	60,8°
272	2028 09 28	00:00	20h 17m 29,3s	-19° 4' 22"	Cap	398414	9d 5h 36m	-11,69	1800	73,0	117,2° E	117,2°	15:52	21:05	01:24	29,7°	290,9°	65,8°
273	2028 09 29	00:00	21h 5m 9,0s	-14° 59' 30"	Cap	400387	10d 5h 36m	-11,87	1791	81,1	128,3° E	128,3°	16:17	21:47	02:26	33,9°	284,7°	71,7°
274	2028 09 30	00:00	21h 50m 34,8s	-10° 22' 49"	Cap	401495	11d 5h 36m	-12,03	1786	87,9	139,3° E	139,2°	16:40	22:28	03:26	38,7°	278,2°	78,2°
275	2028 10 01	00:00	22h 34m 30,9s	-5° 25' 29"	Aqr	401827	12d 5h 36m	-12,18	1784	93,4	150,3° E	150,1°	17:02	23:08	04:25	43,8°	271,4°	85,0°
276	2028 10 02	00:00	23h 17m 45,8s	-0° 17' 51"	Psc	401497	13d 5h 36m	-12,33	1786	97,3	161,2° E	160,9°	17:24	23:48	05:23	49,1°	264,6°	92,0°
277	2028 10 03	00:00	0h 1m 8,3s	+4° 49' 56"	Psc	400619	14d 5h 36m	-12,46	1790	99,4	172,3° E	171,2°	17:46		06:22	59,4°	258,0°	99,0°
278	2028 10 04	00:00	0h 45m 25,8s	+9° 47' 21"	Psc	399287	15d 5h 36m	-12,51	1796	99,8	176,6° W	174,4°	18:11	00:29	07:22	64,2°	251,6°	105,6°
279	2028 10 05	00:00	1h 31m 22,4s	+14° 23' 8"	Psc	397568	16d 5h 36m	-12,39	1803	98,3	165,4° W	164,8°	18:39	01:12	08:23	68,3°	245,9°	111,8°
280	2028 10 06	00:00	2h 19m 34,5s	+18° 24' 57"	Ari	395491	17d 5h 36m	-12,26	1813	94,9	154,2° W	153,8°	19:12	01:57	09:25	71,5°	241,1°	117,1°

Topocentric ephemeris of the Moon (following)

Times are given in UT for Aveiro (8° 37' 48" W, 40° 36' 7" N, zone Z).

	Date	Hour	R. A. (2000.0)	Decl. (2000.0)	Const.	Dist. E.	Age	Magn.	Diam.	Illum.	Elong.	Separ.	Rise	Transit	Set	Elevation	Azimuth	Azimuth
	yyyy mm dd	hh:mm	topocentric	topocentric		km	days	mV	"	%	°	°	hh:mm	hh:mm	hh:mm	(max.)	at rise	at set
281	2028 10 07	00:00	3h 10m 24,8s	+21° 39' 35"	Ari	393061	18d 5h 36m	-12,12	1824	89,8	142,8° W	142,6°	19:51	02:46	10:27	73,7°	237,6°	121,2°
282	2028 10 08	00:00	4h 3m 54,6s	+23° 53' 49"	Tau	390263	19d 5h 36m	-11,96	1837	83,0	131,2° W	131,1°	20:38	03:37	11:27	74,6°	235,8°	123,7°
283	2028 10 09	00:00	4h 59m 37,6s	+24° 55' 48"	Tau	387091	20d 5h 36m	-11,79	1852	74,7	119,5° W	119,5°	21:33	04:30	12:23	74,0°	236,0°	124,3°
284	2028 10 10	00:00	5h 56m 41,9s	+24° 37' 5"	Tau	383569	21d 5h 36m	-11,59	1869	65,2	107,6° W	107,6°	22:36	05:25	13:13	71,9°	238,3°	122,8°
285	2028 10 11	00:00	6h 54m 3,1s	+22° 54' 30"	Gem	379775	22d 5h 36m	-11,37	1888	54,8	95,4° W	95,4°	23:45	06:21	13:57	68,3°	242,7°	119,2°
286	2028 10 12	00:00	7h 50m 44,1s	+19° 50' 55"	Gem	375860	23d 5h 36m	-11,10	1907	43,9	82,9° W	82,9°		07:15	14:35	63,5°	248,9°	113,9°
287	2028 10 13	00:00	8h 46m 12,8s	+15° 34' 58"	Cnc	372056	24d 5h 36m	-10,79	1927	33,1	70,0° W	70,0°	00:57	08:09	15:08	63,5°	248,9°	107,1°
288	2028 10 14	00:00	9h 40m 28,2s	+10° 20' 2"	Leo	368665	25d 5h 36m	-10,42	1945	22,8	56,8° W	56,9°	02:11	09:01	15:38	57,6°	256,4°	99,2°
289	2028 10 15	00:00	10h 33m 56,6s	+4° 23' 16"	Sex	366032	26d 5h 36m	-9,98	1959	13,8	43,3° W	43,5°	03:26	09:52	16:07	51,1°	264,8°	90,7°
290	2028 10 16	00:00	11h 27m 22,7s	-1° 54' 51"	Leo	364489	27d 5h 36m	-9,45	1967	6,7	29,5° W	29,9°	04:42	10:45	16:36	44,4°	273,7°	82,1°
291	2028 10 17	00:00	12h 21m 38,2s	-8° 11' 10"	Vir	364295	28d 5h 36m	-8,85	1968	2,0	15,5° W	16,4°	05:59	11:38	17:07	37,8°	282,5°	73,8°
292	2028 10 18	00:00	13h 17m 29,4s	-14° 0' 42"	Vir	365576	29d 5h 36m	-8,28	1961	0,2	1,6° W	5,6°	07:17	12:34	17:42	32,1°	290,6°	66,5°
293	2028 10 19	00:00	14h 15m 22,7s	-18° 58' 42"	Vir	368286	0d 21h 03m	-8,66	1947	1,3	12,2° E	13,2°	08:35	13:32	18:23	27,5°	297,3°	60,6°
294	2028 10 20	00:00	15h 15m 9,4s	-22° 43' 31"	Lib	372211	1d 21h 03m	-9,24	1926	5,1	25,7° E	26,1°	09:50	14:32	19:10	24,5°	302,0°	56,9°
295	2028 10 21	00:00	16h 15m 57,7s	-25° 0' 12"	Sco	376998	2d 21h 03m	-9,74	1902	11,2	38,8° E	39,0°	10:57	15:32	20:06	23,2°	304,3°	55,5°
296	2028 10 22	00:00	17h 16m 22,1s	-25° 43' 14"	Oph	382215	3d 21h 03m	-10,17	1876	19,0	51,5° E	51,5°	11:55	16:30	21:06	23,6°	304,1°	56,5°
297	2028 10 23	00:00	18h 14m 51,1s	-24° 56' 59"	Sgr	387418	4d 21h 03m	-10,53	1851	27,9	63,7° E	63,7°	12:42	17:24	22:10	25,5°	301,8°	59,6°
298	2028 10 24	00:00	19h 10m 18,4s	-22° 53' 8"	Sgr	392201	5d 21h 03m	-10,84	1828	37,6	75,4° E	75,4°	13:21	18:15	23:14	28,6°	297,8°	64,2°
299	2028 10 25	00:00	20h 2m 18,4s	-19° 46' 49"	Sgr	396241	6d 21h 03m	-11,10	1809	47,4	86,9° E	86,9°	13:53	19:01		28,6°	292,6°	64,2°
300	2028 10 26	00:00	20h 51m 2,6s	-15° 53' 12"	Cap	399312	7d 21h 03m	-11,33	1795	57,2	98,1° E	98,1°	14:20	19:45	00:17	32,6°	286,7°	69,9°
301	2028 10 27	00:00	21h 37m 7,1s	-11° 25' 45"	Cap	401296	8d 21h 03m	-11,54	1787	66,5	109,1° E	109,1°	14:44	20:26	01:18	37,2°	280,3°	76,2°
302	2028 10 28	00:00	22h 21m 20,6s	-6° 35' 54"	Aqr	402174	9d 21h 03m	-11,73	1783	75,1	120,0° E	120,0°	15:06	21:06	02:17	42,2°	273,6°	82,9°
303	2028 10 29	00:00	23h 4m 36,6s	-1° 33' 34"	Psc	402016	10d 21h 03m	-11,91	1783	82,8	131,0° E	130,8°	15:28	21:46	03:16	47,4°	266,8°	89,8°
304	2028 10 30	00:00	23h 47m 48,9s	+3° 31' 53"	Psc	400955	11d 21h 03m	-12,08	1788	89,3	141,9° E	141,7°	15:50	22:27	04:14	52,6°	260,2°	96,7°
305	2028 10 31	00:00	0h 31m 50,1s	+8° 30' 49"	Psc	399171	12d 21h 03m	-12,24	1796	94,4	153,0° E	152,6°	16:15	23:09	05:14	57,8°	253,7°	103,4°
306	2028 11 01	00:00	1h 17m 29,0s	+13° 12' 28"	Psc	396862	13d 21h 03m	-12,40	1807	98,0	164,2° E	163,5°	16:42	23:54	06:14	62,6°	247,8°	109,7°
307	2028 11 02	00:00	2h 5m 26,8s	+17° 24' 31"	Ari	394221	14d 21h 03m	-12,55	1819	99,7	175,5° E	173,7°	17:13		07:16	70,5°	242,7°	115,3°
308	2028 11 03	00:00	2h 56m 10,7s	+20° 53' 11"	Ari	391414	15d 21h 03m	-12,54	1832	99,5	173,0° W	172,0°	17:51	00:42	08:19	73,0°	238,8°	119,9°
309	2028 11 04	00:00	3h 49m 44,2s	+23° 24' 1"	Tau	388566	16d 21h 03m	-12,41	1845	97,3	161,4° W	161,1°	18:36	01:33	09:21	74,3°	236,4°	122,9°
310	2028 11 05	00:00	4h 45m 39,9s	+24° 43' 50"	Tau	385755	17d 21h 03m	-12,27	1859	93,1	149,5° W	149,5°	19:30	02:26	10:18	74,1°	236,0°	124,1°
311	2028 11 06	00:00	5h 43m 0,2s	+24° 43' 12"	Tau	383015	18d 21h 03m	-12,12	1872	86,9	137,6° W	137,5°	20:30	03:21	11:11	72,4°	237,7°	123,2°
312	2028 11 07	00:00	6h 40m 31,0s	+23° 18' 47"	Gem	380354	19d 21h 03m	-11,94	1885	79,1	125,4° W	125,4°	21:37	04:17	11:56	69,3°	241,5°	120,2°
313	2028 11 08	00:00	7h 37m 5,8s	+20° 33' 59"	Gem	377773	20d 21h 03m	-11,75	1898	69,7	113,1° W	113,1°	22:46	05:11	12:35	65,0°	247,0°	115,4°
314	2028 11 09	00:00	8h 32m 5,8s	+16° 38' 9"	Cnc	375294	21d 21h 03m	-11,52	1910	59,2	100,5° W	100,5°	23:58	06:03	13:08	59,6°	253,9°	109,2°
315	2028 11 10	00:00	9h 25m 27,2s	+11° 44' 33"	Leo	372983	22d 21h 03m	-11,26	1922	48,1	87,7° W	87,7°		06:54	13:38	53,6°	261,7°	102,0°
316	2028 11 11	00:00	10h 17m 37,0s	+6° 8' 56"	Sex	370964	23d 21h 03m	-10,95	1933	36,9	74,7° W	74,7°	01:09	07:44	14:06	53,6°	261,7°	94,0°
317	2028 11 12	00:00	11h 9m 22,4s	+0° 8' 39"	Leo	369414	24d 21h 03m	-10,58	1941	26,3	61,4° W	61,5°	02:22	08:34	14:34	47,2°	270,1°	85,8°
318	2028 11 13	00:00	12h 1m 41,0s	-5° 57' 10"	Vir	368545	25d 21h 03m	-10,15	1945	16,7	48,0° W	48,2°	03:36	09:25	15:03	40,7°	278,6°	77,6°
319	2028 11 14	00:00	12h 55m 29,6s	-11° 47' 30"	Crv	368566	26d 21h 03m	-9,65	1945	9,0	34,4° W	34,8°	04:51	10:18	15:35	34,8°	286,8°	69,9°
320	2028 11 15	00:00	13h 51m 32,1s	-16° 59' 45"	Vir	369635	27d 21h 03m	-9,07	1940	3,5	20,8° W	21,4°	06:08	11:14	16:13	29,7°	294,1°	63,4°

Topocentric ephemeris of the Moon (following)

Times are given in UT for Aveiro (8° 37' 48" W, 40° 36' 7" N, zone Z).

	Date	Hour	R. A. (2000.0)	Decl. (2000.0)	Const.	Dist. E.	Age	Magn.	Diam.	Illum.	Elong.	Separ.	Rise	Transit	Set	Elevation	Azimuth	Azimuth
	yyyy mm dd	hh:mm	topocentric	topocentric		km	days	mV	"	%	°	°	hh:mm	hh:mm	hh:mm	(max.)	at rise	at set
321	2028 11 16	00:00	14h 50m 3,0s	-21° 11' 20"	Lib	371815	28d 21h 03m	-8,43	1928	0,6	7,4° W	8,7°	07:23	12:13	16:57	25,9°	299,8°	58,6°
322	2028 11 17	00:00	15h 50m 33,1s	-24° 2' 59"	Sco	375039	0d 10h 42m	-8,33	1912	0,4	5,9° E	7,0°	08:35	13:13	17:49	23,7°	303,3°	56,1°
323	2028 11 18	00:00	16h 51m 46,1s	-25° 22' 45"	Sco	379111	1d 10h 42m	-8,90	1891	2,8	18,8° E	19,0°	09:38	14:13	18:49	23,4°	304,3°	56,0°
324	2028 11 19	00:00	17h 51m 58,9s	-25° 9' 2"	Sgr	383725	2d 10h 42m	-9,42	1868	7,4	31,4° E	31,4°	10:32	15:11	19:53	24,7°	302,9°	58,2°
325	2028 11 20	00:00	18h 49m 37,8s	-23° 30' 12"	Sgr	388508	3d 10h 42m	-9,87	1845	13,8	43,6° E	43,6°	11:15	16:04	20:59	27,3°	299,5°	62,3°
326	2028 11 21	00:00	19h 43m 48,1s	-20° 41' 8"	Sgr	393065	4d 10h 42m	-10,26	1824	21,7	55,4° E	55,4°	11:51	16:54	22:04	31,1°	294,6°	67,7°
327	2028 11 22	00:00	20h 34m 21,0s	-16° 58' 45"	Cap	397032	5d 10h 42m	-10,59	1806	30,5	66,8° E	66,8°	12:20	17:39	23:06	35,5°	288,9°	73,9°
328	2028 11 23	00:00	21h 21m 43,2s	-12° 38' 43"	Aqr	400106	6d 10h 42m	-10,87	1792	39,8	78,0° E	78,0°	12:46	18:22		35,5°	282,6°	73,9°
329	2028 11 24	00:00	22h 6m 41,7s	-7° 54' 10"	Aqr	402073	7d 10h 42m	-11,13	1783	49,3	89,0° E	89,0°	13:09	19:03	00:07	40,4°	275,9°	80,5°
330	2028 11 25	00:00	22h 50m 12,1s	-2° 55' 49"	Aqr	402818	8d 10h 42m	-11,36	1780	58,7	99,9° E	99,9°	13:31	19:43	01:06	45,5°	269,2°	87,4°
331	2028 11 26	00:00	23h 33m 12,5s	+2° 7' 10"	Psc	402333	9d 10h 42m	-11,58	1782	67,8	110,8° E	110,8°	13:53	20:23	02:04	50,8°	262,5°	94,3°
332	2028 11 27	00:00	0h 16m 40,9s	+7° 6' 3"	Psc	400704	10d 10h 42m	-11,78	1789	76,3	121,8° E	121,7°	14:17	21:05	03:03	56,0°	256,0°	101,0°
333	2028 11 28	00:00	1h 1m 32,7s	+11° 51' 25"	Psc	398104	11d 10h 42m	-11,97	1801	84,0	132,9° E	132,7°	14:43	21:49	04:03	60,9°	249,9°	107,5°
334	2028 11 29	00:00	1h 48m 38,7s	+16° 12' 16"	Ari	394775	12d 10h 42m	-12,15	1816	90,4	144,1° E	143,8°	15:13	22:35	05:05	65,4°	244,5°	113,4°
335	2028 11 30	00:00	2h 38m 37,8s	+19° 55' 27"	Ari	391000	13d 10h 42m	-12,33	1834	95,4	155,6° E	155,2°	15:48	23:26	06:07	69,3°	240,1°	118,3°
336	2028 12 01	00:00	3h 31m 48,0s	+22° 46' 0"	Tau	387078	14d 10h 42m	-12,51	1852	98,7	167,3° E	166,8°	16:31		07:10	72,2°	237,1°	122,0°
337	2028 12 02	00:00	4h 27m 54,3s	+24° 28' 43"	Tau	383288	15d 10h 42m	-12,66	1871	99,9	179,2° E	177,2°	17:23	00:19	08:10	74,3°	236,0°	123,8°
338	2028 12 03	00:00	5h 26m 2,9s	+24° 51' 8"	Tau	379863	16d 10h 42m	-12,57	1887	99,0	168,6° W	168,5°	18:22	01:15	09:06	73,0°	237,1°	123,6°
339	2028 12 04	00:00	6h 24m 51,2s	+23° 46' 50"	Gem	376968	17d 10h 42m	-12,43	1902	95,8	156,3° W	156,3°	19:29	02:11	09:54	70,3°	240,3°	121,2°
340	2028 12 05	00:00	7h 22m 53,4s	+21° 17' 40"	Gem	374685	18d 10h 42m	-12,27	1913	90,3	143,7° W	143,7°	20:38	03:06	10:35	66,2°	245,4°	116,8°
341	2028 12 06	00:00	8h 19m 9,1s	+17° 33' 16"	Cnc	373022	19d 10h 42m	-12,09	1922	82,9	131,0° W	131,0°	21:49	03:59	11:11	61,1°	251,9°	111,0°
342	2028 12 07	00:00	9h 13m 17,8s	+12° 48' 35"	Cnc	371934	20d 10h 42m	-11,89	1928	73,7	118,2° W	118,1°	23:01	04:51	11:41	55,3°	259,5°	104,0°
343	2028 12 08	00:00	10h 5m 37,2s	+7° 21' 6"	Leo	371349	21d 10h 42m	-11,66	1931	63,2	105,2° W	105,2°		05:41	12:10	49,1°	267,6°	96,3°
344	2028 12 09	00:00	10h 56m 51,3s	+1° 28' 56"	Leo	371203	22d 10h 42m	-11,39	1931	52,0	92,1° W	92,1°	00:11	06:30	12:37	49,1°	267,6°	88,3°
345	2028 12 10	00:00	11h 47m 58,0s	-4° 29' 41"	Vir	371464	23d 10h 42m	-11,07	1930	40,6	79,0° W	79,1°	01:23	07:19	13:04	42,8°	275,9°	80,3°
346	2028 12 11	00:00	12h 39m 58,9s	-10° 16' 16"	Vir	372145	24d 10h 42m	-10,71	1927	29,7	65,8° W	66,0°	02:35	08:09	13:34	36,9°	284,0°	72,7°
347	2028 12 12	00:00	13h 33m 48,3s	-15° 31' 36"	Vir	373299	25d 10h 42m	-10,30	1921	19,9	52,7° W	52,9°	03:49	09:02	14:08	31,6°	291,4°	65,9°
348	2028 12 13	00:00	14h 30m 0,2s	-19° 55' 58"	Lib	374996	26d 10h 42m	-9,82	1912	11,6	39,6° W	39,8°	05:02	09:58	14:48	27,3°	297,6°	60,5°
349	2028 12 14	00:00	15h 28m 33,5s	-23° 10' 44"	Lib	377294	27d 10h 42m	-9,28	1900	5,4	26,6° W	26,9°	06:14	10:57	15:35	24,5°	302,0°	57,0°
350	2028 12 15	00:00	16h 28m 41,1s	-25° 1' 17"	Sco	380204	28d 10h 42m	-8,67	1886	1,5	13,8° W	14,1°	07:21	11:56	16:31	23,3°	304,1°	55,7°
351	2028 12 16	00:00	17h 28m 55,5s	-25° 20' 43"	Oph	383662	29d 10h 42m	-8,03	1869	0,0	1,2° W	2,4°	08:19	12:55	17:34	23,9°	303,8°	57,0°
352	2028 12 17	00:00	18h 27m 36,5s	-24° 11' 48"	Sgr	387520	0d 21h 54m	-8,49	1850	1,0	11,1° E	11,2°	09:07	13:51	18:40	26,0°	301,2°	60,3°
353	2028 12 18	00:00	19h 23m 25,3s	-21° 45' 47"	Sgr	391550	1d 21h 54m	-9,03	1831	4,0	23,1° E	23,1°	09:47	14:43	19:46	29,3°	296,9°	65,2°
354	2028 12 19	00:00	20h 15m 45,7s	-18° 18' 46"	Cap	395466	2d 21h 54m	-9,51	1813	9,0	34,8° E	34,8°	10:19	15:31	20:51	33,5°	291,4°	71,2°
355	2028 12 20	00:00	21h 4m 43,0s	-14° 7' 40"	Aqr	398956	3d 21h 54m	-9,92	1797	15,5	46,2° E	46,3°	10:47	16:16	21:53	38,3°	285,2°	77,7°
356	2028 12 21	00:00	21h 50m 51,5s	-9° 27' 41"	Cap	401721	4d 21h 54m	-10,28	1785	23,2	57,4° E	57,5°	11:11	16:58	22:53	43,5°	278,6°	84,6°
357	2028 12 22	00:00	22h 35m 0,9s	-4° 31' 24"	Aqr	403499	5d 21h 54m	-10,60	1777	31,8	68,4° E	68,5°	11:33	17:38	23:52	48,7°	271,9°	91,6°
358	2028 12 23	00:00	23h 18m 7,3s	+0° 30' 54"	Psc	404099	6d 21h 54m	-10,89	1774	40,9	79,3° E	79,3°	11:56	18:18		48,7°	265,1°	91,6°
359	2028 12 24	00:00	0h 1m 8,6s	+5° 30' 21"	Psc	403415	7d 21h 54m	-11,15	1777	50,3	90,2° E	90,2°	12:18	18:59	00:51	53,9°	258,5°	98,4°
360	2028 12 25	00:00	0h 45m 2,7s	+10° 18' 24"	Psc	401442	8d 21h 54m	-11,40	1786	59,7	101,1° E	101,0°	12:43	19:42	01:50	59,0°	252,3°	105,0°

Topocentric ephemeris of the Moon (following)

Times are given in UT for Aveiro (8° 37' 48" W, 40° 36' 7" N, zone Z).

	Date	Hour	R. A. (2000.0)	Decl. (2000.0)	Const.	Dist. E.	Age	Magn.	Diam.	Illum.	Elong.	Separ.	Rise	Transit	Set	Elevation	Azimuth	Azimuth
	yyyy mm dd	hh:mm	topocentric	topocentric		km	days	mV	"	%	°	°	hh:mm	hh:mm	hh:mm	(max.)	at rise	at set
361	2028 12 26	00:00	1h 30m 45,2s	+14° 45' 41"	Psc	398280	9d 21h 54m	-11,63	1800	68,9	112,1° E	112,0°	13:11	20:27	02:50	63,6°	246,6°	111,1°
362	2028 12 27	00:00	2h 19m 5,4s	+18° 40' 59"	Ari	394129	10d 21h 54m	-11,84	1819	77,5	123,3° E	123,2°	13:43	21:15	03:52	67,8°	241,8°	116,4°
363	2028 12 28	00:00	3h 10m 38,5s	+21° 50' 52"	Ari	389283	11d 21h 54m	-12,05	1842	85,2	134,8° E	134,7°	14:23	22:07	04:55	71,1°	238,2°	120,6°
364	2028 12 29	00:00	4h 5m 33,7s	+24° 0' 8"	Tau	384104	12d 21h 54m	-12,25	1867	91,7	146,6° E	146,5°	15:11	23:02	05:57	73,4°	236,2°	123,3°
365	2028 12 30	00:00	5h 3m 21,7s	+24° 53' 50"	Tau	378995	13d 21h 54m	-12,45	1892	96,6	158,8° E	158,7°	16:08	23:59	06:55	74,3°	236,4°	124,0°
366	2028 12 31	00:00	6h 2m 53,3s	+24° 20' 57"	Gem	374358	14d 21h 54m	-12,64	1915	99,4	171,2° E	171,2°	17:13		07:47	71,6°	238,8°	122,4°
367	2029 01 01	00:00	7h 2m 36,0s	+22° 17' 59"	Gem	370541	15d 21h 54m	-12,73	1935	99,9	176,0° W	176,0°	18:24	00:57	08:32	67,9°	243,3°	118,7°