

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

O HORA TEMPO UNIVERSAL

DATA	ANG.POS.			HELIOGRÁFICAS			DATA	ANG.POS.			HELIOGRÁFICAS		
	DO	EIXO		LT.	LG.			DO	EIXO		LT.	LG.	
	G			G	G			G		G	G		
JAN. 0	+ 2.45	-2.91	136.76				JAN. 31	-11.82	-5.96	88.56			
1	1.96	3.03	123.59				FEV. 1	12.23	6.03	75.39			
2	1.48	3.15	110.42				2	12.64	6.10	62.23			
3	0.99	3.26	97.25				3	13.04	6.17	49.06			
4	0.51	3.38	84.08				4	13.43	6.23	35.90			
5	+ 0.03	-3.49	70.91				5	-13.82	-6.30	22.73			
6	- 0.46	3.60	57.74				6	14.21	6.36	9.56			
7	0.94	3.71	44.57				7	14.59	6.42	356.40			
8	1.42	3.82	31.41				8	14.96	6.48	343.23			
9	1.90	3.93	18.24				9	15.33	6.54	330.06			
10	- 2.38	-4.04	5.07				10	-15.70	-6.59	316.89			
11	2.86	4.15	351.90				11	16.05	6.64	303.73			
12	3.33	4.25	338.73				12	16.41	6.69	290.56			
13	3.80	4.35	325.56				13	16.76	6.74	277.39			
14	4.28	4.46	312.39				14	17.10	6.79	264.22			
15	- 4.74	-4.56	299.23				15	-17.44	-6.83	251.05			
16	5.21	4.66	286.06				16	17.77	6.87	237.89			
17	5.68	4.76	272.89				17	18.10	6.91	224.72			
18	6.14	4.85	259.72				18	18.42	6.95	211.55			
19	6.59	4.95	246.56				19	18.73	6.99	198.38			
20	- 7.05	-5.04	233.39				20	-19.04	-7.02	185.21			
21	7.50	5.13	220.22				21	19.34	7.05	172.04			
22	7.95	5.22	207.05				22	19.64	7.08	158.87			
23	8.40	5.31	193.89				23	19.93	7.11	145.70			
24	8.84	5.40	180.72				24	20.22	7.13	132.53			
25	- 9.28	-5.48	167.56				25	-20.49	-7.15	119.36			
26	9.71	5.57	154.39				26	20.77	7.17	106.19			
27	10.14	5.65	141.22				27	21.03	7.19	93.02			
28	10.57	5.73	128.06				28	21.30	7.20	79.85			
29	10.99	5.80	114.89				MAR. 1	21.55	7.22	66.68			
30	-11.41	-5.88	101.73				2	-21.80	-7.23	53.50			
31	-11.82	-5.96	88.56				3	-22.04	-7.24	40.33			

INÍCIO DA ROTAÇÃO SINÓDICA NÚMERO 2187 10.38 JAN. 2017
2188 6.73 FEV.

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

O HORA TEMPO UNIVERSAL

DATA	ANG.POS.		HELIOGRÁFICAS		DATA	ANG.POS.		HELIOGRÁFICAS	
	DO	EIXO	LT.	LG.		DO	EIXO	LT.	LG.
	G	G	G	G		G	G	G	G
MAR. 1	-21.55	-7.22	66.68		ABR. 1	-26.15	-6.54	18.05	
2	21.80	7.23	53.50		2	26.18	6.49	4.85	
3	22.04	7.24	40.33		3	26.21	6.43	351.66	
4	22.27	7.24	27.16		4	26.24	6.37	338.47	
5	22.50	7.25	13.98		5	26.25	6.31	325.27	
6	-22.73	-7.25	0.81		6	-26.26	-6.25	312.07	
7	22.94	7.25	347.63		7	26.26	6.19	298.88	
8	23.15	7.25	334.46		8	26.26	6.12	285.68	
9	23.35	7.24	321.28		9	26.24	6.05	272.48	
10	23.55	7.24	308.10		10	26.22	5.98	259.28	
11	-23.74	-7.23	294.92		11	-26.20	-5.91	246.08	
12	23.92	7.22	281.75		12	26.16	5.84	232.88	
13	24.10	7.20	268.57		13	26.12	5.76	219.68	
14	24.27	7.19	255.39		14	26.07	5.69	206.47	
15	24.43	7.17	242.21		15	26.01	5.61	193.27	
16	-24.59	-7.15	229.03		16	-25.95	-5.53	180.07	
17	24.74	7.13	215.85		17	25.88	5.45	166.86	
18	24.88	7.10	202.66		18	25.80	5.37	153.66	
19	25.01	7.08	189.48		19	25.71	5.28	140.45	
20	25.14	7.05	176.30		20	25.62	5.20	127.24	
21	-25.27	-7.02	163.11		21	-25.51	-5.11	114.03	
22	25.38	6.98	149.93		22	25.41	5.02	100.82	
23	25.49	6.95	136.74		23	25.29	4.93	87.62	
24	25.59	6.91	123.56		24	25.17	4.84	74.40	
25	25.68	6.87	110.37		25	25.04	4.75	61.19	
26	-25.77	-6.83	97.18		26	-24.90	-4.66	47.98	
27	25.85	6.79	84.00		27	24.75	4.56	34.77	
28	25.93	6.74	70.81		28	24.60	4.47	21.56	
29	25.99	6.70	57.62		29	24.44	4.37	8.34	
30	26.05	6.65	44.43		30	24.27	4.27	355.13	
31	-26.10	-6.60	31.24		MAIO 1	-24.10	-4.17	341.91	
ABR. 1	-26.15	-6.54	18.05		2	-23.92	-4.07	328.70	

INÍCIO DA ROTAÇÃO SINÓDICA NÚMERO 2189 6.06 MAR. 2017
2190 2.37 ABR.
2191 29.63 ABR.

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

O HORA TEMPO UNIVERSAL

DATA	ANG.POS.		HELIOGRÁFICAS		DATA	ANG.POS.		HELIOGRÁFICAS	
	DO	EIXO	LT.	LG.		DO	EIXO	LT.	LG.
	G	G	G	G		G	G	G	G
MAIO 1	-24.10	-4.17	341.91		JUN. 1	-15.37	-0.67	291.91	
2	23.92	4.07	328.70		2	15.00	0.55	278.67	
3	23.73	3.97	315.48		3	14.61	0.43	265.44	
4	23.53	3.86	302.26		4	14.23	0.31	252.21	
5	23.33	3.76	289.04		5	13.84	0.18	238.97	
6	-23.12	-3.65	275.82		6	-13.45	-0.06	225.74	
7	22.90	3.55	262.60		7	13.05	+0.06	212.50	
8	22.68	3.44	249.38		8	12.65	0.18	199.26	
9	22.45	3.33	236.16		9	12.24	0.30	186.03	
10	22.21	3.22	222.94		10	11.83	0.42	172.79	
11	-21.96	-3.11	209.71		11	-11.42	+0.54	159.56	
12	21.71	3.00	196.49		12	11.00	0.66	146.32	
13	21.46	2.89	183.26		13	10.58	0.78	133.08	
14	21.19	2.78	170.04		14	10.16	0.90	119.85	
15	20.92	2.67	156.81		15	9.73	1.02	106.61	
16	-20.64	-2.55	143.59		16	- 9.30	+1.14	93.37	
17	20.36	2.44	130.36		17	8.87	1.26	80.14	
18	20.07	2.32	117.13		18	8.44	1.37	66.90	
19	19.77	2.21	103.91		19	8.00	1.49	53.66	
20	19.47	2.09	90.68		20	7.56	1.61	40.43	
21	-19.16	-1.98	77.45		21	- 7.12	+1.73	27.19	
22	18.84	1.86	64.22		22	6.68	1.84	13.95	
23	18.52	1.74	50.99		23	6.23	1.96	0.72	
24	18.19	1.62	37.76		24	5.78	2.08	347.48	
25	17.86	1.51	24.53		25	5.34	2.19	334.24	
26	-17.52	-1.39	11.30		26	- 4.89	+2.31	321.01	
27	17.17	1.27	358.07		27	4.44	2.42	307.77	
28	16.82	1.15	344.84		28	3.98	2.53	294.53	
29	16.47	1.03	331.61		29	3.53	2.65	281.30	
30	16.11	0.91	318.37		30	3.08	2.76	268.06	
31	-15.74	-0.79	305.14		JUL. 1	- 2.63	+2.87	254.83	
JUN. 1	-15.37	-0.67	291.91		2	- 2.17	+2.98	241.59	

INÍCIO DA ROTAÇÃO SINÓDICA NÚMERO 2192 26.85 MAIO 2017
2193 23.05 JUN.

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

O HORA TEMPO UNIVERSAL

DATA	ANG.POS.			HELIOGRÁFICAS			DATA	ANG.POS.			HELIOGRÁFICAS		
	DO	EIXO	G	LT.	LG.	G		DO	EIXO	G	LT.	LG.	G
JUL. 1	-	2.63		+2.87	254.83		AGO. 1	+10.86		+5.78	204.64		
2		2.17		2.98	241.59		2	11.25		5.85	191.41		
3		1.72		3.09	228.35		3	11.65		5.92	178.19		
4		1.27		3.20	215.12		4	12.03		5.99	164.96		
5		0.81		3.30	201.88		5	12.42		6.06	151.74		
6	-	0.36		+3.41	188.65		6	+12.80		+6.13	138.52		
7	+	0.09		3.52	175.41		7	13.17		6.19	125.29		
8		0.54		3.62	162.18		8	13.54		6.25	112.07		
9		0.99		3.73	148.94		9	13.91		6.31	98.85		
10		1.44		3.83	135.71		10	14.27		6.37	85.63		
11	+	1.89		+3.93	122.47		11	+14.63		+6.43	72.40		
12		2.34		4.03	109.24		12	14.99		6.48	59.18		
13		2.79		4.13	96.00		13	15.34		6.54	45.96		
14		3.23		4.23	82.77		14	15.68		6.59	32.74		
15		3.68		4.33	69.54		15	16.03		6.64	19.53		
16	+	4.12		+4.42	56.30		16	+16.36		+6.69	6.31		
17		4.56		4.52	43.07		17	16.70		6.73	353.09		
18		5.00		4.61	29.84		18	17.02		6.78	339.87		
19		5.43		4.70	16.61		19	17.35		6.82	326.66		
20		5.87		4.79	3.38		20	17.66		6.86	313.44		
21	+	6.30		+4.88	350.15		21	+17.98		+6.90	300.23		
22		6.73		4.97	336.92		22	18.28		6.94	287.01		
23		7.15		5.06	323.69		23	18.59		6.97	273.80		
24		7.58		5.15	310.46		24	18.89		7.00	260.58		
25		8.00		5.23	297.23		25	19.18		7.03	247.37		
26	+	8.42		+5.31	284.00		26	+19.47		+7.06	234.16		
27		8.83		5.40	270.77		27	19.75		7.09	220.95		
28		9.24		5.48	257.55		28	20.03		7.11	207.73		
29		9.65		5.55	244.32		29	20.30		7.14	194.52		
30		10.06		5.63	231.38		30	20.56		7.16	181.31		
31	+10.46			+5.71	217.87		31	+20.82		+7.18	168.10		
AGO. 1	+10.86			+5.78	204.64		SET. 1	+21.08		+7.19	154.89		

INÍCIO DA ROTAÇÃO SINÓDICA NÚMERO 2194 20.26 JUL. 2017
2195 16.48 AGO.

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

O HORA TEMPO UNIVERSAL

DATA	ANG.POS.		HELIOGRÁFICAS		DATA	ANG.POS.		HELIOGRÁFICAS	
	DO	EIXO	LT.	LG.		DO	EIXO	LT.	LG.
	G	G	G	G		G	G	G	G
SET. 1	+21.08	+7.19	154.89		OUT. 1	+25.96	+6.72	118.83	
2	21.33	7.21	141.68		2	26.02	6.67	105.63	
3	21.57	7.22	128.47		3	26.08	6.62	92.44	
4	21.81	7.23	115.27		4	26.12	6.57	79.24	
5	22.05	7.24	102.06		5	26.17	6.52	66.05	
6	+22.27	+7.24	88.85		6	+26.20	+6.46	52.85	
7	22.49	7.25	75.64		7	26.23	6.40	39.66	
8	22.71	7.25	62.44		8	26.25	6.34	26.47	
9	22.92	7.25	49.23		9	26.26	6.28	13.27	
10	23.12	7.25	36.03		10	26.26	6.22	0.08	
11	+23.32	+7.24	22.82		11	+26.26	+6.15	346.89	
12	23.51	7.24	9.62		12	26.25	6.09	333.70	
13	23.70	7.23	356.41		13	26.23	6.02	320.50	
14	23.88	7.22	343.21		14	26.21	5.95	307.31	
15	24.05	7.21	330.01		15	26.18	5.87	294.12	
16	+24.22	+7.19	316.81		16	+26.14	+5.80	280.93	
17	24.38	7.17	303.60		17	26.09	5.72	267.74	
18	24.54	7.15	290.40		18	26.04	5.64	254.55	
19	24.69	7.13	277.20		19	25.97	5.56	241.36	
20	24.83	7.11	264.00		20	25.90	5.48	228.17	
21	+24.96	+7.09	250.80		21	+25.83	+5.40	214.98	
22	25.09	7.06	237.60		22	25.74	5.32	201.79	
23	25.22	7.03	224.41		23	25.65	5.23	188.61	
24	25.33	7.00	211.21		24	25.55	5.14	175.42	
25	25.44	6.96	198.01		25	25.44	5.05	162.23	
26	+25.55	+6.93	184.81		26	+25.32	+4.96	149.04	
27	25.64	6.89	171.62		27	25.20	4.87	135.85	
28	25.73	6.85	158.42		28	25.07	4.77	122.67	
29	25.81	6.81	145.22		29	24.93	4.68	109.48	
30	25.89	6.77	132.03		30	24.78	4.58	96.29	
OUT. 1	+25.96	+6.72	118.83		31	+24.62	+4.48	83.11	
2	+26.02	+6.67	105.63		NOV. 1	+24.46	+4.38	69.92	

INÍCIO DA ROTAÇÃO SINÓDICA NÚMERO 2196 12.73 SET. 2017
2197 10.01 OUT.

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

O HORA TEMPO UNIVERSAL

DATA	ANG.POS.		HELIOGRÁFICAS		DATA	ANG.POS.		HELIOGRÁFICAS	
	DO	EIXO	LT.	LG.		DO	EIXO	LT.	LG.
	G	G	G	G		G	G	G	G
NOV. 1	+24.46	+4.38	69.92		DEZ. 1	+16.04	+0.89	34.44	
2	24.29	4.28	56.73		2	15.65	0.76	21.26	
3	24.11	4.18	43.55		3	15.25	0.63	8.08	
4	23.92	4.07	30.36		4	14.86	0.50	354.91	
5	23.73	3.97	17.17		5	14.45	0.38	341.73	
6	+23.52	+3.86	3.99		6	+14.04	+0.25	328.55	
7	23.31	3.75	350.80		7	13.63	+0.12	315.37	
8	23.10	3.64	337.62		8	13.21	-0.01	302.19	
9	22.87	3.53	324.43		9	12.78	0.14	289.02	
10	22.64	3.42	311.25		10	12.35	0.26	275.84	
11	+22.40	+3.31	298.07		11	+11.92	-0.39	262.66	
12	22.15	3.20	284.88		12	11.48	0.52	249.49	
13	21.89	3.08	271.70		13	11.03	0.65	236.31	
14	21.62	2.97	258.52		14	10.59	0.78	223.14	
15	21.35	2.85	245.33		15	10.14	0.90	209.96	
16	+21.07	+2.73	232.15		16	+ 9.68	-1.03	196.79	
17	20.79	2.61	218.97		17	9.22	1.16	183.61	
18	20.49	2.49	205.79		18	8.76	1.29	170.44	
19	20.19	2.37	192.60		19	8.30	1.41	157.27	
20	19.88	2.25	179.42		20	7.83	1.54	144.09	
21	+19.57	+2.13	166.24		21	+ 7.36	-1.66	130.92	
22	19.24	2.01	153.06		22	6.89	1.79	117.75	
23	18.91	1.89	139.88		23	6.42	1.91	104.57	
24	18.58	1.76	126.70		24	5.94	2.04	91.40	
25	18.23	1.64	113.52		25	5.46	2.16	78.23	
26	+17.88	+1.52	100.34		26	+ 4.98	-2.28	65.06	
27	17.53	1.39	87.16		27	4.50	2.40	51.88	
28	17.16	1.26	73.98		28	4.02	2.52	38.71	
29	16.79	1.14	60.80		29	3.54	2.64	25.54	
30	16.42	1.01	47.62		30	3.05	2.76	12.37	
DEZ. 1	+16.04	+0.89	34.44		31	+ 2.57	-2.88	359.20	
2	+15.65	+0.76	21.26		32	+ 2.08	-3.00	346.03	

INÍCIO DA ROTAÇÃO SINÓDICA NÚMERO 2198 6.30 NOV. 2017
2199 3.61 DEZ.
2200 30.94 DEZ.

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	IDADE	TERRA		LIB.FIS.			SOL		ANG. POS.		FASE	
		LG.	LT.	LG.	LT.	AP.	CO-LG.	LT.	EIXO	L.I.		
	D	G	G	(0.01	G)		G	G	G	G		
JAN.	0	1.7	-4.68	-3.92	0	-4	+1	294.29	+1.31	347.04	250.0	0.03
	1	2.7	5.26	2.65	0	4	1	306.48	1.29	342.64	250.8	0.07
	2	3.7	5.67	-1.22	-1	4	1	318.66	1.27	339.11	249.7	0.13
	3	4.7	5.89	+0.28	0	4	1	330.83	1.25	336.62	248.3	0.21
	4	5.7	5.88	1.80	0	4	1	343.00	1.22	335.31	247.4	0.31
	5	6.7	-5.60	+3.25	0	-4	+1	355.17	+1.20	335.29	247.1	0.41
	6	7.7	5.01	4.54	0	4	1	7.33	1.18	336.61	247.6	0.52
	7	8.7	4.11	5.58	0	4	1	19.48	1.16	339.27	248.9	0.63
	8	9.7	2.89	6.30	0	4	+1	31.62	1.13	343.25	251.1	0.74
	9	10.7	-1.42	6.62	0	4	0	43.76	1.11	348.41	253.9	0.83
	10	11.7	+0.21	+6.50	0	-4	0	55.89	+1.08	354.45	256.8	0.91
	11	12.7	1.87	5.95	0	4	0	68.01	1.06	0.96	258.0	0.97
	12	13.7	3.42	5.01	0	4	0	80.14	1.03	7.40	245.9	1.00
	13	14.7	4.72	3.75	0	4	0	92.26	1.01	13.24	124.5	1.00
	14	15.7	5.67	2.28	0	4	0	104.39	0.98	18.06	111.4	0.97
	15	16.7	+6.21	+0.71	0	-4	0	116.52	+0.96	21.62	111.0	0.92
	16	17.7	6.32	-0.85	0	4	0	128.65	0.94	23.86	111.7	0.85
	17	18.7	6.03	2.33	0	4	0	140.79	0.92	24.81	112.2	0.77
	18	19.7	5.38	3.65	0	4	0	152.93	0.90	24.58	112.2	0.68
	19	20.7	4.46	4.78	0	4	0	165.08	0.88	23.27	111.5	0.59
	20	21.7	+3.33	-5.68	0	-4	0	177.24	+0.87	21.01	110.2	0.49
	21	22.7	2.08	6.32	-1	4	0	189.40	0.85	17.87	108.3	0.40
	22	23.7	+0.79	6.69	1	4	0	201.57	0.84	13.98	105.8	0.31
	23	24.7	-0.48	6.77	1	4	0	213.74	0.82	9.45	102.9	0.23
	24	25.7	1.65	6.57	1	4	0	225.92	0.80	4.41	99.7	0.15
	25	26.7	-2.69	-6.07	-1	-4	+1	238.10	+0.79	359.06	96.4	0.09
	26	27.7	3.55	5.28	1	4	1	250.29	0.77	353.66	93.9	0.04
	27	28.7	4.22	4.24	1	4	1	262.48	0.74	348.47	94.7	0.01
	28	29.7	4.68	2.96	1	4	1	274.67	0.72	343.81	163.7	0.00
	29	1.0	4.93	-1.52	1	4	1	286.87	0.70	339.95	246.1	0.01
	30	2.0	-4.97	+0.03	-1	-4	+1	299.06	+0.67	337.13	248.8	0.04
	31	3.0	4.80	1.61	1	4	1	311.24	0.64	335.51	248.8	0.10
FEV.	1	4.0	4.44	3.11	1	4	1	323.43	0.61	335.19	248.7	0.17
	2	5.0	3.88	4.45	1	4	1	335.61	0.58	336.22	249.3	0.26
	3	6.0	3.14	5.55	1	4	+1	347.78	0.55	338.58	250.7	0.37
	4	7.0	-2.22	+6.32	-1	-4	0	359.94	+0.51	342.20	253.0	0.48
	5	8.0	1.17	6.72	1	4	0	12.10	0.48	346.95	256.1	0.59
	6	9.0	-0.03	6.70	1	4	0	24.26	0.45	352.60	260.1	0.70
	7	10.0	+1.16	6.26	1	4	0	36.40	0.41	358.80	264.5	0.80
	8	11.0	2.31	5.43	1	4	0	48.54	0.38	5.13	269.1	0.89
	9	12.0	+3.34	+4.27	-1	-4	0	60.68	+0.34	11.09	273.2	0.95
	10	13.0	+4.19	+2.86	-1	-4	0	72.81	+0.31	16.26	275.4	0.99

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	IDADE	TERRA		LIB.FIS.			SOL		ANG. POS.		FASE
		LG.	LT.	LG.	LT.	AP.	CO-LG.	LT.	EIXO	L. I.	
	D	G	G	(0.01	G)		G	G	G	G	
FEV. 10	13.0	+4.19	+2.86	-1	-4	0	72.81	+0.31	16.26	275.4	0.99
11	14.0	4.79	+1.30	1	4	0	84.95	0.27	20.31	214.6	1.00
12	15.0	5.09	-0.30	1	4	-1	97.08	0.24	23.10	110.6	0.99
13	16.0	5.08	1.85	1	4	-1	109.22	0.21	24.57	110.0	0.96
14	17.0	4.75	3.28	1	4	0	121.36	0.18	24.79	110.0	0.90
15	18.0	+4.13	-4.51	-1	-4	0	133.50	+0.15	23.85	109.6	0.84
16	19.0	3.25	5.50	1	4	0	145.65	0.13	21.89	108.4	0.76
17	20.0	2.18	6.24	1	4	0	157.80	0.11	19.01	106.6	0.67
18	21.0	+0.98	6.70	1	4	0	169.96	0.09	15.34	104.2	0.58
19	22.0	-0.28	6.86	1	4	0	182.13	0.07	11.00	101.2	0.48
20	23.0	-1.53	-6.74	-1	-4	0	194.30	+0.05	6.13	97.6	0.39
21	24.0	2.70	6.32	1	4	0	206.48	0.03	0.91	93.7	0.30
22	25.0	3.71	5.62	2	4	+1	218.67	+0.01	355.53	89.4	0.21
23	26.0	4.52	4.65	2	4	1	230.86	-0.01	350.27	85.1	0.14
24	27.0	5.06	3.44	2	4	1	243.06	0.03	345.39	80.9	0.08
25	28.0	-5.32	-2.02	-2	-4	+1	255.26	-0.05	341.20	76.9	0.03
26	29.0	5.27	-0.47	2	4	1	267.46	0.08	337.97	71.9	0.00
27	0.4	4.92	+1.14	2	4	1	279.66	0.10	335.90	258.3	0.00
28	1.4	4.30	2.72	2	4	1	291.86	0.13	335.16	253.3	0.02
MAR. 1	2.4	3.44	4.15	2	4	+1	304.07	0.16	335.83	252.5	0.07
2	3.4	-2.42	+5.34	-2	-4	0	316.26	-0.19	337.89	253.2	0.14
3	4.4	1.29	6.21	1	4	0	328.46	0.22	341.28	255.0	0.23
4	5.4	-0.13	6.69	1	4	0	340.65	0.26	345.84	257.9	0.33
5	6.4	+0.99	6.75	1	4	0	352.83	0.29	351.31	261.7	0.44
6	7.4	2.02	6.40	1	4	0	5.00	0.33	357.35	266.2	0.56
7	8.4	+2.92	+5.66	-1	-4	0	17.17	-0.36	3.57	271.1	0.67
8	9.4	3.66	4.60	1	4	0	29.33	0.40	9.53	276.1	0.77
9	10.4	4.21	3.28	1	4	-1	41.49	0.44	14.82	280.8	0.86
10	11.4	4.56	1.79	1	4	1	53.64	0.47	19.13	285.4	0.92
11	12.4	4.70	+0.22	1	4	1	65.79	0.51	22.28	290.1	0.97
12	13.4	+4.63	-1.34	-1	-4	-1	77.94	-0.54	24.18	300.2	1.00
13	14.4	4.34	2.80	1	4	1	90.09	0.58	24.83	88.2	1.00
14	15.4	3.83	4.09	1	4	-1	102.24	0.61	24.30	102.4	0.98
15	16.4	3.11	5.17	1	4	0	114.39	0.63	22.68	104.2	0.94
16	17.4	2.19	5.99	1	4	0	126.55	0.66	20.08	103.7	0.89
17	18.4	+1.12	-6.54	-1	-4	0	138.71	-0.68	16.65	102.0	0.82
18	19.4	-0.08	6.79	2	4	0	150.87	0.70	12.50	99.5	0.74
19	20.4	1.34	6.75	2	4	0	163.04	0.71	7.79	96.3	0.66
20	21.4	2.60	6.42	2	4	0	175.22	0.73	2.69	92.6	0.56
21	22.4	3.80	5.82	2	4	0	187.41	0.74	357.40	88.5	0.47
22	23.4	-4.85	-4.95	-2	-4	+1	199.60	-0.76	352.14	84.2	0.37
23	24.4	-5.68	-3.84	-2	-4	+1	211.79	-0.77	347.16	79.9	0.28

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	IDADE	TERRA		LIB.FIS.			SOL		ANG. POS.		FASE
		LG.	LT.	LG.	LT.	AP.	CO-LG.	LT.	EIXO	L. I.	
	D	G	G	(0.01	G)		G	G	G	G	
MAR. 23	24.4	-5.68	-3.84	-2	-4	+1	211.79	-0.77	347.16	79.9	0.28
24	25.4	6.21	2.52	2	4	1	223.99	0.78	342.74	75.7	0.19
25	26.4	6.40	-1.03	2	4	1	236.20	0.80	339.13	71.6	0.12
26	27.4	6.19	+0.55	2	4	1	248.41	0.82	336.59	67.3	0.06
27	28.4	5.57	2.14	2	4	+1	260.63	0.83	335.30	60.5	0.02
28	29.4	-4.57	+3.64	-2	-4	0	272.85	-0.85	335.43	7.1	0.00
29	0.9	3.25	4.93	2	4	0	285.07	0.87	337.02	265.6	0.01
30	1.9	1.73	5.91	2	4	0	297.29	0.90	340.07	260.2	0.05
31	2.9	-0.12	6.50	2	4	0	309.50	0.92	344.42	260.9	0.11
ABR. 1	3.9	+1.43	6.66	2	4	0	321.71	0.95	349.81	263.6	0.20
2	4.9	+2.81	+6.39	-2	-4	0	333.92	-0.97	355.88	267.6	0.30
3	5.9	3.95	5.72	1	4	-1	346.12	1.00	2.19	272.2	0.41
4	6.9	4.79	4.71	1	4	1	358.31	1.03	8.27	277.0	0.53
5	7.9	5.33	3.45	1	4	1	10.50	1.06	13.71	281.6	0.63
6	8.9	5.57	2.02	1	4	1	22.68	1.09	18.22	285.9	0.74
7	9.9	+5.56	+0.51	-1	-4	-1	34.86	-1.12	21.60	289.7	0.82
8	10.9	5.31	-1.01	1	4	1	47.03	1.15	23.78	293.2	0.90
9	11.9	4.87	2.45	1	4	1	59.20	1.18	24.75	297.1	0.95
10	12.9	4.27	3.75	1	4	1	71.37	1.21	24.55	304.2	0.98
11	13.9	3.51	4.85	1	4	1	83.53	1.23	23.26	343.9	1.00
12	14.9	+2.61	-5.72	-1	-4	-1	95.70	-1.25	20.96	83.0	0.99
13	15.9	1.59	6.31	1	4	0	107.87	1.27	17.77	94.0	0.97
14	16.9	+0.45	6.62	1	4	0	120.04	1.29	13.83	95.2	0.93
15	17.9	-0.78	6.64	2	4	0	132.21	1.30	9.27	93.7	0.87
16	18.9	2.06	6.38	2	4	0	144.39	1.31	4.27	91.0	0.80
17	19.9	-3.35	-5.84	-2	-4	0	156.57	-1.31	359.04	87.6	0.72
18	20.9	4.58	5.04	2	4	0	168.76	1.32	353.80	83.7	0.64
19	21.9	5.68	4.02	2	4	0	180.96	1.32	348.77	79.8	0.54
20	22.9	6.58	2.80	2	4	+1	193.16	1.32	344.22	75.9	0.44
21	23.9	7.18	-1.41	2	4	1	205.37	1.33	340.38	72.2	0.34
22	24.9	-7.41	+0.09	-2	-4	+1	217.58	-1.33	337.46	68.9	0.25
23	25.9	7.20	1.63	2	4	+1	229.80	1.33	335.68	66.0	0.16
24	26.9	6.50	3.12	2	4	0	242.03	1.34	335.21	63.0	0.09
25	27.9	5.32	4.46	2	4	0	254.26	1.35	336.18	58.4	0.03
26	28.9	3.73	5.54	2	4	0	266.49	1.35	338.64	38.8	0.01
27	0.5	-1.85	+6.26	-2	-4	0	278.73	-1.36	342.55	287.8	0.01
28	1.5	+0.14	6.54	1	4	0	290.96	1.37	347.71	270.6	0.04
29	2.5	2.08	6.36	1	4	0	303.20	1.39	353.78	270.3	0.09
30	3.5	3.80	5.75	1	4	-1	315.43	1.40	0.27	273.4	0.17
MAIO 1	4.5	5.16	4.78	1	4	1	327.65	1.42	6.66	277.5	0.27
2	5.5	+6.12	+3.53	-1	-4	-1	339.87	-1.43	12.45	281.9	0.38
3	6.5	+6.66	+2.11	-1	-4	-1	352.08	-1.45	17.28	285.9	0.49

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	IDADE	TERRA		LIB.FIS.			SOL		ANG. POS.		FASE	
		LG.	LT.	LG.	LT.	AP.	CO-LG.	LT.	EIXO	L. I.		
	D	G	G	(0.01	G)		G	G	G	G		
MAIO	1	4.5	+5.16	+4.78	-1	-4	-1	327.65	-1.42	6.66	277.5	0.27
	2	5.5	6.12	3.53	1	4	1	339.87	1.43	12.45	281.9	0.38
	3	6.5	6.66	2.11	1	4	1	352.08	1.45	17.28	285.9	0.49
	4	7.5	6.81	+0.61	1	4	1	4.28	1.47	20.95	289.3	0.59
	5	8.5	6.62	-0.89	1	4	1	16.48	1.49	23.40	292.2	0.70
	6	9.5	+6.15	-2.31	-1	-4	-1	28.68	-1.51	24.62	294.4	0.78
	7	10.5	5.47	3.59	1	4	1	40.87	1.53	24.68	296.2	0.86
	8	11.5	4.63	4.69	1	4	1	53.05	1.54	23.65	298.2	0.92
	9	12.5	3.66	5.56	1	4	1	65.24	1.55	21.62	301.6	0.97
	10	13.5	2.58	6.17	1	4	1	77.42	1.57	18.67	313.1	0.99
	11	14.5	+1.43	-6.51	-1	-4	-1	89.60	-1.57	14.93	26.7	1.00
	12	15.5	+0.21	6.56	1	4	0	101.78	1.58	10.53	78.4	0.99
	13	16.5	-1.05	6.32	1	4	0	113.97	1.58	5.63	84.9	0.96
	14	17.5	2.35	5.81	1	4	0	126.15	1.57	0.44	84.6	0.91
	15	18.5	3.63	5.05	1	4	0	138.34	1.57	355.19	82.3	0.85
	16	19.5	-4.86	-4.06	-1	-4	0	150.54	-1.56	350.11	79.2	0.78
	17	20.5	5.98	2.89	1	4	0	162.74	1.55	345.46	75.9	0.70
	18	21.5	6.90	1.56	1	4	0	174.94	1.54	341.46	72.7	0.60
	19	22.5	7.56	-0.14	1	4	0	187.15	1.53	338.30	69.8	0.50
	20	23.5	7.87	+1.34	1	4	0	199.37	1.52	336.18	67.5	0.40
	21	24.5	-7.73	+2.79	-1	-4	0	211.60	-1.51	335.24	65.7	0.30
	22	25.5	7.10	4.12	1	4	0	223.83	1.50	335.62	64.4	0.20
	23	26.5	5.96	5.25	1	4	0	236.07	1.49	337.42	63.5	0.12
	24	27.5	4.35	6.06	1	4	0	248.31	1.49	340.67	61.7	0.05
	25	28.5	2.38	6.47	1	4	0	260.55	1.48	345.31	52.9	0.01
	26	0.2	-0.23	+6.42	-1	-4	0	272.80	-1.48	351.09	323.5	0.00
	27	1.2	+1.92	5.91	1	4	-1	285.05	1.47	357.60	281.6	0.02
	28	2.2	3.87	4.99	1	4	1	297.29	1.47	4.29	279.7	0.07
	29	3.2	5.45	3.75	1	4	1	309.54	1.47	10.54	282.2	0.15
	30	4.2	6.60	2.30	-1	4	1	321.77	1.48	15.89	285.6	0.24
	31	5.2	+7.26	+0.75	0	-4	-1	334.00	-1.48	20.04	288.7	0.34
JUN.	1	6.2	7.46	-0.79	0	4	1	346.23	1.48	22.88	291.3	0.44
	2	7.2	7.27	2.25	0	4	1	358.45	1.49	24.43	293.2	0.55
	3	8.2	6.74	3.56	0	4	1	10.66	1.49	24.75	294.3	0.65
	4	9.2	5.97	4.67	0	4	1	22.87	1.50	23.96	294.8	0.74
	5	10.2	+5.00	-5.55	0	-4	-1	35.07	-1.50	22.15	294.9	0.82
	6	11.2	3.91	6.17	0	4	1	47.27	1.50	19.42	294.7	0.89
	7	12.2	2.72	6.52	0	4	1	59.47	1.50	15.88	294.9	0.94
	8	13.2	1.48	6.59	0	4	-1	71.66	1.50	11.64	297.8	0.98
	9	14.2	+0.21	6.37	0	4	0	83.86	1.49	6.86	316.1	1.00
	10	15.2	-1.07	-5.87	0	-4	0	96.05	-1.48	1.72	50.4	1.00
	11	16.2	-2.34	-5.12	-1	-4	0	108.24	-1.47	356.45	74.0	0.98

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	IDADE	TERRA		LIB.FIS.			SOL		ANG.	POS.	FASE
		LG.	LT.	LG.	LT.	AP.	CO-LG.	LT.	EIXO	L. I.	
	D	G	G	(0.01	G)		G	G	G	G	
JUN. 11	16.2	-2.34	-5.12	-1	-4	0	108.24	-1.47	356.45	74.0	0.98
12	17.2	3.57	4.14	1	4	0	120.43	1.45	351.30	76.4	0.95
13	18.2	4.72	2.97	1	4	0	132.63	1.43	346.52	75.0	0.89
14	19.2	5.76	1.65	1	4	0	144.83	1.41	342.36	72.8	0.83
15	20.2	6.63	-0.24	1	4	0	157.04	1.39	339.01	70.5	0.75
16	21.2	-7.25	+1.21	-1	-4	0	169.25	-1.37	336.64	68.5	0.65
17	22.2	7.55	2.64	-1	4	0	181.46	1.34	335.39	67.0	0.55
18	23.2	7.47	3.96	0	4	0	193.69	1.32	335.36	66.3	0.44
19	24.2	6.94	5.11	0	4	0	205.92	1.30	336.63	66.2	0.34
20	25.2	5.95	5.97	0	4	0	218.15	1.28	339.27	67.0	0.23
21	26.2	-4.50	+6.48	0	-4	0	230.40	-1.26	343.26	68.4	0.14
22	27.2	2.70	6.57	0	4	0	242.64	1.24	348.48	69.7	0.07
23	28.2	-0.67	6.19	0	4	-1	254.90	1.22	354.67	67.8	0.02
24	29.2	+1.41	5.38	0	4	1	267.15	1.20	1.36	20.4	0.00
25	0.9	3.36	4.19	0	4	1	279.40	1.19	7.95	290.9	0.01
26	1.9	+5.01	+2.73	0	-4	-1	291.66	-1.17	13.86	286.7	0.05
27	2.9	6.26	+1.13	0	4	1	303.91	1.16	18.63	288.2	0.12
28	3.9	7.05	-0.50	0	4	1	316.15	1.15	22.05	290.2	0.20
29	4.9	7.37	2.05	+1	4	1	328.39	1.14	24.07	291.9	0.29
30	5.9	7.26	3.45	1	4	1	340.62	1.13	24.76	292.9	0.39
JUL. 1	6.9	+6.79	-4.63	+1	-4	-1	352.85	-1.13	24.26	293.1	0.50
2	7.9	6.03	5.57	1	4	1	5.07	1.12	22.68	292.6	0.60
3	8.9	5.05	6.24	1	4	1	17.29	1.11	20.16	291.5	0.69
4	9.9	3.91	6.62	1	4	1	29.50	1.10	16.80	289.8	0.77
5	10.9	2.68	6.71	+1	4	1	41.71	1.09	12.73	287.8	0.85
6	11.9	+1.40	-6.52	0	-4	-1	53.91	-1.08	8.09	285.6	0.91
7	12.9	+0.12	6.05	0	4	-1	66.11	1.06	3.03	284.0	0.96
8	13.9	-1.13	5.32	0	4	0	78.30	1.04	357.76	285.8	0.99
9	14.9	2.32	4.34	0	4	0	90.50	1.02	352.54	323.7	1.00
10	15.9	3.43	3.17	0	4	0	102.69	0.99	347.62	64.6	0.99
11	16.9	-4.42	-1.84	0	-4	0	114.89	-0.97	343.26	71.1	0.97
12	17.9	5.28	-0.41	0	4	0	127.08	0.94	339.69	70.8	0.92
13	18.9	5.95	+1.07	0	4	0	139.28	0.91	337.09	69.5	0.86
14	19.9	6.39	2.52	0	4	0	151.49	0.88	335.58	68.4	0.78
15	20.9	6.56	3.86	0	4	0	163.70	0.84	335.26	67.8	0.69
16	21.9	-6.41	+5.03	0	-4	0	175.91	-0.81	336.19	67.9	0.59
17	22.9	5.90	5.94	0	4	0	188.14	0.78	338.39	68.9	0.48
18	23.9	5.03	6.53	0	3	0	200.36	0.75	341.87	70.9	0.37
19	24.9	3.81	6.72	+1	3	-1	212.60	0.72	346.54	73.7	0.26
20	25.9	2.31	6.48	1	3	1	224.84	0.69	352.23	77.2	0.16
21	26.9	-0.61	+5.80	+1	-3	-1	237.08	-0.66	358.62	81.1	0.08
22	27.9	+1.15	+4.73	+1	-3	-1	249.33	-0.64	5.20	83.9	0.03

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	IDADE	TERRA		LIB.FIS.			SOL		ANG.	POS.	FASE
		LG.	LT.	LG.	LT.	AP.	CO-LG.	LT.	EIXO	L. I.	
	D	G	G	(0.01	G)		G	G	G	G	
JUL. 22	27.9	+1.15	+4.73	+1	-3	-1	249.33	-0.64	5.20	83.9	0.03
23	28.9	2.84	3.34	1	4	1	261.59	0.61	11.42	75.5	0.00
24	0.6	4.32	1.73	1	4	1	273.84	0.59	16.74	294.6	0.01
25	1.6	5.50	+0.05	1	4	1	286.09	0.57	20.80	289.4	0.03
26	2.6	6.28	-1.60	1	4	1	298.34	0.54	23.43	290.2	0.09
27	3.6	+6.66	-3.11	+1	-4	-1	310.59	-0.53	24.64	291.1	0.16
28	4.6	6.64	4.41	1	4	1	322.83	0.51	24.54	291.4	0.25
29	5.6	6.25	5.46	1	4	1	335.06	0.49	23.27	290.9	0.34
30	6.6	5.55	6.22	1	4	1	347.29	0.47	20.99	289.7	0.44
31	7.6	4.61	6.68	1	4	1	359.51	0.46	17.83	287.9	0.53
AGO. 1	8.6	+3.49	-6.84	+1	-4	-1	11.73	-0.44	13.93	285.3	0.63
2	9.6	2.25	6.70	1	4	1	23.94	0.42	9.42	282.2	0.72
3	10.6	+0.97	6.28	1	4	1	36.15	0.41	4.46	278.7	0.80
4	11.6	-0.30	5.59	1	4	1	48.35	0.38	359.24	274.9	0.87
5	12.6	1.50	4.65	1	4	-1	60.54	0.36	353.98	271.0	0.93
6	13.6	-2.59	-3.50	+1	-4	0	72.74	-0.34	348.94	267.6	0.97
7	14.6	3.54	2.18	1	4	0	84.93	0.31	344.37	266.5	0.99
8	15.6	4.31	-0.73	1	4	0	97.12	0.28	340.54	61.4	1.00
9	16.6	4.87	+0.77	1	4	0	109.31	0.25	337.65	71.6	0.98
10	17.6	5.22	2.26	1	4	0	121.50	0.21	335.85	70.9	0.95
11	18.6	-5.34	+3.66	+1	-3	0	133.69	-0.18	335.24	70.1	0.89
12	19.6	5.21	4.88	1	3	0	145.88	0.14	335.89	70.1	0.81
13	20.6	4.83	5.85	1	3	0	158.08	0.11	337.81	70.9	0.72
14	21.6	4.20	6.50	1	3	-1	170.29	0.07	340.96	72.6	0.62
15	22.6	3.33	6.78	1	3	1	182.50	0.04	345.26	75.4	0.51
16	23.6	-2.27	+6.65	+1	-3	-1	194.72	-0.01	350.56	79.1	0.39
17	24.6	-1.06	6.10	1	3	1	206.95	+0.02	356.59	83.6	0.28
18	25.6	+0.24	5.16	2	3	1	219.18	0.06	2.97	88.7	0.18
19	26.6	1.57	3.88	2	3	1	231.42	0.09	9.20	93.9	0.10
20	27.6	2.82	2.36	2	3	1	243.66	0.12	14.79	99.1	0.04
21	28.6	+3.94	+0.70	+2	-3	-1	255.90	+0.15	19.32	104.6	0.01
22	0.2	4.83	-0.98	2	3	2	268.15	0.17	22.51	277.3	0.00
23	1.2	5.44	2.57	2	4	2	280.39	0.20	24.30	286.0	0.02
24	2.2	5.73	3.98	2	4	2	292.63	0.22	24.70	287.8	0.06
25	3.2	5.70	5.14	2	4	2	304.87	0.25	23.85	288.2	0.12
26	4.2	+5.33	-6.01	+2	-4	-1	317.10	+0.27	21.89	287.6	0.20
27	5.2	4.67	6.58	2	4	1	329.33	0.29	18.97	286.1	0.28
28	6.2	3.76	6.83	2	4	1	341.56	0.30	15.25	283.8	0.37
29	7.2	2.65	6.78	2	4	1	353.77	0.32	10.89	280.8	0.47
30	8.2	1.42	6.44	2	4	1	5.98	0.34	6.04	277.2	0.56
31	9.2	+0.13	-5.82	+2	-4	-1	18.19	+0.36	0.89	273.2	0.65
SET. 1	10.2	-1.13	-4.95	+2	-4	-1	30.39	+0.38	355.64	268.8	0.74

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	IDADE	TERRA		LIB.FIS.			SOL		ANG. POS.		FASE
		LG.	LT.	LG.	LT.	AP.	CO-LG.	LT.	EIXO	L.I.	
	D	G	G	(0.01	G)		G	G	G	G	
SET. 1	10.2	-1.13	-4.95	+2	-4	-1	30.39	+0.38	355.64	268.8	0.74
2	11.2	2.30	3.86	2	4	-1	42.58	0.40	350.52	264.3	0.82
3	12.2	3.31	2.59	2	4	0	54.77	0.43	345.78	259.7	0.89
4	13.2	4.11	-1.17	2	4	0	66.95	0.45	341.68	254.9	0.94
5	14.2	4.65	+0.33	2	4	0	79.13	0.48	338.45	249.0	0.98
6	15.2	-4.90	+1.85	+2	-3	0	91.30	+0.51	336.28	225.9	1.00
7	16.2	4.87	3.29	2	3	0	103.48	0.54	335.31	82.9	0.99
8	17.2	4.55	4.58	2	3	-1	115.66	0.57	335.62	75.8	0.97
9	18.2	3.98	5.63	2	3	1	127.83	0.60	337.24	74.5	0.91
10	19.2	3.20	6.35	2	3	1	140.02	0.63	340.14	75.2	0.84
11	20.2	-2.27	+6.71	+2	-3	-1	152.20	+0.66	344.23	77.3	0.75
12	21.2	1.25	6.65	2	3	1	164.39	0.69	349.32	80.6	0.64
13	22.2	-0.20	6.19	2	3	1	176.59	0.71	355.17	84.8	0.53
14	23.2	+0.84	5.35	2	3	1	188.79	0.74	1.39	89.7	0.42
15	24.2	1.84	4.18	2	3	1	201.00	0.77	7.56	95.0	0.31
16	25.2	+2.74	+2.76	+2	-3	-1	213.22	+0.80	13.23	100.2	0.21
17	26.2	3.54	+1.18	2	3	2	225.44	0.83	17.99	105.4	0.12
18	27.2	4.20	-0.45	2	3	2	237.67	0.85	21.56	110.6	0.06
19	28.2	4.69	2.04	2	3	2	249.89	0.88	23.80	117.9	0.02
20	29.2	4.98	3.49	2	3	2	262.12	0.90	24.69	156.3	0.00
21	0.8	+5.04	-4.72	+3	-3	-2	274.35	+0.93	24.28	272.6	0.01
22	1.8	4.85	5.68	3	4	2	286.58	0.95	22.70	281.0	0.04
23	2.8	4.40	6.34	2	4	1	298.81	0.97	20.09	282.2	0.08
24	3.8	3.70	6.68	2	4	1	311.03	0.99	16.61	281.3	0.15
25	4.8	2.76	6.72	2	4	1	323.25	1.00	12.42	279.1	0.22
26	5.8	+1.64	-6.45	+2	-4	-1	335.46	+1.02	7.69	276.1	0.30
27	6.8	+0.38	5.91	2	4	1	347.67	1.03	2.61	272.4	0.39
28	7.8	-0.93	5.12	2	4	1	359.87	1.04	357.38	268.3	0.49
29	8.8	2.22	4.11	2	4	1	12.06	1.06	352.23	264.0	0.58
30	9.8	3.41	2.91	2	4	1	24.25	1.07	347.38	259.6	0.68
OUT. 1	10.8	-4.41	-1.56	+2	-3	-1	36.43	+1.09	343.07	255.3	0.76
2	11.8	5.14	-0.11	2	3	1	48.60	1.11	339.53	251.2	0.84
3	12.8	5.53	+1.37	2	3	1	60.77	1.12	336.96	247.0	0.91
4	13.8	5.55	2.83	2	3	1	72.93	1.14	335.54	241.7	0.96
5	14.8	5.17	4.16	2	3	1	85.09	1.16	335.38	229.0	0.99
6	15.8	-4.42	+5.28	+2	-3	-1	97.25	+1.18	336.58	121.9	1.00
7	16.8	3.37	6.10	2	3	1	109.41	1.20	339.13	85.5	0.98
8	17.8	2.10	6.54	2	3	1	121.57	1.22	342.97	82.0	0.93
9	18.8	-0.74	6.56	2	3	1	133.73	1.23	347.93	83.1	0.86
10	19.8	+0.61	6.16	2	3	1	145.90	1.25	353.74	86.3	0.77
11	20.8	+1.85	+5.37	+2	-3	-1	158.07	+1.27	359.99	90.6	0.67
12	21.8	+2.92	+4.26	+2	-3	-2	170.25	+1.29	6.24	95.5	0.56

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	IDADE	TERRA		LIB.FIS.			SOL		ANG. POS.		FASE
		LG.	LT.	LG.	LT.	AP.	CO-LG.	LT.	EIXO	L. I.	
	D	G	G	(0.01	G)		G	G	G	G	
OUT. 12	21.8	+2.92	+4.26	+2	-3	-2	170.25	+1.29	6.24	95.5	0.56
13	22.8	3.77	2.90	2	3	2	182.43	1.31	12.03	100.4	0.45
14	23.8	4.42	+1.38	2	3	2	194.62	1.32	16.96	105.1	0.34
15	24.8	4.87	-0.19	2	3	2	206.82	1.34	20.76	109.3	0.24
16	25.8	5.12	1.73	2	3	2	219.02	1.36	23.30	113.1	0.15
17	26.8	+5.21	-3.16	+2	-3	-2	231.23	+1.38	24.54	116.8	0.08
18	27.8	5.13	4.40	3	3	2	243.44	1.40	24.52	121.9	0.03
19	28.8	4.87	5.40	3	3	2	255.65	1.41	23.31	135.8	0.01
20	0.2	4.43	6.10	3	3	2	267.87	1.42	21.03	227.2	0.00
21	1.2	3.79	6.51	2	3	2	280.08	1.44	17.83	268.3	0.02
22	2.2	+2.96	-6.60	+2	-3	-1	292.29	+1.45	13.85	273.4	0.05
23	3.2	1.94	6.39	2	3	1	304.50	1.46	9.26	273.1	0.10
24	4.2	+0.76	5.90	2	3	1	316.70	1.46	4.26	270.8	0.16
25	5.2	-0.55	5.16	2	3	1	328.90	1.47	359.05	267.6	0.24
26	6.2	1.91	4.21	2	3	1	341.09	1.47	353.87	263.8	0.32
27	7.2	-3.26	-3.07	+2	-3	-1	353.28	+1.48	348.94	259.9	0.41
28	8.2	4.50	1.79	2	3	1	5.46	1.48	344.48	256.0	0.51
29	9.2	5.55	-0.40	2	3	1	17.63	1.48	340.72	252.3	0.60
30	10.2	6.31	+1.03	2	3	1	29.80	1.49	337.82	249.0	0.70
31	11.2	6.69	2.45	2	3	1	41.96	1.49	335.97	246.1	0.79
NOV. 1	12.2	-6.63	+3.78	+2	-3	-1	54.11	+1.49	335.30	243.4	0.87
2	13.2	6.08	4.94	2	3	1	66.26	1.50	335.94	240.3	0.93
3	14.2	5.07	5.84	2	3	1	78.41	1.50	337.94	234.0	0.98
4	15.2	3.65	6.38	2	3	1	90.55	1.50	341.32	193.9	1.00
5	16.2	1.96	6.50	2	3	1	102.69	1.51	345.99	100.6	0.99
6	17.2	-0.15	+6.18	+2	-3	-1	114.83	+1.51	351.69	91.4	0.95
7	18.2	+1.62	5.44	2	3	2	126.97	1.51	358.05	92.4	0.89
8	19.2	3.20	4.34	2	3	2	139.12	1.51	4.56	96.0	0.80
9	20.2	4.49	2.98	2	3	2	151.27	1.51	10.67	100.4	0.70
10	21.2	5.44	+1.45	2	3	2	163.43	1.51	15.93	104.7	0.60
11	22.2	+6.05	-0.13	+2	-3	-2	175.60	+1.52	20.03	108.5	0.48
12	23.2	6.35	1.66	2	3	2	187.77	1.52	22.85	111.7	0.38
13	24.2	6.37	3.08	2	3	2	199.95	1.52	24.36	114.2	0.28
14	25.2	6.17	4.30	2	3	2	212.14	1.53	24.61	116.1	0.19
15	26.2	5.78	5.30	2	3	2	224.33	1.53	23.69	117.6	0.12
16	27.2	+5.22	-6.02	+2	-3	-2	236.52	+1.54	21.71	119.6	0.06
17	28.2	4.50	6.44	2	3	2	248.72	1.54	18.78	124.4	0.02
18	29.2	3.64	6.56	2	3	2	260.91	1.54	15.04	147.5	0.00
19	0.5	2.63	6.38	2	3	1	273.11	1.54	10.63	240.7	0.00
20	1.5	1.48	5.92	2	3	1	285.31	1.54	5.73	261.7	0.02
21	2.5	+0.21	-5.20	+2	-3	-1	297.50	+1.54	0.56	264.0	0.06
22	3.5	-1.14	-4.26	+2	-3	-1	309.70	+1.53	355.34	262.5	0.11

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	IDADE	TERRA		LIB.FIS.			SOL		ANG. POS.		FASE
		LG.	LT.	LG.	LT.	AP.	CO-LG.	LT.	EIXO	L. I.	
	D	G	G	(0.01	G)		G	G	G	G	
NOV. 22	3.5	-1.14	-4.26	+2	-3	-1	309.70	+1.53	355.34	262.5	0.11
23	4.5	2.54	3.14	2	3	1	321.88	1.52	350.33	259.6	0.17
24	5.5	3.92	1.89	1	3	1	334.07	1.52	345.74	256.4	0.25
25	6.5	5.21	-0.54	1	3	1	346.24	1.51	341.80	253.2	0.34
26	7.5	6.32	+0.86	1	3	1	358.41	1.50	338.67	250.3	0.43
27	8.5	-7.15	+2.24	+1	-3	-1	10.58	+1.49	336.51	247.9	0.53
28	9.5	7.61	3.55	1	3	1	22.73	1.47	335.42	246.0	0.63
29	10.5	7.62	4.72	1	3	1	34.88	1.46	335.53	244.7	0.73
30	11.5	7.12	5.67	1	3	1	47.03	1.45	336.93	244.1	0.82
DEZ. 1	12.5	6.09	6.30	1	3	1	59.17	1.44	339.66	243.7	0.90
2	13.5	-4.58	+6.55	+1	-3	-1	71.30	+1.42	343.74	242.3	0.96
3	14.5	2.71	6.36	1	3	1	83.43	1.41	349.03	231.3	0.99
4	15.5	-0.64	5.72	1	3	2	95.55	1.39	355.26	126.5	1.00
5	16.5	+1.45	4.66	1	3	2	107.68	1.37	1.95	101.1	0.97
6	17.5	3.37	3.29	1	3	2	119.81	1.36	8.50	101.0	0.92
7	18.5	+4.99	+1.71	+1	-3	-2	131.95	+1.34	14.31	104.1	0.84
8	19.5	6.20	+0.05	1	3	2	144.09	1.32	18.96	107.5	0.75
9	20.5	6.99	-1.56	2	3	2	156.23	1.31	22.24	110.4	0.64
10	21.5	7.37	3.04	2	3	2	168.38	1.30	24.11	112.6	0.54
11	22.5	7.38	4.31	2	3	2	180.54	1.29	24.64	113.9	0.43
12	23.5	+7.08	-5.34	+2	-3	-2	192.71	+1.28	23.97	114.5	0.33
13	24.5	6.53	6.08	2	3	2	204.88	1.27	22.22	114.4	0.24
14	25.5	5.77	6.52	2	3	2	217.06	1.26	19.52	113.8	0.16
15	26.5	4.84	6.65	2	3	2	229.24	1.25	15.99	113.0	0.10
16	27.5	3.77	6.49	1	3	2	241.42	1.24	11.76	112.7	0.05
17	28.5	+2.59	-6.05	+1	-3	-1	253.61	+1.23	7.00	115.8	0.02
18	29.5	+1.32	5.34	1	3	1	265.80	1.22	1.90	146.9	0.00
19	0.7	-0.02	4.41	1	3	1	277.99	1.20	356.68	245.0	0.01
20	1.7	1.39	3.29	1	3	1	290.18	1.19	351.58	255.6	0.03
21	2.7	2.77	2.02	1	3	1	302.36	1.17	346.86	255.7	0.06
22	3.7	-4.12	-0.66	+1	-3	-1	314.54	+1.15	342.74	253.7	0.12
23	4.7	5.37	+0.74	+1	3	1	326.72	1.13	339.41	251.4	0.19
24	5.7	6.45	2.13	0	3	1	338.90	1.11	337.01	249.4	0.27
25	6.7	7.29	3.44	0	3	1	351.06	1.09	335.64	247.8	0.36
26	7.7	7.80	4.62	0	3	1	3.23	1.07	335.38	246.8	0.46
27	8.7	-7.91	+5.60	0	-3	-1	15.38	+1.04	336.30	246.6	0.56
28	9.7	7.56	6.30	0	3	1	27.53	1.02	338.45	247.2	0.67
29	10.7	6.71	6.66	0	3	1	39.67	0.99	341.87	248.7	0.77
30	11.7	5.39	6.61	0	3	1	51.80	0.96	346.52	251.0	0.86
31	12.7	3.67	6.12	0	2	1	63.93	0.93	352.25	253.5	0.93
32	13.7	-1.66	+5.20	0	-2	-2	76.06	+0.90	358.74	253.8	0.98

DISCO ILUMINADO

0 HORA TEMPO UNIVERSAL

DATA	FASE	ANG. FASE	ANG. L.I.	BRILH	MAG.	DATA	FASE	ANG. FASE	ANG. L.I.	BRILH	MAG.
		G	G					G	G		
JAN. 0	0.027	161	117	6.6	+3.7	JUL. 4	0.862	44	273	48.3	-0.8
5	.183	129	102	33.6	1.3	9	.781	56	279	41.6	0.4
10	.374	105	98	46.3	0.3	14	.704	66	284	37.2	-0.1
15	.530	87	94	45.0	+0.0	19	.630	75	287	34.4	+0.1
20	.645	73	90	39.6	-0.1	24	.558	83	290	32.9	0.3
25	0.728	63	86	34.6	-0.1	29	0.484	92	293	32.2	+0.5
30	.790	54	82	30.9	0.1	AGO. 3	.404	101	296	31.5	0.7
FEV. 4	.838	47	77	28.5	0.2	8	.315	112	299	29.8	1.0
9	.877	41	73	27.4	0.2	13	.216	125	302	25.4	1.5
14	.910	35	68	27.3	0.3	18	.115	140	308	16.9	2.3
19	0.939	29	63	28.5	-0.5	23	0.034	159	324	6.0	+3.8
24	.965	22	57	31.1	0.8	28	.011	168	49	2.1	4.7
MAR. 1	.986	14	47	35.4	1.1	SET. 2	.077	148	96	14.4	2.7
6	.998	5	5	42.1	1.6	7	.233	122	106	38.7	+0.9
11	.990	11	265	51.4	1.6	12	.448	96	112	60.9	-0.2
16	0.944	27	250	62.5	-1.4	17	0.666	71	116	69.8	-0.8
21	.838	48	245	71.0	1.1	22	.834	48	120	64.9	1.0
26	.669	70	243	70.4	0.8	27	.934	30	124	54.0	1.2
31	.469	94	242	59.0	-0.2	OUT. 2	.982	15	130	43.7	1.3
ABR. 5	.282	116	241	41.2	+0.7	7	.998	5	155	36.0	1.4
10	0.134	137	238	22.2	+2.0	12	0.998	6	273	30.9	-1.2
15	.037	158	232	6.7	3.7	17	.988	13	288	27.7	0.9
20	.001	176	173	0.2	5.7	22	.972	19	291	26.0	0.7
25	.024	162	71	4.2	4.2	27	.952	25	291	25.5	0.5
30	.089	145	65	13.4	2.7	NOV. 1	.926	32	290	26.1	0.4
MAIO 5	0.173	131	63	21.9	+1.8	6	0.893	38	289	27.9	-0.3
10	.262	118	62	27.8	1.2	11	.849	46	286	31.0	0.3
15	.350	107	63	31.5	0.8	16	.789	55	284	35.9	0.3
20	.436	97	63	34.4	0.5	21	.702	66	281	42.4	0.3
25	.525	87	65	37.6	+0.2	26	.577	81	278	49.7	-0.2
30	0.619	76	67	42.0	-0.1	DEZ. 1	0.401	101	275	52.0	+0.1
JUN. 4	.722	64	70	48.2	0.5	6	.185	129	273	36.0	1.2
9	.831	49	75	56.1	0.9	11	.020	164	260	5.1	3.9
14	.930	31	82	64.2	1.4	16	.042	156	115	10.2	3.2
19	.991	11	100	68.2	1.9	21	.225	123	107	40.3	0.9
24	0.991	11	247	65.0	-1.9	26	0.430	98	104	51.1	+0.1
29	0.939	29	266	56.8	-1.3	31	0.591	80	101	47.4	-0.2
JUL. 4	0.862	44	273	48.3	-0.8	36	0.705	66	97	40.6	-0.2

DISCO ILUMINADO

0 HORA TEMPO UNIVERSAL

DATA	FASE	ANG. FASE	ANG. L.I.	BRILH	MAG.	DATA	FASE	ANG. FASE	ANG. L.I.	BRILH	MAG.
		G	G					G	G		
JAN. 0	0.571	82.9	251.4	125.9	-4.2	JUL. 4	0.640	74.8	75.8	94.8	-4.0
5	.548	85.5	250.1	133.4	4.3	9	.660	71.3	77.8	90.4	4.0
10	.523	87.3	249.9	141.6	4.3	14	.679	70.0	79.1	86.4	4.0
15	.498	90.3	248.8	150.2	4.3	19	.698	67.7	81.4	82.8	3.9
20	.470	93.4	247.9	159.4	4.4	24	.716	64.4	85.0	79.6	3.9
25	0.441	97.8	246.0	168.9	-4.4	29	0.734	62.1	87.6	76.6	-3.9
30	.410	100.4	245.2	178.5	4.4	AGO. 3	.750	60.9	89.3	73.9	3.9
FEV. 4	.376	104.4	244.3	187.7	4.5	8	.767	58.8	92.1	71.4	3.9
9	.340	109.7	243.4	195.6	4.5	13	.783	56.6	95.8	69.2	3.9
14	.301	113.5	242.4	200.9	4.5	18	.798	53.5	98.6	67.1	3.9
19	0.259	119.8	241.0	201.8	-4.5	23	0.812	51.4	100.2	65.2	-3.9
24	.215	125.8	239.3	195.6	4.5	28	.826	49.3	103.8	63.5	3.9
MAR. 1	.169	132.5	237.8	179.5	4.5	SET. 2	.840	47.2	105.2	61.9	3.8
6	.122	139.0	233.1	151.2	4.4	7	.853	45.1	107.5	60.4	3.8
11	.079	147.4	227.5	111.2	4.3	12	.865	43.1	110.5	59.0	3.8
16	0.042	156.2	218.6	66.3	-4.2	17	0.877	41.1	111.4	57.8	-3.8
21	.018	165.6	197.7	30.0	4.0	22	.888	39.1	113.1	56.6	3.8
26	.010	168.5	151.0	17.1	3.9	27	.899	37.1	114.5	55.5	3.8
31	.020	164.7	107.7	32.8	4.0	OUT. 2	.909	35.1	116.6	54.5	3.8
ABR. 5	.046	155.2	88.3	68.9	4.2	7	.919	33.1	116.5	53.5	3.8
10	0.083	146.5	80.7	110.4	-4.3	12	0.928	31.2	117.1	52.6	-3.8
15	.126	138.3	75.9	145.2	4.4	17	.936	29.3	117.4	51.8	3.8
20	.172	132.0	72.9	168.3	4.4	22	.944	27.4	117.5	51.0	3.8
25	.217	124.4	70.8	180.2	4.4	27	.951	26.5	117.3	50.3	3.8
30	.261	119.6	68.3	183.4	4.4	NOV. 1	.958	24.7	117.7	49.7	3.8
MAIO 5	0.302	113.3	67.3	180.8	-4.4	6	0.964	22.8	116.9	49.0	-3.8
10	.340	109.6	67.6	174.7	4.4	11	.970	20.0	115.7	48.5	3.8
15	.376	104.3	66.2	166.6	4.3	16	.975	18.2	113.3	47.9	3.8
20	.410	100.4	66.0	157.7	4.3	21	.980	16.5	111.4	47.4	3.8
25	.441	97.8	66.1	148.8	4.3	26	.984	15.7	109.3	47.0	3.8
30	0.471	93.4	66.4	140.1	-4.2	DEZ. 1	0.987	14.0	107.8	46.6	-3.8
JUN. 4	.499	90.2	67.9	131.9	4.2	6	.990	11.3	104.9	46.2	3.8
9	.525	87.1	68.7	124.2	4.2	11	.993	10.6	100.5	45.9	3.8
14	.550	84.2	69.7	117.2	4.1	16	.995	8.9	97.6	45.6	3.8
19	.574	81.5	70.9	110.7	4.1	21	.997	6.3	92.8	45.4	3.8
24	0.597	79.8	71.3	104.9	-4.1	26	0.998	5.6	86.6	45.2	-3.8
29	0.619	76.3	74.0	99.6	-4.0	31	0.999	3.1	76.8	45.0	-3.8
JUL. 4	0.640	74.8	75.8	94.8	-4.0	36	1.000	2.6	53.1	44.9	-3.8

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	TEMPO LUZ	MAG.	DIAM.	TERRA		AS-AT	SOL	
				ALFA+PI	DELTA		DELTA	LONG.
	M		"	G	G	G	G	G
JAN. 0	13.59	+0.9	5.73	71.85	-24.54	+40.32	-23.14	290.31
2	13.70	0.9	5.68	73.50	24.75	39.99	22.95	291.53
4	13.81	0.9	5.64	75.15	24.94	39.64	22.74	292.74
6	13.92	0.9	5.59	76.80	25.11	39.27	22.52	293.96
8	14.03	0.9	5.55	78.46	25.26	38.90	22.29	295.17
10	14.14	+1.0	5.50	80.12	-25.39	+38.52	-22.05	296.38
12	14.26	1.0	5.46	81.79	25.50	38.13	21.81	297.58
14	14.37	1.0	5.42	83.45	25.59	37.72	21.55	298.78
16	14.48	1.0	5.38	85.12	25.66	37.31	21.29	299.98
18	14.59	1.0	5.33	86.79	25.71	36.89	21.01	301.18
20	14.70	+1.0	5.29	88.45	-25.74	+36.47	-20.73	302.37
22	14.82	1.0	5.25	90.12	25.75	36.03	20.44	303.56
24	14.93	1.1	5.21	91.78	25.74	35.59	20.14	304.74
26	15.04	1.1	5.18	93.44	25.72	35.15	19.84	305.92
28	15.15	1.1	5.14	95.10	25.67	34.69	19.53	307.10
30	15.27	+1.1	5.10	96.76	-25.61	+34.24	-19.21	308.28
FEV. 1	15.38	1.1	5.06	98.41	25.52	33.77	18.88	309.45
3	15.49	1.1	5.03	100.06	25.42	33.31	18.55	310.61
5	15.60	1.1	4.99	101.70	25.30	32.84	18.21	311.78
7	15.72	1.2	4.95	103.33	25.16	32.37	17.87	312.94
9	15.83	+1.2	4.92	104.96	-25.00	+31.90	-17.52	314.09
11	15.94	1.2	4.88	106.58	24.82	31.43	17.16	315.25
13	16.05	1.2	4.85	108.19	24.63	30.95	16.80	316.40
15	16.16	1.2	4.82	109.80	24.42	30.48	16.43	317.54
17	16.27	1.2	4.78	111.40	24.19	30.01	16.06	318.68
19	16.38	+1.2	4.75	112.99	-23.95	+29.53	-15.69	319.82
21	16.49	1.3	4.72	114.57	23.69	29.06	15.31	320.95
23	16.60	1.3	4.69	116.14	23.41	28.59	14.92	322.08
25	16.71	1.3	4.66	117.70	23.12	28.12	14.54	323.21
27	16.82	1.3	4.63	119.25	22.81	27.66	14.15	324.33
MAR. 1	16.93	+1.3	4.60	120.79	-22.49	+27.19	-13.75	325.45
3	17.04	1.3	4.57	122.33	22.15	26.73	13.35	326.56
5	17.15	1.3	4.54	123.85	21.80	26.27	12.95	327.67
7	17.26	1.3	4.51	125.36	21.44	25.82	12.55	328.78
9	17.36	1.3	4.48	126.86	21.07	25.37	12.14	329.88
11	17.47	+1.4	4.46	128.35	-20.68	+24.92	-11.73	330.98
13	17.58	+1.4	4.43	129.83	-20.28	+24.48	-11.32	332.08
15	17.68	+1.4	4.40	131.29	-19.87	+24.04	-10.90	333.17

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	FASE	ANG.	DEF.	ÂNGULO		POSICÃO		MERID.CENTRAL		TRANS.MERID.ZERO		
		FASE	ILUM	DEFEITO	EIXO	DATA	DIA	SEG	DATA	DIA	SEG	
		G	"	G	G	G	G	H	M	H	M	
JAN.	0	0.900	36.78	0.57	68.49	344.85	210.99	201.05	10	13.0	10	53.9
	2	.902	36.49	.56	68.28	343.94	191.10	181.15	11	34.8	12	15.7
	4	.903	36.20	.54	68.10	343.05	171.21	161.26	12	56.6	13	37.6
	6	.905	35.91	.53	67.92	342.17	151.31	141.36	14	18.5	14	59.4
	8	.907	35.61	.52	67.76	341.29	131.40	121.45	15	40.5	16	21.3
	10	0.908	35.31	0.51	67.62	340.43	111.50	101.55	17	02.3	17	43.2
	12	.910	35.01	.49	67.48	339.57	91.59	81.64	18	24.3	19	05.1
	14	.911	34.70	.48	67.36	338.73	71.68	61.73	19	46.1	20	27.0
	16	.913	34.40	.47	67.26	337.90	51.77	41.82	21	08.0	21	49.0
	18	.914	34.09	.46	67.17	337.09	31.86	21.91	22	30.0	23	10.8
	20	0.916	33.78	0.45	67.09	336.29	11.95	2.00	23	51.9	--	----
	22	.917	33.47	.44	67.02	335.50	352.05	342.09	00	32.7	01	13.7
	24	.919	33.16	.42	66.97	334.73	332.14	322.19	01	54.6	02	35.6
	26	.920	32.84	.41	66.93	333.97	312.23	302.28	03	16.5	03	57.4
	28	.922	32.52	.40	66.91	333.24	292.33	282.38	04	38.5	05	19.3
	30	0.923	32.20	0.39	66.90	332.52	272.43	262.48	06	00.2	06	41.1
FEV.	1	.925	31.88	.38	66.90	331.81	252.54	242.59	07	22.1	08	03.0
	3	.926	31.56	.37	66.92	331.13	232.65	222.70	08	44.0	09	24.8
	5	.928	31.23	.36	66.94	330.47	212.76	202.82	10	05.7	10	46.6
	7	.929	30.91	.35	66.99	329.83	192.88	182.95	11	27.5	12	08.3
	9	0.930	30.58	0.35	67.04	329.21	173.01	163.08	12	49.2	13	30.0
	11	.932	30.25	.33	67.11	328.61	153.15	143.22	14	10.9	14	51.7
	13	.933	29.92	.32	67.19	328.03	133.29	123.37	15	32.5	16	13.4
	15	.935	29.59	.31	67.28	327.47	113.44	103.52	16	54.2	17	35.0
	17	.936	29.26	.31	67.39	326.94	93.60	83.68	18	15.8	18	56.6
	19	0.938	28.92	0.30	67.51	326.44	73.77	63.86	19	37.3	20	18.1
	21	.939	28.59	.29	67.64	325.95	53.95	44.04	20	58.9	21	39.6
	23	.940	28.25	.28	67.78	325.49	34.13	24.23	22	20.3	23	01.1
	25	.942	27.91	.27	67.94	325.06	14.33	4.43	23	41.8	--	----
	27	.943	27.57	.26	68.11	324.65	354.53	344.64	00	22.5	01	03.2
MAR.	1	0.945	27.23	0.25	68.29	324.26	334.75	324.86	01	44.0	02	24.5
	3	.946	26.89	.25	68.48	323.90	314.97	305.09	03	05.2	03	45.8
	5	.947	26.55	.24	68.69	323.57	295.21	285.33	04	26.5	05	07.1
	7	.949	26.20	.23	68.90	323.26	275.46	265.58	05	47.7	06	28.3
	9	.950	25.86	.22	69.13	322.98	255.71	245.85	07	08.9	07	49.5
	11	0.951	25.51	0.22	69.37	322.73	235.98	226.12	08	30.0	09	10.6
	13	0.953	25.16	0.21	69.62	322.50	216.26	206.41	09	51.1	10	31.7
	15	0.954	24.82	0.20	69.89	322.30	196.55	186.70	11	12.2	11	52.7

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	TEMPO LUZ	MAG.	DIAM.	TERRA			SOL	
				ALFA+PI	DELTA	AS-AT	DELTA	LONG.
	M		"	G	G	G	G	G
MAR. 15	17.68	+1.4	4.40	131.29	-19.87	+24.04	-10.90	333.17
17	17.79	1.4	4.38	132.75	19.44	23.61	10.49	334.26
19	17.89	1.4	4.35	134.20	19.01	23.18	10.07	335.34
21	18.00	1.4	4.33	135.64	18.56	22.75	9.65	336.42
23	18.10	1.4	4.30	137.06	18.11	22.33	9.23	337.50
25	18.20	+1.4	4.28	138.48	-17.64	+21.91	- 8.81	338.57
27	18.30	1.4	4.25	139.88	17.17	21.50	8.38	339.64
29	18.40	1.5	4.23	141.28	16.69	21.09	7.96	340.71
31	18.50	1.5	4.21	142.66	16.20	20.69	7.53	341.77
ABR. 2	18.60	1.5	4.19	144.04	15.70	20.29	7.11	342.83
4	18.70	+1.5	4.16	145.41	-15.19	+19.89	- 6.68	343.88
6	18.80	1.5	4.14	146.76	14.68	19.50	6.25	344.93
8	18.89	1.5	4.12	148.11	14.16	19.12	5.83	345.98
10	18.99	1.5	4.10	149.45	13.63	18.73	5.40	347.02
12	19.08	1.5	4.08	150.78	13.10	18.36	4.97	348.06
14	19.18	+1.5	4.06	152.10	-12.56	+17.98	- 4.55	349.10
16	19.27	1.5	4.04	153.41	12.02	17.61	4.12	350.13
18	19.36	1.5	4.02	154.72	11.47	17.25	3.69	351.16
20	19.45	1.6	4.00	156.02	10.92	16.88	3.27	352.19
22	19.54	1.6	3.98	157.31	10.36	16.53	2.84	353.21
24	19.63	+1.6	3.97	158.59	- 9.80	+16.17	- 2.41	354.23
26	19.71	1.6	3.95	159.87	9.23	15.82	1.99	355.25
28	19.80	1.6	3.93	161.14	8.66	15.47	1.57	356.26
30	19.88	1.6	3.92	162.40	8.09	15.12	1.14	357.27
MAIO 2	19.97	1.6	3.90	163.66	7.52	14.78	0.72	358.27
4	20.05	+1.6	3.88	164.91	- 6.94	+14.43	- 0.30	359.28
6	20.13	1.6	3.87	166.16	6.36	14.10	+ 0.12	0.28
8	20.21	1.6	3.85	167.40	5.78	13.76	0.53	1.27
10	20.29	1.6	3.84	168.63	5.20	13.42	0.95	2.27
12	20.36	1.6	3.82	169.86	4.62	13.09	1.36	3.26
14	20.44	+1.6	3.81	171.09	- 4.03	+12.76	+ 1.78	4.24
16	20.51	1.6	3.79	172.32	3.45	12.43	2.19	5.23
18	20.59	1.6	3.78	173.54	2.87	12.11	2.60	6.21
20	20.66	1.6	3.77	174.75	2.28	11.78	3.01	7.19
22	20.73	1.7	3.76	175.97	1.70	11.45	3.41	8.16
24	20.80	+1.7	3.74	177.18	- 1.11	+11.13	+ 3.81	9.13
26	20.86	+1.7	3.73	178.39	- 0.53	+10.80	+ 4.22	10.10
28	20.93	+1.7	3.72	179.59	+ 0.05	+10.48	+ 4.62	11.07

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	FASE	ANG.	DEF.	ÂNGULO		POSICÃO		MERID.CENTRAL		TRANS.MERID.ZERO	
		FASE	ILUM	DEFEITO	EIXO	DATA	DIA SEG	DATA	DIA SEG	H	M
		G	"	G	G	G	G	H	M	H	M
MAR.15	0.954	24.82	0.20	69.89	322.30	196.55	186.70	11	12.2	11	52.7
17	.955	24.47	.20	70.16	322.12	176.85	167.01	12	33.2	13	13.7
19	.956	24.12	.19	70.45	321.97	157.17	147.33	13	54.1	14	34.6
21	.958	23.77	.18	70.74	321.85	137.49	127.65	15	15.0	15	55.5
23	.959	23.41	.18	71.05	321.75	117.82	107.99	16	36.0	17	16.3
25	0.960	23.06	0.18	71.37	321.68	98.16	88.34	17	56.7	18	37.1
27	.961	22.71	.16	71.70	321.63	78.52	68.70	19	17.5	19	57.9
29	.962	22.35	.16	72.03	321.61	58.88	49.07	20	38.2	21	18.6
31	.964	22.00	.15	72.38	321.62	39.26	29.45	21	58.9	22	39.3
ABR. 2	.965	21.64	.15	72.74	321.65	19.64	9.83	23	19.6	23	59.9
4	0.966	21.28	0.15	73.11	321.70	.03	350.23	--	----	00	40.2
6	.967	20.93	.15	73.48	321.79	340.44	330.64	01	20.5	02	00.7
8	.968	20.57	.13	73.87	321.89	320.85	311.06	02	41.0	03	21.3
10	.969	20.21	.13	74.26	322.02	301.27	291.49	04	01.5	04	41.7
12	.970	19.85	.12	74.66	322.18	281.70	271.92	05	22.0	06	02.2
14	0.971	19.49	0.12	75.07	322.36	262.14	252.37	06	42.5	07	22.6
16	.972	19.13	.11	75.49	322.56	242.59	232.82	08	02.7	08	43.0
18	.973	18.77	.11	75.91	322.78	223.05	213.28	09	23.1	10	03.4
20	.974	18.41	.11	76.35	323.03	203.51	193.75	10	43.5	11	23.6
22	.975	18.04	.11	76.78	323.30	183.98	174.22	12	03.7	12	43.8
24	0.976	17.68	0.09	77.23	323.59	164.46	154.70	13	24.0	14	04.1
26	.977	17.32	.09	77.68	323.91	144.95	135.19	14	44.2	15	24.3
28	.978	16.95	.09	78.13	324.24	125.44	115.69	16	04.4	16	44.5
30	.979	16.59	.08	78.59	324.60	105.94	96.19	17	24.5	18	04.6
MAIO 2	.980	16.22	.08	79.05	324.97	86.45	76.70	18	44.7	19	24.8
4	0.981	15.85	0.08	79.52	325.37	66.96	57.22	20	04.8	20	44.8
6	.982	15.49	.08	79.99	325.78	47.48	37.74	21	24.8	22	04.9
8	.983	15.12	.08	80.46	326.22	28.00	18.26	22	45.0	23	25.0
10	.984	14.75	.06	80.94	326.67	8.53	358.80	--	----	00	05.0
12	.984	14.38	.06	81.41	327.14	349.06	339.33	00	45.0	01	25.0
14	0.985	14.02	0.06	81.89	327.63	329.60	319.87	02	05.0	02	45.0
16	.986	13.65	.05	82.36	328.13	310.14	300.42	03	25.0	04	05.0
18	.987	13.28	.05	82.84	328.65	290.69	280.96	04	45.0	05	25.0
20	.987	12.91	.05	83.31	329.19	271.24	261.52	06	04.9	06	45.0
22	.988	12.54	.04	83.78	329.74	251.79	242.07	07	24.8	08	04.8
24	0.989	12.16	0.04	84.25	330.30	232.35	222.63	08	44.8	09	24.8
26	0.989	11.79	0.04	84.71	330.89	212.91	203.19	10	04.7	10	44.7
28	0.990	11.42	0.04	85.17	331.48	193.47	183.75	11	24.6	12	04.6

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	TEMPO			TERRA			SOL	
	LUZ	MAG.	DIAM.	ALFA+PI	DELTA	AS-AT	DELTA	LONG.
	M		"	G	G	G	G	G
MAIO28	20.93	+1.7	3.72	179.59	+ 0.05	+10.48	+ 4.62	11.07
30	20.99	1.7	3.71	180.80	0.64	10.16	5.01	12.03
JUN. 1	21.05	1.7	3.70	182.00	1.22	9.83	5.41	13.00
3	21.11	1.7	3.69	183.20	1.79	9.51	5.80	13.95
5	21.17	1.7	3.68	184.40	2.37	9.19	6.19	14.91
7	21.23	+1.7	3.67	185.60	+ 2.94	+ 8.87	+ 6.58	15.86
9	21.29	1.7	3.66	186.80	3.52	8.54	6.96	16.81
11	21.34	1.7	3.65	188.00	4.08	8.22	7.35	17.76
13	21.39	1.7	3.64	189.20	4.65	7.89	7.72	18.71
15	21.44	1.7	3.63	190.39	5.21	7.57	8.10	19.65
17	21.49	+1.7	3.62	191.59	+ 5.77	+ 7.24	+ 8.48	20.59
19	21.54	1.7	3.61	192.79	6.33	6.91	8.85	21.53
21	21.59	1.7	3.61	193.99	6.88	6.58	9.22	22.47
23	21.63	1.7	3.60	195.20	7.43	6.25	9.58	23.40
25	21.67	1.7	3.59	196.40	7.97	5.92	9.94	24.33
27	21.71	+1.7	3.59	197.61	+ 8.51	+ 5.58	+10.30	25.26
29	21.75	1.7	3.58	198.81	9.05	5.25	10.66	26.19
JUL. 1	21.79	1.7	3.57	200.02	9.58	4.91	11.01	27.11
3	21.82	1.7	3.57	201.24	10.10	4.57	11.36	28.04
5	21.85	1.7	3.56	202.45	10.62	4.22	11.71	28.96
7	21.88	+1.7	3.56	203.67	+11.14	+ 3.88	+12.05	29.87
9	21.91	1.7	3.55	204.89	11.64	3.53	12.39	30.79
11	21.94	1.7	3.55	206.11	12.15	3.18	12.72	31.71
13	21.97	1.7	3.54	207.34	12.64	2.82	13.06	32.62
15	21.99	1.7	3.54	208.57	13.13	2.47	13.39	33.53
17	22.01	+1.7	3.54	209.80	+13.61	+ 2.11	+13.71	34.44
19	22.03	1.7	3.53	211.04	14.09	1.74	14.03	35.35
21	22.05	1.7	3.53	212.28	14.56	1.38	14.35	36.25
23	22.06	1.7	3.53	213.53	15.02	1.00	14.66	37.16
25	22.07	1.7	3.53	214.78	15.47	0.63	14.97	38.06
27	22.08	+1.7	3.52	216.03	+15.92	+ 0.25	+15.28	38.96
29	22.09	1.7	3.52	217.29	16.35	- 0.13	15.58	39.86
31	22.10	1.7	3.52	218.56	16.78	0.51	15.88	40.76
AGO. 2	22.10	1.7	3.52	219.83	17.21	0.90	16.18	41.66
4	22.11	1.7	3.52	221.10	17.62	1.29	16.47	42.55
6	22.11	+1.7	3.52	222.38	+18.02	- 1.68	+16.75	43.45
8	22.11	+1.7	3.52	223.66	+18.42	- 2.08	+17.03	44.34
10	22.10	+1.7	3.52	224.95	+18.80	- 2.48	+17.31	45.23

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	FASE	ANG.	DEF.	ÂNGULO		POSICÃO		MERID.CENTRAL		TRANS.MERID.ZERO		
		FASE	ILUM	DEFEITO	EIXO	DATA	DIA	SEG	DATA	DIA	SEG	
		G	"	G	G	G	G	H	M	H	M	
MAIO	28	0.990	11.42	0.04	85.17	331.48	193.47	183.75	11	24.6	12	04.6
	30	.991	11.05	.03	85.62	332.09	174.03	164.32	12	44.5	13	24.5
JUN.	1	.991	10.67	.03	86.06	332.71	154.60	144.88	14	04.4	14	44.3
	3	.992	10.30	.03	86.50	333.34	135.17	125.45	15	24.3	16	04.2
	5	.993	9.93	.03	86.92	333.99	115.74	106.02	16	44.2	17	24.1
	7	0.993	9.55	0.03	87.33	334.64	96.31	86.59	18	04.0	18	44.0
	9	.994	9.18	.02	87.72	335.31	76.88	67.16	19	24.0	20	03.9
	11	.994	8.80	.02	88.10	335.99	57.45	47.74	20	43.8	21	23.8
	13	.995	8.43	.02	88.47	336.68	38.02	28.31	22	03.6	22	43.5
	15	.995	8.05	.02	88.81	337.37	18.60	8.88	23	23.5	--	----
	17	0.996	7.68	0.02	89.12	338.08	359.17	349.46	00	03.4	00	43.3
	19	.996	7.30	.02	89.41	338.79	339.74	330.03	01	23.3	02	03.2
	21	.996	6.92	.02	89.66	339.51	320.31	310.60	02	43.1	03	23.1
	23	.997	6.55	.02	89.88	340.25	300.88	291.17	04	03.0	04	43.0
	25	.997	6.17	.02	90.05	340.98	281.45	271.74	05	23.0	06	02.8
	27	0.997	5.79	0.02	90.17	341.73	262.02	252.31	06	42.8	07	22.8
	29	.998	5.41	.02	90.23	342.48	242.59	232.87	08	02.7	08	42.6
JUL.	1	.998	5.04	.02	90.20	343.24	223.15	213.44	09	22.6	10	02.5
	3	.998	4.66	.02	90.09	344.00	203.72	194.00	10	42.5	11	22.5
	5	.999	4.28	.00	89.85	344.77	184.28	174.56	12	02.5	12	42.3
	7	0.999	3.91	0.00	89.46	345.54	164.84	155.12	13	22.3	14	02.3
	9	.999	3.53	.00	88.88	346.32	145.40	135.67	14	42.2	15	22.3
	11	.999	3.16	.00	88.03	347.10	125.95	116.23	16	02.2	16	42.2
	13	0.999	2.78	.00	86.81	347.88	106.50	96.78	17	22.1	18	02.1
	15	1.000	2.41	.00	85.06	348.67	87.05	77.32	18	42.1	19	22.1
	17	1.000	2.05	0.00	82.49	349.47	67.59	57.86	20	02.1	20	42.1
	19	.000	1.69	.00	78.61	350.26	48.13	38.40	21	22.1	22	02.1
	21	.000	1.35	.00	72.44	351.06	28.67	18.94	22	42.1	23	22.1
	23	.000	1.03	.00	62.00	351.86	9.21	359.47	--	----	00	02.2
	25	.000	.79	.00	43.53	352.67	349.74	340.00	00	42.2	01	22.3
	27	1.000	.68	0.00	14.51	353.47	330.26	320.52	02	02.3	02	42.3
	29	.000	.78	.00	345.29	354.28	310.78	301.04	03	22.3	04	02.5
	31	.000	1.03	.00	326.54	355.09	291.30	281.56	04	42.5	05	22.5
AGO.	2	.000	1.34	.00	315.91	355.90	271.82	262.07	06	02.5	06	42.6
	4	.000	1.69	.00	309.61	356.71	252.33	242.58	07	22.8	08	02.7
	6	1.000	2.05	0.00	305.60	357.53	232.83	223.08	08	42.8	09	23.0
	8	1.000	2.42	0.00	302.91	358.34	213.33	203.58	10	03.0	10	43.1
	10	0.999	2.79	0.00	301.03	359.15	193.83	184.08	11	23.3	12	03.4

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	TEMPO LUZ	MAG.	DIAM.	TERRA		AS-AT	SOL	
				ALFA+PI	DELTA		DELTA	LONG.
	M		"	G	G	G	G	G
AGO.10	22.10	+1.7	3.52	224.95	+18.80	- 2.48	+17.31	45.23
12	22.10	1.7	3.52	226.24	19.18	2.89	17.58	46.12
14	22.09	1.7	3.52	227.54	19.54	3.30	17.85	47.01
16	22.08	1.8	3.53	228.85	19.90	3.71	18.12	47.90
18	22.07	1.8	3.53	230.15	20.24	4.12	18.38	48.79
20	22.05	+1.8	3.53	231.47	+20.58	- 4.54	+18.63	49.67
22	22.04	1.8	3.53	232.79	20.90	4.97	18.88	50.56
24	22.02	1.8	3.54	234.11	21.22	5.39	19.13	51.44
26	22.00	1.8	3.54	235.44	21.52	5.82	19.37	52.32
28	21.97	1.8	3.54	236.77	21.82	6.26	19.61	53.21
30	21.95	+1.8	3.55	238.11	+22.10	- 6.69	+19.84	54.09
SET. 1	21.92	1.8	3.55	239.46	22.37	7.13	20.07	54.97
3	21.89	1.8	3.56	240.80	22.62	7.57	20.29	55.85
5	21.86	1.8	3.56	242.16	22.87	8.01	20.51	56.72
7	21.82	1.8	3.57	243.51	23.10	8.46	20.72	57.60
9	21.79	+1.8	3.57	244.87	+23.33	- 8.91	+20.93	58.48
11	21.75	1.8	3.58	246.24	23.54	9.36	21.14	59.36
13	21.71	1.8	3.59	247.60	23.73	9.81	21.33	60.23
15	21.66	1.8	3.59	248.98	23.92	10.27	21.53	61.11
17	21.62	1.8	3.60	250.35	24.09	10.72	21.72	61.98
19	21.57	+1.8	3.61	251.73	+24.25	-11.18	+21.90	62.86
21	21.52	1.8	3.62	253.11	24.40	11.64	22.08	63.73
23	21.47	1.8	3.63	254.50	24.53	12.10	22.25	64.61
25	21.41	1.8	3.64	255.89	24.65	12.56	22.42	65.48
27	21.36	1.8	3.65	257.27	24.76	13.02	22.58	66.36
29	21.30	+1.8	3.66	258.67	+24.85	-13.48	+22.73	67.23
OUT. 1	21.24	1.8	3.67	260.06	24.93	13.94	22.88	68.10
3	21.17	1.8	3.68	261.45	25.00	14.40	23.03	68.97
5	21.11	1.8	3.69	262.85	25.06	14.85	23.17	69.85
7	21.04	1.8	3.70	264.24	25.10	15.31	23.30	70.72
9	20.97	+1.8	3.71	265.64	+25.12	-15.77	+23.43	71.59
11	20.90	1.8	3.72	267.03	25.14	16.22	23.56	72.47
13	20.82	1.8	3.74	268.43	25.14	16.67	23.67	73.34
15	20.75	1.8	3.75	269.83	25.12	17.13	23.78	74.21
17	20.67	1.8	3.77	271.22	25.10	17.57	23.89	75.08
19	20.59	+1.8	3.78	272.62	+25.06	-18.02	+23.99	75.96
21	20.51	+1.8	3.80	274.01	+25.00	-18.46	+24.08	76.83
23	20.42	+1.8	3.81	275.40	+24.94	-18.90	+24.17	77.71

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	FASE	ANG.	DEF.	ÂNGULO		POSICÃO		MERID.CENTRAL		TRANS.MERID.ZERO	
		FASE	ILUM	DEFEITO	EIXO	DATA	DIA SEG	DATA	DIA SEG	H M	H M
		G	"	G	G	G	G	H	M	H	M
AGO.10	0.999	2.79	0.00	301.03	359.15	193.83	184.08	11	23.3	12	03.4
12	.999	3.17	.00	299.67	359.97	174.32	164.57	12	43.5	13	23.5
14	.999	3.55	.00	298.66	.78	154.81	145.05	14	03.6	14	43.7
16	.999	3.93	.00	297.90	1.59	135.29	125.53	15	24.0	16	04.0
18	.999	4.32	.02	297.33	2.41	115.77	106.01	16	44.2	17	24.3
20	0.998	4.70	0.02	296.89	3.22	96.24	86.48	18	04.4	18	44.6
22	.998	5.09	.02	296.56	4.03	76.71	66.95	19	24.8	20	04.9
24	.998	5.48	.02	296.30	4.84	57.18	47.41	20	45.1	21	25.3
26	.997	5.86	.02	296.11	5.65	37.64	27.87	22	05.4	22	45.6
28	.997	6.25	.02	295.97	6.45	18.09	8.32	23	25.8	--	----
30	0.997	6.64	0.02	295.86	7.26	358.54	348.77	00	06.0	00	46.2
SET. 1	.996	7.03	.02	295.79	8.06	338.99	329.21	01	26.5	02	06.6
3	.996	7.42	.02	295.74	8.85	319.44	309.66	02	46.8	03	27.0
5	.995	7.81	.02	295.71	9.65	299.88	290.09	04	07.2	04	47.5
7	.995	8.20	.02	295.69	10.44	280.31	270.53	05	27.7	06	07.9
9	0.994	8.59	0.02	295.68	11.23	260.74	250.96	06	48.1	07	28.3
11	.994	8.98	.02	295.69	12.01	241.17	231.39	08	08.6	08	48.8
13	.993	9.37	.02	295.70	12.79	221.60	211.81	09	29.1	10	09.3
15	.993	9.77	.03	295.71	13.57	202.02	192.23	10	49.6	11	29.8
17	.992	10.16	.03	295.73	14.34	182.44	172.65	12	10.1	12	50.5
19	0.992	10.55	0.03	295.74	15.10	162.86	153.06	13	30.6	14	10.9
21	.991	10.94	.03	295.76	15.86	143.27	133.48	14	51.2	15	31.5
23	.990	11.33	.04	295.78	16.61	123.68	113.89	16	11.7	16	52.0
25	.990	11.72	.04	295.79	17.36	104.09	94.30	17	32.3	18	12.5
27	.989	12.12	.04	295.80	18.10	84.50	74.71	18	52.9	19	33.1
29	0.988	12.51	0.04	295.81	18.83	64.91	55.11	20	13.4	20	53.7
OUT. 1	.987	12.90	.05	295.81	19.56	45.32	35.52	21	34.0	22	14.2
3	.987	13.29	.05	295.81	20.27	25.72	15.92	22	54.5	23	34.8
5	.986	13.68	.05	295.80	20.98	6.13	356.33	--	----	00	15.1
7	.985	14.07	.06	295.79	21.68	346.53	336.73	00	55.4	01	35.7
9	0.984	14.46	0.06	295.78	22.37	326.94	317.14	02	16.0	02	56.2
11	.983	14.85	.06	295.75	23.05	307.34	297.54	03	36.5	04	16.8
13	.982	15.25	.08	295.72	23.72	287.75	277.95	04	57.1	05	37.5
15	.981	15.64	.08	295.68	24.38	268.15	258.36	06	17.8	06	57.9
17	.981	16.03	.08	295.64	25.03	248.56	238.76	07	38.2	08	18.5
19	0.980	16.42	0.08	295.59	25.66	228.97	219.17	08	58.9	09	39.1
21	0.979	16.81	0.08	295.53	26.29	209.38	199.59	10	19.3	10	59.6
23	0.978	17.19	0.09	295.46	26.90	189.79	180.00	11	40.0	12	20.1

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	TEMPO			TERRA			SOL	
	LUZ	MAG.	DIAM.	ALFA+PI	DELTA	AS-AT	DELTA	LONG.
	M		"	G	G	G	G	G
OUT. 23	20.42	+1.8	3.81	275.40	+24.94	-18.90	+24.17	77.71
25	20.33	1.8	3.83	276.79	24.86	19.34	24.26	78.58
27	20.24	1.8	3.85	278.18	24.76	19.77	24.33	79.45
29	20.15	1.8	3.86	279.57	24.66	20.20	24.40	80.33
31	20.06	1.8	3.88	280.95	24.54	20.62	24.47	81.20
NOV. 2	19.96	+1.8	3.90	282.33	+24.41	-21.04	+24.53	82.08
4	19.87	1.8	3.92	283.70	24.26	21.45	24.58	82.96
6	19.77	1.8	3.94	285.07	24.10	21.86	24.63	83.83
8	19.67	1.8	3.96	286.44	23.93	22.26	24.67	84.71
10	19.56	1.8	3.98	287.81	23.75	22.66	24.70	85.59
12	19.46	+1.8	4.00	289.17	+23.56	-23.06	+24.73	86.47
14	19.35	1.8	4.02	290.52	23.35	23.44	24.75	87.35
16	19.24	1.7	4.05	291.87	23.13	23.83	24.77	88.23
18	19.13	1.7	4.07	293.22	22.90	24.20	24.77	89.11
20	19.02	1.7	4.09	294.56	22.66	24.57	24.78	89.99
22	18.90	+1.7	4.12	295.90	+22.41	-24.94	+24.78	90.87
24	18.79	1.7	4.14	297.23	22.14	25.29	24.77	91.76
26	18.67	1.7	4.17	298.55	21.87	25.64	24.75	92.64
28	18.55	1.7	4.20	299.87	21.58	25.99	24.73	93.53
30	18.42	1.7	4.23	301.19	21.28	26.33	24.70	94.42
DEZ. 2	18.30	+1.7	4.25	302.49	+20.98	-26.66	+24.66	95.30
4	18.18	1.7	4.28	303.80	20.66	26.98	24.62	96.19
6	18.05	1.7	4.31	305.09	20.34	27.30	24.58	97.08
8	17.92	1.6	4.34	306.38	20.00	27.61	24.52	97.97
10	17.79	1.6	4.38	307.66	19.65	27.91	24.46	98.87
12	17.66	+1.6	4.41	308.94	+19.30	-28.21	+24.40	99.76
14	17.53	1.6	4.44	310.21	18.94	28.50	24.32	100.66
16	17.39	1.6	4.48	311.48	18.56	28.79	24.24	101.55
18	17.26	1.6	4.51	312.74	18.18	29.07	24.16	102.45
20	17.12	1.6	4.55	313.99	17.80	29.34	24.07	103.35
22	16.98	+1.6	4.58	315.24	+17.40	-29.61	+23.97	104.25
24	16.84	1.5	4.62	316.48	17.00	29.86	23.86	105.16
26	16.70	1.5	4.66	317.71	16.58	30.12	23.75	106.06
28	16.55	1.5	4.70	318.94	16.17	30.36	23.63	106.97
30	16.41	1.5	4.74	320.16	15.74	30.60	23.51	107.88
32	16.27	+1.5	4.79	321.37	+15.31	-30.84	+23.38	108.79

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	FASE	ANG.	DEF.	ÂNGULO		POSICÃO		MERID.CENTRAL		TRANS.MERID.ZERO	
		FASE	ILUM	DEFEITO	EIXO	DATA	DIA SEG	DATA	DIA SEG	H	M
		G	"	G	G	G	G	H	M	H	M
OUT. 23	0.978	17.19	0.09	295.46	26.90	189.79	180.00	11	40.0	12	20.1
25	.977	17.58	.09	295.39	27.50	170.21	160.42	13	00.4	13	40.7
27	.976	17.97	.09	295.31	28.09	150.63	140.84	14	21.0	15	01.3
29	.975	18.36	.11	295.22	28.66	131.05	121.26	15	41.5	16	21.8
31	.973	18.74	.11	295.12	29.22	111.47	101.69	17	02.0	17	42.1
NOV. 2	0.972	19.13	0.11	295.01	29.77	91.90	82.12	18	22.5	19	02.6
4	.971	19.51	.11	294.90	30.30	72.33	62.55	19	42.8	20	23.0
6	.970	19.90	.12	294.78	30.81	52.77	42.99	21	03.2	21	43.5
8	.969	20.28	.12	294.65	31.31	33.21	23.43	22	23.8	23	03.9
10	.968	20.66	.13	294.51	31.80	13.65	3.88	23	44.1	--	----
12	0.967	21.05	0.13	294.36	32.27	354.10	344.33	00	24.3	01	04.4
14	.965	21.43	.15	294.20	32.72	334.56	324.79	01	44.6	02	24.8
16	.964	21.81	.15	294.03	33.16	315.02	305.25	03	05.0	03	45.1
18	.963	22.19	.15	293.86	33.58	295.48	285.71	04	25.3	05	05.4
20	.962	22.57	.16	293.68	33.98	275.95	266.19	05	45.6	06	25.7
22	0.960	22.94	0.16	293.48	34.37	256.43	246.67	07	05.8	07	46.0
24	.959	23.32	.18	293.28	34.73	236.91	227.15	08	26.1	09	06.2
26	.958	23.69	.18	293.07	35.08	217.40	207.64	09	46.3	10	26.5
28	.957	24.06	.18	292.85	35.42	197.89	188.14	11	06.5	11	46.6
30	.955	24.43	.19	292.63	35.73	178.39	168.64	12	26.7	13	06.7
DEZ. 2	0.954	24.80	0.20	292.39	36.02	158.90	149.15	13	46.8	14	27.0
4	.953	25.17	.20	292.14	36.30	139.41	129.67	15	06.9	15	47.0
6	.951	25.54	.21	291.89	36.56	119.93	110.19	16	27.0	17	07.0
8	.950	25.90	.22	291.63	36.80	100.45	90.72	17	47.0	18	27.1
10	.948	26.27	.23	291.36	37.01	80.99	71.25	19	07.1	19	47.1
12	0.947	26.63	0.23	291.07	37.22	61.52	51.80	20	27.1	21	07.1
14	.946	26.99	.24	290.78	37.40	42.07	32.34	21	47.0	22	27.0
16	.944	27.34	.25	290.49	37.56	22.62	12.90	23	07.0	23	47.0
18	.943	27.70	.26	290.18	37.70	3.18	353.46	--	----	00	27.0
20	.941	28.05	.27	289.86	37.82	343.74	334.03	01	06.8	01	46.8
22	0.940	28.40	0.28	289.54	37.93	324.32	314.60	02	26.7	03	06.6
24	.938	28.75	.28	289.21	38.01	304.89	295.19	03	46.5	04	26.5
26	.937	29.10	.29	288.87	38.08	285.48	275.77	05	06.3	05	46.2
28	.935	29.44	.30	288.52	38.12	266.07	256.37	06	26.1	07	06.0
30	.934	29.78	.31	288.16	38.15	246.67	236.97	07	46.0	08	25.7
32	0.932	30.12	0.32	287.80	38.15	227.27	217.58	09	05.6	09	45.5

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	TEMPO LUZ	MAG.	DIÂMETRO		TERRA		SOL	
			EQUAT.	POLAR	ALFA+PI	DELTA	ALFA+PI	DELTA
	M		"	"	G	G	G	G
JAN. 0	46.27	-1.8	35.39	33.10	63.90	-2.76	53.72	-2.48
4	45.73	1.8	35.80	33.48	64.31	2.78	54.02	2.49
8	45.20	1.8	36.23	33.88	64.68	2.81	54.32	2.49
12	44.66	1.9	36.66	34.29	65.01	2.83	54.62	2.50
16	44.12	1.9	37.11	34.70	65.30	2.86	54.92	2.51
20	43.59	-1.9	37.57	35.13	65.53	-2.88	55.23	-2.52
24	43.06	1.9	38.03	35.56	65.72	2.90	55.53	2.53
28	42.53	2.0	38.50	36.00	65.86	2.92	55.83	2.54
FEV. 1	42.02	2.0	38.97	36.44	65.96	2.94	56.13	2.55
5	41.52	2.0	39.44	36.88	66.00	2.96	56.43	2.56
9	41.03	-2.1	39.91	37.32	65.99	-2.97	56.74	-2.57
13	40.56	2.1	40.37	37.75	65.93	2.99	57.04	2.58
17	40.11	2.1	40.82	38.18	65.82	3.00	57.34	2.59
21	39.68	2.1	41.26	38.59	65.66	3.01	57.64	2.59
25	39.28	2.2	41.69	38.99	65.45	3.02	57.94	2.60
MAR. 1	38.90	-2.2	42.09	39.36	65.19	-3.03	58.25	-2.61
5	38.56	2.2	42.47	39.72	64.89	3.03	58.55	2.62
9	38.24	2.2	42.82	40.04	64.55	3.04	58.85	2.63
13	37.96	2.2	43.14	40.34	64.17	3.04	59.15	2.64
17	37.71	2.3	43.42	40.60	63.76	3.03	59.45	2.65
21	37.51	-2.3	43.66	40.83	63.32	-3.03	59.76	-2.65
25	37.33	2.3	43.86	41.02	62.85	3.02	60.06	2.66
29	37.20	2.3	44.01	41.16	62.36	3.01	60.36	2.67
ABR. 2	37.11	2.3	44.12	41.26	61.86	3.00	60.66	2.68
6	37.06	2.3	44.18	41.32	61.35	2.99	60.97	2.69
10	37.05	-2.3	44.19	41.33	60.83	-2.97	61.27	-2.69
14	37.09	2.3	44.15	41.29	60.32	2.95	61.57	2.70
18	37.16	2.3	44.07	41.21	59.82	2.94	61.87	2.71
22	37.27	2.3	43.94	41.09	59.33	2.92	62.17	2.72
26	37.42	2.3	43.76	40.92	58.86	2.89	62.48	2.72
30	37.61	-2.3	43.54	40.72	58.42	-2.87	62.78	-2.73
MAIO 4	37.83	-2.3	43.28	40.48	58.00	-2.85	63.08	-2.74

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

O HORA TEMPO UNIVERSAL

DATA	ANG. FASE	DEF. ILUM	ÂNGULO DEFEITO	POSIÇÃO EIXO	MERID. SIST. I	CENTRAL SIST. II	CORR. FASE
	G	"	G	G	G	G	G
JAN. 0	10.18	0.28	292.22	23.55	59.22	184.86	+0.45
4	10.29	.29	292.08	23.48	330.74	65.85	.46
8	10.36	.30	291.94	23.42	242.29	306.88	.47
12	10.38	.30	291.81	23.36	153.89	187.96	.47
16	10.37	.30	291.68	23.31	65.54	69.08	.47
20	10.30	0.30	291.55	23.27	337.22	310.25	+0.46
24	10.19	.30	291.42	23.24	248.96	191.46	.45
28	10.03	.29	291.30	23.21	160.74	72.71	.44
FEV. 1	9.82	.29	291.17	23.20	72.56	314.01	.42
5	9.56	.27	291.04	23.19	344.42	195.35	.40
9	9.25	0.26	290.91	23.19	256.33	76.74	+0.37
13	8.89	.24	290.78	23.20	168.28	318.16	.35
17	8.47	.22	290.63	23.22	80.26	199.62	.31
21	8.01	.20	290.47	23.24	352.28	81.12	.28
25	7.50	.18	290.29	23.28	264.34	322.66	.25
MAR. 1	6.95	0.15	290.07	23.32	176.42	204.22	+0.21
5	6.35	.13	289.82	23.37	88.53	85.81	.18
9	5.71	.11	289.50	23.43	0.67	327.42	.15
13	5.03	.08	289.09	23.49	272.82	209.05	.11
17	4.31	.06	288.52	23.56	184.98	90.69	.08
21	3.57	0.04	287.71	23.63	97.15	332.34	+0.06
25	2.81	.03	286.42	23.70	9.32	213.99	.03
29	2.02	.02	284.10	23.78	281.49	95.64	.02
ABR. 2	1.23	.02	278.73	23.85	193.65	337.27	.02
6	0.48	.00	255.45	23.93	105.79	218.90	.00
10	0.52	0.00	146.43	24.00	17.91	100.49	+0.00
14	1.27	.02	125.47	24.08	290.00	342.07	-.02
18	2.06	.02	120.37	24.14	202.06	223.61	.02
22	2.85	.03	118.12	24.21	114.08	105.11	.04
26	3.62	.04	116.85	24.27	26.06	346.57	.06
30	4.36	0.06	116.04	24.33	297.99	227.98	-0.08
MAIO 4	5.08	0.08	115.48	24.38	209.87	109.34	-0.11

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	TEMPO LUZ	MAG.	DIÂMETRO EQUAT. POLAR		TERRA ALFA+PI DELTA		SOL ALFA+PI DELTA			
			"	"	G	G	G	G		
MAIO	4	37.83	-2.3	43.28	40.48	58.00	-2.85	63.08	-2.74	
	8	38.09	2.2	42.99	40.20	57.62	2.82	63.38	2.75	
	12	38.38	2.2	42.66	39.90	57.27	2.80	63.69	2.75	
	16	38.70	2.2	42.31	39.56	56.96	2.78	63.99	2.76	
	20	39.05	2.2	41.93	39.21	56.70	2.75	64.29	2.77	
JUN.	24	39.43	-2.1	41.53	38.83	56.48	-2.73	64.59	-2.77	
	28	39.83	2.1	41.11	38.44	56.31	2.71	64.89	2.78	
	1	40.26	2.1	40.67	38.04	56.18	2.69	65.20	2.79	
	5	40.70	2.1	40.23	37.62	56.10	2.67	65.50	2.79	
	9	41.16	2.0	39.78	37.20	56.07	2.65	65.80	2.80	
	13	41.63	-2.0	39.33	36.78	56.09	-2.63	66.10	-2.81	
	17	42.12	2.0	38.88	36.36	56.15	2.62	66.41	2.81	
	21	42.62	2.0	38.42	35.93	56.26	2.60	66.71	2.82	
	25	43.12	1.9	37.97	35.51	56.42	2.59	67.01	2.83	
	29	43.63	1.9	37.53	35.10	56.63	2.58	67.31	2.83	
JUL.	3	44.15	-1.9	37.09	34.69	56.87	-2.57	67.62	-2.84	
	7	44.66	1.9	36.66	34.29	57.17	2.56	67.92	2.85	
	11	45.18	1.8	36.24	33.90	57.50	2.56	68.22	2.85	
	15	45.69	1.8	35.84	33.51	57.87	2.55	68.52	2.86	
	19	46.20	1.8	35.44	33.15	58.28	2.55	68.83	2.86	
	23	46.70	-1.8	35.06	32.79	58.73	-2.55	69.13	-2.87	
	27	47.20	1.7	34.69	32.45	59.21	2.55	69.43	2.88	
	31	47.68	1.7	34.34	32.12	59.72	2.55	69.74	2.88	
	AGO.	4	48.16	1.7	34.00	31.80	60.27	2.55	70.04	2.89
		8	48.62	1.7	33.68	31.50	60.85	2.55	70.34	2.89
12		49.07	-1.7	33.37	31.21	61.46	-2.56	70.65	-2.90	
16		49.50	1.7	33.08	30.94	62.09	2.57	70.95	2.90	
20		49.91	1.6	32.80	30.68	62.75	2.57	71.25	2.91	
24		50.31	1.6	32.54	30.44	63.43	2.58	71.55	2.91	
SET.	28	50.69	1.6	32.30	30.21	64.14	2.59	71.86	2.92	
	1	51.05	-1.6	32.07	30.00	64.86	-2.60	72.16	-2.92	
	5	51.39	-1.6	31.86	29.80	65.61	-2.61	72.46	-2.93	

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

O HORA TEMPO UNIVERSAL

DATA	ANG. FASE	DEF. ILUM	ÂNGULO DEFEITO	POSIÇÃO EIXO	MERID. SIST.I	CENTRAL SIST.II	CORR. FASE
	G	"	G	G	G	G	G
MAIO 4	5.08	0.08	115.48	24.38	209.87	109.34	-0.11
8	5.76	.11	115.06	24.43	121.69	350.64	.15
12	6.41	.13	114.73	24.47	33.46	231.89	.18
16	7.02	.16	114.46	24.51	305.17	113.09	.21
20	7.58	.18	114.25	24.54	216.82	354.22	.25
24	8.11	0.21	114.06	24.56	128.41	235.29	-0.29
28	8.58	.23	113.89	24.58	39.94	116.30	.32
JUN. 1	9.01	.25	113.74	24.60	311.41	357.25	.35
5	9.39	.27	113.61	24.61	222.82	238.15	.38
9	9.72	.29	113.48	24.61	134.17	118.98	.41
13	10.01	0.30	113.37	24.61	45.46	359.75	-0.44
17	10.25	.31	113.25	24.60	316.70	240.48	.46
21	10.44	.32	113.15	24.59	227.89	121.14	.47
25	10.58	.32	113.04	24.57	139.02	1.76	.49
29	10.68	.33	112.93	24.55	50.11	242.33	.50
JUL. 3	10.73	0.32	112.83	24.52	321.14	122.85	-0.50
7	10.75	.32	112.72	24.49	232.14	3.32	.50
11	10.72	.32	112.61	24.45	143.09	243.76	.50
15	10.65	.31	112.50	24.41	54.01	124.16	.49
19	10.54	.30	112.39	24.36	324.89	4.52	.48
23	10.40	0.29	112.27	24.30	235.73	244.85	-0.47
27	10.22	.28	112.15	24.24	146.55	125.15	.45
31	10.01	.26	112.02	24.17	57.34	5.42	.44
AGO. 4	9.76	.25	111.89	24.10	328.10	245.67	.41
8	9.49	.23	111.75	24.02	238.84	125.89	.39
12	9.18	0.21	111.60	23.93	149.56	6.09	-0.37
16	8.85	.20	111.44	23.84	60.27	246.28	.35
20	8.50	.18	111.27	23.74	330.95	126.45	.31
24	8.12	.16	111.08	23.63	241.63	6.60	.29
28	7.72	.15	110.89	23.52	152.29	246.75	.26
SET. 1	7.29	0.13	110.67	23.40	62.95	126.89	-0.23
5	6.85	0.11	110.44	23.27	333.59	7.02	-0.20

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	TEMPO LUZ	MAG.	DIÂMETRO EQUAT. POLAR		TERRA ALFA+PI DELTA		SOL ALFA+PI DELTA	
			"	"	G	G	G	G
SET. 5	M 51.39	-1.6	31.86	29.80	65.61	-2.61	72.46	-2.93
9	51.71	1.6	31.67	29.62	66.37	2.62	72.77	2.93
13	52.00	1.6	31.49	29.45	67.15	2.63	73.07	2.94
17	52.27	1.6	31.33	29.30	67.95	2.65	73.37	2.94
21	52.51	1.5	31.18	29.16	68.76	2.66	73.68	2.95
25	52.73	-1.5	31.05	29.04	69.58	-2.68	73.98	-2.95
29	52.93	1.5	30.94	28.93	70.41	2.69	74.28	2.96
OUT. 3	53.10	1.5	30.84	28.84	71.26	2.71	74.59	2.96
7	53.24	1.5	30.76	28.76	72.11	2.72	74.89	2.96
11	53.35	1.5	30.69	28.70	72.96	2.74	75.20	2.97
15	53.43	-1.5	30.64	28.66	73.83	-2.75	75.50	-2.97
19	53.49	1.5	30.61	28.63	74.70	2.77	75.80	2.98
23	53.52	1.5	30.59	28.61	75.57	2.79	76.11	2.98
27	53.52	1.5	30.60	28.61	76.44	2.80	76.41	2.98
31	53.49	1.5	30.61	28.63	77.32	2.82	76.71	2.99
NOV. 4	53.43	-1.5	30.65	28.66	78.19	-2.84	77.02	-2.99
8	53.35	1.5	30.69	28.71	79.06	2.85	77.32	3.00
12	53.23	1.5	30.76	28.77	79.93	2.87	77.63	3.00
16	53.09	1.5	30.84	28.85	80.79	2.89	77.93	3.00
20	52.91	1.5	30.94	28.94	81.64	2.90	78.24	3.01
24	52.71	-1.5	31.06	29.05	82.49	-2.92	78.54	-3.01
28	52.49	1.6	31.20	29.17	83.33	2.94	78.84	3.01
DEZ. 2	52.23	1.6	31.35	29.32	84.15	2.95	79.15	3.02
6	51.95	1.6	31.52	29.47	84.96	2.97	79.45	3.02
10	51.65	1.6	31.70	29.65	85.76	2.99	79.76	3.02
14	51.32	-1.6	31.91	29.84	86.54	-3.00	80.06	-3.02
18	50.96	1.6	32.13	30.05	87.31	3.02	80.37	3.03
22	50.59	1.6	32.37	30.27	88.05	3.03	80.67	3.03
26	50.19	1.6	32.63	30.51	88.78	3.05	80.98	3.03
30	49.77	1.6	32.90	30.77	89.48	3.06	81.28	3.04
34	49.33	-1.7	33.19	31.04	90.15	-3.08	81.59	-3.04

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

O HORA TEMPO UNIVERSAL

DATA	ANG. FASE	DEF. ILUM	ÂNGULO DEFEITO	POSIÇÃO EIXO	MERID. SIST.I	CENTRAL SIST.II	CORR. FASE
	G	"	G	G	G	G	G
SET. 5	6.85	0.11	110.44	23.27	333.59	7.02	-0.20
9	6.39	.11	110.19	23.14	244.24	247.14	.18
13	5.91	.08	109.91	23.00	154.88	127.26	.15
17	5.42	.08	109.59	22.85	65.52	7.38	.13
21	4.92	.06	109.23	22.70	336.16	247.51	.11
25	4.40	0.05	108.81	22.54	246.80	127.63	-0.08
29	3.87	.04	108.31	22.37	157.45	7.76	.08
OUT. 3	3.33	.03	107.70	22.19	68.11	247.90	.05
7	2.79	.02	106.89	22.01	338.77	128.04	.03
11	2.23	.02	105.76	21.82	249.44	8.20	.02
15	1.68	0.02	103.98	21.63	160.13	248.36	-0.02
19	1.12	.00	100.58	21.43	70.82	128.54	-.02
23	0.57	.00	90.80	21.22	341.53	8.73	+ .00
27	0.19	.00	9.11	21.01	252.26	248.93	.00
31	0.63	.00	306.58	20.80	163.00	129.16	.00
NOV. 4	1.19	0.00	298.29	20.58	73.77	9.40	+0.02
8	1.75	.02	295.17	20.35	344.55	249.66	.02
12	2.31	.02	293.47	20.12	255.35	129.95	.02
16	2.86	.02	292.34	19.89	166.18	10.25	.04
20	3.41	.03	291.51	19.66	77.03	250.58	.05
24	3.95	0.04	290.85	19.42	347.90	130.93	+0.08
28	4.48	.05	290.30	19.18	258.81	11.31	.09
DEZ. 2	5.00	.06	289.82	18.94	169.74	251.72	.11
6	5.51	.08	289.38	18.70	80.69	132.16	.13
10	6.00	.09	288.99	18.46	351.68	12.63	.16
14	6.48	0.11	288.62	18.22	262.70	253.12	+0.18
18	6.94	.12	288.27	17.99	173.75	133.65	.21
22	7.38	.13	287.94	17.75	84.84	14.22	.24
26	7.79	.15	287.62	17.52	355.96	254.81	.26
30	8.19	.18	287.32	17.29	267.11	135.45	.29
34	8.56	0.18	287.03	17.07	178.30	16.12	+0.32

JÚPITER, SISTEMA I, 2017
LONGITUDE DO MERIDIANO CENTRAL DO DISCO ILUMINADO
O HORA TEMPO UNIVERSAL

DIA	JAN.	FEB.	MAR.	ABR.	MAIO	JUN.	JUL.	AGO.	SET.	OUT.	NOV.	DEZ.
	G	G	G	G	G	G	G	G	G	G	G	G
1	217.6	73.0	176.6	35.6	95.9	311.1	5.1	214.6	62.7	112.7	320.8	12.1
2	15.4	230.9	334.6	193.7	253.8	108.9	162.9	12.3	220.4	270.5	118.4	169.8
3	173.3	29.0	132.7	351.8	51.9	266.8	320.6	170.0	18.1	68.1	276.1	327.6
4	331.3	186.9	290.8	149.7	209.8	64.6	118.4	327.8	175.7	225.7	73.8	125.3
5	129.1	344.8	88.7	307.8	7.7	222.4	276.1	125.4	333.5	23.5	231.5	283.1
6	287.0	142.8	246.7	105.8	165.7	20.3	73.9	283.1	131.1	181.1	29.2	80.8
7	84.9	300.8	44.8	263.8	323.6	178.1	231.6	80.8	288.8	338.8	186.9	238.6
8	242.8	98.7	202.8	61.9	121.5	336.0	29.5	238.5	86.4	136.4	344.6	36.3
9	40.7	256.8	.8	219.9	279.5	133.8	187.1	36.1	244.1	294.1	142.3	194.1
10	198.6	54.7	158.8	18.0	77.4	291.6	345.0	193.8	41.7	91.7	300.0	351.8
11	356.5	212.7	317.0	175.9	235.4	89.4	142.6	351.5	199.4	249.4	97.7	149.6
12	154.4	10.6	114.9	334.0	33.3	247.2	300.3	149.2	357.1	47.1	255.4	307.5
13	312.3	168.6	273.0	132.0	191.2	45.0	98.1	307.0	154.7	204.8	53.1	105.1
14	110.2	326.6	71.0	290.0	349.1	202.8	255.8	104.6	312.5	2.5	210.8	263.0
15	268.1	124.6	229.0	88.0	147.0	.6	53.5	262.3	110.1	160.1	8.5	60.7
16	66.0	282.6	27.0	246.0	305.0	158.4	211.2	59.9	267.8	317.8	166.2	218.4
17	223.9	80.6	185.1	44.0	102.9	316.3	9.0	217.6	65.4	115.5	324.0	16.3
18	21.8	238.6	343.1	202.0	260.8	114.0	166.7	15.3	223.1	273.1	121.6	174.0
19	179.8	36.6	141.1	.0	58.7	271.8	324.5	173.0	20.8	70.8	279.5	331.8
20	337.8	194.6	299.3	158.0	216.6	69.6	122.1	330.6	178.4	228.5	77.1	129.5
21	135.6	352.6	97.2	316.0	14.5	227.4	279.8	128.3	336.1	26.2	234.8	287.3
22	293.5	150.6	255.2	114.0	172.4	25.3	77.6	286.0	133.7	183.9	32.5	85.1
23	91.5	308.6	53.4	272.0	330.3	183.0	235.3	83.7	291.5	341.5	190.2	242.9
24	249.4	106.6	211.3	70.0	128.1	340.8	33.0	241.3	89.1	139.2	348.0	40.6
25	47.3	264.6	9.4	228.0	286.0	138.5	190.7	39.0	246.7	297.0	145.7	198.4
26	205.3	62.6	167.4	26.0	83.9	296.3	348.5	196.7	44.5	94.6	303.5	356.3
27	3.2	220.6	325.5	184.0	241.8	94.1	146.1	354.5	202.1	252.3	101.2	154.0
28	161.2	18.6	123.5	342.0	39.6	251.8	303.8	152.0	359.8	50.0	259.0	311.8
29	319.1		281.5	139.9	197.5	49.6	101.5	309.8	157.4	207.6	56.6	109.6
30	117.1		79.5	298.0	355.3	207.4	259.3	107.4	315.1	5.3	214.4	267.5
31	275.0		237.6		153.2		56.9	265.0		163.0		65.2

MOVIMENTO DO MERIDIANO CENTRAL

MIN.	0H.	1H.	2H.	3H.	4H.	5H.	6H.	7H.	8H.	9H.	10H.	11H.
	G	G	G	G	G	G	G	G	G	G	G	G
0	0.0	36.6	73.2	109.7	146.3	182.9	219.5	256.1	292.6	329.2	5.8	42.4
10	6.1	42.7	79.3	115.8	152.4	189.0	225.6	262.2	298.7	335.3	11.9	48.5
20	12.2	48.8	85.4	121.9	158.5	195.1	231.7	268.2	304.8	341.4	18.0	54.6
30	18.3	54.9	91.4	128.0	164.6	201.2	237.8	274.3	310.9	347.5	24.1	60.7
40	24.4	61.0	97.5	134.1	170.7	207.3	243.9	280.4	317.0	353.6	30.2	66.8
50	30.5	67.1	103.6	140.2	176.8	213.4	250.0	286.5	323.1	359.7	36.3	72.9
60	36.6	73.2	109.7	146.3	182.9	219.5	256.1	292.6	329.2	5.8	42.4	79.0

JÚPITER, SISTEMA II 2017
LONGITUDE DO MERIDIANO CENTRAL DO DISCO ILUMINADO
O HORA TEMPO UNIVERSAL

43 D

DIA	JAN.	FEB.	MAR.	ABR.	MAIO	JUN.	JUL.	AGO.	SET.	OUT.	NOV.	DEZ.
	G	G	G	G	G	G	G	G	G	G	G	G
1	335.6	314.5	204.4	186.9	18.3	357.0	182.1	155.1	126.7	307.8	279.3	101.7
2	125.8	104.8	354.8	337.3	168.6	147.1	332.3	305.1	276.8	97.8	69.3	251.8
3	276.1	255.1	145.2	127.7	319.0	297.3	122.3	95.2	66.7	247.8	219.3	42.0
4	66.3	45.5	295.6	278.1	109.2	87.6	272.5	245.3	216.8	38.0	9.4	192.1
5	216.6	195.8	86.0	68.5	259.5	237.8	62.6	35.3	6.8	187.9	159.5	342.3
6	6.8	346.1	236.4	218.9	50.0	28.0	212.7	185.4	156.8	338.0	309.5	132.3
7	157.1	136.4	26.8	9.3	200.2	178.2	2.8	335.5	307.0	128.0	99.6	282.5
8	307.3	286.8	177.2	159.7	350.5	328.5	152.9	125.5	96.9	278.0	249.7	72.5
9	97.6	77.1	327.6	310.1	140.8	118.6	303.0	275.6	247.0	68.1	39.7	222.7
10	247.9	227.5	118.0	100.5	291.1	268.8	93.2	65.6	37.0	218.1	189.8	12.8
11	38.2	17.8	268.5	250.9	81.4	58.9	243.3	215.7	187.0	8.2	340.0	162.9
12	188.4	168.2	58.9	41.3	231.7	209.1	33.5	5.7	337.1	158.2	130.0	313.0
13	338.8	318.5	209.2	191.7	22.0	359.3	183.5	155.8	127.1	308.3	280.0	103.2
14	129.0	108.9	359.6	342.1	172.3	149.5	333.6	305.8	277.1	98.3	70.1	253.3
15	279.3	259.3	150.0	132.4	322.6	299.8	123.7	95.9	67.2	248.3	220.2	43.5
16	69.5	49.6	300.5	282.8	112.9	89.8	273.8	245.9	217.2	38.5	10.3	193.6
17	219.8	199.9	90.8	73.2	263.3	240.0	63.9	36.0	7.3	188.4	160.4	343.8
18	10.1	350.3	241.2	223.6	53.4	30.2	213.9	186.0	157.3	338.5	310.5	133.9
19	160.4	140.7	31.6	14.0	203.7	180.3	4.0	336.1	307.3	128.5	100.5	284.0
20	310.8	291.0	182.0	164.3	354.0	330.5	154.1	126.1	97.4	278.6	250.6	74.2
21	101.0	81.4	332.5	314.8	144.2	120.7	304.3	276.3	247.4	68.6	40.7	224.3
22	251.3	231.8	122.8	105.1	294.5	270.8	94.3	66.2	37.5	218.7	190.8	14.5
23	41.6	22.1	273.3	255.4	84.8	61.0	244.4	216.3	187.5	8.7	341.0	164.6
24	191.9	172.5	63.6	45.8	235.0	211.1	34.5	6.3	337.5	158.8	131.0	314.8
25	342.3	323.0	214.0	196.2	25.3	1.3	184.5	156.4	127.5	308.8	281.1	104.9
26	132.5	113.3	4.4	346.5	175.5	151.4	334.6	306.5	277.6	98.9	71.2	255.1
27	282.8	263.8	154.8	136.9	325.8	301.6	124.7	96.4	67.6	248.9	221.3	45.2
28	73.1	54.0	305.3	287.3	116.0	91.7	274.8	246.5	217.7	39.0	11.4	195.4
29	223.5		95.7	77.6	266.3	241.8	64.8	36.5	7.7	189.0	161.5	345.6
30	13.8		246.1	227.9	56.4	32.0	214.9	186.6	157.7	339.1	311.6	135.7
31	164.1		36.5		206.7		5.0	336.6		129.2		286.0

MOVIMENTO DO MERIDIANO CENTRAL

MIN.	0H.	1H.	2H.	3H.	4H.	5H.	6H.	7H.	8H.	9H.	10H.	11H.
	G	G	G	G	G	G	G	G	G	G	G	G
0	0.0	36.3	72.5	108.8	145.0	181.3	217.6	253.8	290.1	326.4	2.6	38.9
10	6.0	42.3	78.6	114.8	151.1	187.3	223.6	259.9	296.1	332.4	8.7	44.9
20	12.1	48.3	84.6	120.9	157.1	193.4	229.7	265.9	302.2	338.4	14.7	51.0
30	18.1	54.4	90.7	126.9	163.2	199.4	235.7	272.0	308.2	344.5	20.7	57.0
40	24.2	60.4	96.7	133.0	169.2	205.5	241.7	278.0	314.3	350.5	26.8	63.0
50	30.2	66.5	102.7	139.0	175.3	211.5	247.8	284.0	320.3	356.6	32.8	69.1
60	36.3	72.5	108.8	145.0	181.3	217.6	253.8	290.1	326.4	2.6	38.9	75.1

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	TEMPO		DIÂMETRO		ANG. FASE	DEF. ILUM	ANG.POS. DEFEITO
	LUZ	MAG.	EQUAT.	POLAR			
	M		"	"	G	"	G
JAN. 0	91.28	+0.7	15.08	13.45	1.78	0.00	277.57
4	91.09	0.7	15.11	13.48	2.11	.02	276.70
8	90.86	0.7	15.15	13.51	2.44	.02	276.01
12	90.60	0.7	15.19	13.55	2.75	.02	275.44
16	90.31	0.7	15.24	13.60	3.06	.02	274.96
20	90.00	+0.8	15.29	13.64	3.35	0.02	274.53
24	89.65	0.8	15.35	13.70	3.64	.02	274.15
28	89.28	0.8	15.41	13.75	3.91	.02	273.80
FEV. 1	88.88	0.8	15.48	13.82	4.16	.02	273.48
5	88.45	0.8	15.56	13.88	4.40	.02	273.19
9	88.01	+0.8	15.64	13.95	4.62	0.03	272.91
13	87.54	0.8	15.72	14.03	4.82	.03	272.65
17	87.06	0.8	15.81	14.10	5.01	.03	272.42
21	86.56	0.8	15.90	14.19	5.17	.03	272.19
25	86.04	0.8	15.99	14.27	5.31	.03	271.98
MAR. 1	85.51	+0.7	16.09	14.36	5.43	0.04	271.78
5	84.98	0.7	16.19	14.45	5.53	.04	271.60
9	84.43	0.7	16.30	14.54	5.60	.04	271.42
13	83.88	0.7	16.41	14.64	5.65	.04	271.26
17	83.32	0.7	16.52	14.74	5.68	.04	271.11
21	82.77	+0.7	16.63	14.84	5.68	0.04	270.97
25	82.22	0.7	16.74	14.94	5.65	.04	270.84
29	81.67	0.7	16.85	15.04	5.60	.04	270.72
ABR. 2	81.13	0.6	16.96	15.14	5.52	.04	270.60
6	80.59	0.6	17.07	15.24	5.41	.04	270.49
10	80.07	+0.6	17.19	15.33	5.28	0.04	270.39
14	79.57	0.6	17.29	15.43	5.12	.03	270.29
18	79.08	0.6	17.40	15.53	4.94	.03	270.20
22	78.61	0.5	17.50	15.62	4.73	.03	270.10
26	78.17	0.5	17.60	15.71	4.49	.03	270.00
30	77.74	+0.5	17.70	15.79	4.24	0.02	269.89
MAIO 4	77.35	+0.5	17.79	15.88	3.96	0.02	269.77

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	TEMPO LUZ	MAG.	DIÂMETRO EQUAT. POLAR		ANG. FASE	DEF. ILUM	ANG. POS. DEFEITO
	M		"	"	G	"	G
MAIO 4	77.35	+0.5	17.79	15.88	3.96	0.02	269.77
8	76.98	0.4	17.88	15.95	3.65	.02	269.62
12	76.64	0.4	17.95	16.02	3.33	.02	269.44
16	76.34	0.4	18.03	16.09	2.99	.02	269.21
20	76.07	0.4	18.09	16.14	2.64	.02	268.90
24	75.83	+0.3	18.15	16.19	2.26	0.02	268.46
28	75.63	0.3	18.20	16.24	1.88	.00	267.81
JUN. 1	75.47	0.3	18.23	16.27	1.49	.00	266.76
5	75.34	0.3	18.26	16.30	1.08	.00	264.87
9	75.26	0.2	18.28	16.32	0.68	.00	260.58
13	75.21	+0.2	18.30	16.33	0.29	0.00	243.82
17	75.21	0.2	18.30	16.33	0.21	.00	132.35
21	75.24	0.2	18.29	16.32	0.59	.00	105.71
25	75.32	0.3	18.27	16.30	1.00	.00	100.33
29	75.43	0.3	18.24	16.28	1.40	.00	98.13
JUL. 3	75.58	+0.3	18.21	16.25	1.80	0.00	96.96
7	75.77	0.3	18.16	16.21	2.18	.02	96.24
11	75.99	0.3	18.11	16.16	2.56	.02	95.77
15	76.25	0.4	18.05	16.10	2.92	.02	95.44
19	76.55	0.4	17.98	16.04	3.26	.02	95.20
23	76.87	+0.4	17.90	15.97	3.59	0.02	95.02
27	77.23	0.4	17.82	15.90	3.90	.02	94.87
31	77.62	0.5	17.73	15.82	4.18	.02	94.75
AGO. 4	78.03	0.5	17.64	15.74	4.45	.03	94.65
8	78.46	0.5	17.54	15.65	4.69	.03	94.55
12	78.92	+0.5	17.44	15.56	4.91	0.03	94.46
16	79.40	0.6	17.33	15.46	5.10	.03	94.38
20	79.90	0.6	17.22	15.37	5.27	.04	94.29
24	80.41	0.6	17.11	15.27	5.41	.04	94.20
28	80.93	0.6	17.00	15.17	5.53	.04	94.11
SET. 1	81.47	+0.6	16.89	15.07	5.62	0.04	94.01
5	82.01	+0.7	16.78	14.97	5.69	0.04	93.91

EFEMÉRIDES PARA OBSERVAÇÕES FÍSICAS

0 HORA TEMPO UNIVERSAL

DATA	TEMPO LUZ	MAG.	DIÂMETRO		ANG. FASE	DEF. ILUM	ANG.POS. DEFEITO	
			EQUAT.	POLAR				
	M		"	"	G	"	G	
SET. 5	82.01	+0.7	16.78	14.97	5.69	0.04	93.91	
9	82.56	0.7	16.67	14.87	5.72	.04	93.79	
13	83.11	0.7	16.56	14.77	5.74	.04	93.67	
17	83.66	0.7	16.45	14.68	5.73	.04	93.55	
21	84.21	0.7	16.34	14.58	5.69	.04	93.41	
	25	84.76	+0.7	16.24	14.49	5.63	0.04	93.26
	29	85.30	0.7	16.13	14.40	5.55	.04	93.10
OUT. 3	85.83	0.7	16.03	14.31	5.44	.04	92.94	
7	86.35	0.8	15.94	14.22	5.31	.03	92.76	
11	86.86	0.8	15.84	14.14	5.16	.03	92.57	
	15	87.35	+0.8	15.75	14.06	4.99	0.03	92.37
	19	87.83	0.8	15.67	13.98	4.80	.03	92.15
	23	88.29	0.8	15.59	13.91	4.59	.03	91.92
	27	88.72	0.8	15.51	13.84	4.36	.02	91.68
	31	89.14	0.8	15.44	13.78	4.12	.02	91.42
NOV. 4	89.52	+0.8	15.37	13.72	3.86	0.02	91.14	
8	89.89	0.8	15.31	13.66	3.59	.02	90.84	
12	90.23	0.8	15.25	13.61	3.31	.02	90.52	
16	90.54	0.7	15.20	13.56	3.01	.02	90.15	
20	90.82	0.7	15.15	13.52	2.70	.02	89.75	
	24	91.07	+0.7	15.11	13.48	2.39	0.02	89.28
	28	91.28	0.7	15.08	13.45	2.06	.00	88.72
DEZ. 2	91.47	0.7	15.04	13.42	1.73	.00	88.03	
6	91.62	0.7	15.02	13.40	1.39	.00	87.08	
10	91.74	0.7	15.00	13.38	1.04	.00	85.65	
	14	91.82	+0.7	14.99	13.37	0.70	0.00	82.99
	18	91.87	0.7	14.98	13.37	0.35	.00	75.52
	22	91.89	0.6	14.98	13.36	0.09	.00	353.31
	26	91.87	0.7	14.98	13.37	0.37	.00	283.37
	30	91.81	0.7	14.99	13.37	0.72	.00	276.47
	34	91.72	+0.7	15.00	13.39	1.06	0.00	273.93