

Almanaque Astronômico Brasileiro

2017



AAB- 2017



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ALMANAQUE ASTRONÔMICO BRASILEIRO

2017

Dezembro - 2016

Capa: Nebulosa Carina obtida pelo associado Gleison Quintão durante o Star Party realizado em 09/04/2016 no Observatório Wykrota [859]; Telescópio RC8" GSO, Câmara Canon T3i.

I – DEFINIÇÃO

ALMANAQUE – s.m. (Do árabe. *Al-manach*.) 1. Anuário que contém informações variadas. – 2. Calendário que comporta indicações astronômicas e/ou meteorológicas.

ASTRONÔMICO - adj. (Do grego. *Astronomikos*.) 1. Relativo a astronomia: descobertas astronômicas. – 2. Figurativo. De grandes proporções; exagerado, exorbitante.

BRASILEIRO - [Do top. Brasil + -eiro.] Adj. 1. De, ou pertencente ou relativo ao Brasil. s. m. 2. O natural ou habitante do Brasil.

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III - Apresentação

Nobres amigos (as),

A busca da qualidade e pontualidade das informações são objetivos perenes e deles não abrimos mão; desta forma as mudanças que ocorrem anualmente nesta publicação refletem a necessidade observacional, sendo apontadas pelos diversos observadores com quem temos a oportunidade trocar ideias e correspondências. Isso vem demonstrando também o quanto essa é uma publicação útil e dinâmica.

Essa iniciativa que se iniciou em 2003 e que chega em 2017, terá como escopo a disseminação da Ciência Astronômica, em seu aspecto simples. Assim, continuam inseridos os fenômenos que ocorrerão na abóbada celeste, sendo que neste ano foram inseridas algumas sugestões por parte do integrantes da Turma Andrômeda que tomaram parte do projeto piloto para implantação no CEAMIG do GREC (Grupo de Reconhecimento e Estudos do Céu); que embora não sendo um curso regular de Astronomia e Astrofísica (em nível introdutório) teve toda essa semântica.

Como praxe, em seu início são vislumbrados, de forma bem eclética, os feriados para o ano de 2017. Para que isso ocorresse, constam nesta publicação inseridas datas fixas, móveis e também algumas de caráter eclesiástico e comemorativas (fixas e móveis). Reforço o pedido a todos que conheçam outras igualmente importantes e sugestivas, que nos envie com uma pequena sinopse para o CEAMIG (Centro de Estudos Astronômicos de Minas Gerais), para que possamos incluí-las nas edições que certamente ocorrerão nos próximos anos.

Os horários inseridos não levam em consideração o período de vigência do horário de verão. Assim sendo, solicito que no período de sua vigência, seja inserida a quantidade de tempo definida pelo Decreto do Horário de Verão nos horários de Brasília (Hora Legal). Geralmente, adiantam-se 60 minutos à hora oficial nos estados brasileiros citados no referido decreto (os dias de início e término estão inclusos nas páginas 11 e 19 nesta edição).

Incluíram-se também dados para as observações da Lua e Sol. Os eclipses que ocorrerão este ano foram tratados de uma maneira mais técnica (sob o ponto de vista observacional).

Para os planetas do sistema solar (incluindo também os planetas menores 1 Ceres e 134340 Plutão) são mencionados, como também apresentados os diagramas para os satélites galileanos. Buscamos também contemplar os asteroides em oposição que estejam com suas elongações favoráveis e cometas cuja magnitude esteja abaixo de 12.5. As ocorrências das chuvas de meteoros são também apresentadas.

As informações do nascer e ocaso do Sol provocados pela rotação da Terra serão válidos somente para as capitais dos estados do Brasil, onde foram utilizadas as coordenadas geográficas descritas abaixo das respectivas localidades, bem como seu respectivo fuso horário, vigente conforme legislação em vigor.

Como praxe, encontram-se para a utilização em nosso dia a dia as tabelas com fusos horários de diversas nações a qual o Brasil possui relações diplomáticas, a Tabela de conversão de pesos e medidas, Pesos e medidas brasileiras, Unidades de Medidas Legais no Brasil, Medidas de superfície mais usadas no Brasil, Alfabeto Grego; Magnitude Limite de um telescópio (texto), Resolução, Limite de Aumento e MALE para pequenos instrumentos, Símbolos utilizados em astronomia e os Símbolos e Abreviaturas utilizadas neste almanaque.

É, novamente uma oportunidade ímpar para agradecer e felicitar o amigo Gleison Quintão, que obteve a imagem da "Nebulosa Carina" realizada em 09/04/2016 no Observatório Wykrota (IAU Code 859), que foi escolhida em 23/11/2016 pelos demais associados do CEAMIG que ilustra a capa da presente edição.

Noites estreladas!

IV - Calendário 2017

Feriados

Confraternização Universal	01 janeiro	Carnaval	28 fevereiro
Domingo de Ramos	09 abril	Sexta-feira da Paixão	14 abril
Páscoa	16 abril	Tiradentes	21 abril
Dia de trabalho	01 maio	Dia de Nossa Senhora	15 agosto
Corpus Christi	15 junho	Nossa Senhora Aparecida	12 outubro
Independência do Brasil	07 setembro	Proclamação da República	15 novembro
Finados	02 novembro	Natal	25 dezembro

Calendário Gregoriano e Datas Comemorativas

Janeiro

Seg	Ter	Qua	Qui	Sex	Sab	Dom
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

01	Dia Mundial da Paz	21	Dia Mundial da Religião
03	Dia da Abreugrafia	24	Dia Nacional dos Aposentados
05	Criação da 1ª tipografia do Brasil		Dia da Instituição do Casamento Civil no Brasil
06	Dia da Gratidão	25	Dia do Carteiro
07	Dia da liberdade de cultos	27	Dia da Elevação do Brasil à Vice-Reinado (1763)
08	Dia do Fotógrafo	28	Dia da Abertura dos Portos no Brasil (1808)
09	Dia do Fico (1822)	30	Dia da Saudade
14	Dia do Enfermo		Dia da Não-Violência
20	Dia do Farmacêutico		Dia Nacional das Histórias em quadrinhos

Fevereiro

Seg	Ter	Qua	Qui	Sex	Sab	Dom
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

02	Dia do Agente Fiscal	16	Dia do Repórter
05	Dia do Datiloscopista	19	Dia do Esportista
07	Dia do Gráfico	21	Dia da Conquista de Monte Castelo (1945)
11	Dia do Zelador	23	Dia do Rotaryano
	Dia da Criação da Casa da Moeda	24	Promulgação da 1ª Constituição Republicana
13	Dia do Ministério Público	25	Dia do Ministério das Comunicações
14	Dia da Amizade	27	Dia dos Idosos

Março

Seg	Ter	Qua	Qui	Sex	Sab	Dom
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

02	Dia Nacional do Turismo	12	Dia do Bibliotecário
03	Dia do Meteorologista	14	Dia Nacional da Poesia
05	Dia do Filatelista Brasileiro		Dia dos Animais
07	Dia dos Fuzileiros Navais	15	Dia da Escola
08	Dia Internacional da Mulher	19	Dia do Carpinteiro
10	Dia do Telefone	21	Dia Universal do Teatro
		26	Dia do Cacau

Abril

Seg	Ter	Qua	Qui	Sex	Sab	Dom
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

01	Dia da Mentira	20	Dia do Diplomata
07	Dia Mundial da Saúde	21	Dia do Metalúrgico
08	Dia Mundial de Combate ao Câncer	22	Dia do Descobrimento do Brasil
10	Dia da Engenharia		Dia da Força Aérea Brasileira
12	Dia da Intendência	23	Dia do Escoteiro
13	Dia do Jovem	26	Dia do Goleiro
15	Dia do Desenhista	27	Dia do Sacerdote
18	Dia de Monteiro Lobato	28	Dia da Sogra
19	Dia do Índio	30	Dia do Ferroviário

Mai

Seg	Ter	Qua	Qui	Sex	Sab	Dom
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

02	Dia do Ex-Combatente	16	Dia do Gari
05	Dia do Pintor	21	Dia da Língua Nacional
08	Dia da Vitória	24	Dia do Vestibulando
10	Dia da Cavalaria	29	Dia do Geógrafo
13	Dia da Abolição da Escravatura	30	Dia das Bandeiras
15	Dia do Assistente Social	31	Dia do Comissário de Bordo

Junho

Seg	Ter	Qua	Qui	Sex	Sab	Dom
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

01	Dia da 1ª transmissão de TV no Brasil	18	Dia do Químico
05	Dia da Ecologia	19	Dia dos Profissionais de Marketing
07	Dia da Liberdade de Imprensa	21	Dia da Mídia
09	Dia Nacional do Pe. Anchieta	22	Dia do Empregador Gráfico
11	Dia da Marinha Brasileira	27	Dia Nacional do Progresso
12	Dia dos Namorados	28	Dia da Renovação Espiritual
13	Dia do Turista	29	Dia da Telefonista

Julho

Seg	Ter	Qua	Qui	Sex	Sab	Dom
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

01	Dia da Vacina BCG	17	Dia do Protetor de florestas
02	Dia do Hospital	19	Dia da Caridade
06	Criação do IBGE		Dia Nacional do Futebol
10	Dia da Pizza	20	Dia do Amigo e Internacional da Amizade
14	Dia da Liberdade de Pensamento	25	Dia do Motorista
15	Dia Nacional dos Clubes		Dia do Escritor
16	Dia do Comerciante	26	Dia da Vovó

Agosto

Seg	Ter	Qua	Qui	Sex	Sab	Dom
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

01	Dia Nacional do Selo	15	Dia da Informática
03	Dia do Tintureiro	22	Dia do Folclore
08	Dia dos Bandeirantes	24	Dia da Infância
11	Dia do Estudante	25	Dia do Exército Brasileiro
12	Dia Nacional das Artes	27	Dia do Corretor de Imóveis
13	Dia do Pensamento	28	Dia Nacional dos Bancários
14	Dia da Unidade Humana	31	Dia do Nutricionista

Setembro

Seg	Ter	Qua	Qui	Sex	Sab	Dom
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

03	Dia Nacional do Biólogo	20	Dia do Funcionário Público Municipal
06	Dia do Hino Nacional	21	Dia da Árvore
08	Dia Nacional da Alfabetização	22	Dia da Juventude do Brasil
09	Dia do Administrador	27	Dia do Ancião
10	Dia da Imprensa	28	Dia da Lei do Ventre Livre
13	Dia do Agrônomo	29	Dia do Petróleo
18	Dia dos Símbolos Nacionais	30	Dia da Secretária

Outubro

Seg	Ter	Qua	Qui	Sex	Sab	Dom
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

03	Dia Mundial do Dentista	15	Dia do Professor
04	Dia da Natureza	16	Dia da Ciência & Tecnologia
05	Dia das Aves	18	Dia do Médico
07	Dia do Compositor	23	Dia do Aviador e da Aviação
12	Dia do Descobrimento da América	25	Dia da Democracia
	Dia das Crianças		Dia do Sapateiro
	Dia do Mar	30	Dia do Comerciante

Novembro

Seg	Ter	Qua	Qui	Sex	Sab	Dom
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

03	Dia do Barbeiro	11	Dia do Armistício
04	Dia do Inventor	12	Dia do Supermercado
05	Dia Mundial do Radioamador	19	Dia da Bandeira
	Dia da Ciência	20	Dia Nacional da Consciência Negra
08	Dia Mundial do Urbanismo	22	Dia do Músico
09	Dia do Município	25	Dia do Doador de Sangue
10	Dia do Trigo		

Dezembro

Seg	Ter	Qua	Qui	Sex	Sab	Dom
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

01	Dia Mundial de Combate a AIDS	11	Dia do Arquiteto
02	Dia da Astronomia	13	Dia do Ótico
	Dia Nacional do Samba	16	Dia do Reservista
03	Dia Nacional do Deficiente Físico	19	Dia do Atleta Profissional
04	Dia do Orientador Profissional	20	Dia do Mecânico
09	Dia da Criança Defeituosa	23	Dia do Vizinho
10	Dia da Declaração dos Direitos Humanos	28	Dia do Salva Vidas

Calendário Juliano - 2017

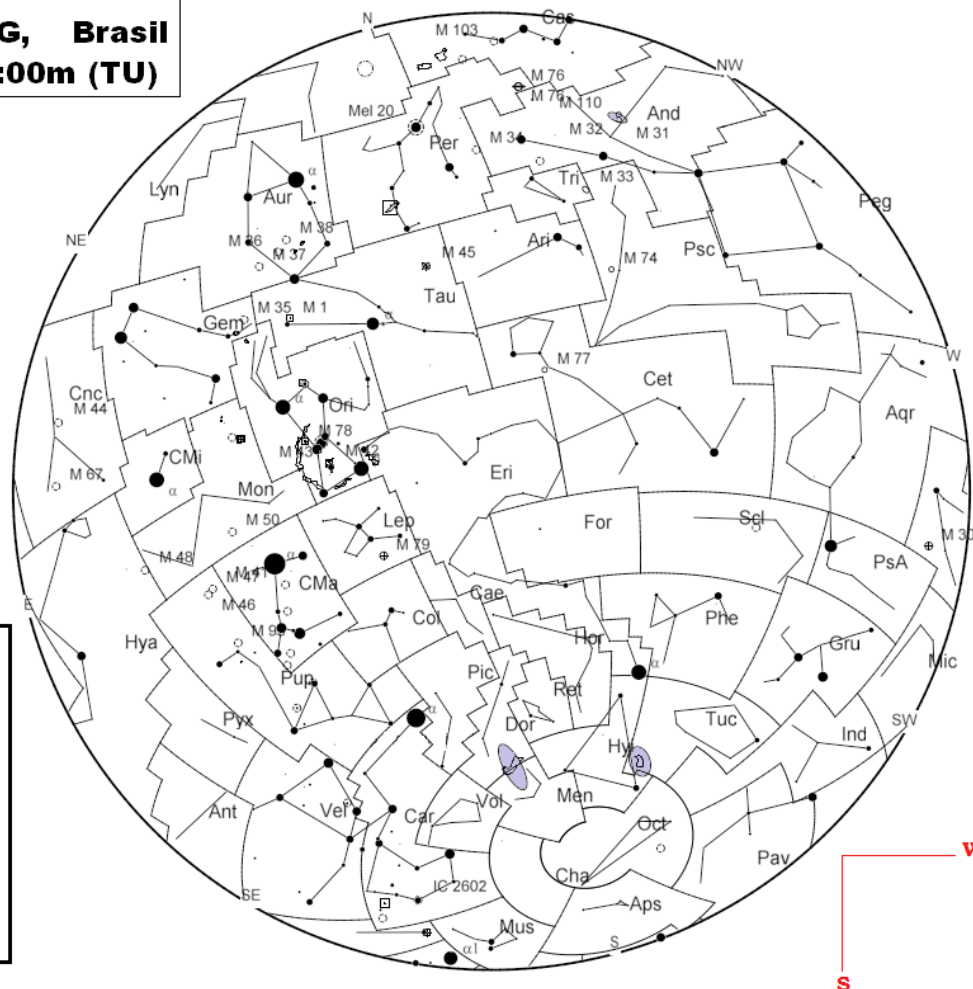
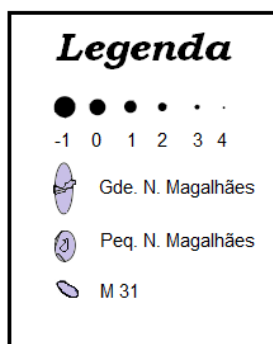
Dias Julianos (Dias Astronômicos) iniciados às 12:00 GMT, sendo numerados consecutivamente a partir de 1° de janeiro de 4713 A.C. Dia Juliano 2.457388 = 1° de janeiro de 2016.5 (GMT).

Mês / Dia	Jan	Fev	Mar	Abr	Mai	Jun
1	2457754.5	2457785.5	2457813.5	2457844.5	2457874.5	2457905.5
2	2457755.5	2457786.5	2457814.5	2457845.5	2457875.5	2457906.5
3	2457756.5	2457787.5	2457815.5	2457846.5	2457876.5	2457907.5
4	2457757.5	2457788.5	2457816.5	2457847.5	2457877.5	2457908.5
5	2457758.5	2457789.5	2457817.5	2457848.5	2457878.5	2457909.5
6	2457759.5	2457790.5	2457818.5	2457849.5	2457879.5	2457910.5
7	2457760.5	2457791.5	2457819.5	2457850.5	2457880.5	2457911.5
8	2457761.5	2457792.5	2457820.5	2457851.5	2457881.5	2457912.5
9	2457762.5	2457793.5	2457821.5	2457852.5	2457882.5	2457913.5
10	2457763.5	2457794.5	2457822.5	2457853.5	2457883.5	2457914.5
11	2457764.5	2457795.5	2457823.5	2457854.5	2457884.5	2457915.5
12	2457765.5	2457796.5	2457824.5	2457855.5	2457885.5	2457916.5
13	2457766.5	2457797.5	2457825.5	2457856.5	2457886.5	2457917.5
14	2457767.5	2457798.5	2457826.5	2457857.5	2457887.5	2457918.5
15	2457768.5	2457799.5	2457827.5	2457858.5	2457888.5	2457919.5
16	2457769.5	2457800.5	2457828.5	2457859.5	2457889.5	2457920.5
17	2457770.5	2457801.5	2457829.5	2457860.5	2457890.5	2457921.5
18	2457771.5	2457802.5	2457830.5	2457861.5	2457891.5	2457922.5
19	2457772.5	2457803.5	2457831.5	2457862.5	2457892.5	2457923.5
20	2457773.5	2457804.5	2457832.5	2457863.5	2457893.5	2457924.5
21	2457774.5	2457805.5	2457833.5	2457864.5	2457894.5	2457925.5
22	2457775.5	2457806.5	2457834.5	2457865.5	2457895.5	2457926.5
23	2457776.5	2457807.5	2457835.5	2457866.5	2457896.5	2457927.5
24	2457777.5	2457808.5	2457836.5	2457867.5	2457897.5	2457928.5
25	2457778.5	2457809.5	2457837.5	2457868.5	2457898.5	2457929.5
26	2457779.5	2457810.5	2457838.5	2457869.5	2457899.5	2457930.5
27	2457780.5	2457811.5	2457839.5	2457870.5	2457900.5	2457931.5
28	2457781.5	2457812.5	2457840.5	2457871.5	2457901.5	2457932.5
29	2457782.5		2457841.5	2457872.5	2457902.5	2457933.5
30	2457783.5		2457842.5	2457873.5	2457903.5	2457934.5
31	2457784.5		2457843.5		2457904.5	

Mês / Dia	Jul	Ago	Set	Out	Nov	Dez
1	2457935.5	2457966.5	2457997.5	2458027.5	2458058.5	2458088.5
2	2457936.5	2457967.5	2457998.5	2458028.5	2458059.5	2458089.5
3	2457937.5	2457968.5	2457999.5	2458029.5	2458060.5	2458090.5
4	2457938.5	2457969.5	2458000.5	2458030.5	2458061.5	2458091.5
5	2457939.5	2457970.5	2458001.5	2458031.5	2458062.5	2458092.5
6	2457940.5	2457971.5	2458002.5	2458032.5	2458063.5	2458093.5
7	2457941.5	2457972.5	2458003.5	2458033.5	2458064.5	2458094.5
8	2457942.5	2457973.5	2458004.5	2458034.5	2458065.5	2458095.5
9	2457943.5	2457974.5	2458005.5	2458035.5	2458066.5	2458096.5
10	2457944.5	2457975.5	2458006.5	2458036.5	2458067.5	2458097.5
11	2457945.5	2457976.5	2458007.5	2458037.5	2458068.5	2458098.5
12	2457946.5	2457977.5	2458008.5	2458038.5	2458069.5	2458099.5
13	2457947.5	2457978.5	2458009.5	2458039.5	2458070.5	2458100.5
14	2457948.5	2457979.5	2458010.5	2458040.5	2458071.5	2458101.5
15	2457949.5	2457980.5	2458011.5	2458041.5	2458072.5	2458102.5
16	2457950.5	2457981.5	2458012.5	2458042.5	2458073.5	2458103.5
17	2457951.5	2457982.5	2458013.5	2458043.5	2458074.5	2458104.5
18	2457952.5	2457983.5	2458014.5	2458044.5	2458075.5	2458105.5
19	2457953.5	2457984.5	2458015.5	2458045.5	2458076.5	2458106.5
20	2457954.5	2457985.5	2458016.5	2458046.5	2458077.5	2458107.5
21	2457955.5	2457986.5	2458017.5	2458047.5	2458078.5	2458108.5
22	2457956.5	2457987.5	2458018.5	2458048.5	2458079.5	2458109.5
23	2457957.5	2457988.5	2458019.5	2458049.5	2458080.5	2458110.5
24	2457958.5	2457989.5	2458020.5	2458050.5	2458081.5	2458111.5
25	2457959.5	2457990.5	2458021.5	2458051.5	2458082.5	2458112.5
26	2457960.5	2457991.5	2458022.5	2458052.5	2458083.5	2458113.5
27	2457961.5	2457992.5	2458023.5	2458053.5	2458084.5	2458114.5
28	2457962.5	2457993.5	2458024.5	2458054.5	2458085.5	2458115.5
29	2457963.5	2457994.5	2458025.5	2458055.5	2458086.5	2458116.5
30	2457964.5	2457995.5	2458026.5	2458056.5	2458087.5	2458117.5
31	2457965.5	2457996.5		2458057.5		2458118.5

V – Aspecto e os fenômenos do Céu – Janeiro a Dezembro

Aspecto do Céu em Belo Horizonte – MG, Brasil
15/01/2017 – 00h:00m (TU)



Janeiro 2017 00:00 (Tempo Universal)

Dia	Hora	Evento	Dia	Hora	Evento
01	06:00	Marte 0.0°N de Netuno	12	11:00	Vênus em máx. elong. (47,1° E), Mag: -4.5
02	07:00	Vênus 1.9°S da Lua	21:00	Vênus 0.4°N de Netuno	
03	04:12	Netuno 0.4°S da Lua (Ocultação)	14	13:43	Dicotomia (meia fase) de Vênus
	06:46	Marte 0.3°S da Lua (Ocultação)	15	04:31	Regulus (mag. 1.41) 0.9°N da Lua (Ocultação)
04	14:18	Terra no periélio (Dist. ao Sol = 0,98330 u.a)	19	07:00	Júpiter 2.5°S da Lua
05	19:47	Lua Crescente	09:43	Mercúrio em máx. elong. (24.1° W)	
06	04:00	Urano 3.1°N da Lua	22:14	Lua Minguante	
07	06:47	Plutão em conjunção com o Sol	22	00:15	Lua no Apogeu (Dist. da Terra = 404.911 km)
08	14:00	Mercúrio estacionário	24	10:00	Saturno 3.5°S da Lua
09	11:57	Plutão na máx. dist. da Terra (34.23065 u.a)	25	11:00	Lua em máx. declinação Sul (-18.9°)
	14:31	Aldebaran (mag. 0.99) 0.4°S da Lua (Ocult.)	26	00:00	Mercúrio 3.7°S da Lua
10	06:08	Lua no perigeu (Dist. da Terra = 363.241 km)	09:00	Plutão 2.7°S da Lua	
11	09:00	Lua em máxima declinação Norte (18.9°)	28	00:07	Lua Nova (Lunação 1164; duração = 29d 14h 5m)
12	11:34	Lua Cheia	29	19:00	Mercúrio 1.2°S de Plutão
			30	11:25	Netuno 0.2°S da Lua (Ocultação)
			31	17:00	Vênus 3.8°N da Lua

Aspecto do Céu em Belo Horizonte – MG, Brasil
15/02/2017 – 00h:00m (TU)

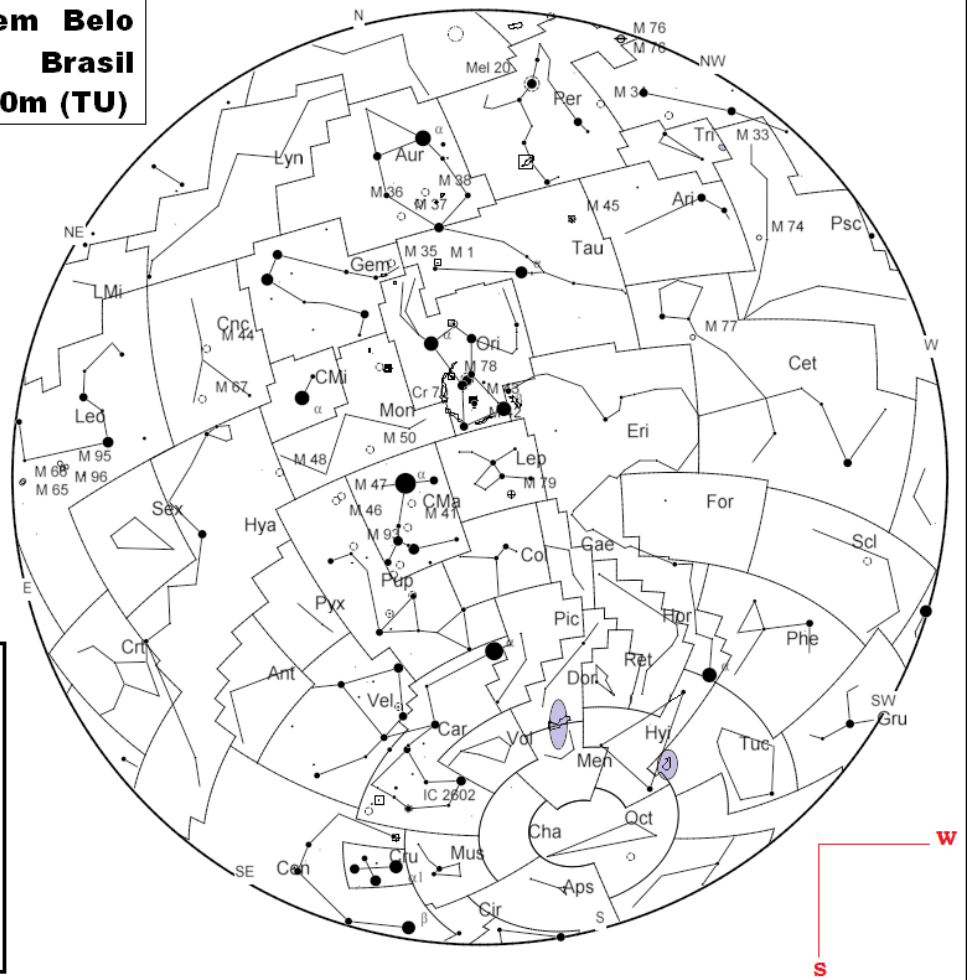
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Gde. N. Magalhães

Peq. N. Magalhães

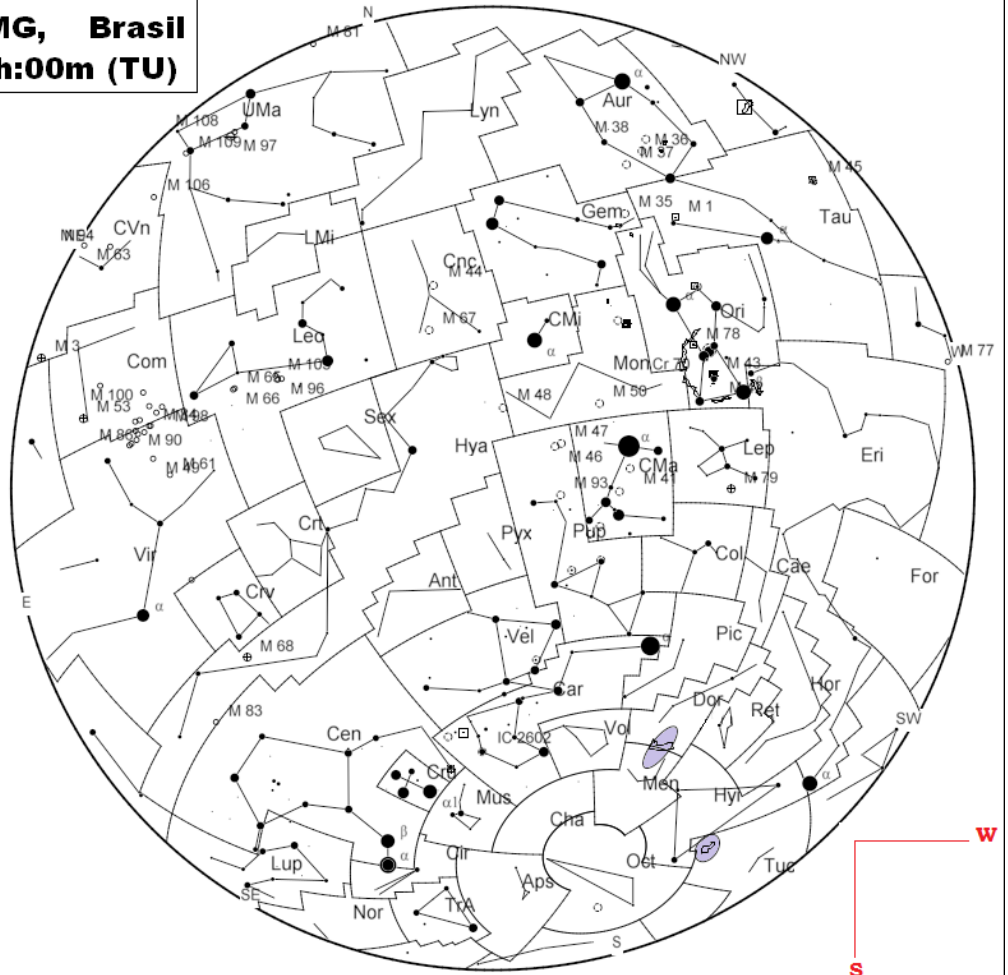
M 31



Fevereiro 2017
00:00 (Tempo Universal)

Dia	Hora	Evento	Dia	Hora	Evento
01	02:00	Marte 2.2°N da Lua	16	09:37	Júpiter no afélio (5.45652 u.a do Sol)
02	10:00	Urano 3.3°N da Lua	18	19:34	Lua Minguante
04	04:19	Lua Crescente		21:15	Lua no Apogeu (Dist. da Terra = 404.375 km)
05	21:38	Aldebaran (mag. 0.99) 0.3°S da Lua (Ocultação)	19	03:00	Término do Horário de Verão no Brasil
06	14:00	Lua no perigeu (Dist. da Terra = 368.816 km)	20	16:58	Vênus no periélio (0.71845 u.a do Sol)
	19:00	Júpiter estacionário		23:00	Saturno 3.5°S da Lua
07	14:26	Mercúrio no afélio (0.46669 u.a do Sol)	21	20:00	Lua em máxima declinação Sul (-18.9°)
	18:00	Lua em máxima declinação Norte (18.9°)	22	19:00	Plutão 2.7°S da Lua
11	00:43	Lua Cheia (Eclipse)	26	00:00	Mercúrio 2.4°S da Lua
	14:29	Regulus (mag. 1.41) 0.8°N da Lua (Ocultação)		14:59	Lua Nova (Lunação 1165; duração = 29d 11h 59m) Eclipse
15	16:00	Júpiter 2.5°S da Lua		20:59	Netuno 0.1°S da Lua (Ocultação)
			27	00:00	Marte 0.6°N de Urano

**Aspecto do Céu em Belo Horizonte - MG, Brasil
15/03/2017 - 00h:00m (TU)**



Legenda

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Gde. N. Magalhães

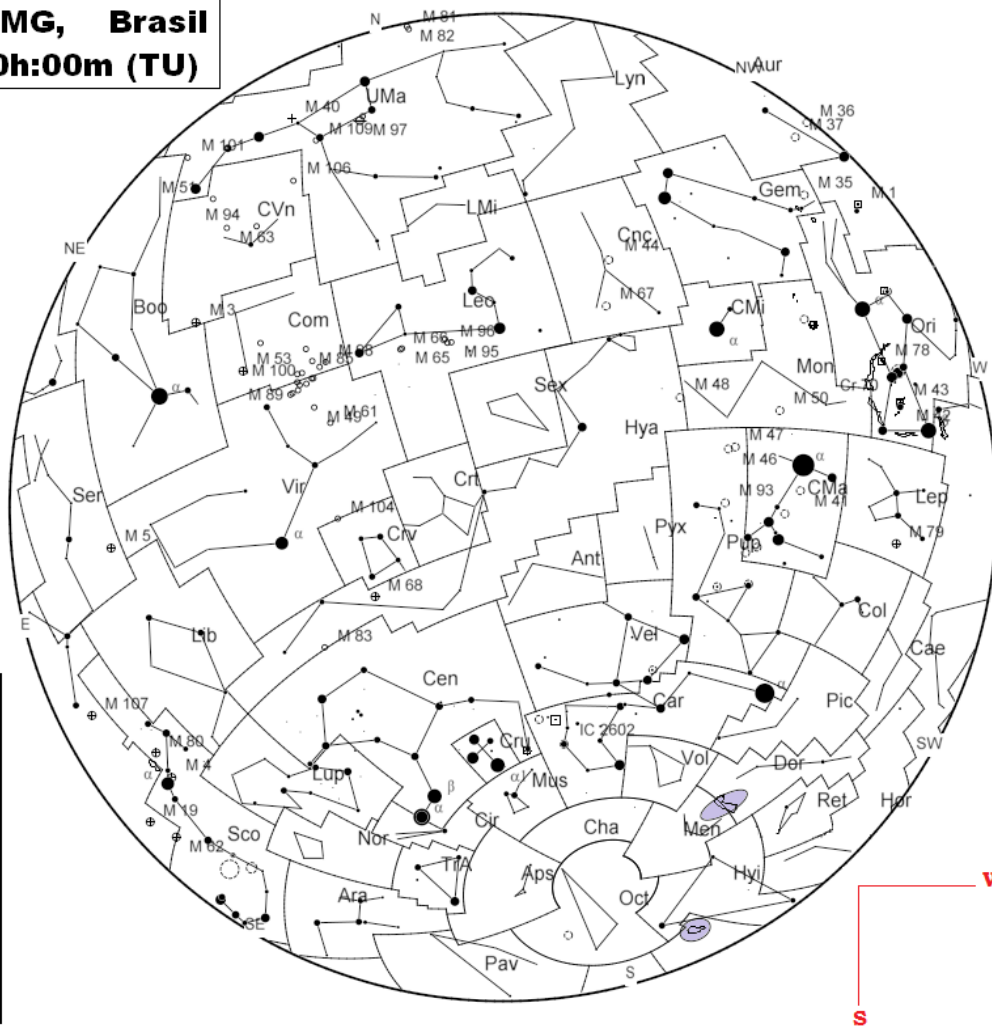
Pequ. N. Magalhães

M 31

**Março 2017
00:00 (Tempo Universal)**

Dia	Hora	Evento	Dia	Hora	Evento
01	18:00	Urano 3.4°N da Lua	18	17:26	Lua no Apogeu (Dist. da Terra = 404.650 km)
01	21:00	Marte 4.1°N da Lua	20	10:00	Saturno 3.4°S da Lua
02	02:00	Netuno em conjunção com o Sol	20	10:29	Equinócio de Março
	13:00	Vênus estacionário	21	15:59	Lua Minguante
	21:01	Netuno em Máx. Dist. da Terra	21	05:00	Lua em máxima declinação Sul (-18.9°)
03	07:25	Lua no perigeu (Dist. da Terra = 369.063 km)	22	05:00	Plutão 2.7°S da Lua
04	10:00	Mercúrio 1.0°S de Netuno	23	14:03	Mercúrio no Periélio (0.30750 u.a do Sol)
05	03:02	Aldebaran (mag. 0.99) 0.3°S da Lua (Ocultação)	25	01:59	Vênus em Max. Aprox. da Terra
05	11:33	Lua Crescente		10:00	Vênus em conjunção inferior
07	00:30	Mercúrio em conjunção superior (1.7° do Sol)	26	08:22	Netuno 0.1°N da Lua (Ocultação)
07	01:00	Lua em máxima declinação Norte (18.9°)		16:00	Mercúrio 2.1°N de Urano
09	00:00	Término da temporada de tempestade de poeira em Marte	28	02:58	Lua Nova (Lunação 1166; duração = 29d 09h 19m)
10	22:45	Regulus (mag. 1.41) 0.7°N da Lua (Ocultação)	29	05:00	Urano 3.4°N da Lua
12	14:54	Lua Cheia	30	12:40	Lua no perigeu (Dist. da Terra = 363.854 km)
14	21:00	Júpiter 2.3°S da Lua		15:00	Marte 5.2°N da Lua

**Aspecto do Céu em Belo Horizonte – MG, Brasil
15/04/2017 – 00h:00m (TU)**



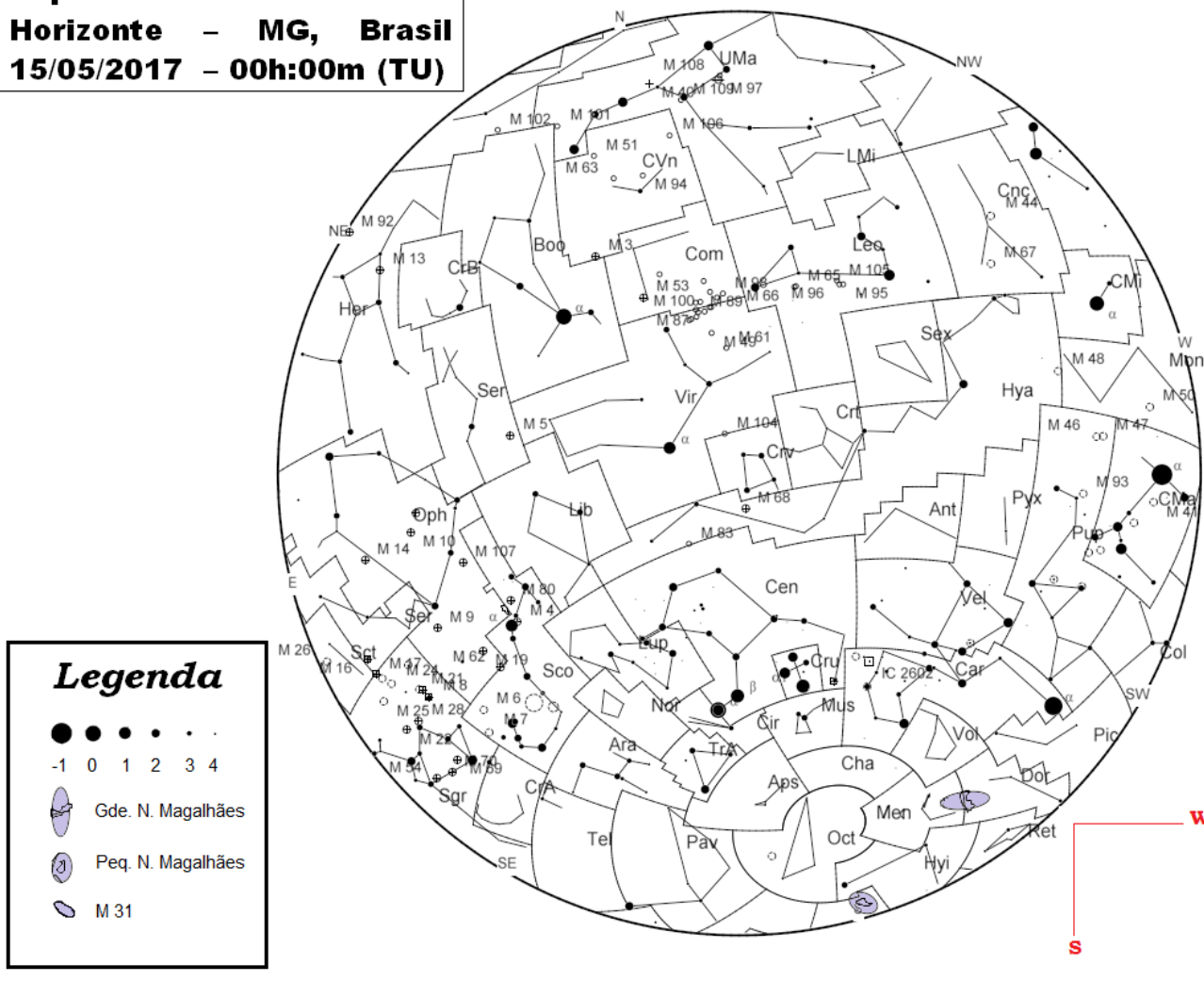
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- ☾ Gde. N. Magalhães
- ☾ Peq. N. Magalhães
- ☾ M 31

**Abril 2017
00:00 (Tempo Universal)**

Dia	Hora	Evento	Dia	Hora	Evento
01	09:12	Aldebaran (mag. 0.99) 0.4°S da Lua (Ocultação)	18	13:00	Plutão 2.6°S da Lua
	10:18	Mercúrio em máxima elong. (18.9°E)	19	09:57	Lua Minguante
03	06:00	Lua em máxima declinação Norte (19.0°)	20	09:23	Mercúrio em conjunção inferior
	18:40	Lua Crescente		20:00	Plutão estacionário
06	05:00	Saturno estacionário	22	19:49	Netuno 0.3°N da Lua (Ocultação)
07	04:55	Regulus (mag. 1.41) 0.6°N da Lua (Ocultação)	23	21:00	Vênus 5.0°N da Lua
	21:39	Júpiter em oposição	25	18:00	Urano 3.5°N da Lua
10	04:00	Mercúrio estacionário		20:00	Mercúrio 4.3°N da Lua
	22:00	Júpiter 2.1°S da Lua	26	12:16	Lua Nova (Lunação 1167; duração = 29d 07h 28m)
11	06:09	Lua Cheia	27	16:19	Lua no perigeu (Dist. da Terra = 359.323 km)
12	23:00	Vênus estacionário	28	09:00	Marte 5.6°N da Lua
14	20:30	Urano em conjunção com o Sol		17:41	Aldebaran (mag. 0.99) 0.5°S da Lua (Ocultação)
15	18:00	Lua no Apogeu (Dist. da Terra = 405.477 km)		22:00	Mercúrio 0.2°S de Urano
16	18:00	Saturno 3.2°S da Lua	30	13:00	Lua em máxima declinação Norte (19.1°)
17	13:00	Lua em máxima declinação Sul (-19.0°)			

Aspecto do Céu em Belo Horizonte – MG, Brasil
15/05/2017 – 00h:00m (TU)

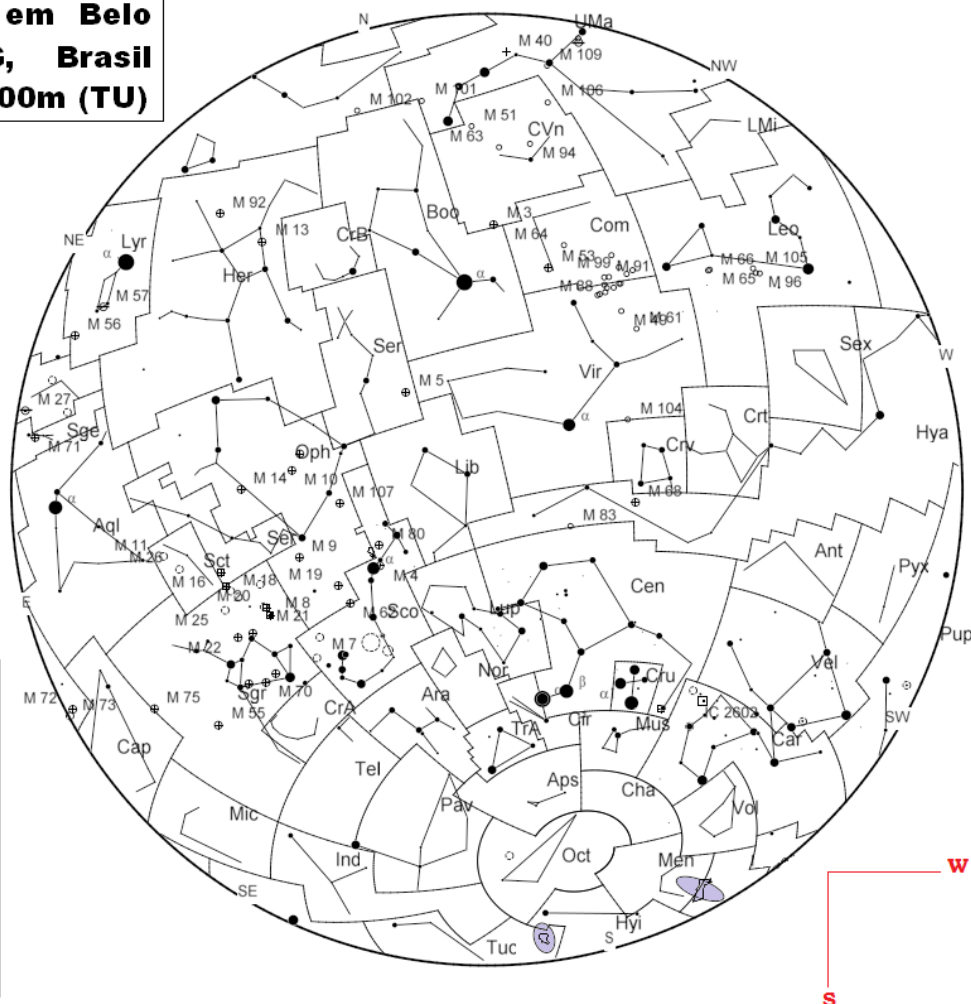


Maio 2017

00:00 (Tempo Universal)

Dia	Hora	Evento	Dia	Hora	Evento
02	14:00	Mercúrio estacionário	19	00:33	Lua Minguante
03	02:47	Lua Crescente	20	05:30	Netuno 0.5°N da Lua (Ocultação)
04	10:14	Regulus (mag. 1.41) 0.5°N da Lua (Ocultação)	22	14:00	Vênus 2.3°N da Lua
05	11:52	Início da Primavera no Hemisfério Norte de Marte	23	06:00	Urano 3.7°N da Lua
07	23:00	Júpiter 2.0°S da Lua	24	02:00	Mercúrio 1.6°N da Lua
09	23:00	Mercúrio 2.3°S de Urano	25	19:45	Lua Nova (Lunação 1168; duração = 29d 6h 46m)
10	21:43	Lua Cheia	26	01:24	Lua no perigeu (Dist. da Terra = 357.209 km)
12	19:52	Lua no Apogeu (Dist. da Terra = 406.210 km)	27	04:05	Aldebaran (mag. 0.99) 0.6°S da Lua (Ocultação)
13	22:00	Saturno 3.1°S da Lua	27	02:00	Marte 5.3°N da Lua
14	19:00	Lua em máxima declinação Sul (-19.º)	31	23:00	Lua em máxima declinação Norte (19.3º)
15	20:00	Plutão 2.4°S da Lua		16:32	Regulus (mag. 1.41) 0.3°N da Lua (Ocultação)
17	23:14	Mercúrio em máxima elongação (25.7°W)			

Aspecto do Céu em Belo Horizonte - MG, Brasil
15/06/2017 - 00h:00m (TU)



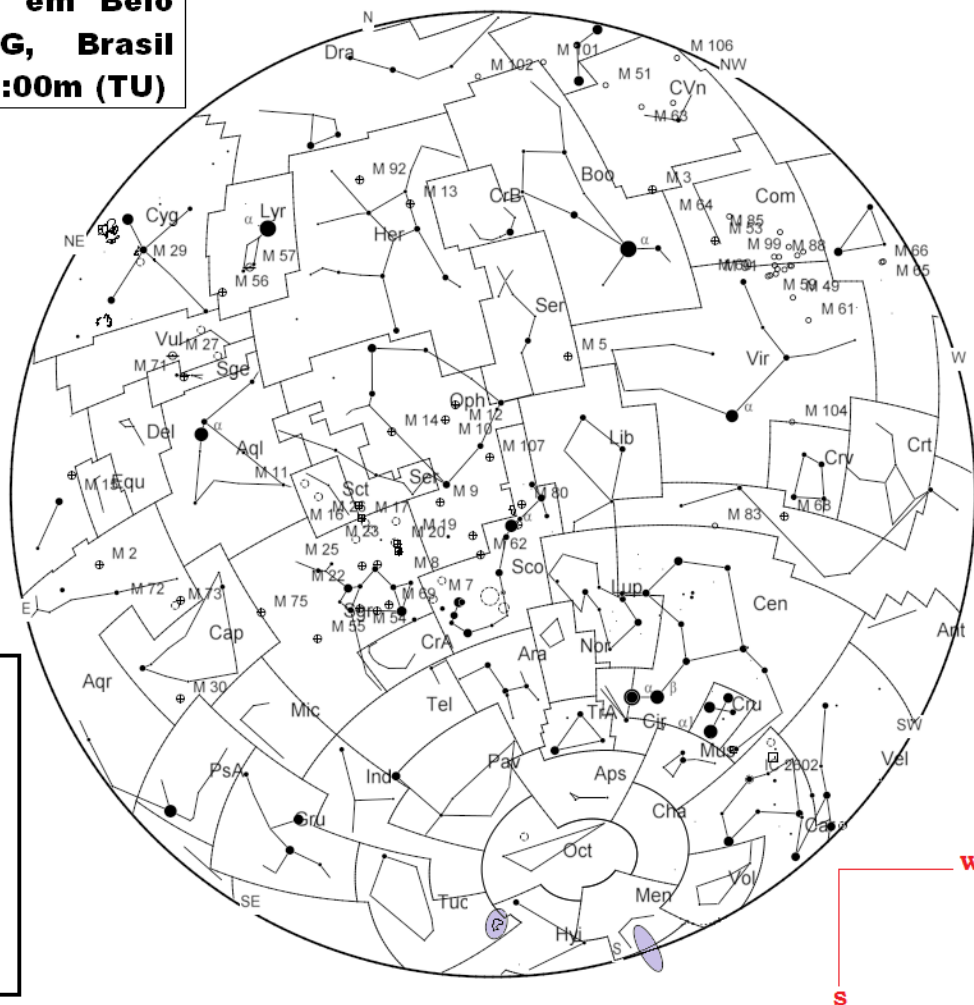
Legenda

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- 1 0 1 2 3 4
- Gde. N. Magalhães
- Peq. N. Magalhães
- M 31

Junho 2017
00:00 (Tempo Universal)

Dia	Hora	Evento	Dia	Hora	Evento
01	12:42	Lua Crescente	17	11:33	Lua Minguante
03	07:00	Vênus 1.7°S de Urano	19	17:00	Urano 3.9°N da Lua
	12:30	Vênus em máxima elong. (45.8°W)	20	22:00	Vênus 2.3°N da Lua
04	01:00	Júpiter 2.2°S da Lua	21	04:25	Solstício de Junho
08	22:22	Lua no Apogeu (Dist. da Terra = 406.401 km)	13:19	Mercúrio em conjunção superior	
09	13:10	Lua Cheia	22	14:45	Aldebaran (mag. 0.99) 0.6°S da Lua (Ocultação)
10	01:00	Saturno 3.1°S da Lua	23	10:50	Lua no perigeu (Dist. da Terra = 357.937 km)
	05:00	Júpiter estacionário	24	02:31	Lua Nova (Lunação 1169; duração = 29d 7h 15m)
11	02:00	Lua em máxima declinação Sul (-19.4°)	08:00	Mercúrio 5.2°N da Lua	
12	01:00	Mercúrio 4.9°N de Aldebaran (mag. 0.99)	10:00	Lua em máxima declinação Norte (19.4°)	
12	01:00	Plutão 2.3°S da Lua	19:00	Marte 4.4°N da Lua	
15	10:05	Saturno em oposição	28	00:49	Regulus (mag. 1.41) 0.1°N da Lua (Ocultação)
16	12:38	Netuno 0.7°N da Lua (Ocultação)	20:00	Mercúrio 0.8°N de Marte	
	23:00	Netuno estacionário			

Aspecto do Céu em Belo Horizonte – MG, Brasil
15/07/2017 – 00h:00m (TU)



Legenda

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- Gde. N. Magalhães
- Peq. N. Magalhães
- M 31

Julho 2017
00:00 (Tempo Universal)

Dia	Hora	Evento	Dia	Hora	Evento
01	00:51	Lua Crescente	17	02:00	Urano 4.1°N da Lua
01	09:00	Júpiter 2.6°S da Lua	20	00:09	Aldebaran (mag. 0.99) 0.5°S da Lua (Ocultação)
02	14:00	Mercúrio 4.8°S de Pollux (mag. 1.22)	20	11:00	Vênus 2.6°N da Lua
03	20:11	Terra no afélio (Dist. da Terra = 1.01667555414138 u.a.)	21	17:11	Lua no perigeu (Distância da Terra = 261.236 km)
06	04:28	Lua no Apogeu (Dist. da Terra = 405.932 km)	21	21:00	Lua em máxima declinação Norte (19.4°)
07	03:00	Saturno 3.2°S da Lua	23	09:46	Lua Nova (Lunação 1170; duração = 29d 8h 45m)
08	10:00	Lua em máxima declinação Sul (-19.5°)	23	11:00	Marte 3.1°N da Lua
09	04:07	Lua Cheia	25	08:48	Mercúrio 0.8°S da Lua (Ocultação)
09	06:00	Plutão 2.3°S da Lua	25	10:36	Regulus (mag. 1.41) 0.0°N da Lua (Ocultação)
10	04:37	Plutão em oposição	26	03:00	Mercúrio 1.0°S de Regulus (mag. 1.41)
10	09:00	Marte 5.6°S de Pollux (mag. 1.22)	27	00:57	Marte em conjunção com o Sol
13	17:49	Netuno 0.8°N da Lua (Ocultação)	28	22:00	Júpiter 3.0°S da Lua
14	01:00	Vênus 3.1°N de Aldebaran (mag. 0.99)	30	04:46	Mercúrio em máxima elongação Vespertina (27.2°E)
16	19:26	Lua Minguante	30	15:23	Lua Crescente

**Aspecto do Céu em Belo Horizonte - MG, Brasil
15/08/2017 - 00h:00m (TU)**

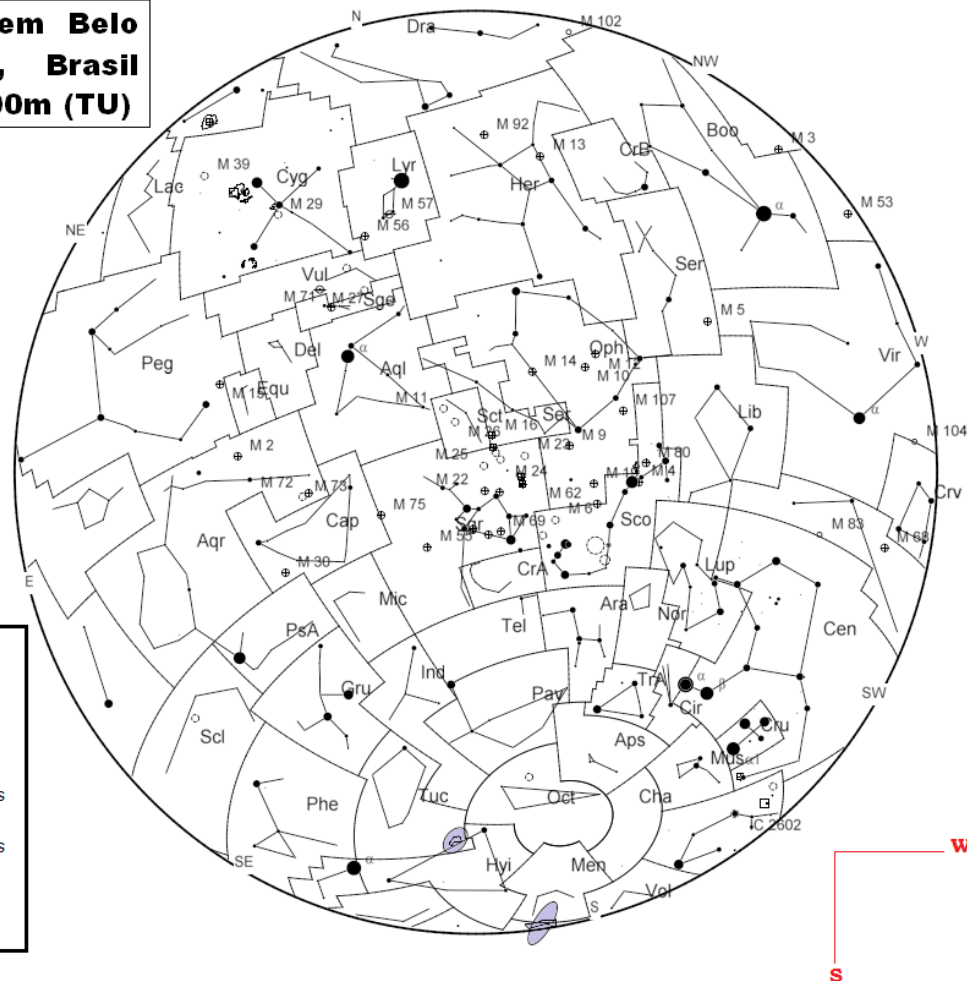
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Peq. N. Magalhães

M 31



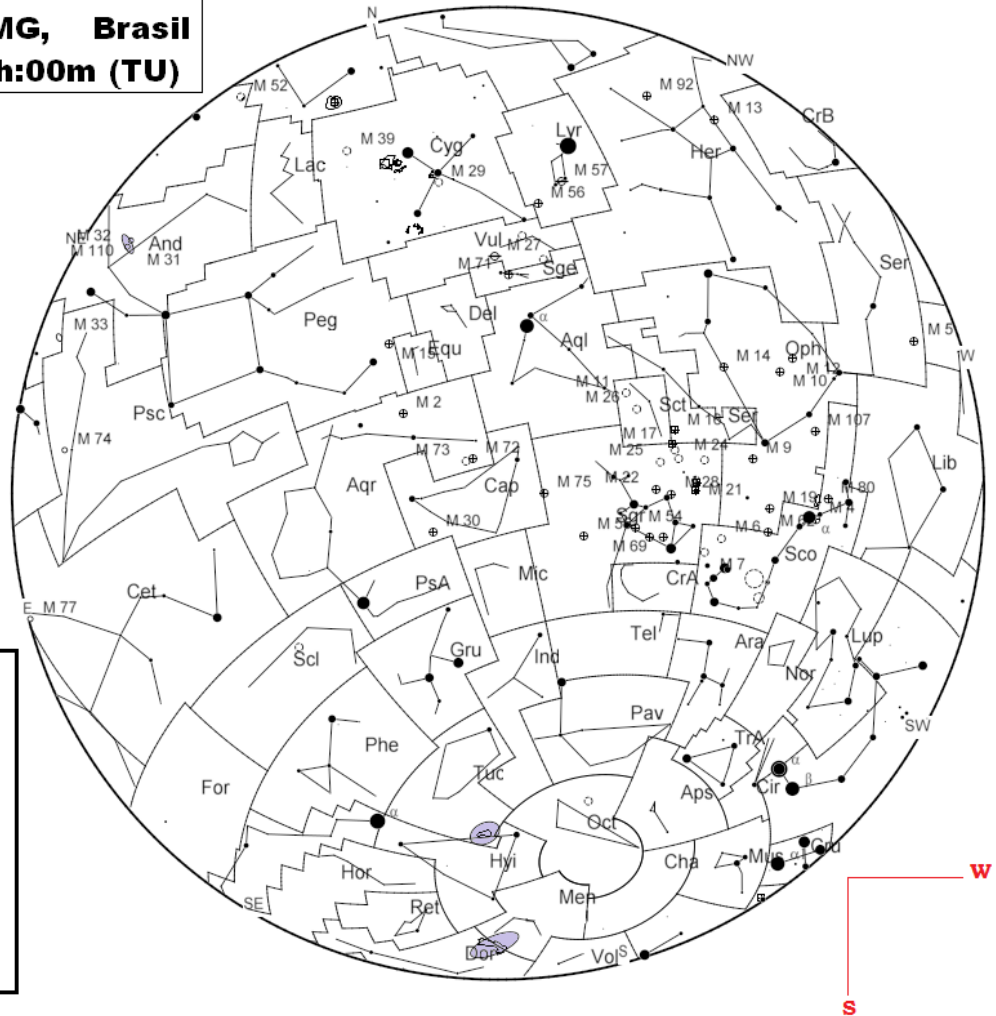
**Agosto 2017
00:00 (Tempo Universal)**

Dia	Hora	Evento	Dia	Hora	Evento
02	17:56	Lua no Apogeu (Dist. da Terra = 405.024 km)	19	04:00	Vênus 2.2°N da Lua
03	07:00	Saturno 3.4°S da Lua	21	03:00	Marte 1.5°N da Lua
	09:00	Urano estacionário	18:30		Lua Nova (Lunação 1171; duração = 29d 11h 00m) Eclipse
04	17:00	Lua em máxima declinação Sul (-19.4°)	20:29		Regulus (mag. 1.41) 0.0°N da Lua (Ocultação)
05	11:00	Plutão 2.4°S da Lua	22	09:00	Mercúrio 5.8°S da Lua
07	18:20	Lua Cheia (Eclipse)	25	14:00	Saturno estacionário
09	23:00	Netuno 0.8°N da Lua (Ocultação)	15:00		Júpiter 3.2°S da Lua
12	05:00	Mercúrio estacionário	27	01:56	Mercúrio em conjunção inferior
13	07:00	Urano 4.1°N da Lua	29	08:13	Lua Crescente
15	01:15	Lua Minguante	30	11:26	Lua no Apogeu (Dist. da Terra = 404.305 km)
16	07:03	Aldebaran (mag. 0.99) 0.4°S da Lua (Ocultação)	14:00		Saturno 3.5°S da Lua
18	06:00	Lua em máxima declinação Norte (19.4°)	31	18:00	Mercúrio 3.5°S de Regulus (mag. 1.41)
	13:16	Lua no perigeu (Dist. da Terra = 366.127 km)			

**Aspecto do Céu em Belo Horizonte - MG, Brasil
15/09/2017 - 00h:00m (TU)**

Legenda

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- Gde. N. Magalhães
- Peq. N. Magalhães
- M 31



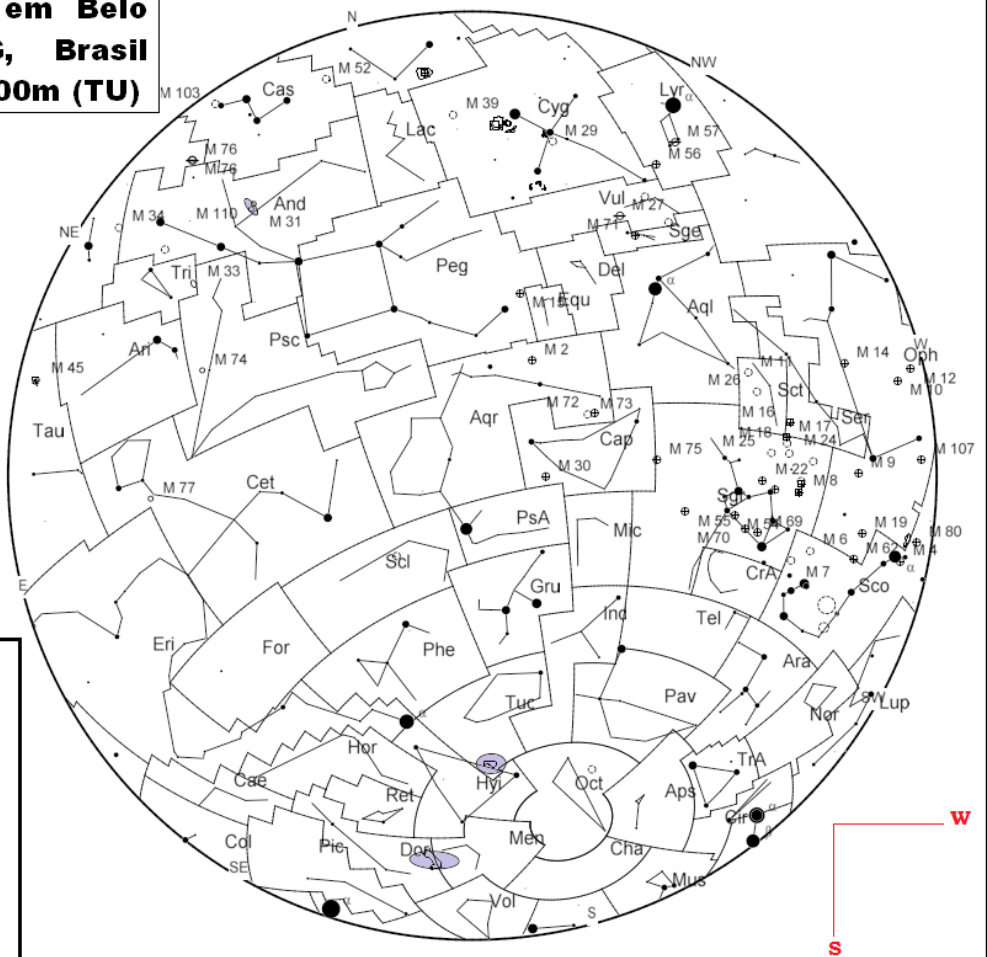
**Setembro 2017
00:00 (Tempo Universal)**

Dia	Hora	Evento	Dia	Hora	Evento
01	02:00	Lua em máxima declinação Sul (-19.4°)	16	14:00	Mercúrio 0.0°N de Marte
	18:00	Plutão 2.5°S da Lua	18	00:55	Vênus 0.5°N da Lua (Ocultação)
03	16:00	Mercúrio 3.3°S de Marte		04:56	Regulus (mag. 1.41) 0.1°S da Lua (Ocultação)
04	14:00	Mercúrio estacionário		19:42	Marte 0.1°S da Lua (Ocultação)
05	05:27	Netuno em oposição		23:21	Mercúrio 0.0°N da Lua (Ocultação)
	12:00	Marte 0.7°N de Regulus (mag. 1.41)	20	02:00	Vênus 0.5°N de Regulus (mag. 1.41)
06	04:34	Netuno 0.7°N da Lua (Ocultação)		05:30	Lua Nova (Lunação 1172; duração = 29d 13h 42m)
	07:03	Lua Cheia	22	10:00	Júpiter 3.5°S da Lua
09	12:00	Urano 4.0°N da Lua		20:02	Equinócio de setembro
10	04:00	Mercúrio 0.7°S de Regulus (mag. 1.41)	27	00:00	Saturno 3.4°S da Lua
11	23:00	Júpiter 3.1°N de Spica (mag. 1.06)		06:51	Lua no Apogeu (Dist. da Terra = 404.341 km)
12	12:34	Aldebaran (mag. 0.99) 0.5°S da Lua (Ocultação)	28	02:54	Lua Crescente
	10:17	Mercúrio em máxima elongação matutina W(18°)		08:00	Plutão estacionário
13	06:25	Lua Minguante		10:00	Lua em máxima declinação Sul (-19.5°)
	16:05	Lua no perigeu (Dist. da Terra = 369.855 km)	29	02:00	Plutão 2.4°S da Lua
14	13:00	Lua em máxima declinação Norte (19.5°)			

Aspecto do Céu em Belo Horizonte - MG, Brasil
15/10/2017 - 00h:00m (TU)

Legenda

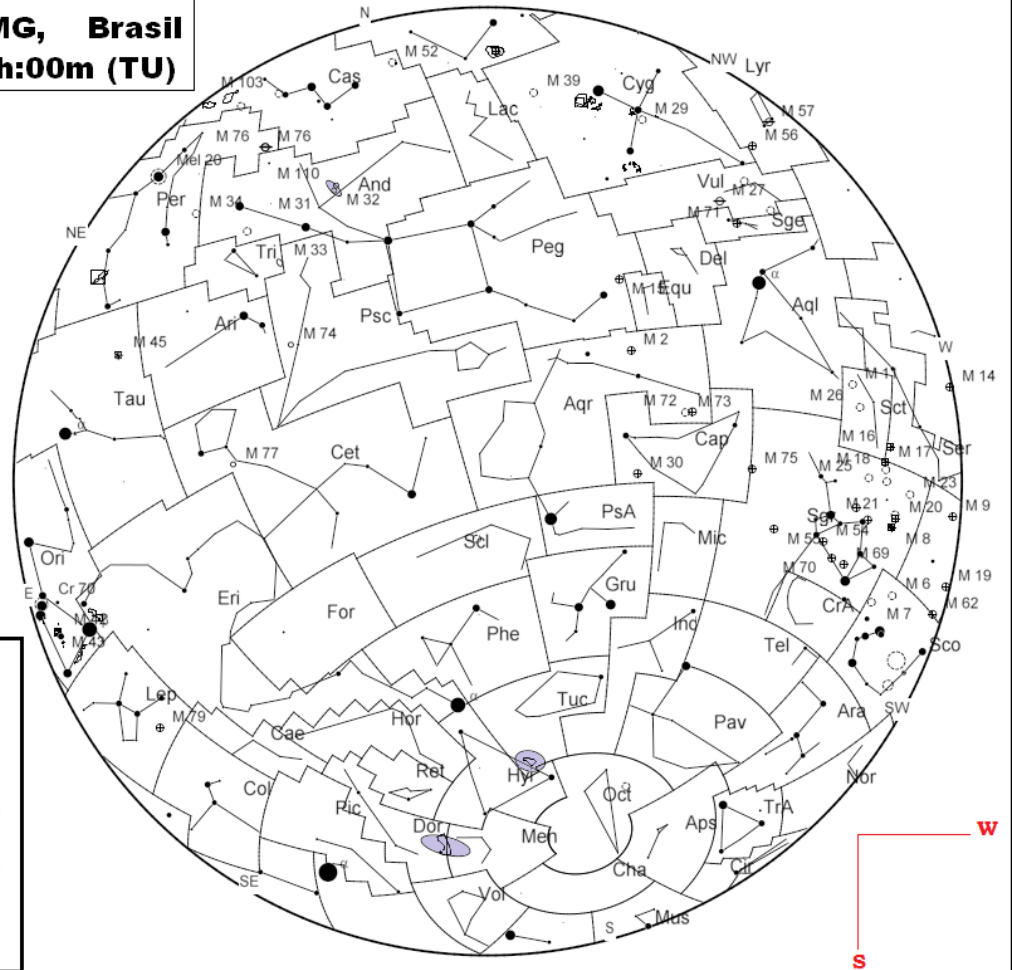
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- Gde. N. Magalhães
- Peq. N. Magalhães
- M 31



Outubro 2017
00:00 (Tempo Universal)

Dia	Hora	Evento	Dia	Hora	Evento
03	12:14	Netuno 0.7°N da Lua (Ocultação)	18	01:00	Vênus 1.9°S da Lua
05	16:00	Vênus 0.2°N de Marte	18	09:00	Mercúrio 0.9°S de Júpiter
05	18:40	Lua Cheia	19	03:51	Urano em oposição
06	18:00	Urano 4.0°N da Lua	19	19:12	Lua Nova (Lunação 1173; duração = 29d 13h 42m)
09	01:28	Mercúrio em conjunção superior	20	05:00	Júpiter 3.7°S da Lua
09	05:52	Lua no perigeu (Dist. da Terra = 366.857 km)	20	11:00	Mercúrio 4.9°S da Lua
09	18:30	Aldebaran (mag. 0.99) 0.6°S da Lua (Ocultação)	24	11:00	Saturno 3.2°S da Lua
11	18:00	Lua em máxima declinação Norte (19.6°)	25	02:26	Lua no Apogeu (Dist. da Terra = 405.150 km)
12	12:26	Lua Minguante	25	18:00	Lua em máxima declinação Sul (-19.7°)
13	18:00	Mercúrio 2.7°N de Spica (mag. 1.06)	26	10:00	Plutão 2.3°S da Lua
15	03:00	Início do Horário de Verão no Brasil	26	18:09	Júpiter em conjunção com o Sol
15	11:18	Regulus (mag. 1.41) 0.2°S da Lua (Ocultação)	27	22:22	Lua Crescente
17	11:00	Marte 1.7°S da Lua	30	20:55	Netuno 0.9°N da Lua (Ocultação)

Aspecto do Céu em Belo Horizonte - MG, Brasil
15/11/2017 - 00h:00m (TU)



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- 1 0 1 2 3 4
- Gde. N. Magalhães
- Peq. N. Magalhães
- M 31

Novembro 2017					
00:00 (Tempo Universal)					
Dia	Hora	Evento	Dia	Hora	Evento
02	18:00	Vênus 3.5°N de Spica (mag. 1.06)	18	11:42	Lua Nova (Lunação 1174; duração = 29d 18h 48m)
03	03:00	Urano 4.0°N da Lua	21	00:00	Saturno 3.0°S da Lua
04	05:23	Lua Cheia	21	18:53	Lua no Apogeu (Dist. da Terra = 406.131 km)
06	00:10	Lua no perigeu (Dist. da Terra = 261.437 km)	22	01:00	Lua em máxima declinação Sul (-19.9°)
06	02:49	Aldebaran (mag. 0.99) 0.8°S da Lua (Ocultação)	22	18:00	Plutão 2.1°S da Lua
08	01:00	Lua em máxima declinação Norte (19.8°)	22	20:00	Netuno estacionário
10	20:36	Lua Minguante	23	18:00	Mercúrio em máxima elongação E (21.9°)
11	16:32	Regulus (mag. 1.41) 0.4°S da Lua (Ocultação)	26	17:03	Lua Crescente
12	20:00	Mercúrio 2.2N de Antares (mag. 1.07) (mag. 1.07)	27	05:18	Netuno 1.1°N da Lua (Ocultação)
13	08:00	Vênus 0.3°N de Júpiter	28	10:00	Mercúrio 3.0°S de Saturno
15	03:00	Marte 3.1°S da Lua	29	23:00	Marte 3.1°N de Spica (mag. 1.06)
17	00:00	Júpiter 3.9°S da Lua	30	12:00	Urano 4.1°N da Lua
17	08:00	Vênus 3.8°S da Lua			

Aspecto do Céu em Belo Horizonte – MG, Brasil
15/12/2017 – 00h:00m (TU)

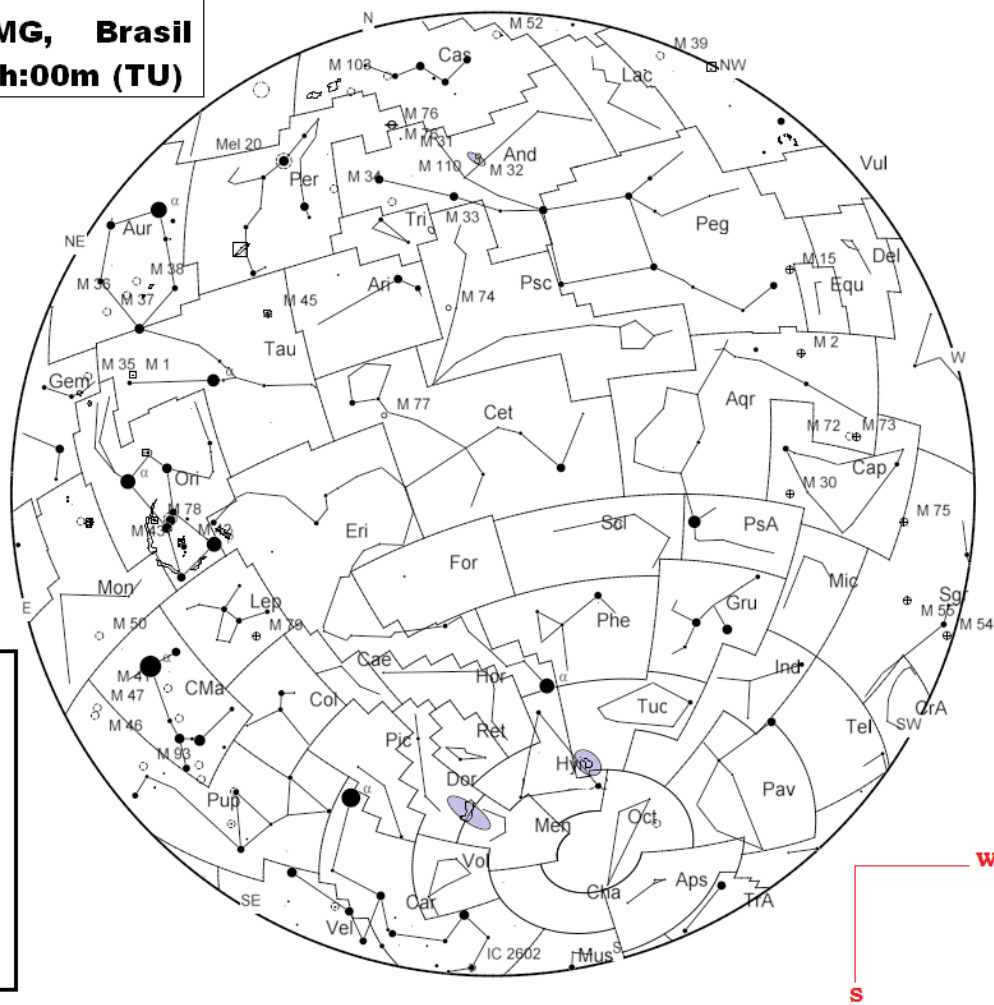
Legenda

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○ Gde. N. Magalhães

○ Peq. N. Magalhães

○ M 31



Dezembro 2017
00:00 (Tempo Universal)

Dia	Hora	Evento	Dia	Hora	Evento
03	03:00	Mercúrio estacionário	17	18:00	Vênus 4.1°S da Lua
03	13:24	Aldebaran (mag. 0.99) 0.8°S da Lua (Ocultação)	18	06:30	Lua Nova (Lunação 1175; duração = 29d 19h 47m)
03	15:47	Lua Cheia	18	13:00	Saturno 2.8°S da Lua
04	08:43	Lua no perigeu (Dist. da Terra = 357.495 km)	19	01:28	Lua no Apogeu (Dist. da Terra = 406.604 km)
05	11:00	Lua em máxima declinação Norte (19.9°)	19	08:00	Lua em máxima declinação Sul (-20.0°)
06	02:00	Mercúrio 1.4°S de Saturno	20	02:00	Plutão 1.9°S da Lua
08	22:49	Regulus (mag. 1.41) 0.6°S da Lua (Ocultação)	21	16:28	Solstício de dezembro
09	08:00	Vênus 5.0°N de Antares (mag. 1.07) (mag. 1.07)	21	21:00	Saturno em conjunção com o Sol
10	07:51	Lua Minguante	23	06:00	Mercúrio estacionário
12	23:32	Mercúrio em conjunção inferior	24	13:00	Netuno 1.3°N da Lua
13	19:00	Marte 4.0°S da Lua	25	17:00	Vênus 1.1°S de Saturno
14	16:00	Júpiter 4.1°S da Lua	26	09:20	Lua Crescente
15	15:00	Mercúrio 2.2°N de Vênus	27	20:00	Urano 4.3°N da Lua
17	09:00	Mercúrio 1.8°S da Lua	31	00:49	Aldebaran (mag. 0.99) 0.8°S da Lua (Ocultação)

VI - Efemérides da Lua

00:00 Hora – Tempo Universal

Janeiro					Fevereiro				
Dia	Elong.	Ang. PH	Fase	Mag.	Dia	Elong.	Ang. PH	Fase	Mag.
1	31.2	148.8	0.072	-6.9	1	49.0	130.9	0.173	-8.2
2	42.9	137.0	0.134	-7.8	2	61.8	118.1	0.264	-8.9
3	54.8	125.0	0.213	-8.5	3	74.6	105.2	0.369	-9.5
4	67.1	112.8	0.306	-9.1	4	87.7	92.2	0.481	-10.0
5	79.5	100.3	0.410	-9.7	5	100.8	79.1	0.595	-10.5
6	92.3	87.6	0.521	-10.2	6	114.0	65.9	0.704	-10.9
7	105.3	74.6	0.633	-10.7	7	127.3	52.6	0.803	-11.3
8	118.6	61.3	0.740	-11.1	8	140.5	39.4	0.886	-11.7
9	132.1	47.8	0.836	-11.5	9	153.7	26.2	0.948	-12.0
10	145.7	34.2	0.913	-11.8	10	166.7	13.2	0.987	-12.4
11	159.3	20.7	0.968	-12.2	11	178.9	1.1	1.000	-12.7
12	172.4	7.6	0.996	-12.5	12	167.8	12.2	0.989	-12.4
13	172.5	7.5	0.996	-12.5	13	155.5	24.4	0.955	-12.1
14	159.8	20.1	0.970	-12.2	14	143.6	36.3	0.903	-11.8
15	147.2	32.7	0.921	-11.9	15	132.1	47.8	0.836	-11.5
16	134.9	45.0	0.853	-11.5	16	120.8	59.1	0.757	-11.1
17	123.0	56.9	0.773	-11.2	17	109.7	70.1	0.670	-10.8
18	111.4	68.4	0.684	-10.9	18	98.8	81.0	0.578	-10.5
19	100.2	79.7	0.590	-10.5	19	88.0	91.9	0.484	-10.1
20	89.2	90.7	0.494	-10.1	20	77.1	102.7	0.390	-9.6
21	78.3	101.5	0.400	-9.7	21	66.2	113.6	0.299	-9.1
22	67.5	112.3	0.310	-9.2	22	55.1	124.8	0.215	-8.5
23	56.7	123.1	0.227	-8.6	23	43.7	136.2	0.139	-7.8
24	45.9	134.0	0.152	-8.0	24	32.1	147.8	0.077	-7.0
25	34.8	145.1	0.090	-7.2	25	20.1	159.8	0.031	-6.0
26	23.6	156.4	0.042	-6.3	26	7.8	172.2	0.005	-4.7
27	12.2	167.8	0.011	-5.2	27	4.9	175.1	0.002	-4.4
28	2.2	177.8	0.000	-4.1	28	17.7	162.2	0.024	-5.7
29	11.9	168.0	0.011	-5.2					
30	24.0	155.9	0.044	-6.3					
31	36.4	143.5	0.098	-7.3					

Março					Abril				
Dia	Elong.	Ang. PH	Fase	Mag.	Dia	Elong.	Ang. PH	Fase	Mag.
1	30.8	149.1	0.071	-6.9	1	53.2	126.7	0.201	-8.4
2	44.0	135.9	0.141	-7.8	2	66.7	113.2	0.303	-9.1
3	57.2	122.6	0.230	-8.6	3	79.9	100.0	0.413	-9.7
4	70.5	109.4	0.334	-9.3	4	92.9	87.0	0.526	-10.2
5	83.7	96.2	0.446	-9.9	5	105.6	74.3	0.636	-10.7
6	96.8	83.0	0.561	-10.4	6	118.1	61.8	0.736	-11.1
7	109.8	70.0	0.671	-10.8	7	130.3	49.6	0.824	-11.4
8	122.7	57.2	0.771	-11.2	8	142.3	37.6	0.896	-11.7
9	135.5	44.4	0.857	-11.6	9	154.0	25.9	0.950	-12.1
10	148.1	31.9	0.925	-11.9	10	165.4	14.6	0.984	-12.4
11	160.4	19.5	0.971	-12.2	11	175.3	4.7	0.998	-12.6
12	172.5	7.5	0.996	-12.5	12	170.6	9.4	0.993	-12.5
13	175.0	5.0	0.998	-12.6	13	159.9	20.1	0.970	-12.2
14	163.5	16.4	0.980	-12.3	14	149.1	30.9	0.929	-11.9
15	152.1	27.8	0.942	-12.0	15	138.2	41.7	0.874	-11.6
16	140.9	39.0	0.888	-11.7	16	127.4	52.4	0.805	-11.3
17	129.8	50.1	0.821	-11.4	17	116.6	63.2	0.725	-11.0
18	118.9	60.9	0.743	-11.1	18	105.7	74.1	0.637	-10.7
19	108.1	71.8	0.656	-10.8	19	94.6	85.2	0.542	-10.3
20	97.2	82.6	0.564	-10.4	20	83.3	96.5	0.443	-9.9
21	86.3	93.5	0.469	-10.0	21	71.7	108.2	0.344	-9.4
22	75.2	104.6	0.374	-9.5	22	59.7	120.2	0.249	-8.8
23	63.9	116.0	0.281	-9.0	23	47.3	132.6	0.161	-8.0
24	52.2	127.7	0.194	-8.3	24	34.4	145.5	0.088	-7.2
25	40.1	139.8	0.118	-7.6	25	21.2	158.8	0.034	-6.1
26	27.7	152.2	0.058	-6.6	26	8.3	171.7	0.005	-4.8
27	14.9	165.0	0.017	-5.5	27	8.4	171.6	0.005	-4.8
28	3.3	176.7	0.001	-4.2	28	21.6	158.3	0.035	-6.1
29	12.5	167.5	0.012	-5.2	29	35.5	144.5	0.093	-7.2
30	25.9	154.0	0.051	-6.5	30	49.2	130.7	0.174	-8.2
31	39.6	140.3	0.115	-7.5					

Maio					Junho				
Dia	Elong.	Ang. PH	Fase	Mag.	Dia	Elong.	Ang. PH	Fase	Mag.
1	62.7	117.2	0.272	-8.9	1	83.6	96.3	0.445	-9.9
2	75.8	104.1	0.379	-9.6	2	95.6	84.2	0.550	-10.3
3	88.6	91.3	0.489	-10.1	3	107.3	72.5	0.650	-10.7
4	100.9	78.9	0.596	-10.5	4	118.7	61.1	0.741	-11.1
5	113.0	66.9	0.696	-10.9	5	129.9	50.0	0.822	-11.4
6	124.7	55.1	0.786	-11.3	6	140.9	39.0	0.889	-11.7
7	136.2	43.7	0.862	-11.6	7	151.7	28.2	0.941	-12.0
8	147.5	32.4	0.922	-11.9	8	162.4	17.6	0.977	-12.3
9	158.5	21.4	0.965	-12.2	9	172.3	7.7	0.996	-12.5
10	169.0	11.0	0.991	-12.4	10	173.4	6.6	0.997	-12.6
11	174.9	5.0	0.998	-12.6	11	163.7	16.3	0.980	-12.3
12	167.0	13.0	0.987	-12.4	12	153.0	27.0	0.946	-12.0
13	156.6	23.3	0.959	-12.1	13	142.0	37.9	0.894	-11.7
14	145.9	34.0	0.915	-11.8	14	130.8	49.1	0.828	-11.4
15	135.1	44.8	0.855	-11.5	15	119.5	60.4	0.747	-11.1
16	124.2	55.7	0.782	-11.2	16	107.8	72.0	0.654	-10.7
17	113.1	66.7	0.698	-10.9	17	95.9	84.0	0.552	-10.3
18	101.8	78.0	0.604	-10.6	18	83.6	96.3	0.445	-9.9
19	90.3	89.6	0.504	-10.1	19	70.8	109.0	0.337	-9.3
20	78.3	101.5	0.400	-9.7	20	57.7	122.2	0.234	-8.7
21	65.9	113.9	0.297	-9.1	21	44.2	135.7	0.142	-7.8
22	53.1	126.7	0.201	-8.4	22	30.4	149.6	0.069	-6.8
23	39.9	140.0	0.117	-7.5	23	16.5	163.5	0.021	-5.6
24	26.3	153.6	0.052	-6.5	24	4.4	175.6	0.001	-4.4
25	12.8	167.2	0.012	-5.3	25	13.1	166.9	0.013	-5.3
26	5.6	174.4	0.002	-4.5	26	26.6	153.3	0.053	-6.5
27	17.5	162.5	0.023	-5.7	27	40.1	139.8	0.118	-7.6
28	31.2	148.7	0.073	-6.9	28	53.1	126.8	0.201	-8.4
29	44.9	135.0	0.146	-7.9	29	65.7	114.2	0.295	-9.1
30	58.2	121.7	0.238	-8.7	30	77.8	102.0	0.396	-9.6
31	71.1	108.7	0.339	-9.3					

Julho					Agosto				
Dia	Elong.	Ang. PH	Fase	Mag.	Dia	Elong.	Ang. PH	Fase	Mag.
1	89.6	90.3	0.498	-10.1	1	105.0	74.8	0.631	-10.7
2	101.0	78.8	0.597	-10.5	2	115.9	63.9	0.720	-11.0
3	112.2	67.7	0.690	-10.9	3	126.8	53.1	0.800	-11.3
4	123.2	56.7	0.775	-11.2	4	137.7	42.2	0.870	-11.6
5	134.1	45.8	0.848	-11.5	5	148.7	31.2	0.928	-11.9
6	144.9	35.0	0.909	-11.8	6	159.9	20.1	0.970	-12.2
7	155.7	24.2	0.956	-12.1	7	171.2	8.8	0.994	-12.5
8	166.5	13.5	0.986	-12.4	8	177.1	2.9	0.999	-12.7
9	176.2	3.8	0.999	-12.6	9	165.5	14.5	0.984	-12.4
10	170.5	9.5	0.993	-12.5	10	153.5	26.4	0.948	-12.0
11	159.5	20.5	0.968	-12.2	11	141.4	38.5	0.891	-11.7
12	148.1	31.8	0.925	-11.9	12	129.0	50.9	0.816	-11.4
13	136.5	43.4	0.863	-11.6	13	116.4	63.4	0.724	-11.0
14	124.7	55.2	0.785	-11.3	14	103.7	76.2	0.619	-10.6
15	112.6	67.3	0.693	-10.9	15	90.7	89.2	0.507	-10.2
16	100.2	79.6	0.590	-10.5	16	77.5	102.4	0.393	-9.6
17	87.6	92.3	0.480	-10.0	17	64.1	115.7	0.283	-9.0
18	74.5	105.3	0.368	-9.5	18	50.7	129.2	0.184	-8.3
19	61.2	118.7	0.260	-8.8	19	37.1	142.8	0.102	-7.4
20	47.6	132.3	0.163	-8.1	20	23.6	156.4	0.042	-6.3
21	33.8	146.2	0.085	-7.1	21	10.2	169.8	0.008	-5.0
22	19.9	160.1	0.030	-5.9	22	3.1	176.9	0.001	-4.2
23	6.2	173.8	0.003	-4.5	23	16.0	164.0	0.019	-5.6
24	8.2	171.7	0.005	-4.8	24	28.5	151.4	0.061	-6.7
25	21.6	158.4	0.035	-6.1	25	40.7	139.2	0.122	-7.6
26	34.6	145.3	0.089	-7.2	26	52.5	127.3	0.197	-8.4
27	47.3	132.6	0.161	-8.0	27	64.0	115.8	0.282	-9.0
28	59.5	120.4	0.247	-8.8	28	75.2	104.6	0.374	-9.5
29	71.3	108.5	0.341	-9.3	29	86.3	93.6	0.469	-10.0
30	82.8	97.1	0.439	-9.8	30	97.2	82.7	0.564	-10.4
31	94.0	85.8	0.536	-10.3	31	108.0	71.8	0.656	-10.8

Setembro					Outubro				
Dia	Elong.	Ang. PH	Fase	Mag.	Dia	Elong.	Ang. PH	Fase	Mag.
1	119.0	60.9	0.743	-11.1	1	121.8	58.0	0.765	-11.2
2	130.0	49.9	0.822	-11.4	2	133.3	46.5	0.844	-11.5
3	141.3	38.6	0.891	-11.7	3	145.2	34.7	0.911	-11.8
4	152.7	27.2	0.945	-12.0	4	157.3	22.7	0.961	-12.1
5	164.4	15.5	0.982	-12.3	5	169.5	10.5	0.992	-12.5
6	176.2	3.8	0.999	-12.6	6	175.0	5.0	0.998	-12.6
7	170.9	9.0	0.994	-12.5	7	163.2	16.7	0.979	-12.3
8	158.5	21.5	0.965	-12.2	8	150.1	29.9	0.934	-12.0
9	145.7	34.2	0.914	-11.8	9	136.7	43.2	0.864	-11.6
10	132.8	47.1	0.841	-11.5	10	123.3	56.6	0.775	-11.2
11	119.8	60.1	0.749	-11.1	11	110.0	69.9	0.672	-10.8
12	106.7	73.2	0.645	-10.7	12	96.8	83.1	0.560	-10.4
13	93.5	86.3	0.532	-10.3	13	83.7	96.1	0.447	-9.9
14	80.3	99.5	0.417	-9.7	14	70.9	109.0	0.337	-9.3
15	67.2	112.7	0.307	-9.2	15	58.2	121.7	0.237	-8.7
16	54.0	125.9	0.207	-8.4	16	45.7	134.2	0.152	-7.9
17	41.0	138.9	0.123	-7.6	17	33.5	146.4	0.083	-7.1
18	28.1	151.9	0.059	-6.7	18	21.6	158.4	0.035	-6.1
19	15.4	164.6	0.018	-5.5	19	10.2	169.7	0.008	-5.0
20	3.9	176.1	0.001	-4.3	20	5.2	174.8	0.002	-4.5
21	10.1	169.9	0.008	-5.0	21	14.7	165.3	0.016	-5.4
22	21.9	158.1	0.036	-6.1	22	25.6	154.3	0.049	-6.5
23	33.5	146.4	0.083	-7.1	23	36.6	143.3	0.099	-7.3
24	44.9	135.0	0.146	-7.9	24	47.4	132.4	0.163	-8.1
25	56.0	123.9	0.221	-8.6	25	58.2	121.6	0.238	-8.7
26	67.0	112.9	0.306	-9.1	26	69.0	110.9	0.322	-9.2
27	77.9	102.0	0.396	-9.6	27	79.8	100.0	0.413	-9.7
28	88.7	91.1	0.490	-10.1	28	90.8	89.1	0.508	-10.2
29	99.6	80.3	0.585	-10.5	29	101.9	77.9	0.605	-10.6
30	110.6	69.2	0.677	-10.8	30	113.4	66.5	0.699	-10.9
					31	125.2	54.7	0.789	-11.3

Novembro					Dezembro				
Dia	Elong.	Ang. PH	Fase	Mag.	Dia	Elong.	Ang. PH	Fase	Mag.
1	137.4	42.5	0.869	-11.6	1	142.8	37.1	0.899	-11.8
2	150.0	30.0	0.933	-11.9	2	156.2	23.8	0.958	-12.1
3	162.8	17.2	0.978	-12.3	3	169.5	10.5	0.992	-12.5
4	174.2	5.8	0.997	-12.6	4	173.4	6.6	0.997	-12.6
5	168.2	11.8	0.989	-12.4	5	160.6	19.4	0.972	-12.2
6	154.9	25.1	0.953	-12.1	6	146.7	33.2	0.918	-11.9
7	141.2	38.7	0.890	-11.7	7	133.0	46.9	0.841	-11.5
8	127.6	52.3	0.806	-11.3	8	119.6	60.3	0.748	-11.1
9	114.1	65.7	0.706	-10.9	9	106.6	73.3	0.644	-10.7
10	101.0	78.8	0.597	-10.5	10	94.0	85.8	0.536	-10.3
11	88.2	91.7	0.486	-10.1	11	81.8	98.0	0.430	-9.8
12	75.7	104.2	0.378	-9.6	12	70.0	109.8	0.330	-9.3
13	63.5	116.4	0.278	-9.0	13	58.5	121.4	0.240	-8.7
14	51.6	128.3	0.190	-8.3	14	47.2	132.7	0.161	-8.0
15	39.9	140.0	0.117	-7.5	15	36.1	143.8	0.097	-7.3
16	28.5	151.5	0.061	-6.7	16	25.2	154.7	0.048	-6.4
17	17.4	162.6	0.023	-5.7	17	14.5	165.4	0.016	-5.4
18	7.4	172.6	0.004	-4.7	18	5.0	175.0	0.002	-4.4
19	7.5	172.5	0.004	-4.7	19	8.6	171.4	0.006	-4.8
20	17.3	162.7	0.023	-5.7	20	18.8	161.1	0.027	-5.8
21	27.8	152.1	0.058	-6.6	21	29.5	150.4	0.065	-6.8
22	38.5	141.4	0.109	-7.5	22	40.3	139.6	0.119	-7.6
23	49.2	130.7	0.174	-8.2	23	51.3	128.6	0.188	-8.3
24	60.0	119.9	0.251	-8.8	24	62.4	117.5	0.269	-8.9
25	70.9	109.0	0.337	-9.3	25	73.7	106.1	0.361	-9.5
26	82.0	97.9	0.431	-9.8	26	85.4	94.5	0.461	-10.0
27	93.3	86.5	0.530	-10.3	27	97.4	82.5	0.566	-10.4
28	105.0	74.8	0.631	-10.7	28	109.8	70.0	0.671	-10.8
29	117.2	62.7	0.729	-11.0	29	122.7	57.2	0.771	-11.2
30	129.7	50.1	0.820	-11.4	30	136.1	43.8	0.861	-11.6
					31	149.8	30.1	0.933	-11.9

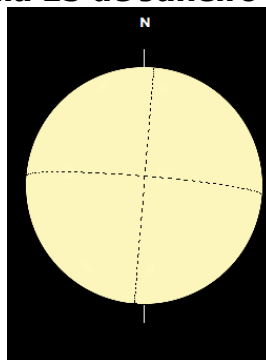
VII - Efemérides do Sol

00:00 Hora – Tempo Universal

Janeiro

Dia	$\alpha(J2000.0)$	$\delta(J2000.0)$	\varnothing "	DT (ua)*	P.H	Po°	Bo°	Lo°	NRC
1	18h 45m 45.63s	-23° 01' 04.5"	1951.78	0.9833379	8.94"	1.96	-3.04	123.76	2185
2	18h 50m 10.49s	-22° 56' 01.5"	1951.81	0.9833245	8.94"	1.48	-3.15	110.59	2185
3	18h 54m 34.99s	-22° 50' 31.0"	1951.83	0.9833152	8.94"	0.99	-3.27	97.42	2185
4	18h 58m 59.11s	-22° 44' 33.2"	1951.84	0.9833103	8.94"	0.51	-3.38	84.25	2185
5	19h 03m 22.80s	-22° 38' 08.4"	1951.84	0.9833098	8.94"	0.02	-3.50	71.08	2185
6	19h 07m 46.04s	-22° 31' 16.7"	1951.83	0.9833142	8.94"	-0.46	-3.61	57.91	2185
7	19h 12m 08.80s	-22° 23' 58.3"	1951.81	0.9833238	8.94"	-0.94	-3.72	44.74	2185
8	19h 16m 31.06s	-22° 16' 13.4"	1951.78	0.9833388	8.94"	-1.42	-3.83	31.57	2185
9	19h 20m 52.80s	-22° 08' 02.3"	1951.74	0.9833597	8.94"	-1.90	-3.94	18.40	2185
10	19h 25m 13.98s	-21° 59' 25.2"	1951.68	0.9833866	8.94"	-2.38	-4.05	5.23	2185
11	19h 29m 34.59s	-21° 50' 22.4"	1951.62	0.9834200	8.94"	-2.86	-4.15	352.07	2186
12	19h 33m 54.61s	-21° 40' 54.1"	1951.54	0.9834598	8.94"	-3.33	-4.26	338.90	2186
13	19h 38m 14.03s	-21° 31' 00.6"	1951.45	0.9835063	8.94"	-3.81	-4.36	325.73	2186
14	19h 42m 32.81s	-21° 20' 42.1"	1951.34	0.9835592	8.94"	-4.28	-4.46	312.56	2186
15	19h 46m 50.95s	-21° 09' 59.0"	1951.22	0.9836186	8.94"	-4.75	-4.56	299.39	2186
16	19h 51m 08.44s	-20° 58' 51.5"	1951.09	0.9836842	8.94"	-5.22	-4.66	286.23	2186
17	19h 55m 25.26s	-20° 47' 20.0"	1950.95	0.9837557	8.94"	-5.68	-4.76	273.06	2186
18	19h 59m 41.39s	-20° 35' 24.7"	1950.80	0.9838329	8.94"	-6.14	-4.86	259.89	2186
19	20h 03m 56.82s	-20° 23' 05.9"	1950.64	0.9839154	8.94"	-6.60	-4.95	246.73	2186
20	20h 08m 11.55s	-20° 10' 24.1"	1950.46	0.9840031	8.94"	-7.05	-5.05	233.56	2186
21	20h 12m 25.55s	-19° 57' 19.5"	1950.28	0.9840957	8.94"	-7.51	-5.14	220.39	2186
22	20h 16m 38.81s	-19° 43' 52.5"	1950.09	0.9841928	8.94"	-7.96	-5.23	207.22	2186
23	20h 20m 51.33s	-19° 30' 03.4"	1949.88	0.9842943	8.93"	-8.40	-5.32	194.06	2186
24	20h 25m 03.08s	-19° 15' 52.7"	1949.68	0.9844000	8.93"	-8.84	-5.40	180.89	2186
25	20h 29m 14.07s	-19° 01' 20.7"	1949.46	0.9845095	8.93"	-9.28	-5.49	167.73	2186
26	20h 33m 24.27s	-18° 46' 27.8"	1949.23	0.9846226	8.93"	-9.72	-5.57	154.56	2186
27	20h 37m 33.68s	-18° 31' 14.3"	1949.00	0.9847393	8.93"	-10.15	-5.65	141.39	2186
28	20h 41m 42.29s	-18° 15' 40.7"	1948.77	0.9848594	8.93"	-10.57	-5.73	128.23	2186
29	20h 45m 50.08s	-17° 59' 47.4"	1948.52	0.9849827	8.93"	-10.99	-5.81	115.06	2186
30	20h 49m 57.05s	-17° 43' 34.7"	1948.27	0.9851092	8.93"	-11.41	-5.89	101.89	2186
31	20h 54m 03.20s	-17° 27' 03.1"	1948.01	0.9852390	8.93"	-11.83	-5.96	88.73	2186

Aspecto do disco solar no dia 15 de Janeiro às 12:00 – Tempo Universal



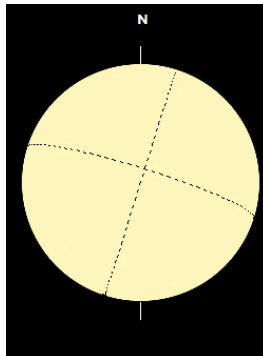
Efemérides do Sol

00:00 Hora – Tempo Universal

Fevereiro

Dia	α (J2000.0)	δ (J2000.0)	\varnothing "	DT (ua)*	P.H	Po°	Bo°	Lo°	NRC
1	20h 58m 08.51s	-17° 10' 12.9"	1947.75	0.9853722	8.92"	-12.24	-6.03	75.56	2186
2	21h 02m 12.99s	-16° 53' 04.6"	1947.48	0.9855088	8.92"	-12.64	-6.10	62.40	2186
3	21h 06m 16.64s	-16° 35' 38.6"	1947.20	0.9856491	8.92"	-13.04	-6.17	49.23	2186
4	21h 10m 19.45s	-16° 17' 55.4"	1946.92	0.9857933	8.92"	-13.43	-6.24	36.06	2186
5	21h 14m 21.44s	-15° 59' 55.2"	1946.63	0.9859418	8.92"	-13.82	-6.30	22.90	2186
6	21h 18m 22.59s	-15° 41' 38.6"	1946.32	0.9860948	8.92"	-14.21	-6.37	9.73	2186
7	21h 22m 22.93s	-15° 23' 05.9"	1946.01	0.9862527	8.92"	-14.59	-6.43	356.56	2187
8	21h 26m 22.45s	-15° 04' 17.6"	1945.69	0.9864155	8.92"	-14.97	-6.48	343.40	2187
9	21h 30m 21.16s	-14° 45' 14.0"	1945.36	0.9865837	8.91"	-15.34	-6.54	330.23	2187
10	21h 34m 19.08s	-14° 25' 55.7"	1945.02	0.9867572	8.91"	-15.70	-6.60	317.06	2187
11	21h 38m 16.21s	-14° 06' 23.0"	1944.66	0.9869362	8.91"	-16.06	-6.65	303.90	2187
12	21h 42m 12.58s	-13° 46' 36.2"	1944.30	0.9871205	8.91"	-16.41	-6.70	290.73	2187
13	21h 46m 08.18s	-13° 26' 35.8"	1943.93	0.9873101	8.91"	-16.76	-6.75	277.56	2187
14	21h 50m 03.05s	-13° 06' 22.3"	1943.55	0.9875047	8.91"	-17.11	-6.79	264.39	2187
15	21h 53m 57.18s	-12° 45' 55.8"	1943.15	0.9877041	8.90"	-17.44	-6.84	251.23	2187
16	21h 57m 50.61s	-12° 25' 17.0"	1942.75	0.9879081	8.90"	-17.77	-6.88	238.06	2187
17	22h 01m 43.34s	-12° 04' 26.2"	1942.34	0.9881163	8.90"	-18.10	-6.92	224.89	2187
18	22h 05m 35.38s	-11° 43' 23.7"	1941.93	0.9883285	8.90"	-18.42	-6.95	211.72	2187
19	22h 09m 26.75s	-11° 22' 10.1"	1941.50	0.9885444	8.90"	-18.74	-6.99	198.55	2187
20	22h 13m 17.47s	-11° 00' 45.7"	1941.07	0.9887637	8.89"	-19.05	-7.02	185.38	2187
21	22h 17m 07.55s	-10° 39' 10.9"	1940.63	0.9889860	8.89"	-19.35	-7.05	172.21	2187
22	22h 20m 57.00s	-10° 17' 26.2"	1940.19	0.9892112	8.89"	-19.65	-7.08	159.04	2187
23	22h 24m 45.83s	-09° 55' 31.9"	1939.75	0.9894388	8.89"	-19.94	-7.11	145.87	2187
24	22h 28m 34.06s	-09° 33' 28.5"	1939.30	0.9896686	8.89"	-20.22	-7.13	132.70	2187
25	22h 32m 21.70s	-09° 11' 16.4"	1938.84	0.9899004	8.88"	-20.50	-7.15	119.53	2187
26	22h 36m 08.76s	-08° 48' 56.1"	1938.38	0.9901338	8.88"	-20.77	-7.17	106.36	2187
27	22h 39m 55.25s	-08° 26' 27.8"	1937.92	0.9903688	8.88"	-21.04	-7.19	93.19	2187
28	22h 43m 41.19s	-08° 03' 52.2"	1937.46	0.9906052	8.88"	-21.30	-7.21	80.02	2187

Aspecto do disco solar no dia 15 de Fevereiro às 12:00 – Tempo Universal



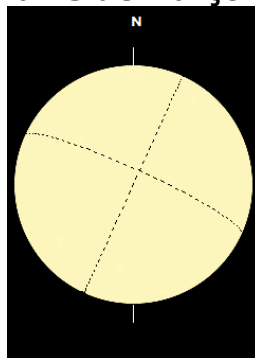
Efemérides do Sol

00:00 Hora – Tempo Universal

Março

Dia	α (J2000.0)	δ (J2000.0)	\varnothing "	DT (ua)*	P.H	Po°	Bo°	Lo°	NRC
1	22h 47m 26.60s	-07° 41' 09.5"	1937.00	0.9908430	8.88"	-21.55	-7.22	66.85	2187
2	22h 51m 11.48s	-07° 18' 20.1"	1936.53	0.9910822	8.87"	-21.80	-7.23	53.67	2187
3	22h 54m 55.86s	-06° 55' 24.5"	1936.06	0.9913229	8.87"	-22.04	-7.24	40.50	2187
4	22h 58m 39.74s	-06° 32' 23.2"	1935.59	0.9915654	8.87"	-22.28	-7.25	27.33	2187
5	23h 02m 23.16s	-06° 09' 16.4"	1935.11	0.9918098	8.87"	-22.51	-7.25	14.15	2187
6	23h 06m 06.11s	-05° 46' 04.6"	1934.63	0.9920565	8.86"	-22.73	-7.25	0.98	2187
7	23h 09m 48.63s	-05° 22' 48.2"	1934.14	0.9923056	8.86"	-22.95	-7.25	347.80	2188
8	23h 13m 30.73s	-04° 59' 27.6"	1933.65	0.9925575	8.86"	-23.16	-7.25	334.63	2188
9	23h 17m 12.44s	-04° 36' 03.1"	1933.15	0.9928124	8.86"	-23.36	-7.24	321.45	2188
10	23h 20m 53.76s	-04° 12' 35.2"	1932.65	0.9930704	8.86"	-23.55	-7.24	308.27	2188
11	23h 24m 34.74s	-03° 49' 04.2"	1932.14	0.9933316	8.85"	-23.74	-7.23	295.10	2188
12	23h 28m 15.38s	-03° 25' 30.5"	1931.63	0.9935960	8.85"	-23.93	-7.22	281.92	2188
13	23h 31m 55.73s	-03° 01' 54.4"	1931.11	0.9938637	8.85"	-24.10	-7.20	268.74	2188
14	23h 35m 35.79s	-02° 38' 16.3"	1930.58	0.9941344	8.85"	-24.27	-7.19	255.56	2188
15	23h 39m 15.60s	-02° 14' 36.5"	1930.05	0.9944080	8.84"	-24.44	-7.17	242.38	2188
16	23h 42m 55.18s	-01° 50' 55.4"	1929.52	0.9946844	8.84"	-24.59	-7.15	229.20	2188
17	23h 46m 34.56s	-01° 27' 13.4"	1928.98	0.9949633	8.84"	-24.74	-7.13	216.02	2188
18	23h 50m 13.75s	-01° 03' 30.7"	1928.43	0.9952444	8.84"	-24.88	-7.10	202.84	2188
19	23h 53m 52.79s	-00° 39' 47.8"	1927.88	0.9955274	8.83"	-25.02	-7.08	189.65	2188
20	23h 57m 31.68s	-00° 16' 04.9"	1927.33	0.9958121	8.83"	-25.15	-7.05	176.47	2188
21	00h 01m 10.45s	+00° 07' 37.4"	1926.78	0.9960981	8.83"	-25.27	-7.02	163.29	2188
22	00h 04m 49.13s	+00° 31' 19.0"	1926.22	0.9963851	8.83"	-25.39	-6.98	150.10	2188
23	00h 08m 27.72s	+00° 54' 59.3"	1925.67	0.9966727	8.82"	-25.49	-6.95	136.92	2188
24	00h 12m 06.25s	+01° 18' 38.1"	1925.11	0.9969607	8.82"	-25.60	-6.91	123.73	2188
25	00h 15m 44.74s	+01° 42' 14.9"	1924.55	0.9972488	8.82"	-25.69	-6.87	110.55	2188
26	00h 19m 23.21s	+02° 05' 49.5"	1924.00	0.9975364	8.82"	-25.78	-6.83	97.36	2188
27	00h 23m 01.66s	+02° 29' 21.3"	1923.45	0.9978235	8.81"	-25.86	-6.79	84.17	2188
28	00h 26m 40.13s	+02° 52' 50.2"	1922.89	0.9981097	8.81"	-25.93	-6.74	70.98	2188
29	00h 30m 18.62s	+03° 16' 15.6"	1922.35	0.9983948	8.81"	-26.00	-6.70	57.79	2188
30	00h 33m 57.15s	+03° 39' 37.3"	1921.80	0.9986789	8.81"	-26.06	-6.65	44.60	2188
31	00h 37m 35.74s	+04° 02' 54.9"	1921.25	0.9989618	8.80"	-26.11	-6.60	31.41	2188

Aspecto do disco solar no dia 15 de Março às 12:00 – Tempo Universal



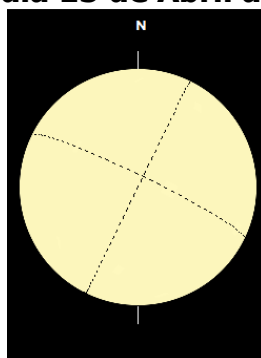
Efemérides do Sol

00:00 Hora – Tempo Universal

Abril

Dia	α (J2000.0)	δ (J2000.0)	\varnothing "	DT (ua)*	P.H	Po°	Bo°	Lo°	NRC
1	00h 41m 14.40s	+04° 26' 07.9"	1920.71	0.9992438	8.80"	-26.15	-6.54	18.22	2188
2	00h 44m 53.16s	+04° 49' 16.1"	1920.17	0.9995249	8.80"	-26.19	-6.49	5.03	2188
3	00h 48m 32.01s	+05° 12' 19.0"	1919.63	0.9998056	8.80"	-26.22	-6.43	351.83	2189
4	00h 52m 10.99s	+05° 35' 16.4"	1919.10	1.0000859	8.79"	-26.24	-6.37	338.64	2189
5	00h 55m 50.11s	+05° 58' 07.7"	1918.56	1.0003662	8.79"	-26.26	-6.31	325.44	2189
6	00h 59m 29.38s	+06° 20' 52.8"	1918.02	1.0006467	8.79"	-26.27	-6.25	312.25	2189
7	01h 03m 08.83s	+06° 43' 31.1"	1917.48	1.0009277	8.79"	-26.27	-6.19	299.05	2189
8	01h 06m 48.48s	+07° 06' 02.5"	1916.94	1.0012091	8.78"	-26.26	-6.12	285.85	2189
9	01h 10m 28.35s	+07° 28' 26.6"	1916.40	1.0014912	8.78"	-26.25	-6.05	272.65	2189
10	01h 14m 08.46s	+07° 50' 43.1"	1915.86	1.0017740	8.78"	-26.23	-5.98	259.45	2189
11	01h 17m 48.83s	+08° 12' 51.6"	1915.32	1.0020574	8.78"	-26.20	-5.91	246.25	2189
12	01h 21m 29.49s	+08° 34' 51.8"	1914.78	1.0023415	8.77"	-26.17	-5.84	233.05	2189
13	01h 25m 10.46s	+08° 56' 43.4"	1914.23	1.0026260	8.77"	-26.12	-5.76	219.85	2189
14	01h 28m 51.75s	+09° 18' 26.1"	1913.69	1.0029108	8.77"	-26.07	-5.69	206.65	2189
15	01h 32m 33.38s	+09° 39' 59.6"	1913.15	1.0031957	8.77"	-26.02	-5.61	193.45	2189
16	01h 36m 15.37s	+10° 01' 23.5"	1912.60	1.0034806	8.76"	-25.95	-5.53	180.24	2189
17	01h 39m 57.74s	+10° 22' 37.5"	1912.06	1.0037651	8.76"	-25.88	-5.45	167.04	2189
18	01h 43m 40.51s	+10° 43' 41.4"	1911.52	1.0040490	8.76"	-25.80	-5.37	153.83	2189
19	01h 47m 23.68s	+11° 04' 34.7"	1910.98	1.0043319	8.76"	-25.71	-5.28	140.63	2189
20	01h 51m 07.27s	+11° 25' 17.1"	1910.45	1.0046137	8.75"	-25.62	-5.20	127.42	2189
21	01h 54m 51.31s	+11° 45' 48.3"	1909.91	1.0048938	8.75"	-25.52	-5.11	114.21	2189
22	01h 58m 35.78s	+12° 06' 08.0"	1909.38	1.0051721	8.75"	-25.41	-5.02	101.00	2189
23	02h 02m 20.72s	+12° 26' 15.8"	1908.86	1.0054480	8.75"	-25.29	-4.93	87.79	2189
24	02h 06m 06.13s	+12° 46' 11.4"	1908.34	1.0057214	8.74"	-25.17	-4.84	74.58	2189
25	02h 09m 52.03s	+13° 05' 54.5"	1907.83	1.0059917	8.74"	-25.04	-4.75	61.37	2189
26	02h 13m 38.41s	+13° 25' 24.6"	1907.32	1.0062588	8.74"	-24.90	-4.66	48.16	2189
27	02h 17m 25.28s	+13° 44' 41.6"	1906.82	1.0065224	8.74"	-24.75	-4.56	34.94	2189
28	02h 21m 12.66s	+14° 03' 45.0"	1906.33	1.0067825	8.73"	-24.60	-4.46	21.73	2189
29	02h 25m 00.54s	+14° 22' 34.5"	1905.84	1.0070390	8.73"	-24.44	-4.37	8.52	2189
30	02h 28m 48.93s	+14° 41' 09.8"	1905.37	1.0072921	8.73"	-24.27	-4.27	355.30	2190

Aspecto do disco solar no dia 15 de Abril às 12:00 – Tempo Universal



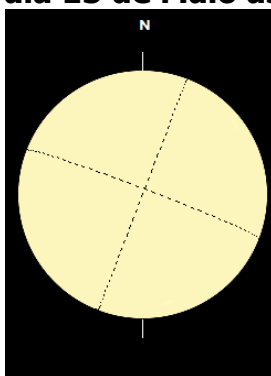
Efemérides do Sol

00:00 Hora – Tempo Universal

Maio

Dia	α (J2000.0)	δ (J2000.0)	\varnothing "	DT (ua)*	P.H	Po°	Bo°	Lo°	NRC
1	02h 32m 37.84s	+14° 59' 30.5"	1904.89	1.0075421	8.73"	-24.10	-4.17	342.09	2190
2	02h 36m 27.25s	+15° 17' 36.2"	1904.43	1.0077890	8.73"	-23.92	-4.07	328.87	2190
3	02h 40m 17.18s	+15° 35' 26.7"	1903.96	1.0080333	8.72"	-23.73	-3.96	315.65	2190
4	02h 44m 07.64s	+15° 53' 01.6"	1903.51	1.0082752	8.72"	-23.53	-3.86	302.43	2190
5	02h 47m 58.63s	+16° 10' 20.6"	1903.06	1.0085148	8.72"	-23.33	-3.76	289.22	2190
6	02h 51m 50.16s	+16° 27' 23.4"	1902.61	1.0087525	8.72"	-23.12	-3.65	276.00	2190
7	02h 55m 42.23s	+16° 44' 09.8"	1902.16	1.0089884	8.72"	-22.90	-3.55	262.78	2190
8	02h 59m 34.86s	+17° 00' 39.3"	1901.72	1.0092225	8.71"	-22.68	-3.44	249.55	2190
9	03h 03m 28.05s	+17° 16' 51.7"	1901.28	1.0094550	8.71"	-22.45	-3.33	236.33	2190
10	03h 07m 21.81s	+17° 32' 46.8"	1900.85	1.0096858	8.71"	-22.21	-3.22	223.11	2190
11	03h 11m 16.13s	+17° 48' 24.2"	1900.42	1.0099151	8.71"	-21.97	-3.11	209.89	2190
12	03h 15m 11.03s	+18° 03' 43.7"	1899.99	1.0101426	8.71"	-21.71	-3.00	196.66	2190
13	03h 19m 06.51s	+18° 18' 45.1"	1899.56	1.0103683	8.70"	-21.46	-2.89	183.44	2190
14	03h 23m 02.57s	+18° 33' 27.9"	1899.14	1.0105922	8.70"	-21.19	-2.78	170.22	2190
15	03h 26m 59.21s	+18° 47' 52.0"	1898.73	1.0108139	8.70"	-20.92	-2.66	156.99	2190
16	03h 30m 56.43s	+19° 01' 57.1"	1898.32	1.0110333	8.70"	-20.64	-2.55	143.77	2190
17	03h 34m 54.23s	+19° 15' 43.0"	1897.91	1.0112503	8.70"	-20.36	-2.44	130.54	2190
18	03h 38m 52.60s	+19° 29' 09.3"	1897.51	1.0114644	8.69"	-20.07	-2.32	117.31	2190
19	03h 42m 51.54s	+19° 42' 15.8"	1897.11	1.0116755	8.69"	-19.77	-2.20	104.08	2190
20	03h 46m 51.05s	+19° 55' 02.1"	1896.72	1.0118831	8.69"	-19.46	-2.09	90.86	2190
21	03h 50m 51.12s	+20° 07' 28.2"	1896.34	1.0120871	8.69"	-19.15	-1.97	77.63	2190
22	03h 54m 51.74s	+20° 19' 33.7"	1895.96	1.0122869	8.69"	-18.84	-1.85	64.40	2190
23	03h 58m 52.91s	+20° 31' 18.4"	1895.60	1.0124822	8.69"	-18.52	-1.74	51.17	2190
24	04h 02m 54.61s	+20° 42' 41.9"	1895.24	1.0126728	8.68"	-18.19	-1.62	37.94	2190
25	04h 06m 56.84s	+20° 53' 44.2"	1894.90	1.0128582	8.68"	-17.86	-1.50	24.71	2190
26	04h 10m 59.57s	+21° 04' 24.9"	1894.56	1.0130383	8.68"	-17.52	-1.38	11.48	2190
27	04h 15m 02.79s	+21° 14' 43.8"	1894.23	1.0132130	8.68"	-17.17	-1.26	358.25	2191
28	04h 19m 06.48s	+21° 24' 40.8"	1893.92	1.0133823	8.68"	-16.82	-1.14	345.01	2191
29	04h 23m 10.61s	+21° 34' 15.5"	1893.61	1.0135463	8.68"	-16.47	-1.02	331.78	2191
30	04h 27m 15.18s	+21° 43' 27.7"	1893.31	1.0137053	8.68"	-16.11	-0.90	318.55	2191
31	04h 31m 20.15s	+21° 52' 17.2"	1893.02	1.0138596	8.67"	-15.74	-0.78	305.32	2191

Aspecto do disco solar no dia 15 de Maio às 12:00 – Tempo Universal



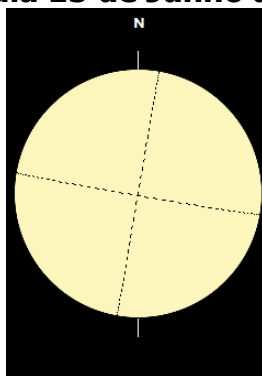
Efemérides do Sol

00:00 Hora – Tempo Universal

Junho

Dia	α (J2000.0)	δ (J2000.0)	\varnothing "	DT (ua)*	P.H	Po°	Bo°	Lo°	NRC
1	04h 35m 25.52s	+22° 00' 43.9"	1892.74	1.0140094	8.67"	-15.37	-0.66	292.08	2191
2	04h 39m 31.26s	+22° 08' 47.5"	1892.47	1.0141550	8.67"	-14.99	-0.54	278.85	2191
3	04h 43m 37.37s	+22° 16' 27.9"	1892.21	1.0142966	8.67"	-14.61	-0.42	265.62	2191
4	04h 47m 43.83s	+22° 23' 44.9"	1891.95	1.0144346	8.67"	-14.23	-0.30	252.38	2191
5	04h 51m 50.63s	+22° 30' 38.3"	1891.70	1.0145689	8.67"	-13.84	-0.18	239.15	2191
6	04h 55m 57.74s	+22° 37' 08.0"	1891.46	1.0146999	8.67"	-13.44	-0.06	225.91	2191
7	05h 00m 05.15s	+22° 43' 13.9"	1891.22	1.0148277	8.67"	-13.05	0.06	212.68	2191
8	05h 04m 12.85s	+22° 48' 55.9"	1890.99	1.0149522	8.66"	-12.64	0.18	199.44	2191
9	05h 08m 20.82s	+22° 54' 13.8"	1890.76	1.0150736	8.66"	-12.24	0.30	186.21	2191
10	05h 12m 29.05s	+22° 59' 07.5"	1890.54	1.0151919	8.66"	-11.83	0.42	172.97	2191
11	05h 16m 37.50s	+23° 03' 37.0"	1890.32	1.0153070	8.66"	-11.42	0.54	159.73	2191
12	05h 20m 46.17s	+23° 07' 42.1"	1890.12	1.0154189	8.66"	-11.00	0.66	146.50	2191
13	05h 24m 55.04s	+23° 11' 22.9"	1889.91	1.0155275	8.66"	-10.58	0.78	133.26	2191
14	05h 29m 04.08s	+23° 14' 39.1"	1889.72	1.0156327	8.66"	-10.15	0.90	120.03	2191
15	05h 33m 13.27s	+23° 17' 30.7"	1889.53	1.0157342	8.66"	-9.73	1.02	106.79	2191
16	05h 37m 22.60s	+23° 19' 57.7"	1889.35	1.0158318	8.66"	-9.30	1.14	93.55	2191
17	05h 41m 32.04s	+23° 22' 00.0"	1889.17	1.0159253	8.66"	-8.87	1.26	80.32	2191
18	05h 45m 41.58s	+23° 23' 37.6"	1889.01	1.0160144	8.66"	-8.43	1.38	67.08	2191
19	05h 49m 51.19s	+23° 24' 50.4"	1888.85	1.0160987	8.65"	-7.99	1.50	53.84	2191
20	05h 54m 00.84s	+23° 25' 38.4"	1888.70	1.0161780	8.65"	-7.56	1.62	40.61	2191
21	05h 58m 10.53s	+23° 26' 01.6"	1888.57	1.0162518	8.65"	-7.11	1.73	27.37	2191
22	06h 02m 20.21s	+23° 26' 00.1"	1888.44	1.0163198	8.65"	-6.67	1.85	14.13	2191
23	06h 06m 29.86s	+23° 25' 33.8"	1888.33	1.0163817	8.65"	-6.23	1.97	0.90	2191
24	06h 10m 39.45s	+23° 24' 42.7"	1888.22	1.0164374	8.65"	-5.78	2.08	347.66	2192
25	06h 14m 48.95s	+23° 23' 26.9"	1888.13	1.0164867	8.65"	-5.33	2.20	334.42	2192
26	06h 18m 58.33s	+23° 21' 46.5"	1888.05	1.0165298	8.65"	-4.88	2.31	321.18	2192
27	06h 23m 07.56s	+23° 19' 41.4"	1887.98	1.0165667	8.65"	-4.43	2.43	307.95	2192
28	06h 27m 16.60s	+23° 17' 11.7"	1887.92	1.0165977	8.65"	-3.98	2.54	294.71	2192
29	06h 31m 25.44s	+23° 14' 17.5"	1887.88	1.0166231	8.65"	-3.53	2.65	281.48	2192
30	06h 35m 34.05s	+23° 10' 58.9"	1887.84	1.0166432	8.65"	-3.08	2.76	268.24	2192

Aspecto do disco solar no dia 15 de Junho às 12:00 – Tempo Universal



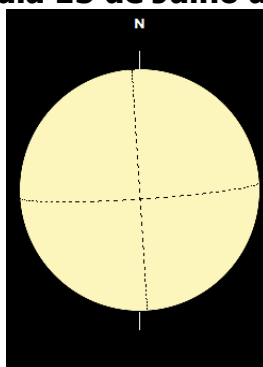
Efemérides do Sol

00:00 Hora – Tempo Universal

Julho

Dia	α (J2000.0)	δ (J2000.0)	\varnothing "	DT (ua)*	P.H	Po°	Bo°	Lo°	NRC
1	06h 39m 42.41s	+23° 07' 15.8"	1887.81	1.0166582	8.65"	-2.62	2.87	255.00	2192
2	06h 43m 50.50s	+23° 03' 08.5"	1887.79	1.0166684	8.65"	-2.17	2.98	241.77	2192
3	06h 47m 58.30s	+22° 58' 37.0"	1887.78	1.0166741	8.65"	-1.72	3.09	228.53	2192
4	06h 52m 05.79s	+22° 53' 41.4"	1887.78	1.0166755	8.65"	-1.26	3.20	215.29	2192
5	06h 56m 12.96s	+22° 48' 21.9"	1887.79	1.0166729	8.65"	-0.81	3.31	202.06	2192
6	07h 00m 19.77s	+22° 42' 38.7"	1887.80	1.0166663	8.65"	-0.36	3.42	188.82	2192
7	07h 04m 26.23s	+22° 36' 31.8"	1887.82	1.0166560	8.65"	0.10	3.52	175.59	2192
8	07h 08m 32.31s	+22° 30' 01.4"	1887.84	1.0166420	8.65"	0.55	3.63	162.35	2192
9	07h 12m 37.99s	+22° 23' 07.7"	1887.88	1.0166244	8.65"	1.00	3.73	149.12	2192
10	07h 16m 43.26s	+22° 15' 50.8"	1887.91	1.0166034	8.65"	1.45	3.83	135.88	2192
11	07h 20m 48.11s	+22° 08' 10.9"	1887.96	1.0165788	8.65"	1.90	3.94	122.65	2192
12	07h 24m 52.53s	+22° 00' 08.2"	1888.01	1.0165507	8.65"	2.35	4.04	109.42	2192
13	07h 28m 56.49s	+21° 51' 42.9"	1888.07	1.0165190	8.65"	2.79	4.14	96.18	2192
14	07h 33m 00.00s	+21° 42' 55.1"	1888.14	1.0164835	8.65"	3.24	4.23	82.95	2192
15	07h 37m 03.03s	+21° 33' 45.0"	1888.21	1.0164441	8.65"	3.68	4.33	69.72	2192
16	07h 41m 05.58s	+21° 24' 12.9"	1888.29	1.0164005	8.65"	4.13	4.43	56.48	2192
17	07h 45m 07.65s	+21° 14' 18.9"	1888.38	1.0163525	8.65"	4.57	4.52	43.25	2192
18	07h 49m 09.21s	+21° 04' 03.2"	1888.48	1.0162997	8.65"	5.00	4.62	30.02	2192
19	07h 53m 10.26s	+20° 53' 26.2"	1888.59	1.0162419	8.65"	5.44	4.71	16.79	2192
20	07h 57m 10.79s	+20° 42' 27.9"	1888.70	1.0161786	8.65"	5.87	4.80	3.56	2192
21	08h 01m 10.79s	+20° 31' 08.7"	1888.83	1.0161097	8.65"	6.30	4.89	350.33	2193
22	08h 05m 10.24s	+20° 19' 28.9"	1888.97	1.0160348	8.66"	6.73	4.98	337.10	2193
23	08h 09m 09.12s	+20° 07' 28.6"	1889.12	1.0159538	8.66"	7.16	5.07	323.87	2193
24	08h 13m 07.42s	+19° 55' 08.2"	1889.28	1.0158667	8.66"	7.58	5.15	310.64	2193
25	08h 17m 05.13s	+19° 42' 27.9"	1889.46	1.0157734	8.66"	8.00	5.24	297.41	2193
26	08h 21m 02.24s	+19° 29' 27.9"	1889.64	1.0156742	8.66"	8.42	5.32	284.18	2193
27	08h 24m 58.74s	+19° 16' 08.6"	1889.84	1.0155693	8.66"	8.84	5.40	270.95	2193
28	08h 28m 54.62s	+19° 02' 30.2"	1890.04	1.0154590	8.66"	9.25	5.48	257.72	2193
29	08h 32m 49.88s	+18° 48' 33.0"	1890.26	1.0153435	8.66"	9.66	5.56	244.50	2193
30	08h 36m 44.51s	+18° 34' 17.3"	1890.48	1.0152231	8.66"	10.06	5.64	231.27	2193
31	08h 40m 38.53s	+18° 19' 43.3"	1890.71	1.0150983	8.66"	10.47	5.71	218.04	2193

Aspecto do disco solar no dia 15 de Julho às 12:00 – Tempo Universal



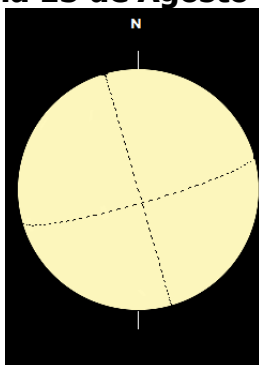
Efemérides do Sol

00:00 Hora – Tempo Universal

Agosto

Dia	α (J2000.0)	δ (J2000.0)	\varnothing "	DT (ua)*	P.H	Po°	Bo°	Lo°	NRC
1	08h 44m 31.92s	+18° 04' 51.3"	1890.95	1.0149692	8.66"	10.86	5.79	204.82	2193
2	08h 48m 24.69s	+17° 49' 41.6"	1891.20	1.0148360	8.67"	11.26	5.86	191.59	2193
3	08h 52m 16.83s	+17° 34' 14.6"	1891.46	1.0146992	8.67"	11.65	5.93	178.37	2193
4	08h 56m 08.36s	+17° 18' 30.5"	1891.72	1.0145588	8.67"	12.04	6.00	165.14	2193
5	08h 59m 59.27s	+17° 02' 29.7"	1891.99	1.0144152	8.67"	12.42	6.06	151.92	2193
6	09h 03m 49.58s	+16° 46' 12.3"	1892.26	1.0142685	8.67"	12.80	6.13	138.69	2193
7	09h 07m 39.28s	+16° 29' 38.7"	1892.54	1.0141188	8.67"	13.18	6.19	125.47	2193
8	09h 11m 28.38s	+16° 12' 49.2"	1892.82	1.0139663	8.67"	13.55	6.26	112.25	2193
9	09h 15m 16.90s	+15° 55' 44.1"	1893.11	1.0138111	8.67"	13.92	6.32	99.03	2193
10	09h 19m 04.84s	+15° 38' 23.7"	1893.41	1.0136532	8.68"	14.28	6.38	85.81	2193
11	09h 22m 52.21s	+15° 20' 48.2"	1893.71	1.0134926	8.68"	14.64	6.43	72.58	2193
12	09h 26m 39.02s	+15° 02' 57.9"	1894.01	1.0133292	8.68"	14.99	6.49	59.36	2193
13	09h 30m 25.29s	+14° 44' 53.2"	1894.33	1.0131628	8.68"	15.35	6.54	46.14	2193
14	09h 34m 11.02s	+14° 26' 34.4"	1894.64	1.0129932	8.68"	15.69	6.59	32.92	2193
15	09h 37m 56.24s	+14° 08' 01.7"	1894.97	1.0128202	8.68"	16.03	6.64	19.71	2193
16	09h 41m 40.95s	+13° 49' 15.4"	1895.30	1.0126434	8.68"	16.37	6.69	6.49	2193
17	09h 45m 25.15s	+13° 30' 15.8"	1895.64	1.0124627	8.69"	16.70	6.74	353.27	2194
18	09h 49m 08.86s	+13° 11' 03.4"	1895.98	1.0122777	8.69"	17.03	6.78	340.05	2194
19	09h 52m 52.09s	+12° 51' 38.4"	1896.34	1.0120881	8.69"	17.35	6.82	326.84	2194
20	09h 56m 34.83s	+12° 32' 01.1"	1896.70	1.0118937	8.69"	17.67	6.86	313.62	2194
21	10h 00m 17.10s	+12° 12' 11.9"	1897.07	1.0116945	8.69"	17.98	6.90	300.41	2194
22	10h 03m 58.91s	+11° 52' 11.1"	1897.46	1.0114903	8.69"	18.29	6.94	287.19	2194
23	10h 07m 40.25s	+11° 31' 59.0"	1897.85	1.0112813	8.70"	18.59	6.97	273.98	2194
24	10h 11m 21.15s	+11° 11' 36.1"	1898.25	1.0110675	8.70"	18.89	7.01	260.76	2194
25	10h 15m 01.61s	+10° 51' 02.5"	1898.66	1.0108493	8.70"	19.18	7.04	247.55	2194
26	10h 18m 41.65s	+10° 30' 18.6"	1899.08	1.0106269	8.70"	19.47	7.07	234.34	2194
27	10h 22m 21.27s	+10° 09' 24.8"	1899.50	1.0104006	8.70"	19.75	7.09	221.12	2194
28	10h 26m 00.50s	+09° 48' 21.3"	1899.94	1.0101706	8.71"	20.03	7.12	207.91	2194
29	10h 29m 39.34s	+09° 27' 08.6"	1900.38	1.0099373	8.71"	20.30	7.14	194.70	2194
30	10h 33m 17.82s	+09° 05' 46.9"	1900.82	1.0097010	8.71"	20.57	7.16	181.49	2194
31	10h 36m 55.94s	+08° 44' 16.6"	1901.27	1.0094620	8.71"	20.83	7.18	168.28	2194

Aspecto do disco solar no dia 15 de Agosto às 12:00 – Tempo Universal



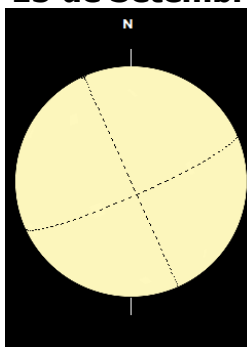
Efemérides do Sol

00:00 Hora – Tempo Universal

Setembro

Dia	α (J2000.0)	δ (J2000.0)	\varnothing "	DT (ua)*	P.H	Po°	Bo°	Lo°	NRC
1	10h 40m 33.73s	+08° 22' 37.9"	1901.73	1.0092206	8.71"	21.09	7.19	155.07	2194
2	10h 44m 11.21s	+08° 00' 51.3"	1902.18	1.0089770	8.72"	21.34	7.21	141.86	2194
3	10h 47m 48.38s	+07° 38' 57.0"	1902.65	1.0087316	8.72"	21.58	7.22	128.65	2194
4	10h 51m 25.27s	+07° 16' 55.3"	1903.11	1.0084846	8.72"	21.82	7.23	115.44	2194
5	10h 55m 01.90s	+06° 54' 46.6"	1903.58	1.0082362	8.72"	22.05	7.24	102.24	2194
6	10h 58m 38.30s	+06° 32' 31.3"	1904.05	1.0079867	8.72"	22.28	7.25	89.03	2194
7	11h 02m 14.47s	+06° 10' 09.4"	1904.53	1.0077362	8.73"	22.50	7.25	75.82	2194
8	11h 05m 50.45s	+05° 47' 41.5"	1905.00	1.0074847	8.73"	22.72	7.25	62.62	2194
9	11h 09m 26.26s	+05° 25' 07.8"	1905.48	1.0072323	8.73"	22.93	7.25	49.41	2194
10	11h 13m 01.92s	+05° 02' 28.5"	1905.96	1.0069790	8.73"	23.13	7.25	36.21	2194
11	11h 16m 37.46s	+04° 39' 44.0"	1906.44	1.0067246	8.74"	23.33	7.25	23.00	2194
12	11h 20m 12.90s	+04° 16' 54.6"	1906.92	1.0064689	8.74"	23.52	7.24	9.80	2194
13	11h 23m 48.26s	+03° 54' 00.7"	1907.41	1.0062116	8.74"	23.71	7.23	356.59	2195
14	11h 27m 23.56s	+03° 31' 02.4"	1907.90	1.0059526	8.74"	23.89	7.22	343.39	2195
15	11h 30m 58.82s	+03° 08' 00.3"	1908.40	1.0056915	8.74"	24.06	7.21	330.19	2195
16	11h 34m 34.05s	+02° 44' 54.5"	1908.90	1.0054281	8.75"	24.23	7.19	316.99	2195
17	11h 38m 09.27s	+02° 21' 45.5"	1909.40	1.0051622	8.75"	24.39	7.18	303.78	2195
18	11h 41m 44.49s	+01° 58' 33.6"	1909.91	1.0048935	8.75"	24.54	7.16	290.58	2195
19	11h 45m 19.74s	+01° 35' 19.2"	1910.43	1.0046220	8.75"	24.69	7.14	277.38	2195
20	11h 48m 55.03s	+01° 12' 02.6"	1910.95	1.0043478	8.76"	24.83	7.11	264.18	2195
21	11h 52m 30.38s	+00° 48' 44.2"	1911.48	1.0040707	8.76"	24.97	7.09	250.98	2195
22	11h 56m 05.80s	+00° 25' 24.2"	1912.01	1.0037911	8.76"	25.10	7.06	237.78	2195
23	11h 59m 41.31s	+00° 02' 03.1"	1912.55	1.0035090	8.76"	25.22	7.03	224.58	2195
24	12h 03m 16.93s	-00° 21' 18.7"	1913.09	1.0032247	8.77"	25.34	7.00	211.38	2195
25	12h 06m 52.68s	-00° 44' 41.0"	1913.64	1.0029385	8.77"	25.45	6.96	198.19	2195
26	12h 10m 28.58s	-01° 08' 03.4"	1914.19	1.0026506	8.77"	25.55	6.93	184.99	2195
27	12h 14m 04.65s	-01° 31' 25.5"	1914.74	1.0023615	8.77"	25.65	6.89	171.79	2195
28	12h 17m 40.90s	-01° 54' 47.0"	1915.29	1.0020712	8.78"	25.74	6.85	158.59	2195
29	12h 21m 17.35s	-02° 18' 07.5"	1915.85	1.0017803	8.78"	25.82	6.81	145.40	2195
30	12h 24m 54.03s	-02° 41' 26.6"	1916.41	1.0014890	8.78"	25.90	6.77	132.20	2195

Aspecto do disco solar no dia 15 de Setembro às 12:00 – Tempo Universal



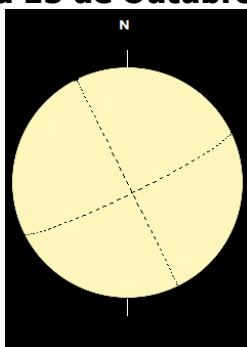
Efemérides do Sol

00:00 Hora – Tempo Universal

Outubro

Dia	α (J2000.0)	δ (J2000.0)	\varnothing "	DT (ua)*	P.H	Po°	Bo°	Lo°	NRC
1	12h 28m 30.95s	-03° 04' 44.0"	1916.96	1.0011975	8.78"	25.96	6.72	119.01	2195
2	12h 32m 08.14s	-03° 27' 59.4"	1917.52	1.0009064	8.79"	26.03	6.67	105.81	2195
3	12h 35m 45.62s	-03° 51' 12.4"	1918.08	1.0006158	8.79"	26.08	6.62	92.61	2195
4	12h 39m 23.40s	-04° 14' 22.6"	1918.63	1.0003260	8.79"	26.13	6.57	79.42	2195
5	12h 43m 01.52s	-04° 37' 29.7"	1919.19	1.0000374	8.79"	26.17	6.52	66.23	2195
6	12h 46m 40.00s	-05° 00' 33.4"	1919.74	0.9997501	8.80"	26.20	6.46	53.03	2195
7	12h 50m 18.87s	-05° 23' 33.4"	1920.29	0.9994643	8.80"	26.23	6.40	39.84	2195
8	12h 53m 58.15s	-05° 46' 29.2"	1920.84	0.9991800	8.80"	26.25	6.34	26.64	2195
9	12h 57m 37.86s	-06° 09' 20.6"	1921.38	0.9988971	8.80"	26.26	6.28	13.45	2195
10	13h 01m 18.03s	-06° 32' 07.3"	1921.92	0.9986157	8.81"	26.27	6.22	0.26	2195
11	13h 04m 58.68s	-06° 54' 48.9"	1922.46	0.9983354	8.81"	26.27	6.15	347.07	2196
12	13h 08m 39.83s	-07° 17' 24.9"	1923.00	0.9980561	8.81"	26.26	6.09	333.87	2196
13	13h 12m 21.50s	-07° 39' 55.1"	1923.54	0.9977774	8.81"	26.24	6.02	320.68	2196
14	13h 16m 03.70s	-08° 02' 19.1"	1924.07	0.9974991	8.82"	26.21	5.95	307.49	2196
15	13h 19m 46.46s	-08° 24' 36.4"	1924.61	0.9972210	8.82"	26.18	5.87	294.30	2196
16	13h 23m 29.78s	-08° 46' 46.8"	1925.15	0.9969429	8.82"	26.14	5.80	281.11	2196
17	13h 27m 13.68s	-09° 08' 49.7"	1925.68	0.9966647	8.82"	26.09	5.72	267.92	2196
18	13h 30m 58.18s	-09° 30' 44.8"	1926.22	0.9963862	8.83"	26.04	5.64	254.73	2196
19	13h 34m 43.29s	-09° 52' 31.8"	1926.76	0.9961074	8.83"	25.98	5.56	241.54	2196
20	13h 38m 29.03s	-10° 14' 10.1"	1927.30	0.9958284	8.83"	25.91	5.48	228.35	2196
21	13h 42m 15.41s	-10° 35' 39.5"	1927.84	0.9955493	8.83"	25.83	5.40	215.16	2196
22	13h 46m 02.44s	-10° 56' 59.4"	1928.38	0.9952701	8.84"	25.74	5.31	201.97	2196
23	13h 49m 50.13s	-11° 18' 09.5"	1928.92	0.9949912	8.84"	25.65	5.23	188.78	2196
24	13h 53m 38.50s	-11° 39' 09.4"	1929.46	0.9947128	8.84"	25.55	5.14	175.59	2196
25	13h 57m 27.56s	-11° 59' 58.7"	1930.00	0.9944350	8.84"	25.44	5.05	162.41	2196
26	14h 01m 17.31s	-12° 20' 37.0"	1930.54	0.9941581	8.85"	25.33	4.96	149.22	2196
27	14h 05m 07.78s	-12° 41' 03.7"	1931.07	0.9938825	8.85"	25.20	4.87	136.03	2196
28	14h 08m 58.97s	-13° 01' 18.7"	1931.61	0.9936084	8.85"	25.07	4.77	122.84	2196
29	14h 12m 50.89s	-13° 21' 21.3"	1932.14	0.9933362	8.85"	24.93	4.68	109.65	2196
30	14h 16m 43.56s	-13° 41' 11.2"	1932.66	0.9930661	8.86"	24.78	4.58	96.47	2196
31	14h 20m 36.98s	-14° 00' 48.1"	1933.18	0.9927986	8.86"	24.63	4.48	83.28	2196

Aspecto do disco solar no dia 15 de Outubro às 12:00 – Tempo Universal



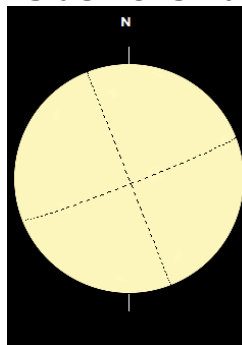
Efemérides do Sol

00:00 Hora – Tempo Universal

Novembro

Dia	α (J2000.0)	δ (J2000.0)	\varnothing "	DT (ua)*	P.H	Po°	Bo°	Lo°	NRC
1	14h 24m 31.17s	-14° 20' 11.4"	1933.70	0.9925340	8.86"	24.46	4.38	70.09	2196
2	14h 28m 26.14s	-14° 39' 20.9"	1934.21	0.9922726	8.86"	24.29	4.28	56.91	2196
3	14h 32m 21.90s	-14° 58' 16.1"	1934.71	0.9920147	8.86"	24.11	4.17	43.72	2196
4	14h 36m 18.47s	-15° 16' 56.6"	1935.20	0.9917606	8.87"	23.92	4.07	30.54	2196
5	14h 40m 15.87s	-15° 35' 22.1"	1935.69	0.9915105	8.87"	23.73	3.97	17.35	2196
6	14h 44m 14.10s	-15° 53' 32.1"	1936.17	0.9912643	8.87"	23.53	3.86	4.17	2196
7	14h 48m 13.17s	-16° 11' 26.4"	1936.65	0.9910222	8.87"	23.32	3.75	350.98	2197
8	14h 52m 13.10s	-16° 29' 04.5"	1937.11	0.9907840	8.88"	23.10	3.64	337.80	2197
9	14h 56m 13.89s	-16° 46' 26.0"	1937.57	0.9905494	8.88"	22.87	3.53	324.61	2197
10	15h 00m 15.54s	-17° 03' 30.6"	1938.02	0.9903182	8.88"	22.64	3.42	311.43	2197
11	15h 04m 18.05s	-17° 20' 17.8"	1938.47	0.9900902	8.88"	22.40	3.31	298.24	2197
12	15h 08m 21.43s	-17° 36' 47.2"	1938.91	0.9898650	8.88"	22.15	3.19	285.06	2197
13	15h 12m 25.67s	-17° 52' 58.4"	1939.35	0.9896425	8.89"	21.89	3.08	271.88	2197
14	15h 16m 30.78s	-18° 08' 51.1"	1939.78	0.9894225	8.89"	21.63	2.96	258.69	2197
15	15h 20m 36.75s	-18° 24' 24.8"	1940.21	0.9892047	8.89"	21.35	2.85	245.51	2197
16	15h 24m 43.58s	-18° 39' 39.1"	1940.63	0.9889892	8.89"	21.07	2.73	232.33	2197
17	15h 28m 51.27s	-18° 54' 33.7"	1941.05	0.9887758	8.89"	20.79	2.61	219.15	2197
18	15h 32m 59.79s	-19° 09' 08.1"	1941.46	0.9885645	8.90"	20.49	2.49	205.96	2197
19	15h 37m 09.15s	-19° 23' 22.0"	1941.87	0.9883555	8.90"	20.19	2.37	192.78	2197
20	15h 41m 19.33s	-19° 37' 14.9"	1942.28	0.9881486	8.90"	19.88	2.25	179.60	2197
21	15h 45m 30.33s	-19° 50' 46.6"	1942.68	0.9879442	8.90"	19.57	2.13	166.42	2197
22	15h 49m 42.12s	-20° 03' 56.5"	1943.08	0.9877423	8.90"	19.24	2.01	153.24	2197
23	15h 53m 54.70s	-20° 16' 44.4"	1943.47	0.9875431	8.91"	18.91	1.88	140.06	2197
24	15h 58m 08.04s	-20° 29' 09.9"	1943.86	0.9873469	8.91"	18.58	1.76	126.88	2197
25	16h 02m 22.14s	-20° 41' 12.6"	1944.24	0.9871538	8.91"	18.23	1.64	113.70	2197
26	16h 06m 36.98s	-20° 52' 52.2"	1944.61	0.9869642	8.91"	17.88	1.51	100.51	2197
27	16h 10m 52.54s	-21° 04' 08.3"	1944.98	0.9867783	8.91"	17.53	1.39	87.33	2197
28	16h 15m 08.80s	-21° 15' 00.6"	1945.33	0.9865965	8.91"	17.16	1.26	74.16	2197
29	16h 19m 25.76s	-21° 25' 28.8"	1945.68	0.9864191	8.92"	16.79	1.13	60.98	2197
30	16h 23m 43.38s	-21° 35' 32.5"	1946.02	0.9862464	8.92"	16.42	1.01	47.80	2197

Aspecto do disco solar no dia 15 de Novembro às 12:00 – Tempo Universal



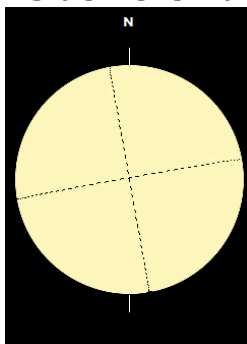
Efemérides do Sol

00:00 Hora – Tempo Universal

Dezembro

Dia	$\alpha(J2000.0)$	$\delta(J2000.0)$	\varnothing "	DT (ua)*	P.H	Po°	Bo°	Lo°	NRC
1	16h 28m 01.67s	-21° 45' 11.6"	1946.36	0.9860788	8.92"	16.04	0.88	34.62	2197
2	16h 32m 20.59s	-21° 54' 25.6"	1946.68	0.9859165	8.92"	15.65	0.75	21.44	2197
3	16h 36m 40.14s	-22° 03' 14.4"	1946.99	0.9857600	8.92"	15.25	0.63	8.26	2197
4	16h 41m 00.30s	-22° 11' 37.7"	1947.28	0.9856094	8.92"	14.86	0.50	355.08	2198
5	16h 45m 21.04s	-22° 19' 35.3"	1947.57	0.9854647	8.92"	14.45	0.37	341.90	2198
6	16h 49m 42.36s	-22° 27' 06.9"	1947.84	0.9853259	8.93"	14.04	0.24	328.73	2198
7	16h 54m 04.21s	-22° 34' 12.3"	1948.11	0.9851930	8.93"	13.62	0.11	315.55	2198
8	16h 58m 26.59s	-22° 40' 51.3"	1948.36	0.9850655	8.93"	13.20	-0.01	302.37	2198
9	17h 02m 49.47s	-22° 47' 03.6"	1948.60	0.9849434	8.93"	12.78	-0.14	289.20	2198
10	17h 07m 12.81s	-22° 52' 49.1"	1948.83	0.9848262	8.93"	12.35	-0.27	276.02	2198
11	17h 11m 36.60s	-22° 58' 07.6"	1949.05	0.9847137	8.93"	11.91	-0.40	262.84	2198
12	17h 16m 00.80s	-23° 02' 58.8"	1949.27	0.9846057	8.93"	11.48	-0.53	249.67	2198
13	17h 20m 25.39s	-23° 07' 22.7"	1949.47	0.9845019	8.93"	11.03	-0.65	236.49	2198
14	17h 24m 50.32s	-23° 11' 19.0"	1949.67	0.9844021	8.93"	10.59	-0.78	223.32	2198
15	17h 29m 15.58s	-23° 14' 47.7"	1949.86	0.9843062	8.93"	10.13	-0.91	210.14	2198
16	17h 33m 41.11s	-23° 17' 48.6"	1950.04	0.9842141	8.94"	9.68	-1.04	196.97	2198
17	17h 38m 06.89s	-23° 20' 21.5"	1950.22	0.9841256	8.94"	9.22	-1.16	183.79	2198
18	17h 42m 32.88s	-23° 22' 26.5"	1950.39	0.9840408	8.94"	8.76	-1.29	170.62	2198
19	17h 46m 59.04s	-23° 24' 03.5"	1950.55	0.9839597	8.94"	8.30	-1.42	157.44	2198
20	17h 51m 25.33s	-23° 25' 12.3"	1950.70	0.9838823	8.94"	7.83	-1.54	144.27	2198
21	17h 55m 51.71s	-23° 25' 52.9"	1950.85	0.9838086	8.94"	7.36	-1.67	131.10	2198
22	18h 00m 18.15s	-23° 26' 05.3"	1950.99	0.9837388	8.94"	6.89	-1.79	117.92	2198
23	18h 04m 44.61s	-23° 25' 49.4"	1951.12	0.9836731	8.94"	6.41	-1.92	104.75	2198
24	18h 09m 11.05s	-23° 25' 05.2"	1951.24	0.9836115	8.94"	5.94	-2.04	91.58	2198
25	18h 13m 37.43s	-23° 23' 52.9"	1951.35	0.9835543	8.94"	5.46	-2.16	78.40	2198
26	18h 18m 03.72s	-23° 22' 12.2"	1951.46	0.9835018	8.94"	4.98	-2.29	65.23	2198
27	18h 22m 29.88s	-23° 20' 03.4"	1951.55	0.9834542	8.94"	4.50	-2.41	52.06	2198
28	18h 26m 55.89s	-23° 17' 26.5"	1951.63	0.9834118	8.94"	4.02	-2.53	38.89	2198
29	18h 31m 21.70s	-23° 14' 21.5"	1951.71	0.9833750	8.94"	3.53	-2.65	25.72	2198
30	18h 35m 47.30s	-23° 10' 48.6"	1951.77	0.9833440	8.94"	3.05	-2.77	12.55	2198
31	18h 40m 12.64s	-23° 06' 47.8"	1951.82	0.9833193	8.94"	2.57	-2.89	359.37	2199

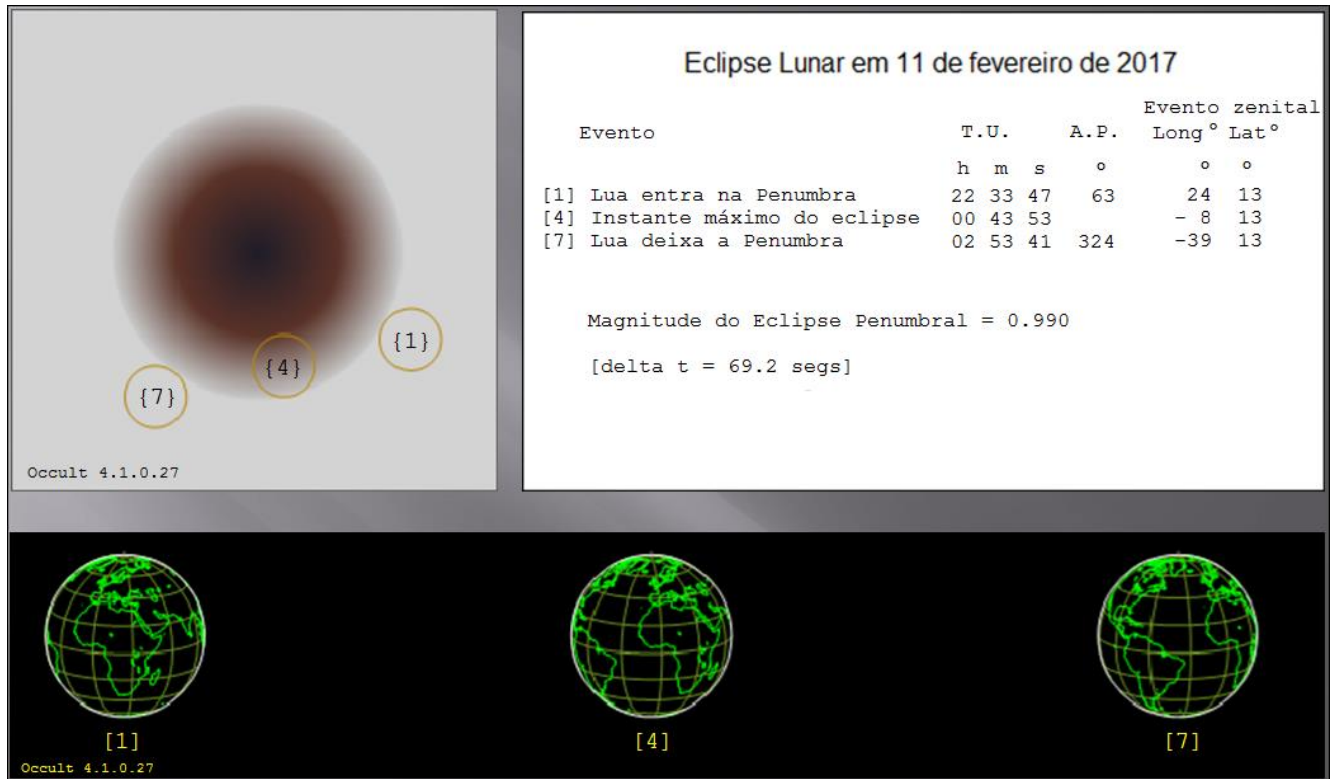
Aspecto do disco solar no dia 15 de Dezembro às 12:00 – Tempo Universal



Eclipses

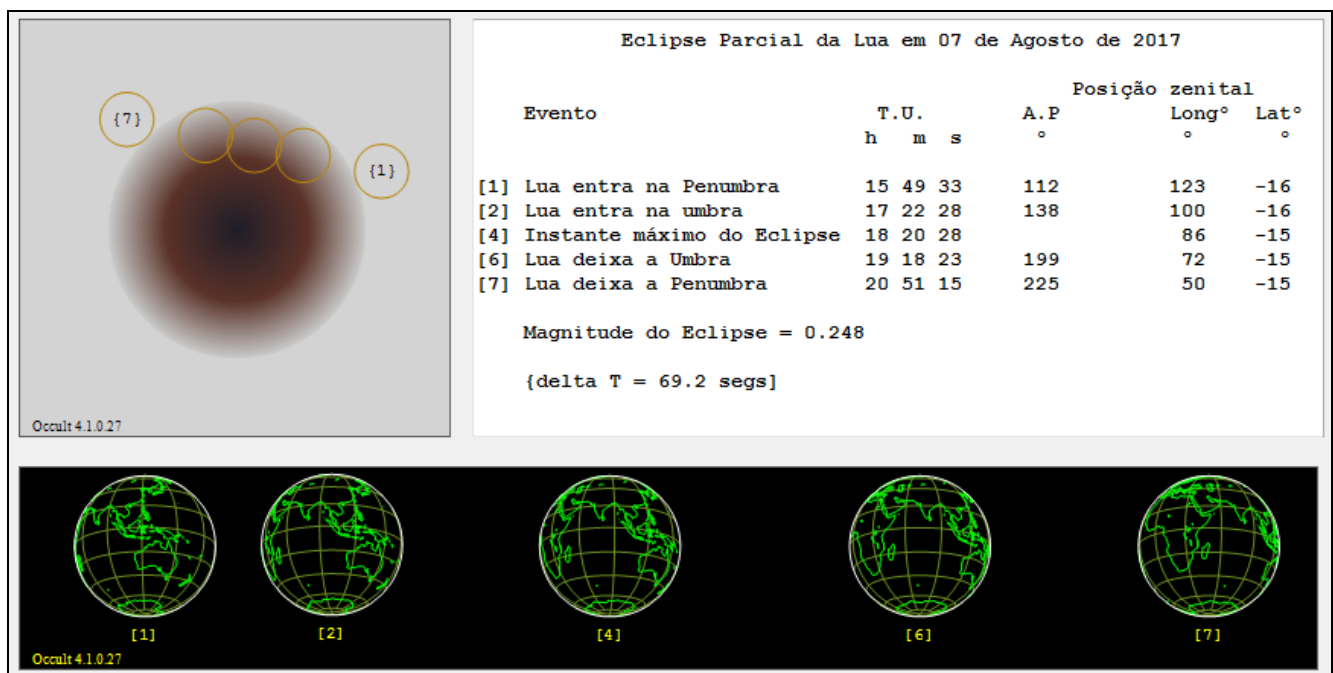
A) Eclipse Penumbral da Lua em 11/02/2017

Na noite de 10 para 11 de fevereiro de 2017, ocorrerá o primeiro eclipse penumbral da Lua deste ano, cuja região de visibilidade engloba as Américas, Europa, África e Ásia. O instante máximo ocorre as 00:43:53 (TU); o tempo de duração total da fase penumbral é estimado em: 263,2 minutos (04:23,2), sendo que a lua estará no zênite no continente africano sobre a República do Mali.



B) Eclipse Parcial da Lua em 07/08/2017

Em 07 de agosto de 2017, ocorrerá o eclipse parcial da Lua, cuja região de visibilidade nesta oportunidade engloba Europa, África, Ásia e Oceania. O instante máximo ocorre as 18:20:28 (TU); o tempo de duração total da fase parcial é estimado em: 116,5 minutos (01:55,5); já a fase penumbral a duração é estimada em 304.8 minutos (05:04.8). A lua estará no zênite em algum ponto do oceano indico localizado a cerca de 2400 km a oeste da ilha de Java na Indonésia e 2190 km a sudeste das ilhas Maldivas.



C) Eclipse Anular do Sol em 26/02/2017

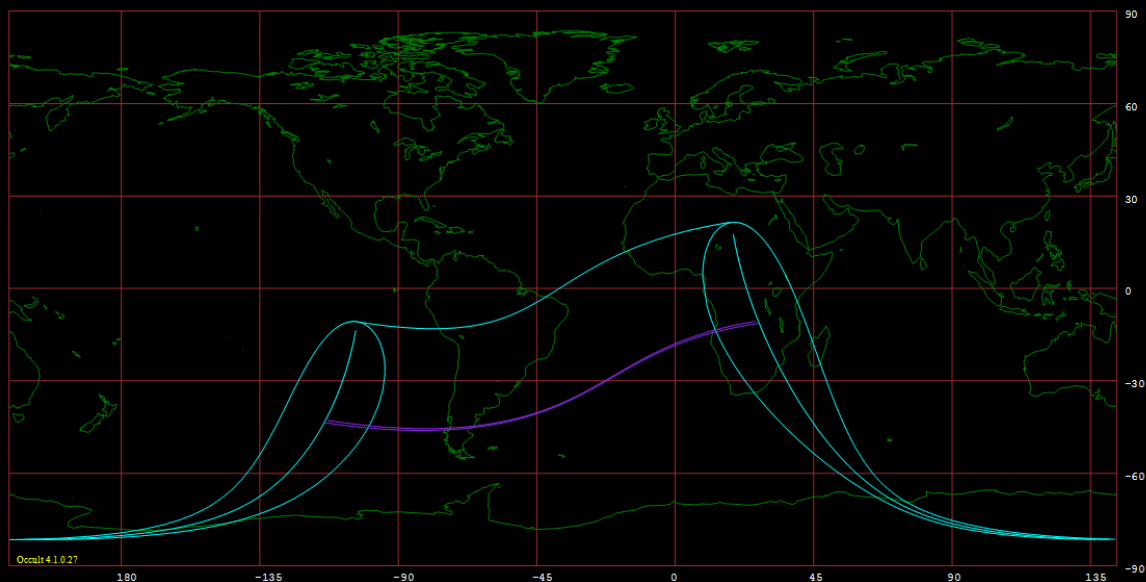
Este eclipse anular é visível de forma total na região austral da América do Sul (Argentina e Chile) bem como na região meridional do continente africano (Angola e Zâmbia) sendo que o cone de sombra inicia-se ao sul do oceano Pacífico em algum ponto sobre as coordenadas de latitude: 43.2765°S e longitude: 112.8806W. O instante máximo do eclipse ocorre sobre o Atlântico sul em algum ponto sobre as coordenadas de latitude: 34.6797°S e longitude: 31.1909° W, quando então a duração da anularidade é estimada em 0.44s. O eclipse se encerra sobre o continente africano em algum ponto sobre as coordenadas de latitude: -10.9629°S e longitude: 26.8646E°, região sul da República Democrática do Congo.

No Brasil este evento poderá ser acompanhado de forma parcial sendo observado nas seguintes localidades:

Circunstâncias Gerais de Visibilidade no Brasil

Cidade	1º Contato			Máximo		4º Contato			Mag.
	Hora (TU)	A.P ⁰	Alt. ⁰	Hora (TU)	Alt. ⁰	Hora (TU)	A.P ⁰	Alt. ⁰	
Aracaju - SE	14 02 17	196	80	15 19 25	80	16 31 33	104	63	0.304
Belo Horizonte - MG	13 16 55	210	61	14 43 09	77	16 09 10	95	71	0.443
Brasília - DF	13 24 18	198	60	14 37 09	76	15 51 16	107	80	0.276
Campo Grande - MS	12 57 14	206	46	14 10 01	63	15 28 17	105	77	0.335
Cuiabá - MT	13 13 32	192	49	14 10 43	63	15 11 36	119	77	0.177
Curitiba - PR	12 54 23	219	49	14 20 29	66	15 50 48	90	72	0.535
Florianópolis - SC	12 51 46	224	49	14 19 58	65	15 52 18	86	70	0.607
Fortaleza - CE	14 44 44	174	85	15 28 37	79	16 10 48	125	69	0.087
Goiânia - GO	13 19 07	199	57	14 31 44	74	15 46 27	107	81	0.281
João Pessoa - PB	14 23 37	190	87	15 32 19	75	16 35 58	109	59	0.237
Maceió - AL	14 10 52	194	84	15 25 43	78	16 35 10	105	61	0.285
Natal - RN	14 30 10	186	87	15 33 47	75	16 33 01	113	60	0.199
Palmas - TO	13 54 33	180	67	14 44 54	80	15 35 34	123	87	0.111
Porto Alegre - RS	12 44 40	228	44	14 11 25	61	15 43 50	85	69	0.647
Recife - PE	14 18 39	192	86	15 30 36	76	16 37 08	107	59	0.263
Rio de Janeiro - RJ	13 10 29	217	59	14 40 42	74	16 10 50	89	69	0.535
Salvador - BA	13 51 56	199	76	15 12 14	82	16 28 01	101	65	0.335
São Paulo - SP	13 02 29	217	54	14 29 51	71	15 59 33	91	72	0.513
Teresina - PI	14 38 39	168	83	15 13 13	86	15 47 13	131	79	0.050
Vitória - ES	13 22 52	213	65	14 53 19	78	16 21 08	90	66	0.503
Aracaju - SE	14 02 17	196	80	15 19 25	80	16 31 33	104	63	0.304

Eclipse Anular do Sol em 26 de fevereiro de 2017

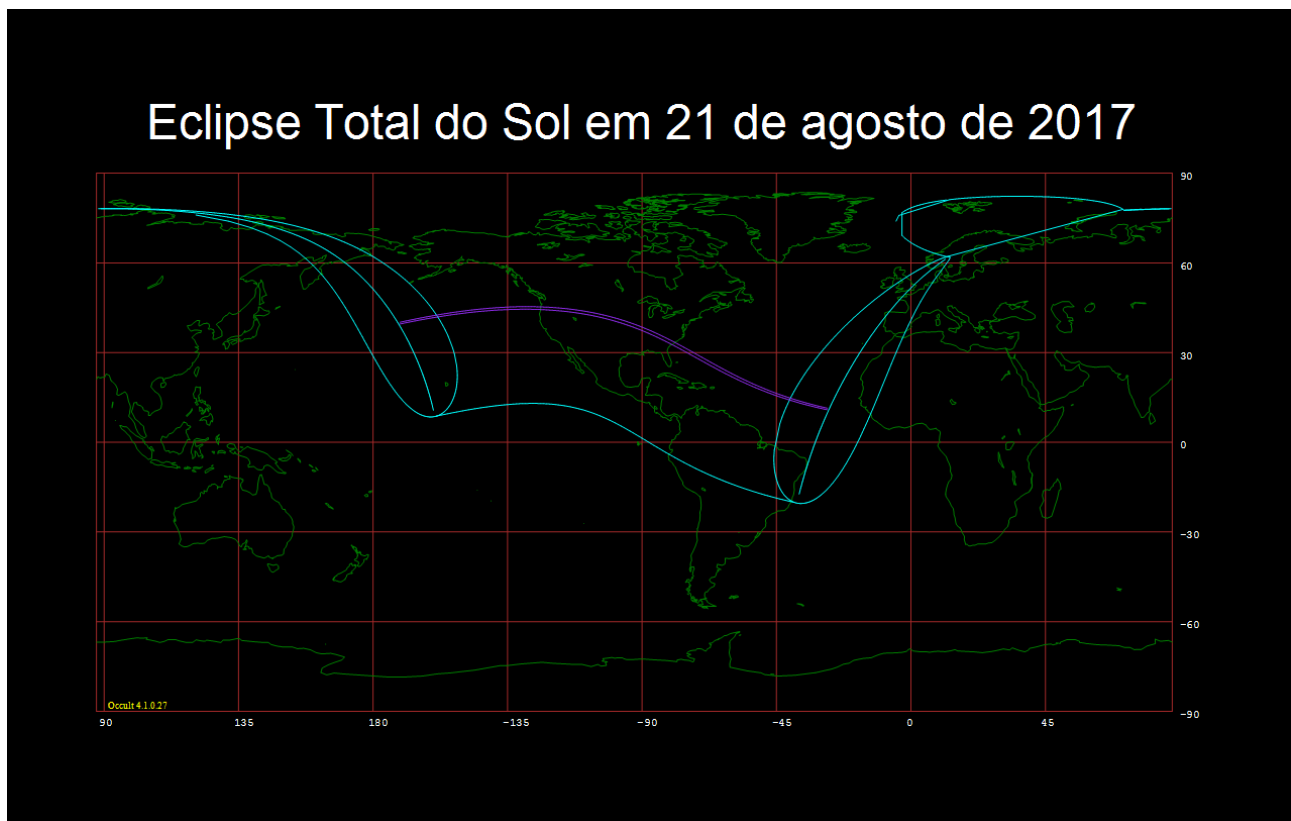


D) Eclipse Total do Sol 21/08/2017

Em 21 de agosto de 2017 teremos a ocorrência do segundo eclipse solar que será visível como total numa estreita faixa que atravessará costa a costa os Estados Unidos da América, abrangendo os seguintes estados: Oregon, Idaho, Montana (pequena porção ao sul do Condado de Beaverhead), Wyoming, Nebraska, Kansas, Iowa (pequena porção a sudoeste do condado de Fremont), Missouri, Illinois, Kentucky, Tennessee, Carolina do Norte, Geórgia e Carolina do Sul. ao norte e ao sul dessas localidades o eclipse será visível de forma parcial.

Este evento é observável também em partes da África e Europa. Abaixo as circunstâncias gerais de visibilidade para as capitais do Brasil que serão abrangidas no limite sul.

Cidade	1º Contato			Máximo		4º Contato			Mag.
	Hora (TU)	A.P ⁰	Alt. ⁰	Hora (TU)	Alt. ⁰	Hora (TU)	A.P ⁰	Alt. ⁰	
Aracaju – SE	19 34 23	336	11	20 16 44	1	.. . . .	...	..	0.299
Belém – PA	19 13 25	324	30	20 11 20	16	21 03 27	81	3	0.498
Boa Vista - RR	18 55 52	327	47	20 01 10	31	20 58 58	83	17	0.487
Brasília – DF	19 56 01	2	15	20 17 46	10	20 38 55	42	5	0.063
Fortaleza - CE	19 20 32	322	18	20 13 59	5	.. . . .	...	..	0.509
Goiânia - GO	20 03 13	9	14	20 17 40	11	20 32 01	35	8	0.027
João Pessoa - PB	19 26 29	326	12	20 15 11	0	.. . . .	...	..	0.432
Macapá – AP	19 09 11	324	34	20 09 24	19	21 03 16	83	6	0.514
Maceió – AL	19 31 02	322	11	20 16 08	0	.. . . .	...	..	0.353
Manaus - AM	19 13 04	339	40	20 07 09	28	20 56 05	71	16	0.323
Natal – RN	19 24 20	324	13	20 14 43	1	.. . . .	...	..	0.468
Palmas – TO	19 34 58	344	22	20 16 12	12	20 54 36	61	3	0.230
Porto Velho - RO	19 34 39	359	37	20 08 11	29	20 39 55	52	22	0.110
Recife – PE	19 28 15	328	11	20 15 32	0	.. . . .	...	..	0.402
Rio Branco - AC	19 50 11	14	37	20 05 40	33	20 21 05	37	30	0.022
Salvador - BA	19 39 20	342	11	20 17 20	2	.. . . .	...	..	0.230
São Luís - MA	19 17 16	323	24	20 13 02	11	.. . . .	...	..	0.500
Teresina - PI	19 22 22	327	11	20 14 35	9	.. . . .	...	..	0.437



Ocultações de Estrelas pela Lua – 2017

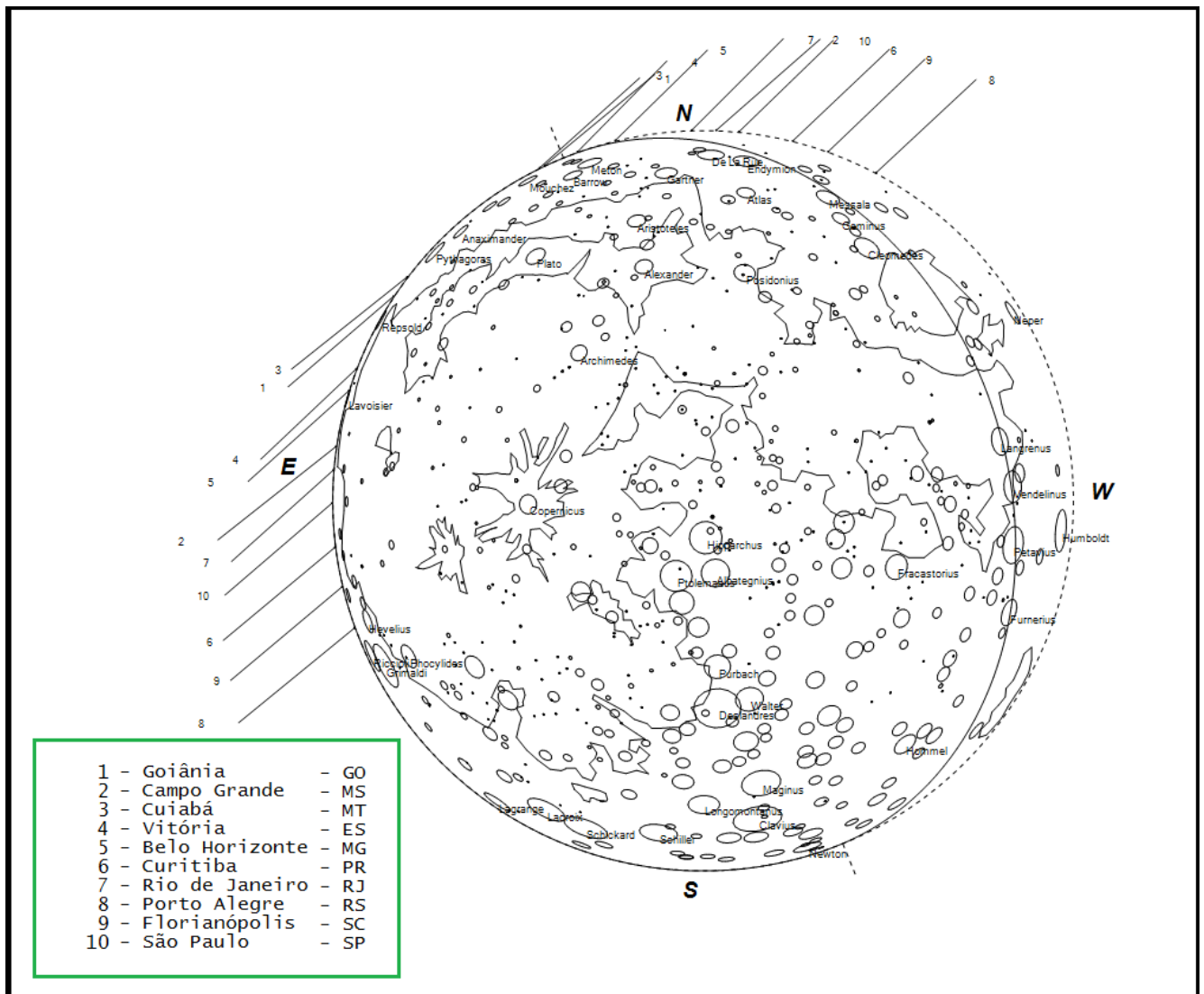
Data: 15 Jan 2017

Regulus - Magnitude 1.41

Lua: % iluminado = 91 (-), Elongação do Sol = 145°

Cidade	Desaparecimento							Reaparecimento					
	Hora (T.U)	Sol Alt.	Lua Alt. Az.	AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt. Az.	AC °	AP °	AV °	
Belo Horizonte - MG	03 14 10		45 48	-30N	51	28	03 57 41		52 36	29N	352	329	
Campo Grande - MS	02 49 55		31 61	-39N	59	37	03 44 03		42 51	44N	336	314	
Cuiabá - MT	02 58 58		34 63	-10N	31	9	03 18 00		38 60	17N	3	341	
Curitiba - PR	02 58 26		35 53	-55N	75	53	04 07 49		46 36	56N	324	302	
Florianópolis - SC	03 00 32		34 51	-61N	81	59	04 14 19		45 32	62N	318	296	
Goiânia - GO	03 10 07		42 56	-14N	34	12	03 32 30		46 52	16N	4	342	
Porto Alegre - RS	02 57 36		30 52	-68N	88	66	04 13 59		42 34	70N	310	288	
Rio de Janeiro - RJ	03 12 07		43 46	-43N	63	41	04 10 48		51 29	41N	340	317	
São Paulo - SP	03 03 40		38 51	-48N	68	46	04 07 30		48 34	48N	332	310	
Vitória - ES	03 25 17		49 41	-27N	47	25	04 02 53		54 29	23N	358	335	

Circunstâncias de Desaparecimento e Reaparecimento



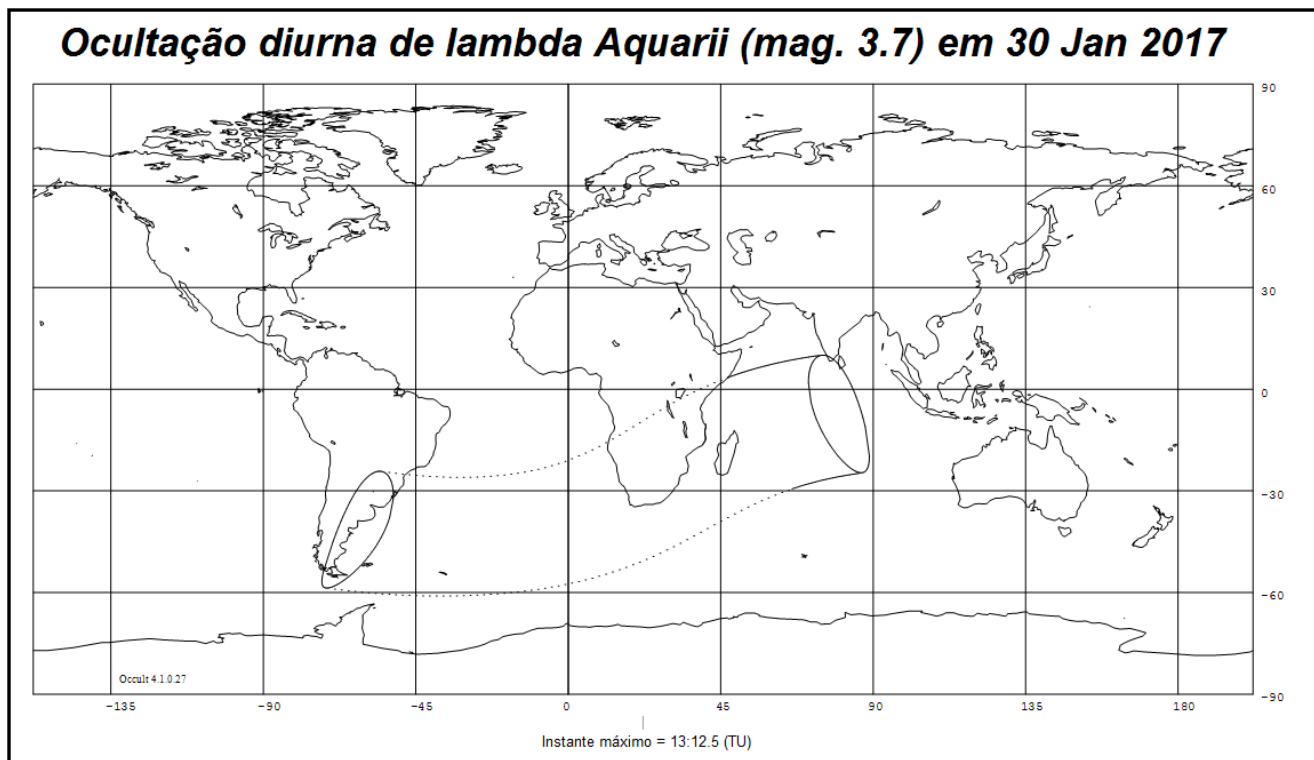
Data: 30 Jan 2017

Lambda Aquarii - Magnitude 3.7

Lua: % iluminado = 7 (+), Elongação do Sol = 31°

Cidade	Desaparecimento							Reaparecimento						
	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC °	AP °	AV °
Curitiba - PR	11 36 08	35	4	96	20N	358	113	11 48 50	38	7	95	-6N	333	87
Florianópolis - SC	11 27 50	34	3	97	40N	18	42	11 59 45	41	10	93	-27N	312	69
Porto Alegre - RS								12 05 35	40	10	93	-40	298	57

Circunstâncias global de visibilidade



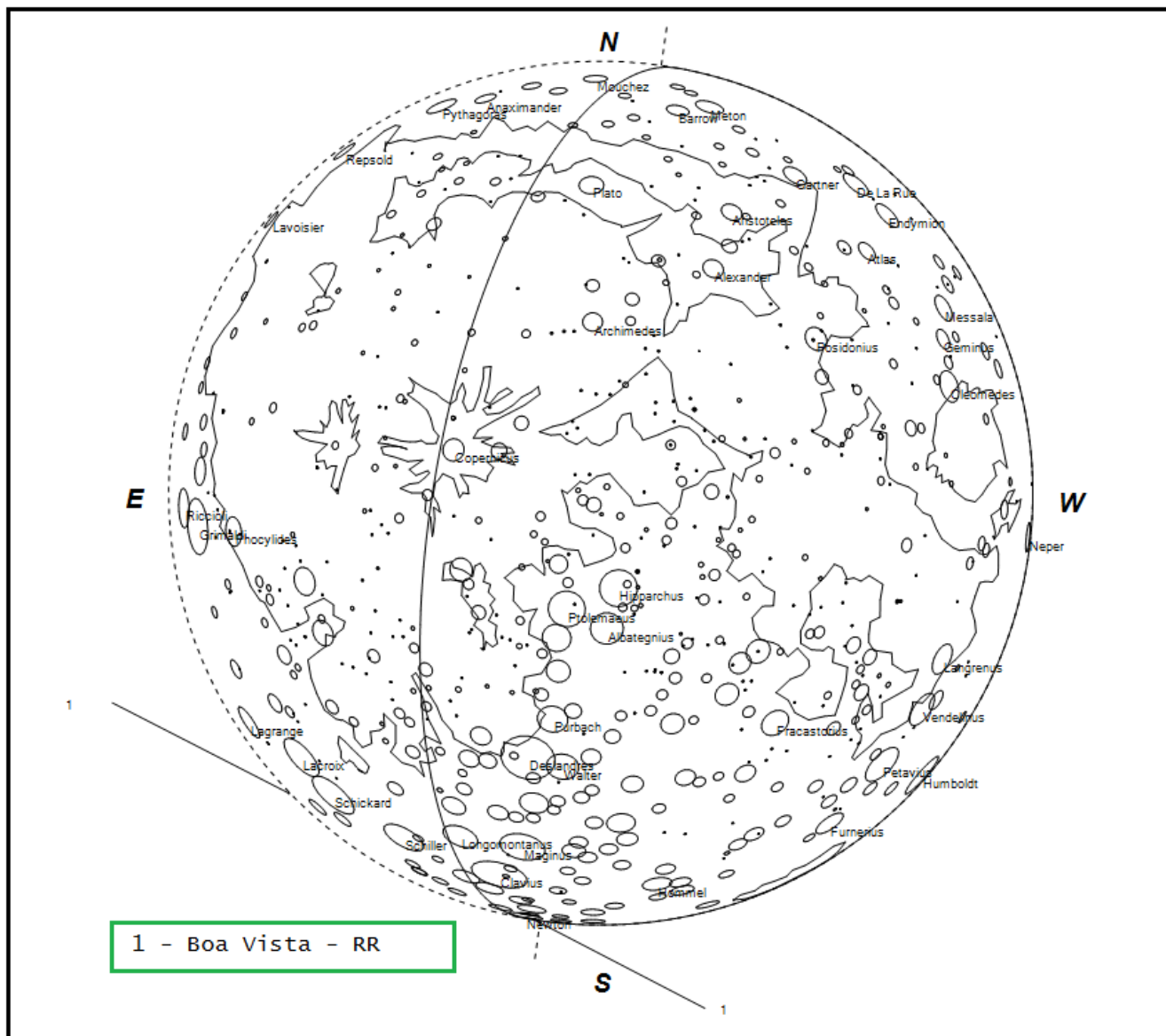
Data: 05 Fev 2017

Aldebaran - Magnitude 0.99

Lua: % iluminado = 69 (+), Elongação do Sol = 112°

Cidade	Desaparecimento							Reaparecimento						
	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC °	AP °	AV °
Boa Vista – RR	19 59 27	32	35	72	28S	142	150	20 23 09	26	41	70	-10S	180	188

Circunstâncias de Desaparecimento e Reaparecimento



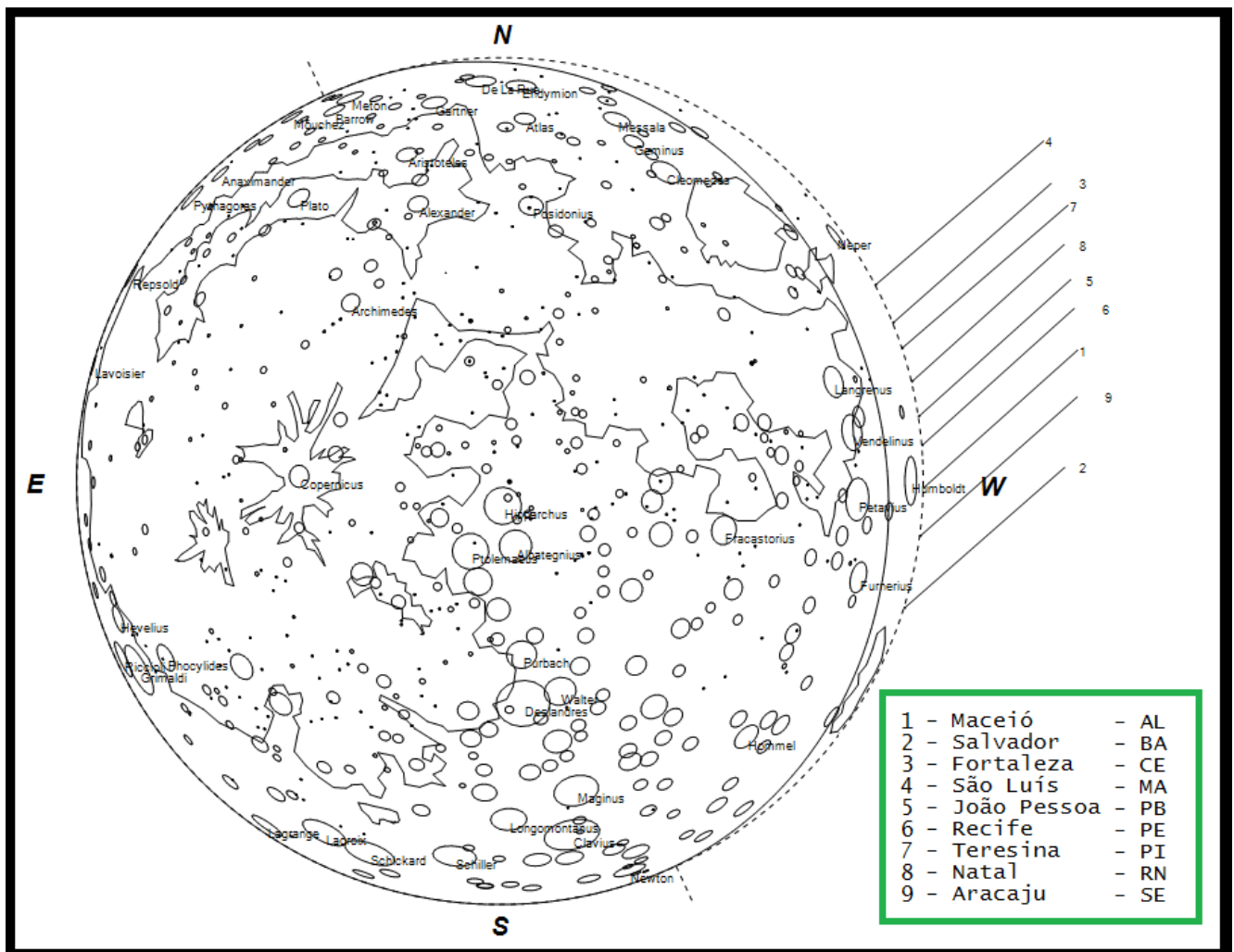
Data: 12 Fev 2017

Sigma Leonis – Magnitude 4.1

Lua: % iluminado = 96 (-), Elongação do Sol = 156

Cidade	Desaparecimento						Reaparecimento					
	Hora (T.U)	Sol Alt.	Lua Alt. Az.	AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt. Az.	AC °	AP °	AV °
Aracaju - SE							23 00 32		9 82	39S	238	213
Fortaleza - CE							23 03 01		9 83	68S	267	243
João Pessoa - PB							23 03 59		13 82	55S	254	230
Maceió - AL							23 02 21		11 82	46S	245	220
Natal - RN							23 04 11		13 83	60S	259	234
Recife - PE							23 03 35		13 82	51S	250	226
Salvador - BA							22 57 32		7 82	29S	228	203
São Luís - MA							23 01 31		4 84	74S	273	248
Teresina - PI							23 01 54		5 84	65S	264	239

Circunstâncias de Reaparecimento



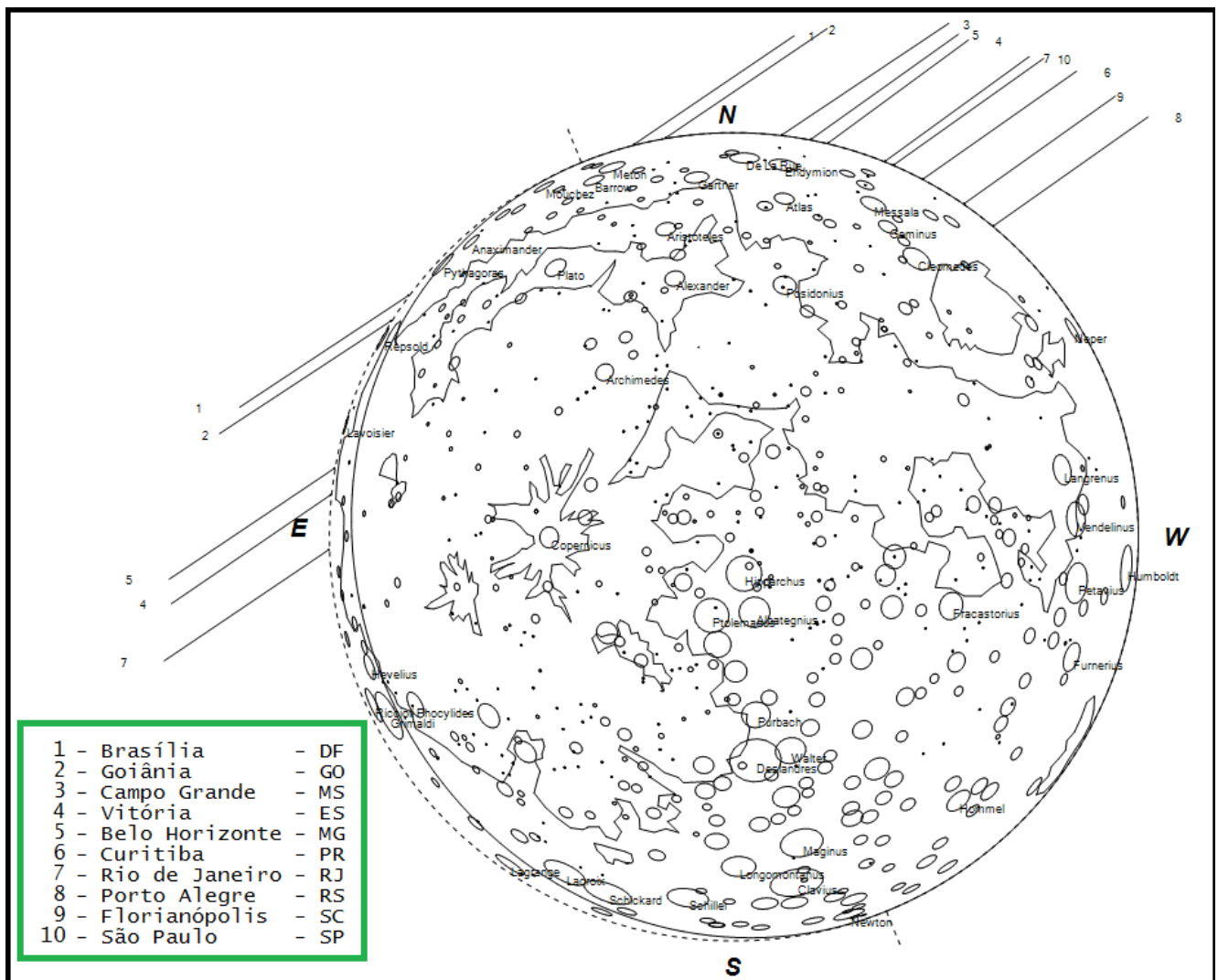
Data: 10 Mar 2017

Regulus - Magnitude 1.41

Lua: % iluminado = 97 (+), Elongação do Sol = 159°

Cidade	Desaparecimento						Reaparecimento							
	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC °	AP °	AV °
Belo Horizonte - MG	20 42 30	7	8	74	37N	58	36	21 30 01	-4	19	69	-55N	327	305
Brasília - DF	20 49 02	9	7	76	10N	31	9	21 10 17	4	12	74	-29N	352	330
Campo Grande - MS								21 21 20	8	7	75	-50N	331	309
Curitiba - PR								21 37 43	-1	14	70	-72N	310	288
Florianópolis - SC								21 42 46	-2	15	68	-79N	303	281
Goiânia - GO	20 47 00	11	5	76	14N	36	13	21 12 36	4	11	74	-34N	348	325
Porto Alegre - RS								21 44 41	0	12	69	-84N	298	276
Rio de Janeiro - RJ	20 42 11	6	8	74	48N	70	48	21 38 21	-7	20	67	-66N	316	294
São Paulo - SP								21 36 21	-3	16	69	-67N	315	292
Vitória - ES	20 43 34	3	11	73	41N	62	40	21 35 18	-9	23	67	-57N	324	302

Circunstâncias de Desaparecimento e Reaparecimento



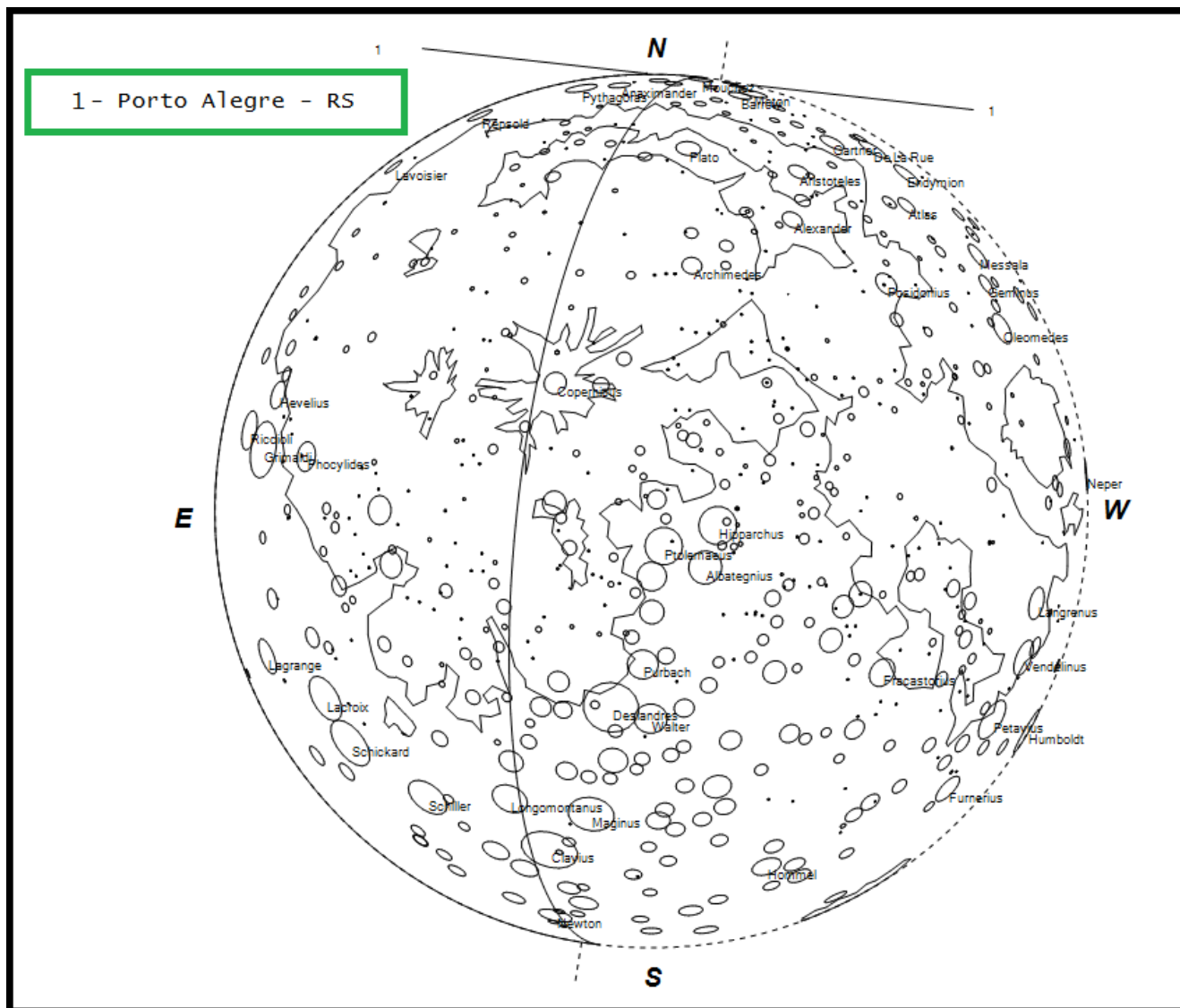
Data: 22 Mar 2017

rho Sagittarii - Magnitude 3.9

Lua: % iluminado = 35 (-), Elongação do Sol = 72°

Cidade	Desaparecimento							Reaparecimento						
	Hora (T.U)	Sol Alt.	Lua Alt.	Lua Az.	AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt.	Lua Az.	AC °	AP °	AV °
Barra do Chuí - RS								05 08 30		12	103	30N	323	332
Chuí - RS								05 08 24		12	104	30N	323	332
Porto Alegre - RS	04 41 48		7	106	-17N	10	19	04 48 46		9	105	-3N	356	5
S. Vit. do Palmar - RS								05 07 51		12	104	30N	324	333

Circunstâncias de Desaparecimento e Reaparecimento



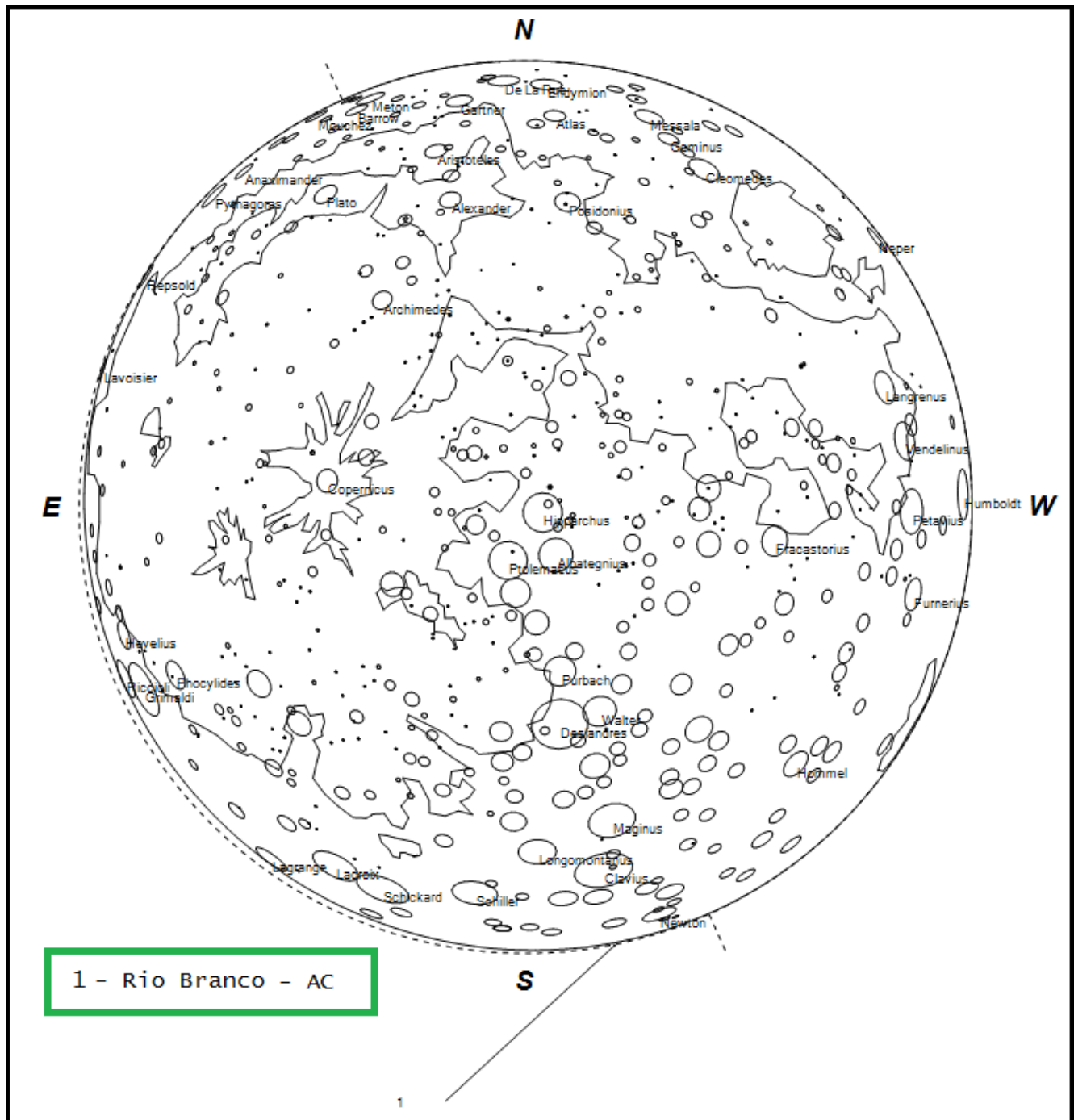
Data: 10 Abr 2017

Porrima – (gamma Virginis) - Magnitude 2.8

Lua: % iluminado = 99 (+), Elongação do Sol = 169°

	Desaparecimento							Reaparecimento						
	Hora	Sol	Lua		AC	AP	AV	Hora	Sol	Lua		AC	AP	AV
Cidade	(T.U)	Alt.	Alt.	Az.	0	0	0	(T.U)	Alt.	Alt.	Az.	0	0	0
Rio Branco – AC	09 56 07	-10	1	269	52S	167	143							

Circunstâncias de Desaparecimento



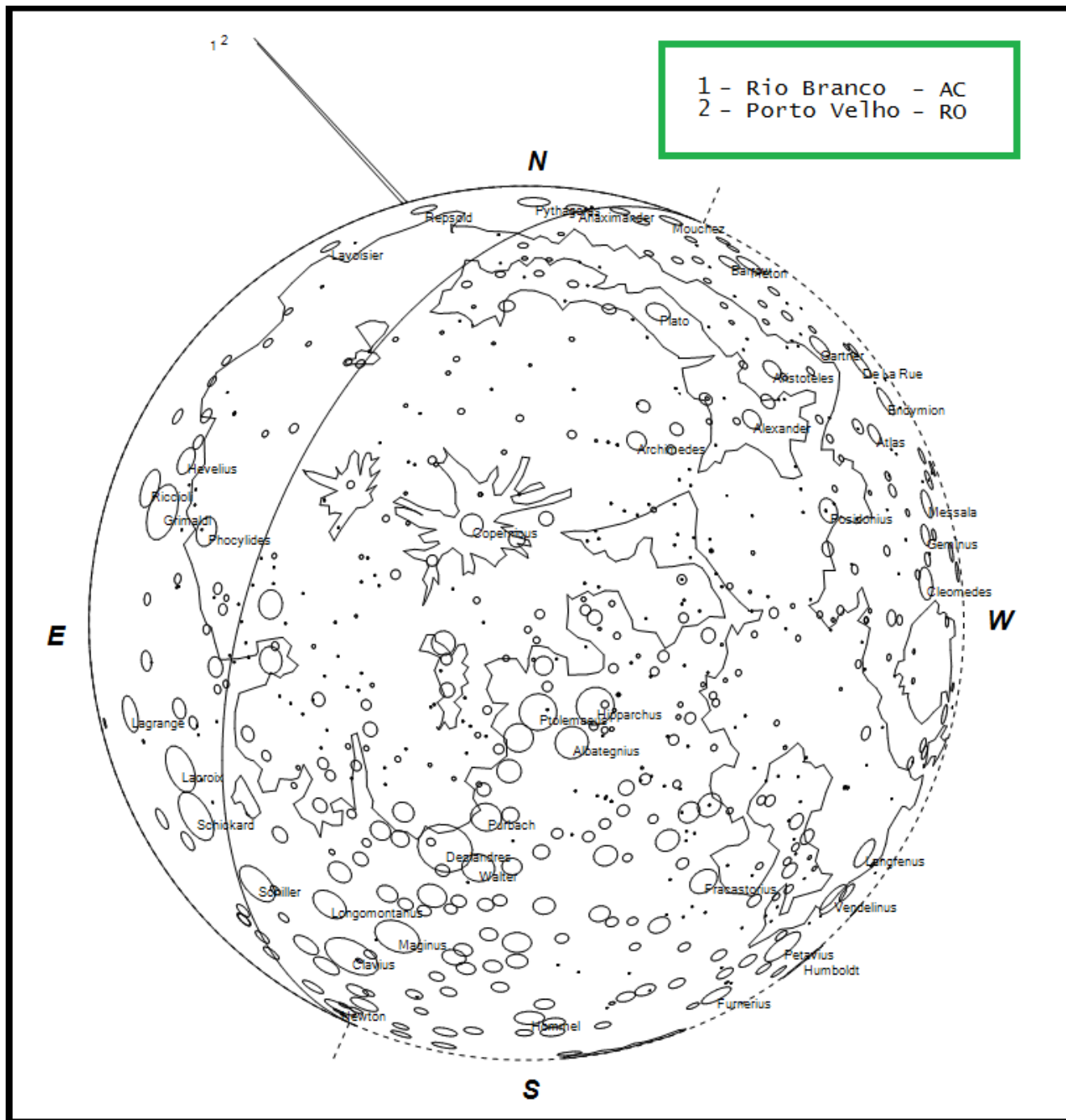
Data: 22 Abr 2017

lambda Aquarii - Magnitude 3.7

Lua: % iluminado = 18 (-), Elongação do Sol = 51°

Cidade	Desaparecimento							Reaparecimento						
	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC °	AP °	AV °
Porto Velho - RO	18 00 40	56	17	265	-63N	40	64							
Rio Branco - AC	17 57 18	59	22	266	-63N	40	64							

Circunstâncias de Desaparecimento



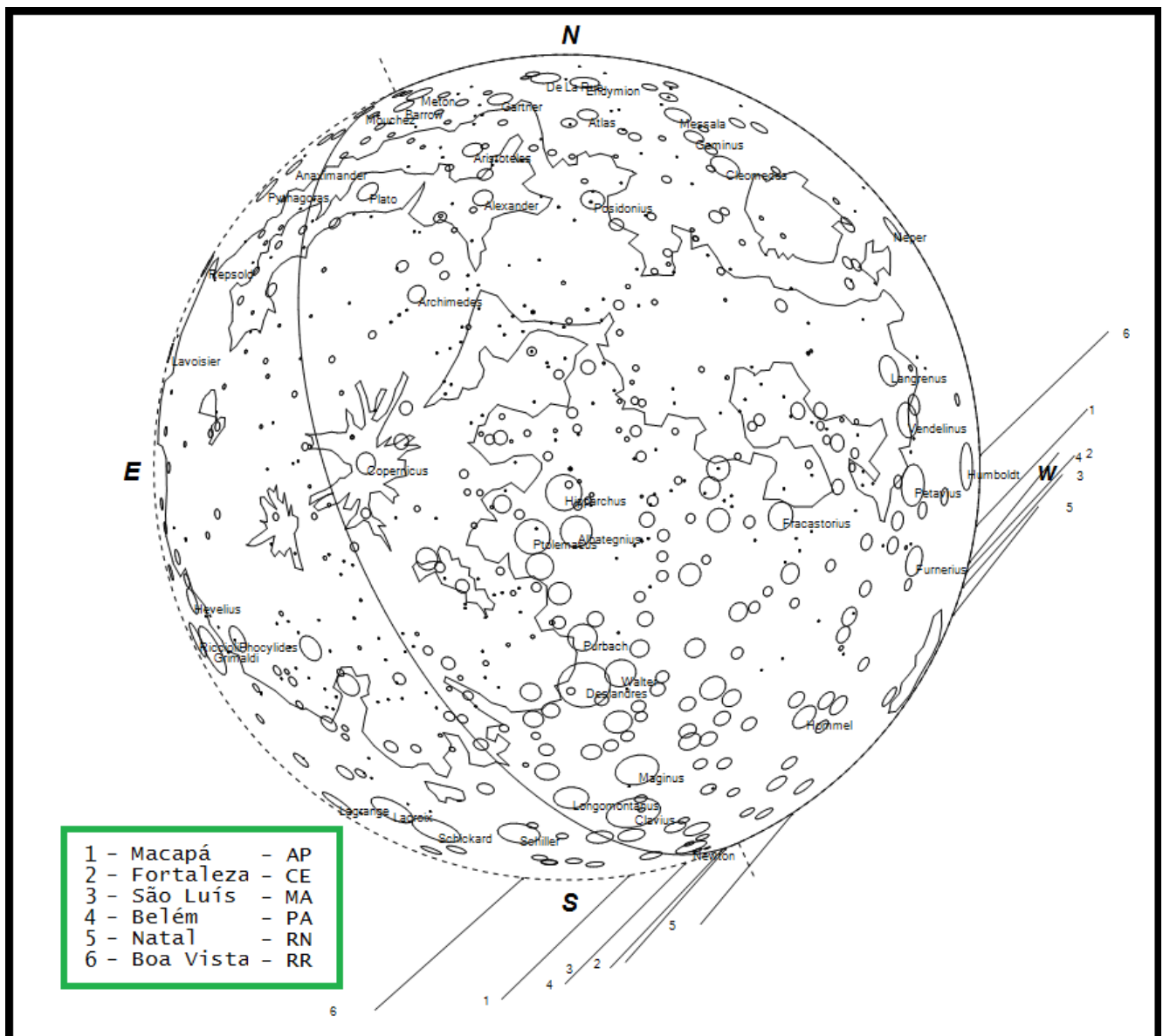
Data: 05 Mai 2017

Sigma Leonis - Magnitude 4.1

Lua: % iluminado = 77 (+), Elongação do Sol = 123°

Cidade	Desaparecimento							Reaparecimento						
	Hora (T.U)	Sol Alt.	Lua Alt. Az.	AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt. Az.	AC °	AP °	AV °		
Belém - PA	19 34 03	23	28 83	32S	172	148	20 12 04	14	37 81	-27S	231	206		
Boa Vista - RR	19 11 12	41	11 84	55S	149	125	20 02 01	29	23 85	-43S	247	223		
Fortaleza - CE	19 54 22	8	43 78	26S	178	153	20 34 08	-2	52 75	-28S	232	208		
Macapá - AP	19 25 53	27	24 84	40S	164	139	20 10 33	17	35 83	-33S	237	213		
Natal - RN	20 10 46	0	49 74	16S	188	164	20 38 44	-7	56 70	-20S	225	200		
São Luís - MA	19 43 33	16	34 81	27S	177	153	20 18 55	8	43 79	-24S	229	204		

Circunstâncias de Desaparecimento e Reaparecimento



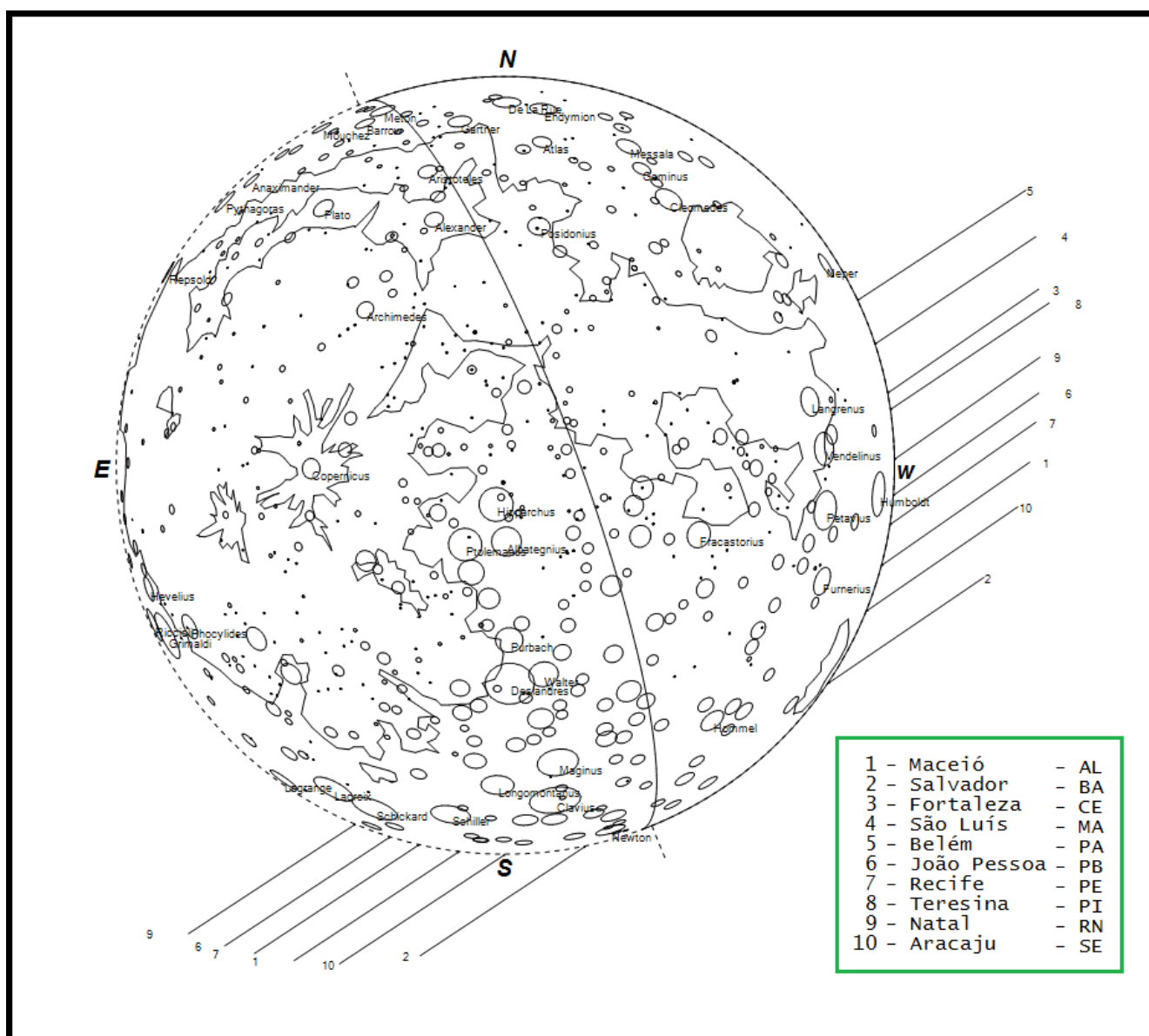
Data: 31 Mai 2017

Regulus - Magnitude 1.4

Lua: % iluminado = 41 (+), Elongação do Sol = 79°

Cidade	Desaparecimento							Reaparecimento						
	Hora (T.U)	Sol Alt.	Lua Alt.	Lua Az.	AC 0	AP 0	AV 0	Hora (T.U)	Sol Alt.	Lua Alt.	Lua Az.	AC 0	AP 0	AV 0
Aracaju - SE	14 37 36	57	7	76	43S	158	136	15 13 50	55	15	74	-25S	226	204
Belém - PA								15 15 35	67	7	78	-72S	273	251
Fortaleza - CE								15 19 49	62	17	76	-58S	259	236
João Pessoa - PB	14 29 03	61	8	77	60S	141	118	15 20 19	57	20	75	-43S	244	221
Maceió - AL	14 34 08	78	7	77	50S	151	129	15 16 57	56	18	74	-33S	233	211
Natal - RN	14 26 30	62	7	77	65S	135	113	15 21 04	58	20	75	-48S	249	227
Recife - PE	14 31 17	60	8	77	55S	145	123	15 19 19	56	19	74	-39S	239	217
Salvador - BA	14 44 17	55	7	76	31S	170	147	15 08 32	54	12	75	-13S	214	192
São Luís - MA								15 17 05	65	11	77	-66S	266	244
Teresina - PI								15 17 10	62	12	77	-56S	256	234

Circunstâncias de Desaparecimento e Reaparecimento



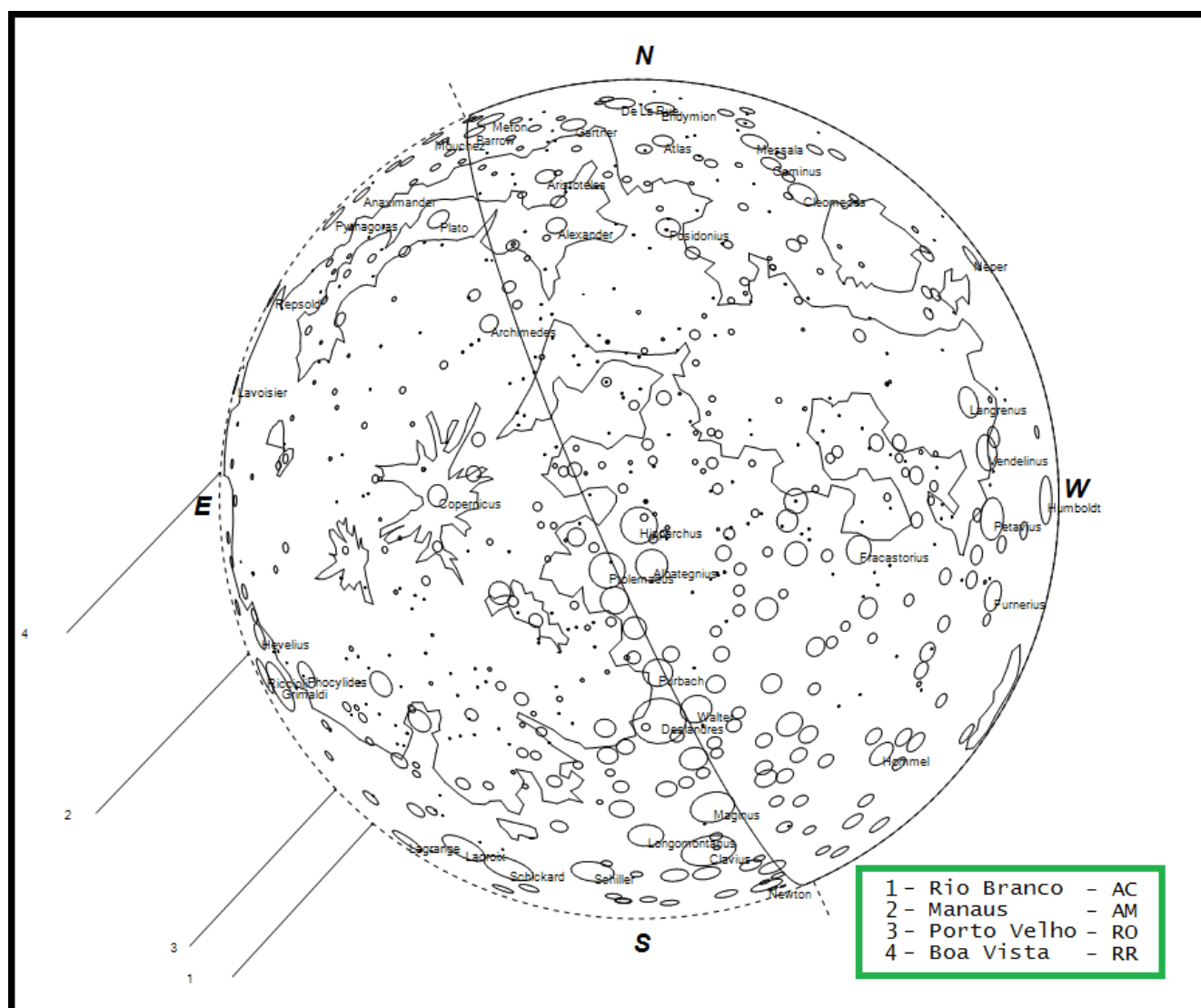
Data: 02 Jun 2017

Sigma Leonis - Magnitude 4.1

Lua: % iluminado = 56 (+), Elongação do Sol = 97°

Cidade	Desaparecimento							Reaparecimento					
	Hora (T.U)	Sol Alt.	Lua Alt. Az.	AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt. Az.	AC °	AP °	AV °	
Boa Vista – RR	04 23 07		5 276	39N	62	37							
Manaus - AM	04 19 33		4 276	64N	87	63							
Porto Velho - RO	04 19 09		8 277	86N	109	85							
Rio Branco - AC	04 18 42		11 278	87S	116	92							

Circunstâncias de Desaparecimento e Reaparecimento



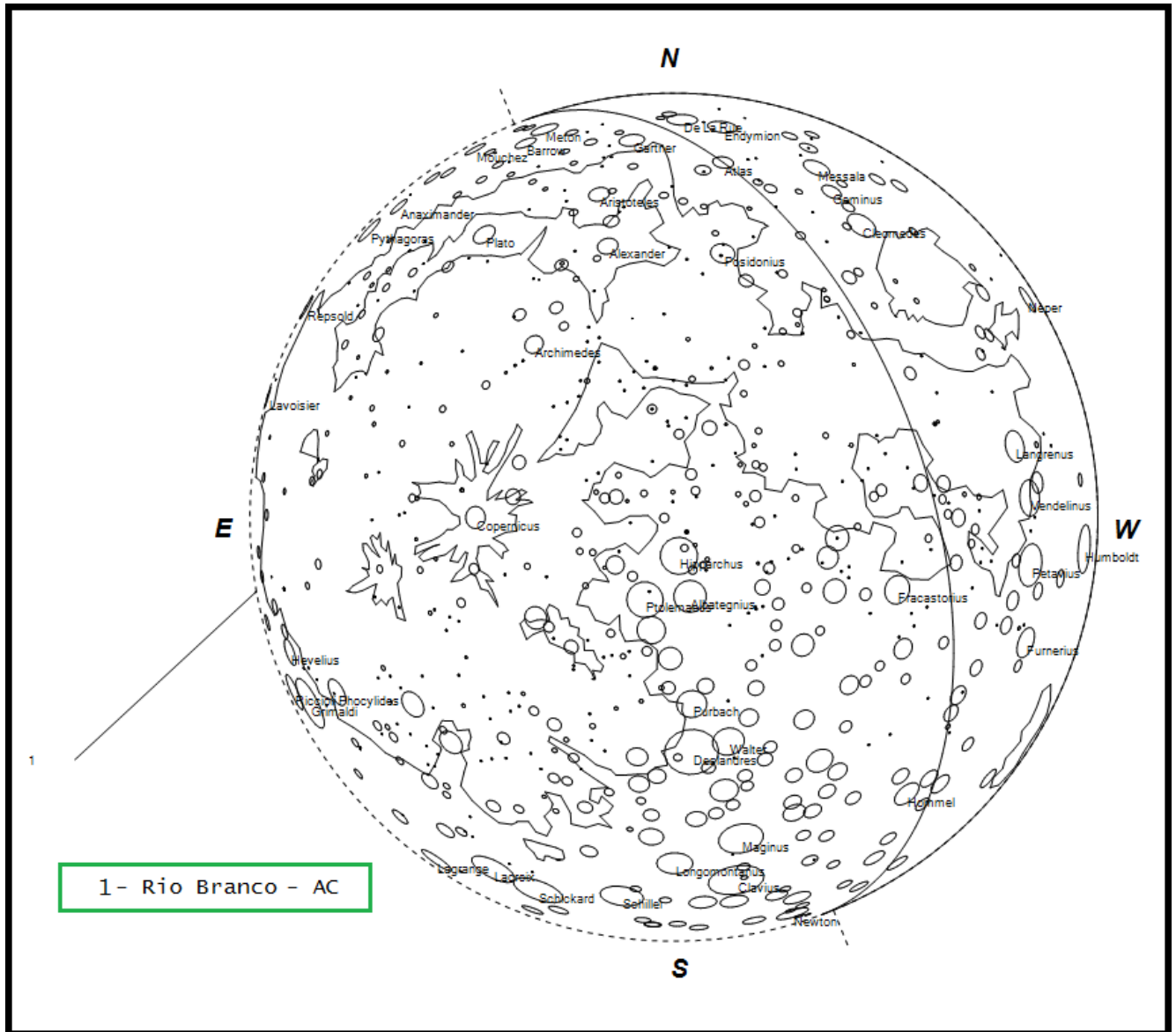
Data: 27 Jun 2017

Regulus - Magnitude 1.4

Lua: % iluminado = 20 (+), Elongação do Sol = 53°

Cidade	Desaparecimento						Reaparecimento						
	Hora (T.U)	Sol Alt.	Lua Alt. Az.	AC 0	AP 0	AV 0	Hora (T.U)	Sol Alt.	Lua Alt. Az.	AC 0	AP 0	AV 0	
Boa Vista - RR	02 05 11		0 282	58N	78	56							

Circunstâncias de Desaparecimento



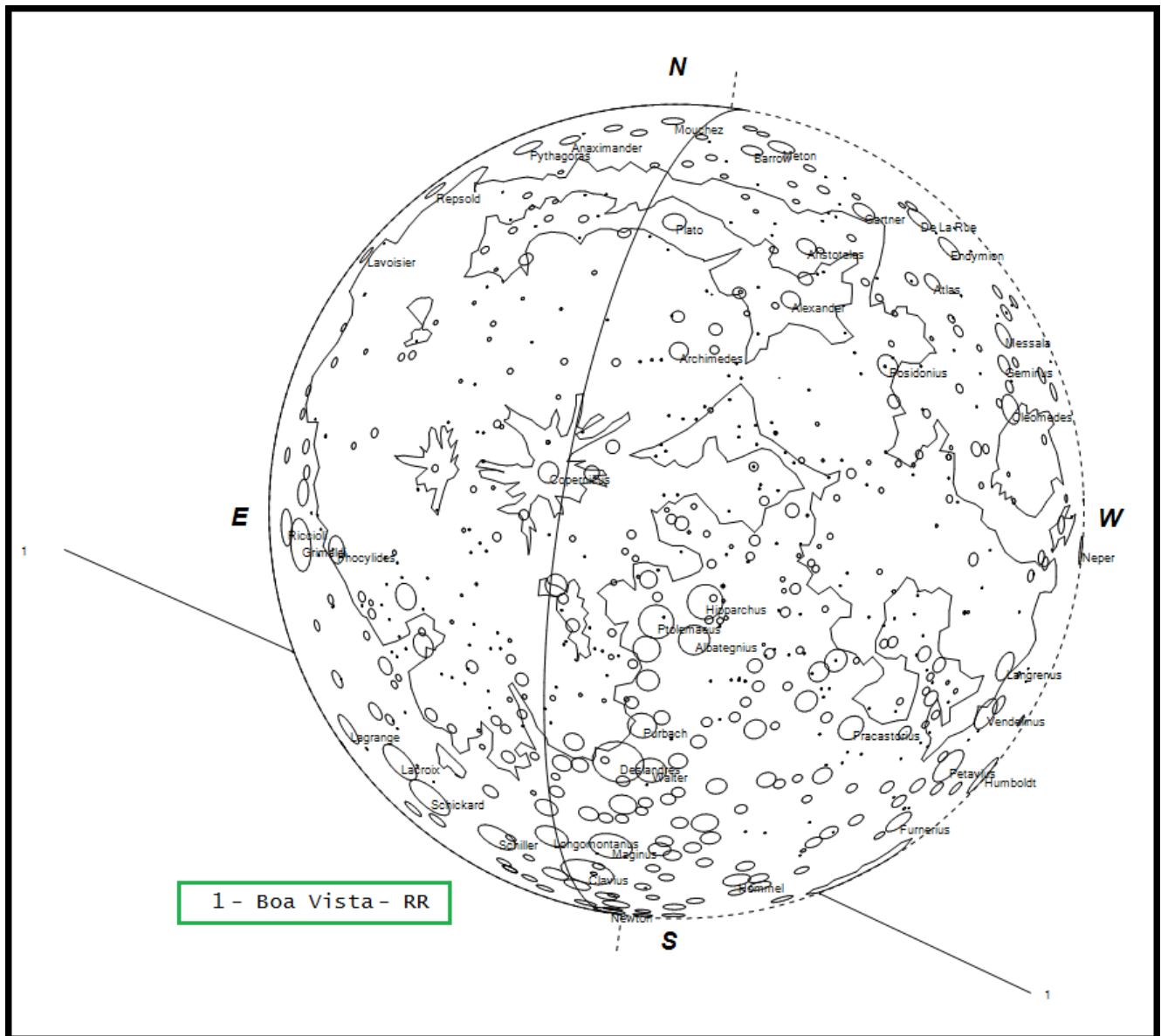
Data: 16 Ago 2017

Aldebaran - Magnitude 0.99

Lua: % iluminado = 36 (-), Elongação do Sol = 74°

Cidade	Desaparecimento							Reaparecimento						
	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC 0	AP 0	AV 0	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC 0	AP 0	AV 0
Boa Vista - RR	04 57 48		0	76	-52S	118	126	05 36 38		9	74	38S	208	216

Circunstâncias de Desaparecimento e Reaparecimento



Ocultações planetárias pela Lua – 2017

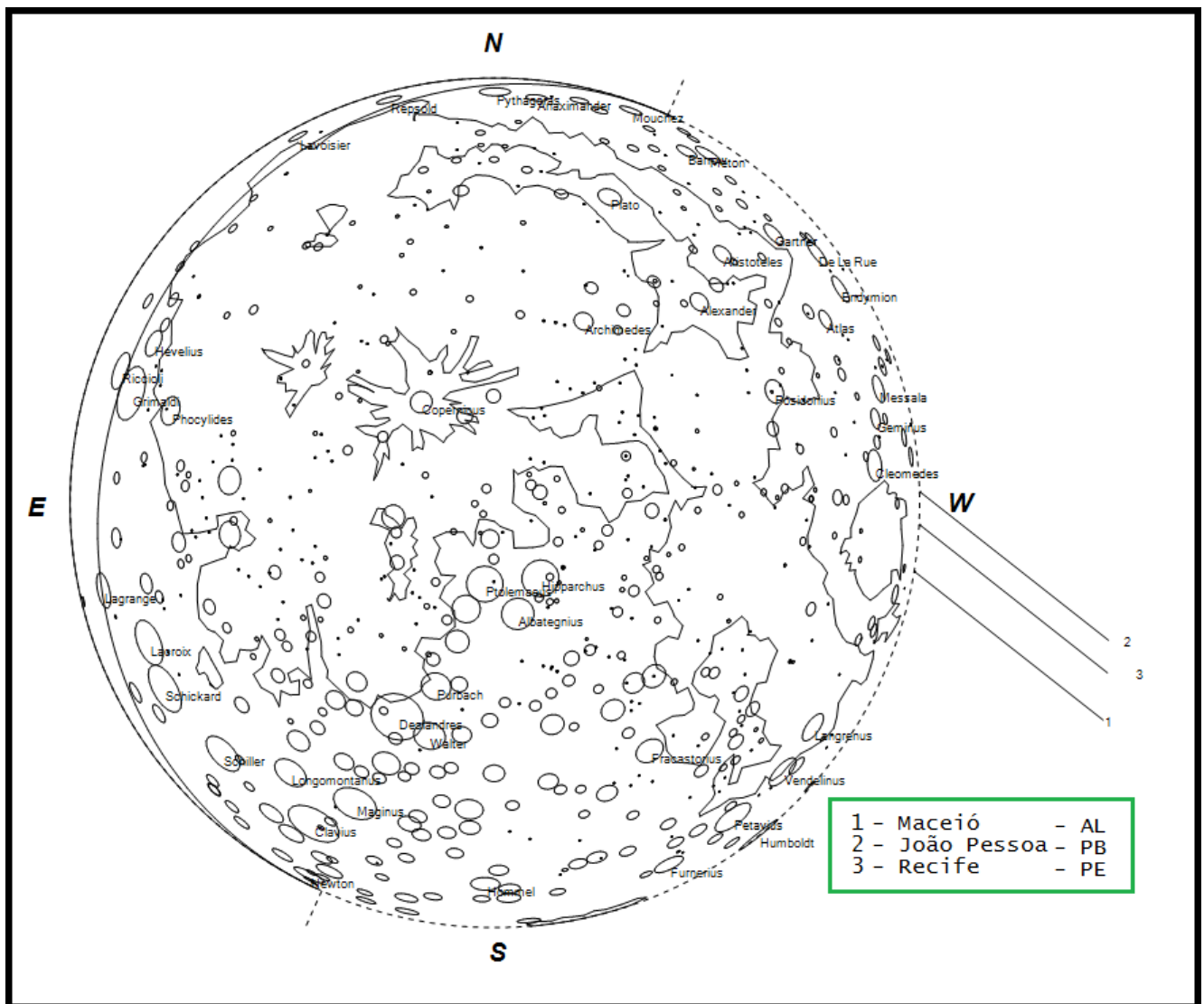
Data: 26 Mar 2017

Netuno (Magnitude 8.0)

Lua: % iluminado = 4 (-), Elongação do Sol = 23°

Cidade	Desaparecimento						Reaparecimento							
	Hora (T.U)	Sol Alt.	Lua Alt.	Lua Az.	AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt.	Lua Az.	AC °	AP °	AV °
João Pessoa – PB								07 03 19		1	97	40N	295	320
Maceió – AL								07 05 51		2	97	50N	285	309
Recife - PE								07 04 31		2	97	44N	291	315

Circunstâncias de Reaparecimento



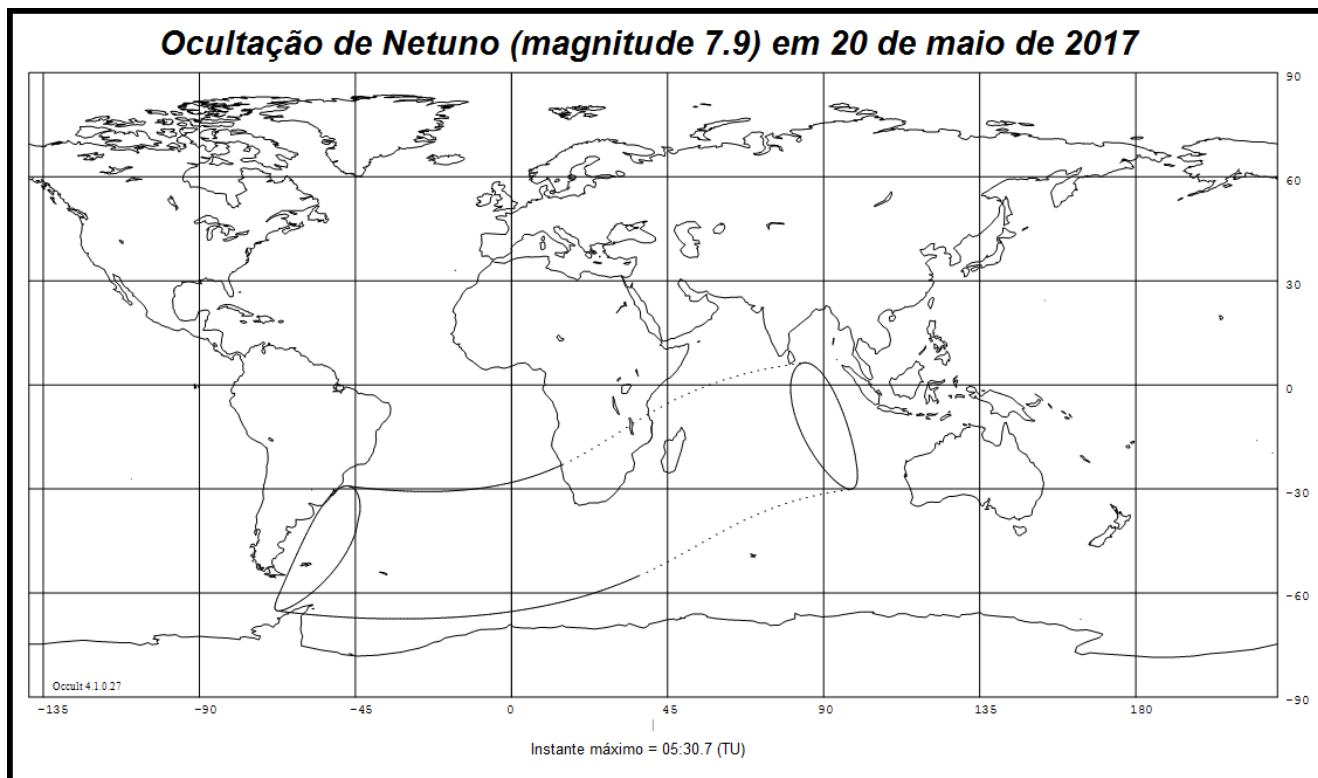
Data: 20 Mai 2017

Netuno (Magnitude 7.9)

Lua: Lua: % iluminado = 37 (-), Elongação do Sol = 75°

Cidade	Desaparecimento							Reaparecimento						
	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC °	AP °	AV °
Barra do Chuí – RS								04 26 19		0	98	39N	298	62
Chuí – RS								04 26 13		0	98	39N	298	62
S. Vit. do Palmar - RS								04 25 51		0	98	38N	299	63

Circunstâncias global de visibilidade



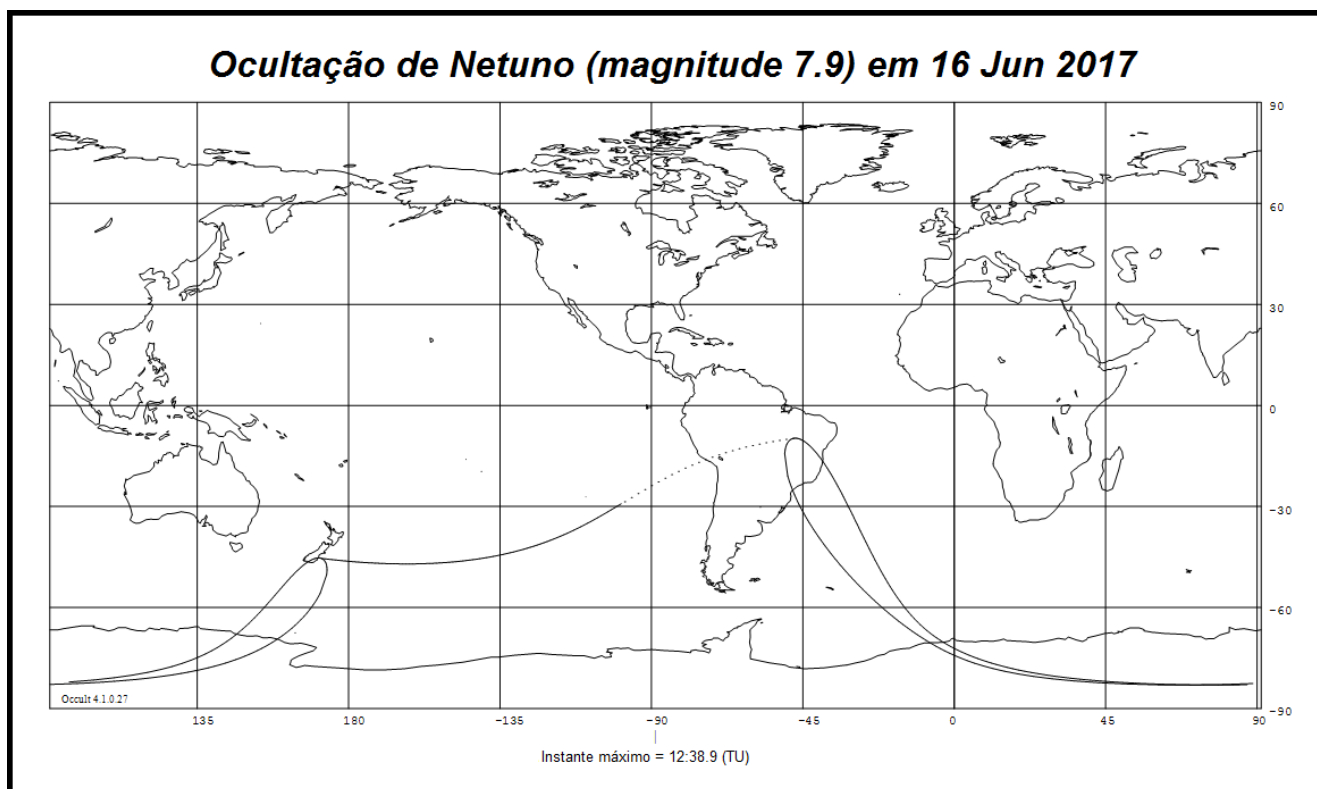
Data: 16 Jun 2017

Netuno (Magnitude 7.9)

Lua: % iluminado = 60 (-), Elongação do Sol = 102°

Cidade	Desaparecimento							Reaparecimento						
	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt. Az.		AC °	AP °	AV °
Belo Horizonte - MG	14 02 23	45	6	265	-64N	42	293							
Brasília - DF	14 11 31	48	7	265	-48N	26	281							
Campo Grande - MS	14 00 55	40	17	269	-59N	36	287	14 51 59	45	5	264	58N	279	169
Cuiabá - MT	14 13 12	45	15	267	-40N	18	273	14 51 32	49	6	264	39N	298	193
Curitiba - PR	13 52 09	37	14	269	-77N	54	300							
Florianópolis - SC	13 48 24	35	14	269	-83N	60	304							
Goiânia - GO	14 09 50	47	9	265	-50N	28	282							
Palmas - TO	14 32 03	55	2	263	-14N	352	252							
Porto Alegre - RS	13 43 56	32	17	272	-86N	64	305	14 43 23	36	4	264	85N	253	133
Rio de Janeiro - RJ	13 56 56	42	7	265	-73N	51	299							
São Paulo - SP	13 55 35	40	11	267	-74N	51	298							
Vitória - ES	14 01 18	45	3	264	-67N	45	295							

Circunstâncias global de visibilidade



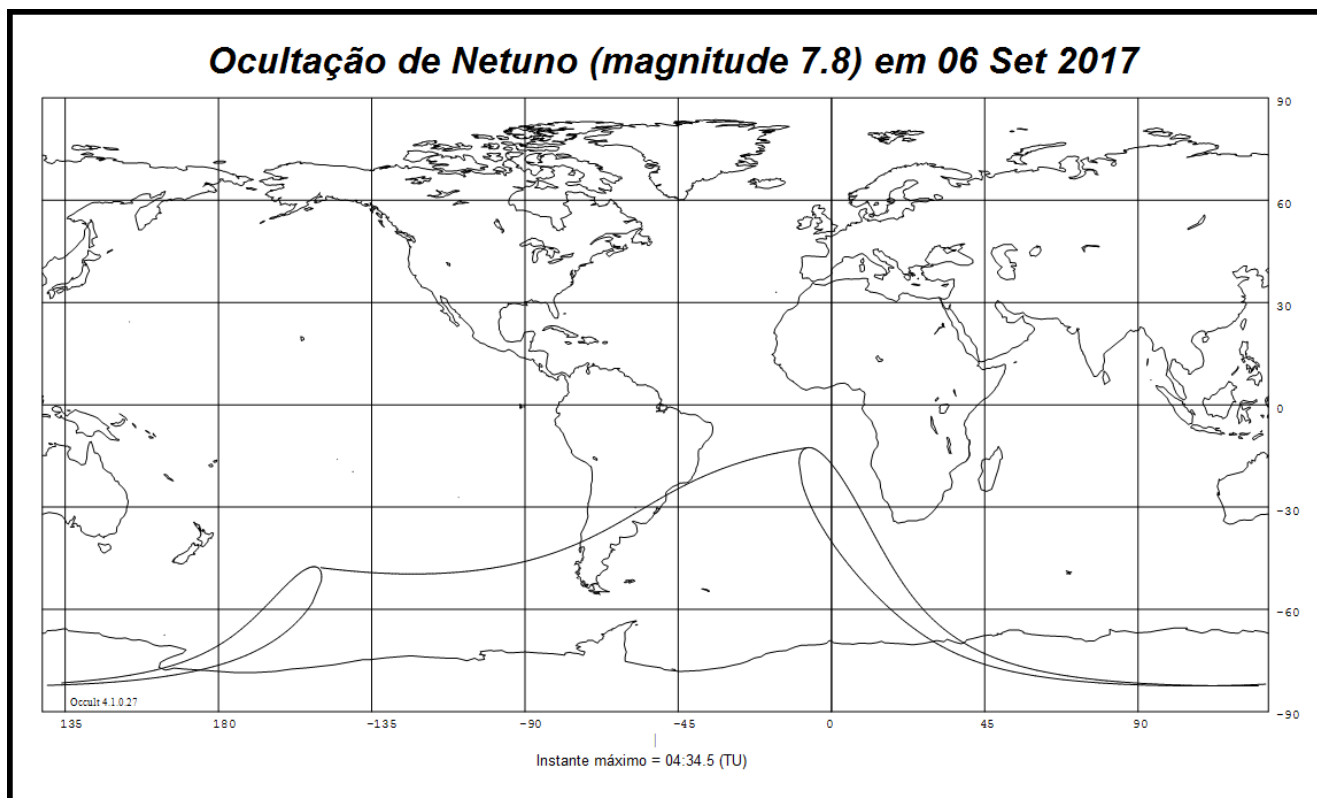
Data: 06 Set 2017

Netuno (Magnitude 7.8)

Lua: % iluminado = 100 (+), Elongação do Sol = 178°

Cidade	Desaparecimento						Reaparecimento					
	Hora (T.U)	Sol Alt.	Lua Alt. Az.	AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt. Az.	AC °	AP °	AV °
Barra do Chuí - RS	05 07 43		56 313	77N	8	226	05 54 06		48 300	13N	297	164
Chuí - RS	05 07 54		56 313	77N	8	226	05 53 50		48 300	13N	297	164
Florianópolis - SC	05 36 34		50 293	61N	351	226	06 00 40		45 288	29N	314	193
Porto Alegre - RS	05 25 13		53 301	66N	356	225	05 56 44		47 293	24N	309	182
S. Vit. do Palmar - RS	05 08 33		56 313	76N	7	226	05 54 04		48 299	13N	297	165

Circunstâncias global de visibilidade



Ocultação do Planeta Menor (1) Ceres – 2017

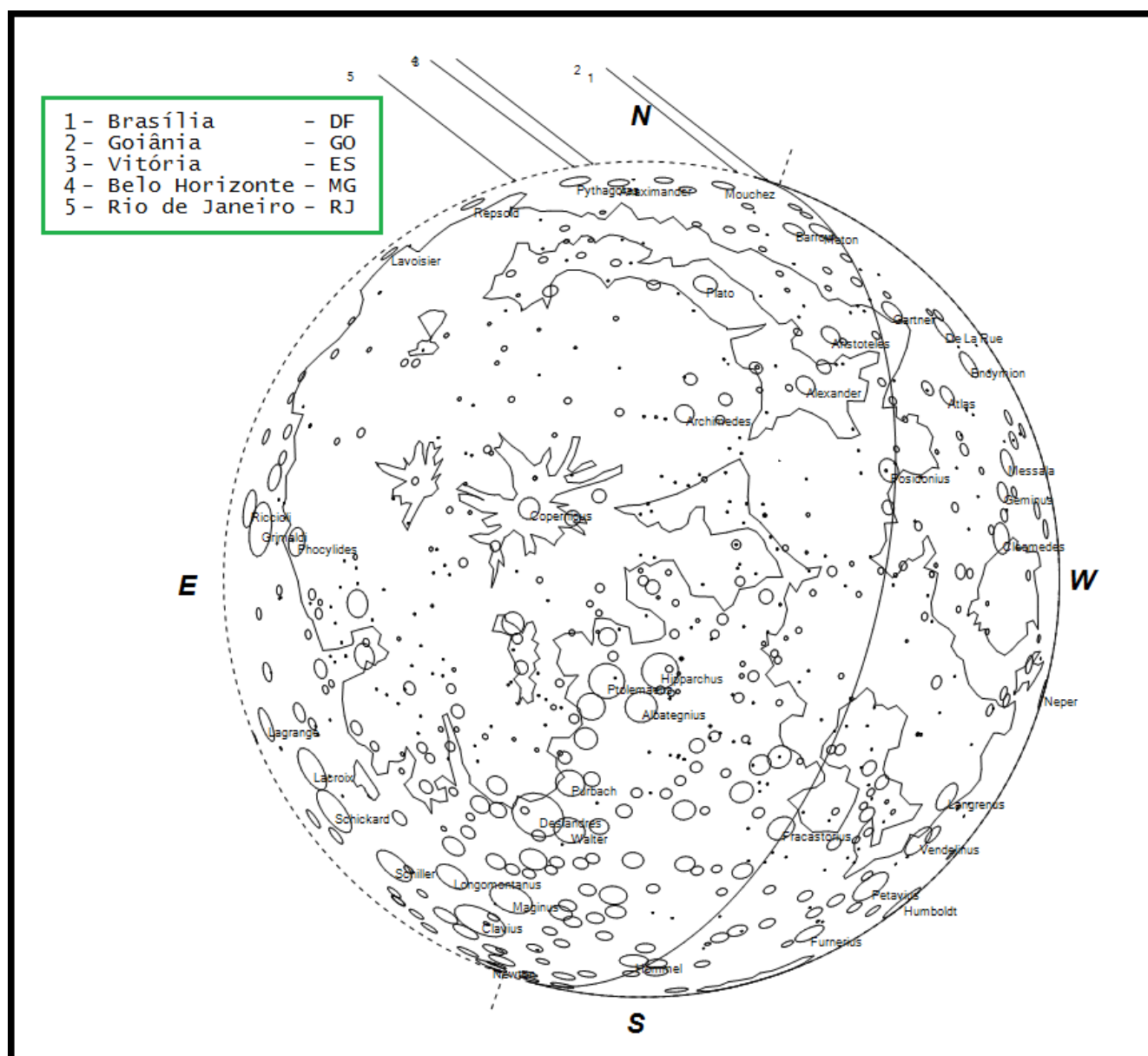
Data: 02 Mar 2017

(1) Ceres (Magnitude 9.0)

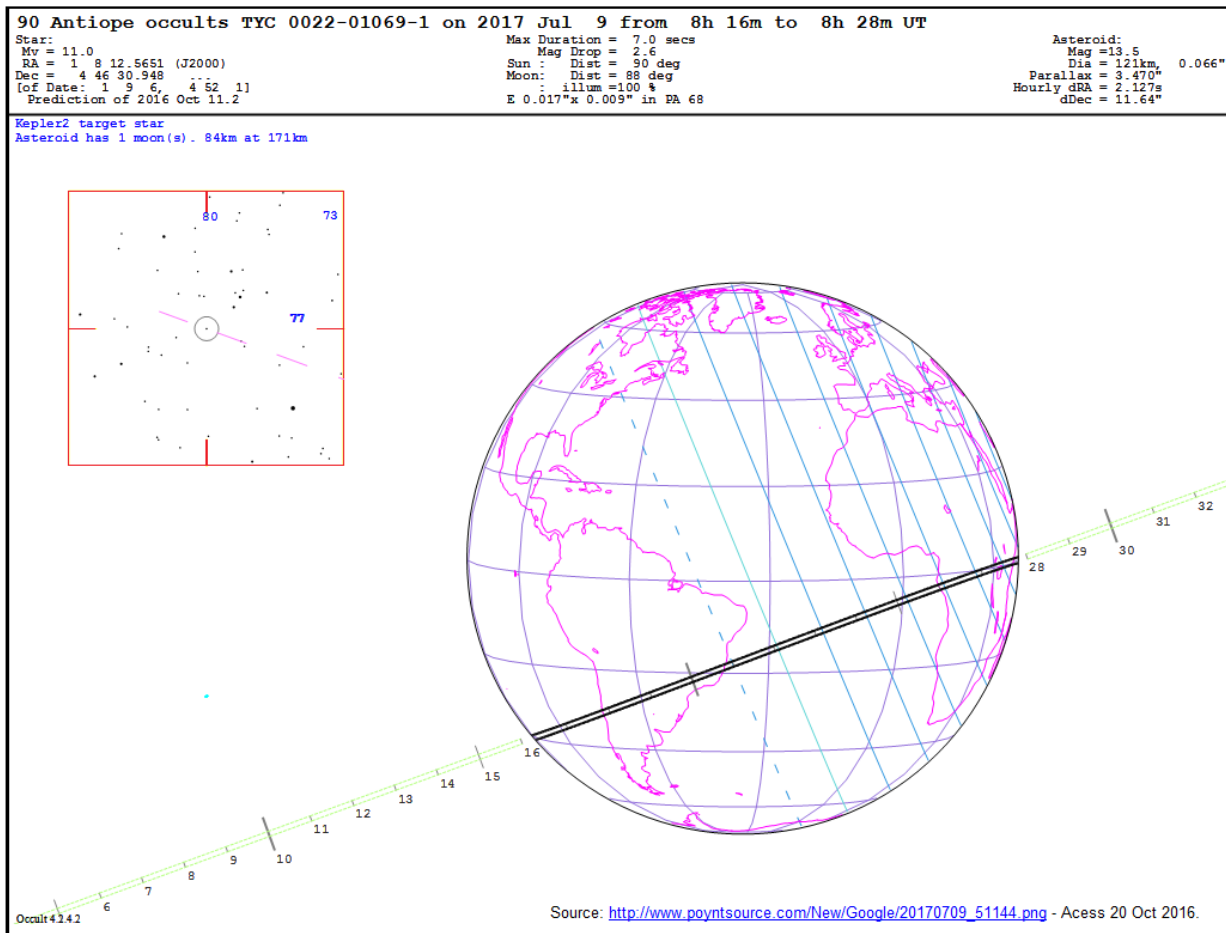
Lua: % iluminado = 22 (+), Elongação do Sol = 56°

Cidade	Desaparecimento						Reaparecimento							
	Hora (T.U)	Sol Alt.	Lua Alt.	Az.	AC °	AP °	AV °	Hora (T.U)	Sol Alt.	Lua Alt.	Az.	AC °	AP °	AV °
Belo Horizonte - MG	21 44 47	-6	35	299	42N	26	45	22 36 27		24	292	-44N	300	182
Brasília - DF	21 57 11	-6	38	297	18N	2	21	22 23 44		32	294	-22N	322	206
Campo Grande - MS	21 26 51	8	47	312	35N	20	244	22 20 05	-4	37	301	-44N	300	175
Curitiba - PR	21 21 30	5	41	312	57N	41	264	22 29 43	-11	28	298	-63N	281	155
Florianópolis - SC	21 17 35	5	39	314	63N	48	268	22 29 15	-11	26	299	-69N	275	147
Goiânia - GO	21 51 03	-3	40	300	22N	6	25	22 23 59	-11	33	295	-27N	317	199
Porto Alegre - RS	21 08 36	9	41	320	67N	52	266	22 23 39	-7	28	303	-75N	270	137
Rio de Janeiro - RJ	21 37 14	-5	35	302	53N	37	56	22 37 54		22	293	-55N	289	169
São Paulo - SP	21 30 03	0	38	307	53N	37	266	22 33 47		26	295	-58N	287	164
Vitória - ES	21 48 48	-11	31	297	44N	29	48	22 40 21		20	290	-45N	299	183

Circunstâncias de Desaparecimento e Reaparecimento



Ocultação de TYC 0022-01069-1 (mag 11.0) por (90) Antiope / 09 Jul 2017



Notas:

Distância da linha central da ocultação - em km

As distâncias são positivas para a direita, com referência ao sentido do movimento ao longo da trajetória.

O tempo de incerteza e: +/- 2 segundos

b/km	Proba- bilidade	Localização	Long. o ' o '	Lat. o ' o '	alt m	T.U. h m s	Sep. "	Alt o	Sol o
117 -	0%								
100 -	2%								
82 -	16%								
65 -	50%								
3 S	100%	102 Obs. Cerro Tololo	- 70 45.	-30 15.	2353	08 17 55	-0.002	41	-43
3 S	100%	807 Obs. Cerro Tololo	- 70 45.	-30 15.	2353	08 17 55	-0.002	41	-43
0 -	100%								
-12 N	100%	104 Ob. Mamalluca	- 70 45.	-29 55.	647	08 17 55	0,006	41	-43
-25 N	99%	870 Campinas	- 46 45.	-21 5.	0	08 20 02	0,013	62	-19
-35 N	95%	859 Obs. Wykrota-CEAMIG	- 43 45.	-19 45.	1469	08 20 22	0,018	64	-16
-37 N	94%	B. Hte BHZ - Breno Loureiro	- 43 55.	-19 55.	897	08 20 20	0.019	64	-16
-47 N	83%	177 Obs. CEAMIG-REA, BHZ	- 43 55.	-19 45.	840	08 20 20	0.024	64	-16
65 -	50%								
82 -	16%								
-89 N	8%	262 Obs. Europeu do Sul	- 70 45.	-29 15.	2362	08 17 55	0.046	41	-43
-89 N	8%	809 Obs. Europeu do Sul	- 70 45.	-29 15.	2362	08 17 55	0.046	41	-43
-89 N	8%	103 ESO., La Silla	- 70 45.	-29 15.	2362	08 17 55	0.046	41	-43
100 -	2%								
-115 N	0%	304 Obs. Las Campanas	- 70 45.	-29 5.	2245	08 17 55	0.059	42	-43
-115 N	0%	105 Obs. Las Campanas -TIE	- 70 45.	-29 5.	2245	08 17 55	0.059	42	-43
117 -	0%								

Nascer e Ocaso do Sol

Região Sudeste

Coordenadas	Rio de Janeiro – RJ TU – 03:00 φ = 22° 53' 43" S L = 43° 16' 22" W Altitude = 50 Mts		São Paulo – SP TU – 03:00 φ = 23° 32' 36" S L = 46° 37' 59" W Altitude = 760 Mts		Belo Horizonte – MG TU – 03:00 φ = 19° 48' 33" S L = 43° 58' 15" W Altitude = 858 Mts.		Vitória – ES TU – 03:00 φ = 20° 18' 52" S L = 40° 19' 06" W Altitude = 50 Mts.	
	Data	Nascer	Ocaso	Nascer	Ocaso	Nascer	Ocaso	Nascer	Ocaso
01 Jan	05:11:26	18:42:06	05:23:27	18:57:07	05:20:12	18:38:47	05:04:49	18:24:48
08 Jan	05:16:09	18:43:33	05:28:14	18:58:31	05:24:42	18:40:29	05:09:21	18:26:28
15 Jan	05:21:08	18:43:52	05:33:18	18:58:45	05:29:21	18:41:08	05:14:02	18:27:05
22 Jan	05:26:11	18:43:03	05:38:27	18:57:49	05:33:58	18:40:44	05:18:42	18:26:38
29 Jan	05:31:07	18:41:06	05:43:31	18:55:45	05:38:25	18:39:17	05:23:13	18:25:08
05 Fev	05:35:48	18:38:06	05:48:19	18:52:36	05:42:33	18:36:49	05:27:24	18:22:36
12 Fev	05:40:07	18:34:07	05:52:47	18:48:28	05:46:17	18:33:26	05:31:12	18:19:09
19 Fev	05:44:03	18:29:18	05:56:53	18:43:30	05:49:36	18:29:15	05:34:35	18:14:53
26 Fev	05:47:38	18:23:48	06:00:37	18:37:50	05:52:32	18:24:24	05:37:36	18:09:58
05 Mar	05:50:52	18:17:46	06:04:01	18:31:38	05:55:06	18:19:01	05:40:14	18:04:31
12 Mar	05:53:47	18:11:20	06:07:06	18:25:02	05:57:21	18:13:15	05:42:34	17:58:40
19 Mar	05:56:29	18:04:39	06:09:58	18:18:12	05:59:23	18:07:15	05:44:40	17:52:35
26 Mar	05:59:03	17:57:54	06:12:42	18:11:17	06:01:17	18:01:10	05:46:39	17:46:26
02 Abr	06:01:34	17:51:13	06:15:22	18:04:26	06:03:08	17:55:08	05:48:35	17:40:20
09 Abr	06:04:05	17:44:44	06:18:03	17:57:48	06:05:00	17:49:18	05:50:32	17:34:25
16 Abr	06:06:41	17:38:37	06:20:48	17:51:31	06:06:58	17:43:48	05:52:34	17:28:51
23 Abr	06:09:24	17:32:59	06:23:41	17:45:44	06:09:05	17:38:46	05:54:45	17:23:45
30 Abr	06:12:18	17:27:57	06:26:43	17:40:34	06:11:24	17:34:20	05:57:08	17:19:14
07 Mai	06:15:20	17:23:39	06:29:53	17:36:08	06:13:53	17:30:34	05:59:41	17:15:24
14 Mai	06:18:27	17:20:09	06:33:08	17:32:31	06:16:32	17:27:33	06:02:23	17:12:20
21 Mai	06:21:38	17:17:33	06:36:25	17:29:49	06:19:17	17:25:22	06:05:11	17:10:07
28 Mai	06:24:46	17:15:53	06:39:38	17:28:03	06:22:03	17:24:03	06:08:00	17:08:45
04 Jun	06:27:42	17:15:07	06:42:38	17:27:14	06:24:43	17:23:34	06:10:41	17:08:14
11 Jun	06:30:17	17:15:14	06:45:16	17:27:18	06:27:06	17:23:52	06:13:06	17:08:30
18 Jun	06:32:22	17:16:10	06:47:22	17:28:13	06:29:06	17:24:52	06:15:06	17:09:30
25 Jun	06:33:49	17:17:48	06:48:49	17:29:51	06:30:34	17:26:29	06:16:34	17:11:07
02 Jul	06:34:30	17:19:59	06:49:28	17:32:04	06:31:21	17:28:33	06:17:21	17:13:12
09 Jul	06:34:17	17:22:33	06:49:12	17:34:41	06:31:21	17:30:55	06:17:19	17:15:35
16 Jul	06:33:08	17:25:22	06:47:59	17:37:34	06:30:29	17:33:26	06:16:25	17:18:08
23 Jul	06:31:03	17:28:18	06:45:47	17:40:36	06:28:46	17:36:00	06:14:40	17:20:45
30 Jul	06:28:01	17:31:13	06:42:39	17:43:38	06:26:10	17:38:28	06:12:01	17:23:16
06 Ago	06:24:05	17:34:01	06:38:36	17:46:33	06:22:44	17:40:47	06:08:31	17:25:38
13 Ago	06:19:20	17:36:40	06:33:43	17:49:20	06:18:32	17:42:53	06:04:15	17:27:48
20 Ago	06:13:54	17:39:08	06:28:08	17:51:57	06:13:40	17:44:47	05:59:20	17:29:46
27 Ago	06:07:52	17:41:27	06:21:58	17:54:24	06:08:14	17:46:29	05:53:50	17:31:32
03 Set	06:01:22	17:43:36	06:15:18	17:56:42	06:02:21	17:48:00	05:47:53	17:33:08
10 Set	05:54:32	17:45:40	06:08:18	17:58:56	05:56:09	17:49:26	05:41:37	17:34:37
17 Set	05:47:31	17:47:43	06:01:08	18:01:09	05:49:47	17:50:50	05:35:10	17:36:06
24 Set	05:40:27	17:49:51	05:53:54	18:03:27	05:43:23	17:52:19	05:28:42	17:37:40
01 Out	05:33:29	17:52:08	05:46:47	18:05:53	05:37:05	17:53:56	05:22:19	17:39:21
08 Out	05:26:47	17:54:38	05:39:54	18:08:33	05:31:02	17:55:46	05:16:11	17:41:16
15 Out	05:20:28	17:57:27	05:33:27	18:11:31	05:25:22	17:57:56	05:10:27	17:43:30
22 Out	05:14:44	18:00:38	05:27:33	18:14:52	05:20:16	18:00:29	05:05:16	17:46:08
29 Out	05:09:42	18:04:13	05:22:22	18:18:36	05:15:51	18:03:28	05:00:47	17:49:10
05 Nov	05:05:30	18:08:12	05:18:01	18:22:44	05:12:14	18:06:51	04:57:06	17:52:38
12 Nov	05:02:16	18:12:33	05:14:39	18:27:13	05:09:33	18:10:40	04:54:21	17:56:30
19 Nov	05:00:08	18:17:13	05:12:24	18:32:00	05:07:55	18:14:51	04:52:39	18:00:44
26 Nov	04:59:10	18:22:02	05:11:20	18:36:55	05:07:21	18:19:15	04:52:03	18:05:12
03 Dez	04:59:21	18:26:50	05:11:26	18:41:48	05:07:53	18:23:43	04:52:32	18:09:42
10 Dez	05:00:42	18:31:25	05:12:44	18:46:27	05:09:28	18:28:05	04:54:05	18:14:05
17 Dez	05:03:08	18:35:35	05:15:08	18:50:38	05:12:02	18:32:08	04:56:39	18:18:09
24 Dez	05:06:31	18:39:06	05:18:31	18:54:09	05:15:26	18:35:38	05:00:02	18:21:40
31 Dez	05:10:38	18:41:44	05:22:39	18:56:46	05:19:27	18:38:24	05:04:04	18:24:24

Nascer e Ocaso do Sol

Região Sul

Coordenadas	Porto Alegre – RS		Curitiba – PR		Florianópolis – SC	
	TU – 03:00 φ = 30° 02' 15" S L = 51° 13' 13" W Altitude = 50 Mts		TU – 03:00 φ = 25° 25' 48" S L = 49° 16' 15" W Altitude = 904 Mts		TU – 03:00 φ = 27° 35' 36" S L = 48° 35' 56" W Altitude = 25 Mts	
Data	Nascer	Ocaso	Nascer	Ocaso	Nascer	Ocaso
01 Jan	05:27:20	19:29:08	05:29:59	19:11:13	05:22:17	19:13:33
08 Jan	05:32:40	19:29:57	05:34:55	19:12:28	05:27:25	19:14:35
15 Jan	05:38:31	19:29:23	05:40:12	19:12:29	05:32:58	19:14:19
22 Jan	05:44:39	19:27:27	05:45:36	19:11:17	05:38:44	19:12:46
29 Jan	05:50:51	19:24:13	05:50:58	19:08:54	05:44:30	19:09:58
05 Fev	05:56:57	19:19:47	05:56:08	19:05:24	05:50:07	19:06:01
12 Fev	06:02:47	19:14:16	06:00:58	19:00:54	05:55:26	19:01:01
19 Fev	06:08:20	19:07:51	06:05:27	18:55:32	06:00:26	18:55:09
26 Fev	06:13:33	19:00:42	06:09:35	18:49:29	06:05:07	18:48:33
05 Mar	06:18:28	18:52:59	06:13:23	18:42:52	06:09:27	18:41:24
12 Mar	06:23:05	18:44:51	06:16:53	18:35:51	06:13:30	18:33:50
19 Mar	06:27:29	18:36:28	06:20:10	18:28:36	06:17:20	18:26:02
26 Mar	06:31:45	18:28:02	06:23:19	18:21:16	06:21:02	18:18:09
02 Abr	06:35:57	18:19:40	06:26:24	18:14:01	06:24:40	18:10:22
09 Abr	06:40:07	18:11:33	06:29:29	18:06:58	06:28:16	18:02:48
16 Abr	06:44:19	18:03:49	06:32:38	18:00:18	06:31:56	17:55:36
23 Abr	06:48:36	17:56:38	06:35:53	17:54:08	06:35:41	17:48:57
30 Abr	06:52:58	17:50:09	06:39:17	17:48:37	06:39:34	17:42:57
07 Mai	06:57:23	17:44:29	06:42:47	17:43:51	06:43:30	17:37:44
14 Mai	07:01:46	17:39:44	06:46:20	17:39:56	06:47:28	17:33:25
21 Mai	07:06:04	17:36:02	06:49:54	17:36:58	06:51:23	17:30:06
28 Mai	07:10:07	17:33:27	06:53:20	17:34:59	06:55:08	17:27:49
04 Jun	07:13:46	17:31:59	06:56:31	17:33:59	06:58:32	17:26:36
11 Jun	07:16:50	17:31:38	06:59:15	17:33:57	07:01:26	17:26:24
18 Jun	07:19:09	17:32:21	07:01:25	17:34:48	07:03:40	17:27:11
25 Jun	07:20:34	17:34:02	07:02:52	17:36:27	07:05:06	17:28:51
02 Jul	07:20:57	17:36:31	07:03:26	17:38:44	07:05:35	17:31:14
09 Jul	07:20:12	17:39:38	07:03:03	17:41:29	07:05:01	17:34:10
16 Jul	07:18:18	17:43:13	07:01:38	17:44:34	07:03:22	17:37:29
23 Jul	07:15:14	17:47:07	06:59:13	17:47:50	07:00:38	17:41:04
30 Jul	07:11:05	17:51:11	06:55:48	17:51:08	06:56:52	17:44:44
06 Ago	07:05:52	17:55:16	06:51:26	17:54:22	06:52:05	17:48:23
13 Ago	06:59:45	17:59:18	06:46:13	17:57:29	06:46:26	17:51:57
20 Ago	06:52:50	18:03:15	06:40:17	18:00:28	06:40:01	17:55:24
27 Ago	06:45:16	18:07:06	06:33:44	18:03:17	06:32:58	17:58:44
03 Set	06:37:10	18:10:51	06:26:41	18:05:59	06:25:24	18:01:56
10 Set	06:28:42	18:14:32	06:19:17	18:08:36	06:17:29	18:05:05
17 Set	06:20:02	18:18:15	06:11:42	18:11:14	06:09:22	18:08:15
24 Set	06:11:19	18:22:04	06:04:05	18:13:57	06:01:12	18:11:30
01 Out	06:02:41	18:26:01	05:56:33	18:16:47	05:53:08	18:14:53
08 Out	05:54:18	18:30:11	05:49:16	18:19:52	05:45:19	18:18:29
15 Out	05:46:20	18:34:40	05:42:24	18:23:14	05:37:55	18:22:24
22 Out	05:38:58	18:39:29	05:36:06	18:26:59	05:31:06	18:26:40
29 Out	05:32:22	18:44:38	05:30:32	18:31:06	05:25:01	18:31:18
05 Nov	05:26:39	18:50:07	05:25:49	18:35:35	05:19:49	18:36:16
12 Nov	05:22:02	18:55:52	05:22:08	18:40:25	05:15:40	18:41:33
19 Nov	05:18:39	19:01:47	05:19:34	18:45:30	05:12:43	18:47:02
26 Nov	05:16:35	19:07:40	05:18:14	18:50:41	05:11:01	18:52:34
03 Dez	05:15:54	19:13:20	05:18:08	18:55:46	05:10:38	18:57:55
10 Dez	05:16:38	19:18:31	05:19:16	19:00:34	05:11:34	19:02:54
17 Dez	05:18:44	19:22:59	05:21:36	19:04:50	05:13:48	19:07:17
24 Dez	05:22:05	19:26:31	05:24:58	19:08:21	05:17:09	19:10:48
31 Dez	05:26:28	19:28:51	05:29:10	19:10:53	05:21:26	19:13:15

Nascer e Ocaso do Sol

Região Norte – Parte I

Coordenadas	Rio Branco – AC TU – 05:00 $\varphi = 9^{\circ} 58' 22'' S$ L = $67^{\circ} 48' 40'' W$ Altitude = 153 Mts		Macapá – AP TU – 03:00 $\varphi = 0^{\circ} 02' 25'' N$ L = $51^{\circ} 03' 13'' W$ Altitude = 200 Mts		Manaus – AM TU – 04:00 $\varphi = 3^{\circ} 08' 07'' S$ L = $60^{\circ} 01' 34'' W$ Altitude = 100 Mts		Porto Velho – RO TU – 04:00 $\varphi = 8^{\circ} 45' 48'' S$ L = $63^{\circ} 54' 48'' W$ Altitude = 85 Mts	
	Data	Nascer	Ocaso	Nascer	Ocaso	Nascer	Ocaso	Nascer	Ocaso
01 Jan	05:14:02	17:55:52	06:24:22	18:31:41	05:54:36	18:12:45	06:00:41	18:38:01
08 Jan	05:17:50	17:58:16	06:27:31	18:34:46	05:57:57	18:15:37	06:04:24	18:40:30
15 Jan	05:21:29	17:59:57	06:30:14	18:37:24	06:00:57	18:17:57	06:07:55	18:42:18
22 Jan	05:24:50	18:00:49	06:32:25	18:39:29	06:03:30	18:19:39	06:11:08	18:43:20
29 Jan	05:27:48	18:00:51	06:33:59	18:40:56	06:05:30	18:20:40	06:13:54	18:43:34
05 Fev	05:30:15	18:00:04	06:34:52	18:41:43	06:06:53	18:20:57	06:16:10	18:42:58
12 Fev	05:32:11	17:58:29	06:35:06	18:41:51	06:07:39	18:20:32	06:17:52	18:41:37
19 Fev	05:33:35	17:56:11	06:34:43	18:41:22	06:07:50	18:19:30	06:19:02	18:39:34
26 Fev	05:34:32	17:53:19	06:33:47	18:40:23	06:07:30	18:17:54	06:19:45	18:36:56
05 Mar	05:35:05	17:49:58	06:32:25	18:38:57	06:06:43	18:15:52	06:20:02	18:33:50
12 Mar	05:35:17	17:46:14	06:30:40	18:37:11	06:05:35	18:13:29	06:19:59	18:30:21
19 Mar	05:35:15	17:42:17	06:28:40	18:35:11	06:04:13	18:10:52	06:19:42	18:26:39
26 Mar	05:35:06	17:38:15	06:26:34	18:33:06	06:02:43	18:08:10	06:19:18	18:22:53
02 Abr	05:34:55	17:34:15	06:24:28	18:31:02	06:01:13	18:05:30	06:18:52	18:19:08
09 Abr	05:34:48	17:30:24	06:22:26	18:29:05	05:59:48	18:02:57	06:18:30	18:15:32
16 Abr	05:34:50	17:26:50	06:20:37	18:27:21	05:58:34	18:00:38	06:18:17	18:12:12
23 Abr	05:35:05	17:23:40	06:19:07	18:25:57	05:57:37	17:58:40	06:18:19	18:09:16
30 Abr	05:35:38	17:20:59	06:17:59	18:24:56	05:57:01	17:57:08	06:18:39	18:06:48
07 Mai	05:36:29	17:18:51	06:17:17	18:24:20	05:56:48	17:56:03	06:19:18	18:04:52
14 Mai	05:37:39	17:17:20	06:17:01	18:24:12	05:56:59	17:55:29	06:20:16	18:03:31
21 Mai	05:39:06	17:16:27	06:17:14	18:24:32	05:57:36	17:55:26	06:21:33	18:02:47
28 Mai	05:40:47	17:16:12	06:17:54	18:25:18	05:58:35	17:55:53	06:23:07	18:02:41
04 Jun	05:42:36	17:16:33	06:18:56	18:26:24	05:59:52	17:56:45	06:24:50	18:03:07
11 Jun	05:44:26	17:17:23	06:20:14	18:27:45	06:01:20	17:57:56	06:26:35	18:04:02
18 Jun	05:46:09	17:18:39	06:21:42	18:29:15	06:02:53	17:59:22	06:28:17	18:05:20
25 Jun	05:47:39	17:20:14	06:23:14	18:30:46	06:04:24	18:00:54	06:29:47	18:06:53
02 Jul	05:48:46	17:21:57	06:24:39	18:32:10	06:05:44	18:02:23	06:30:56	18:08:34
09 Jul	05:49:22	17:23:40	06:25:51	18:33:17	06:06:44	18:03:42	06:31:37	18:10:13
16 Jul	05:49:23	17:25:17	06:26:42	18:34:03	06:07:19	18:04:44	06:31:45	18:11:43
23 Jul	05:48:47	17:26:42	06:27:09	18:34:24	06:07:27	18:05:25	06:31:16	18:13:00
30 Jul	05:47:30	17:27:50	06:27:08	18:34:16	06:07:02	18:05:41	06:30:10	18:13:58
06 Ago	05:45:34	17:28:38	06:26:37	18:33:38	06:06:04	18:05:30	06:28:25	18:14:34
13 Ago	05:43:00	17:29:04	06:25:37	18:32:31	06:04:34	18:04:52	06:26:03	18:14:49
20 Ago	05:39:53	17:29:12	06:24:11	18:30:58	06:02:36	18:03:51	06:23:09	18:14:43
27 Ago	05:36:18	17:29:03	06:22:21	18:29:03	06:00:13	18:02:29	06:19:48	18:14:20
03 Set	05:32:20	17:28:39	06:20:13	18:26:49	05:57:30	18:00:50	06:16:04	18:13:42
10 Set	05:28:06	17:28:06	06:17:51	18:24:24	05:54:33	17:59:00	06:12:05	18:12:55
17 Set	05:23:44	17:27:30	06:15:23	18:21:54	05:51:29	17:57:06	06:07:57	18:12:04
24 Set	05:19:21	17:26:58	06:12:56	18:19:25	05:48:26	17:55:15	06:03:50	18:11:16
01 Out	05:15:04	17:26:33	06:10:35	18:17:05	05:45:28	17:53:31	05:59:48	18:10:37
08 Out	05:11:02	17:26:22	06:08:28	18:14:59	05:42:45	17:52:01	05:56:01	18:10:11
15 Out	05:07:23	17:26:33	06:06:42	18:13:16	05:40:23	17:50:54	05:52:36	18:10:07
22 Out	05:04:14	17:27:10	06:05:24	18:12:02	05:38:30	17:50:15	05:49:41	18:10:29
29 Out	05:01:41	17:28:16	06:04:38	18:11:22	05:37:10	17:50:08	05:47:23	18:11:22
05 Nov	04:59:52	17:29:53	06:04:29	18:11:19	05:36:30	17:50:37	05:45:46	18:12:46
12 Nov	04:58:50	17:32:04	06:05:00	18:11:57	05:36:32	17:51:44	05:44:57	18:14:45
19 Nov	04:58:41	17:34:47	06:06:14	18:13:17	05:37:20	17:53:30	05:44:58	18:17:17
26 Nov	04:59:24	17:37:57	06:08:07	18:15:16	05:38:51	17:55:52	05:45:50	18:20:17
03 Dez	05:00:56	17:41:26	06:10:36	18:17:50	05:41:02	17:58:43	05:47:30	18:23:39
10 Dez	05:03:15	17:45:07	06:13:34	18:20:52	05:43:48	18:01:57	05:49:54	18:27:15
17 Dez	05:06:13	17:48:48	06:16:53	18:24:13	05:47:00	18:05:25	05:52:54	18:30:54
24 Dez	05:09:39	17:52:17	06:20:22	18:27:42	05:50:28	18:08:54	05:56:21	18:34:23
31 Dez	05:13:22	17:55:22	06:23:47	18:31:06	05:53:59	18:12:12	06:00:02	18:37:30

Nota.: Rio Branco – AC, Fuso horário TU – 05:00 de acordo com a Lei nº 12.876/2013.

Nascer e Ocaso do Sol

Região Norte – Parte - II

Coordenadas	Boa Vista – RR TU – 04:00 $\varphi = 2^{\circ} 49' 17''$ N L = $60^{\circ} 39' 45''$ W Altitude = 85 Mts		Belém – PA TU – 03:00 $\varphi = 1^{\circ} 28' 03''$ S L = $48^{\circ} 29' 18''$ W Altitude = 50 Mts		Palmas – TO TU – 03:00 $\varphi = 10^{\circ} 10' 07''$ S L = $48^{\circ} 19' 54''$ W Altitude = 230 Mts	
	Data	Nascer	Ocaso	Nascer	Ocaso	Nascer	Ocaso
01 Jan	07:07:33	19:05:25	06:11:34	18:23:41	05:55:41	18:38:34
08 Jan	07:10:31	19:08:41	06:14:48	18:26:40	05:59:30	18:40:58
15 Jan	07:12:59	19:11:34	06:17:39	18:29:10	06:03:10	18:42:37
22 Jan	07:14:50	19:13:59	06:19:59	18:31:05	06:06:34	18:43:27
29 Jan	07:16:00	19:15:49	06:21:45	18:32:21	06:09:34	18:43:28
05 Fev	07:16:28	19:17:02	06:22:52	18:32:55	06:12:05	18:42:37
12 Fev	07:16:14	19:17:38	06:23:20	18:32:48	06:14:04	18:40:59
19 Fev	07:15:21	19:17:39	06:23:12	18:32:05	06:15:32	18:38:39
26 Fev	07:13:54	19:17:11	06:22:32	18:30:49	06:16:33	18:35:44
05 Mar	07:12:00	19:16:17	06:21:25	18:29:07	06:17:09	18:32:19
12 Mar	07:09:42	19:15:02	06:19:57	18:27:05	06:17:24	18:28:32
19 Mar	07:07:11	19:13:35	06:18:14	18:24:49	06:17:26	18:24:31
26 Mar	07:04:32	19:12:02	06:16:24	18:22:27	06:17:21	18:20:26
02 Abr	07:01:54	19:10:30	06:14:34	18:20:07	06:17:14	18:16:22
09 Abr	06:59:21	19:09:04	06:12:49	18:17:54	06:17:10	18:12:28
16 Abr	06:57:02	19:07:51	06:11:15	18:15:55	06:17:15	18:08:50
23 Abr	06:55:02	19:06:56	06:09:59	18:14:15	06:17:34	18:05:37
30 Abr	06:53:27	19:06:22	06:09:06	18:13:00	06:18:10	18:02:53
07 Mai	06:52:19	19:06:13	06:08:36	18:12:12	06:19:03	18:00:42
14 Mai	06:51:40	19:06:27	06:08:33	18:11:52	06:20:15	17:59:07
21 Mai	06:51:33	19:07:07	06:08:56	18:12:01	06:21:44	17:58:12
28 Mai	06:51:56	19:08:10	06:09:44	18:12:39	06:23:27	17:57:55
04 Jun	06:52:45	19:09:29	06:10:53	18:13:39	06:25:18	17:58:14
11 Jun	06:53:54	19:10:59	06:12:15	18:14:56	06:27:08	17:59:03
18 Jun	06:55:19	19:12:33	06:13:46	18:16:23	06:28:52	18:00:19
25 Jun	06:56:51	19:14:03	06:15:17	18:17:55	06:30:22	18:01:53
02 Jul	06:58:21	19:15:21	06:16:40	18:19:21	06:31:29	18:03:37
09 Jul	06:59:42	19:16:18	06:17:46	18:20:34	06:32:04	18:05:21
16 Jul	07:00:47	19:16:50	06:18:31	18:21:27	06:32:04	18:07:00
23 Jul	07:01:32	19:16:53	06:18:49	18:21:57	06:31:26	18:08:27
30 Jul	07:01:51	19:16:25	06:18:38	18:22:00	06:30:08	18:09:38
06 Ago	07:01:44	19:15:22	06:17:55	18:21:34	06:28:09	18:10:28
13 Ago	07:01:09	19:13:49	06:16:42	18:20:39	06:25:32	18:10:57
20 Ago	07:00:10	19:11:48	06:15:01	18:19:21	06:22:23	18:11:08
27 Ago	06:58:50	19:09:24	06:12:57	18:17:40	06:18:45	18:11:02
03 Set	06:57:12	19:06:40	06:10:33	18:15:42	06:14:43	18:10:42
10 Set	06:55:21	19:03:44	06:07:56	18:13:33	06:10:26	18:10:12
17 Set	06:53:24	19:00:42	06:05:12	18:11:19	06:06:00	18:09:40
24 Set	06:51:29	18:57:42	06:02:29	18:09:06	06:01:34	18:09:11
01 Out	06:49:40	18:54:50	05:59:52	18:07:02	05:57:14	18:08:50
08 Out	06:48:04	18:52:12	05:57:28	18:05:13	05:53:08	18:08:43
15 Out	06:46:50	18:49:58	05:55:26	18:03:45	05:49:25	18:08:57
22 Out	06:46:02	18:48:14	05:53:52	18:02:47	05:46:12	18:09:37
29 Out	06:45:46	18:47:04	05:52:52	18:02:21	05:43:36	18:10:46
05 Nov	06:46:04	18:46:34	05:52:28	18:02:32	05:41:43	18:12:26
12 Nov	06:47:02	18:46:47	05:52:47	18:03:23	05:40:39	18:14:39
19 Nov	06:48:38	18:47:45	05:53:49	18:04:55	05:40:26	18:17:25
26 Nov	06:50:51	18:49:25	05:55:32	18:07:04	05:41:07	18:20:36
03 Dez	06:53:36	18:51:44	05:57:53	18:09:45	05:42:37	18:24:07
10 Dez	06:56:45	18:54:35	06:00:46	18:12:53	05:44:54	18:27:49
17 Dez	07:00:10	18:57:51	06:04:02	18:16:17	05:47:51	18:31:31
24 Dez	07:03:39	19:01:20	06:07:30	18:19:46	05:51:17	18:35:00
31 Dez	07:07:00	19:04:49	06:10:58	18:23:07	05:55:00	18:38:05

Nascer e Ocaso do Sol

Região Nordeste – Parte I

Coordenadas	Salvador – BA TU – 03:00 $\varphi = 12^{\circ} 55' 34''$ S $L = 38^{\circ} 31' 13''$ W Altitude = 30 Mts		Aracajú – SE TU – 03:00 $\varphi = 10^{\circ} 55' 00''$ S $L = 37^{\circ} 03' 00''$ W Altitude = 30 Mts		Maceió – AL TU – 03:00 $\varphi = 9^{\circ} 40' 00''$ S $L = 35^{\circ} 44' 00''$ W Altitude = 30 Mts	
	Data	Nascer	Ocaso	Nascer	Ocaso	Nascer	Ocaso
01 Jan	05:10:52	18:03:06	05:09:19	17:54:40	05:06:48	17:46:57
08 Jan	05:14:52	18:05:19	05:13:11	17:57:01	05:10:34	17:49:24
15 Jan	05:18:48	18:06:42	05:16:55	17:58:36	05:14:10	17:51:07
22 Jan	05:22:31	18:07:14	05:20:24	17:59:21	05:17:28	17:52:04
29 Jan	05:25:54	18:06:51	05:23:31	17:59:16	05:20:22	17:52:11
05 Fev	05:28:50	18:05:36	05:26:08	17:58:19	05:22:45	17:51:29
12 Fev	05:31:16	18:03:30	05:28:14	17:56:34	05:24:36	17:49:59
19 Fev	05:33:14	18:00:41	05:29:50	17:54:06	05:25:56	17:47:48
26 Fev	05:34:45	17:57:16	05:30:59	17:51:03	05:26:48	17:45:01
05 Mar	05:35:52	17:53:20	05:31:43	17:47:30	05:27:15	17:41:46
12 Mar	05:36:39	17:49:02	05:32:07	17:43:35	05:27:21	17:38:08
19 Mar	05:37:12	17:44:29	05:32:17	17:39:26	05:27:14	17:34:17
26 Mar	05:37:38	17:39:52	05:32:20	17:35:12	05:26:59	17:30:20
02 Abr	05:38:02	17:35:18	05:32:21	17:31:01	05:26:43	17:26:26
09 Abr	05:38:29	17:30:53	05:32:25	17:26:59	05:26:30	17:22:41
16 Abr	05:39:03	17:26:46	05:32:38	17:23:13	05:26:26	17:19:12
23 Abr	05:39:51	17:23:04	05:33:04	17:19:52	05:26:36	17:16:07
30 Abr	05:40:54	17:19:53	05:33:47	17:17:01	05:27:04	17:13:30
07 Mai	05:42:12	17:17:17	05:34:47	17:14:43	05:27:50	17:11:26
14 Mai	05:43:47	17:15:19	05:36:05	17:13:02	05:28:55	17:09:58
21 Mai	05:45:36	17:14:04	05:37:39	17:12:01	05:30:18	17:09:09
28 Mai	05:47:35	17:13:31	05:39:27	17:11:40	05:31:57	17:08:57
04 Jun	05:49:39	17:13:37	05:41:21	17:11:56	05:33:43	17:09:19
11 Jun	05:51:38	17:14:18	05:43:14	17:12:43	05:35:32	17:10:11
18 Jun	05:53:26	17:15:30	05:44:59	17:13:57	05:37:14	17:11:27
25 Jun	05:54:56	17:17:05	05:46:28	17:15:32	05:38:44	17:13:01
02 Jul	05:55:57	17:18:54	05:47:34	17:17:17	05:39:52	17:14:43
09 Jul	05:56:23	17:20:48	05:48:07	17:19:04	05:40:31	17:16:25
16 Jul	05:56:10	17:22:40	05:48:03	17:20:46	05:40:35	17:17:59
23 Jul	05:55:15	17:24:25	05:47:21	17:22:18	05:40:02	17:19:22
30 Jul	05:53:36	17:25:56	05:45:57	17:23:34	05:38:50	17:20:26
06 Ago	05:51:15	17:27:09	05:43:53	17:24:30	05:36:58	17:21:10
13 Ago	05:48:13	17:28:04	05:41:10	17:25:06	05:34:29	17:21:32
20 Ago	05:44:37	17:28:42	05:37:53	17:25:25	05:31:27	17:21:35
27 Ago	05:40:31	17:29:05	05:34:08	17:25:26	05:27:58	17:21:21
03 Set	05:36:00	17:29:14	05:29:59	17:25:13	05:24:06	17:20:52
10 Set	05:31:13	17:29:14	05:25:34	17:24:52	05:19:57	17:20:13
17 Set	05:26:17	17:29:13	05:21:00	17:24:28	05:15:41	17:19:32
24 Set	05:21:19	17:29:15	05:16:26	17:24:07	05:11:23	17:18:54
01 Out	05:16:28	17:29:25	05:11:57	17:23:54	05:07:12	17:18:23
08 Out	05:11:51	17:29:48	05:07:43	17:23:55	05:03:15	17:18:07
15 Out	05:07:37	17:30:33	05:03:52	17:24:16	04:59:41	17:18:12
22 Out	05:03:55	17:31:42	05:00:31	17:25:04	04:56:37	17:18:43
29 Out	05:00:50	17:33:20	04:57:48	17:26:21	04:54:10	17:19:43
05 Nov	04:58:29	17:35:27	04:55:47	17:28:08	04:52:24	17:21:15
12 Nov	04:57:00	17:38:05	04:54:36	17:30:28	04:51:27	17:23:21
19 Nov	04:56:25	17:41:13	04:54:18	17:33:18	04:51:21	17:26:00
26 Nov	04:56:45	17:44:43	04:54:53	17:36:35	04:52:07	17:29:06
03 Dez	04:58:00	17:48:29	04:56:19	17:40:10	04:53:41	17:32:32
10 Dez	05:00:06	17:52:21	04:58:33	17:43:54	04:56:01	17:36:11
17 Dez	05:02:57	17:56:09	05:01:28	17:47:38	04:59:00	17:39:51
24 Dez	05:06:22	17:59:39	05:04:54	17:51:07	05:02:26	17:43:21
31 Dez	05:10:10	18:02:38	05:08:38	17:54:11	05:06:08	17:46:27

Nascer e Ocaso do Sol

Região Nordeste – Parte II

Coordenadas	Recife – PE TU – 03:00 $\varphi = 8^{\circ} 10' 52'' S$ $L = 34^{\circ} 54' 47'' W$ Altitude = 30 Mts		João Pessoa – PB TU – 03:00 $\varphi = 7^{\circ} 06' 57'' S$ $L = 34^{\circ} 53' 14'' W$ Altitude = 47 Mts		Natal – RN TU – 03:00 $\varphi = 5^{\circ} 45' 54'' S$ $L = 35^{\circ} 12' 04'' W$ Altitude = 31 Mts	
	Data	Nascer	Ocaso	Nascer	Ocaso	Nascer	Ocaso
01 Jan	05:05:44	17:41:03	05:07:34	17:39:28	05:10:52	17:38:29
08 Jan	05:09:25	17:43:35	05:11:10	17:42:04	05:14:24	17:41:11
15 Jan	05:12:53	17:45:27	05:14:33	17:44:02	05:17:40	17:43:15
22 Jan	05:16:02	17:46:33	05:17:35	17:45:16	05:20:32	17:44:38
29 Jan	05:18:44	17:46:53	05:20:08	17:45:43	05:22:56	17:45:16
05 Fev	05:20:54	17:46:24	05:22:09	17:45:23	05:24:45	17:45:08
12 Fev	05:22:30	17:45:08	05:23:36	17:44:18	05:25:59	17:44:15
19 Fev	05:23:35	17:43:12	05:24:30	17:42:32	05:26:39	17:42:43
26 Fev	05:24:11	17:40:41	05:24:55	17:40:13	05:26:51	17:40:37
05 Mar	05:24:22	17:37:42	05:24:54	17:37:25	05:26:36	17:38:04
12 Mar	05:24:12	17:34:21	05:24:33	17:34:15	05:26:00	17:35:08
19 Mar	05:23:48	17:30:46	05:23:58	17:30:52	05:25:10	17:32:00
26 Mar	05:23:17	17:27:06	05:23:15	17:27:23	05:24:13	17:28:46
02 Abr	05:22:45	17:23:28	05:22:31	17:23:57	05:23:15	17:25:33
09 Abr	05:22:16	17:19:59	05:21:51	17:20:38	05:22:21	17:22:29
16 Abr	05:21:56	17:16:45	05:21:21	17:17:36	05:21:37	17:19:40
23 Abr	05:21:52	17:13:54	05:21:06	17:14:55	05:21:09	17:17:13
30 Abr	05:22:06	17:11:32	05:21:10	17:12:43	05:21:00	17:15:13
07 Mai	05:22:39	17:09:41	05:21:34	17:11:01	05:21:13	17:13:42
14 Mai	05:23:32	17:08:25	05:22:19	17:09:53	05:21:47	17:12:45
21 Mai	05:24:45	17:07:45	05:23:24	17:09:21	05:22:43	17:12:21
28 Mai	05:26:14	17:07:42	05:24:48	17:09:23	05:23:59	17:12:31
04 Jun	05:27:54	17:08:10	05:26:23	17:09:56	05:25:29	17:13:10
11 Jun	05:29:38	17:09:07	05:28:04	17:10:55	05:27:06	17:14:13
18 Jun	05:31:19	17:10:25	05:29:43	17:12:15	05:28:43	17:15:35
25 Jun	05:32:49	17:11:58	05:31:13	17:13:48	05:30:13	17:17:08
02 Jul	05:34:00	17:13:38	05:32:26	17:15:26	05:31:28	17:18:43
09 Jul	05:34:43	17:15:14	05:33:12	17:16:59	05:32:19	17:20:11
16 Jul	05:34:54	17:16:42	05:33:29	17:18:22	05:32:41	17:21:28
23 Jul	05:34:30	17:17:55	05:33:11	17:19:29	05:32:31	17:22:27
30 Jul	05:33:29	17:18:49	05:32:17	17:20:15	05:31:46	17:23:04
06 Ago	05:31:48	17:19:21	05:30:45	17:20:38	05:30:25	17:23:16
13 Ago	05:29:33	17:19:30	05:28:38	17:20:38	05:28:30	17:23:04
20 Ago	05:26:45	17:19:19	05:26:01	17:20:17	05:26:05	17:22:31
27 Ago	05:23:30	17:18:50	05:22:56	17:19:37	05:23:14	17:21:38
03 Set	05:19:53	17:18:05	05:19:30	17:18:42	05:20:01	17:20:30
10 Set	05:16:01	17:17:11	05:15:48	17:17:37	05:16:33	17:19:11
17 Set	05:12:00	17:16:14	05:11:59	17:16:29	05:12:58	17:17:48
24 Set	05:07:59	17:15:19	05:08:09	17:15:23	05:09:22	17:16:28
01 Out	05:04:04	17:14:33	05:04:26	17:14:25	05:05:53	17:15:16
08 Out	05:00:23	17:14:00	05:00:56	17:13:41	05:02:38	17:14:18
15 Out	04:57:05	17:13:49	04:57:49	17:13:19	04:59:44	17:13:41
22 Out	04:54:16	17:14:05	04:55:11	17:13:24	04:57:21	17:13:32
29 Out	04:52:04	17:14:50	04:53:09	17:13:59	04:55:32	17:13:54
05 Nov	04:50:32	17:16:09	04:51:48	17:15:07	04:54:23	17:14:50
12 Nov	04:49:48	17:18:01	04:51:12	17:16:51	04:53:59	17:16:22
19 Nov	04:49:54	17:20:28	04:51:26	17:19:09	04:54:24	17:18:31
26 Nov	04:50:50	17:23:24	04:52:29	17:21:59	04:55:35	17:21:12
03 Dez	04:52:32	17:26:43	04:54:17	17:25:12	04:57:30	17:24:18
10 Dez	04:54:58	17:30:16	04:56:47	17:28:41	05:00:05	17:27:42
17 Dez	04:57:59	17:33:54	04:59:50	17:32:17	05:03:11	17:31:15
24 Dez	05:01:26	17:37:23	05:03:17	17:35:46	05:06:38	17:34:45
31 Dez	05:05:05	17:40:32	05:06:55	17:38:57	05:10:14	17:37:58

Nascer e Ocaso do Sol

Região Nordeste – Parte III

Coordenadas	Fortaleza – CE TU – 03:00 $\varphi = 3^{\circ} 45' 47''$ S L = $38^{\circ} 31' 23''$ W Altitude = 30 Mts		Teresina – PI TU – 03:00 $\varphi = 5^{\circ} 05' 13''$ S L = $42^{\circ} 48' 42''$ W Altitude = 100 Mts		São Luís – MA TU – 03:00 $\varphi = 2^{\circ} 33' 00''$ S L = $44^{\circ} 18' 00''$ W Altitude = 30 Mts	
	Data	Nascer	Ocaso	Nascer	Ocaso	Nascer	Ocaso
01 Jan	05:27:42	17:47:59	05:42:40	18:07:21	05:52:32	18:08:47
08 Jan	05:31:06	17:50:49	05:46:08	18:10:06	05:55:51	18:11:41
15 Jan	05:34:10	17:53:06	05:49:19	18:12:15	05:58:48	18:14:04
22 Jan	05:36:47	17:54:44	05:52:06	18:13:44	06:01:17	18:15:51
29 Jan	05:38:53	17:55:40	05:54:22	18:14:29	06:03:13	18:16:56
05 Fev	05:40:22	17:55:52	05:56:03	18:14:29	06:04:31	18:17:19
12 Fev	05:41:14	17:55:21	05:57:08	18:13:45	06:05:11	18:17:00
19 Fev	05:41:32	17:54:12	05:57:40	18:12:22	06:05:16	18:16:04
26 Fev	05:41:19	17:52:30	05:57:41	18:10:25	06:04:50	18:14:35
05 Mar	05:40:40	17:50:21	05:57:17	18:08:01	06:03:57	18:12:39
12 Mar	05:39:39	17:47:50	05:56:31	18:05:16	06:02:43	18:10:23
19 Mar	05:38:24	17:45:06	05:55:31	18:02:17	06:01:14	18:07:53
26 Mar	05:37:02	17:42:17	05:54:24	17:59:13	05:59:38	18:05:17
02 Abr	05:35:39	17:39:30	05:53:16	17:56:11	05:58:02	18:02:43
09 Abr	05:34:21	17:36:49	05:52:12	17:53:16	05:56:30	18:00:16
16 Abr	05:33:14	17:34:24	05:51:19	17:50:36	05:55:10	17:58:04
23 Abr	05:32:23	17:32:19	05:50:42	17:48:18	05:54:07	17:56:12
30 Abr	05:31:53	17:30:40	05:50:25	17:46:27	05:53:25	17:54:44
07 Mai	05:31:46	17:29:30	05:50:29	17:45:04	05:53:07	17:53:45
14 Mai	05:32:02	17:28:50	05:50:57	17:44:14	05:53:14	17:53:15
21 Mai	05:32:43	17:28:42	05:51:47	17:43:57	05:53:46	17:53:16
28 Mai	05:33:46	17:29:05	05:52:58	17:44:12	05:54:42	17:53:46
04 Jun	05:35:05	17:29:54	05:54:23	17:44:55	05:55:56	17:54:40
11 Jun	05:36:35	17:31:03	05:55:57	17:46:01	05:57:22	17:55:53
18 Jun	05:38:09	17:32:28	05:57:33	17:47:23	05:58:54	17:57:19
25 Jun	05:39:40	17:34:00	05:59:04	17:48:56	06:00:25	17:58:51
02 Jul	05:40:59	17:35:31	06:00:20	17:50:29	06:01:46	18:00:20
09 Jul	05:41:57	17:36:52	06:01:14	17:51:55	06:02:48	18:01:37
16 Jul	05:42:30	17:37:57	06:01:40	17:53:07	06:03:27	18:02:36
23 Jul	05:42:33	17:38:43	06:01:36	17:54:00	06:03:38	18:03:14
30 Jul	05:42:04	17:39:04	06:00:57	17:54:31	06:03:17	18:03:26
06 Ago	05:41:01	17:38:58	05:59:43	17:54:36	06:02:24	18:03:10
13 Ago	05:39:26	17:38:26	05:57:56	17:54:16	06:01:00	18:02:27
20 Ago	05:37:22	17:37:31	05:55:39	17:53:34	05:59:07	18:01:20
27 Ago	05:34:53	17:36:16	05:52:56	17:52:33	05:56:51	17:59:53
03 Set	05:32:03	17:34:44	05:49:53	17:51:15	05:54:14	17:58:08
10 Set	05:28:59	17:33:01	05:46:34	17:49:46	05:51:23	17:56:12
17 Set	05:25:48	17:31:14	05:43:09	17:48:14	05:48:25	17:54:11
24 Set	05:22:37	17:29:30	05:39:43	17:46:44	05:45:28	17:52:13
01 Out	05:19:33	17:27:53	05:36:24	17:45:22	05:42:37	17:50:23
08 Out	05:16:42	17:26:30	05:33:18	17:44:14	05:40:00	17:48:47
15 Out	05:14:13	17:25:30	05:30:35	17:43:28	05:37:44	17:47:33
22 Out	05:12:13	17:24:58	05:28:20	17:43:10	05:35:57	17:46:48
29 Out	05:10:47	17:24:57	05:26:41	17:43:23	05:34:43	17:46:35
05 Nov	05:09:59	17:25:31	05:25:41	17:44:10	05:34:08	17:46:58
12 Nov	05:09:55	17:26:44	05:25:25	17:45:35	05:34:15	17:48:00
19 Nov	05:10:38	17:28:35	05:25:56	17:47:36	05:35:07	17:49:41
26 Nov	05:12:04	17:31:01	05:27:14	17:50:11	05:36:42	17:51:59
03 Dez	05:14:12	17:33:55	05:29:14	17:53:13	05:38:56	17:54:47
10 Dez	05:16:54	17:37:12	05:31:52	17:56:34	05:41:44	17:57:59
17 Dez	05:20:05	17:40:40	05:35:00	18:00:05	05:44:57	18:01:25
24 Dez	05:23:33	17:44:10	05:38:28	18:03:35	05:48:25	18:04:54
31 Dez	05:27:05	17:47:27	05:42:02	18:06:49	05:51:55	18:08:13

Nascer e Ocaso do Sol

Região Centro-Oeste

Coordenadas	Brasília – DF TU – 03:00 $\varphi = 15^{\circ} 46' 45'' S$ $L = 47^{\circ} 55' 46''$ Altitude = 1100		Goiânia – GO TU – 03:00 $\varphi = 16^{\circ} 40' 21'' S$ $L = 49^{\circ} 15' 29'' W$ Altitude = 750 Mts		Campo Grande – MS TU – 04:00 $\varphi = 21^{\circ} 34' 00'' S$ $L = 54^{\circ} 54' 54'' W$ Altitude = 532 Mts		Cuiabá – MT TU – 04:00 $\varphi = 15^{\circ} 35' 36'' S$ $L = 56^{\circ} 06' 01'' W$ Altitude = 177 Mts	
	Data	Nascer	Ocaso	Nascer	Ocaso	Nascer	Ocaso	Nascer	Ocaso
01 Jan	05:44:12	18:46:59	05:47:36	18:53:35	05:01:58	18:22:48	05:17:00	18:19:19
08 Jan	05:48:24	18:48:59	05:51:51	18:55:32	05:06:31	18:24:27	05:21:11	18:21:20
15 Jan	05:52:37	18:50:04	05:56:09	18:56:32	05:11:13	18:25:02	05:25:24	18:22:26
22 Jan	05:56:42	18:50:13	06:00:21	18:56:34	05:15:56	18:24:33	05:29:28	18:22:36
29 Jan	06:00:30	18:49:25	06:04:17	18:55:38	05:20:28	18:23:00	05:33:15	18:21:48
05 Fev	06:03:55	18:47:41	06:07:50	18:53:45	05:24:42	18:20:26	05:36:38	18:20:05
12 Fev	06:06:52	18:45:04	06:10:57	18:50:58	05:28:32	18:16:56	05:39:34	18:17:29
19 Fev	06:09:22	18:41:42	06:13:37	18:47:26	05:31:58	18:12:37	05:42:03	18:14:08
26 Fev	06:11:27	18:37:42	06:15:53	18:43:16	05:35:01	18:07:39	05:44:06	18:10:10
05 Mar	06:13:09	18:33:11	06:17:45	18:38:34	05:37:42	18:02:09	05:45:46	18:05:41
12 Mar	06:14:32	18:28:17	06:19:18	18:33:30	05:40:05	17:56:15	05:47:07	18:00:48
19 Mar	06:15:40	18:23:10	06:20:38	18:28:11	05:42:14	17:50:07	05:48:15	17:55:42
26 Mar	06:16:42	18:17:57	06:21:50	18:22:48	05:44:16	17:43:55	05:49:14	17:50:31
02 Abr	06:17:41	18:12:48	06:23:00	18:17:28	05:46:14	17:37:46	05:50:12	17:45:24
09 Abr	06:18:42	18:07:49	06:24:11	18:12:19	05:48:14	17:31:49	05:51:12	17:40:26
16 Abr	06:19:50	18:03:09	06:25:29	18:07:28	05:50:19	17:26:12	05:52:18	17:35:47
23 Abr	06:21:09	17:58:55	06:26:59	18:03:05	05:52:33	17:21:03	05:53:36	17:31:35
30 Abr	06:22:43	17:55:14	06:28:41	17:59:14	05:54:58	17:16:31	05:55:08	17:27:55
07 Mai	06:24:30	17:52:10	06:30:37	17:56:02	05:57:34	17:12:39	05:56:54	17:24:52
14 Mai	06:26:30	17:49:47	06:32:45	17:53:31	06:00:18	17:09:33	05:58:53	17:22:31
21 Mai	06:28:41	17:48:10	06:35:03	17:51:47	06:03:07	17:07:17	06:01:04	17:20:54
28 Mai	06:30:59	17:47:18	06:37:27	17:50:50	06:05:58	17:05:55	06:03:21	17:20:04
04 Jun	06:33:17	17:47:10	06:39:49	17:50:38	06:08:40	17:05:23	06:05:38	17:19:57
11 Jun	06:35:26	17:47:42	06:42:01	17:51:07	06:11:06	17:05:39	06:07:47	17:20:29
18 Jun	06:37:19	17:48:50	06:43:56	17:52:13	06:13:06	17:06:38	06:09:39	17:21:37
25 Jun	06:38:48	17:50:25	06:45:24	17:53:49	06:14:34	17:08:16	06:11:08	17:23:13
02 Jul	06:39:43	17:52:20	06:46:18	17:55:46	06:15:20	17:10:21	06:12:04	17:25:08
09 Jul	06:39:59	17:54:26	06:46:30	17:57:54	06:15:17	17:12:45	06:12:20	17:27:12
16 Jul	06:39:30	17:56:33	06:45:57	18:00:07	06:14:22	17:15:20	06:11:51	17:29:19
23 Jul	06:38:16	17:58:38	06:44:36	18:02:17	06:12:34	17:17:57	06:10:38	17:31:23
30 Jul	06:36:14	18:00:32	06:42:28	18:04:18	06:09:53	17:20:31	06:08:37	17:33:16
06 Ago	06:33:26	18:02:11	06:39:32	18:06:06	06:06:21	17:22:55	06:05:50	17:34:54
13 Ago	06:29:56	18:03:34	06:35:54	18:07:38	06:02:03	17:25:07	06:02:21	17:36:16
20 Ago	06:25:50	18:04:43	06:31:38	18:08:55	05:57:04	17:27:07	05:58:16	17:37:23
27 Ago	06:21:12	18:05:37	06:26:50	18:09:59	05:51:32	17:28:56	05:53:39	17:38:16
03 Set	06:16:08	18:06:19	06:21:36	18:10:52	05:45:32	17:30:34	05:48:37	17:38:57
10 Set	06:10:47	18:06:54	06:16:04	18:11:37	05:39:13	17:32:07	05:43:17	17:39:30
17 Set	06:05:16	18:07:27	06:10:23	18:12:20	05:32:43	17:33:39	05:37:47	17:40:02
24 Set	05:59:44	18:08:04	06:04:40	18:13:08	05:26:12	17:35:15	05:32:17	17:40:37
01 Out	05:54:18	18:08:48	05:59:04	18:14:03	05:19:47	17:36:59	05:26:52	17:41:20
08 Out	05:49:06	18:09:47	05:53:41	18:15:12	05:13:36	17:38:57	05:21:42	17:42:17
15 Out	05:44:18	18:11:06	05:48:43	18:16:42	05:07:49	17:41:14	05:16:56	17:43:35
22 Out	05:40:02	18:12:49	05:44:17	18:18:35	05:02:36	17:43:55	05:12:41	17:45:17
29 Out	05:36:25	18:14:59	05:40:30	18:20:55	04:58:04	17:47:00	05:09:06	17:47:25
05 Nov	05:33:34	18:17:37	05:37:30	18:23:42	04:54:21	17:50:30	05:06:16	17:50:02
12 Nov	05:31:36	18:20:43	05:35:23	18:26:57	04:51:34	17:54:25	05:04:20	17:53:07
19 Nov	05:30:36	18:24:16	05:34:15	18:30:38	04:49:50	17:58:41	05:03:21	17:56:39
26 Nov	05:30:35	18:28:08	05:34:08	18:34:36	04:49:13	18:03:10	05:03:21	18:00:30
03 Dez	05:31:33	18:32:11	05:35:00	18:38:44	04:49:41	18:07:42	05:04:20	18:04:32
10 Dez	05:33:27	18:36:15	05:36:50	18:42:52	04:51:14	18:12:07	05:06:14	18:08:36
17 Dez	05:36:11	18:40:08	05:39:33	18:46:47	04:53:47	18:16:11	05:08:59	18:12:29
24 Dez	05:39:36	18:43:38	05:42:57	18:50:17	04:57:10	18:19:41	05:12:24	18:15:59
31 Dez	05:43:29	18:46:32	05:46:52	18:53:10	05:01:12	18:22:25	05:16:17	18:18:53

Planetas

Mercúrio

	Distância média (ua) 0,39	Período de Revolução 88 dias	Inclinação Equatorial 7°	Diâm. Equatorial 4.800	00:00 Hora – Tempo Universal			
Data	α	δ	∅	Elong	DT (ua)*	Ang. PH	Fase	Mag.
01 Jan	18h 12m 19.41s	-20° 20' 51.0"	9.80	8.3	0.6860157	153.6	0.052	2.9
08 Jan	17h 54m 06.28s	-20° 24' 48.3"	8.52	19.4	0.7887710	113.0	0.304	0.5
15 Jan	18h 05m 54.65s	-21° 22' 49.9"	7.24	23.6	0.9276838	86.2	0.533	-0.1
22 Jan	18h 34m 56.97s	-22° 16' 25.3"	6.36	24.0	1.0573357	68.4	0.684	-0.2
29 Jan	19h 12m 34.47s	-22° 30' 42.5"	5.77	22.4	1.1655973	55.8	0.781	-0.2
05 Fev	19h 54m 36.43s	-21° 50' 03.2"	5.37	19.8	1.2514275	45.9	0.848	-0.2
12 Fev	20h 39m 00.64s	-20° 07' 31.2"	5.11	16.5	1.3160134	37.2	0.898	-0.4
19 Fev	21h 24m 47.85s	-17° 19' 56.8"	4.94	12.5	1.3596719	28.4	0.940	-0.6
26 Fev	22h 11m 35.56s	-13° 26' 08.7"	4.87	7.7	1.3802968	18.4	0.974	-1.0
05 Mar	22h 59m 23.94s	-08° 27' 07.0"	4.90	2.5	1.3718011	6.5	0.997	-1.6
12 Mar	23h 48m 12.00s	-02° 29' 54.4"	5.08	5.0	1.3224573	14.5	0.984	-1.6
19 Mar	00h 36m 46.95s	+04° 00' 19.4"	5.52	11.6	1.2172215	39.5	0.886	-1.3
26 Mar	01h 20m 37.78s	+10° 03' 52.4"	6.37	17.1	1.0550081	70.9	0.664	-0.8
02 Abr	01h 52m 03.01s	+14° 21' 55.4"	7.73	19.0	0.8694308	103.1	0.386	0.1
09 Abr	02h 04m 46.00s	+16° 01' 26.6"	9.49	15.7	0.7084113	133.4	0.156	1.6
16 Abr	01h 58m 37.78s	+14° 48' 44.0"	11.13	7.1	0.6039586	162.4	0.024	4.1
23 Abr	01h 43m 05.55s	+11° 36' 25.4"	11.82	4.9	0.5683101	168.8	0.010	4.8
30 Abr	01h 32m 26.62s	+08° 30' 55.8"	11.30	15.2	0.5946199	144.9	0.091	2.6
07 Mai	01h 34m 25.78s	+07° 09' 14.4"	10.11	22.2	0.6645320	125.3	0.211	1.5
14 Mai	01h 49m 05.76s	+07° 46' 17.0"	8.83	25.4	0.7614071	109.3	0.335	0.8
21 Mai	02h 14m 13.13s	+09° 57' 55.2"	7.68	25.5	0.8749660	95.0	0.456	0.4
28 Mai	02h 48m 22.07s	+13° 14' 26.8"	6.73	23.2	0.9986799	80.4	0.583	-0.1
04 Jun	03h 31m 32.68s	+17° 06' 09.0"	5.97	18.8	1.1249156	63.3	0.725	-0.5
11 Jun	04h 24m 40.94s	+20° 55' 35.8"	5.43	12.3	1.2383930	41.3	0.875	-1.1
18 Jun	05h 27m 24.82s	+23° 47' 19.8"	5.12	4.3	1.3116671	14.4	0.984	-1.9
25 Jun	06h 34m 32.87s	+24° 42' 22.9"	5.09	4.6	1.3197164	14.8	0.983	-1.8
02 Jul	07h 37m 50.55s	+23° 26' 33.5"	5.30	12.3	1.2677578	38.3	0.893	-1.0
09 Jul	08h 32m 30.04s	+20° 34' 17.1"	5.69	18.5	1.1814819	56.1	0.779	-0.5
16 Jul	09h 17m 47.96s	+16° 48' 49.9"	6.22	23.2	1.0810558	69.9	0.672	-0.1
23 Jul	09h 54m 17.31s	+12° 44' 39.0"	6.88	26.1	0.9764457	81.8	0.571	0.2
30 Jul	10h 22m 02.75s	+08° 50' 05.1"	7.70	27.2	0.8722447	93.8	0.467	0.4
06 Ago	10h 39m 55.32s	+05° 34' 49.6"	8.70	25.9	0.7724624	107.5	0.350	0.8
13 Ago	10h 45m 19.55s	+03° 38' 02.8"	9.81	21.4	0.6848878	124.9	0.214	1.4
20 Ago	10h 35m 42.50s	+03° 48' 45.5"	10.73	12.9	0.6264495	147.9	0.077	2.8
27 Ago	10h 14m 53.77s	+06° 23' 55.9"	10.73	4.2	0.6260794	169.0	0.009	4.8
03 Set	09h 59m 35.72s	+09° 47' 01.5"	9.46	12.2	0.7104321	142.2	0.105	2.2
10 Set	10h 07m 08.87s	+11° 22' 23.2"	7.69	17.6	0.8735578	105.8	0.364	0.1
17 Set	10h 38m 33.86s	+09° 57' 15.5"	6.29	16.8	1.0680016	70.0	0.671	-0.8
24 Set	11h 22m 37.55s	+06° 01' 45.7"	5.45	12.1	1.2341097	39.7	0.885	-1.2
01 Out	12h 09m 07.41s	+00° 52' 34.2"	5.00	6.4	1.3446441	17.6	0.977	-1.4
08 Out	12h 54m 10.94s	-04° 31' 10.2"	4.78	1.3	1.4045427	3.2	0.999	-1.5
15 Out	13h 37m 33.33s	-09° 39' 44.0"	4.71	4.4	1.4257424	10.2	0.992	-1.1
22 Out	14h 19m 58.21s	-14° 19' 05.5"	4.74	8.8	1.4165239	19.4	0.972	-0.7
29 Out	15h 02m 08.52s	-18° 20' 56.0"	4.87	12.7	1.3809308	28.0	0.941	-0.5
05 Nov	15h 44m 25.59s	-21° 38' 07.4"	5.09	16.2	1.3199293	37.0	0.899	-0.4
12 Nov	16h 26m 29.97s	-24° 02' 57.6"	5.45	19.2	1.2323306	47.6	0.837	-0.3
19 Nov	17h 06m 38.77s	-25° 26' 53.7"	6.02	21.4	1.1158552	61.5	0.738	-0.3
26 Nov	17h 40m 06.58s	-25° 42' 02.2"	6.92	21.8	0.9705562	81.6	0.573	-0.3
03 Dez	17h 55m 48.85s	-24° 44' 17.1"	8.29	18.2	0.8105425	112.2	0.311	0.4
10 Dez	17h 37m 47.23s	-22° 34' 05.3"	9.71	6.9	0.6920250	157.4	0.038	3.3
17 Dez	16h 59m 44.98s	-20° 02' 29.9"	9.56	9.6	0.7026179	148.4	0.074	2.5
24 Dez	16h 47m 08.33s	-19° 28' 22.2"	8.11	19.6	0.8281763	106.6	0.357	0.2
31 Dez	17h 03m 54.70s	-20° 40' 24.2"	6.85	22.6	0.9806444	79.1	0.594	-0.3

Vênus

Distância média (ua) Período de Revolução Inclinação Equatorial Diâm. Equatorial
 0,72 224,7 dias 3,4° 12.100

00:00 Hora – Tempo Universal

Data	α	δ	\varnothing	Elong	DT (ua)*	Ang. PH	Fase	Mag.
01 Jan	22h 00m 22.62s	-13° 43' 29.5"	21.71	46.8	0.7684451	82.5	0.566	-4.3
08 Jan	22h 28m 09.96s	-10° 34' 41.2"	23.27	47.1	0.7167901	86.3	0.533	-4.4
15 Jan	22h 54m 08.33s	-07° 17' 49.9"	25.09	47.1	0.6649024	90.4	0.497	-4.4
22 Jan	23h 18m 11.13s	-03° 57' 46.3"	27.21	46.8	0.6130980	94.8	0.458	-4.5
29 Jan	23h 40m 06.64s	-00° 39' 24.5"	29.70	46.0	0.5616732	99.8	0.415	-4.5
05 Fev	23h 59m 31.84s	+02° 31' 52.9"	32.64	44.7	0.5110128	105.3	0.368	-4.6
12 Fev	00h 15m 49.06s	+05° 29' 48.7"	36.12	42.6	0.4617768	111.7	0.315	-4.6
19 Fev	00h 28m 06.68s	+08° 06' 47.8"	40.20	39.5	0.4149673	119.0	0.258	-4.6
26 Fev	00h 35m 19.43s	+10° 13' 07.7"	44.85	35.1	0.3718871	127.6	0.195	-4.6
05 Mar	00h 36m 14.58s	+11° 35' 43.8"	49.89	29.2	0.3343212	137.7	0.130	-4.5
12 Mar	00h 30m 05.69s	+11° 58' 37.8"	54.73	21.6	0.3047768	149.4	0.070	-4.4
19 Mar	00h 17m 44.36s	+11° 09' 49.1"	58.27	13.1	0.2862485	161.7	0.025	-4.2
26 Mar	00h 02m 29.42s	+09° 15' 03.3"	59.31	8.3	0.2812165	168.4	0.010	-4.0
02 Abr	23h 49m 06.41s	+06° 45' 04.2"	57.41	14.1	0.2905373	160.2	0.029	-4.2
09 Abr	23h 41m 25.93s	+04° 21' 35.0"	53.27	22.5	0.3131169	148.0	0.076	-4.4
16 Abr	23h 41m 01.76s	+02° 35' 32.2"	48.14	29.7	0.3464931	136.6	0.137	-4.5
23 Abr	23h 47m 29.37s	+01° 38' 51.7"	43.01	35.2	0.3878171	126.8	0.201	-4.5
30 Abr	23h 59m 30.67s	+01° 30' 04.8"	38.37	39.3	0.4346632	118.4	0.262	-4.5
07 Mai	00h 15m 44.86s	+02° 02' 14.4"	34.37	42.1	0.4853225	111.3	0.319	-4.5
14 Mai	00h 35m 09.77s	+03° 07' 30.9"	30.97	44.0	0.5385784	105.1	0.370	-4.5
21 Mai	00h 57m 00.04s	+04° 38' 22.0"	28.11	45.1	0.5934625	99.5	0.417	-4.4
28 Mai	01h 20m 43.18s	+06° 27' 44.4"	25.69	45.7	0.6492311	94.6	0.460	-4.4
04 Jun	01h 45m 57.96s	+08° 29' 13.6"	23.65	45.9	0.7054146	90.1	0.499	-4.3
11 Jun	02h 12m 33.96s	+10° 37' 11.0"	21.90	45.7	0.7616784	85.9	0.536	-4.3
18 Jun	02h 40m 26.25s	+12° 46' 24.1"	20.40	45.2	0.8176664	82.0	0.570	-4.2
25 Jun	03h 09m 31.70s	+14° 51' 51.2"	19.11	44.5	0.8730342	78.2	0.602	-4.2
02 Jul	03h 39m 47.43s	+16° 48' 41.9"	17.98	43.7	0.9275659	74.7	0.632	-4.1
09 Jul	04h 11m 11.95s	+18° 32' 26.5"	17.00	42.6	0.9811359	71.3	0.660	-4.1
16 Jul	04h 43m 42.53s	+19° 58' 54.6"	16.14	41.5	1.0335593	68.0	0.687	-4.1
23 Jul	05h 17m 12.81s	+21° 04' 15.1"	15.38	40.2	1.0846036	64.8	0.713	-4.0
30 Jul	05h 51m 31.72s	+21° 45' 09.2"	14.71	38.9	1.1341103	61.6	0.737	-4.0
06 Ago	06h 26m 26.13s	+21° 59' 03.5"	14.11	37.5	1.1820267	58.6	0.761	-4.0
13 Ago	07h 01m 41.40s	+21° 44' 19.8"	13.58	36.0	1.2282573	55.5	0.783	-4.0
20 Ago	07h 37m 01.84s	+21° 00' 18.9"	13.11	34.5	1.2726347	52.6	0.804	-4.0
27 Ago	08h 12m 11.34s	+19° 47' 25.7"	12.68	32.9	1.3150224	49.6	0.824	-4.0
03 Set	08h 46m 57.15s	+18° 07' 03.7"	12.31	31.3	1.3554026	46.7	0.843	-4.0
10 Set	09h 21m 11.34s	+16° 01' 25.6"	11.97	29.7	1.3937527	43.9	0.861	-3.9
17 Set	09h 54m 50.72s	+13° 33' 21.5"	11.66	28.0	1.4299714	41.0	0.877	-3.9
24 Set	10h 27m 55.36s	+10° 46' 14.4"	11.39	26.3	1.4639466	38.2	0.893	-3.9
01 Out	11h 00m 29.42s	+07° 43' 46.2"	11.15	24.6	1.4956826	35.4	0.907	-3.9
08 Out	11h 32m 40.97s	+04° 29' 49.4"	10.94	22.9	1.5252201	32.7	0.921	-3.9
15 Out	12h 04m 41.08s	+01° 08' 20.3"	10.74	21.1	1.5525339	30.0	0.933	-3.9
22 Out	12h 36m 41.49s	-02° 16' 33.5"	10.57	19.4	1.5775456	27.3	0.944	-3.9
29 Out	13h 08m 54.56s	-05° 40' 37.0"	10.42	17.6	1.6002726	24.7	0.954	-3.9
05 Nov	13h 41m 33.09s	-08° 59' 29.9"	10.29	15.9	1.6208000	22.1	0.963	-3.9
12 Nov	14h 14m 49.93s	-12° 08' 49.3"	10.18	14.2	1.6391747	19.6	0.971	-3.9
19 Nov	14h 48m 55.49s	-15° 04' 03.2"	10.08	12.4	1.6553526	17.1	0.978	-3.9
26 Nov	15h 23m 56.64s	-17° 40' 34.6"	9.99	10.7	1.6693479	14.7	0.984	-3.9
03 Dez	15h 59m 55.99s	-19° 53' 51.6"	9.92	9.0	1.6812548	12.2	0.989	-3.9
10 Dez	16h 36m 51.59s	-21° 39' 43.2"	9.86	7.2	1.6911653	9.9	0.993	-3.9
17 Dez	17h 14m 35.08s	-22° 54' 30.0"	9.82	5.5	1.6990575	7.5	0.996	-3.9
24 Dez	17h 52m 51.39s	-23° 35' 23.0"	9.78	3.9	1.7049172	5.2	0.998	-3.9
31 Dez	18h 31m 20.57s	-23° 40' 41.0"	9.76	2.2	1.7088055	3.0	0.999	-3.9

Marte

Distância média (ua) Período de Revolução Inclinação Equatorial Diâm. Equatorial
 1,52 687 dias 1,9° 6.794

00:00 Hora – Tempo Universal

Data	α	δ	\varnothing	Elong	DT (ua)*	Ang. PH	Fase	Mag.
01 Jan	22h 45m 09.16s	-08° 51' 42.5"	5.70	58.7	1.6412903	36.6	0.901	0.9
08 Jan	23h 04m 40.99s	-06° 44' 08.7"	5.54	56.9	1.6881257	35.6	0.907	0.9
15 Jan	23h 24m 00.65s	-04° 34' 28.2"	5.39	55.0	1.7351817	34.5	0.912	1.0
22 Jan	23h 43m 10.54s	-02° 23' 42.3"	5.25	53.2	1.7824473	33.4	0.917	1.0
29 Jan	00h 02m 13.70s	-00° 12' 47.3"	5.12	51.3	1.8297926	32.3	0.922	1.1
05 Fev	00h 21m 12.39s	+01° 57' 18.5"	4.99	49.4	1.8770297	31.2	0.928	1.1
12 Fev	00h 40m 08.60s	+04° 05' 37.3"	4.86	47.5	1.9240491	30.1	0.933	1.2
19 Fev	00h 59m 04.79s	+06° 11' 15.7"	4.75	45.6	1.9708088	28.9	0.938	1.2
26 Fev	01h 18m 03.86s	+08° 13' 25.8"	4.64	43.7	2.0171673	27.7	0.943	1.3
05 Mar	01h 37m 07.83s	+10° 11' 18.6"	4.54	41.7	2.0629112	26.5	0.947	1.3
12 Mar	01h 56m 18.08s	+12° 04' 05.4"	4.44	39.8	2.1078968	25.3	0.952	1.4
19 Mar	02h 15m 36.12s	+13° 51' 00.5"	4.35	37.9	2.1520688	24.1	0.956	1.4
26 Mar	02h 35m 03.73s	+15° 31' 24.6"	4.26	35.9	2.1952941	22.9	0.961	1.4
02 Abr	02h 54m 41.76s	+17° 04' 38.1"	4.18	33.9	2.2373565	21.6	0.965	1.5
09 Abr	03h 14m 30.07s	+18° 30' 02.8"	4.11	32.0	2.2780962	20.4	0.969	1.5
16 Abr	03h 34m 28.44s	+19° 47' 03.6"	4.04	30.0	2.3174591	19.1	0.972	1.5
23 Abr	03h 54m 36.73s	+20° 55' 12.4"	3.97	28.0	2.3553324	17.8	0.976	1.6
30 Abr	04h 14m 53.99s	+21° 54' 03.7"	3.91	26.0	2.3915138	16.6	0.979	1.6
07 Mai	04h 35m 18.14s	+22° 43' 15.3"	3.86	24.0	2.4258381	15.3	0.982	1.6
14 Mai	04h 55m 46.95s	+23° 22' 29.5"	3.81	22.0	2.4582596	14.0	0.985	1.6
21 Mai	05h 16m 18.48s	+23° 51' 36.7"	3.76	20.0	2.4886915	12.7	0.988	1.7
28 Mai	05h 36m 50.32s	+24° 10' 31.7"	3.72	18.0	2.5169541	11.4	0.990	1.7
04 Jun	05h 57m 19.20s	+24° 19' 15.2"	3.68	16.0	2.5428834	10.1	0.992	1.7
11 Jun	06h 17m 42.04s	+24° 17' 52.3"	3.65	13.9	2.5664448	8.8	0.994	1.7
18 Jun	06h 37m 56.42s	+24° 06' 35.4"	3.62	11.9	2.5875794	7.5	0.996	1.7
25 Jun	06h 58m 00.14s	+23° 45' 41.0"	3.59	9.8	2.6061339	6.1	0.997	1.7
02 Jul	07h 17m 50.51s	+23° 15' 31.3"	3.57	7.7	2.6219515	4.8	0.998	1.7
09 Jul	07h 37m 25.36s	+22° 36' 31.0"	3.55	5.6	2.6350087	3.5	0.999	1.7
16 Jul	07h 56m 43.49s	+21° 49' 08.8"	3.54	3.5	2.6452765	2.2	1.000	1.7
23 Jul	08h 15m 44.30s	+20° 53' 54.6"	3.53	1.6	2.6526315	1.0	1.000	1.7
30 Jul	08h 34m 26.80s	+19° 51' 22.6"	3.52	1.5	2.6569303	0.9	1.000	1.7
06 Ago	08h 52m 50.60s	+18° 42' 06.6"	3.52	3.4	2.6581629	2.1	1.000	1.7
13 Ago	09h 10m 56.12s	+17° 26' 41.5"	3.52	5.5	2.6563337	3.4	0.999	1.7
20 Ago	09h 28m 44.43s	+16° 05' 40.5"	3.53	7.7	2.6513552	4.7	0.998	1.8
27 Ago	09h 46m 16.13s	+14° 39' 39.9"	3.54	10.0	2.6431067	6.1	0.997	1.8
03 Set	10h 03m 32.11s	+13° 09' 14.9"	3.56	12.3	2.6315975	7.4	0.996	1.8
10 Set	10h 20m 33.86s	+11° 34' 59.5"	3.58	14.6	2.6168724	8.8	0.994	1.8
17 Set	10h 37m 23.46s	+09° 57' 25.2"	3.60	17.0	2.5988901	10.2	0.992	1.8
24 Set	10h 54m 02.34s	+08° 17' 05.9"	3.63	19.4	2.5775644	11.6	0.990	1.8
01 Out	11h 10m 31.98s	+06° 34' 35.5"	3.67	21.8	2.5529343	12.9	0.987	1.8
08 Out	11h 26m 54.27s	+04° 50' 26.2"	3.71	24.3	2.5250944	14.3	0.985	1.8
15 Out	11h 43m 11.62s	+03° 05' 07.0"	3.75	26.8	2.4940629	15.7	0.981	1.8
22 Out	11h 59m 25.71s	+01° 19' 10.2"	3.81	29.3	2.4598010	17.0	0.978	1.8
29 Out	12h 15m 38.09s	-00° 26' 51.4"	3.86	31.9	2.4223894	18.4	0.974	1.8
05 Nov	12h 31m 50.53s	-02° 12' 25.8"	3.93	34.5	2.3819811	19.7	0.971	1.8
12 Nov	12h 48m 05.36s	-03° 57' 04.8"	4.00	37.1	2.3386657	21.1	0.967	1.8
19 Nov	13h 04m 24.09s	-05° 40' 16.6"	4.08	39.7	2.2924615	22.4	0.962	1.7
26 Nov	13h 20m 47.92s	-07° 21' 28.0"	4.17	42.4	2.2434988	23.7	0.958	1.7
03 Dez	13h 37m 18.12s	-09° 00' 06.4"	4.27	45.1	2.1919908	25.0	0.953	1.7
10 Dez	13h 53m 56.50s	-10° 35' 43.4"	4.38	47.8	2.1381021	26.3	0.948	1.6
17 Dez	14h 10m 44.01s	-12° 07' 48.0"	4.50	50.5	2.0819083	27.5	0.943	1.6
24 Dez	14h 27m 40.98s	-13° 35' 47.4"	4.63	53.2	2.0235847	28.8	0.938	1.5
31 Dez	14h 44m 47.67s	-14° 59' 10.1"	4.77	56.0	1.9633962	30.0	0.933	1.5

Longitude do Meridiano Central de Marte

00:00 Hora – Tempo Universal

	Jan	Fev	Mar	Abr	Mai	Jun	Jul	Ago	Set	Out	Nov	Dez
1	201.4	252.8	334.9	29.6	96.4	154.9	223.5	281.9	339.4	45.6	101.9	168.8
2	191.4	242.8	325.1	19.8	86.7	145.2	213.8	272.2	329.6	35.8	92.1	159.1
3	181.5	232.9	315.2	10.0	76.9	135.5	204.1	262.4	319.8	26.0	82.4	149.3
4	171.5	223.0	305.3	0.2	67.2	125.7	194.3	252.7	310.0	16.2	72.6	139.6
5	161.6	213.0	295.4	350.4	57.5	116.0	184.6	243.0	300.2	6.4	62.8	129.9
6	151.6	203.1	285.5	340.6	47.7	106.3	174.9	233.2	290.5	356.6	53.0	120.1
7	141.7	193.1	275.6	330.8	38.0	96.6	165.2	223.5	280.7	346.8	43.2	110.4
8	131.7	183.2	265.8	321.0	28.2	86.9	155.5	213.7	270.9	337.0	33.4	100.6
9	121.8	173.2	255.9	311.3	18.5	77.2	145.8	204.0	261.1	327.2	23.7	90.9
10	111.8	163.3	246.0	301.5	8.8	67.5	136.0	194.2	251.3	317.4	13.9	81.2
11	101.9	153.4	236.2	291.7	359.0	57.8	126.3	184.5	241.5	307.6	4.1	71.4
12	91.9	143.4	226.3	281.9	349.3	48.0	116.6	174.7	231.7	297.8	354.3	61.7
13	81.9	133.5	216.4	272.1	339.6	38.3	106.9	164.9	221.9	288.0	344.5	52.0
14	72.0	123.6	206.6	262.3	329.9	28.6	97.1	155.2	212.2	278.2	334.8	42.3
15	62.0	113.7	196.7	252.6	320.1	18.9	87.4	145.4	202.4	268.4	325.0	32.5
16	52.1	103.7	186.9	242.8	310.4	9.2	77.7	135.7	192.6	258.6	315.2	22.8
17	42.1	93.8	177.0	233.0	300.7	359.5	68.0	125.9	182.8	248.8	305.5	13.1
18	32.2	83.9	167.2	223.2	290.9	349.8	58.2	116.1	173.0	239.0	295.7	3.4
19	22.2	74.0	157.3	213.5	281.2	340.1	48.5	106.4	163.2	229.2	285.9	353.6
20	12.2	64.1	147.5	203.7	271.5	330.4	38.8	96.6	153.4	219.4	276.2	343.9
21	2.3	54.2	137.7	194.0	261.8	320.6	29.0	86.9	143.6	209.6	266.4	334.2
22	352.3	44.2	127.8	184.2	252.1	310.9	19.3	77.1	133.8	199.8	256.6	324.5
23	342.4	34.3	118.0	174.4	242.3	301.2	9.6	67.3	124.0	190.1	246.9	314.8
24	332.4	24.4	108.2	164.7	232.6	291.5	359.8	57.5	114.2	180.3	237.1	305.1
25	322.5	14.5	98.3	154.9	222.9	281.8	350.1	47.8	104.4	170.5	227.4	295.4
26	312.5	4.6	88.5	145.2	213.2	272.1	340.4	38.0	94.6	160.7	217.6	285.7
27	302.5	354.7	78.7	135.4	203.5	262.4	330.6	28.2	84.8	150.9	207.8	276.0
28	292.6	344.8	68.9	125.7	193.7	252.6	320.9	18.5	75.0	141.1	198.1	266.3
29	282.6		59.1	115.9	184.0	242.9	311.2	8.7	65.2	131.3	188.3	256.6
30	272.7		49.3	106.2	174.3	233.2	301.4	358.9	55.4	121.5	178.6	246.9
31	262.7		39.4		164.6		291.7	349.1		111.7		237.2

Movimento do Meridiano Central Marciano

00:00 Hora – Tempo Universal

Minuto	0h o	1h o	2h o	3h o	4h o	5h o	6h o	7h o	8h o	9h o	10h o	11h o
0	0.0	14.6	29.2	43.9	58.5	73.1	87.7	102.3	117.0	131.6	146.2	160.8
10	2.4	17.1	31.7	46.3	60.9	75.5	90.2	104.8	119.4	134.0	148.6	163.3
20	4.9	19.5	34.1	48.7	63.4	78.0	92.6	107.2	121.8	136.5	151.1	165.7
30	7.3	21.9	36.6	51.2	65.8	80.4	95.0	109.7	124.3	138.9	153.5	168.1
40	9.7	24.4	39.0	53.6	68.2	82.8	97.5	112.1	126.7	141.3	156.0	170.6
50	12.2	26.8	41.4	56.0	70.7	85.3	99.9	114.5	129.1	143.8	158.4	173.0
60	14.6	29.2	43.9	58.5	73.1	87.7	102.3	117.0	131.6	146.2	160.8	175.4

Júpiter

	Distância média (ua) 5,20	Período de Revolução 11,86 anos	Inclinação Equatorial 1,3°	Diâm. Equatorial 143.200					
	00:00 Hora – Tempo Universal								
Data	α	δ	\varnothing	Elong	DT (ua)*	Ang. PH	Fase	Mag.	
01 Jan	13h 19m 15.24s	-06° 58' 32.1"	35.51	79.7	5.5448203	10.2	0.992	-1.9	
08 Jan	13h 21m 48.75s	-07° 12' 09.7"	36.24	86.2	5.4325284	10.4	0.992	-2.0	
15 Jan	13h 23m 53.13s	-07° 22' 44.4"	37.01	92.8	5.3194432	10.4	0.992	-2.0	
22 Jan	13h 25m 26.28s	-07° 30' 07.2"	37.81	99.5	5.2069391	10.2	0.992	-2.1	
29 Jan	13h 26m 26.38s	-07° 34' 10.7"	38.63	106.4	5.0965524	10.0	0.992	-2.1	
05 Fev	13h 26m 52.02s	-07° 34' 49.6"	39.46	113.4	4.9899831	9.5	0.993	-2.2	
12 Fev	13h 26m 42.91s	-07° 32' 04.4"	40.27	120.5	4.8889036	9.0	0.994	-2.2	
19 Fev	13h 25m 59.08s	-07° 25' 57.9"	41.06	127.8	4.7948733	8.2	0.995	-2.3	
26 Fev	13h 24m 41.43s	-07° 16' 37.2"	41.80	135.2	4.7095111	7.4	0.996	-2.3	
05 Mar	13h 22m 51.92s	-07° 04' 15.1"	42.48	142.7	4.6344501	6.3	0.997	-2.4	
12 Mar	13h 20m 34.08s	-06° 49' 13.3"	43.07	150.3	4.5711042	5.2	0.998	-2.4	
19 Mar	13h 17m 52.09s	-06° 31' 57.6"	43.55	158.0	4.5206018	3.9	0.999	-2.4	
26 Mar	13h 14m 51.04s	-06° 12' 59.4"	43.91	165.7	4.4839419	2.6	0.999	-2.4	
02 Abr	13h 11m 37.04s	-05° 52' 55.7"	44.12	173.4	4.4619209	1.2	1.000	-2.5	
09 Abr	13h 08m 17.09s	-05° 32' 29.3"	44.19	177.9	4.4549077	0.4	1.000	-2.5	
16 Abr	13h 04m 57.96s	-05° 12' 22.1"	44.12	170.7	4.4628639	1.7	1.000	-2.5	
23 Abr	13h 01m 46.21s	-04° 53' 15.0"	43.89	163.1	4.4855403	3.1	0.999	-2.4	
30 Abr	12h 58m 48.22s	-04° 35' 46.7"	43.53	155.5	4.5224320	4.4	0.999	-2.4	
07 Mai	12h 56m 09.84s	-04° 20' 33.3"	43.06	148.0	4.5726263	5.6	0.998	-2.4	
14 Mai	12h 53m 55.55s	-04° 08' 01.9"	42.48	140.7	4.6349372	6.7	0.997	-2.4	
21 Mai	12h 52m 08.77s	-03° 58' 32.9"	41.82	133.5	4.7081283	7.7	0.995	-2.3	
28 Mai	12h 50m 52.19s	-03° 52' 21.3"	41.09	126.4	4.7908713	8.6	0.994	-2.3	
04 Jun	12h 50m 07.60s	-03° 49' 36.6"	40.33	119.5	4.8816240	9.3	0.993	-2.2	
11 Jun	12h 49m 55.53s	-03° 50' 20.3"	39.54	112.8	4.9788012	9.9	0.993	-2.2	
18 Jun	12h 50m 15.79s	-03° 54' 29.3"	38.75	106.2	5.0809516	10.3	0.992	-2.1	
25 Jun	12h 51m 07.93s	-04° 01' 58.0"	37.96	99.8	5.1866693	10.6	0.991	-2.1	
02 Jul	12h 52m 31.01s	-04° 12' 38.5"	37.19	93.5	5.2944618	10.7	0.991	-2.0	
09 Jul	12h 54m 23.49s	-04° 26' 18.9"	36.44	87.4	5.4029139	10.7	0.991	-2.0	
16 Jul	12h 56m 43.58s	-04° 42' 45.6"	35.73	81.3	5.5108120	10.6	0.991	-2.0	
23 Jul	12h 59m 29.75s	-05° 01' 46.2"	35.05	75.4	5.6170187	10.4	0.992	-1.9	
30 Jul	13h 02m 40.26s	-05° 23' 07.3"	34.42	69.6	5.7203403	10.1	0.992	-1.9	
06 Ago	13h 06m 13.16s	-05° 46' 34.0"	33.83	63.9	5.8196895	9.6	0.993	-1.8	
13 Ago	13h 10m 06.48s	-06° 11' 51.3"	33.29	58.2	5.9141800	9.1	0.994	-1.8	
20 Ago	13h 14m 18.67s	-06° 38' 46.3"	32.80	52.6	6.0029880	8.5	0.995	-1.8	
27 Ago	13h 18m 48.03s	-07° 07' 05.5"	32.35	47.1	6.0852293	7.8	0.995	-1.8	
03 Set	13h 23m 32.78s	-07° 36' 34.9"	31.96	41.6	6.1601300	7.1	0.996	-1.7	
10 Set	13h 28m 31.13s	-08° 07' 00.5"	31.62	36.1	6.2271045	6.3	0.997	-1.7	
17 Set	13h 33m 41.76s	-08° 38' 10.6"	31.32	30.7	6.2856148	5.4	0.998	-1.7	
24 Set	13h 39m 03.10s	-09° 09' 52.7"	31.08	25.3	6.3350609	4.5	0.998	-1.7	
01 Out	13h 44m 33.54s	-09° 41' 54.4"	30.88	19.9	6.3749594	3.6	0.999	-1.7	
08 Out	13h 50m 11.38s	-10° 14' 02.9"	30.74	14.5	6.4050109	2.6	0.999	-1.7	
15 Out	13h 55m 55.37s	-10° 46' 08.0"	30.64	9.1	6.4249610	1.7	1.000	-1.7	
22 Out	14h 01m 43.93s	-11° 17' 58.3"	30.60	3.7	6.4345000	0.7	1.000	-1.7	
29 Out	14h 07m 35.36s	-11° 49' 22.8"	30.60	2.1	6.4334512	0.4	1.000	-1.7	
05 Nov	14h 13m 27.91s	-12° 20' 10.5"	30.66	7.4	6.4218260	1.3	1.000	-1.7	
12 Nov	14h 19m 20.12s	-12° 50' 12.2"	30.76	12.9	6.3996889	2.3	1.000	-1.7	
19 Nov	14h 25m 10.18s	-13° 19' 18.2"	30.92	18.4	6.3670608	3.3	0.999	-1.7	
26 Nov	14h 30m 56.13s	-13° 47' 19.3"	31.13	24.0	6.3241179	4.2	0.999	-1.7	
03 Dez	14h 36m 35.86s	-14° 14' 05.7"	31.39	29.6	6.2712331	5.1	0.998	-1.7	
10 Dez	14h 42m 07.57s	-14° 39' 30.7"	31.71	35.3	6.2088410	6.0	0.997	-1.7	
17 Dez	14h 47m 29.04s	-15° 03' 26.3"	32.08	41.1	6.1373452	6.8	0.996	-1.8	
24 Dez	14h 52m 37.89s	-15° 25' 45.4"	32.50	46.9	6.0573241	7.6	0.996	-1.8	
31 Dez	14h 57m 31.59s	-15° 46' 20.4"	32.98	52.8	5.9695591	8.3	0.995	-1.8	

Longitude do Meridiano Central de Júpiter, Sistema I

00:00 Hora – Tempo Universal

	Jan	Fev	Mar	Abr	Mai	Jun	JuĴ	Ago	Set	Out	Nov	Dez
1	216.2	71.6	175.5	34.7	95.0	310.5	4.7	214.1	62.0	111.8	319.8	11.1
2	14.1	229.6	333.5	192.7	253.0	108.3	162.5	11.8	219.7	269.5	117.5	168.8
3	171.9	27.6	131.6	350.8	51.0	266.2	320.2	169.5	17.3	67.2	275.1	326.5
4	329.8	185.5	289.6	148.8	209.0	64.1	118.0	327.2	175.0	224.8	72.8	124.3
5	127.7	343.5	87.6	306.8	6.9	221.9	275.7	124.9	332.7	22.5	230.5	282.0
6	285.6	141.5	245.6	104.9	164.9	19.7	73.5	282.5	130.3	180.2	28.2	79.8
7	83.5	299.5	43.7	262.9	322.8	177.6	231.2	80.2	288.0	337.8	185.9	237.5
8	241.4	97.4	201.7	60.9	120.8	335.4	29.0	237.9	85.6	135.5	343.6	35.3
9	39.3	255.4	359.7	219.0	278.7	133.2	186.7	35.6	243.3	293.2	141.3	193.0
10	197.2	53.4	157.8	17.0	76.7	291.1	344.4	193.3	41.0	90.8	299.0	350.7
11	355.1	211.4	315.8	175.0	234.6	88.9	142.2	351.0	198.6	248.5	96.7	148.5
12	153.0	9.4	113.9	333.0	32.5	246.7	299.9	148.6	356.3	46.2	254.4	306.3
13	310.9	167.4	271.9	131.1	190.5	44.5	97.6	306.3	153.9	203.9	52.1	104.0
14	108.8	325.4	69.9	289.1	348.4	202.4	255.4	104.0	311.6	1.5	209.8	261.8
15	266.7	123.3	228.0	87.1	146.3	0.2	53.1	261.7	109.3	159.2	7.5	59.5
16	64.6	281.3	26.0	245.1	304.3	158.0	210.8	59.3	266.9	316.9	165.2	217.3
17	222.5	79.3	184.1	43.1	102.2	315.8	8.5	217.0	64.6	114.5	323.0	15.1
18	20.5	237.3	342.1	201.1	260.1	113.6	166.2	14.7	222.2	272.2	120.7	172.8
19	178.4	35.4	140.1	359.2	58.0	271.4	324.0	172.4	19.9	69.9	278.4	330.6
20	336.3	193.4	298.2	157.2	215.9	69.2	121.7	330.0	177.6	227.6	76.1	128.4
21	134.2	351.4	96.2	315.2	13.8	227.0	279.4	127.7	335.2	25.2	233.8	286.1
22	292.2	149.4	254.3	113.2	171.7	24.8	77.1	285.4	132.9	182.9	31.5	83.9
23	90.1	307.4	52.3	271.2	329.6	182.5	234.8	83.0	290.5	340.6	189.3	241.7
24	248.0	105.4	210.4	69.2	127.5	340.3	32.5	240.7	88.2	138.3	347.0	39.5
25	46.0	263.4	8.4	227.2	285.4	138.1	190.2	38.4	245.9	296.0	144.7	197.2
26	203.9	61.4	166.4	25.1	83.3	295.9	347.9	196.0	43.5	93.6	302.4	355.0
27	1.9	219.5	324.5	183.1	241.1	93.6	145.6	353.7	201.2	251.3	100.1	152.8
28	159.8	17.5	122.5	341.1	39.0	251.4	303.3	151.4	358.9	49.0	257.9	310.6
29	317.8		280.6	139.1	196.9	49.2	101.0	309.0	156.5	206.7	55.6	108.4
30	115.7		78.6	297.1	354.8	206.9	258.7	106.7	314.2	4.4	213.3	266.2
31	273.7		236.7		152.6		56.4	264.4		162.1		64.0

Movimento do Meridiano Central, Sistema I

Minuto	0h o	1h o	2h o	3h o	4h o	5h o	6h o	7h o	8h o	9h o	10h o	11h o
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

Longitude do Meridiano Central de Júpiter, Sistema II

00:00 Hora – Tempo Universal

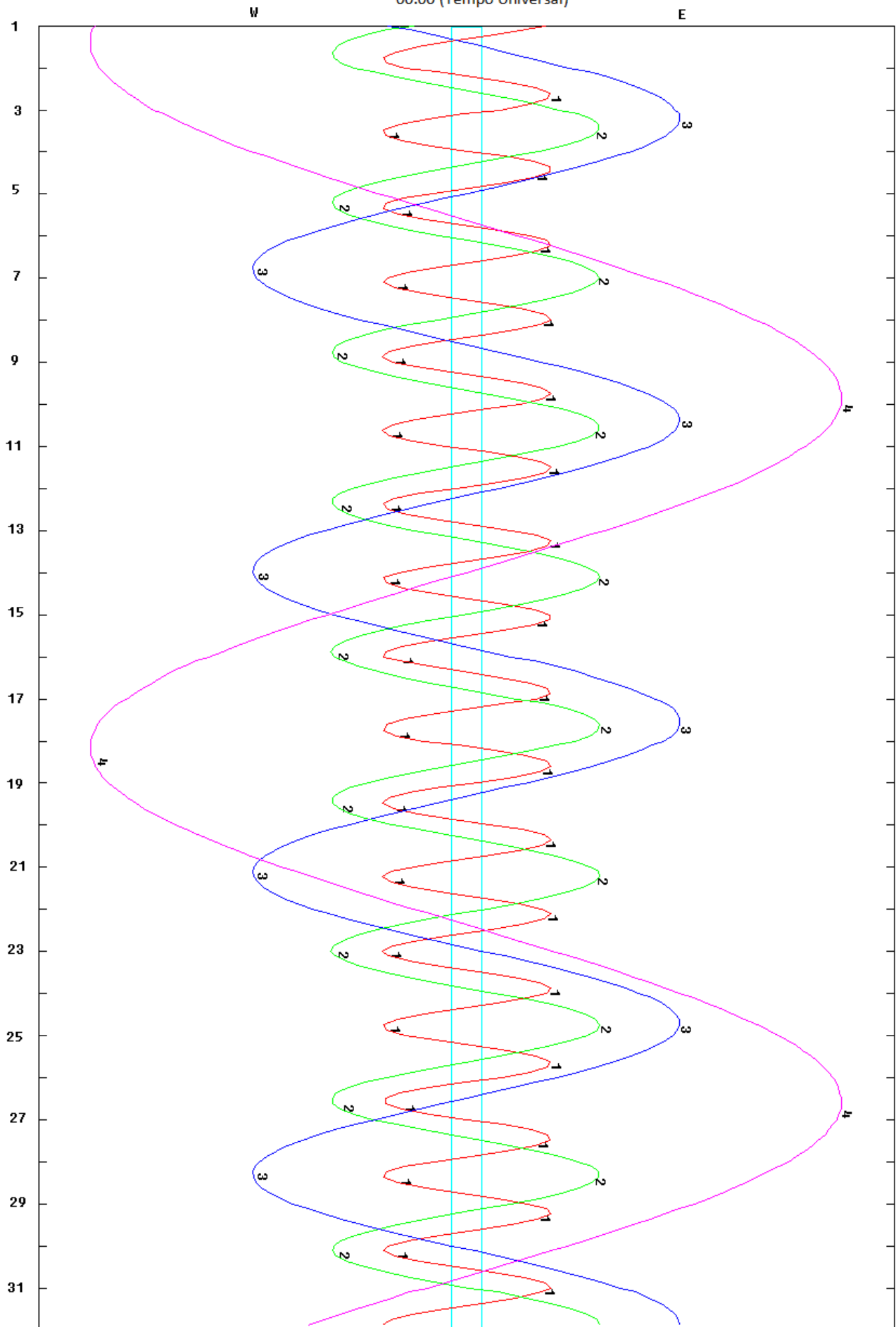
	Jan	Fev	Mar	Abr	Mai	Jun	JuI	Ago	Set	Out	Nov	Dez
1	334.1	313.0	203.3	185.9	17.4	356.3	181.6	154.5	125.9	306.9	278.2	100.6
2	124.4	103.4	353.7	336.3	167.7	146.5	331.8	304.6	275.9	96.9	68.3	250.7
3	274.6	253.7	144.0	126.7	318.0	296.7	121.9	94.6	66.0	246.9	218.4	40.9
4	64.9	44.0	294.4	277.1	108.4	87.0	87.0	272.0	244.7	216.0	37.0	8.4
5	215.1	194.4	84.8	67.5	258.7	237.2	62.1	34.8	6.0	187.0	158.5	341.1
6	5.4	344.7	235.2	217.9	49.0	27.4	212.2	184.8	156.1	337.0	308.6	131.2
7	155.7	135.1	25.6	8.3	199.4	177.6	2.4	334.9	306.1	127.1	98.6	281.3
8	305.9	285.4	176.1	158.7	349.7	327.8	152.5	124.9	96.1	277.1	248.7	71.4
9	96.2	75.8	326.5	309.1	140.0	118.0	302.6	275.0	246.2	67.1	38.8	221.5
10	246.4	226.1	116.9	99.5	290.3	268.2	92.7	65.0	36.2	217.2	188.8	11.6
11	36.7	16.5	267.3	249.9	80.6	58.4	242.8	215.1	186.2	7.2	338.9	161.8
12	187.0	166.8	57.7	40.3	230.9	208.6	32.9	5.1	336.3	157.3	129.0	311.9
13	337.3	317.2	208.1	190.7	21.2	358.8	183.0	155.2	126.3	307.3	279.0	102.0
14	127.5	107.6	358.5	341.1	171.5	149.0	333.1	305.2	276.3	97.3	69.1	252.1
15	277.8	257.9	148.9	131.5	321.8	299.2	123.2	95.3	66.3	247.4	219.2	42.3
16	68.1	48.3	299.3	281.9	112.1	89.3	273.3	245.3	216.4	37.4	9.3	192.4
17	218.4	198.7	89.7	72.3	262.4	239.5	63.4	35.3	6.4	187.5	159.4	342.5
18	8.7	349.0	240.1	222.6	52.7	29.7	213.5	185.4	156.4	337.5	309.4	132.7
19	159.0	139.4	30.6	13.0	203.0	179.8	3.6	335.4	306.5	127.6	99.5	282.8
20	309.3	289.8	181.0	163.4	353.3	330.0	153.6	125.5	96.5	277.6	249.6	73.0
21	99.6	80.2	331.4	313.8	143.5	120.2	303.7	275.5	246.5	67.7	39.7	223.1
22	249.9	230.5	121.8	104.1	293.8	270.3	93.8	65.6	36.6	217.7	189.8	13.2
23	40.2	20.9	272.2	254.5	84.1	60.5	243.9	215.6	186.6	7.8	339.9	163.4
24	190.5	171.3	62.6	44.9	234.3	210.6	34.0	5.6	336.6	157.8	130.0	313.5
25	340.8	321.7	213.0	195.2	24.6	0.8	184.0	155.7	126.7	307.9	280.0	103.7
26	131.1	112.1	3.4	345.6	174.8	150.9	334.1	305.7	276.7	97.9	70.1	253.8
27	281.4	262.5	153.9	136.0	325.1	301.1	124.2	95.7	66.7	248.0	220.2	44.0
28	71.7	52.9	304.3	286.3	115.3	91.2	274.2	245.8	216.8	38.0	10.3	194.1
29	222.1		94.7	76.7	265.6	241.4	64.3	35.8	6.8	188.1	160.4	344.3
30	12.4		245.1	227.0	55.8	31.5	214.4	185.8	156.8	338.1	310.5	134.5
31	162.7		35.5		206.1		4.5	335.9		128.2		284.6

Movimento do Meridiano Central, Sistema II

Minuto	0h o	1h o	2h o	3h o	4h o	5h o	6h o	7h o	8h o	9h o	10h o	11h o
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

Diagrama dos Satélites galileanos Janeiro 2017

1 = Io, 2 = Europa, 3 = Ganimedes, 4 = Callisto
00:00 (Tempo Universal)



Eventos mútuos em Janeiro 2017

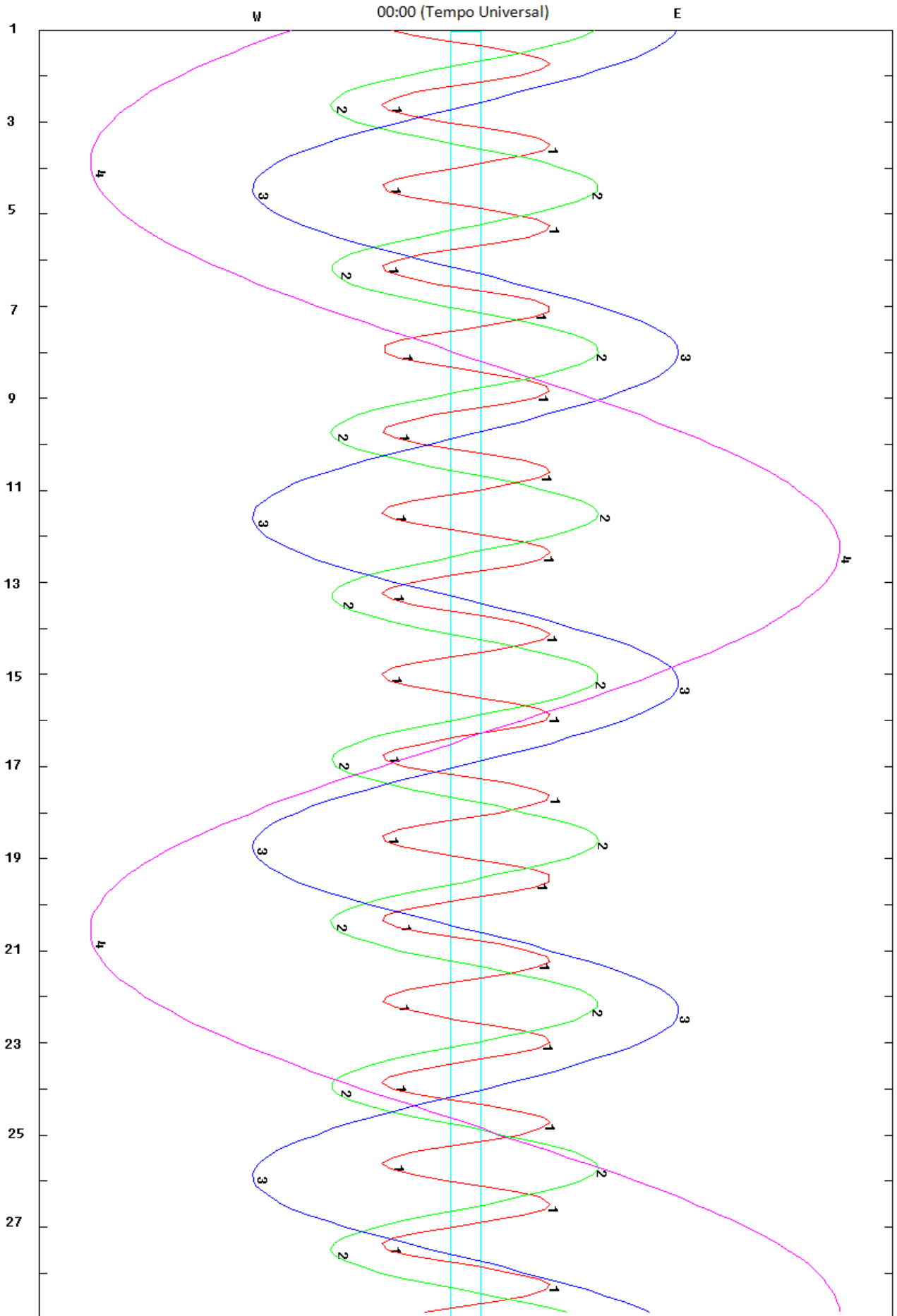
1	1	5.2	3.Ec.D	11	3	38.3	2.Sh.I	21	11	17.0	1.Ec.D
	2	58.6	1.Sh.I		6	7.2	2.Tr.I		14	42.0	1.Oc.R
	3	47.3	3.Ec.R		6	9.1	2.Sh.E		19	28.7	2.Sh.I
	4	10.9	1.Tr.I		8	31.2	2.Tr.E		21	56.7	2.Tr.I
	5	11.2	1.Sh.E		17	48.6	1.Sh.I		21	59.1	2.Sh.E
	6	9.0	3.Oc.D		18	56.1	3.Sh.I	22	0	19.3	2.Tr.E
	6	22.2	1.Tr.E		19	2.1	1.Tr.I		8	38.4	1.Sh.I
	8	31.1	3.Oc.R		20	1.0	1.Sh.E		9	50.9	1.Tr.I
2	0	6.5	1.Ec.D		21	13.0	1.Tr.E		10	50.7	1.Sh.E
	3	31.5	1.Oc.R		21	34.4	3.Sh.E		12	1.5	1.Tr.E
	6	50.2	2.Ec.D	12	0	4.2	3.Tr.I		12	58.0	3.Ec.D
	11	48.2	2.Oc.R		2	19.0	3.Tr.E		15	36.9	3.Ec.R
	21	27.0	1.Sh.I		14	55.8	1.Ec.D		18	5.5	3.Oc.D
	22	39.6	1.Tr.I		18	21.8	1.Oc.R		20	17.1	3.Oc.R
	23	39.6	1.Sh.E		22	43.2	2.Ec.D	23	5	45.3	1.Ec.D
3	0	50.9	1.Tr.E	13	3	41.4	2.Oc.R		9	9.9	1.Oc.R
	18	34.7	1.Ec.D		12	16.9	1.Sh.I		14	35.3	2.Ec.D
	22	0.0	1.Oc.R		13	30.4	1.Tr.I		19	29.4	2.Oc.R
4	1	4.7	2.Sh.I		14	29.3	1.Sh.E	24	3	6.7	1.Sh.I
	3	31.8	2.Tr.I		15	41.2	1.Tr.E		4	18.9	1.Tr.I
	3	35.8	2.Sh.E	14	9	24.0	1.Ec.D		5	19.0	1.Sh.E
	5	56.7	2.Tr.E		12	49.9	1.Oc.R		6	29.4	1.Tr.E
	14	58.8	3.Sh.I		16	55.0	2.Sh.I	25	0	13.5	1.Ec.D
	15	55.3	1.Sh.I		19	24.1	2.Tr.I		3	37.7	1.Oc.R
	17	8.2	1.Tr.I		19	25.7	2.Sh.E		8	45.7	2.Sh.I
	17	38.1	3.Sh.E		21	47.6	2.Tr.E		11	12.3	2.Tr.I
	18	7.8	1.Sh.E	15	6	45.2	1.Sh.I		11	16.0	2.Sh.E
	19	19.4	1.Tr.E		7	58.6	1.Tr.I		13	34.6	2.Tr.E
	20	3.3	3.Tr.I		8	57.6	1.Sh.E		21	35.0	1.Sh.I
	22	21.7	3.Tr.E		9	0.8	3.Ec.D		22	46.7	1.Tr.I
5	13	2.9	1.Ec.D		10	9.4	1.Tr.E		23	47.2	1.Sh.E
	16	28.5	1.Oc.R		11	40.7	3.Ec.R	26	0	57.1	1.Tr.E
	20	8.2	2.Ec.D		14	11.2	3.Oc.D		2	51.7	3.Sh.I
6	1	6.6	2.Oc.R		16	26.2	3.Oc.R		5	28.0	3.Sh.E
	10	23.6	1.Sh.I	16	3	52.3	1.Ec.D		7	54.1	3.Tr.I
	11	36.8	1.Tr.I		7	18.1	1.Oc.R		10	2.2	3.Tr.E
	12	36.1	1.Sh.E		12	0.5	2.Ec.D		18	41.8	1.Ec.D
	13	47.9	1.Tr.E		16	57.8	2.Oc.R		22	5.5	1.Oc.R
7	7	31.1	1.Ec.D	17	1	13.6	1.Sh.I	27	3	52.9	2.Ec.D
	10	56.9	1.Oc.R		2	26.8	1.Tr.I		8	44.5	2.Oc.R
	14	21.5	2.Sh.I		3	25.9	1.Sh.E		16	3.3	1.Sh.I
	16	49.7	2.Tr.I		4	37.5	1.Tr.E		17	14.4	1.Tr.I
	16	52.4	2.Sh.E		22	20.5	1.Ec.D		18	15.5	1.Sh.E
	19	14.1	2.Tr.E	18	1	46.1	1.Oc.R		19	24.9	1.Tr.E
8	4	51.9	1.Sh.I		6	11.9	2.Sh.I	28	13	10.0	1.Ec.D
	5	2.8	3.Ec.D		8	40.7	2.Tr.I		16	33.1	1.Oc.R
	6	5.3	1.Tr.I		8	42.4	2.Sh.E		22	2.5	2.Sh.I
	7	4.4	1.Sh.E		11	3.8	2.Tr.E	29	0	27.1	2.Tr.I
	7	43.8	3.Ec.R		19	41.8	1.Sh.I		0	32.7	2.Sh.E
	8	16.3	1.Tr.E		20	54.9	1.Tr.I		2	49.1	2.Tr.E
	10	12.0	3.Oc.D		21	54.1	1.Sh.E		10	31.6	1.Sh.I
	12	30.5	3.Oc.R		22	53.5	3.Sh.I		11	42.1	1.Tr.I
9	1	59.4	1.Ec.D		23	5.6	1.Tr.E		12	43.8	1.Sh.E
	5	25.2	1.Oc.R	19	1	30.8	3.Sh.E		13	52.5	1.Tr.E
	9	25.4	2.Ec.D		4	1.0	3.Tr.I		16	55.1	3.Ec.D
	14	24.0	2.Oc.R		6	12.3	3.Tr.E		19	32.9	3.Ec.R
	23	20.3	1.Sh.I		16	48.8	1.Ec.D		21	55.2	3.Oc.D
10	0	33.7	1.Tr.I		20	14.1	1.Oc.R	30	0	3.6	3.Oc.R
	1	32.8	1.Sh.E	20	1	18.1	2.Ec.D		7	38.3	1.Ec.D
	2	44.7	1.Tr.E		6	14.1	2.Oc.R		11	0.8	1.Oc.R
	20	27.6	1.Ec.D		14	10.1	1.Sh.I		17	10.1	2.Ec.D
	23	53.5	1.Oc.R		15	23.0	1.Tr.I		21	58.8	2.Oc.R
					16	22.4	1.Sh.E	31	4	59.9	1.Sh.I
					17	33.6	1.Tr.E		6	9.8	1.Tr.I
									7	12.1	1.Sh.E
									8	20.1	1.Tr.E

Diagrama dos Satélites galileanos

Fevereiro 2017

1 = Io, 2 = Europa, 3 = Ganímedes, 4 = Callisto

00:00 (Tempo Universal)



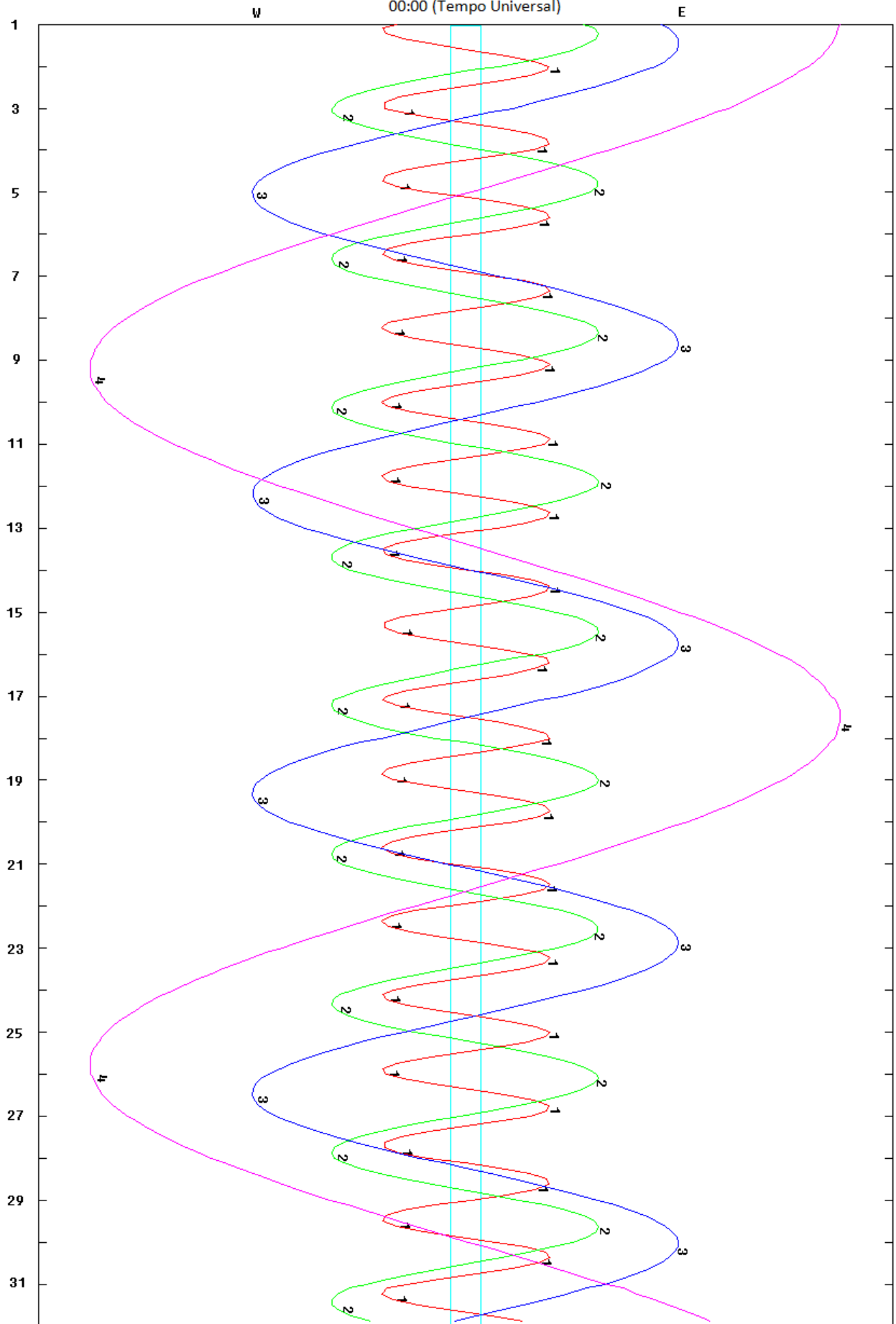
Eventos mútuos em Fevereiro 2017

1	2	6.5	1.Ec.D	11	16	56.2	1.Ec.D	21	0	53.7	2.Ec.D
	5	28.3	1.Oc.R		20	12.2	1.Oc.R		5	13.1	2.Oc.R
	11	19.6	2.Sh.I	12	3	10.6	2.Sh.I		10	39.3	1.Sh.I
	13	41.8	2.Tr.I		5	21.8	2.Tr.I		11	36.0	1.Tr.I
	13	49.7	2.Sh.E		5	40.5	2.Sh.E		12	51.5	1.Sh.E
	16	3.4	2.Tr.E		7	42.7	2.Tr.E		13	46.1	1.Tr.E
	23	28.1	1.Sh.I		14	17.8	1.Sh.I	22	7	46.1	1.Ec.D
2	0	37.3	1.Tr.I		15	21.2	1.Tr.I		10	53.9	1.Oc.R
	1	40.3	1.Sh.E		16	30.0	1.Sh.E		19	2.4	2.Sh.I
	2	47.6	1.Tr.E		17	31.4	1.Tr.E		20	57.3	2.Tr.I
	6	49.3	3.Sh.I	13	0	50.0	3.Ec.D		21	32.1	2.Sh.E
	9	24.6	3.Sh.E		3	25.7	3.Ec.R		23	17.8	2.Tr.E
	11	42.0	3.Tr.I		5	21.0	3.Oc.D	23	5	7.6	1.Sh.I
	13	47.2	3.Tr.E		7	24.1	3.Oc.R		6	2.7	1.Tr.I
	20	34.8	1.Ec.D		11	24.5	1.Ec.D		7	19.8	1.Sh.E
	23	55.8	1.Oc.R		14	39.4	1.Oc.R		8	12.8	1.Tr.E
3	6	27.6	2.Ec.D		22	19.3	2.Ec.D		18	41.5	3.Sh.I
	11	12.7	2.Oc.R	14	2	50.5	2.Oc.R		21	14.2	3.Sh.E
	17	56.4	1.Sh.I		8	46.2	1.Sh.I		22	36.3	3.Tr.I
	19	4.8	1.Tr.I		9	48.3	1.Tr.I	24	0	35.3	3.Tr.E
	20	8.6	1.Sh.E		10	58.4	1.Sh.E		2	14.5	1.Ec.D
	21	15.1	1.Tr.E		11	58.5	1.Tr.E		5	20.6	1.Oc.R
4	15	3.1	1.Ec.D	15	5	52.8	1.Ec.D		14	11.0	2.Ec.D
	18	23.2	1.Oc.R		9	6.3	1.Oc.R		18	23.6	2.Oc.R
5	0	36.5	2.Sh.I		16	27.9	2.Sh.I		23	35.9	1.Sh.I
	2	55.5	2.Tr.I		18	34.3	2.Tr.I	25	0	29.4	1.Tr.I
	3	6.5	2.Sh.E		18	57.8	2.Sh.E		1	48.1	1.Sh.E
	5	16.9	2.Tr.E		20	55.0	2.Tr.E		2	39.5	1.Tr.E
	12	24.7	1.Sh.I	16	3	14.4	1.Sh.I		20	42.8	1.Ec.D
	13	32.2	1.Tr.I		4	15.3	1.Tr.I		23	47.3	1.Oc.R
	14	36.9	1.Sh.E		5	26.6	1.Sh.E	26	8	19.5	2.Sh.I
	15	42.5	1.Tr.E		6	25.4	1.Tr.E		10	7.9	2.Tr.I
	20	52.4	3.Ec.D		14	44.4	3.Sh.I		10	49.2	2.Sh.E
	23	29.2	3.Ec.R		17	17.9	3.Sh.E		12	28.3	2.Tr.E
6	1	40.4	3.Oc.D		19	3.3	3.Tr.I		18	4.1	1.Sh.I
	3	46.0	3.Oc.R		21	3.8	3.Tr.E		18	56.0	1.Tr.I
	9	31.4	1.Ec.D	17	0	21.2	1.Ec.D		20	16.4	1.Sh.E
	12	50.6	1.Oc.R		3	33.4	1.Oc.R		21	6.1	1.Tr.E
	19	44.7	2.Ec.D		11	36.7	2.Ec.D	27	8	46.5	3.Ec.D
7	0	25.8	2.Oc.R		16	2.2	2.Oc.R		11	20.1	3.Ec.R
	6	53.0	1.Sh.I		21	42.7	1.Sh.I		12	29.1	3.Oc.D
	7	59.6	1.Tr.I		22	42.3	1.Tr.I		14	28.7	3.Oc.R
	9	5.2	1.Sh.E		23	54.9	1.Sh.E		15	11.2	1.Ec.D
	10	9.8	1.Tr.E	18	0	52.4	1.Tr.E		18	13.9	1.Oc.R
8	3	59.6	1.Ec.D		18	49.5	1.Ec.D	28	3	28.1	2.Ec.D
	7	17.8	1.Oc.R		22	0.2	1.Oc.R		7	33.5	2.Oc.R
	13	53.7	2.Sh.I	19	5	44.9	2.Sh.I		12	32.5	1.Sh.I
	16	9.1	2.Tr.I		7	45.9	2.Tr.I		13	22.6	1.Tr.I
	16	23.7	2.Sh.E		8	14.7	2.Sh.E		14	44.7	1.Sh.E
	18	30.2	2.Tr.E		10	6.4	2.Tr.E		15	32.7	1.Tr.E
9	1	21.3	1.Sh.I		16	11.0	1.Sh.I				
	2	26.9	1.Tr.I		17	9.1	1.Tr.I				
	3	33.5	1.Sh.E		18	23.2	1.Sh.E				
	4	37.1	1.Tr.E		19	19.2	1.Tr.E				
	10	47.2	3.Sh.I	20	4	48.5	3.Ec.D				
	13	21.6	3.Sh.E		7	23.1	3.Ec.R				
	15	25.4	3.Tr.I		8	57.8	3.Oc.D				
	17	28.0	3.Tr.E		10	58.8	3.Oc.R				
	22	27.9	1.Ec.D		13	17.8	1.Ec.D				
10	1	45.1	1.Oc.R		16	27.1	1.Oc.R				
	9	2.2	2.Ec.D								
	13	38.6	2.Oc.R								
	19	49.6	1.Sh.I								
	20	54.1	1.Tr.I								
	22	1.8	1.Sh.E								
	23	4.3	1.Tr.E								

Diagrama dos Satélites galileanos

Março 2017

1 = Io, 2 = Europa, 3 = Ganimedes, 4 = Callisto
00:00 (Tempo Universal)



Eventos mútuos em Março 2017

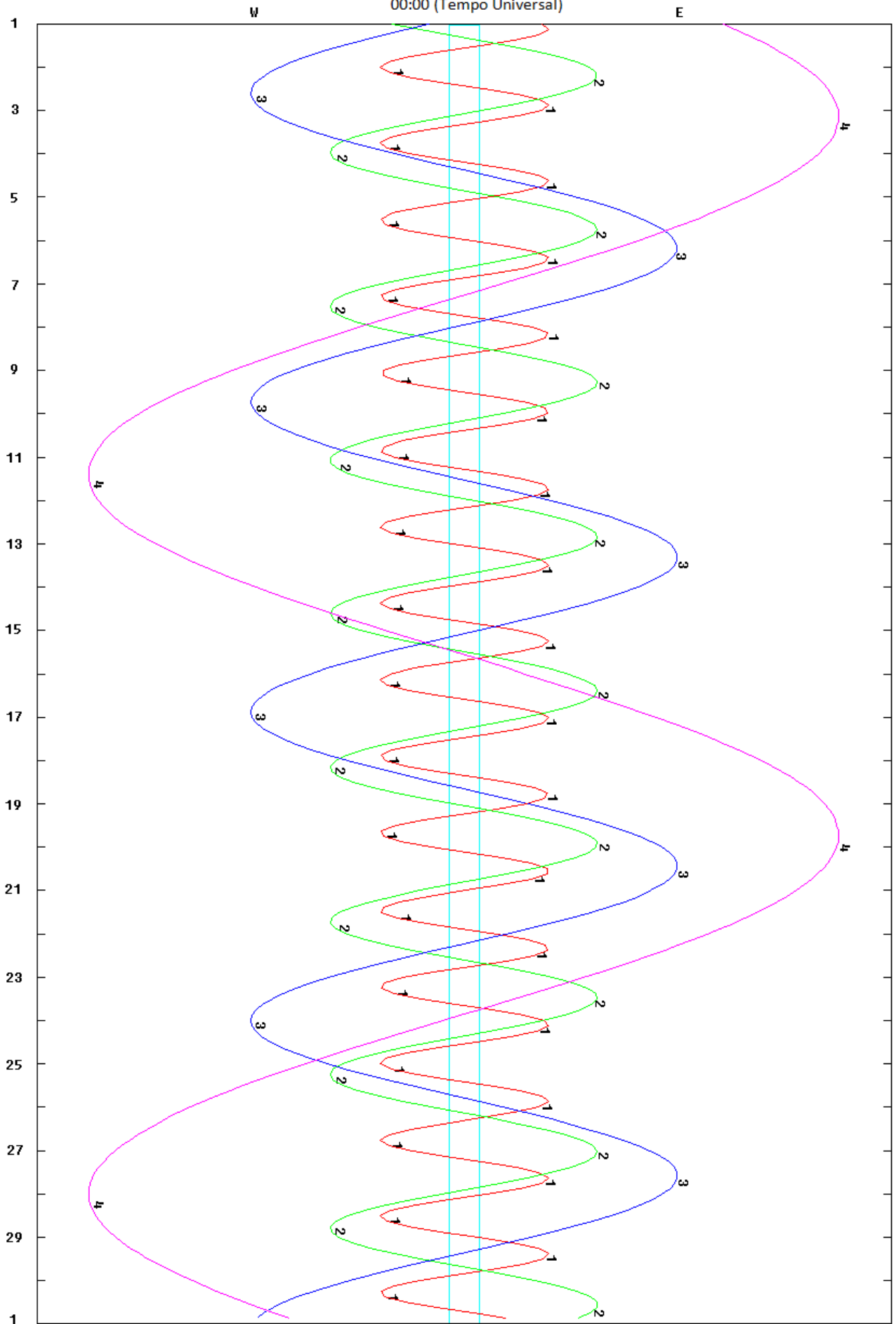
1	9	39.5	1.Ec.D	11	3	22.4	1.Sh.I	21	0	38.1	3.Oc.R
	12	40.4	1.Oc.R		4	0.7	1.Tr.I		11	10.9	2.Ec.D
	21	37.1	2.Sh.I		5	34.7	1.Sh.E		14	24.5	2.Oc.R
	23	18.4	2.Tr.I		6	11.0	1.Tr.E		18	12.5	1.Sh.I
2	0	6.7	2.Sh.E	12	0	29.9	1.Ec.D		18	37.4	1.Tr.I
	1	38.8	2.Tr.E		3	18.8	1.Oc.R		20	24.8	1.Sh.E
	7	0.8	1.Sh.I		13	29.3	2.Sh.I		20	47.7	1.Tr.E
	7	49.0	1.Tr.I		14	46.3	2.Tr.I	22	15	20.5	1.Ec.D
	9	13.0	1.Sh.E		15	58.8	2.Sh.E		17	55.7	1.Oc.R
	9	59.2	1.Tr.E		17	6.8	2.Tr.E	23	5	22.7	2.Sh.I
	22	38.9	3.Sh.I		21	50.7	1.Sh.I		6	11.5	2.Tr.I
3	1	10.7	3.Sh.E		22	26.9	1.Tr.I		7	51.9	2.Sh.E
	2	5.2	3.Tr.I	13	0	3.0	1.Sh.E		8	32.6	2.Tr.E
	4	3.2	3.Tr.E		0	37.2	1.Tr.E		12	40.8	1.Sh.I
	4	7.9	1.Ec.D		16	42.8	3.Ec.D		13	3.3	1.Tr.I
	7	7.0	1.Oc.R		18	58.3	1.Ec.D		14	53.1	1.Sh.E
	16	45.3	2.Ec.D		19	14.1	3.Ec.R		15	13.7	1.Tr.E
	20	43.0	2.Oc.R		19	19.0	3.Oc.D	24	9	49.1	1.Ec.D
4	1	29.1	1.Sh.I		21	18.0	3.Oc.R		10	33.2	3.Sh.I
	2	15.5	1.Tr.I		21	45.1	1.Oc.R		12	10.3	3.Tr.I
	3	41.3	1.Sh.E	14	8	36.7	2.Ec.D		12	21.8	1.Oc.R
	4	25.7	1.Tr.E		12	8.9	2.Oc.R		13	2.1	3.Sh.E
	22	36.3	1.Ec.D		16	19.1	1.Sh.I		14	9.7	3.Tr.E
5	1	33.4	1.Oc.R		16	53.1	1.Tr.I	25	0	28.0	2.Ec.D
	10	54.3	2.Sh.I		18	31.4	1.Sh.E		3	31.9	2.Oc.R
	12	28.0	2.Tr.I		19	3.4	1.Tr.E		7	9.2	1.Sh.I
	13	23.8	2.Sh.E	15	13	26.7	1.Ec.D		7	29.3	1.Tr.I
	14	48.4	2.Tr.E		16	11.2	1.Oc.R		9	21.5	1.Sh.E
	19	57.4	1.Sh.I	16	2	47.2	2.Sh.I		9	39.7	1.Tr.E
	20	41.9	1.Tr.I		3	55.2	2.Tr.I	26	4	17.5	1.Ec.D
	22	9.6	1.Sh.E		5	16.6	2.Sh.E		6	47.8	1.Oc.R
	22	52.0	1.Tr.E		6	15.9	2.Tr.E		18	40.3	2.Sh.I
6	12	44.9	3.Ec.D		10	47.4	1.Sh.I		19	18.9	2.Tr.I
	15	17.4	3.Ec.R		11	19.2	1.Tr.I		21	9.3	2.Sh.E
	15	56.3	3.Oc.D		12	59.7	1.Sh.E		21	40.3	2.Tr.E
	17	4.7	1.Ec.D		13	29.5	1.Tr.E	27	1	37.6	1.Sh.I
	17	55.3	3.Oc.R	17	6	35.1	3.Sh.I		1	55.2	1.Tr.I
	19	59.9	1.Oc.R		7	55.2	1.Ec.D		3	49.9	1.Sh.E
7	6	2.4	2.Ec.D		8	51.9	3.Tr.I		4	5.7	1.Tr.E
	9	52.1	2.Oc.R		9	5.0	3.Sh.E		22	46.0	1.Ec.D
	14	25.7	1.Sh.I		10	37.4	1.Oc.R	28	0	38.7	3.Ec.D
	15	8.2	1.Tr.I		10	50.1	3.Tr.E		1	13.9	1.Oc.R
	16	38.0	1.Sh.E		21	53.8	2.Ec.D		3	56.5	3.Oc.R
	17	18.4	1.Tr.E	18	1	16.8	2.Oc.R		13	45.1	2.Ec.D
8	11	33.0	1.Ec.D		5	15.7	1.Sh.I		16	39.1	2.Oc.R
	14	26.2	1.Oc.R		5	45.3	1.Tr.I		20	6.0	1.Sh.I
9	0	12.0	2.Sh.I		7	28.0	1.Sh.E		20	21.2	1.Tr.I
	1	37.6	2.Tr.I		7	55.6	1.Tr.E		22	18.3	1.Sh.E
	2	41.5	2.Sh.E	19	2	23.6	1.Ec.D		22	31.6	1.Tr.E
	3	58.0	2.Tr.E		5	3.5	1.Oc.R	29	17	14.5	1.Ec.D
	8	54.0	1.Sh.I		16	4.7	2.Sh.I		19	39.8	1.Oc.R
	9	34.5	1.Tr.I		17	3.2	2.Tr.I	30	7	58.5	2.Sh.I
	11	6.3	1.Sh.E		18	33.9	2.Sh.E		8	26.9	2.Tr.I
	11	44.7	1.Tr.E		19	24.0	2.Tr.E		10	27.5	2.Sh.E
10	2	36.5	3.Sh.I		23	44.1	1.Sh.I		10	48.6	2.Tr.E
	5	7.4	3.Sh.E	20	0	11.3	1.Tr.I		14	34.4	1.Sh.I
	5	30.0	3.Tr.I		1	56.4	1.Sh.E		14	47.0	1.Tr.I
	6	1.5	1.Ec.D		2	21.7	1.Tr.E		16	46.7	1.Sh.E
	7	27.7	3.Tr.E		20	40.6	3.Ec.D		16	57.6	1.Tr.E
	8	52.6	1.Oc.R		20	52.1	1.Ec.D	31	11	43.1	1.Ec.D
	19	19.6	2.Ec.D		23	29.7	1.Oc.R		14	5.9	1.Oc.R
	23	0.7	2.Oc.R						14	31.7	3.Sh.I
									15	26.9	3.Tr.I
									16	59.7	3.Sh.E
									17	28.2	3.Tr.E

Diagrama dos Satélites galileanos

Abril 2017

1 = Io, 2 = Europa, 3 = Ganimedes, 4 = Callisto

00:00 (Tempo Universal)



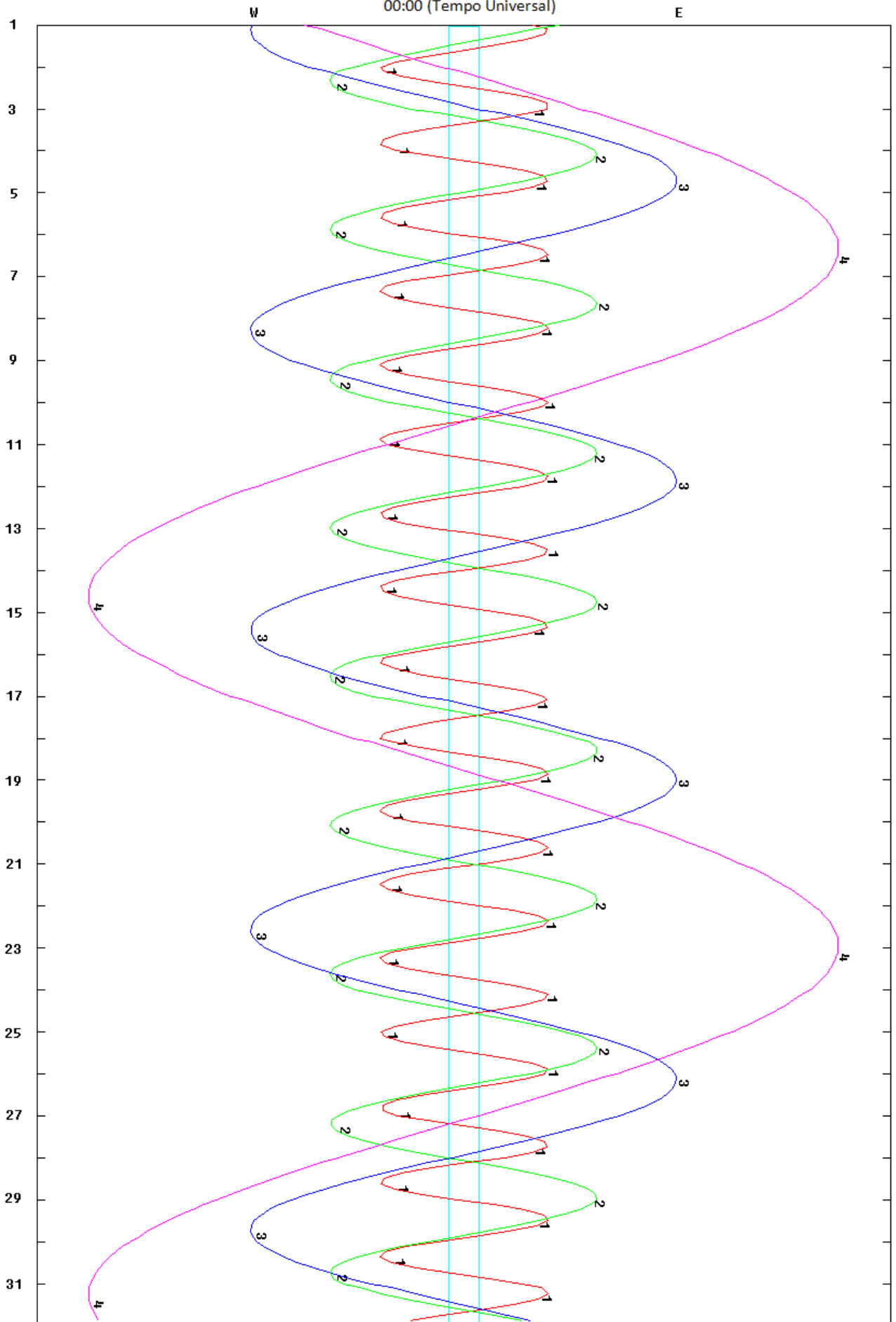
Eventos mútuos em Abril 2017

1	3	2.2	2.Ec.D	11	2	30.4	1.Oc.D	21	17	6.7	1.Oc.D
	5	46.1	2.Oc.R		4	47.4	1.Ec.R		19	39.0	1.Ec.R
	9	2.8	1.Sh.I		8	26.6	3.Oc.D	22	1	11.8	3.Tr.I
	9	12.9	1.Tr.I		11	3.8	3.Ec.R		2	26.1	3.Sh.I
	11	15.1	1.Sh.E		18	44.8	2.Oc.D		3	21.6	3.Tr.E
	11	23.5	1.Tr.E		21	21.1	2.Ec.R		4	50.8	3.Sh.E
2	6	11.6	1.Ec.D		23	48.3	1.Tr.I		10	5.4	2.Oc.D
	8	31.8	1.Oc.R		23	53.5	1.Sh.I		13	11.8	2.Ec.R
	21	16.2	2.Sh.I	12	1	59.0	1.Tr.E		14	24.2	1.Tr.I
	21	34.1	2.Tr.I		2	5.7	1.Sh.E		14	44.5	1.Sh.I
	23	45.0	2.Sh.E		20	56.3	1.Oc.D		16	35.1	1.Tr.E
	23	56.0	2.Tr.E		23	15.9	1.Ec.R		16	56.4	1.Sh.E
3	3	31.3	1.Sh.I	13	12	56.8	2.Tr.I	23	11	32.8	1.Oc.D
	3	38.8	1.Tr.I		13	10.9	2.Sh.I		14	7.6	1.Ec.R
	5	43.5	1.Sh.E		15	19.9	2.Tr.E	24	4	20.1	2.Tr.I
	5	49.4	1.Tr.E		15	39.3	2.Sh.E		5	5.5	2.Sh.I
4	0	40.1	1.Ec.D		18	14.2	1.Tr.I		6	44.4	2.Tr.E
	2	57.9	1.Oc.R		18	22.0	1.Sh.I		7	33.3	2.Sh.E
	4	37.2	3.Ec.D		20	25.0	1.Tr.E		8	50.3	1.Tr.I
	7	14.2	3.Oc.R		20	34.1	1.Sh.E		9	13.0	1.Sh.I
	16	19.3	2.Ec.D	14	15	22.4	1.Oc.D		11	1.2	1.Tr.E
	18	53.1	2.Oc.R		17	44.5	1.Ec.R		11	24.8	1.Sh.E
	21	59.7	1.Sh.I		21	56.2	3.Tr.I	25	5	59.0	1.Oc.D
	22	4.7	1.Tr.I		22	27.7	3.Sh.I		8	36.3	1.Ec.R
5	0	11.9	1.Sh.E	15	0	2.8	3.Tr.E		14	59.2	3.Oc.D
	0	15.3	1.Tr.E		0	53.5	3.Sh.E		19	0.0	3.Ec.R
	19	8.6	1.Ec.D		7	51.5	2.Oc.D		23	12.7	2.Oc.D
	21	23.8	1.Oc.R		10	38.0	2.Ec.R	26	2	28.7	2.Ec.R
6	10	34.6	2.Sh.I		12	40.2	1.Tr.I		3	16.4	1.Tr.I
	10	41.9	2.Tr.I		12	50.5	1.Sh.I		3	41.5	1.Sh.I
	13	3.3	2.Sh.E		14	50.9	1.Tr.E		5	27.3	1.Tr.E
	13	4.2	2.Tr.E		15	2.5	1.Sh.E		5	53.3	1.Sh.E
	16	28.2	1.Sh.I	16	9	48.4	1.Oc.D	27	0	25.2	1.Oc.D
	16	30.6	1.Tr.I		12	13.1	1.Ec.R		3	4.9	1.Ec.R
	18	40.3	1.Sh.E	17	2	4.2	2.Tr.I		17	28.9	2.Tr.I
	18	41.2	1.Tr.E		2	28.9	2.Sh.I		18	24.3	2.Sh.I
7	13	37.2	1.Ec.D		4	27.6	2.Tr.E		19	53.6	2.Tr.E
	15	50.2	1.Ec.R		4	57.1	2.Sh.E		20	51.9	2.Sh.E
	18	29.7	3.Sh.I		7	6.1	1.Tr.I		21	42.6	1.Tr.I
	18	41.6	3.Tr.I		7	19.0	1.Sh.I		22	10.0	1.Sh.I
	20	45.4	3.Tr.E		9	16.9	1.Tr.E		23	53.5	1.Tr.E
	20	56.6	3.Sh.E		9	31.0	1.Sh.E	28	0	21.8	1.Sh.E
8	5	36.4	2.Ec.D	18	4	14.5	1.Oc.D		18	51.5	1.Oc.D
	8	4.2	2.Ec.R		6	41.8	1.Ec.R		21	33.6	1.Ec.R
	10	56.5	1.Tr.I		11	42.1	3.Oc.D	29	4	29.4	3.Tr.I
	10	56.6	1.Sh.I		15	1.7	3.Ec.R		6	24.6	3.Sh.I
	13	7.1	1.Tr.E		20	58.4	2.Oc.D		6	42.5	3.Tr.E
	13	8.8	1.Sh.E		23	54.9	2.Ec.R		8	48.2	3.Sh.E
9	8	4.3	1.Oc.D	19	1	32.1	1.Tr.I		12	20.2	2.Oc.D
	10	18.8	1.Ec.R		1	47.5	1.Sh.I		15	45.6	2.Ec.R
	23	49.0	2.Tr.I		3	42.9	1.Tr.E		16	8.8	1.Tr.I
	23	52.4	2.Sh.I		3	59.4	1.Sh.E		16	38.5	1.Sh.I
10	2	11.6	2.Tr.E	22	22	40.5	1.Oc.D		18	19.8	1.Tr.E
	2	20.9	2.Sh.E	20	1	10.3	1.Ec.R		18	50.3	1.Sh.E
	5	22.4	1.Tr.I		15	12.4	2.Tr.I	30	13	17.8	1.Oc.D
	5	25.0	1.Sh.I		15	47.5	2.Sh.I		16	2.2	1.Ec.R
	7	33.0	1.Tr.E		17	36.2	2.Tr.E				
	7	37.2	1.Sh.E		18	15.6	2.Sh.E				
					19	58.1	1.Tr.I				
					20	16.0	1.Sh.I				
					22	9.0	1.Tr.E				
					22	27.9	1.Sh.E				

Diagrama dos Satélites galileanos

Maio 2017

1 = Io, 2 = Europa, 3 = Ganimedes, 4 = Callisto
00:00 (Tempo Universal)



Eventos mútuos em Maio 2017

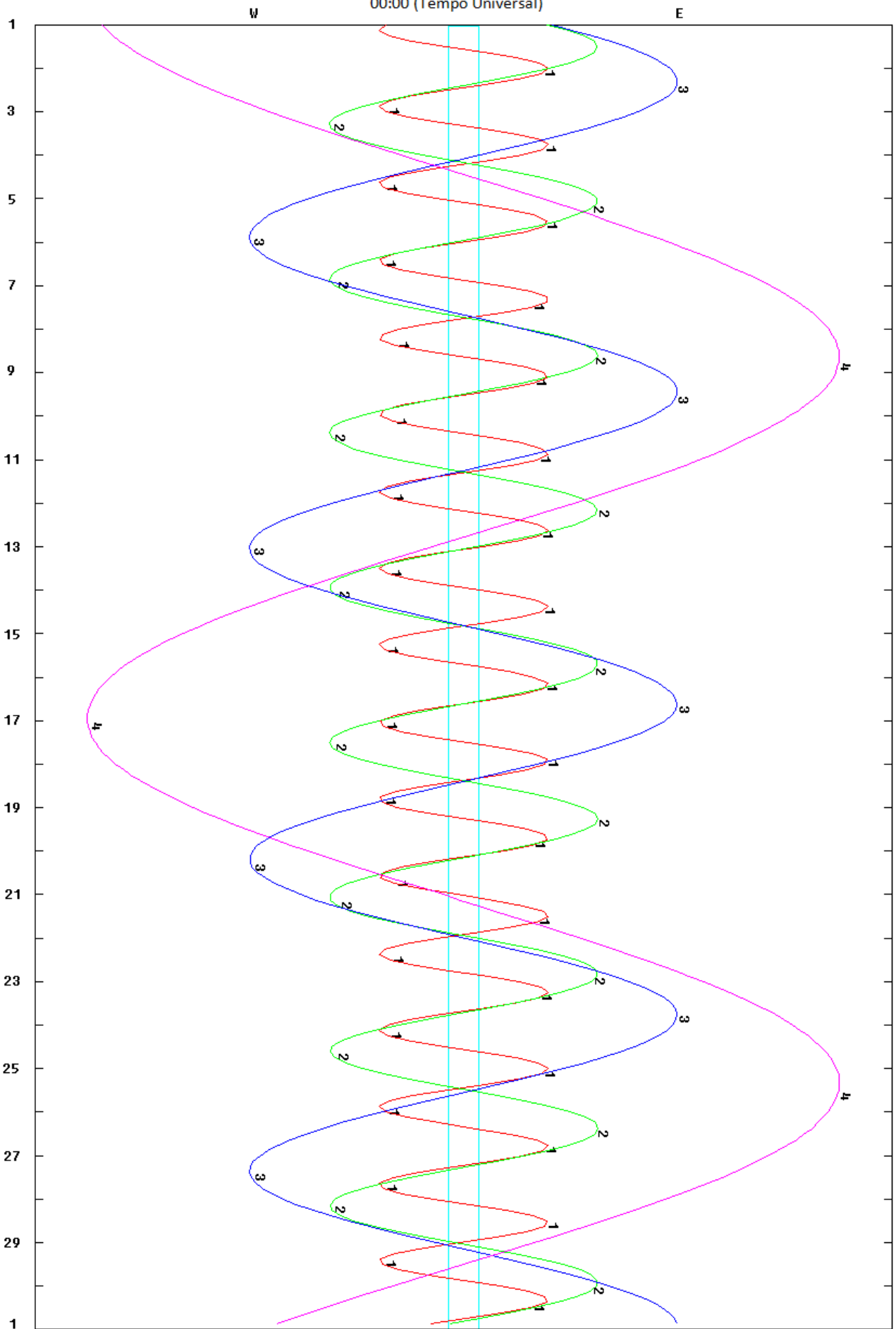
1	6	37.2	2.Tr.I	11	3	56.8	1.Oc.D	21	0	32.4	1.Sh.E
	7	42.4	2.Sh.I		6	54.3	1.Ec.R		18	38.0	1.Oc.D
	9	2.3	2.Tr.E		22	6.3	2.Tr.I		21	46.8	1.Ec.R
	10	9.8	2.Sh.E		23	38.5	2.Sh.I	22	13	39.0	2.Tr.I
	10	35.1	1.Tr.I	12	0	32.7	2.Tr.E		15	34.0	2.Sh.I
	11	7.1	1.Sh.I		1	13.8	1.Tr.I		15	54.7	1.Tr.I
	12	46.0	1.Tr.E		1	58.4	1.Sh.I		16	6.4	2.Tr.E
	13	18.7	1.Sh.E		2	5.1	2.Sh.E		16	49.9	1.Sh.I
2	7	44.2	1.Oc.D		3	24.9	1.Tr.E		17	59.9	2.Sh.E
	10	30.9	1.Ec.R		4	9.8	1.Sh.E		18	5.8	1.Tr.E
	18	17.9	3.Oc.D		22	23.6	1.Oc.D		19	1.0	1.Sh.E
	20	33.7	3.Oc.R	13	1	23.1	1.Ec.R	23	13	5.2	1.Oc.D
	20	33.8	3.Ec.D		11	14.3	3.Tr.I		16	15.6	1.Ec.R
	22	57.8	3.Ec.R		13	33.8	3.Tr.E	24	4	34.6	3.Oc.D
3	1	28.1	2.Oc.D		14	23.1	3.Sh.I		7	0.1	3.Oc.R
	5	1.4	1.Tr.I		16	44.3	3.Sh.E		8	24.2	2.Oc.D
	5	2.6	2.Ec.R		16	54.1	2.Oc.D		8	31.2	3.Ec.D
	5	35.6	1.Sh.I		19	40.5	1.Tr.I		10	21.8	1.Tr.I
	7	12.4	1.Tr.E		20	27.0	1.Sh.I		10	52.0	3.Ec.R
	7	47.2	1.Sh.E		20	53.5	2.Ec.R		11	18.5	1.Sh.I
4	2	10.6	1.Oc.D		21	51.5	1.Tr.E		12	32.9	1.Tr.E
	4	59.5	1.Ec.R		22	38.3	1.Sh.E		12	44.5	2.Ec.R
	19	46.8	2.Tr.I	14	16	50.3	1.Oc.D		13	29.5	1.Sh.E
	21	1.3	2.Sh.I		19	51.8	1.Ec.R	25	7	32.3	1.Oc.D
	22	12.3	2.Tr.E	15	11	16.4	2.Tr.I		10	44.3	1.Ec.R
	23	27.8	1.Tr.I		12	56.6	2.Sh.I	26	2	51.6	2.Tr.I
	23	28.5	2.Sh.E		13	43.1	2.Tr.E		4	48.9	1.Tr.I
5	0	4.2	1.Sh.I		14	7.2	1.Tr.I		4	53.1	2.Sh.I
	1	38.8	1.Tr.E		14	55.6	1.Sh.I		5	19.3	2.Tr.E
	2	15.7	1.Sh.E		15	23.1	2.Sh.E		5	47.2	1.Sh.I
	20	37.1	1.Oc.D		16	18.2	1.Tr.E		7	0.0	1.Tr.E
	23	28.3	1.Ec.R		17	6.8	1.Sh.E		7	18.8	2.Sh.E
6	7	50.5	3.Tr.I	16	11	17.2	1.Oc.D		7	58.1	1.Sh.E
	10	6.8	3.Tr.E		14	20.6	1.Ec.R	27	1	59.6	1.Oc.D
	10	24.1	3.Sh.I	17	1	4.9	3.Oc.D		5	13.1	1.Ec.R
	12	46.5	3.Sh.E		3	27.3	3.Oc.R		18	14.0	3.Tr.I
	14	36.3	2.Oc.D		4	31.8	3.Ec.D		20	39.1	3.Tr.E
	17	54.2	1.Tr.I		6	3.6	2.Oc.D		21	35.3	2.Oc.D
	18	19.5	2.Ec.R		6	53.7	3.Ec.R		22	21.2	3.Sh.I
	18	32.7	1.Sh.I		8	34.0	1.Tr.I		23	16.0	1.Tr.I
	20	5.2	1.Tr.E		9	24.2	1.Sh.I	28	0	15.8	1.Sh.I
	20	44.2	1.Sh.E		10	10.5	2.Ec.R		0	40.0	3.Sh.E
7	15	3.6	1.Oc.D		10	45.0	1.Tr.E		1	27.2	1.Tr.E
	17	56.9	1.Ec.R		11	35.3	1.Sh.E		2	1.6	2.Ec.R
8	8	55.9	2.Tr.I	18	5	44.0	1.Oc.D		2	26.6	1.Sh.E
	10	19.4	2.Sh.I		8	49.3	1.Ec.R		20	26.9	1.Oc.D
	11	21.8	2.Tr.E	19	0	27.9	2.Tr.I		23	41.8	1.Ec.R
	12	20.7	1.Tr.I		2	15.8	2.Sh.I	29	16	3.8	2.Tr.I
	12	46.4	2.Sh.E		2	55.0	2.Tr.E		17	43.3	1.Tr.I
	13	1.3	1.Sh.I		3	0.8	1.Tr.I		18	11.4	2.Sh.I
	14	31.7	1.Tr.E		3	52.8	1.Sh.I		18	31.9	2.Tr.E
	15	12.7	1.Sh.E		4	41.9	2.Sh.E		18	44.4	1.Sh.I
9	9	30.2	1.Oc.D		5	11.9	1.Tr.E		19	54.4	1.Tr.E
	12	25.7	1.Ec.R		6	3.9	1.Sh.E		20	36.9	2.Sh.E
	21	39.5	3.Oc.D	20	0	11.0	1.Oc.D		20	55.2	1.Sh.E
	23	58.7	3.Oc.R		3	18.0	1.Ec.R	30	14	54.3	1.Oc.D
10	0	32.6	3.Ec.D		14	42.4	3.Tr.I		18	10.6	1.Ec.R
	2	55.6	3.Ec.R		17	4.8	3.Tr.E	31	8	9.7	3.Oc.D
	3	45.0	2.Oc.D		18	22.5	3.Sh.I		10	37.8	3.Oc.R
	6	47.2	1.Tr.I		19	13.6	2.Oc.D		10	46.9	2.Oc.D
	7	29.9	1.Sh.I		20	42.5	3.Sh.E		12	10.6	1.Tr.I
	7	36.5	2.Ec.R		21	27.7	1.Tr.I		12	31.6	3.Ec.D
	8	58.3	1.Tr.E		22	21.3	1.Sh.I		13	13.0	1.Sh.I
	9	41.3	1.Sh.E		23	27.5	2.Ec.R		14	21.7	1.Tr.E
					23	38.8	1.Tr.E		14	51.4	3.Ec.R
									15	18.6	2.Ec.R
									15	23.8	1.Sh.E

Diagrama dos Satélites galileanos

Junho 2017

1 = Io, 2 = Europa, 3 = Ganímedes, 4 = Callisto

00:00 (Tempo Universal)



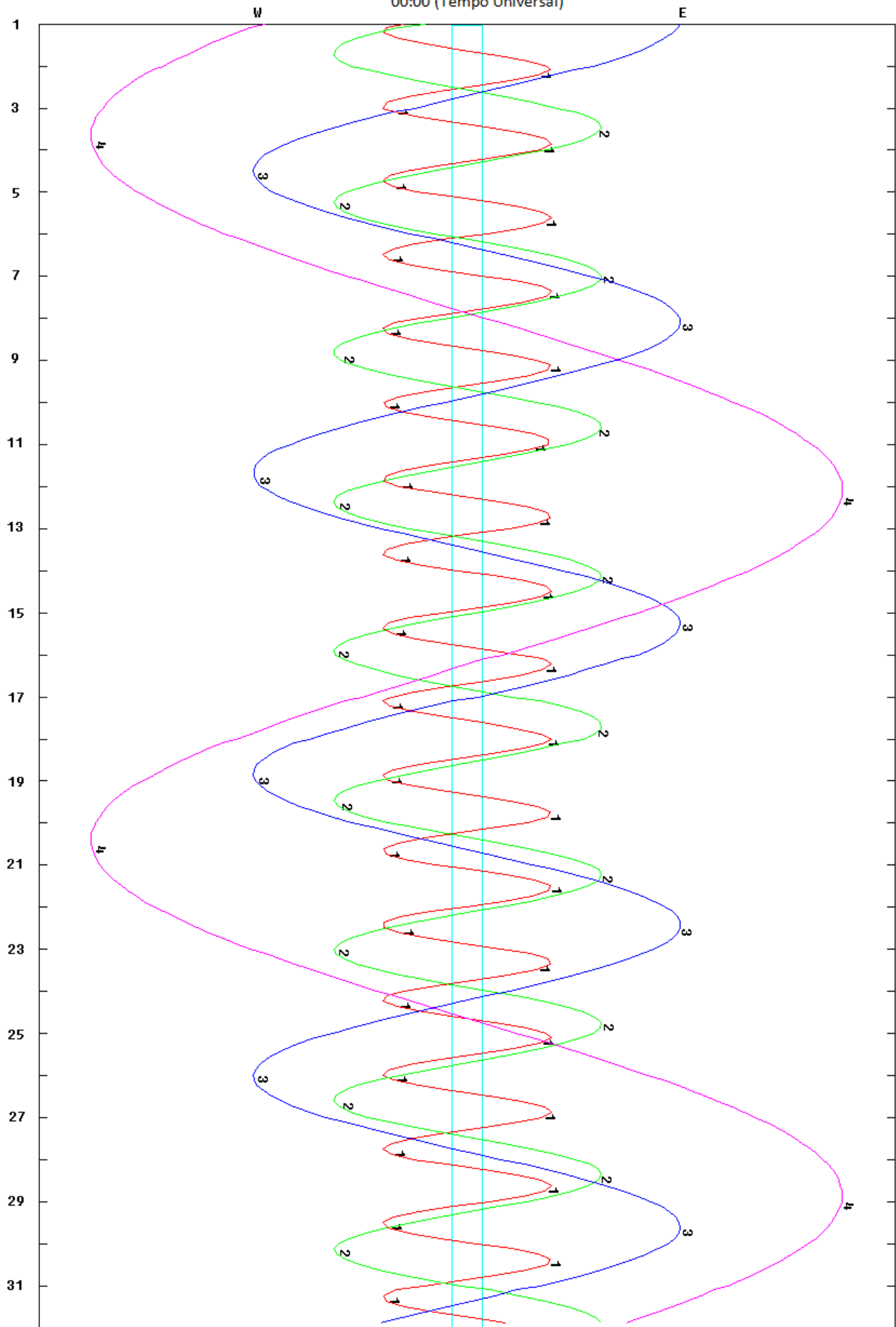
Eventos mútuos em Junho 2017

1	9	21.7	1.Oc.D	11	1	30.7	3.Tr.I	21	17	43.7	1.Tr.I
	12	39.3	1.Ec.R		2	25.0	2.Oc.D		18	8.0	2.Oc.D
2	5	17.5	2.Tr.I		2	55.9	1.Tr.I		18	56.7	1.Sh.I
	6	38.0	1.Tr.I		4	0.2	3.Tr.E		19	20.5	3.Oc.D
	7	30.6	2.Sh.I		4	4.8	1.Sh.I		19	55.0	1.Tr.E
	7	41.6	1.Sh.I		5	7.1	1.Tr.E		21	7.0	1.Sh.E
	7	45.8	2.Tr.E		6	15.3	1.Sh.E		21	54.6	3.Oc.R
	8	49.2	1.Tr.E		6	18.9	3.Sh.I		23	1.2	2.Ec.R
	9	52.4	1.Sh.E		7	9.8	2.Ec.R	22	0	30.6	3.Ec.D
	9	55.8	2.Sh.E		8	35.4	3.Sh.E		2	47.3	3.Ec.R
3	3	49.3	1.Oc.D	12	0	8.0	1.Oc.D		14	56.8	1.Oc.D
	7	8.2	1.Ec.R		3	32.1	1.Ec.R		18	24.9	1.Ec.R
	21	50.0	3.Tr.I		21	0.3	2.Tr.I	23	12	11.9	1.Tr.I
	23	59.0	2.Oc.D		21	23.7	1.Tr.I		12	48.9	2.Tr.I
4	0	17.4	3.Tr.E		22	33.4	1.Sh.I		13	25.3	1.Sh.I
	1	5.4	1.Tr.I		23	26.5	2.Sh.I		14	23.2	1.Tr.E
	2	10.2	1.Sh.I		23	29.3	2.Tr.E		15	18.6	2.Tr.E
	2	19.9	3.Sh.I		23	34.9	1.Tr.E		15	23.3	2.Sh.I
	3	16.6	1.Tr.E	13	0	43.9	1.Sh.E		15	35.7	1.Sh.E
	4	20.9	1.Sh.E		1	51.0	2.Sh.E		17	47.2	2.Sh.E
	4	35.7	2.Ec.R		18	36.0	1.Oc.D	24	9	25.2	1.Oc.D
	4	37.5	3.Sh.E		22	0.9	1.Ec.R		12	53.7	1.Ec.R
	22	16.9	1.Oc.D	14	15	32.6	3.Oc.D	25	6	40.1	1.Tr.I
5	1	36.9	1.Ec.R		15	38.8	2.Oc.D		7	23.4	2.Oc.D
	18	30.9	2.Tr.I		15	51.6	1.Tr.I		7	54.0	1.Sh.I
	19	32.9	1.Tr.I		17	2.1	1.Sh.I		8	51.4	1.Tr.E
	20	38.9	1.Sh.I		18	2.8	1.Tr.E		9	6.8	3.Tr.I
	20	49.0	2.Sh.I		18	5.1	3.Oc.R		9	53.0	2.Oc.R
	20	59.5	2.Tr.E		19	12.5	1.Sh.E		9	54.4	2.Ec.D
	21	44.1	1.Tr.E		20	27.0	2.Ec.R		10	4.3	1.Sh.E
	22	49.5	1.Sh.E		20	31.3	3.Ec.D		11	39.5	3.Tr.E
	23	13.9	2.Sh.E		22	49.0	3.Ec.R		12	18.4	2.Ec.R
6	16	44.6	1.Oc.D	15	13	4.0	1.Oc.D		14	18.0	3.Sh.I
	20	5.7	1.Ec.R		16	29.6	1.Ec.R		16	32.3	3.Sh.E
7	11	48.6	3.Oc.D	16	10	16.2	2.Tr.I	26	3	53.6	1.Oc.D
	13	11.8	2.Oc.D		10	19.5	1.Tr.I		7	22.5	1.Ec.R
	14	0.6	1.Tr.I		11	30.7	1.Sh.I	27	1	8.4	1.Tr.I
	14	19.1	3.Oc.R		12	30.8	1.Tr.E		2	5.6	2.Tr.I
	15	7.5	1.Sh.I		12	45.5	2.Tr.E		2	22.6	1.Sh.I
	16	11.7	1.Tr.E		12	45.7	2.Sh.I		3	19.8	1.Tr.E
	16	31.3	3.Ec.D		13	41.2	1.Sh.E		4	32.9	1.Sh.E
	17	18.1	1.Sh.E		15	10.0	2.Sh.E		4	35.4	2.Tr.E
	17	52.8	2.Ec.R	17	7	32.1	1.Oc.D		4	41.6	2.Sh.I
	18	50.0	3.Ec.R		10	58.5	1.Ec.R		7	5.3	2.Sh.E
8	11	12.3	1.Oc.D	18	4	47.5	1.Tr.I		22	22.1	1.Oc.D
	14	34.5	1.Ec.R		4	53.1	2.Oc.D	28	1	51.3	1.Ec.R
9	7	45.7	2.Tr.I		5	16.1	3.Tr.I		19	36.8	1.Tr.I
	8	28.2	1.Tr.I		5	59.4	1.Sh.I		20	39.3	2.Oc.D
	9	36.2	1.Sh.I		6	58.8	1.Tr.E		20	51.3	1.Sh.I
	10	8.2	2.Sh.I		7	47.4	3.Tr.E		21	48.2	1.Tr.E
	10	14.6	2.Tr.E		8	9.8	1.Sh.E		23	1.6	1.Sh.E
	10	39.4	1.Tr.E		9	44.1	2.Ec.R		23	9.0	2.Oc.R
	11	46.7	1.Sh.E		10	18.0	3.Sh.I		23	11.7	2.Ec.D
	12	32.9	2.Sh.E		12	33.4	3.Sh.E		23	12.6	3.Oc.D
10	5	40.1	1.Oc.D	19	2	0.2	1.Oc.D	29	1	35.5	2.Ec.R
	9	3.3	1.Ec.R		5	27.3	1.Ec.R		1	48.0	3.Oc.R
					23	15.6	1.Tr.I		4	29.9	3.Ec.D
					23	31.8	2.Tr.I		6	45.6	3.Ec.R
				20	0	28.0	1.Sh.I		16	50.6	1.Oc.D
					1	26.8	1.Tr.E		20	20.1	1.Ec.R
					2	1.3	2.Tr.E	30	14	5.3	1.Tr.I
					2	4.0	2.Sh.I		15	20.0	1.Sh.I
					2	38.4	1.Sh.E		15	23.7	2.Tr.I
					4	28.1	2.Sh.E		16	16.6	1.Tr.E
					20	28.5	1.Oc.D		17	30.2	1.Sh.E
					23	56.1	1.Ec.R		17	53.6	2.Tr.E
									18	0.8	2.Sh.I
									20	24.3	2.Sh.E

Diagrama dos Satélites galileanos

Julho 2017

1 = Io, 2 = Europa, 3 = Ganimedes, 4 = Callisto
00:00 (Tempo Universal)



Eventos mútuos em Julho 2017

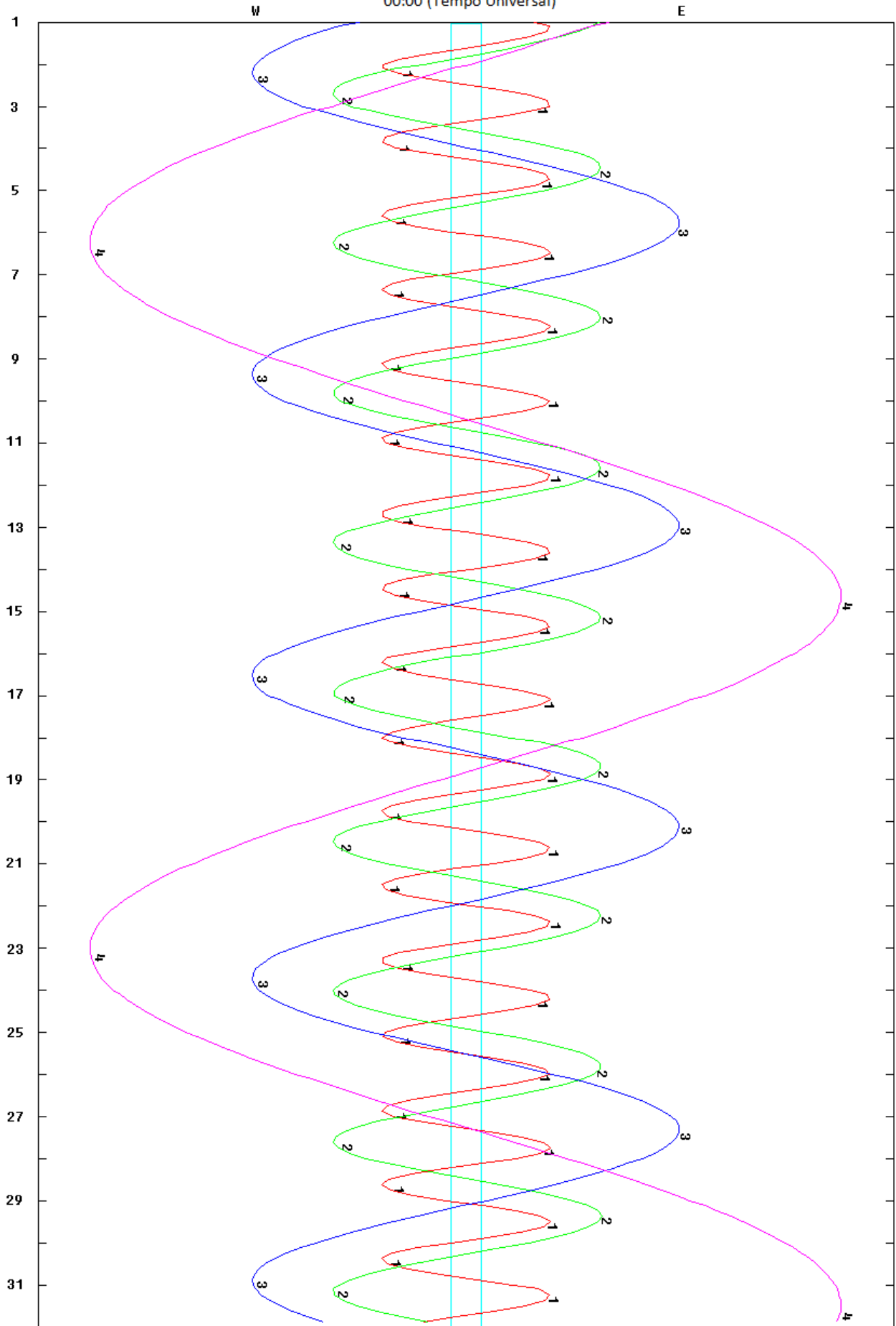
1	11	19.3	1.Oc.D	11	4	57.1	1.Tr.I	21	2	5.6	1.Ec.R
	14	48.9	1.Ec.R		6	11.9	1.Sh.I		19	50.8	1.Tr.I
2	8	33.7	1.Tr.I		7	8.6	1.Tr.E		21	4.0	1.Sh.I
	9	48.6	1.Sh.I		7	19.2	2.Tr.I		22	2.5	1.Tr.E
	9	55.8	2.Oc.D		8	22.2	1.Sh.E		23	14.2	1.Sh.E
10	45.1	1.Tr.E			9	49.3	2.Tr.E		23	19.4	2.Tr.I
11	58.9	1.Sh.E			9	56.5	2.Sh.I	22	1	49.6	2.Tr.E
12	25.6	2.Oc.R			12	19.6	2.Sh.E		1	52.8	2.Sh.I
12	29.0	2.Ec.D		12	2	12.3	1.Oc.D		4	15.4	2.Sh.E
13	1.2	3.Tr.I			5	41.7	1.Ec.R		17	7.2	1.Oc.D
14	52.8	2.Ec.R			23	25.9	1.Tr.I		20	34.5	1.Ec.R
15	35.0	3.Tr.E		13	0	40.6	1.Sh.I	23	14	20.0	1.Tr.I
18	17.4	3.Sh.I			1	37.4	1.Tr.E		15	32.6	1.Sh.I
20	30.7	3.Sh.E			1	47.9	2.Oc.D		16	31.6	1.Tr.E
3	5	47.9	1.Oc.D		2	50.8	1.Sh.E		17	42.9	1.Sh.E
	9	17.7	1.Ec.R		4	18.0	2.Oc.R		17	44.2	2.Oc.D
4	3	2.3	1.Tr.I		4	21.0	2.Ec.D		22	36.2	2.Ec.R
	4	17.3	1.Sh.I		6	44.4	2.Ec.R	24	1	7.4	3.Tr.I
	4	41.4	2.Tr.I		7	9.9	3.Oc.D		3	42.6	3.Tr.E
	5	13.7	1.Tr.E		9	46.8	3.Oc.R		6	14.9	3.Sh.I
	6	27.5	1.Sh.E		12	29.1	3.Ec.D		8	25.3	3.Sh.E
	7	11.4	2.Tr.E		14	42.7	3.Ec.R		11	36.5	1.Oc.D
	7	19.1	2.Sh.I		20	41.3	1.Oc.D		15	3.2	1.Ec.R
	9	42.4	2.Sh.E	14	0	10.5	1.Ec.R	25	8	49.1	1.Tr.I
5	0	16.7	1.Oc.D		17	54.8	1.Tr.I		10	1.3	1.Sh.I
	3	46.6	1.Ec.R		19	9.3	1.Sh.I		11	0.8	1.Tr.E
21	30.9	1.Tr.I			20	6.3	1.Tr.E		12	11.5	1.Sh.E
22	45.9	1.Sh.I			20	39.1	2.Tr.I		12	39.8	2.Tr.I
23	12.7	2.Oc.D			21	19.5	1.Sh.E		15	9.9	2.Tr.E
23	42.3	1.Tr.E			23	9.3	2.Tr.E		15	11.1	2.Sh.I
6	0	56.2	1.Sh.E		23	15.6	2.Sh.I		17	33.5	2.Sh.E
	1	42.6	2.Oc.R	15	1	38.4	2.Sh.E	26	6	6.0	1.Oc.D
	1	46.3	2.Ec.D		15	10.4	1.Oc.D		9	32.1	1.Ec.R
	3	9.1	3.Oc.D		18	39.3	1.Ec.R	27	3	18.3	1.Tr.I
	4	9.9	2.Ec.R	16	12	23.7	1.Tr.I		4	29.9	1.Sh.I
	5	45.5	3.Oc.R		13	38.0	1.Sh.I		5	30.1	1.Tr.E
	8	29.4	3.Ec.D		14	35.3	1.Tr.E		6	40.2	1.Sh.E
10	44.1	3.Ec.R			15	6.3	2.Oc.D		7	3.8	2.Oc.D
18	45.5	1.Oc.D			15	48.2	1.Sh.E		11	53.5	2.Ec.R
22	15.3	1.Ec.R			17	36.4	2.Oc.R		15	23.3	3.Oc.D
7	15	59.6	1.Tr.I		17	38.4	2.Ec.D		18	0.5	3.Oc.R
	17	14.6	1.Sh.I		20	1.7	2.Ec.R		20	29.2	3.Ec.D
	18	0.5	2.Tr.I		21	2.0	3.Tr.I		22	40.9	3.Oc.R
	18	11.0	1.Tr.E		23	37.0	3.Tr.E	28	0	35.3	1.Oc.D
	19	24.8	1.Sh.E	17	2	16.0	3.Sh.I		4	0.8	1.Ec.R
	20	30.6	2.Tr.E		4	27.3	3.Sh.E		21	47.6	1.Tr.I
	20	38.2	2.Sh.I		9	39.5	1.Oc.D		22	58.6	1.Sh.I
	23	1.4	2.Sh.E		13	8.1	1.Ec.R		23	59.4	1.Tr.E
8	13	14.4	1.Oc.D	18	6	52.7	1.Tr.I	29	1	8.9	1.Sh.E
	16	44.1	1.Ec.R		8	6.6	1.Sh.I		2	1.3	2.Tr.I
9	10	28.3	1.Tr.I		9	4.3	1.Tr.E		4	30.0	2.Sh.I
	11	43.3	1.Sh.I		9	58.7	2.Tr.I		4	31.4	2.Tr.E
	12	30.1	2.Oc.D		10	16.8	1.Sh.E		6	52.3	2.Sh.E
	12	39.8	1.Tr.E		12	28.8	2.Tr.E		19	4.8	1.Oc.D
	13	53.5	1.Sh.E		12	33.9	2.Sh.I		22	29.6	1.Ec.R
	15	0.1	2.Oc.R		14	56.6	2.Sh.E	30	16	16.9	1.Tr.I
	15	3.7	2.Ec.D	19	4	8.7	1.Oc.D		17	27.3	1.Sh.I
	17	0.1	3.Tr.I		7	36.9	1.Ec.R		18	28.7	1.Tr.E
	17	27.2	2.Ec.R	20	1	21.7	1.Tr.I		19	37.6	1.Sh.E
	19	34.6	3.Tr.E		2	35.3	1.Sh.I		20	23.8	2.Oc.D
	22	17.1	3.Sh.I		3	33.3	1.Tr.E	31	1	10.8	2.Ec.R
10	0	29.3	3.Sh.E		4	25.0	2.Oc.D		5	16.3	3.Tr.I
	7	43.3	1.Oc.D		4	45.5	1.Sh.E		7	51.4	3.Tr.E
	11	12.9	1.Ec.R		6	55.2	2.Oc.R		10	14.0	3.Sh.I
					6	55.8	2.Ec.D		12	23.5	3.Sh.E
					9	18.9	2.Ec.R		13	34.3	1.Oc.D
					11	15.2	3.Oc.D		16	58.3	1.Ec.R
					13	52.4	3.Oc.R				
					16	29.6	3.Ec.D				
					18	42.2	3.Ec.R				
					22	37.9	1.Oc.D				

Diagrama dos Satélites galileanos

Agosto 2017

1 = Io, 2 = Europa, 3 = Ganimedes, 4 = Callisto

00:00 (Tempo Universal)

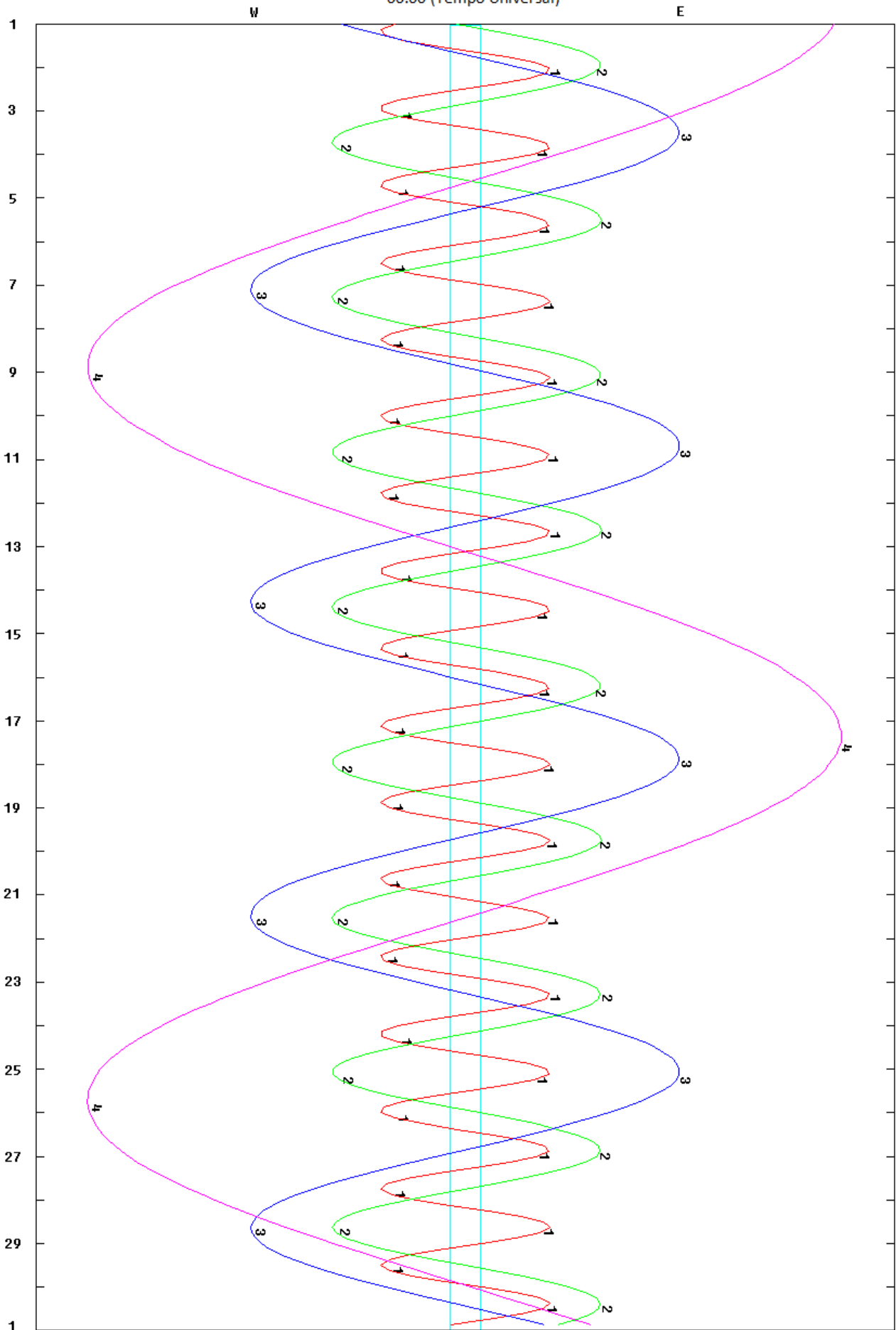


Eventos mútuos em Agosto 2017

1	10	46.3	1.Tr.I	11	2	24.9	3.Oc.R	21	0	23.9	1.Tr.E
	11	56.0	1.Sh.I		4	28.2	3.Ec.D		1	21.8	1.Sh.E
	12	58.1	1.Tr.E		4	32.2	1.Oc.D		4	31.2	2.Oc.D
	14	6.3	1.Sh.E		6	38.0	3.Ec.R		8	55.2	2.Ec.R
	15	22.4	2.Tr.I		7	50.8	1.Ec.R		18	1.4	3.Tr.I
	17	48.2	2.Sh.I	12	1	43.3	1.Tr.I		19	31.3	1.Oc.D
	17	52.4	2.Tr.E		2	47.9	1.Sh.I		20	34.7	3.Tr.E
	20	10.3	2.Sh.E		3	55.3	1.Tr.E		22	12.5	3.Sh.I
2	8	3.9	1.Oc.D		4	58.4	1.Sh.E		22	43.2	1.Ec.R
	11	27.1	1.Ec.R		7	29.0	2.Tr.I	22	0	19.4	3.Sh.E
3	5	15.7	1.Tr.I		9	43.8	2.Sh.I		16	41.6	1.Tr.I
	6	24.6	1.Sh.I		9	58.7	2.Tr.E		17	39.8	1.Sh.I
	7	27.5	1.Tr.E		12	5.6	2.Sh.E		18	53.7	1.Tr.E
	8	34.9	1.Sh.E		23	2.0	1.Oc.D		19	50.4	1.Sh.E
	9	44.2	2.Oc.D	13	2	19.6	1.Ec.R		23	37.3	2.Tr.I
	14	28.2	2.Ec.R		20	12.9	1.Tr.I	23	1	38.4	2.Sh.I
	19	34.9	3.Oc.D		21	16.6	1.Sh.I		2	6.5	2.Tr.E
	22	11.7	3.Oc.R		22	24.9	1.Tr.E		3	59.8	2.Sh.E
4	0	29.1	3.Ec.D		23	27.0	1.Sh.E		14	1.3	1.Oc.D
	2	33.4	1.Oc.D	14	1	47.4	2.Oc.D		17	11.9	1.Ec.R
	2	39.8	3.Ec.R		6	20.3	2.Ec.R	24	11	11.4	1.Tr.I
	5	55.8	1.Ec.R		13	43.9	3.Tr.I		12	8.5	1.Sh.I
	23	45.2	1.Tr.I		16	18.0	3.Tr.E		13	23.5	1.Tr.E
5	0	53.3	1.Sh.I		17	31.7	1.Oc.D		14	19.1	1.Sh.E
	1	57.0	1.Tr.E		18	13.2	3.Sh.I		17	53.5	2.Oc.D
	3	3.6	1.Sh.E		20	21.0	3.Sh.E		22	12.7	2.Ec.R
	4	44.5	2.Tr.I		20	48.3	1.Ec.R	25	8	23.7	3.Oc.D
	7	7.0	2.Sh.I	15	14	42.6	1.Tr.I		8	31.2	1.Oc.D
	7	14.5	2.Tr.E		15	45.2	1.Sh.I		10	57.9	3.Oc.R
	9	29.0	2.Sh.E		16	54.6	1.Tr.E		11	40.6	1.Ec.R
	21	3.1	1.Oc.D		17	55.7	1.Sh.E		12	26.4	3.Ec.D
6	0	24.6	1.Ec.R		20	51.3	2.Tr.I		14	34.2	3.Ec.R
	18	14.6	1.Tr.I		23	1.8	2.Sh.I	26	5	41.3	1.Tr.I
	19	21.9	1.Sh.I		23	20.9	2.Tr.E		6	37.2	1.Sh.I
	20	26.5	1.Tr.E	16	1	23.5	2.Sh.E		7	53.4	1.Tr.E
	21	32.3	1.Sh.E		12	1.6	1.Oc.D		8	47.8	1.Sh.E
	23	4.9	2.Oc.D		15	17.1	1.Ec.R		13	0.9	2.Tr.I
7	3	45.6	2.Ec.R	17	9	12.3	1.Tr.I		14	56.8	2.Sh.I
	9	28.3	3.Tr.I		10	13.9	1.Sh.I		15	29.9	2.Tr.E
	12	3.0	3.Tr.E		11	24.3	1.Tr.E		17	18.2	2.Sh.E
	14	13.2	3.Sh.I		12	24.4	1.Sh.E	27	3	1.2	1.Oc.D
	15	32.7	1.Oc.D		15	9.1	2.Oc.D		6	9.3	1.Ec.R
	16	21.8	3.Sh.E		19	37.8	2.Ec.R	28	0	11.1	1.Tr.I
	18	53.3	1.Ec.R	18	4	4.9	3.Oc.D		1	5.8	1.Sh.I
8	12	44.1	1.Tr.I		6	31.5	1.Oc.D		2	23.3	1.Tr.E
	13	50.6	1.Sh.I		6	40.2	3.Oc.R		3	16.4	1.Sh.E
	14	56.1	1.Tr.E		8	27.2	3.Ec.D		7	16.1	2.Oc.D
	16	1.0	1.Sh.E		9	45.8	1.Ec.R		11	30.2	2.Ec.R
	18	6.2	2.Tr.I		10	36.0	3.Ec.R		21	31.2	1.Oc.D
	20	25.1	2.Sh.I	19	3	42.0	1.Tr.I		22	21.4	3.Tr.I
	20	36.1	2.Tr.E		4	42.6	1.Sh.I	29	0	38.0	1.Ec.R
	22	47.0	2.Sh.E		5	54.1	1.Tr.E		0	53.6	3.Tr.E
9	10	2.5	1.Oc.D		6	53.1	1.Sh.E		2	12.0	3.Sh.I
	13	22.1	1.Ec.R		10	14.5	2.Tr.I		4	18.0	3.Sh.E
10	7	13.7	1.Tr.I		12	20.4	2.Sh.I		18	41.0	1.Tr.I
	8	19.2	1.Sh.I		12	43.9	2.Tr.E		19	34.4	1.Sh.I
	9	25.6	1.Tr.E		14	42.0	2.Sh.E		20	53.3	1.Tr.E
	10	29.7	1.Sh.E	20	1	1.4	1.Oc.D		21	45.1	1.Sh.E
	12	26.0	2.Oc.D		4	14.5	1.Ec.R	30	2	24.1	2.Tr.I
	17	3.0	2.Ec.R		22	11.8	1.Tr.I		4	14.7	2.Sh.I
	23	48.7	3.Oc.D		23	11.2	1.Sh.I		4	53.0	2.Tr.E
									6	36.0	2.Sh.E
									16	1.3	1.Oc.D
									19	6.7	1.Ec.R
								31	13	11.0	1.Tr.I
									14	3.0	1.Sh.I
									15	23.2	1.Tr.E
									16	13.8	1.Sh.E
									20	39.0	2.Oc.D

Diagrama dos Satélites galileanos Setembro 2017

1 = Io, 2 = Europa, 3 = Ganimedes, 4 = Callisto
00:00 (Tempo Universal)



Eventos mútuos em Setembro 2017

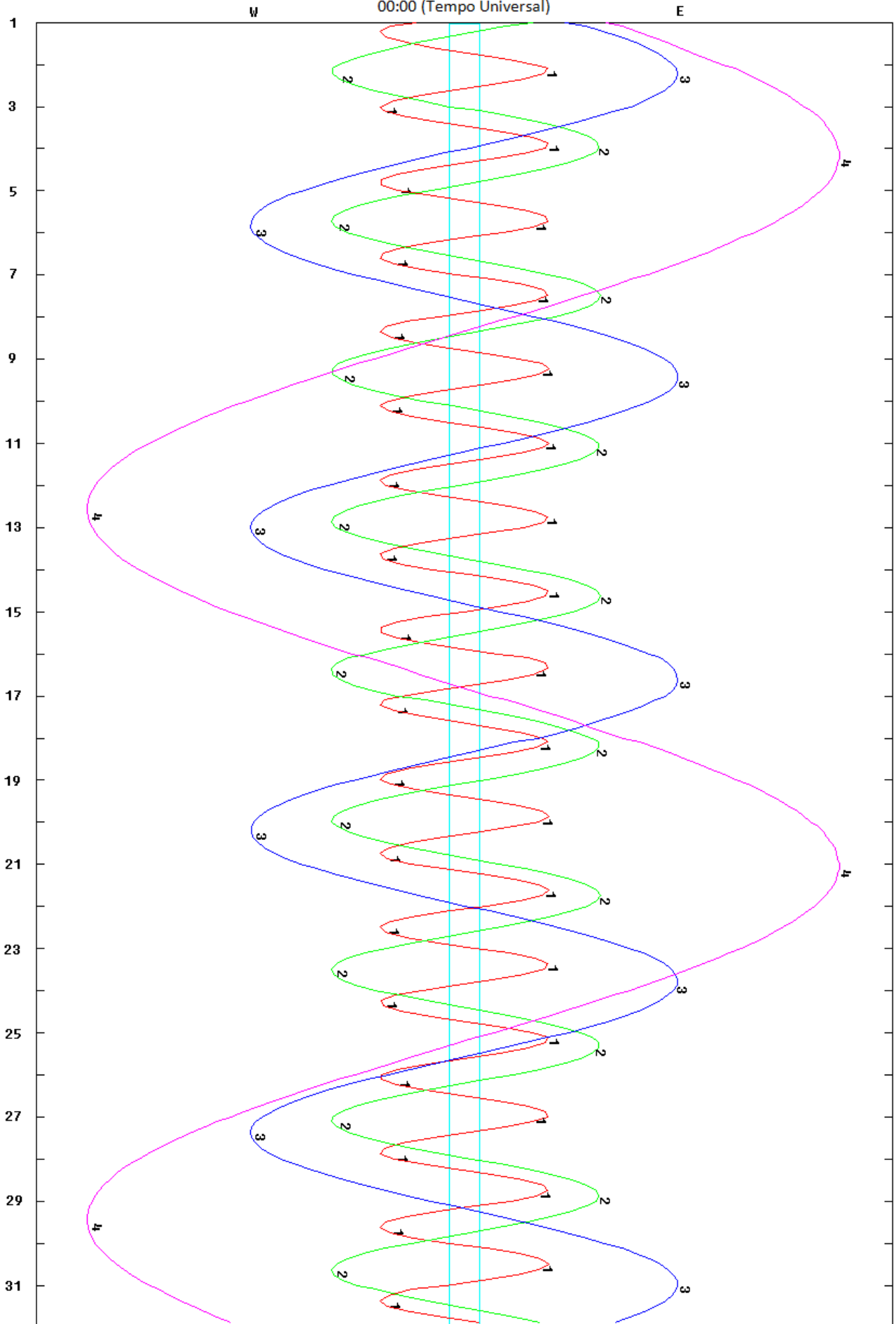
1	0	47.7	2.Ec.R	11	4	11.1	1.Tr.I	21	0	50.4	1.Ec.R
	10	31.4	1.Oc.D		4	54.8	1.Sh.I		19	12.0	1.Tr.I
	12	44.7	3.Oc.D		6	23.5	1.Tr.E		19	46.5	1.Sh.I
	13	35.3	1.Ec.R		7	5.7	1.Sh.E		21	24.4	1.Tr.E
	15	17.5	3.Oc.R		12	49.1	2.Oc.D		21	57.6	1.Sh.E
	16	25.6	3.Ec.D		16	40.3	2.Ec.R	22	5	1.2	2.Oc.D
	18	32.5	3.Ec.R	12	1	32.2	1.Oc.D		8	33.2	2.Ec.R
2	7	41.0	1.Tr.I		4	27.3	1.Ec.R		16	33.5	1.Oc.D
	8	31.7	1.Sh.I		7	5.5	3.Tr.I		19	19.0	1.Ec.R
	9	53.2	1.Tr.E		9	34.9	3.Tr.E	23	1	58.9	3.Oc.D
	10	42.5	1.Sh.E		10	9.3	3.Sh.I		6	28.2	3.Ec.R
	15	48.1	2.Tr.I		12	13.7	3.Sh.E		13	42.2	1.Tr.I
	17	33.0	2.Sh.I		22	41.2	1.Tr.I		14	15.2	1.Sh.I
	18	16.7	2.Tr.E		23	23.5	1.Sh.I		15	54.7	1.Tr.E
	19	54.2	2.Sh.E	13	0	53.6	1.Tr.E		16	26.2	1.Sh.E
3	5	1.5	1.Oc.D		1	34.4	1.Sh.E	24	0	13.0	2.Tr.I
	8	4.0	1.Ec.R		7	59.8	2.Tr.I		1	20.3	2.Sh.I
4	2	10.9	1.Tr.I		9	26.8	2.Sh.I		2	39.9	2.Tr.E
	3	0.3	1.Sh.I		10	27.7	2.Tr.E		3	40.8	2.Sh.E
	4	23.2	1.Tr.E		11	47.6	2.Sh.E		11	3.8	1.Oc.D
	5	11.1	1.Sh.E		20	2.4	1.Oc.D		13	47.6	1.Ec.R
	10	2.1	2.Oc.D		22	55.9	1.Ec.R	25	8	12.4	1.Tr.I
	14	5.2	2.Ec.R	14	17	11.3	1.Tr.I		8	43.8	1.Sh.I
	23	31.6	1.Oc.D		17	52.1	1.Sh.I		10	24.9	1.Tr.E
5	2	32.7	1.Ec.R		19	23.7	1.Tr.E		10	54.8	1.Sh.E
	2	42.6	3.Tr.I		20	3.0	1.Sh.E		18	25.5	2.Oc.D
	5	13.5	3.Tr.E	15	2	13.0	2.Oc.D		21	50.7	2.Ec.R
	6	10.7	3.Sh.I		5	58.0	2.Ec.R	26	5	34.1	1.Oc.D
	8	15.9	3.Sh.E		14	32.6	1.Oc.D		8	16.1	1.Ec.R
	20	40.9	1.Tr.I		17	24.5	1.Ec.R		15	56.1	3.Tr.I
	21	29.0	1.Sh.I		21	32.9	3.Oc.D		18	7.0	3.Sh.I
	22	53.3	1.Tr.E	16	0	2.4	3.Oc.R		18	21.8	3.Tr.E
	23	39.8	1.Sh.E		0	24.8	3.Ec.D		20	9.8	3.Sh.E
6	5	11.7	2.Tr.I		2	29.9	3.Ec.R	27	2	42.7	1.Tr.I
	6	50.9	2.Sh.I		11	41.5	1.Tr.I		3	12.4	1.Sh.I
	7	40.1	2.Tr.E		12	20.7	1.Sh.I		4	55.2	1.Tr.E
	9	11.9	2.Sh.E		13	53.9	1.Tr.E		5	23.5	1.Sh.E
	18	1.7	1.Oc.D		14	31.7	1.Sh.E		13	37.3	2.Tr.I
	21	1.4	1.Ec.R		21	24.3	2.Tr.I		14	37.9	2.Sh.I
7	15	11.0	1.Tr.I		22	44.8	2.Sh.I		16	3.9	2.Tr.E
	15	57.6	1.Sh.I		23	51.8	2.Tr.E		16	58.2	2.Sh.E
	17	23.3	1.Tr.E	17	1	5.5	2.Sh.E	28	0	4.4	1.Oc.D
	18	8.4	1.Sh.E		9	2.8	1.Oc.D		2	44.7	1.Ec.R
	23	25.6	2.Oc.D		11	53.2	1.Ec.R		21	12.9	1.Tr.I
8	3	22.8	2.Ec.R	18	6	11.6	1.Tr.I		21	40.9	1.Sh.I
	12	31.8	1.Oc.D		6	49.3	1.Sh.I		23	25.4	1.Tr.E
	15	30.0	1.Ec.R		8	24.1	1.Tr.E		23	52.1	1.Sh.E
	17	8.4	3.Oc.D		9	0.3	1.Sh.E	29	7	50.1	2.Oc.D
	19	39.7	3.Oc.R		15	36.9	2.Oc.D		11	8.5	2.Ec.R
	20	25.7	3.Ec.D		19	15.4	2.Ec.R		18	34.6	1.Oc.D
	22	31.6	3.Ec.R	19	3	33.0	1.Oc.D		21	13.3	1.Ec.R
9	9	41.1	1.Tr.I		6	21.7	1.Ec.R	30	6	25.3	3.Oc.D
	10	26.2	1.Sh.I		11	30.1	3.Tr.I		10	25.9	3.Ec.R
	11	53.4	1.Tr.E		13	57.8	3.Tr.E		15	43.2	1.Tr.I
	12	37.1	1.Sh.E		14	8.2	3.Sh.I		16	9.6	1.Sh.I
	18	35.9	2.Tr.I		16	11.8	3.Sh.E		17	55.7	1.Tr.E
	20	9.0	2.Sh.I	20	0	41.8	1.Tr.I		18	20.7	1.Sh.E
	21	4.0	2.Tr.E		1	18.0	1.Sh.I				
	22	29.9	2.Sh.E		2	54.3	1.Tr.E				
10	7	2.0	1.Oc.D		3	29.0	1.Sh.E				
	9	58.6	1.Ec.R		10	48.4	2.Tr.I				
					12	2.5	2.Sh.I				
					13	15.6	2.Tr.E				
					14	23.0	2.Sh.E				
					22	3.3	1.Oc.D				

Diagrama dos Satélites galileanos

Outubro 2017

1 = Io, 2 = Europa, 3 = Ganimedes, 4 = Callisto

00:00 (Tempo Universal)



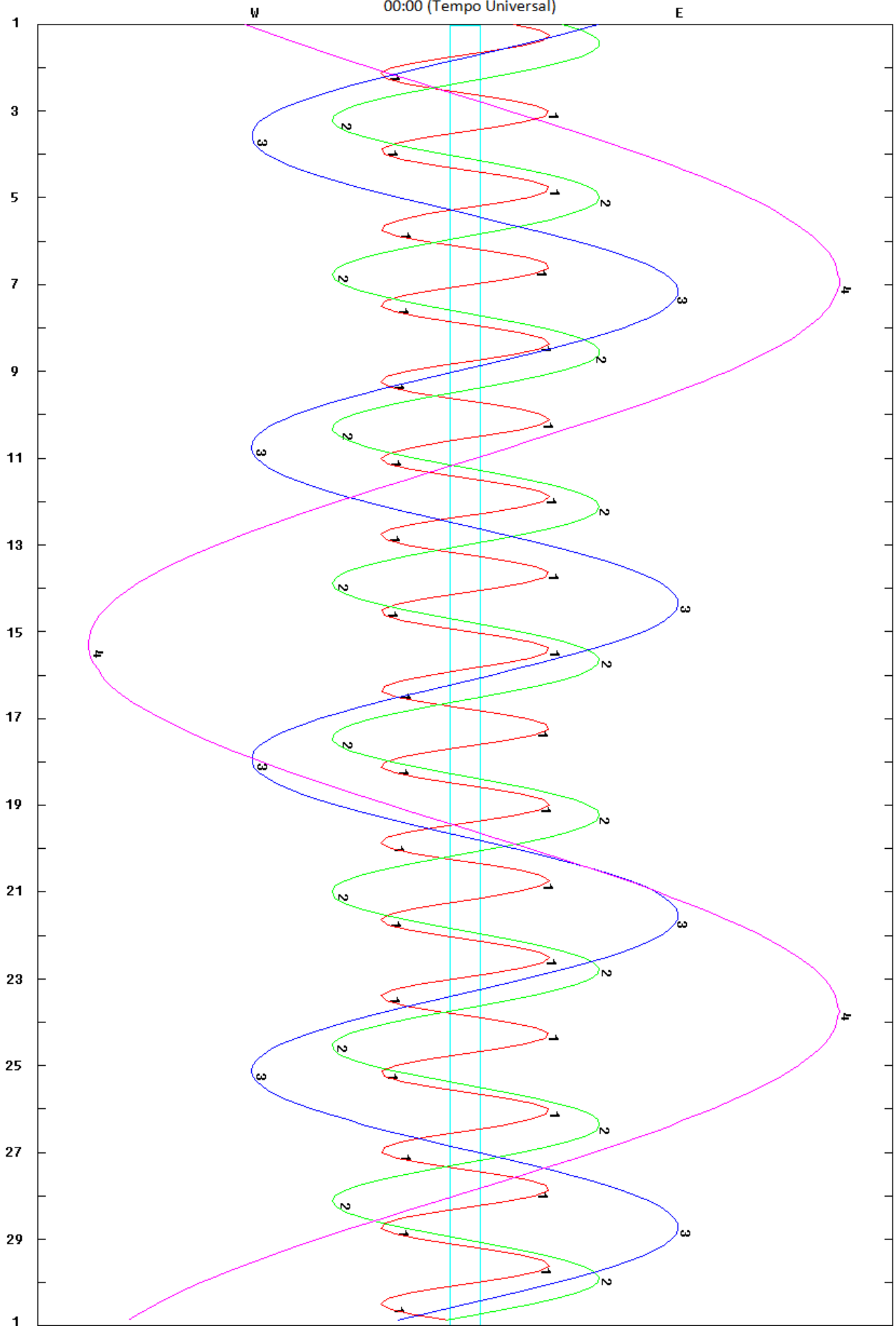
Eventos mútuos em Outubro 2017

1	3	2.0	2.Tr.I	11	0	51.8	3.Tr.I	21	0	38.2	1.Oc.D
	3	55.7	2.Sh.I		2	5.5	3.Sh.I		2	55.5	1.Ec.R
	5	28.2	2.Tr.E		3	13.2	3.Tr.E		19	49.1	3.Oc.D
	6	15.9	2.Sh.E		4	6.6	3.Sh.E		21	47.1	1.Tr.I
	13	4.9	1.Oc.D		6	45.0	1.Tr.I		21	52.5	1.Sh.I
	15	41.8	1.Ec.R		7	1.1	1.Sh.I		22	18.7	3.Ec.R
2	10	13.5	1.Tr.I		8	57.5	1.Tr.E		23	59.4	1.Tr.E
	10	38.1	1.Sh.I		9	12.3	1.Sh.E	22	0	3.7	1.Sh.E
	12	25.9	1.Tr.E		19	15.6	2.Tr.I		11	29.4	2.Tr.I
	12	49.3	1.Sh.E		19	48.1	2.Sh.I		11	40.2	2.Sh.I
	21	14.6	2.Oc.D		21	40.8	2.Tr.E		13	53.4	2.Tr.E
3	0	26.0	2.Ec.R		22	8.0	2.Sh.E		13	59.6	2.Sh.E
	7	35.2	1.Oc.D	12	4	6.8	1.Oc.D		19	8.5	1.Oc.D
	10	10.4	1.Ec.R		6	33.1	1.Ec.R		21	24.0	1.Ec.R
	20	23.9	3.Tr.I	13	1	15.3	1.Tr.I	23	16	17.4	1.Tr.I
	22	6.6	3.Sh.I		1	29.6	1.Sh.I		16	21.0	1.Sh.I
	22	47.5	3.Tr.E		3	27.7	1.Tr.E		18	29.7	1.Tr.E
4	0	8.5	3.Sh.E		3	40.8	1.Sh.E		18	32.3	1.Sh.E
	4	43.8	1.Tr.I		13	29.6	2.Oc.D	24	5	44.9	2.Oc.D
	5	6.8	1.Sh.I		16	19.4	2.Ec.R		8	12.4	2.Ec.R
	6	56.2	1.Tr.E		22	37.0	1.Oc.D		13	38.8	1.Oc.D
	7	17.9	1.Sh.E	14	1	1.6	1.Ec.R		15	52.4	1.Ec.R
	16	26.4	2.Tr.I		15	20.5	3.Oc.D	25	9	48.9	3.Tr.I
	17	13.1	2.Sh.I		18	21.0	3.Ec.R		10	2.6	3.Sh.I
	18	52.3	2.Tr.E		19	45.7	1.Tr.I		10	47.8	1.Tr.I
	19	33.2	2.Sh.E		19	58.2	1.Sh.I		10	49.6	1.Sh.I
5	2	5.6	1.Oc.D		21	58.1	1.Tr.E		12	2.1	3.Sh.E
	4	39.0	1.Ec.R		22	9.5	1.Sh.E		12	5.2	3.Tr.E
	23	14.0	1.Tr.I	15	8	40.3	2.Tr.I		13	0.1	1.Tr.E
	23	35.3	1.Sh.I		9	5.5	2.Sh.I		13	0.8	1.Sh.E
6	1	26.5	1.Tr.E		11	5.0	2.Tr.E	26	0	53.9	2.Tr.I
	1	46.5	1.Sh.E		11	25.3	2.Sh.E		0	57.3	2.Sh.I
	10	39.6	2.Oc.D		17	7.3	1.Oc.D		3	16.7	2.Sh.E
	13	43.9	2.Ec.R		19	30.1	1.Ec.R		3	17.4	2.Tr.E
	20	35.8	1.Oc.D	16	14	16.0	1.Tr.I		8	9.1	1.Oc.D
	23	7.5	1.Ec.R		14	26.8	1.Sh.I		10	21.1	1.Oc.R
7	10	52.5	3.Oc.D		16	28.4	1.Tr.E	27	5	18.0	1.Sh.I
	14	23.3	3.Ec.R		16	38.0	1.Sh.E		5	18.1	1.Tr.I
	17	44.4	1.Tr.I	17	2	54.5	2.Oc.D		7	29.3	1.Sh.E
	18	3.9	1.Sh.I		5	36.9	2.Ec.R		7	30.4	1.Tr.E
	19	56.8	1.Tr.E		11	37.6	1.Oc.D		19	10.3	2.Ec.D
	20	15.1	1.Sh.E		13	58.5	1.Ec.R		21	34.9	2.Oc.R
8	5	51.1	2.Tr.I	18	5	20.5	3.Tr.I	28	2	38.4	1.Ec.D
	6	30.7	2.Sh.I		6	4.4	3.Sh.I		4	51.3	1.Oc.R
	8	16.6	2.Tr.E		7	39.4	3.Tr.E		23	46.6	1.Sh.I
	8	50.7	2.Sh.E		8	4.7	3.Sh.E		23	48.5	1.Tr.I
	15	6.1	1.Oc.D		8	46.4	1.Tr.I	29	0	17.1	3.Ec.D
	17	36.0	1.Ec.R		8	55.3	1.Sh.I		1	57.9	1.Sh.E
9	12	14.7	1.Tr.I		10	58.8	1.Tr.E		2	0.7	1.Tr.E
	12	32.5	1.Sh.I		11	6.6	1.Sh.E		2	34.4	3.Oc.R
	14	27.1	1.Tr.E		22	4.9	2.Tr.I		14	14.5	2.Sh.I
	14	43.7	1.Sh.E		22	22.9	2.Sh.I		14	18.4	2.Tr.I
10	0	4.4	2.Oc.D	19	0	29.2	2.Tr.E		16	33.7	2.Sh.E
	3	1.5	2.Ec.R		0	42.5	2.Sh.E		16	41.5	2.Tr.E
	9	36.4	1.Oc.D		6	7.9	1.Oc.D		21	6.9	1.Ec.D
	12	4.5	1.Ec.R		8	27.1	1.Ec.R		23	21.5	1.Oc.R
				20	3	16.7	1.Tr.I	30	18	15.1	1.Sh.I
					3	23.9	1.Sh.I		18	18.8	1.Tr.I
					5	29.0	1.Tr.E		20	26.4	1.Sh.E
					5	35.1	1.Sh.E		20	31.0	1.Tr.E
					16	19.9	2.Oc.D	31	8	27.9	2.Ec.D
					18	54.9	2.Ec.R		10	59.5	2.Oc.R
									15	35.3	1.Ec.D
									17	51.6	1.Oc.R

Diagrama dos Satélites galileanos

Novembro 2017

1 = Io, 2 = Europa, 3 = Ganimedes, 4 = Callisto
00:00 (Tempo Universal)



Eventos mútuos em Novembro 2017

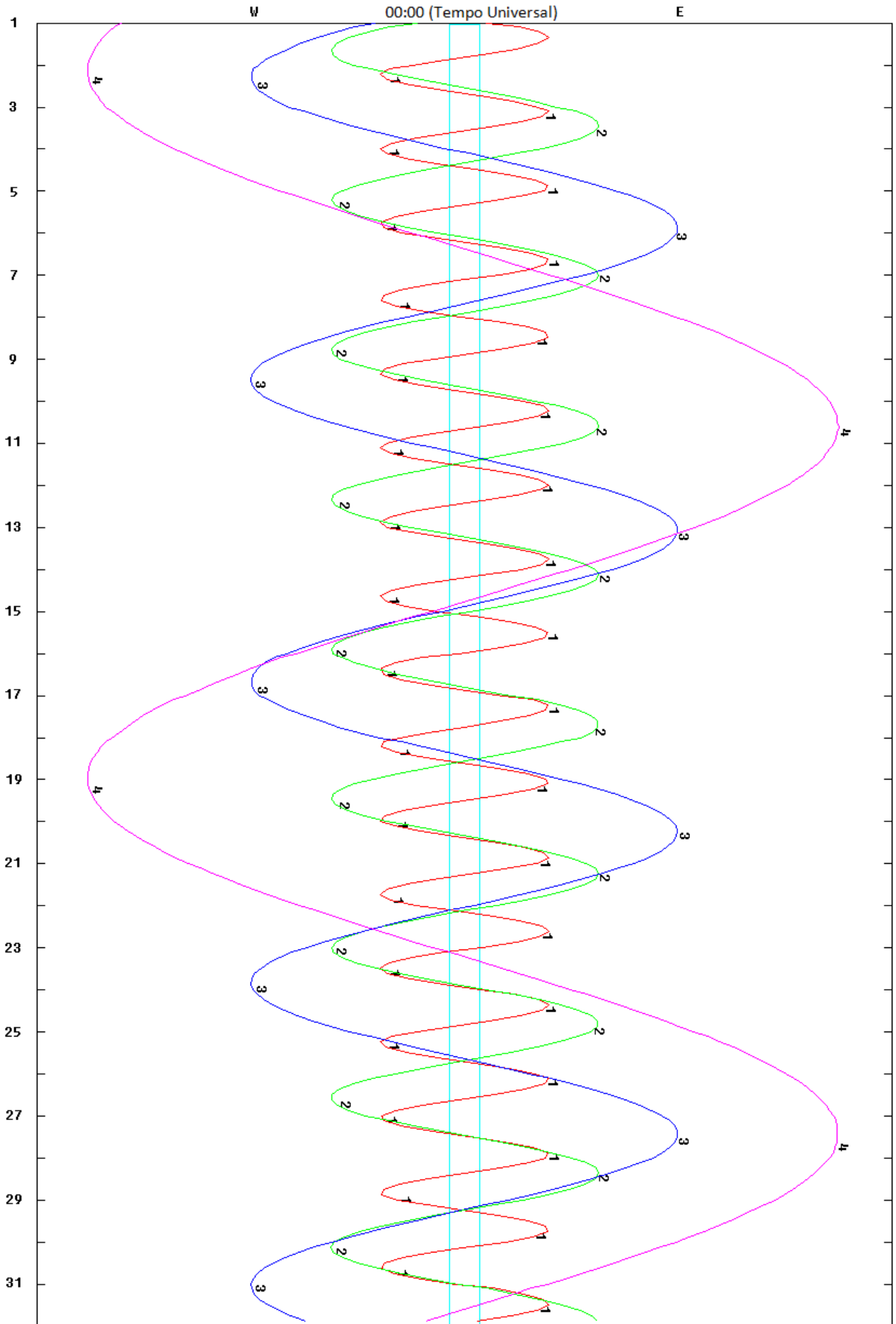
1	12	43.7	1.Sh.I	11	0	22.0	2.Ec.D	21	0	22.3	1.Tr.I
	12	49.1	1.Tr.I		3	14.7	2.Oc.R		2	8.5	1.Sh.E
	14	0.6	3.Sh.I		6	25.9	1.Ec.D		2	34.1	1.Tr.E
	14	17.3	3.Tr.I		8	52.6	1.Oc.R		16	15.5	2.Ec.D
	14	55.0	1.Sh.E	12	3	34.9	1.Sh.I		19	28.9	2.Oc.R
	15	1.4	1.Tr.E		3	51.0	1.Tr.I		21	16.2	1.Ec.D
	15	59.3	3.Sh.E		5	46.1	1.Sh.E		23	53.0	1.Oc.R
	16	30.8	3.Tr.E		6	3.1	1.Tr.E	22	18	25.9	1.Sh.I
2	3	31.6	2.Sh.I		8	13.8	3.Ec.D		18	52.6	1.Tr.I
	3	42.8	2.Tr.I		11	25.9	3.Oc.R		20	37.1	1.Sh.E
	5	50.7	2.Sh.E		19	22.7	2.Sh.I		21	4.3	1.Tr.E
	6	5.4	2.Tr.E		19	55.4	2.Tr.I	23	1	56.5	3.Sh.I
	10	3.8	1.Ec.D		21	41.3	2.Sh.E		3	42.6	3.Tr.I
	12	21.9	1.Oc.R		22	16.7	2.Tr.E		3	52.6	3.Sh.E
3	7	12.2	1.Sh.I	13	0	54.3	1.Ec.D		5	47.1	3.Tr.E
	7	19.4	1.Tr.I		3	22.7	1.Oc.R		11	13.4	2.Sh.I
	9	23.5	1.Sh.E		22	3.4	1.Sh.I		12	6.9	2.Tr.I
	9	31.6	1.Tr.E		22	21.3	1.Tr.I		13	31.5	2.Sh.E
	21	46.1	2.Ec.D	14	0	14.6	1.Sh.E		14	26.9	2.Tr.E
4	0	24.8	2.Oc.R		0	33.3	1.Tr.E		15	44.5	1.Ec.D
	4	32.2	1.Ec.D		13	39.6	2.Ec.D		18	23.1	1.Oc.R
	6	52.0	1.Oc.R		16	39.3	2.Oc.R	24	12	54.4	1.Sh.I
5	1	40.8	1.Sh.I		19	22.6	1.Ec.D		13	22.7	1.Tr.I
	1	49.8	1.Tr.I		21	52.8	1.Oc.R		15	5.5	1.Sh.E
	3	52.0	1.Sh.E	15	16	31.9	1.Sh.I		15	34.4	1.Tr.E
	4	2.0	1.Tr.E		16	51.6	1.Tr.I	25	5	33.8	2.Ec.D
	4	15.4	3.Ec.D		18	43.1	1.Sh.E		8	54.0	2.Oc.R
	7	0.3	3.Oc.R		19	3.5	1.Tr.E		10	12.9	1.Ec.D
	16	48.7	2.Sh.I		21	57.4	3.Sh.I		12	53.1	1.Oc.R
	17	7.1	2.Tr.I		23	14.2	3.Tr.I	26	7	22.9	1.Sh.I
	19	7.6	2.Sh.E		23	54.4	3.Sh.E		7	52.9	1.Tr.I
	19	29.3	2.Tr.E	16	1	21.8	3.Tr.E		9	34.0	1.Sh.E
	23	0.6	1.Ec.D		8	39.6	2.Sh.I		10	4.6	1.Tr.E
6	1	22.2	1.Oc.R		9	19.3	2.Tr.I		16	8.9	3.Ec.D
	20	9.3	1.Sh.I		10	58.1	2.Sh.E		18	6.0	3.Ec.R
	20	20.1	1.Tr.I		11	40.3	2.Tr.E		18	9.6	3.Oc.D
	22	20.5	1.Sh.E		13	51.1	1.Ec.D		20	13.7	3.Oc.R
	22	32.2	1.Tr.E		16	22.9	1.Oc.R	27	0	30.2	2.Sh.I
7	11	3.7	2.Ec.D	17	11	0.4	1.Sh.I		1	30.4	2.Tr.I
	13	49.4	2.Oc.R		11	21.8	1.Tr.I		2	48.1	2.Sh.E
	17	29.0	1.Ec.D		13	11.5	1.Sh.E		3	50.0	2.Tr.E
	19	52.3	1.Oc.R		13	33.7	1.Tr.E		4	41.2	1.Ec.D
8	14	37.8	1.Sh.I	18	2	57.9	2.Ec.D		7	23.0	1.Oc.R
	14	50.4	1.Tr.I		6	4.5	2.Oc.R	28	1	51.4	1.Sh.I
	16	49.1	1.Sh.E		8	19.4	1.Ec.D		2	23.1	1.Tr.I
	17	2.5	1.Tr.E		10	53.0	1.Oc.R		4	2.5	1.Sh.E
	17	59.0	3.Sh.I	19	5	28.9	1.Sh.I		4	34.7	1.Tr.E
	18	45.9	3.Tr.I		5	52.1	1.Tr.I		18	51.4	2.Ec.D
	19	56.9	3.Sh.E		7	40.1	1.Sh.E		22	18.2	2.Oc.R
	20	56.6	3.Tr.E		8	3.9	1.Tr.E		23	9.6	1.Ec.D
9	6	5.7	2.Sh.I		12	11.4	3.Ec.D	29	1	53.0	1.Oc.R
	6	31.3	2.Tr.I		15	50.3	3.Oc.R		20	19.9	1.Sh.I
	8	24.5	2.Sh.E		21	56.5	2.Sh.I		20	53.3	1.Tr.I
	8	53.1	2.Tr.E		22	43.2	2.Tr.I		22	31.0	1.Sh.E
	11	57.5	1.Ec.D	20	0	14.8	2.Sh.E		23	4.8	1.Tr.E
	14	22.5	1.Oc.R		1	3.7	2.Tr.E	30	5	54.8	3.Sh.I
10	9	6.3	1.Sh.I		2	47.8	1.Ec.D		7	50.2	3.Sh.E
	9	20.7	1.Tr.I		5	23.0	1.Oc.R		8	9.5	3.Tr.I
	11	17.5	1.Sh.E		23	57.4	1.Sh.I		10	10.7	3.Tr.E
	11	32.7	1.Tr.E						13	46.9	2.Sh.I
									14	53.8	2.Tr.I
									16	4.8	2.Sh.E
									17	12.9	2.Tr.E
									17	37.9	1.Ec.D
									20	22.9	1.Oc.R

Diagrama dos Satélites galileanos

Dezembro 2017

1 = Io, 2 = Europa, 3 = Ganimedes, 4 = Callisto

00:00 (Tempo Universal)



Eventos mútuos em Dezembro 2017

1	14	48.3	1.Sh.I	11	0	4.4	3.Ec.D	21	2	1.6	1.Sh.I
	15	23.3	1.Tr.I		2	0.1	3.Ec.R		2	53.1	1.Tr.I
	16	59.4	1.Sh.E		2	59.9	3.Oc.D		4	12.3	1.Sh.E
	17	34.8	1.Tr.E		4	57.6	3.Oc.R		5	3.9	1.Tr.E
2	8	9.8	2.Ec.D		5	37.0	2.Sh.I		17	48.5	3.Sh.I
	11	43.1	2.Oc.R		7	2.8	2.Tr.I		19	41.6	3.Sh.E
	12	6.2	1.Ec.D		7	54.4	2.Sh.E		21	21.0	3.Tr.I
	14	52.8	1.Oc.R		8	27.8	1.Ec.D		21	26.8	2.Sh.I
3	9	16.9	1.Sh.I		9	20.6	2.Tr.E		23	9.7	2.Tr.I
	9	53.5	1.Tr.I		11	21.9	1.Oc.R		23	12.2	3.Tr.E
	11	27.9	1.Sh.E	12	5	39.2	1.Sh.I		23	17.4	1.Ec.D
	12	4.9	1.Tr.E		6	23.6	1.Tr.I		23	43.7	2.Sh.E
	20	6.7	3.Ec.D		7	50.1	1.Sh.E	22	1	26.2	2.Tr.E
	22	3.0	3.Ec.R		8	34.7	1.Tr.E		2	19.9	1.Oc.R
	22	35.4	3.Oc.D	13	0	3.3	2.Ec.D		20	29.9	1.Sh.I
4	0	36.3	3.Oc.R		2	56.1	1.Ec.D		21	22.8	1.Tr.I
	3	3.6	2.Sh.I		3	55.0	2.Oc.R		22	40.6	1.Sh.E
	4	17.0	2.Tr.I		5	51.7	1.Oc.R		23	33.6	1.Tr.E
	5	21.3	2.Sh.E	14	0	7.7	1.Sh.I	23	15	57.6	2.Ec.D
	6	34.6	1.Ec.D		0	53.6	1.Tr.I		17	45.7	1.Ec.D
	6	35.7	2.Tr.E		2	18.6	1.Sh.E		20	6.1	2.Oc.R
	9	22.7	1.Oc.R		3	4.7	1.Tr.E		20	49.5	1.Oc.R
5	3	45.3	1.Sh.I		13	50.9	3.Sh.I	24	14	58.5	1.Sh.I
	4	23.5	1.Tr.I		15	44.7	3.Sh.E		15	52.7	1.Tr.I
	5	56.3	1.Sh.E		16	58.9	3.Tr.I		17	9.1	1.Sh.E
	6	34.9	1.Tr.E		18	53.6	3.Tr.E		18	3.3	1.Tr.E
	21	27.3	2.Ec.D		18	53.7	2.Sh.I	25	8	0.5	3.Ec.D
6	1	2.9	1.Ec.D		20	25.3	2.Tr.I		9	54.9	3.Ec.R
	1	6.9	2.Oc.R		21	10.8	2.Sh.E		10	43.4	2.Sh.I
	3	52.5	1.Oc.R		21	24.4	1.Ec.D		11	44.7	3.Oc.D
	22	13.9	1.Sh.I		22	42.7	2.Tr.E		12	14.0	1.Ec.D
	22	53.6	1.Tr.I	15	0	21.4	1.Oc.R		12	31.6	2.Tr.I
7	0	24.8	1.Sh.E		18	36.1	1.Sh.I		13	0.1	2.Sh.E
	1	4.9	1.Tr.E		19	23.5	1.Tr.I		13	35.9	3.Oc.R
	9	53.2	3.Sh.I		20	46.9	1.Sh.E		14	47.7	2.Tr.E
	11	47.8	3.Sh.E		21	34.5	1.Tr.E		15	19.0	1.Oc.R
	12	35.2	3.Tr.I	16	13	21.7	2.Ec.D	26	9	26.9	1.Sh.I
	14	33.2	3.Tr.E		15	52.6	1.Ec.D		10	22.4	1.Tr.I
	16	20.4	2.Sh.I		17	19.3	2.Oc.R		11	37.5	1.Sh.E
	17	40.0	2.Tr.I		18	51.1	1.Oc.R		12	33.0	1.Tr.E
	18	37.9	2.Sh.E	17	13	4.6	1.Sh.I	27	5	15.1	2.Ec.D
	19	31.2	1.Ec.D		13	53.4	1.Tr.I		6	42.2	1.Ec.D
	19	58.2	2.Tr.E		15	15.4	1.Sh.E		9	28.7	2.Oc.R
	22	22.4	1.Oc.R		16	4.3	1.Tr.E		9	48.5	1.Oc.R
8	16	42.3	1.Sh.I	18	4	2.9	3.Ec.D	28	3	55.3	1.Sh.I
	17	23.6	1.Tr.I		5	57.9	3.Ec.R		4	52.1	1.Tr.I
	18	53.2	1.Sh.E		7	23.7	3.Oc.D		6	5.9	1.Sh.E
	19	34.8	1.Tr.E		8	10.2	2.Sh.I		7	2.6	1.Tr.E
9	10	45.7	2.Ec.D		9	18.1	3.Oc.R		21	46.5	3.Sh.I
	13	59.5	1.Ec.D		9	47.6	2.Tr.I		23	38.8	3.Sh.E
	14	31.5	2.Oc.R		10	20.9	1.Ec.D		23	59.9	2.Sh.I
	16	52.2	1.Oc.R		10	27.3	2.Sh.E	29	1	10.5	1.Ec.D
10	11	10.8	1.Sh.I		12	4.6	2.Tr.E		1	41.6	3.Tr.I
	11	53.7	1.Tr.I		13	20.7	1.Oc.R		1	53.1	2.Tr.I
	13	21.7	1.Sh.E	19	7	33.1	1.Sh.I		2	16.4	2.Sh.E
	14	4.8	1.Tr.E		8	23.2	1.Tr.I		3	29.2	3.Tr.E
					9	43.8	1.Sh.E		4	8.8	2.Tr.E
					10	34.1	1.Tr.E		4	17.9	1.Oc.R
				20	2	39.2	2.Ec.D		22	23.7	1.Sh.I
					4	49.2	1.Ec.D		23	21.7	1.Tr.I
					6	42.4	2.Oc.R	30	0	34.2	1.Sh.E
					7	50.3	1.Oc.R		1	32.2	1.Tr.E
									18	33.6	2.Ec.D
									19	38.7	1.Ec.D
									22	47.4	1.Oc.R
									22	51.9	2.Oc.R
								31	16	52.2	1.Sh.I
									17	51.4	1.Tr.I
									19	2.7	1.Sh.E
									20	1.8	1.Tr.E

Saturno

Distância média (ua)		Período de Revolução		Inclinação Equatorial		Diâm. Equatorial		
9,54		29,46 anos		2,5°		120.000		
00:00 Hora – Tempo Universal								
Data	α	δ	\varnothing	Elong	DT (ua)*	Ang. PH	Fase	Mag.
01 Jan	17h 21m 49.79s	-21° 51' 33.6"	15.08	19.5	10.9693687	1.9	1.000	0.5
08 Jan	17h 25m 12.29s	-21° 54' 37.6"	15.15	25.9	10.9241249	2.4	1.000	0.5
15 Jan	17h 28m 28.00s	-21° 57' 15.2"	15.23	32.2	10.8672982	3.0	0.999	0.5
22 Jan	17h 31m 35.20s	-21° 59' 26.9"	15.32	38.6	10.7995150	3.5	0.999	0.6
29 Jan	17h 34m 32.26s	-22° 01' 14.1"	15.43	45.1	10.7214882	4.0	0.999	0.6
05 Fev	17h 37m 17.34s	-22° 02' 38.1"	15.56	51.5	10.6341732	4.4	0.999	0.6
12 Fev	17h 39m 48.96s	-22° 03' 40.8"	15.70	58.0	10.5387222	4.8	0.998	0.6
19 Fev	17h 42m 05.64s	-22° 04' 24.4"	15.85	64.6	10.4362793	5.1	0.998	0.6
26 Fev	17h 44m 06.01s	-22° 04' 51.6"	16.02	71.2	10.3280571	5.3	0.998	0.6
05 Mar	17h 45m 48.60s	-22° 05' 04.3"	16.20	77.8	10.2154799	5.5	0.998	0.5
12 Mar	17h 47m 12.41s	-22° 05' 05.4"	16.38	84.5	10.1001131	5.6	0.998	0.5
19 Mar	17h 48m 16.54s	-22° 04' 56.7"	16.57	91.2	9.9834548	5.7	0.998	0.5
26 Mar	17h 49m 00.29s	-22° 04' 40.9"	16.77	98.0	9.8670286	5.6	0.998	0.5
02 Abr	17h 49m 23.05s	-22° 04' 19.1"	16.97	104.8	9.7525091	5.5	0.998	0.4
09 Abr	17h 49m 24.79s	-22° 03' 53.1"	17.16	111.7	9.6416224	5.3	0.998	0.4
16 Abr	17h 49m 05.78s	-22° 03' 23.7"	17.35	118.6	9.5359354	5.0	0.998	0.4
23 Abr	17h 48m 26.56s	-22° 02' 51.9"	17.53	125.6	9.4369681	4.7	0.998	0.3
30 Abr	17h 47m 27.95s	-22° 02' 17.3"	17.70	132.6	9.3462926	4.2	0.999	0.3
07 Mai	17h 46m 11.46s	-22° 01' 40.6"	17.86	139.7	9.2654042	3.7	0.999	0.2
14 Mai	17h 44m 38.97s	-22° 01' 01.1"	17.99	146.8	9.1955194	3.2	0.999	0.2
21 Mai	17h 42m 52.61s	-22° 00' 19.5"	18.11	154.0	9.1377131	2.5	1.000	0.1
28 Mai	17h 40m 54.84s	-21° 59' 34.8"	18.20	161.1	9.0929955	1.9	1.000	0.1
04 Jun	17h 38m 48.65s	-21° 58' 48.3"	18.26	168.3	9.0621639	1.2	1.000	0.1
11 Jun	17h 36m 37.25s	-21° 58' 00.1"	18.29	175.4	9.0456379	0.5	1.000	0.0
18 Jun	17h 34m 23.75s	-21° 57' 12.1"	18.30	176.9	9.0436357	0.3	1.000	0.0
25 Jun	17h 32m 11.42s	-21° 56' 25.3"	18.27	169.9	9.0562449	1.0	1.000	0.1
02 Jul	17h 30m 03.61s	-21° 55' 42.4"	18.22	162.8	9.0832743	1.7	1.000	0.1
09 Jul	17h 28m 03.53s	-21° 55' 05.9"	18.13	155.7	9.1241539	2.4	1.000	0.1
16 Jul	17h 26m 13.87s	-21° 54' 38.8"	18.03	148.6	9.1781536	3.0	0.999	0.2
23 Jul	17h 24m 37.22s	-21° 54' 23.1"	17.90	141.5	9.2444508	3.6	0.999	0.2
30 Jul	17h 23m 15.87s	-21° 54' 22.1"	17.75	134.5	9.3219861	4.1	0.999	0.3
06 Ago	17h 22m 11.73s	-21° 54' 37.7"	17.58	127.6	9.4094247	4.6	0.998	0.3
13 Ago	17h 21m 26.03s	-21° 55' 11.9"	17.41	120.7	9.5053924	5.0	0.998	0.3
20 Ago	17h 20m 59.86s	-21° 56' 05.0"	17.22	113.9	9.6085242	5.3	0.998	0.4
27 Ago	17h 20m 53.91s	-21° 57' 18.1"	17.03	107.1	9.7173082	5.5	0.998	0.4
03 Set	17h 21m 08.56s	-21° 58' 50.4"	16.83	100.4	9.8300885	5.7	0.998	0.5
10 Set	17h 21m 43.58s	-22° 00' 41.0"	16.64	93.8	9.9452895	5.7	0.998	0.5
17 Set	17h 22m 38.73s	-22° 02' 47.6"	16.44	87.2	10.0614348	5.7	0.998	0.5
24 Set	17h 23m 53.48s	-22° 05' 08.2"	16.26	80.6	10.1769730	5.6	0.998	0.5
01 Out	17h 25m 27.15s	-22° 07' 40.0"	16.08	74.1	10.2903104	5.5	0.998	0.5
08 Out	17h 27m 18.54s	-22° 10' 19.4"	15.91	67.7	10.4000130	5.3	0.998	0.6
15 Out	17h 29m 26.67s	-22° 13' 02.9"	15.75	61.2	10.5048004	5.0	0.998	0.6
22 Out	17h 31m 50.30s	-22° 15' 46.9"	15.60	54.8	10.6033587	4.6	0.998	0.6
29 Out	17h 34m 28.17s	-22° 18' 27.9"	15.47	48.5	10.6944016	4.2	0.999	0.6
05 Nov	17h 37m 18.63s	-22° 21' 01.9"	15.35	42.1	10.7768501	3.8	0.999	0.6
12 Nov	17h 40m 20.31s	-22° 23' 25.8"	15.25	35.8	10.8498094	3.3	0.999	0.6
19 Nov	17h 43m 31.65s	-22° 25' 36.3"	15.16	29.5	10.9123767	2.8	0.999	0.5
26 Nov	17h 46m 51.08s	-22° 27' 30.9"	15.09	23.2	10.9637273	2.2	1.000	0.5
03 Dez	17h 50m 16.76s	-22° 29' 06.9"	15.04	16.9	11.0032754	1.6	1.000	0.5
10 Dez	17h 53m 47.14s	-22° 30' 23.0"	15.00	10.6	11.0306360	1.0	1.000	0.5
17 Dez	17h 57m 20.53s	-22° 31' 17.4"	14.98	4.4	11.0454325	0.4	1.000	0.5
24 Dez	18h 00m 55.18s	-22° 31' 50.1"	14.98	2.2	11.0474011	0.2	1.000	0.4
31 Dez	18h 04m 29.25s	-22° 32' 00.5"	14.99	8.4	11.0365359	0.8	1.000	0.5

Longitude do Meridiano Central de Saturno, Sistema I

00:00 Hora – Tempo Universal

	Jan	Fev	Mar	Abr	Mai	Jun	JuI	Ago	Set	Out	Nov	Dez
1	223.3	114.4	354.4	249.1	20.7	277.2	48.6	302.6	194.2	319.6	208.1	332.3
2	347.5	238.7	118.7	13.4	145.1	41.6	173.0	66.9	318.4	83.8	332.2	96.4
3	111.7	2.9	243.0	137.8	269.5	166.0	297.4	191.1	82.6	207.9	96.4	220.6
4	235.9	127.2	7.4	262.2	33.9	290.4	61.7	315.4	206.8	332.1	220.5	344.7
5	0.1	251.4	131.7	26.5	158.3	54.8	186.1	79.7	331.0	96.2	344.7	108.9
6	124.4	15.7	256.0	150.9	282.7	179.2	310.4	204.0	95.2	220.4	108.8	233.0
7	248.6	140.0	20.3	275.3	47.1	303.6	74.7	328.2	219.4	344.5	232.9	357.2
8	12.8	264.3	144.7	39.7	171.5	68.0	199.1	92.5	343.6	108.7	357.1	121.3
9	137.0	28.5	269.0	269.0	164.1	295.9	192.4	323.4	216.8	107.8	232.8	121.2
10	261.2	152.8	33.3	288.4	60.3	316.8	87.8	341.0	232.0	357.0	245.3	9.7
11	25.4	277.1	157.7	52.8	184.7	81.2	212.1	105.3	356.2	121.1	9.5	133.8
12	149.6	41.4	282.0	177.2	309.2	205.6	336.4	229.5	120.3	245.3	133.6	258.0
13	273.9	165.6	46.3	301.6	73.6	330.0	100.8	353.8	244.5	9.4	257.8	22.1
14	38.1	289.9	170.7	66.0	198.0	94.3	225.1	118.0	8.7	133.6	21.9	146.3
15	162.3	54.2	295.0	190.4	322.4	218.7	349.4	242.3	132.9	257.7	146.0	270.4
16	286.5	178.5	59.3	314.8	86.8	343.1	113.7	6.5	257.1	21.9	270.2	34.6
17	50.8	302.8	183.7	79.1	211.2	107.5	238.1	130.8	21.3	146.0	34.3	158.8
18	175.0	67.1	308.0	203.5	335.6	231.9	2.4	255.0	145.4	270.2	158.4	282.9
19	299.2	191.4	72.4	327.9	100.0	356.2	126.7	19.3	269.6	34.3	282.6	47.1
20	63.4	315.7	196.7	92.3	224.4	120.6	251.0	143.5	33.8	158.4	46.7	171.3
21	187.7	80.0	321.1	216.7	348.8	245.0	15.3	267.7	158.0	282.6	170.9	295.4
22	311.9	204.3	85.4	341.1	113.2	9.4	139.6	32.0	282.1	46.7	295.0	59.6
23	76.2	328.6	209.8	105.5	237.6	133.7	263.9	156.2	46.3	170.9	59.1	183.8
24	200.4	92.9	334.1	229.9	2.0	258.1	28.2	280.4	170.5	295.0	183.3	307.9
25	324.6	217.2	98.5	354.3	126.4	22.5	152.5	44.7	294.6	59.1	307.4	72.1
26	88.9	341.5	222.9	118.7	250.8	146.8	276.8	168.9	58.8	183.3	71.6	196.3
27	213.1	105.8	347.2	243.1	15.2	271.2	41.1	293.1	183.0	307.4	195.7	320.5
28	337.4	230.1	111.6	7.5	139.6	35.6	165.4	57.3	307.1	71.6	319.9	84.6
29	101.6		235.9	131.9	264.0	159.9	289.7	181.5	71.3	195.7	84.0	208.8
30	225.9		0.3	256.3	28.4	284.3	54.0	305.7	195.5	319.8	208.1	333.0
31	350.1		124.7		152.8		178.3	70.0		84.0		97.2

Movimento do Meridiano Central, Sistema I

Minuto	0h o	1h o	2h o	3h o	4h o	5h o	6h o	7h o	8h o	9h o	10h o	11h o
0	0.0	35.2	70.4	105.5	140.7	175.9	211.1	246.3	281.4	316.6	351.8	35.2
10	5.9	41.0	76.2	111.4	146.6	181.8	216.9	252.1	287.3	322.5	357.7	32.8
20	11.7	46.9	82.1	117.3	152.4	187.6	222.8	258.0	293.2	328.3	3.5	38.7
30	17.6	52.8	87.9	123.1	158.3	193.5	228.7	263.8	299.0	334.2	9.4	44.6
40	23.5	58.6	93.8	129.0	164.2	199.3	234.5	269.7	304.9	340.1	15.2	50.4
50	29.3	64.5	99.7	134.9	170.0	205.2	240.4	275.6	310.7	345.9	21.1	56.3
60	35.2	70.4	105.5	140.7	175.9	211.1	246.3	281.4	316.6	351.8	27.0	62.2

Urano

Distância média (ua) 19,18		Período de Revolução 84 anos		Inclinação Equatorial 0,8°		Diâm. Equatorial 52.290		
00:00 Hora – Tempo Universal								
Data	α	δ	\emptyset	Elong	DT (ua)*	Ang. PH	Fase	Mag.
01 Jan	01h 15m 59.50s	+07° 22' 48.4"	3.55	99.7	19.751649	2.8	0.999	5.8
08 Jan	01h 16m 07.53s	+07° 23' 53.7"	3.52	92.6	19.871331	2.8	0.999	5.8
15 Jan	01h 16m 25.12s	+07° 25' 56.4"	3.50	85.5	19.991615	2.8	0.999	5.8
22 Jan	01h 16m 51.94s	+07° 28' 54.5"	3.48	78.5	20.110799	2.8	0.999	5.8
29 Jan	01h 17m 27.83s	+07° 32' 46.5"	3.46	71.6	20.227151	2.7	0.999	5.8
05 Fev	01h 18m 12.30s	+07° 37' 29.1"	3.44	64.7	20.338917	2.6	1.000	5.8
12 Fev	01h 19m 04.82s	+07° 42' 58.9"	3.43	57.8	20.444517	2.4	1.000	5.9
19 Fev	01h 20m 04.66s	+07° 49' 10.9"	3.41	51.0	20.542610	2.2	1.000	5.9
26 Fev	01h 21m 11.29s	+07° 56' 01.6"	3.39	44.3	20.631896	2.0	1.000	5.9
05 Mar	01h 22m 23.85s	+08° 03' 25.5"	3.38	37.6	20.711135	1.7	1.000	5.9
12 Mar	01h 23m 41.56s	+08° 11' 17.7"	3.37	30.9	20.779336	1.5	1.000	5.9
19 Mar	01h 25m 03.50s	+08° 19' 32.2"	3.36	24.3	20.835770	1.2	1.000	5.9
26 Mar	01h 26m 28.93s	+08° 28' 04.6"	3.35	17.7	20.879775	0.9	1.000	5.9
02 Abr	01h 27m 56.92s	+08° 36' 49.0"	3.35	11.2	20.910779	0.6	1.000	5.9
09 Abr	01h 29m 26.55s	+08° 45' 39.9"	3.35	4.8	20.928480	0.2	1.000	5.9
16 Abr	01h 30m 56.89s	+08° 54' 31.6"	3.35	1.9	20.932827	0.1	1.000	5.9
23 Abr	01h 32m 27.18s	+09° 03' 19.9"	3.35	8.2	20.923817	0.4	1.000	5.9
30 Abr	01h 33m 56.47s	+09° 11' 58.9"	3.35	14.6	20.901541	0.7	1.000	5.9
07 Mai	01h 35m 23.87s	+09° 20' 24.0"	3.36	21.0	20.866355	1.0	1.000	5.9
14 Mai	01h 36m 48.52s	+09° 28' 30.0"	3.36	27.4	20.818825	1.3	1.000	5.9
21 Mai	01h 38m 09.69s	+09° 36' 13.0"	3.37	33.8	20.759542	1.6	1.000	5.9
28 Mai	01h 39m 26.55s	+09° 43' 28.6"	3.39	40.2	20.689175	1.9	1.000	5.9
04 Jun	01h 40m 38.27s	+09° 50' 12.4"	3.40	46.6	20.608643	2.1	1.000	5.9
11 Jun	01h 41m 44.18s	+09° 56' 20.8"	3.41	53.0	20.519033	2.3	1.000	5.9
18 Jun	01h 42m 43.64s	+10° 01' 50.6"	3.43	59.4	20.421417	2.5	1.000	5.9
25 Jun	01h 43m 36.03s	+10° 06' 38.7"	3.45	65.9	20.316932	2.7	0.999	5.8
02 Jul	01h 44m 20.69s	+10° 10' 42.0"	3.47	72.3	20.206942	2.8	0.999	5.8
09 Jul	01h 44m 57.22s	+10° 13' 58.2"	3.49	78.8	20.092920	2.9	0.999	5.8
16 Jul	01h 45m 25.22s	+10° 16' 25.8"	3.51	85.4	19.976283	2.9	0.999	5.8
23 Jul	01h 45m 44.42s	+10° 18' 03.3"	3.53	92.0	19.858487	2.9	0.999	5.8
30 Jul	01h 45m 54.47s	+10° 18' 49.5"	3.55	98.6	19.741166	2.9	0.999	5.8
06 Ago	01h 45m 55.43s	+10° 18' 44.4"	3.57	105.3	19.625990	2.8	0.999	5.8
13 Ago	01h 45m 47.29s	+10° 17' 48.7"	3.59	112.1	19.514509	2.7	0.999	5.8
20 Ago	01h 45m 30.29s	+10° 16' 03.4"	3.61	118.9	19.408254	2.5	1.000	5.7
27 Ago	01h 45m 04.62s	+10° 13' 30.0"	3.63	125.8	19.308860	2.4	1.000	5.7
03 Set	01h 44m 30.89s	+10° 10' 11.8"	3.64	132.7	19.217887	2.1	1.000	5.7
10 Set	01h 43m 49.70s	+10° 06' 12.2"	3.66	139.6	19.136681	1.9	1.000	5.7
17 Set	01h 43m 01.87s	+10° 01' 35.9"	3.67	146.7	19.066485	1.6	1.000	5.7
24 Set	01h 42m 08.20s	+09° 56' 27.2"	3.68	153.7	19.008540	1.3	1.000	5.7
01 Out	01h 41m 09.90s	+09° 50' 52.9"	3.69	160.9	18.963879	0.9	1.000	5.7
08 Out	01h 40m 08.09s	+09° 44' 59.5"	3.70	168.0	18.933219	0.6	1.000	5.7
15 Out	01h 39m 04.09s	+09° 38' 54.3"	3.70	175.2	18.917094	0.2	1.000	5.7
22 Out	01h 37m 59.08s	+09° 32' 44.2"	3.70	177.5	18.915940	0.1	1.000	5.7
29 Out	01h 36m 54.60s	+09° 26' 37.9"	3.70	170.2	18.929879	0.5	1.000	5.7
05 Nov	01h 35m 51.95s	+09° 20' 42.9"	3.69	163.0	18.958669	0.8	1.000	5.7
12 Nov	01h 34m 52.49s	+09° 15' 07.3"	3.69	155.7	19.001865	1.2	1.000	5.7
19 Nov	01h 33m 57.38s	+09° 09' 57.6"	3.67	148.4	19.058899	1.5	1.000	5.7
26 Nov	01h 33m 07.94s	+09° 05' 21.7"	3.66	141.1	19.128876	1.8	1.000	5.7
03 Dez	01h 32m 25.17s	+09° 01' 25.3"	3.65	133.8	19.210588	2.0	1.000	5.7
10 Dez	01h 31m 49.99s	+08° 58' 14.1"	3.63	126.6	19.302699	2.3	1.000	5.7
17 Dez	01h 31m 23.07s	+08° 55' 51.5"	3.61	119.3	19.403824	2.5	1.000	5.7
24 Dez	01h 31m 05.12s	+08° 54' 22.0"	3.59	112.1	19.512335	2.6	0.999	5.8
31 Dez	01h 30m 56.50s	+08° 53' 47.4"	3.57	104.9	19.626421	2.7	0.999	5.8

Netuno

Distância média (ua)		Período de Revolução		Inclinação Equatorial		Diâm. Equatorial		
30,06		165 anos		1,8°		50.450		
00:00 Hora – Tempo Universal								
Data	α	δ	\varnothing	Elong	DT (ua)*	Ang. PH	Fase	Mag.
01 Jan	22h 45m 33.67s	-08° 47' 50.7"	2.20	58.9	30.448446	1.6	1.000	7.9
08 Jan	22h 46m 12.06s	-08° 43' 52.5"	2.19	51.9	30.548396	1.5	1.000	7.9
15 Jan	22h 46m 55.20s	-08° 39' 26.2"	2.19	45.0	30.639377	1.3	1.000	7.9
22 Jan	22h 47m 42.49s	-08° 34' 35.5"	2.18	38.0	30.720198	1.2	1.000	7.9
29 Jan	22h 48m 33.49s	-08° 29' 23.1"	2.18	31.2	30.789697	1.0	1.000	8.0
05 Fev	22h 49m 27.48s	-08° 23' 53.4"	2.17	24.3	30.846862	0.8	1.000	8.0
12 Fev	22h 50m 23.89s	-08° 18' 09.8"	2.17	17.5	30.890992	0.6	1.000	8.0
19 Fev	22h 51m 21.99s	-08° 12' 16.7"	2.17	10.7	30.921610	0.4	1.000	8.0
26 Fev	22h 52m 21.22s	-08° 06' 17.6"	2.17	3.9	30.938304	0.1	1.000	8.0
05 Mar	22h 53m 20.80s	-08° 00' 17.1"	2.17	3.0	30.940841	0.1	1.000	8.0
12 Mar	22h 54m 20.14s	-07° 54' 19.0"	2.17	9.7	30.929321	0.3	1.000	8.0
19 Mar	22h 55m 18.51s	-07° 48' 27.6"	2.17	16.4	30.904038	0.5	1.000	8.0
26 Mar	22h 56m 15.38s	-07° 42' 46.4"	2.17	23.1	30.865338	0.7	1.000	8.0
02 Abr	22h 57m 10.05s	-07° 37' 19.6"	2.17	29.7	30.813745	0.9	1.000	8.0
09 Abr	22h 58m 01.95s	-07° 32' 10.7"	2.18	36.4	30.750082	1.1	1.000	8.0
16 Abr	22h 58m 50.51s	-07° 27' 23.1"	2.18	43.0	30.675309	1.3	1.000	7.9
23 Abr	22h 59m 35.30s	-07° 22' 59.9"	2.19	49.7	30.590400	1.5	1.000	7.9
30 Abr	23h 00m 15.78s	-07° 19' 03.9"	2.20	56.3	30.496471	1.6	1.000	7.9
07 Mai	23h 00m 51.52s	-07° 15' 38.1"	2.20	62.9	30.394887	1.7	1.000	7.9
14 Mai	23h 01m 22.17s	-07° 12' 44.4"	2.21	69.6	30.287074	1.8	1.000	7.9
21 Mai	23h 01m 47.46s	-07° 10' 24.6"	2.22	76.2	30.174415	1.9	1.000	7.9
28 Mai	23h 02m 07.12s	-07° 08' 40.1"	2.23	82.8	30.058390	1.9	1.000	7.9
04 Jun	23h 02m 20.92s	-07° 07' 32.4"	2.24	89.5	29.940665	1.9	1.000	7.9
11 Jun	23h 02m 28.81s	-07° 07' 01.5"	2.25	96.1	29.822873	1.9	1.000	7.9
18 Jun	23h 02m 30.77s	-07° 07' 07.5"	2.26	102.8	29.706549	1.9	1.000	7.9
25 Jun	23h 02m 26.83s	-07° 07' 49.9"	2.26	109.5	29.593264	1.8	1.000	7.9
02 Jul	23h 02m 17.05s	-07° 09' 08.1"	2.27	116.2	29.484695	1.7	1.000	7.9
09 Jul	23h 02m 01.74s	-07° 11' 00.1"	2.28	123.0	29.382389	1.6	1.000	7.9
16 Jul	23h 01m 41.16s	-07° 13' 24.0"	2.29	129.8	29.287727	1.5	1.000	7.8
23 Jul	23h 01m 15.70s	-07° 16' 16.9"	2.29	136.6	29.202059	1.3	1.000	7.8
30 Jul	23h 00m 45.75s	-07° 19' 36.5"	2.30	143.4	29.126751	1.2	1.000	7.8
06 Ago	23h 00m 11.95s	-07° 23' 18.4"	2.31	150.2	29.062936	1.0	1.000	7.8
13 Ago	22h 59m 34.86s	-07° 27' 19.0"	2.31	157.1	29.011511	0.8	1.000	7.8
20 Ago	22h 58m 55.18s	-07° 31' 33.7"	2.31	164.0	28.973285	0.5	1.000	7.8
27 Ago	22h 58m 13.55s	-07° 35' 58.4"	2.31	170.9	28.948989	0.3	1.000	7.8
03 Set	22h 57m 30.86s	-07° 40' 27.6"	2.32	177.7	28.939041	0.1	1.000	7.8
10 Set	22h 56m 47.84s	-07° 44' 56.7"	2.31	175.0	28.943574	0.2	1.000	7.8
17 Set	22h 56m 05.34s	-07° 49' 20.3"	2.31	168.1	28.962605	0.4	1.000	7.8
24 Set	22h 55m 24.08s	-07° 53' 34.2"	2.31	161.0	28.996012	0.6	1.000	7.8
01 Out	22h 54m 45.00s	-07° 57' 32.7"	2.31	154.0	29.043325	0.8	1.000	7.8
08 Out	22h 54m 08.75s	-08° 01' 11.9"	2.30	147.0	29.103801	1.0	1.000	7.8
15 Out	22h 53m 36.12s	-08° 04' 27.2"	2.30	139.9	29.176601	1.2	1.000	7.8
22 Out	22h 53m 07.66s	-08° 07' 15.3"	2.29	132.8	29.260748	1.4	1.000	7.8
29 Out	22h 52m 44.09s	-08° 09' 32.1"	2.28	125.7	29.354954	1.5	1.000	7.9
05 Nov	22h 52m 25.80s	-08° 11' 15.6"	2.27	118.7	29.457731	1.7	1.000	7.9
12 Nov	22h 52m 13.26s	-08° 12' 23.1"	2.27	111.6	29.567578	1.8	1.000	7.9
19 Nov	22h 52m 06.68s	-08° 12' 53.5"	2.26	104.5	29.682925	1.8	1.000	7.9
26 Nov	22h 52m 06.40s	-08° 12' 45.1"	2.25	97.4	29.801978	1.9	1.000	7.9
03 Dez	22h 52m 12.42s	-08° 11' 58.1"	2.24	90.4	29.922875	1.9	1.000	7.9
10 Dez	22h 52m 24.78s	-08° 10' 32.5"	2.23	83.3	30.043860	1.9	1.000	7.9
17 Dez	22h 52m 43.31s	-08° 08' 29.2"	2.22	76.3	30.163203	1.8	1.000	7.9
24 Dez	22h 53m 07.94s	-08° 05' 49.3"	2.21	69.3	30.279073	1.8	1.000	7.9
31 Dez	22h 53m 38.28s	-08° 02' 34.8"	2.20	62.3	30.389708	1.7	1.000	7.9

(134340) Plutão

	Distância média (ua) 39,44	Período de Revolução 248 anos	Inclinação Equatorial 17,2°	Diâm. Equatorial 2.200-2.300
			00:00 Hora – Tempo Universal	
Data	α	δ	\emptyset Elong DT (ua)* Ang. PH	Fase Mag.
01 Jan	19h 11m 55.69s	-21° 22' 56.7"	0.12 6.1 34.220487 0.2	1.000 14.3
08 Jan	19h 12m 57.37s	-21° 21' 49.3"	0.12 1.3 34.230482 0.0	1.000 14.3
15 Jan	19h 13m 59.01s	-21° 20' 39.4"	0.12 7.8 34.226129 0.2	1.000 14.3
22 Jan	19h 14m 59.76s	-21° 19' 27.9"	0.12 14.6 34.207577 0.4	1.000 14.3
29 Jan	19h 15m 59.03s	-21° 18' 16.3"	0.12 21.5 34.175078 0.6	1.000 14.3
05 Fev	19h 16m 56.03s	-21° 17' 06.2"	0.12 28.4 34.129163 0.8	1.000 14.3
12 Fev	19h 17m 50.17s	-21° 15' 59.0"	0.12 35.3 34.070661 1.0	1.000 14.3
19 Fev	19h 18m 40.78s	-21° 14' 56.1"	0.12 42.1 34.000489 1.1	1.000 14.3
26 Fev	19h 19m 27.38s	-21° 13' 59.0"	0.12 49.0 33.919642 1.3	1.000 14.3
05 Mar	19h 20m 09.34s	-21° 13' 09.1"	0.12 55.9 33.829351 1.4	1.000 14.3
12 Mar	19h 20m 46.27s	-21° 12' 27.7"	0.12 62.7 33.731080 1.5	1.000 14.3
19 Mar	19h 21m 17.73s	-21° 11' 55.8"	0.12 69.6 33.626291 1.6	1.000 14.2
26 Mar	19h 21m 43.48s	-21° 11' 34.5"	0.12 76.4 33.516463 1.7	1.000 14.2
02 Abr	19h 22m 03.16s	-21° 11' 24.6"	0.12 83.3 33.403243 1.7	1.000 14.2
09 Abr	19h 22m 16.68s	-21° 11' 26.9"	0.12 90.1 33.288407 1.7	1.000 14.2
16 Abr	19h 22m 23.93s	-21° 11' 41.5"	0.12 96.9 33.173626 1.7	1.000 14.2
23 Abr	19h 22m 24.97s	-21° 12' 08.9"	0.13 103.8 33.060515 1.7	1.000 14.2
30 Abr	19h 22m 19.81s	-21° 12' 48.8"	0.13 110.6 32.950769 1.6	1.000 14.2
07 Mai	19h 22m 08.67s	-21° 13' 41.5"	0.13 117.4 32.846106 1.5	1.000 14.2
14 Mai	19h 21m 51.85s	-21° 14' 45.8"	0.13 124.3 32.748035 1.4	1.000 14.2
21 Mai	19h 21m 29.69s	-21° 16' 01.7"	0.13 131.1 32.657936 1.3	1.000 14.2
28 Mai	19h 21m 02.61s	-21° 17' 27.6"	0.13 137.9 32.577192 1.2	1.000 14.2
04 Jun	19h 20m 31.13s	-21° 19' 03.3"	0.13 144.8 32.507106 1.0	1.000 14.2
11 Jun	19h 19m 55.87s	-21° 20' 46.7"	0.13 151.6 32.448684 0.8	1.000 14.2
18 Jun	19h 19m 17.47s	-21° 22' 37.2"	0.13 158.4 32.402758 0.6	1.000 14.2
25 Jun	19h 18m 36.61s	-21° 24' 32.7"	0.13 165.3 32.370099 0.4	1.000 14.2
02 Jul	19h 17m 54.01s	-21° 26' 32.4"	0.13 172.1 32.351322 0.2	1.000 14.2
09 Jul	19h 17m 10.53s	-21° 28' 34.0"	0.13 178.6 32.346696 0.0	1.000 14.2
16 Jul	19h 16m 26.89s	-21° 30' 36.8"	0.13 174.1 32.356298 0.2	1.000 14.2
23 Jul	19h 15m 43.92s	-21° 32' 38.4"	0.13 167.3 32.380123 0.4	1.000 14.2
30 Jul	19h 15m 02.34s	-21° 34' 38.0"	0.13 160.5 32.417969 0.6	1.000 14.2
06 Ago	19h 14m 23.03s	-21° 36' 33.8"	0.13 153.6 32.469286 0.8	1.000 14.2
13 Ago	19h 13m 46.61s	-21° 38' 24.9"	0.13 146.8 32.533363 1.0	1.000 14.2
20 Ago	19h 13m 13.81s	-21° 40' 09.6"	0.13 139.9 32.609428 1.1	1.000 14.2
27 Ago	19h 12m 45.20s	-21° 41' 47.3"	0.13 133.0 32.696513 1.3	1.000 14.2
03 Set	19h 12m 21.44s	-21° 43' 16.6"	0.13 126.2 32.793356 1.4	1.000 14.2
10 Set	19h 12m 02.89s	-21° 44' 37.2"	0.13 119.3 32.898602 1.5	1.000 14.2
17 Set	19h 11m 50.02s	-21° 45' 47.9"	0.13 112.5 33.010895 1.6	1.000 14.2
24 Set	19h 11m 43.05s	-21° 46' 48.4"	0.12 105.6 33.128728 1.7	1.000 14.2
01 Out	19h 11m 42.33s	-21° 47' 38.1"	0.12 98.7 33.250390 1.7	1.000 14.2
08 Out	19h 11m 47.85s	-21° 48' 16.9"	0.12 91.8 33.374174 1.7	1.000 14.2
15 Out	19h 11m 59.72s	-21° 48' 44.3"	0.12 85.0 33.498459 1.7	1.000 14.2
22 Out	19h 12m 17.80s	-21° 49' 00.4"	0.12 78.1 33.621542 1.7	1.000 14.3
29 Out	19h 12m 42.07s	-21° 49' 05.2"	0.12 71.2 33.741625 1.6	1.000 14.3
05 Nov	19h 13m 12.14s	-21° 48' 58.9"	0.12 64.3 33.857027 1.5	1.000 14.3
12 Nov	19h 13m 47.80s	-21° 48' 41.8"	0.12 57.4 33.966243 1.4	1.000 14.3
19 Nov	19h 14m 28.58s	-21° 48' 14.2"	0.12 50.5 34.067761 1.3	1.000 14.3
26 Nov	19h 15m 14.13s	-21° 47' 36.8"	0.12 43.6 34.160091 1.2	1.000 14.3
03 Dez	19h 16m 03.79s	-21° 46' 50.2"	0.12 36.7 34.241955 1.0	1.000 14.3
10 Dez	19h 16m 57.08s	-21° 45' 55.4"	0.12 29.8 34.312332 0.8	1.000 14.3
17 Dez	19h 17m 53.31s	-21° 44' 52.9"	0.12 22.9 34.370256 0.7	1.000 14.3
24 Dez	19h 18m 51.92s	-21° 43' 44.3"	0.12 16.0 34.414869 0.5	1.000 14.3
31 Dez	19h 19m 52.09s	-21° 42' 30.3"	0.12 9.2 34.445603 0.3	1.000 14.3

(1) Ceres

	Distância média (ua) 2,7663	Período de Revolução 4.59 anos	Inclinação Equatorial 10,5°	Diâm. Equatorial 974.6	00:00 Hora – Tempo Universal			
Data	α	δ	\emptyset	Elong	DT (ua)*	Ang. PH	Fase	Mag.
01 Jan	01h 36m 38.2s	+02° 01' 40"	0.00	102.4	2.4528	19.8	0.970	8.6
08 Jan	01h 39m 39.3s	+02° 52' 38"	0.00	96.3	2.5435	20.2	0.969	8.7
15 Jan	01h 43m 37.0s	+03° 47' 00"	0.00	90.5	2.6353	20.4	0.969	8.8
22 Jan	01h 48m 26.5s	+04° 44' 07"	0.00	84.9	2.7273	20.4	0.969	8.8
29 Jan	01h 54m 03.7s	+05° 43' 26"	0.00	79.4	2.8184	20.2	0.969	8.9
05 Fev	02h 00m 24.4s	+06° 44' 25"	0.00	74.2	2.9078	19.8	0.971	8.9
12 Fev	02h 07m 24.2s	+07° 46' 31"	0.00	69.1	2.9947	19.2	0.972	9.0
19 Fev	02h 14m 59.5s	+08° 49' 16"	0.00	64.2	3.0786	18.6	0.974	9.0
26 Fev	02h 23m 07.6s	+09° 52' 16"	0.00	59.4	3.1589	17.8	0.976	9.0
05 Mar	02h 31m 45.7s	+10° 55' 08"	0.00	54.7	3.2350	16.9	0.978	9.1
12 Mar	02h 40m 51.0s	+11° 57' 27"	0.00	50.1	3.3065	15.9	0.981	9.1
19 Mar	02h 50m 21.3s	+12° 58' 53"	0.00	45.7	3.3732	14.9	0.983	9.1
26 Mar	03h 00m 14.8s	+13° 59' 06"	0.00	41.3	3.4346	13.8	0.986	9.1
02 Abr	03h 10m 30.0s	+14° 57' 48"	0.00	37.1	3.4905	12.6	0.988	9.0
09 Abr	03h 21m 05.0s	+15° 54' 41"	0.00	32.9	3.5406	11.4	0.990	9.0
16 Abr	03h 31m 58.2s	+16° 49' 27"	0.00	28.8	3.5849	10.1	0.992	9.0
23 Abr	03h 43m 08.5s	+17° 41' 51"	0.00	24.7	3.6232	8.8	0.994	9.0
30 Abr	03h 54m 34.7s	+18° 31' 40"	0.00	20.8	3.6554	7.5	0.996	8.9
07 Mai	04h 06m 15.3s	+19° 18' 39"	0.00	16.8	3.6813	6.1	0.997	8.8
14 Mai	04h 18m 08.9s	+20° 02' 36"	0.00	13.0	3.7010	4.8	0.998	8.8
21 Mai	04h 30m 14.6s	+20° 43' 20"	0.00	9.1	3.7145	3.4	0.999	8.7
28 Mai	04h 42m 31.1s	+21° 20' 43"	0.00	5.3	3.7217	2.0	1.000	8.6
04 Jun	04h 54m 56.8s	+21° 54' 36"	0.00	1.6	3.7226	0.6	1.000	8.5
11 Jun	05h 07m 30.2s	+22° 24' 52"	0.00	2.3	3.7173	0.9	1.000	8.5
18 Jun	05h 20m 10.2s	+22° 51' 26"	0.00	6.0	3.7059	2.3	1.000	8.6
25 Jun	05h 32m 55.5s	+23° 14' 17"	0.00	9.7	3.6885	3.7	0.999	8.7
02 Jul	05h 45m 44.0s	+23° 33' 23"	0.00	13.5	3.6649	5.1	0.998	8.8
09 Jul	05h 58m 34.2s	+23° 48' 45"	0.00	17.2	3.6355	6.4	0.997	8.8
16 Jul	06h 11m 24.6s	+24° 00' 26"	0.00	21.0	3.6003	7.8	0.995	8.8
23 Jul	06h 24m 13.7s	+24° 08' 33"	0.00	24.7	3.5595	9.2	0.994	8.9
30 Jul	06h 36m 59.3s	+24° 13' 13"	0.00	28.5	3.5131	10.5	0.992	8.9
06 Ago	06h 49m 39.5s	+24° 14' 36"	0.00	32.3	3.4613	11.8	0.989	8.9
13 Ago	07h 02m 12.6s	+24° 12' 57"	0.00	36.2	3.4044	13.0	0.987	8.9
20 Ago	07h 14m 37.1s	+24° 08' 31"	0.00	40.1	3.3425	14.2	0.985	8.9
27 Ago	07h 26m 50.5s	+24° 01' 37"	0.00	44.1	3.2758	15.4	0.982	8.9
03 Set	07h 38m 50.7s	+23° 52' 36"	0.00	48.1	3.2045	16.5	0.979	8.9
10 Set	07h 50m 35.6s	+23° 41' 54"	0.00	52.2	3.1290	17.6	0.977	8.9
17 Set	08h 02m 03.4s	+23° 29' 57"	0.00	56.4	3.0496	18.6	0.974	8.8
24 Set	08h 13m 11.2s	+23° 17' 18"	0.00	60.7	2.9664	19.5	0.971	8.8
01 Out	08h 23m 56.2s	+23° 04' 31"	0.00	65.2	2.8800	20.3	0.969	8.8
08 Out	08h 34m 15.7s	+22° 52' 14"	0.00	69.7	2.7908	21.0	0.967	8.7
15 Out	08h 44m 06.9s	+22° 41' 06"	0.00	74.4	2.6992	21.6	0.965	8.7
22 Out	08h 53m 25.9s	+22° 31' 55"	0.00	79.2	2.6057	22.0	0.964	8.6
29 Out	09h 02m 08.3s	+22° 25' 29"	0.00	84.2	2.5109	22.3	0.963	8.5
05 Nov	09h 10m 10.1s	+22° 22' 36"	0.00	89.4	2.4156	22.4	0.962	8.4
12 Nov	09h 17m 26.6s	+22° 24' 09"	0.00	94.7	2.3205	22.3	0.963	8.3
19 Nov	09h 23m 51.6s	+22° 31' 04"	0.00	100.4	2.2263	22.0	0.964	8.3
26 Nov	09h 29m 18.8s	+22° 44' 09"	0.00	106.2	2.1342	21.5	0.965	8.1
03 Dez	09h 33m 41.9s	+23° 04' 10"	0.00	112.4	2.0451	20.6	0.968	8.0
10 Dez	09h 36m 54.6s	+23° 31' 38"	0.00	118.8	1.9603	19.5	0.971	7.9
17 Dez	09h 38m 49.5s	+24° 06' 52"	0.00	125.5	1.8809	18.1	0.975	7.7
24 Dez	09h 39m 20.9s	+24° 49' 43"	0.00	132.5	1.8085	16.4	0.980	7.6
31 Dez	09h 38m 25.4s	+25° 39' 23"	0.00	139.7	1.7445	14.3	0.984	7.4

VIII - Meteoros

00:00 Hora Legal do Brasil

Data	Chuva de Meteoro	TZ*	α	δ	Frac. Illum.	Longitude
04/01	Quadrantideas	80	15h28m	50°	0,32	284°
12/04	Virginideas	5	14h04m	-9°	0,99	22°
22/04	Lyrideas	12	18h08m	32°	0,24	32°
28/04	alpa-Scorpiideas	5	16h32m	-24°	0,04	38°
06/05	eta-Aquarideas	35	22h20m	-1°	0,80	45°
13/05	alpa-Scorpiideas	5	16h04m	-24°	0,95	52°
10/06	Opiucideas	5	17h56m	-23°	1,00	79°
20/06	Opiucideas	5	17h20m	-20°	0,22	89°
08/07	Capricornideas	5			0,99	106°
16/07	Capricornideas	5	20h44m	-15°	0,58	113°
21/07	alpa-Cygnideas	5	21h00m	48°	0,08	118°
26/07	Capricornideas	5	21h00m	-15°	0,10	123°
29/07	delta-Aquarideas	20	22h36m	-17°	0,35	126°
31/07	Piscis Australideas	5	22h40m	-30°	0,55	128°
02/08	alpa-Capricornideas	5	20h36m	-10°	0,73	130°
07/08	iota-Aquarideas	8	22h10m	-15°	1,00	134°
13/08	Perseidas	75	03h04m	58°	0,71	140°
21/08	alpa-Cygnideas	5	21h00m	48°	0,01	148°
09/09	Piscideas	10	00h36m	7°	0,91	166°
21/09	Piscideas	5	00h24m	0°	0,01	178°
13/10	Piscideas	??	01h44m	14°	0,43	200°
22/10	Orionideas	25	06h24m	15°	0,05	209°
03/11	Taurideas	8	03h44m	14°	0,98	221°
18/11	Leonideas	10	10h08m	22°	0,00	236°
09/12	Puppideas-Velideas	15	09h00m	-48°	0,63	257°
14/12	Geminideas	75	07h28m	32°	0,15	262°
23/12	Ursídeas	5	14h28m	78°	0,20	271°
26/12	Puppideas-Velideas	15	09h20m	-65°	0,47	274°

Nota: TZ* = Taxa Horária Zenital. Este valor indica o número de meteoros que um observador poderia observar durante uma hora (60 minutos), se o radiante estiver situado no zênite, onde a absorção atmosférica é mínima. Na contagem adota-se o limite padrão de magnitude de = 5,6.

IX - Asteroides

(13) Egeria			\varnothing (km)	210	Mag. Max. Opp:		10.1
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra	Dist. Sol	Elong. °	Fase	Mag.
			(ua)	(ua)			
05 Dez 2016	08h 07m 59.7s	41° 31' 15"	1.585	2.377	133.9	17.4	10.5
07 Jan 2017	07h 42m 3.2s	46° 59' 56"	1.440	2.367	154.7	10.2	10.1
10 Fev 2017	07h 04m 10.1s	47° 23' 26"	1.561	2.362	134.7	17.3	10.5

(21) Lutetia			\varnothing (km)	121 x 101 x 75	Mag. Max. Opp:		10.9
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra	Dist. Sol (ua)	Elong. °	Fase	Mag.
			(ua)				
05 Dez 2016	08h 06m 36.8s	21° 58' 33"	1.887	2.667	133.9	15.4	11.8
12 Jan 2017	07h 35m 2.5s	24° 08' 08"	1.732	2.714	177.5	0.9	10.9
20 Fev 2017	07h 03m 29.8s	25° 18' 45"	1.985	2.756	133.0	15.2	11.9

(4) Vesta			\varnothing (km)	530	Mag. Max. Opp:		6.2
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra	Dist. Sol	Elong. °	Fase	Mag.
			(ua)	(ua)			
10 Dez 2016	08h 31m 9.9s	19° 48' 27"	1.755	2.530	132.9	16.6	7.1
18 Jan 2017	08h 02m 17.6s	23° 23' 30"	1.523	2.506	177.1	1.1	6.2
25 Fev 2017	07h 30m 34.0s	26° 00' 26"	1.687	2.478	133.8	16.8	7.0

(82) Alkmene			\varnothing (km)	61	Mag. Max. Opp:		10.6
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra	Dist. Sol	Elong. °	Fase	Mag.
			(ua)	(ua)			
28 Dez 2016	10h 00m 51.9s	16° 44' 30"	1.401	2.167	129.9	20.4	11.7
10 Fev 2017	09h 40m 20.9s	18° 53' 56"	1.176	2.161	175.3	2.1	10.6
25 Mar 2017	09h 16m 56.2s	19° 21' 39"	1.390	2.181	131.3	20.1	11.7

(39) Laetitia			\varnothing (km)	150	Mag. Max. Opp:		10.0
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra	Dist. Sol	Elong. °	Fase	Mag.
			(ua)	(ua)			
04 Jan 2017	10h 11m 33.2s	06° 17' 20"	2.221	2.959	130.9	14.6	10.9
14 Fev 2017	09h 46m 59.2s	10° 01' 10"	2.006	2.992	176.9	1.0	10.0
28 Mar 2017	09h 22m 31.5s	14° 17' 53"	2.269	3.022	131.3	14.4	11.0

(14) Irene			\varnothing (km)	150	Mag. Max. Opp:		9.0
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra	Dist. Sol	Elong. °	Fase	Mag.
			(ua)	(ua)			
13 Jan 2017	10h 48m 47.9s	19° 49' 45"	1.441	2.251	135.6	17.8	9.8
18 Fev 2017	10h 32m 02.2s	25° 04' 21"	1.239	2.210	165.3	6.5	9.0
27 Mar 2017	10h 05m 03.0s	27° 06' 38"	1.351	2.178	135.5	18.7	9.6

(15) Eunomia			\varnothing (km)	260	Mag. Max. Opp:		9.2
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra	Dist. Sol	Elong. °	Fase	Mag.
			(ua)	(ua)			
15 Jan 2017	10h 29m 05.0s	00° 14' 05"	1.977	2.763	135.2	14.5	9.7
20 Fev 2017	09h 59m 24.2s	00° 14' 47"	1.852	2.828	168.7	3.9	9.2
29 Mar 2017	09h 33m 09.7s	02° 10' 23"	2.091	2.888	135.4	14.0	9.9

(9) Metis			\varnothing (km)	190	Mag. Max. Opp:		9.0
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra	Dist. Sol	Elong. °	Fase	Mag.
			(ua)	(ua)			
17 Jan 2017	11h 00m 53.9s	15° 25' 11"	1.436	2.248	135.8	17.8	9.7
22 Fev 2017	10h 36m 13.9s	19° 17' 24"	1.314	2.295	170.3	4.2	9.0
31 Mar 2017	10h 07m 58.2s	20° 39' 46"	1.524	2.345	135.8	17.3	9.9

(26) Proserpina			\varnothing (km)	91		Mag. Max. Opp:	10.8
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
16 Jan 2017	10h 55m 19.3s	12° 18' 32"	1.862	2.652	135.2	15.2	11.7
23 Feb 2017	10h 31m 14.7s	15° 09' 10"	1.629	2.615	174.5	2.1	10.8
01 Abr 2017	10h 04m 10.0s	16° 48' 01"	1.768	2.580	135.8	15.7	11.6
(16) Psyche			\varnothing (km)	250		Mag. Max. Opp:	10.3
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
25 Jan 2017	11h 20m 0.3s	04° 47' 46"	2.414	3.197	136.0	12.3	11.0
06 Mar 2017	10h 55m 9.7s	07° 58' 14"	2.240	3.231	176.5	1.1	10.3
11 Abr 2017	10h 33m 51.7s	10° 26' 14"	2.469	3.257	135.1	12.5	11.1
(29) Amphitrite			\varnothing (km)	210		Mag. Max. Opp:	9.1
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
25 Jan 2017	11h 27m 38.4s	07° 10' 06"	1.765	2.559	135.1	15.8	9.9
04 Mar 2017	10h 59m 56.5s	08° 54' 09"	1.596	2.587	177.7	0.9	9.1
10 Abr 2017	10h 32m 37.9s	09° 58' 38"	1.800	2.615	136.0	15.4	10.0
(43) Ariadne			\varnothing (km)	66		Mag. Max. Opp:	10.6
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
28 Jan 2017	11h 23m 17.3s	-01° 26' 03"	1.568	2.374	135.7	16.9	11.7
09 Mar 2017	10h 54m 51.4s	00° 27' 18"	1.323	2.312	174.0	2.6	10.6
11 Abr 2017	10h 26m 28.3s	03° 50' 53"	1.417	2.245	135.6	18.2	11.4
(41) Daphne			\varnothing (km)	170		Mag. Max. Opp:	9.6
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
30 Jan 2017	11h 22m 38.7s	-05° 54' 45"	1.505	2.314	135.5	17.4	10.8
09 Mar 2017	11h 05m 49.3s	00° 09' 17"	1.225	2.215	174.7	2.4	9.6
15 Abr 2017	10h 49m 17.0s	08° 21' 15"	1.294	2.129	135.5	19.3	10.4
(88) Thisbe			\varnothing (km)	230		Mag. Max. Opp:	11.2
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
14 Feb 2017	12h 23m 10.1s	-10° 01' 21"	2.272	3.056	135.5	13.1	12.0
24 Mar 2017	11h 57m 53.0s	-08° 14' 20"	2.018	3.009	172.2	2.6	11.2
30 Abr 2017	11h 34m 20.9s	-05° 02' 12"	2.149	2.958	136.0	13.7	11.9
(63) Ausonia			\varnothing (km)	100		Mag. Max. Opp:	10.1
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
04 Mar 2017	13h 36m 15.3s	-15° 11' 08"	1.509	2.321	135.3	17.5	11.1
11 Abr 2017	13h 08m 26.7s	-14° 59' 01"	1.270	2.268	172.9	3.2	10.1
19 Mai 2017	12h 40m 40.3s	-12° 41' 09"	1.378	2.218	135.8	18.5	10.8
(12) Victoria			\varnothing (km)	110		Mag. Max. Opp:	9.8
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
13 Mar 2017	14h 05m 21.7s	-20° 45' 44"	1.551	2.365	135.5	17.1	10.9
20 Abr 2017	13h 39m 54.2s	-17° 24' 31"	1.270	2.271	173.4	2.9	9.8
27 Mai 2017	13h 14m 44.6s	-11° 43' 29"	1.331	2.176	135.9	18.9	10.4

(30) Urania			\varnothing (km)	100		Mag. Max. Opp:	11.0
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
22 Mar 2017	15h 18m 26.8s	-21° 22' 51"	1.862	2.666	135.3	15.3	11.9
26 Abr 2017	14h 49m 06.7s	-19° 45' 24"	1.652	2.660	176.7	1.3	11.0
03 Jun 2017	14h 19m 55.9s	-17° 02' 34"	1.825	2.645	135.4	15.7	11.8

(93) Minerva			\varnothing (km)	140		Mag. Max. Opp:	11.0
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
02 Abr 2017	15h 28m 04.8s	-26° 36' 01"	1.706	2.518	135.4	16.2	11.8
11 Mai 2017	14h 59m 13.0s	-27° 53' 59"	1.472	2.472	169.5	4.3	11.0
19 Jun 2017	14h 31m 33.6s	-26° 25' 28"	1.605	2.434	135.2	17.1	11.7

(52) Europa			\varnothing (km)	300		Mag. Max. Opp:	10.9
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
04 Abr 2017	15h 49m 57.1s	-09° 55' 57"	2.397	3.191	135.8	12.6	11.4
12 Mai 2017	15h 27m 10.9s	-07° 53' 01"	2.230	3.228	169.4	3.3	10.9
20 Jun 2017	15h 02m 43.2s	-07° 26' 13"	2.456	3.264	135.9	12.5	11.5

(80) Sappho			\varnothing (km)	78		Mag. Max. Opp:	11.0
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
06 Abr 2017	15h 53m 19.6s	-18° 56' 37"	1.743	2.558	135.9	15.8	12.1
14 Mai 2017	15h 26m 11.4s	-14° 59' 29"	1.481	2.490	176.4	1.5	11.0
21 Jun 2017	14h 56m 30.3s	-11° 15' 17"	1.585	2.415	135.2	17.3	11.8

(27) Euterpe			\varnothing (km)	96		Mag. Max. Opp:	10.4
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
17 Abr 2017	16h 41m 59.0s	-20° 47' 59"	1.844	2.652	135.1	15.5	11.3
26 Mai 2017	16h 10m 10.1s	-19° 44' 18"	1.679	2.691	178.6	0.5	10.4
04 Jul 2017	15h 39m 51.6s	-18° 39' 31"	1.905	2.721	135.1	15.3	11.4

(83) Beatrix			\varnothing (km)	81		Mag. Max. Opp:	11.3
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
26 Abr 2017	17h 17m 07.2s	-27° 31' 01"	1.460	2.286	135.1	18.1	12.2
04 Jun 2017	16h 46m 57.9s	-28° 47' 01"	1.303	2.314	173.6	2.8	11.3
14 Jul 2017	16h 17m 27.8s	-27° 56' 54"	1.511	2.346	135.5	17.7	12.3

(6) Hebe			\varnothing (km)	190		Mag. Max. Opp:	9.2
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
13 Mai 2017	18h 10m 27.2s	-04° 17' 46"	1.779	2.601	135.9	15.7	9.8
18 Jun 2017	17h 43m 28.0s	-03° 52' 03"	1.548	2.528	160.5	7.7	9.2
23 Jul 2017	17h 14m 34.7s	-07° 10' 15"	1.620	2.453	135.8	16.8	9.5

(28) Bellona			\varnothing (km)	120		Mag. Max. Opp:	11.5
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
15 Mai 2017	18h 27m 59.9s	-12° 01' 03"	2.227	3.037	136.0	13.4	12.0
22 Jun 2017	18h 01m 16.2s	-12° 03' 26"	2.074	3.077	168.6	3.7	11.5
31 Jul 2017	17h 34m 58.4s	-13° 54' 13"	2.308	3.113	135.3	13.3	12.1

(40) Harmonia			\varnothing (km)	110		Mag. Max. Opp:	9.3
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
15 Mai 2017	18h 37m 45.9s	-21° 35' 11"	1.455	2.287	135.3	18.1	10.5
24 Jun 2017	18h 07m 48.5s	-23° 08' 43"	1.249	2.266	179.3	0.3	9.3
02 Ago 2017	17h 37m 19.4s	-24° 25' 47"	1.408	2.245	135.2	18.6	10.5
(10) Hygiea			\varnothing (km)	410		Mag. Max. Opp:	9.1
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
20 Mai 2017	19h 00m 46.1s	-24° 00' 27"	2.027	2.835	135.1	14.6	10.0
30 Jun 2017	18h 34m 36.2s	-23° 44' 37"	1.846	2.863	179.4	0.2	9.1
09 Ago 2017	18h 09m 48.7s	-23° 07' 40"	2.080	2.895	135.9	14.1	10.1
(5) Astraea			\varnothing (km)	120		Mag. Max. Opp:	10.8
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
24 Mai 2017	19h 11m 55.1s	-16° 42' 49"	2.036	2.846	135.2	14.5	11.5
02 Jul 2017	18h 42m 26.2s	-17° 35' 34"	1.889	2.903	174.5	1.9	10.8
08 Ago 2017	18h 14m 56.8s	-19° 07' 14"	2.117	2.949	137.9	13.3	11.6
(3) Juno			\varnothing (km)	230		Mag. Max. Opp:	9.7
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
27 Mai 2017	19h 06m 14.9s	-05° 25' 59"	2.339	3.144	135.7	13.0	10.3
03 Jul 2017	18h 40m 02.4s	-05° 02' 28"	2.096	3.079	162.0	5.9	9.7
08 Ago 2017	18h 13m 45.9s	-07° 23' 48"	2.197	3.008	135.7	13.6	10.1
(25) Phocaea			\varnothing (km)	75		Mag. Max. Opp:	10.0
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
18 Jul 2017	20h 43m 10.4s	27° 11' 08"	0.959	1.790	130.2	25.8	10.2
17 Ago 2017	20h 25m 13.6s	25° 37' 36"	0.931	1.804	136.3	22.8	10.0
13 Set 2017	20h 24m 32.7s	18° 00' 30"	1.011	1.833	130.7	24.6	10.3
(89) Julia			\varnothing (km)	150		Mag. Max. Opp:	9.0
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
01 Ago 2017	23h 15m 33.1s	06° 06' 37"	1.259	2.107	135.6	19.7	9.7
07 Set 2017	22h 43m 19.2s	10° 52' 31"	1.103	2.085	162.3	8.4	9.0
14 Out 2017	22h 15m 51.0s	10° 55' 34"	1.248	2.080	135.5	19.6	9.7
(24) Themis			\varnothing (km)	200		Mag. Max. Opp:	11.5
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
11 Set 2017	02h 01m 29.9s	12° 04' 46"	2.515	3.312	135.7	12.2	12.4
20 Out 2017	01h 38m 17.4s	10° 01' 47"	2.274	3.270	179.8	0.1	11.5
27 Nov 2017	01h 15m 17.7s	07° 54' 13"	2.447	3.227	135.7	12.3	12.3
(64) Angelina			\varnothing (km)	98		Mag. Max. Opp:	11.1
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
13 Set 2017	02h 07m 42.4s	14° 46' 28"	1.938	2.746	135.3	14.9	11.8
22 Out 2017	01h 41m 46.5s	12° 44' 12"	1.701	2.696	177.9	0.8	11.1
28 Nov 2017	01h 16m 56.9s	10° 09' 09"	1.848	2.647	135.9	15.0	11.6

(2) Pallas			\varnothing (km)	550		Mag. Max. Opp:	8.1
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
04 Out 2017	03h 19m 23.3s	-16° 40' 16"	1.796	2.604	135.3	15.7	8.4
24 Out 2017	03h 10m 00.9s	-22° 40' 37"	1.705	2.555	140.9	14.2	8.1
13 Nov 2017	02h 54m 04.0s	-26° 53' 17"	1.708	2.507	135.0	16.2	8.2
(7) Iris			\varnothing (km)	200		Mag. Max. Opp:	6.9
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
21 Set 2017	02h 23m 48.6s	23° 38' 54"	1.011	1.868	135.9	22.0	8.0
30 Out 2017	02h 05m 04.6s	21° 24' 16"	0.849	1.837	171.8	4.4	6.9
08 Dez 2017	01h 51m 39.5s	16° 14' 15"	0.999	1.838	135.7	22.0	7.9
(44) Nysa			\varnothing (km)	71		Mag. Max. Opp:	9.6
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
26 Set 2017	03h 06m 05.1s	11° 38' 42"	1.519	2.340	135.2	17.6	10.4
03 Nov 2017	02h 41m 56.1s	08° 50' 32"	1.290	2.278	173.4	2.9	9.6
10 Dez 2017	02h 14m 14.2s	07° 22' 14"	1.407	2.221	135.7	18.0	10.1
(48) Doris			\varnothing (km)	220		Mag. Max. Opp:	10.9
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
01 Out 2017	03h 22m 11.5s	13° 13' 58"	2.126	2.929	135.9	13.8	11.7
08 Nov 2017	03h 00m 29.1s	10° 08' 50"	1.927	2.913	173.4	2.3	10.9
16 Dez 2017	02h 37m 39.8s	08° 10' 10"	2.118	2.901	135.2	13.8	11.6
(42) Isis			\varnothing (km)	100		Mag. Max. Opp:	10.4
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
12 Out 2017	04h 09m 06.9s	12° 16' 25"	1.437	2.259	135.3	18.1	11.0
18 Nov 2017	03h 36m 34.4s	11° 59' 04"	1.368	2.352	172.8	3.0	10.4
24 Dez 2017	03h 07m 48.6s	13° 05' 23"	1.637	2.441	135.9	16.3	11.4
(59) Elpis			\varnothing (km)	160		Mag. Max. Opp:	11.3
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
07 Nov 2017	05h 51m 57.0s	10° 44' 17"	1.684	2.486	135.1	16.3	11.9
13 Dez 2017	05h 26m 23.4s	09° 06' 10"	1.557	2.523	165.9	5.5	11.3
19 Jan 2018	05h 00m 39.3s	10° 19' 35"	1.773	2.565	135.1	15.7	12.1
(20) Massalia			\varnothing (km)	150		Mag. Max. Opp:	8.4
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
10 Nov 2017	06h 07m 40.5s	22° 34' 19"	1.267	2.101	136.8	18.8	9.5
18 Dez 2017	05h 40m 58.1s	22° 12' 24"	1.093	2.077	178.8	0.6	8.4
24 Jan 2018	05h 14m 25.7s	21° 53' 59"	1.244	2.067	135.7	19.4	9.4
(92) Undina			\varnothing (km)	130		Mag. Max. Opp:	11.1
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
11 Nov 2017	06h 12m 14.0s	18° 37' 29"	2.425	3.206	135.4	12.5	11.8
19 Dez 2017	05h 45m 35.6s	19° 42' 44"	2.261	3.244	176.3	1.1	11.1
25 Jan 2018	05h 20m 04.1s	21° 05' 43"	2.499	3.279	135.9	12.1	11.9
(31) Euphrosyne			\varnothing (km)	260		Mag. Max. Opp:	10.5
Data	α (J2000.0)	δ (J2000.0)	Dist. Terra (ua)	Dist. Sol (ua)	Elong. °	Fase	Mag.
27 Nov 2017	06h 43m 57.9s	56° 00' 21"	1.661	2.460	135.1	16.5	10.7
21 Dez 2017	06h 15m 46.1s	60° 30' 42"	1.601	2.458	142.8	14.0	10.5
13 Jan 2018	05h 40m 39.7s	61° 11' 36"	1.661	2.462	135.5	16.3	10.7

X - Cometas

Efemérides do Cometa 45P/Honda-Mrkos-Pajdusakova - 00:00 UTC (J2000)

T 2016 Dec 31.1896 TT
 q 0.532533 Peri. 326.2690
 a 3.024518 Node 89.0072
 e 0.823928 Incl. 4.2495
 Ref: MPC 84320

aaaa/mm./dd	h	m	s	o	'	"	delta	RSol	Elong	Fase	Mag	"/min	AP
2017 Jan 1	20	59	11.1	-18	51	8	0.691	0.533	31.4	106.2	7.2	1.44	62.4
2017 Jan 2	21	1	15.4	-18	35	7	0.670	0.534	30.9	109.1	7.2	1.36	60.4
2017 Jan 3	21	3	9.7	-18	18	59	0.648	0.536	30.4	111.9	7.1	1.27	58.0
2017 Jan 4	21	4	53.5	-18	2	45	0.627	0.539	29.8	114.8	7.1	1.19	55.2
2017 Jan 5	21	6	26.4	-17	46	26	0.606	0.542	29.2	117.7	7.1	1.10	51.7
2017 Jan 6	21	7	47.9	-17	30	1	0.585	0.547	28.6	120.6	7.1	1.02	47.6
2017 Jan 7	21	8	57.8	-17	13	28	0.564	0.552	27.9	123.5	7.1	0.94	42.6
2017 Jan 8	21	9	55.6	-16	56	48	0.544	0.558	27.2	126.4	7.1	0.87	36.4
2017 Jan 9	21	10	41.2	-16	39	57	0.524	0.565	26.4	129.2	7.1	0.81	29.1
2017 Jan 10	21	11	14.3	-16	22	54	0.504	0.572	25.6	132.0	7.2	0.76	20.4
2017 Jan 11	21	11	34.6	-16	5	34	0.485	0.580	24.8	134.8	7.2	0.74	10.7
2017 Jan 12	21	11	41.9	-15	47	55	0.466	0.588	23.8	137.5	7.2	0.74	0.5
2017 Jan 13	21	11	36.0	-15	29	52	0.447	0.597	22.9	140.2	7.3	0.77	350.5
2017 Jan 14	21	11	16.6	-15	11	20	0.429	0.607	21.9	142.8	7.3	0.83	341.4
2017 Jan 15	21	10	43.5	-14	52	13	0.411	0.617	20.9	145.4	7.4	0.91	333.5
2017 Jan 16	21	9	56.3	-14	32	23	0.394	0.628	19.8	147.9	7.4	1.01	326.9
2017 Jan 17	21	8	54.5	-14	11	43	0.377	0.639	18.7	150.4	7.5	1.12	321.6
2017 Jan 18	21	7	37.8	-13	50	4	0.360	0.650	17.6	152.8	7.5	1.26	317.3
2017 Jan 19	21	6	5.5	-13	27	16	0.343	0.662	16.4	155.2	7.6	1.41	313.9
2017 Jan 20	21	4	16.8	-13	3	5	0.327	0.674	15.2	157.5	7.6	1.58	311.1
2017 Jan 21	21	2	10.9	-12	37	20	0.312	0.686	14.0	159.7	7.7	1.77	309.0
2017 Jan 22	20	59	46.6	-12	9	42	0.296	0.698	12.8	161.8	7.7	1.97	307.3
2017 Jan 23	20	57	2.5	-11	39	55	0.281	0.711	11.7	163.7	7.8	2.20	306.0
2017 Jan 24	20	53	56.9	-11	7	35	0.267	0.724	10.7	165.4	7.8	2.46	304.9
2017 Jan 25	20	50	27.8	-10	32	17	0.252	0.737	9.9	166.7	7.9	2.74	304.1
2017 Jan 26	20	46	32.6	-9	53	30	0.238	0.751	9.4	167.6	7.9	3.07	303.5
2017 Jan 27	20	42	8.0	-9	10	37	0.224	0.764	9.4	167.8	7.9	3.44	303.1
2017 Jan 28	20	37	10.4	-8	22	55	0.211	0.778	9.9	167.4	7.9	3.87	302.8
2017 Jan 29	20	31	34.7	-7	29	28	0.198	0.792	11.1	166.2	8.0	4.38	302.7
2017 Jan 30	20	25	15.2	-6	29	13	0.185	0.805	12.8	164.3	8.0	4.96	302.6
2017 Jan 31	20	18	4.4	-5	20	51	0.173	0.819	15.0	161.9	8.0	5.65	302.5
2017 Fev 1	20	9	53.1	-4	2	46	0.161	0.833	17.7	159.0	8.0	6.48	302.5
2017 Fev 2	20	0	29.9	-2	33	3	0.149	0.848	20.9	155.5	7.9	7.46	302.6
2017 Fev 3	19	49	40.5	-0	49	27	0.138	0.862	24.6	151.6	7.9	8.63	302.5
2017 Fev 4	19	37	7.4	1	10	36	0.128	0.876	28.9	147.1	7.9	10.03	302.5
2017 Fev 5	19	22	29.0	3	29	50	0.118	0.890	33.8	141.9	7.9	11.68	302.3
2017 Fev 6	19	5	19.9	6	10	44	0.109	0.905	39.5	136.1	7.8	13.59	301.9
2017 Fev 7	18	45	11.6	9	14	47	0.101	0.919	46.1	129.4	7.8	15.73	301.2
2017 Fev 8	18	21	35.4	12	41	1	0.095	0.933	53.5	121.8	7.8	17.96	300.1
2017 Fev 9	17	54	9.1	16	24	14	0.089	0.948	61.8	113.4	7.8	20.05	298.4
2017 Fev 10	17	22	48.0	20	13	26	0.086	0.962	70.9	104.3	7.8	21.66	295.9
2017 Fev 11	16	47	59.4	23	52	4	0.084	0.976	80.4	94.7	7.9	22.43	292.6
2017 Fev 12	16	10	52.2	27	1	49	0.085	0.991	90.0	85.1	8.1	22.16	288.6
2017 Fev 13	15	33	11.2	29	28	44	0.087	1.005	99.3	75.7	8.2	20.93	284.2
2017 Fev 14	14	56	50.8	31	7	52	0.092	1.020	108.0	67.1	8.5	19.04	279.6
2017 Fev 15	14	23	23.0	32	3	18	0.097	1.034	115.8	59.3	8.7	16.84	275.2
2017 Fev 16	13	53	39.0	32	24	18	0.105	1.048	122.7	52.5	9.0	14.64	271.2
2017 Fev 17	13	27	51.1	32	21	9	0.113	1.063	128.7	46.5	9.3	12.61	267.7
2017 Fev 18	13	5	45.5	32	2	34	0.122	1.077	134.0	41.3	9.6	10.84	264.7
2017 Fev 19	12	46	56.3	31	35	0	0.132	1.091	138.5	36.9	9.9	9.32	262.2
2017 Fev 20	12	30	54.2	31	2	49	0.143	1.105	142.4	33.1	10.1	8.04	260.0
2017 Fev 21	12	17	11.6	30	28	45	0.154	1.120	145.8	29.8	10.4	6.98	258.2
2017 Fev 22	12	5	24.8	29	54	30	0.165	1.134	148.8	26.9	10.7	6.09	256.6
2017 Fev 23	11	55	13.6	29	21	1	0.177	1.148	151.3	24.5	10.9	5.34	255.1
2017 Fev 24	11	46	22.0	28	48	50	0.189	1.162	153.5	22.4	11.2	4.72	253.9
2017 Fev 25	11	38	36.6	28	18	10	0.201	1.176	155.3	20.6	11.4	4.19	252.7
2017 Fev 26	11	31	46.8	27	49	7	0.214	1.190	156.9	19.0	11.7	3.74	251.6
2017 Fev 27	11	25	44.0	27	21	39	0.227	1.204	158.2	17.8	11.9	3.35	250.6
2017 Fev 28	11	20	21.4	26	55	44	0.240	1.218	159.2	16.8	12.1	3.02	249.6
2017 Mar 1	11	15	33.1	26	31	15	0.253	1.232	160.0	16.0	12.3	2.73	248.7
2017 Mar 2	11	11	14.5	26	8	5	0.267	1.246	160.6	15.3	12.5	2.48	247.7

Efemérides do Cometa 2P/Encke - 00:00 UTC (J2000)

T 2017 Mar 10.0894 TT
q 0.335903 Peri. 186.5589
a 2.214828 Node 334.5629
e 0.848339 Incl. 11.7788
Ref: NK 2573

aaaa/mm./dd	h	m	s	o	'	"	delta	RSol	Elong	Fase	Mag	"/min	AP
2017 Jan 23	23	24	38.7	5	31	32	1.341	1.063	51.7	46.6	12.5	0.83	74.2
2017 Jan 24	23	25	56.6	5	37	3	1.334	1.046	51.0	47.0	12.4	0.85	74.1
2017 Jan 25	23	27	15.7	5	42	39	1.327	1.030	50.3	47.3	12.3	0.86	74.1
2017 Jan 26	23	28	36.0	5	48	21	1.319	1.014	49.7	47.8	12.2	0.87	74.1
2017 Jan 27	23	29	57.5	5	54	8	1.311	0.997	49.0	48.2	12.1	0.88	74.1
2017 Jan 28	23	31	20.1	5	59	59	1.303	0.981	48.3	48.6	11.9	0.90	74.1
2017 Jan 29	23	32	43.9	6	5	54	1.294	0.964	47.7	49.1	11.8	0.91	74.2
2017 Jan 30	23	34	8.6	6	11	52	1.285	0.947	47.1	49.6	11.7	0.92	74.2
2017 Jan 31	23	35	34.4	6	17	51	1.276	0.930	46.4	50.1	11.6	0.93	74.3
2017 Fev 1	23	37	1.1	6	23	52	1.266	0.913	45.8	50.7	11.4	0.94	74.5
2017 Fev 2	23	38	28.7	6	29	53	1.256	0.896	45.1	51.3	11.3	0.94	74.6
2017 Fev 3	23	39	57.2	6	35	53	1.245	0.878	44.5	51.9	11.1	0.95	74.8
2017 Fev 4	23	41	26.3	6	41	50	1.234	0.861	43.9	52.5	11.0	0.96	75.1
2017 Fev 5	23	42	56.1	6	47	43	1.223	0.843	43.3	53.2	10.8	0.96	75.4
2017 Fev 6	23	44	26.3	6	53	30	1.211	0.826	42.6	54.0	10.7	0.97	75.7
2017 Fev 7	23	45	57.0	6	59	10	1.199	0.808	42.0	54.8	10.5	0.97	76.1
2017 Fev 8	23	47	28.0	7	4	40	1.186	0.790	41.4	55.6	10.3	0.97	76.5
2017 Fev 9	23	48	59.1	7	9	59	1.173	0.772	40.8	56.5	10.2	0.97	77.1
2017 Fev 10	23	50	30.1	7	15	2	1.160	0.754	40.1	57.5	10.0	0.96	77.7
2017 Fev 11	23	52	0.8	7	19	48	1.146	0.736	39.5	58.5	9.8	0.95	78.4
2017 Fev 12	23	53	31.0	7	24	13	1.131	0.718	38.9	59.7	9.6	0.94	79.3
2017 Fev 13	23	55	0.5	7	28	13	1.116	0.699	38.2	60.9	9.4	0.93	80.3
2017 Fev 14	23	56	28.8	7	31	44	1.101	0.681	37.6	62.1	9.2	0.91	81.5
2017 Fev 15	23	57	55.6	7	34	40	1.085	0.662	36.9	63.5	9.0	0.89	83.0
2017 Fev 16	23	59	20.5	7	36	55	1.069	0.644	36.2	65.0	8.8	0.87	84.8
2017 Fev 17	0	0	43.0	7	38	23	1.052	0.625	35.5	66.7	8.6	0.84	87.1
2017 Fev 18	0	2	2.4	7	38	56	1.034	0.607	34.8	68.4	8.3	0.80	89.9
2017 Fev 19	0	3	18.0	7	38	26	1.016	0.588	34.1	70.4	8.1	0.76	93.5
2017 Fev 20	0	4	29.0	7	36	40	0.998	0.570	33.3	72.5	7.8	0.71	98.2
2017 Fev 21	0	5	34.5	7	33	28	0.979	0.552	32.6	74.7	7.6	0.66	104.5
2017 Fev 22	0	6	33.2	7	28	36	0.960	0.533	31.7	77.2	7.3	0.62	113.1
2017 Fev 23	0	7	23.9	7	21	46	0.940	0.515	30.8	79.9	7.0	0.58	124.7
2017 Fev 24	0	8	4.9	7	12	41	0.919	0.497	29.9	82.9	6.8	0.57	139.5
2017 Fev 25	0	8	34.5	7	0	59	0.899	0.480	28.9	86.2	6.5	0.60	156.4
2017 Fev 26	0	8	50.6	6	46	15	0.877	0.463	27.9	89.7	6.2	0.69	172.7
2017 Fev 27	0	8	50.8	6	28	1	0.856	0.446	26.7	93.7	5.9	0.84	186.1
2017 Fev 28	0	8	32.4	6	5	46	0.835	0.430	25.5	98.0	5.6	1.06	196.3
2017 Mar 1	0	7	52.4	5	38	58	0.813	0.414	24.1	102.7	5.3	1.33	203.8
2017 Mar 2	0	6	47.7	5	6	58	0.792	0.400	22.6	107.9	5.0	1.66	209.3
2017 Mar 3	0	5	15.0	4	29	13	0.771	0.386	20.9	113.6	4.7	2.04	213.4
2017 Mar 4	0	3	11.1	3	45	7	0.751	0.374	19.1	119.8	4.5	2.46	216.5
2017 Mar 5	0	0	33.2	2	54	14	0.732	0.363	17.1	126.5	4.2	2.91	218.9
2017 Mar 6	23	57	19.4	1	56	20	0.714	0.354	14.9	133.8	4.0	3.38	220.8
2017 Mar 7	23	53	28.9	0	51	26	0.698	0.346	12.6	141.5	3.8	3.85	222.3
2017 Mar 8	23	49	2.8	-	0	20	0.684	0.341	10.0	149.6	3.7	4.28	223.5
2017 Mar 9	23	44	4.2	-	1	37	0.672	0.337	7.3	157.9	3.6	4.65	224.6
2017 Mar 10	23	38	38.3	-	2	58	0.664	0.336	4.6	166.3	3.5	4.93	225.4
2017 Mar 11	23	32	52.5	-	4	22	0.658	0.337	2.1	173.7	3.5	5.08	226.2
2017 Mar 12	23	26	55.5	-	5	46	0.655	0.340	2.4	173.0	3.6	5.11	226.8
2017 Mar 13	23	20	56.5	-	7	9	0.656	0.345	5.0	165.6	3.7	5.01	227.4
2017 Mar 14	23	15	4.4	-	8	29	0.659	0.352	7.8	157.6	3.8	4.80	227.9
2017 Mar 15	23	9	27.0	-	9	43	0.665	0.361	10.5	149.8	4.0	4.51	228.3
2017 Mar 16	23	4	10.6	-10	52	47	0.674	0.372	13.2	142.4	4.2	4.15	228.7
2017 Mar 17	22	59	19.2	-11	55	16	0.684	0.384	15.7	135.4	4.4	3.75	228.9
2017 Mar 18	22	54	55.5	-12	51	11	0.696	0.397	18.1	129.0	4.7	3.35	229.1
2017 Mar 19	22	51	0.4	-13	40	40	0.709	0.412	20.3	123.0	5.0	2.95	229.2
2017 Mar 20	22	47	33.5	-14	24	1	0.724	0.427	22.3	117.5	5.3	2.57	229.1
2017 Mar 21	22	44	33.9	-15	1	43	0.739	0.443	24.3	112.5	5.5	2.22	228.9
2017 Mar 22	22	41	59.8	-15	34	18	0.754	0.460	26.0	107.9	5.8	1.90	228.6
2017 Mar 23	22	39	49.2	-16	2	17	0.770	0.477	27.7	103.7	6.1	1.61	228.0
2017 Mar 24	22	38	0.1	-16	26	11	0.786	0.494	29.2	99.8	6.4	1.35	227.2
2017 Mar 25	22	36	30.2	-16	46	30	0.802	0.512	30.7	96.3	6.7	1.12	226.0
2017 Mar 26	22	35	17.6	-17	3	41	0.817	0.530	32.0	93.0	6.9	0.92	224.5
2017 Mar 27	22	34	20.4	-17	18	6	0.833	0.548	33.3	90.1	7.2	0.74	222.3
2017 Mar 28	22	33	36.6	-17	30	8	0.849	0.566	34.5	87.3	7.4	0.59	219.2
2017 Mar 29	22	33	4.9	-17	40	5	0.864	0.585	35.7	84.8	7.7	0.46	214.8

2017	Mar	30	22	32	43.6	-17	48	14	0.879	0.603	36.8	82.5	7.9	0.35	208.2
2017	Mar	31	22	32	31.5	-17	54	47	0.893	0.622	37.9	80.3	8.2	0.26	197.7
2017	Abr	1	22	32	27.5	-17	59	59	0.907	0.640	38.9	78.3	8.4	0.19	181.0
2017	Abr	2	22	32	30.5	-18	3	59	0.921	0.659	39.9	76.5	8.6	0.16	156.9
2017	Abr	3	22	32	39.6	-18	6	57	0.934	0.677	40.8	74.8	8.8	0.16	131.5
2017	Abr	4	22	32	53.9	-18	9	1	0.947	0.696	41.8	73.2	9.0	0.18	112.5
2017	Abr	5	22	33	12.9	-18	10	18	0.960	0.714	42.7	71.7	9.2	0.21	100.5
2017	Abr	6	22	33	35.9	-18	10	54	0.972	0.732	43.6	70.3	9.4	0.25	92.9
2017	Abr	7	22	34	2.2	-18	10	56	0.984	0.751	44.4	69.0	9.6	0.28	87.9
2017	Abr	8	22	34	31.5	-18	10	27	0.995	0.769	45.3	67.8	9.8	0.30	84.4
2017	Abr	9	22	35	3.3	-18	9	32	1.006	0.787	46.1	66.6	10.0	0.33	81.9
2017	Abr	10	22	35	37.2	-18	8	14	1.017	0.805	47.0	65.5	10.1	0.35	80.0
2017	Abr	11	22	36	12.8	-18	6	37	1.027	0.822	47.8	64.5	10.3	0.37	78.5
2017	Abr	12	22	36	49.9	-18	4	45	1.037	0.840	48.6	63.5	10.4	0.38	77.4
2017	Abr	13	22	37	28.1	-18	2	38	1.047	0.858	49.4	62.6	10.6	0.39	76.5
2017	Abr	14	22	38	7.3	-18	0	20	1.056	0.875	50.2	61.7	10.7	0.40	75.8
2017	Abr	15	22	38	47.2	-17	57	53	1.065	0.892	51.0	60.9	10.9	0.41	75.2
2017	Abr	16	22	39	27.5	-17	55	19	1.073	0.910	51.8	60.1	11.0	0.42	74.8
2017	Abr	17	22	40	8.2	-17	52	39	1.081	0.927	52.6	59.4	11.2	0.42	74.4
2017	Abr	18	22	40	49.0	-17	49	55	1.089	0.944	53.4	58.7	11.3	0.42	74.2
2017	Abr	19	22	41	29.8	-17	47	9	1.096	0.961	54.2	58.0	11.4	0.42	73.9
2017	Abr	20	22	42	10.4	-17	44	21	1.103	0.977	55.0	57.4	11.6	0.42	73.8
2017	Abr	21	22	42	50.8	-17	41	32	1.110	0.994	55.8	56.7	11.7	0.42	73.7
2017	Abr	22	22	43	30.8	-17	38	45	1.116	1.011	56.6	56.1	11.8	0.41	73.6
2017	Abr	23	22	44	10.2	-17	35	59	1.122	1.027	57.4	55.6	11.9	0.41	73.6
2017	Abr	24	22	44	49.1	-17	33	16	1.128	1.043	58.2	55.0	12.0	0.40	73.7
2017	Abr	25	22	45	27.2	-17	30	36	1.134	1.060	59.0	54.5	12.1	0.39	73.7
2017	Abr	26	22	46	4.6	-17	28	1	1.139	1.076	59.8	54.0	12.3	0.38	73.8
2017	Abr	27	22	46	41.1	-17	25	30	1.144	1.092	60.6	53.5	12.4	0.37	74.0
2017	Abr	28	22	47	16.6	-17	23	5	1.148	1.108	61.4	53.0	12.5	0.36	74.2

Efemérides do Cometa 73P/Schwassmann-wachmann 3-C - 00:00 UTC (J2000)

T 2017 Mar 16.8222 TT
q 0.972075 Peri. 199.3869
a 3.091773 Node 69.6700
e 0.685593 Incl. 11.2365
Ref: NK 2710

aaaa/mm./dd	h	m	s	o	'	"	delta	RSol	Elong	Fase	Mag	"/min	AP		
2017	Fev	17	18	39	58.6	-20	48	20	1.389	1.050	49.0	45.2	12.5	3.09	94.0
2017	Fev	18	18	45	16.0	-20	53	10	1.387	1.045	48.7	45.3	12.5	3.10	93.5
2017	Fev	19	18	50	34.2	-20	57	23	1.385	1.040	48.5	45.4	12.5	3.10	93.0
2017	Fev	20	18	55	53.2	-21	1	1	1.384	1.035	48.3	45.5	12.4	3.11	92.6
2017	Fev	21	19	1	12.6	-21	4	2	1.382	1.030	48.1	45.6	12.4	3.11	92.1
2017	Fev	22	19	6	32.5	-21	6	26	1.381	1.026	47.8	45.6	12.4	3.11	91.6
2017	Fev	23	19	11	52.7	-21	8	13	1.381	1.021	47.6	45.7	12.3	3.11	91.1
2017	Fev	24	19	17	13.1	-21	9	23	1.380	1.017	47.4	45.7	12.3	3.11	90.7
2017	Fev	25	19	22	33.5	-21	9	56	1.380	1.013	47.1	45.8	12.3	3.11	90.2
2017	Fev	26	19	27	53.8	-21	9	51	1.380	1.009	46.9	45.8	12.3	3.11	89.7
2017	Fev	27	19	33	13.9	-21	9	9	1.380	1.005	46.7	45.8	12.2	3.11	89.2
2017	Fev	28	19	38	33.6	-21	7	49	1.381	1.002	46.5	45.8	12.2	3.10	88.7
2017	Mar	1	19	43	52.8	-21	5	53	1.381	0.998	46.2	45.8	12.2	3.10	88.3
2017	Mar	2	19	49	11.3	-21	3	19	1.382	0.995	46.0	45.8	12.2	3.10	87.8
2017	Mar	3	19	54	29.2	-21	0	9	1.384	0.992	45.8	45.7	12.2	3.09	87.3
2017	Mar	4	19	59	46.1	-20	56	23	1.385	0.990	45.6	45.7	12.1	3.08	86.8
2017	Mar	5	20	5	2.1	-20	52	0	1.387	0.987	45.4	45.7	12.1	3.08	86.4
2017	Mar	6	20	10	17.0	-20	47	2	1.389	0.985	45.2	45.6	12.1	3.07	85.9
2017	Mar	7	20	15	30.6	-20	41	29	1.391	0.982	44.9	45.5	12.1	3.06	85.4
2017	Mar	8	20	20	43.0	-20	35	22	1.393	0.980	44.7	45.4	12.1	3.05	85.0
2017	Mar	9	20	25	53.9	-20	28	40	1.395	0.979	44.5	45.4	12.1	3.04	84.5
2017	Mar	10	20	31	3.2	-20	21	26	1.398	0.977	44.3	45.3	12.1	3.03	84.1
2017	Mar	11	20	36	11.0	-20	13	39	1.401	0.976	44.1	45.2	12.1	3.02	83.6
2017	Mar	12	20	41	17.1	-20	5	20	1.404	0.975	44.0	45.0	12.1	3.01	83.2
2017	Mar	13	20	46	21.3	-19	56	30	1.407	0.974	43.8	44.9	12.1	2.99	82.7
2017	Mar	14	20	51	23.7	-19	47	10	1.411	0.973	43.6	44.8	12.1	2.98	82.3
2017	Mar	15	20	56	24.1	-19	37	21	1.414	0.972	43.4	44.6	12.1	2.97	81.9
2017	Mar	16	21	1	22.5	-19	27	3	1.418	0.972	43.2	44.5	12.1	2.95	81.5
2017	Mar	17	21	6	18.8	-19	16	17	1.422	0.972	43.1	44.3	12.1	2.94	81.0
2017	Mar	18	21	11	13.0	-19	5	5	1.426	0.972	42.9	44.2	12.1	2.92	80.6
2017	Mar	19	21	16	4.9	-18	53	27	1.430	0.973	42.8	44.0	12.1	2.91	80.2
2017	Mar	20	21	20	54.5	-18	41	25	1.435	0.973	42.6	43.9	12.1	2.89	79.8
2017	Mar	21	21	25	41.8	-18	28	58	1.439	0.974	42.5	43.7	12.1	2.87	79.5
2017	Mar	22	21	30	26.7	-18	16	9	1.444	0.975	42.3	43.5	12.1	2.86	79.1
2017	Mar	23	21	35	9.1	-18	2	58	1.449	0.976	42.2	43.3	12.1	2.84	78.7

2017 Mar 24	21 39 49.1	-17 49 27	1.454	0.978	42.1	43.1	12.2	2.82	78.3
2017 Mar 25	21 44 26.6	-17 35 35	1.459	0.979	42.0	42.9	12.2	2.80	78.0
2017 Mar 26	21 49 1.6	-17 21 25	1.464	0.981	41.9	42.7	12.2	2.79	77.6
2017 Mar 27	21 53 34.0	-17 6 57	1.469	0.983	41.8	42.5	12.2	2.77	77.3
2017 Mar 28	21 58 3.8	-16 52 12	1.474	0.985	41.7	42.3	12.2	2.75	77.0
2017 Mar 29	22 2 31.0	-16 37 12	1.480	0.988	41.6	42.1	12.3	2.73	76.6
2017 Mar 30	22 6 55.6	-16 21 57	1.485	0.990	41.5	41.9	12.3	2.71	76.3
2017 Mar 31	22 11 17.6	-16 6 28	1.491	0.993	41.4	41.7	12.3	2.69	76.0
2017 Abr 1	22 15 36.9	-15 50 46	1.496	0.996	41.3	41.5	12.4	2.67	75.7
2017 Abr 2	22 19 53.6	-15 34 52	1.502	1.000	41.3	41.3	12.4	2.65	75.4
2017 Abr 3	22 24 7.6	-15 18 48	1.508	1.003	41.2	41.1	12.4	2.63	75.1
2017 Abr 4	22 28 19.0	-15 2 33	1.514	1.007	41.2	40.9	12.4	2.61	74.9
2017 Abr 5	22 32 27.7	-14 46 10	1.520	1.010	41.1	40.7	12.5	2.58	74.6
2017 Abr 6	22 36 33.9	-14 29 37	1.526	1.014	41.1	40.4	12.5	2.56	74.4
2017 Abr 7	22 40 37.4	-14 12 58	1.532	1.019	41.1	40.2	12.5	2.54	74.1

Efemérides do Cometa 41P/Tuttle-Giacobini-Kresak - 00:00 UTC (J2000)													
T 2017 Abr 13.9584 TT													
q 1.045103 Peri. 62.1408													
a 3.084355 Node 141.0756													
e 0.661160 Incl. 9.2293													
Ref: MPC 62882													
aaaa/mm./dd	h	m	s	o	'	"	delta	RSol	Elong	Fase	Mag	"/min	AP
2017 Fev 12	9	19	18.0	16	3	35	0.334	1.320	174.0	4.5	12.4	1.28	357.4
2017 Fev 13	9	19	12.6	16	34	50	0.327	1.312	172.8	5.4	12.3	1.33	357.8
2017 Fev 14	9	19	7.7	17	7	23	0.320	1.305	171.5	6.4	12.1	1.38	358.1
2017 Fev 15	9	19	3.6	17	41	15	0.313	1.297	170.2	7.4	12.0	1.44	358.5
2017 Fev 16	9	19	0.4	18	16	27	0.306	1.290	169.0	8.4	11.9	1.50	359.0
2017 Fev 17	9	18	58.3	18	53	2	0.300	1.282	167.7	9.5	11.7	1.55	359.5
2017 Fev 18	9	18	57.5	19	31	0	0.293	1.275	166.3	10.5	11.6	1.61	360.0
2017 Fev 19	9	18	58.2	20	10	24	0.287	1.268	165.0	11.6	11.4	1.67	0.5
2017 Fev 20	9	19	0.6	20	51	15	0.281	1.261	163.7	12.7	11.3	1.73	1.1
2017 Fev 21	9	19	5.1	21	33	34	0.275	1.254	162.3	13.9	11.1	1.80	1.7
2017 Fev 22	9	19	11.8	22	17	23	0.269	1.247	161.0	15.0	11.0	1.86	2.4
2017 Fev 23	9	19	21.1	23	2	42	0.264	1.240	159.6	16.2	10.8	1.92	3.1
2017 Fev 24	9	19	33.3	23	49	33	0.258	1.233	158.2	17.3	10.7	1.99	3.8
2017 Fev 25	9	19	48.7	24	37	58	0.253	1.226	156.8	18.5	10.6	2.06	4.5
2017 Fev 26	9	20	7.6	25	27	56	0.248	1.220	155.4	19.7	10.4	2.12	5.3
2017 Fev 27	9	20	30.5	26	19	28	0.243	1.213	154.0	21.0	10.3	2.19	6.1
2017 Fev 28	9	20	57.8	27	12	37	0.238	1.207	152.6	22.2	10.1	2.26	7.0
2017 Mar 1	9	21	29.9	28	7	21	0.233	1.200	151.2	23.4	10.0	2.34	7.8
2017 Mar 2	9	22	7.2	29	3	41	0.228	1.194	149.8	24.7	9.9	2.41	8.7
2017 Mar 3	9	22	50.4	30	1	39	0.224	1.188	148.4	26.0	9.7	2.48	9.7
2017 Mar 4	9	23	40.0	31	1	13	0.219	1.181	146.9	27.3	9.6	2.56	10.6
2017 Mar 5	9	24	36.4	32	2	25	0.215	1.175	145.5	28.6	9.5	2.64	11.6
2017 Mar 6	9	25	40.4	33	5	13	0.211	1.170	144.1	29.9	9.3	2.72	12.6
2017 Mar 7	9	26	52.6	34	9	38	0.207	1.164	142.6	31.2	9.2	2.80	13.6
2017 Mar 8	9	28	13.6	35	15	40	0.203	1.158	141.2	32.5	9.1	2.88	14.7
2017 Mar 9	9	29	44.4	36	23	16	0.200	1.152	139.8	33.8	9.0	2.96	15.8
2017 Mar 10	9	31	25.7	37	32	26	0.196	1.147	138.3	35.1	8.8	3.04	16.9
2017 Mar 11	9	33	18.4	38	43	7	0.193	1.142	136.9	36.5	8.7	3.13	18.0
2017 Mar 12	9	35	23.7	39	55	18	0.189	1.136	135.5	37.8	8.6	3.22	19.1
2017 Mar 13	9	37	42.5	41	8	55	0.186	1.131	134.0	39.2	8.5	3.30	20.3
2017 Mar 14	9	40	16.3	42	23	53	0.183	1.126	132.6	40.5	8.4	3.39	21.5
2017 Mar 15	9	43	6.3	43	40	9	0.180	1.121	131.2	41.8	8.3	3.47	22.8
2017 Mar 16	9	46	14.1	44	57	36	0.177	1.116	129.8	43.2	8.2	3.56	24.1
2017 Mar 17	9	49	41.6	46	16	7	0.175	1.112	128.4	44.5	8.1	3.65	25.5
2017 Mar 18	9	53	30.7	47	35	33	0.172	1.107	127.0	45.8	7.9	3.73	26.9
2017 Mar 19	9	57	43.5	48	55	46	0.170	1.103	125.7	47.2	7.8	3.82	28.4
2017 Mar 20	10	2	22.6	50	16	32	0.167	1.099	124.3	48.5	7.8	3.90	30.0
2017 Mar 21	10	7	30.8	51	37	38	0.165	1.095	123.0	49.8	7.7	3.98	31.7
2017 Mar 22	10	13	11.1	52	58	49	0.163	1.091	121.6	51.0	7.6	4.06	33.6
2017 Mar 23	10	19	26.9	54	19	47	0.161	1.087	120.3	52.3	7.5	4.13	35.5
2017 Mar 24	10	26	22.1	55	40	9	0.159	1.083	119.1	53.5	7.4	4.20	37.6
2017 Mar 25	10	34	0.7	56	59	32	0.158	1.080	117.8	54.8	7.3	4.27	39.8
2017 Mar 26	10	42	27.3	58	17	27	0.156	1.077	116.6	55.9	7.3	4.33	42.2
2017 Mar 27	10	51	46.4	59	33	25	0.155	1.073	115.4	57.1	7.2	4.39	44.8
2017 Mar 28	11	2	2.9	60	46	47	0.154	1.070	114.3	58.2	7.1	4.45	47.7
2017 Mar 29	11	13	21.4	61	56	56	0.152	1.068	113.1	59.3	7.1	4.50	50.8
2017 Mar 30	11	25	46.1	63	3	6	0.152	1.065	112.1	60.4	7.0	4.54	54.1
2017 Mar 31	11	39	20.2	64	4	31	0.151	1.062	111.0	61.4	6.9	4.58	57.7
2017 Abr 1	11	54	5.4	65	0	18	0.150	1.060	110.0	62.3	6.9	4.61	61.6
2017 Abr 2	12	10	1.1	65	49	36	0.149	1.058	109.1	63.3	6.8	4.63	65.7

2017	Abr	3	12	27	3.7	66	31	33	0.149	1.056	108.2	64.1	6.8	4.65	70.1
2017	Abr	4	12	45	6.2	67	5	19	0.149	1.054	107.3	64.9	6.8	4.66	74.7
2017	Abr	5	13	3	57.5	67	30	14	0.149	1.052	106.5	65.7	6.7	4.66	79.6
2017	Abr	6	13	23	22.9	67	45	46	0.148	1.051	105.8	66.4	6.7	4.66	84.5
2017	Abr	7	13	43	5.0	67	51	36	0.149	1.049	105.1	67.1	6.7	4.65	89.5
2017	Abr	8	14	2	44.8	67	47	44	0.149	1.048	104.4	67.7	6.7	4.63	94.5
2017	Abr	9	14	22	3.9	67	34	21	0.149	1.047	103.9	68.2	6.7	4.60	99.4
2017	Abr	10	14	40	45.5	67	11	58	0.150	1.047	103.4	68.7	6.7	4.57	104.1
2017	Abr	11	14	58	36.1	66	41	13	0.150	1.046	102.9	69.1	6.7	4.53	108.6
2017	Abr	12	15	15	25.9	66	2	56	0.151	1.045	102.5	69.4	6.7	4.48	112.8
2017	Abr	13	15	31	8.9	65	17	59	0.152	1.045	102.2	69.7	6.7	4.43	116.8
2017	Abr	14	15	45	42.6	64	27	17	0.153	1.045	101.9	69.9	6.7	4.37	120.5
2017	Abr	15	15	59	7.2	63	31	42	0.154	1.045	101.7	70.0	6.7	4.31	123.9
2017	Abr	16	16	11	24.7	62	32	4	0.155	1.045	101.5	70.1	6.7	4.24	127.1
2017	Abr	17	16	22	38.8	61	29	10	0.156	1.046	101.4	70.2	6.7	4.17	129.9
2017	Abr	18	16	32	53.6	60	23	38	0.158	1.047	101.4	70.1	6.8	4.10	132.6
2017	Abr	19	16	42	13.7	59	16	5	0.159	1.047	101.4	70.1	6.8	4.03	135.0
2017	Abr	20	16	50	43.8	58	7	2	0.161	1.048	101.5	69.9	6.8	3.95	137.3
2017	Abr	21	16	58	28.4	56	56	55	0.162	1.050	101.6	69.7	6.9	3.87	139.4
2017	Abr	22	17	5	31.8	55	46	8	0.164	1.051	101.7	69.5	6.9	3.79	141.3
2017	Abr	23	17	11	57.7	54	34	58	0.166	1.052	102.0	69.2	7.0	3.71	143.2
2017	Abr	24	17	17	49.9	53	23	43	0.168	1.054	102.3	68.8	7.0	3.63	144.9
2017	Abr	25	17	23	11.6	52	12	34	0.170	1.056	102.6	68.4	7.1	3.55	146.5
2017	Abr	26	17	28	5.6	51	1	43	0.172	1.058	102.9	68.0	7.2	3.47	148.0
2017	Abr	27	17	32	34.5	49	51	18	0.174	1.060	103.4	67.5	7.2	3.40	149.4
2017	Abr	28	17	36	40.8	48	41	26	0.176	1.063	103.8	66.9	7.3	3.32	150.8
2017	Abr	29	17	40	26.6	47	32	14	0.178	1.065	104.3	66.4	7.3	3.25	152.1
2017	Abr	30	17	43	53.5	46	23	45	0.180	1.068	104.8	65.8	7.4	3.17	153.4
2017	Mai	1	17	47	3.4	45	16	3	0.183	1.071	105.4	65.1	7.5	3.10	154.6
2017	Mai	2	17	49	57.7	44	9	10	0.185	1.074	106.0	64.4	7.6	3.04	155.7
2017	Mai	3	17	52	37.7	43	3	9	0.187	1.077	106.7	63.7	7.7	2.97	156.9
2017	Mai	4	17	55	4.5	41	58	1	0.190	1.080	107.3	63.0	7.7	2.91	158.0
2017	Mai	5	17	57	19.2	40	53	46	0.192	1.084	108.0	62.2	7.8	2.85	159.1
2017	Mai	6	17	59	22.6	39	50	26	0.195	1.087	108.8	61.4	7.9	2.79	160.2
2017	Mai	7	18	1	15.7	38	47	59	0.198	1.091	109.5	60.6	8.0	2.73	161.2
2017	Mai	8	18	2	59.1	37	46	26	0.200	1.095	110.3	59.8	8.1	2.67	162.3
2017	Mai	9	18	4	33.5	36	45	45	0.203	1.099	111.1	58.9	8.2	2.62	163.3
2017	Mai	10	18	5	59.4	35	45	56	0.206	1.103	112.0	58.1	8.3	2.57	164.4
2017	Mai	11	18	7	17.4	34	46	58	0.209	1.108	112.8	57.2	8.4	2.52	165.4
2017	Mai	12	18	8	28.0	33	48	50	0.212	1.112	113.7	56.3	8.5	2.47	166.5
2017	Mai	13	18	9	31.5	32	51	29	0.214	1.117	114.6	55.3	8.6	2.43	167.5
2017	Mai	14	18	10	28.5	31	54	54	0.217	1.122	115.5	54.4	8.7	2.39	168.5
2017	Mai	15	18	11	19.2	30	59	4	0.220	1.127	116.5	53.4	8.8	2.35	169.6
2017	Mai	16	18	12	4.1	30	3	58	0.224	1.132	117.4	52.5	8.9	2.31	170.6
2017	Mai	17	18	12	43.4	29	9	33	0.227	1.137	118.4	51.5	9.0	2.28	171.6
2017	Mai	18	18	13	17.4	28	15	48	0.230	1.142	119.4	50.5	9.1	2.24	172.6
2017	Mai	19	18	13	46.4	27	22	41	0.233	1.147	120.4	49.5	9.2	2.21	173.6
2017	Mai	20	18	14	10.6	26	30	11	0.236	1.153	121.4	48.5	9.3	2.18	174.6
2017	Mai	21	18	14	30.4	25	38	16	0.240	1.158	122.5	47.5	9.5	2.16	175.6
2017	Mai	22	18	14	46.0	24	46	55	0.243	1.164	123.5	46.5	9.6	2.13	176.6
2017	Mai	23	18	14	57.5	23	56	7	0.246	1.170	124.6	45.5	9.7	2.11	177.5
2017	Mai	24	18	15	5.4	23	5	50	0.250	1.176	125.6	44.4	9.8	2.09	178.4
2017	Mai	25	18	15	9.6	22	16	3	0.254	1.182	126.7	43.4	9.9	2.06	179.3
2017	Mai	26	18	15	10.6	21	26	45	0.257	1.188	127.8	42.4	10.0	2.04	180.2
2017	Mai	27	18	15	8.6	20	37	56	0.261	1.194	128.9	41.3	10.2	2.02	181.0
2017	Mai	28	18	15	3.7	19	49	35	0.265	1.201	130.0	40.3	10.3	2.01	181.7
2017	Mai	29	18	14	56.2	19	1	42	0.269	1.207	131.1	39.3	10.4	1.99	182.5
2017	Mai	30	18	14	46.3	18	14	16	0.273	1.214	132.2	38.3	10.5	1.97	183.2
2017	Mai	31	18	14	34.2	17	27	17	0.277	1.220	133.3	37.2	10.7	1.95	183.8
2017	Jun	1	18	14	20.1	16	40	46	0.281	1.227	134.4	36.2	10.8	1.93	184.5
2017	Jun	2	18	14	4.2	15	54	42	0.285	1.234	135.5	35.2	10.9	1.92	185.0
2017	Jun	3	18	13	46.5	15	9	6	0.289	1.240	136.5	34.2	11.1	1.90	185.6
2017	Jun	4	18	13	27.4	14	23	57	0.294	1.247	137.6	33.2	11.2	1.88	186.1
2017	Jun	5	18	13	6.9	13	39	17	0.298	1.254	138.7	32.3	11.3	1.86	186.6
2017	Jun	6	18	12	45.2	12	55	5	0.303	1.261	139.8	31.3	11.4	1.85	187.0
2017	Jun	7	18	12	22.5	12	11	22	0.308	1.269	140.9	30.3	11.6	1.83	187.4
2017	Jun	8	18	11	58.8	11	28	8	0.313	1.276	141.9	29.4	11.7	1.81	187.8
2017	Jun	9	18	11	34.3	10	45	24	0.318	1.283	143.0	28.5	11.8	1.79	188.2
2017	Jun	10	18	11	9.1	10	3	9	0.323	1.290	144.0	27.6	12.0	1.77	188.5
2017	Jun	11	18	10	43.4	9	21	25	0.328	1.298	145.0	26.7	12.1	1.75	188.8
2017	Jun	12	18	10	17.3	8	40	12	0.333	1.305	146.0	25.8	12.2	1.73	189.0
2017	Jun	13	18	9	50.9	7	59	30	0.339	1.313	146.9	25.0	12.4	1.71	189.2
2017	Jun	14	18	9	24.2	7	19	20	0.345	1.320	147.9	24.1	12.5	1.69	189.4

Efemérides do Cometa C/2015 ER61 (PANSTARRS) - 00:00 UTC (J2000)

T 2017 Mai 9.9109 TT
 q 1.042322 Peri. 68.1412
 z 0.002241 Node 235.2518
 e 0.997664 Incl. 6.3442
 Ref: MPC101096

aaaa/mm./dd	h	m	s	o	'	"	delta	RSol	Elong	Fase	Mag	"/min	AP
2017 Mar 14	19	2	7.4	-21	50	6	1.401	1.397	69.0	41.6	12.5	2.72	79.6
2017 Mar 15	19	6	45.4	-21	38	2	1.390	1.387	68.9	42.0	12.4	2.75	79.2
2017 Mar 16	19	11	25.5	-21	25	19	1.378	1.377	68.8	42.3	12.4	2.78	78.7
2017 Mar 17	19	16	7.6	-21	11	57	1.367	1.367	68.7	42.7	12.4	2.81	78.3
2017 Mar 18	19	20	51.6	-20	57	55	1.356	1.356	68.5	43.1	12.3	2.84	77.8
2017 Mar 19	19	25	37.5	-20	43	13	1.345	1.346	68.4	43.4	12.3	2.86	77.4
2017 Mar 20	19	30	25.2	-20	27	50	1.334	1.337	68.2	43.8	12.3	2.89	76.9
2017 Mar 21	19	35	14.6	-20	11	47	1.324	1.327	68.1	44.1	12.2	2.92	76.5
2017 Mar 22	19	40	5.5	-19	55	3	1.315	1.317	67.9	44.5	12.2	2.94	76.0
2017 Mar 23	19	44	58.0	-19	37	38	1.305	1.307	67.7	44.9	12.2	2.97	75.6
2017 Mar 24	19	49	51.9	-19	19	33	1.296	1.298	67.5	45.2	12.1	3.00	75.1
2017 Mar 25	19	54	47.0	-19	0	46	1.287	1.288	67.3	45.6	12.1	3.02	74.7
2017 Mar 26	19	59	43.4	-18	41	19	1.279	1.279	67.1	45.9	12.1	3.04	74.3
2017 Mar 27	20	4	40.9	-18	21	12	1.270	1.270	66.8	46.3	12.0	3.07	73.9
2017 Mar 28	20	9	39.3	-18	0	25	1.263	1.261	66.6	46.6	12.0	3.09	73.4
2017 Mar 29	20	14	38.6	-17	38	58	1.255	1.252	66.4	46.9	12.0	3.11	73.0
2017 Mar 30	20	19	38.7	-17	16	52	1.248	1.243	66.1	47.3	12.0	3.13	72.6
2017 Mar 31	20	24	39.4	-16	54	8	1.241	1.234	65.8	47.6	11.9	3.15	72.2
2017 Abr 1	20	29	40.6	-16	30	47	1.235	1.226	65.6	47.9	11.9	3.17	71.9
2017 Abr 2	20	34	42.2	-16	6	49	1.229	1.217	65.3	48.2	11.9	3.18	71.5
2017 Abr 3	20	39	44.1	-15	42	15	1.223	1.209	65.0	48.5	11.8	3.20	71.1
2017 Abr 4	20	44	46.2	-15	17	6	1.218	1.201	64.7	48.8	11.8	3.22	70.8
2017 Abr 5	20	49	48.3	-14	51	23	1.213	1.193	64.4	49.1	11.8	3.23	70.4
2017 Abr 6	20	54	50.4	-14	25	8	1.208	1.185	64.1	49.4	11.8	3.24	70.1
2017 Abr 7	20	59	52.4	-13	58	22	1.204	1.178	63.8	49.7	11.8	3.25	69.7
2017 Abr 8	21	4	54.1	-13	31	5	1.200	1.170	63.5	50.0	11.7	3.26	69.4
2017 Abr 9	21	9	55.4	-13	3	20	1.196	1.163	63.2	50.2	11.7	3.27	69.1
2017 Abr 10	21	14	56.3	-12	35	8	1.193	1.156	62.8	50.5	11.7	3.28	68.8
2017 Abr 11	21	19	56.5	-12	6	31	1.190	1.149	62.5	50.7	11.7	3.28	68.5
2017 Abr 12	21	24	56.1	-11	37	29	1.187	1.142	62.2	50.9	11.7	3.29	68.3
2017 Abr 13	21	29	54.9	-11	8	6	1.185	1.135	61.9	51.1	11.6	3.29	68.0
2017 Abr 14	21	34	52.8	-10	38	22	1.183	1.129	61.5	51.4	11.6	3.29	67.8
2017 Abr 15	21	39	49.8	-10	8	18	1.182	1.123	61.2	51.5	11.6	3.29	67.5
2017 Abr 16	21	44	45.7	-9	37	58	1.180	1.116	60.9	51.7	11.6	3.29	67.3
2017 Abr 17	21	49	40.4	-9	7	23	1.180	1.111	60.5	51.9	11.6	3.28	67.1
2017 Abr 18	21	54	33.9	-8	36	34	1.179	1.105	60.2	52.0	11.6	3.28	66.9
2017 Abr 19	21	59	26.1	-8	5	33	1.179	1.100	59.9	52.2	11.6	3.27	66.7
2017 Abr 20	22	4	17.0	-7	34	22	1.179	1.094	59.5	52.3	11.6	3.27	66.5
2017 Abr 21	22	9	6.3	-7	3	4	1.179	1.090	59.2	52.4	11.5	3.26	66.3
2017 Abr 22	22	13	54.1	-6	31	38	1.180	1.085	58.9	52.5	11.5	3.25	66.2
2017 Abr 23	22	18	40.4	-6	0	9	1.181	1.080	58.6	52.6	11.5	3.24	66.0
2017 Abr 24	22	23	25.0	-5	28	36	1.182	1.076	58.2	52.6	11.5	3.22	65.9
2017 Abr 25	22	28	7.8	-4	57	2	1.184	1.072	57.9	52.7	11.5	3.21	65.8
2017 Abr 26	22	32	48.9	-4	25	29	1.186	1.068	57.6	52.7	11.5	3.19	65.7
2017 Abr 27	22	37	28.2	-3	53	58	1.188	1.065	57.3	52.7	11.5	3.18	65.6
2017 Abr 28	22	42	5.7	-3	22	31	1.190	1.061	57.0	52.7	11.5	3.16	65.5
2017 Abr 29	22	46	41.2	-2	51	9	1.193	1.058	56.8	52.7	11.5	3.14	65.5
2017 Abr 30	22	51	14.9	-2	19	54	1.196	1.056	56.5	52.7	11.5	3.12	65.4
2017 Mai 1	22	55	46.5	-1	48	47	1.199	1.053	56.2	52.7	11.5	3.10	65.3
2017 Mai 2	23	0	16.2	-1	17	50	1.203	1.051	55.9	52.6	11.5	3.08	65.3
2017 Mai 3	23	4	43.8	-0	47	3	1.206	1.049	55.7	52.5	11.5	3.06	65.3
2017 Mai 4	23	9	9.5	-0	16	29	1.210	1.047	55.4	52.5	11.5	3.03	65.3
2017 Mai 5	23	13	33.1	0	13	53	1.214	1.046	55.2	52.4	11.5	3.01	65.3
2017 Mai 6	23	17	54.6	0	44	0	1.218	1.044	55.0	52.3	11.5	2.99	65.3
2017 Mai 7	23	22	14.1	1	13	51	1.223	1.043	54.7	52.1	11.5	2.96	65.3
2017 Mai 8	23	26	31.4	1	43	27	1.228	1.043	54.5	52.0	11.5	2.94	65.3
2017 Mai 9	23	30	46.7	2	12	45	1.233	1.042	54.3	51.9	11.5	2.91	65.3
2017 Mai 10	23	34	59.9	2	41	46	1.238	1.042	54.1	51.7	11.6	2.89	65.4
2017 Mai 11	23	39	11.0	3	10	27	1.243	1.042	53.9	51.5	11.6	2.86	65.4
2017 Mai 12	23	43	20.0	3	38	50	1.248	1.043	53.8	51.4	11.6	2.83	65.5
2017 Mai 13	23	47	26.9	4	6	52	1.254	1.044	53.6	51.2	11.6	2.81	65.6
2017 Mai 14	23	51	31.7	4	34	33	1.259	1.045	53.4	51.0	11.6	2.78	65.6
2017 Mai 15	23	55	34.3	5	1	53	1.265	1.046	53.3	50.8	11.6	2.75	65.7
2017 Mai 16	23	59	34.9	5	28	51	1.271	1.047	53.2	50.6	11.6	2.72	65.8
2017 Mai 17	0	3	33.3	5	55	27	1.277	1.049	53.0	50.4	11.6	2.69	65.9
2017 Mai 18	0	7	29.7	6	21	41	1.283	1.051	52.9	50.2	11.6	2.67	66.0

2017	Mai	19	0	11	23.9	6	47	32	1.289	1.053	52.8	49.9	11.7	2.64	66.1
2017	Mai	20	0	15	16.0	7	12	59	1.296	1.056	52.7	49.7	11.7	2.61	66.2
2017	Mai	21	0	19	6.0	7	38	3	1.302	1.059	52.7	49.5	11.7	2.58	66.3
2017	Mai	22	0	22	54.0	8	2	43	1.308	1.062	52.6	49.2	11.7	2.55	66.5
2017	Mai	23	0	26	39.8	8	26	59	1.315	1.065	52.5	49.0	11.7	2.52	66.6
2017	Mai	24	0	30	23.5	8	50	51	1.322	1.069	52.5	48.7	11.7	2.49	66.7
2017	Mai	25	0	34	5.1	9	14	19	1.328	1.073	52.5	48.5	11.8	2.47	66.9
2017	Mai	26	0	37	44.6	9	37	23	1.335	1.077	52.4	48.2	11.8	2.44	67.0
2017	Mai	27	0	41	22.0	10	0	2	1.342	1.081	52.4	48.0	11.8	2.41	67.1
2017	Mai	28	0	44	57.3	10	22	17	1.348	1.086	52.4	47.7	11.8	2.38	67.3
2017	Mai	29	0	48	30.5	10	44	7	1.355	1.090	52.4	47.5	11.8	2.35	67.5
2017	Mai	30	0	52	1.7	11	5	33	1.362	1.095	52.5	47.2	11.9	2.32	67.6
2017	Mai	31	0	55	30.8	11	26	35	1.369	1.101	52.5	46.9	11.9	2.29	67.8
2017	Jun	1	0	58	57.8	11	47	13	1.376	1.106	52.5	46.7	11.9	2.27	67.9
2017	Jun	2	1	2	22.8	12	7	26	1.382	1.112	52.6	46.4	11.9	2.24	68.1
2017	Jun	3	1	5	45.7	12	27	16	1.389	1.117	52.6	46.2	12.0	2.21	68.3
2017	Jun	4	1	9	6.6	12	46	42	1.396	1.124	52.7	45.9	12.0	2.18	68.5
2017	Jun	5	1	12	25.4	13	5	44	1.403	1.130	52.8	45.7	12.0	2.16	68.6
2017	Jun	6	1	15	42.3	13	24	23	1.410	1.136	52.9	45.4	12.0	2.13	68.8
2017	Jun	7	1	18	57.1	13	42	39	1.417	1.143	53.0	45.2	12.0	2.10	69.0
2017	Jun	8	1	22	10.0	14	0	32	1.423	1.150	53.1	44.9	12.1	2.07	69.2
2017	Jun	9	1	25	20.8	14	18	2	1.430	1.157	53.2	44.7	12.1	2.05	69.4
2017	Jun	10	1	28	29.6	14	35	10	1.437	1.164	53.4	44.4	12.1	2.02	69.6
2017	Jun	11	1	31	36.5	14	51	56	1.443	1.171	53.5	44.2	12.1	1.99	69.7
2017	Jun	12	1	34	41.4	15	8	19	1.450	1.179	53.7	44.0	12.2	1.97	69.9
2017	Jun	13	1	37	44.4	15	24	21	1.456	1.187	53.9	43.7	12.2	1.94	70.1
2017	Jun	14	1	40	45.3	15	40	1	1.463	1.194	54.0	43.5	12.2	1.92	70.3
2017	Jun	15	1	43	44.4	15	55	21	1.469	1.202	54.2	43.3	12.2	1.89	70.5
2017	Jun	16	1	46	41.4	16	10	19	1.476	1.211	54.4	43.0	12.3	1.87	70.7
2017	Jun	17	1	49	36.5	16	24	57	1.482	1.219	54.6	42.8	12.3	1.84	70.9
2017	Jun	18	1	52	29.7	16	39	14	1.488	1.227	54.8	42.6	12.3	1.82	71.1
2017	Jun	19	1	55	21.0	16	53	12	1.495	1.236	55.1	42.4	12.3	1.79	71.3
2017	Jun	20	1	58	10.3	17	6	49	1.501	1.245	55.3	42.2	12.4	1.77	71.5
2017	Jun	21	2	0	57.6	17	20	7	1.507	1.253	55.6	42.0	12.4	1.74	71.7
2017	Jun	22	2	3	43.0	17	33	6	1.513	1.262	55.8	41.8	12.4	1.72	71.9
2017	Jun	23	2	6	26.5	17	45	46	1.518	1.271	56.1	41.6	12.4	1.69	72.1
2017	Jun	24	2	9	8.0	17	58	7	1.524	1.281	56.4	41.4	12.5	1.67	72.3
2017	Jun	25	2	11	47.7	18	10	10	1.530	1.290	56.7	41.2	12.5	1.65	72.5
2017	Jun	26	2	14	25.3	18	21	55	1.536	1.299	56.9	41.0	12.5	1.62	72.7
2017	Jun	27	2	17	1.1	18	33	22	1.541	1.309	57.3	40.8	12.5	1.60	72.9
2017	Jun	28	2	19	34.9	18	44	31	1.546	1.319	57.6	40.6	12.5	1.58	73.1

Efemérides do Cometa C/2015 V2 (Johnson) - 00:00 UTC (J2000)

T 2017 Jun 12.3622 TT
q 1.636916 Peri. 164.8999
z -0.000977 Node 69.8559
e 1.001599 Incl. 49.8755
Ref: MPC101097

aaaa/mm./dd	h	m	s	o	'	"	delta	RSol	Elong	Fase	Mag	"/min	AP
2017 Jan 1	14	33	6.1	44	1	51	2.479	2.642	88.5	21.8	11.2	0.96	90.3
2017 Jan 2	14	35	13.6	44	1	46	2.464	2.633	88.7	21.9	11.2	0.95	90.1
2017 Jan 3	14	37	20.7	44	1	46	2.449	2.623	89.0	22.0	11.1	0.95	89.9
2017 Jan 4	14	39	27.5	44	1	51	2.435	2.614	89.3	22.1	11.1	0.95	89.7
2017 Jan 5	14	41	33.9	44	2	0	2.420	2.605	89.5	22.2	11.1	0.94	89.5
2017 Jan 6	14	43	39.8	44	2	15	2.406	2.596	89.8	22.3	11.0	0.94	89.3
2017 Jan 7	14	45	45.4	44	2	34	2.391	2.587	90.1	22.3	11.0	0.94	89.1
2017 Jan 8	14	47	50.5	44	2	58	2.377	2.578	90.3	22.4	11.0	0.94	88.9
2017 Jan 9	14	49	55.2	44	3	26	2.363	2.568	90.6	22.5	11.0	0.93	88.7
2017 Jan 10	14	51	59.3	44	4	0	2.349	2.559	90.8	22.6	10.9	0.93	88.5
2017 Jan 11	14	54	3.1	44	4	38	2.335	2.550	91.1	22.7	10.9	0.92	88.3
2017 Jan 12	14	56	6.3	44	5	21	2.321	2.541	91.3	22.8	10.9	0.92	88.0
2017 Jan 13	14	58	9.0	44	6	9	2.307	2.532	91.6	22.8	10.8	0.92	87.8
2017 Jan 14	15	0	11.1	44	7	1	2.293	2.523	91.8	22.9	10.8	0.91	87.6
2017 Jan 15	15	2	12.7	44	7	59	2.279	2.514	92.0	23.0	10.8	0.91	87.4
2017 Jan 16	15	4	13.7	44	9	1	2.265	2.505	92.3	23.1	10.8	0.90	87.1
2017 Jan 17	15	6	14.2	44	10	9	2.251	2.496	92.5	23.2	10.7	0.90	86.9
2017 Jan 18	15	8	14.0	44	11	21	2.237	2.487	92.7	23.3	10.7	0.89	86.7
2017 Jan 19	15	10	13.1	44	12	38	2.224	2.478	92.9	23.4	10.7	0.89	86.4
2017 Jan 20	15	12	11.6	44	14	1	2.210	2.468	93.2	23.5	10.6	0.88	86.2
2017 Jan 21	15	14	9.4	44	15	28	2.197	2.460	93.4	23.5	10.6	0.88	85.9
2017 Jan 22	15	16	6.5	44	17	0	2.183	2.451	93.6	23.6	10.6	0.87	85.7
2017 Jan 23	15	18	2.8	44	18	37	2.170	2.442	93.8	23.7	10.6	0.87	85.4
2017 Jan 24	15	19	58.4	44	20	19	2.156	2.433	94.0	23.8	10.5	0.86	85.2
2017 Jan 25	15	21	53.2	44	22	6	2.143	2.424	94.2	23.9	10.5	0.85	84.9
2017 Jan 26	15	23	47.1	44	23	58	2.130	2.415	94.5	24.0	10.5	0.85	84.6

2017	Jan	27	15	25	40.2	44	25	54	2.117	2.406	94.7	24.1	10.4	0.84	84.4
2017	Jan	28	15	27	32.4	44	27	55	2.103	2.397	94.9	24.2	10.4	0.84	84.1
2017	Jan	29	15	29	23.7	44	30	1	2.090	2.388	95.1	24.3	10.4	0.83	83.8
2017	Jan	30	15	31	14.1	44	32	12	2.077	2.379	95.3	24.3	10.4	0.82	83.5
2017	Jan	31	15	33	3.5	44	34	27	2.064	2.371	95.5	24.4	10.3	0.81	83.3
2017	Fev	1	15	34	51.9	44	36	47	2.051	2.362	95.7	24.5	10.3	0.81	83.0
2017	Fev	2	15	36	39.3	44	39	11	2.038	2.353	95.9	24.6	10.3	0.80	82.7
2017	Fev	3	15	38	25.7	44	41	39	2.025	2.344	96.1	24.7	10.2	0.79	82.4
2017	Fev	4	15	40	11.0	44	44	12	2.013	2.336	96.3	24.8	10.2	0.78	82.1
2017	Fev	5	15	41	55.2	44	46	48	2.000	2.327	96.5	24.9	10.2	0.77	81.8
2017	Fev	6	15	43	38.3	44	49	29	1.987	2.318	96.6	25.0	10.1	0.77	81.5
2017	Fev	7	15	45	20.2	44	52	13	1.974	2.310	96.8	25.1	10.1	0.76	81.2
2017	Fev	8	15	47	1.0	44	55	2	1.962	2.301	97.0	25.2	10.1	0.75	80.9
2017	Fev	9	15	48	40.5	44	57	54	1.949	2.292	97.2	25.3	10.1	0.74	80.6
2017	Fev	10	15	50	18.9	45	0	50	1.936	2.284	97.4	25.4	10.0	0.73	80.3
2017	Fev	11	15	51	55.9	45	3	50	1.924	2.275	97.6	25.5	10.0	0.72	79.9
2017	Fev	12	15	53	31.7	45	6	53	1.911	2.267	97.8	25.6	10.0	0.71	79.6
2017	Fev	13	15	55	6.2	45	10	0	1.899	2.258	97.9	25.7	9.9	0.70	79.2
2017	Fev	14	15	56	39.3	45	13	11	1.887	2.250	98.1	25.8	9.9	0.69	78.9
2017	Fev	15	15	58	11.0	45	16	25	1.874	2.241	98.3	25.9	9.9	0.68	78.5
2017	Fev	16	15	59	41.3	45	19	42	1.862	2.233	98.5	26.0	9.8	0.67	78.1
2017	Fev	17	16	1	10.1	45	23	2	1.849	2.224	98.7	26.1	9.8	0.66	77.7
2017	Fev	18	16	2	37.4	45	26	25	1.837	2.216	98.8	26.1	9.8	0.65	77.3
2017	Fev	19	16	4	3.1	45	29	52	1.825	2.208	99.0	26.2	9.7	0.64	76.9
2017	Fev	20	16	5	27.3	45	33	21	1.813	2.199	99.2	26.3	9.7	0.63	76.5
2017	Fev	21	16	6	49.8	45	36	52	1.800	2.191	99.4	26.4	9.7	0.61	76.0
2017	Fev	22	16	8	10.7	45	40	26	1.788	2.183	99.6	26.5	9.7	0.60	75.6
2017	Fev	23	16	9	29.8	45	44	3	1.776	2.174	99.7	26.6	9.6	0.59	75.1
2017	Fev	24	16	10	47.2	45	47	41	1.764	2.166	99.9	26.7	9.6	0.58	74.7
2017	Fev	25	16	12	2.8	45	51	22	1.752	2.158	100.1	26.8	9.6	0.56	74.2
2017	Fev	26	16	13	16.6	45	55	4	1.740	2.150	100.3	26.9	9.5	0.55	73.7
2017	Fev	27	16	14	28.4	45	58	47	1.728	2.142	100.5	27.0	9.5	0.54	73.1
2017	Fev	28	16	15	38.4	46	2	32	1.716	2.134	100.7	27.1	9.5	0.52	72.6
2017	Mar	1	16	16	46.3	46	6	17	1.704	2.126	100.8	27.2	9.4	0.51	72.0
2017	Mar	2	16	17	52.2	46	10	3	1.692	2.118	101.0	27.3	9.4	0.49	71.5
2017	Mar	3	16	18	56.1	46	13	49	1.680	2.110	101.2	27.4	9.4	0.48	70.9
2017	Mar	4	16	19	57.9	46	17	36	1.668	2.102	101.4	27.5	9.3	0.46	70.2
2017	Mar	5	16	20	57.5	46	21	21	1.656	2.094	101.6	27.6	9.3	0.45	69.6
2017	Mar	6	16	21	55.0	46	25	6	1.644	2.086	101.8	27.7	9.3	0.43	68.9
2017	Mar	7	16	22	50.2	46	28	51	1.632	2.078	102.0	27.8	9.2	0.42	68.2
2017	Mar	8	16	23	43.1	46	32	33	1.620	2.071	102.2	27.9	9.2	0.40	67.4
2017	Mar	9	16	24	33.8	46	36	15	1.608	2.063	102.4	28.0	9.2	0.39	66.6
2017	Mar	10	16	25	22.0	46	39	54	1.596	2.055	102.6	28.1	9.1	0.37	65.8
2017	Mar	11	16	26	7.9	46	43	31	1.584	2.048	102.8	28.2	9.1	0.35	64.8
2017	Mar	12	16	26	51.3	46	47	5	1.572	2.040	103.0	28.3	9.1	0.33	63.8
2017	Mar	13	16	27	32.2	46	50	36	1.561	2.032	103.2	28.4	9.0	0.32	62.7
2017	Mar	14	16	28	10.5	46	54	4	1.549	2.025	103.4	28.5	9.0	0.30	61.5
2017	Mar	15	16	28	46.2	46	57	28	1.537	2.017	103.6	28.6	9.0	0.28	60.2
2017	Mar	16	16	29	19.2	47	0	48	1.525	2.010	103.8	28.7	8.9	0.26	58.6
2017	Mar	17	16	29	49.5	47	4	3	1.513	2.003	104.0	28.8	8.9	0.24	56.9
2017	Mar	18	16	30	17.0	47	7	12	1.502	1.995	104.2	28.9	8.9	0.23	55.0
2017	Mar	19	16	30	41.7	47	10	16	1.490	1.988	104.5	29.0	8.9	0.21	52.6
2017	Mar	20	16	31	3.5	47	13	14	1.478	1.981	104.7	29.1	8.8	0.19	49.9
2017	Mar	21	16	31	22.3	47	16	4	1.466	1.974	104.9	29.2	8.8	0.17	46.6
2017	Mar	22	16	31	38.0	47	18	47	1.455	1.966	105.2	29.3	8.8	0.15	42.4
2017	Mar	23	16	31	50.7	47	21	21	1.443	1.959	105.4	29.4	8.7	0.13	37.0
2017	Mar	24	16	32	0.3	47	23	47	1.431	1.952	105.6	29.5	8.7	0.11	29.9
2017	Mar	25	16	32	6.7	47	26	2	1.420	1.945	105.9	29.5	8.7	0.10	20.2
2017	Mar	26	16	32	9.8	47	28	7	1.408	1.938	106.1	29.6	8.6	0.08	7.0
2017	Mar	27	16	32	9.6	47	30	1	1.396	1.932	106.4	29.7	8.6	0.08	350.0
2017	Mar	28	16	32	6.0	47	31	42	1.385	1.925	106.6	29.8	8.6	0.08	330.6
2017	Mar	29	16	31	59.0	47	33	10	1.373	1.918	106.9	29.9	8.5	0.08	312.6
2017	Mar	30	16	31	48.6	47	34	24	1.361	1.911	107.2	30.0	8.5	0.10	298.3
2017	Mar	31	16	31	34.7	47	35	23	1.350	1.905	107.4	30.0	8.4	0.12	287.6
2017	Abr	1	16	31	17.2	47	36	5	1.338	1.898	107.7	30.1	8.4	0.14	279.8
2017	Abr	2	16	30	56.1	47	36	30	1.327	1.892	108.0	30.2	8.4	0.16	273.9
2017	Abr	3	16	30	31.4	47	36	36	1.315	1.885	108.3	30.2	8.3	0.19	269.3
2017	Abr	4	16	30	3.1	47	36	23	1.304	1.879	108.5	30.3	8.3	0.21	265.6
2017	Abr	5	16	29	31.1	47	35	50	1.292	1.872	108.8	30.4	8.3	0.24	262.6
2017	Abr	6	16	28	55.3	47	34	54	1.281	1.866	109.1	30.4	8.2	0.27	260.0
2017	Abr	7	16	28	15.8	47	33	35	1.269	1.860	109.4	30.5	8.2	0.30	257.8
2017	Abr	8	16	27	32.5	47	31	52	1.258	1.854	109.7	30.6	8.2	0.33	255.8
2017	Abr	9	16	26	45.4	47	29	43	1.247	1.848	110.1	30.6	8.1	0.36	254.0
2017	Abr	10	16	25	54.5	47	27	7	1.235	1.842	110.4	30.7	8.1	0.39	252.4
2017	Abr	11	16	24	59.8	47	24	3	1.224	1.836	110.7	30.7	8.1	0.42	250.9

2017	Abr	12	16	24	1.1	47	20	28	1.213	1.830	111.0	30.8	8.0	0.46	249.5	
2017	Abr	13	16	22	58.7	47	16	22	1.202	1.824	111.4	30.8	8.0	0.49	248.2	
2017	Abr	14	16	21	52.3	47	11	42	1.190	1.818	111.7	30.8	8.0	0.53	246.9	
2017	Abr	15	16	20	42.1	47	6	28	1.179	1.813	112.0	30.9	7.9	0.56	245.7	
2017	Abr	16	16	19	28.0	47	0	37	1.168	1.807	112.4	30.9	7.9	0.60	244.6	
2017	Abr	17	16	18	10.0	46	54	8	1.157	1.801	112.7	30.9	7.9	0.64	243.4	
2017	Abr	18	16	16	48.2	46	46	58	1.146	1.796	113.1	30.9	7.8	0.67	242.3	
2017	Abr	19	16	15	22.6	46	39	6	1.135	1.791	113.5	31.0	7.8	0.71	241.3	
2017	Abr	20	16	13	53.3	46	30	30	1.125	1.785	113.8	31.0	7.8	0.75	240.2	
2017	Abr	21	16	12	20.2	46	21	7	1.114	1.780	114.2	31.0	7.7	0.79	239.2	
2017	Abr	22	16	10	43.4	46	10	56	1.103	1.775	114.6	31.0	7.7	0.84	238.1	
2017	Abr	23	16	9	3.1	45	59	55	1.093	1.770	115.0	31.0	7.7	0.88	237.1	
2017	Abr	24	16	7	19.3	45	48	1	1.082	1.765	115.4	31.0	7.6	0.92	236.1	
2017	Abr	25	16	5	32.0	45	35	11	1.072	1.760	115.8	31.0	7.6	0.97	235.1	
2017	Abr	26	16	3	41.4	45	21	25	1.061	1.755	116.2	31.0	7.6	1.01	234.1	
2017	Abr	27	16	1	47.5	45	6	39	1.051	1.751	116.6	30.9	7.5	1.06	233.1	
2017	Abr	28	15	59	50.6	44	50	51	1.041	1.746	117.0	30.9	7.5	1.11	232.1	
2017	Abr	29	15	57	50.8	44	34	0	1.031	1.741	117.4	30.9	7.5	1.16	231.1	
2017	Abr	30	15	55	48.1	44	16	2	1.021	1.737	117.8	30.9	7.4	1.21	230.1	
2017	Mai	1	15	53	42.8	43	56	55	1.011	1.732	118.2	30.8	7.4	1.25	229.2	
2017	Mai	2	15	51	34.9	43	36	38	1.002	1.728	118.6	30.8	7.4	1.31	228.2	
2017	Mai	3	15	49	24.8	43	15	8	0.992	1.724	119.1	30.7	7.3	1.36	227.2	
2017	Mai	4	15	47	12.5	42	52	24	0.983	1.720	119.5	30.7	7.3	1.41	226.3	
2017	Mai	5	15	44	58.3	42	28	23	0.974	1.716	119.9	30.6	7.3	1.46	225.3	
2017	Mai	6	15	42	42.3	42	3	3	0.965	1.712	120.3	30.6	7.3	1.51	224.3	
2017	Mai	7	15	40	24.7	41	36	23	0.956	1.708	120.7	30.5	7.2	1.57	223.4	
2017	Mai	8	15	38	5.7	41	8	20	0.947	1.704	121.2	30.4	7.2	1.62	222.5	
2017	Mai	9	15	35	45.5	40	38	54	0.938	1.701	121.6	30.4	7.2	1.68	221.5	
2017	Mai	10	15	33	24.4	40	8	2	0.930	1.697	122.0	30.3	7.1	1.73	220.6	
2017	Mai	11	15	31	2.4	39	35	44	0.922	1.694	122.4	30.2	7.1	1.79	219.7	
2017	Mai	12	15	28	39.9	39	1	57	0.914	1.690	122.8	30.2	7.1	1.84	218.8	
2017	Mai	13	15	26	17.0	38	26	42	0.906	1.687	123.2	30.1	7.1	1.90	217.9	
2017	Mai	14	15	23	54.0	37	49	56	0.899	1.684	123.6	30.0	7.0	1.96	217.0	
2017	Mai	15	15	21	31.0	37	11	40	0.892	1.681	124.0	29.9	7.0	2.01	216.1	
2017	Mai	16	15	19	8.2	36	31	52	0.885	1.678	124.4	29.8	7.0	2.07	215.2	
2017	Mai	17	15	16	46.0	35	50	33	0.878	1.675	124.7	29.8	7.0	2.12	214.4	
2017	Mai	18	15	14	24.4	35	7	42	0.871	1.672	125.1	29.7	6.9	2.18	213.5	
2017	Mai	19	15	12	3.7	34	23	19	0.865	1.669	125.4	29.6	6.9	2.23	212.7	
2017	Mai	20	15	9	44.0	33	37	26	0.859	1.667	125.7	29.5	6.9	2.29	211.8	
2017	Mai	21	15	7	25.7	32	50	3	0.854	1.664	126.0	29.5	6.9	2.34	211.0	
2017	Mai	22	15	5	8.8	32	1	10	0.848	1.662	126.3	29.4	6.8	2.39	210.2	
2017	Mai	23	15	2	53.5	31	10	50	0.844	1.660	126.6	29.3	6.8	2.44	209.4	
2017	Mai	24	15	0	40.1	30	19	4	0.839	1.657	126.8	29.3	6.8	2.49	208.6	
2017	Mai	25	14	58	28.7	29	25	54	0.835	1.655	127.0	29.2	6.8	2.54	207.8	
2017	Mai	26	14	56	19.4	28	31	22	0.831	1.653	127.2	29.2	6.8	2.58	207.0	
2017	Mai	27	14	54	12.5	27	35	31	0.827	1.652	127.4	29.2	6.8	2.62	206.2	
2017	Mai	28	14	52	8.0	26	38	25	0.824	1.650	127.5	29.1	6.8	2.66	205.5	
2017	Mai	29	14	50	6.1	25	40	6	0.821	1.648	127.6	29.1	6.7	2.70	204.8	
2017	Mai	30	14	48	7.0	24	40	38	0.818	1.647	127.7	29.1	6.7	2.74	204.0	
2017	Mai	31	14	46	10.7	23	40	5	0.816	1.645	127.8	29.2	6.7	2.77	203.3	
2017	Jun	1	14	44	17.3	22	38	32	0.814	1.644	127.8	29.2	6.7	2.80	202.6	
2017	Jun	2	14	42	26.9	21	36	3	0.813	1.643	127.8	29.2	6.7	2.83	201.9	
2017	Jun	3	14	40	39.7	20	32	42	0.812	1.642	127.7	29.3	6.7	2.85	201.2	
2017	Jun	4	14	38	55.6	19	28	34	0.811	1.641	127.6	29.3	6.7	2.87	200.5	
2017	Jun	5	14	37	14.7	18	23	45	0.811	1.640	127.5	29.4	6.7	2.89	199.9	
2017	Jun	6	14	35	37.1	17	18	19	0.811	1.639	127.3	29.5	6.7	2.90	199.2	
2017	Jun	7	14	34	2.8	16	12	22	0.812	1.639	127.2	29.6	6.7	2.91	198.6	
2017	Jun	8	14	32	31.9	15	5	59	0.813	1.638	126.9	29.7	6.7	2.92	197.9	
2017	Jun	9	14	31	4.3	13	59	14	0.815	1.638	126.7	29.8	6.7	2.92	197.3	
2017	Jun	10	14	29	40.1	12	52	14	0.816	1.637	126.4	29.9	6.7	2.92	196.7	
2017	Jun	11	14	28	19.3	11	45	3	0.819	1.637	126.1	30.1	6.7	2.92	196.1	
2017	Jun	12	14	27	1.9	10	37	47	0.821	1.637	125.7	30.2	6.7	2.91	195.4	
2017	Jun	13	14	25	48.0	9	30	30	0.824	1.637	125.3	30.4	6.7	2.90	194.8	
2017	Jun	14	14	24	37.5	8	23	18	0.828	1.637	124.9	30.6	6.7	2.89	194.2	
2017	Jun	15	14	23	30.4	7	16	16	0.832	1.637	124.5	30.8	6.7	2.87	193.6	
2017	Jun	16	14	22	26.7	6	9	27	0.836	1.638	124.0	30.9	6.8	2.85	193.0	
2017	Jun	17	14	21	26.4	5	2	56	0.841	1.638	123.5	31.1	6.8	2.83	192.4	
2017	Jun	18	14	20	29.5	3	56	47	0.846	1.639	123.0	31.3	6.8	2.81	191.8	
2017	Jun	19	14	19	35.9	2	51	5	0.852	1.639	122.5	31.5	6.8	2.78	191.2	
2017	Jun	20	14	18	45.8	1	45	53	0.857	1.640	121.9	31.7	6.8	2.75	190.6	
2017	Jun	21	14	17	58.9	0	41	14	0.864	1.641	121.4	31.9	6.8	2.72	190.0	
2017	Jun	22	14	17	15.4	-	0	22	49	0.870	1.642	120.8	32.1	6.9	2.69	189.3
2017	Jun	23	14	16	35.2	-	1	26	12	0.877	1.643	120.2	32.3	6.9	2.66	188.7
2017	Jun	24	14	15	58.2	-	2	28	53	0.885	1.644	119.6	32.5	6.9	2.62	188.1
2017	Jun	25	14	15	24.5	-	3	30	50	0.892	1.646	119.0	32.7	6.9	2.59	187.4
2017	Jun	26	14	14	53.9	-	4	32	0	0.900	1.647	118.3	32.9	6.9	2.55	186.8

2017	Jun	27	14	14	26.6	- 5	32	22	0.909	1.649	117.7	33.1	7.0	2.51	186.1
2017	Jun	28	14	14	2.4	- 6	31	55	0.918	1.650	117.0	33.3	7.0	2.47	185.4
2017	Jun	29	14	13	41.2	- 7	30	36	0.927	1.652	116.4	33.4	7.0	2.44	184.8
2017	Jun	30	14	13	23.1	- 8	28	24	0.936	1.654	115.7	33.6	7.0	2.40	184.1
2017	Jul	1	14	13	8.0	- 9	25	19	0.945	1.656	115.1	33.8	7.1	2.36	183.4
2017	Jul	2	14	12	55.9	-10	21	20	0.955	1.658	114.4	33.9	7.1	2.32	182.7
2017	Jul	3	14	12	46.6	-11	16	27	0.965	1.660	113.7	34.1	7.1	2.28	182.0
2017	Jul	4	14	12	40.3	-12	10	38	0.976	1.663	113.1	34.2	7.2	2.24	181.3
2017	Jul	5	14	12	36.7	-13	3	55	0.987	1.665	112.4	34.4	7.2	2.20	180.6
2017	Jul	6	14	12	36.0	-13	56	16	0.998	1.667	111.7	34.5	7.2	2.16	179.8
2017	Jul	7	14	12	37.9	-14	47	42	1.009	1.670	111.1	34.6	7.2	2.12	179.1
2017	Jul	8	14	12	42.6	-15	38	13	1.020	1.673	110.4	34.7	7.3	2.09	178.3
2017	Jul	9	14	12	49.9	-16	27	50	1.032	1.676	109.8	34.8	7.3	2.05	177.6
2017	Jul	10	14	12	59.9	-17	16	32	1.044	1.678	109.1	34.9	7.3	2.01	176.8
2017	Jul	11	14	13	12.4	-18	4	21	1.056	1.681	108.4	35.0	7.4	1.98	176.0
2017	Jul	12	14	13	27.4	-18	51	17	1.068	1.685	107.8	35.1	7.4	1.94	175.2
2017	Jul	13	14	13	45.0	-19	37	20	1.081	1.688	107.1	35.1	7.4	1.91	174.5
2017	Jul	14	14	14	5.1	-20	22	32	1.093	1.691	106.5	35.2	7.5	1.88	173.6
2017	Jul	15	14	14	27.5	-21	6	53	1.106	1.694	105.9	35.2	7.5	1.84	172.8
2017	Jul	16	14	14	52.4	-21	50	24	1.119	1.698	105.2	35.3	7.5	1.81	172.0
2017	Jul	17	14	15	19.7	-22	33	5	1.132	1.702	104.6	35.3	7.6	1.78	171.2
2017	Jul	18	14	15	49.4	-23	14	59	1.146	1.705	104.0	35.3	7.6	1.75	170.3
2017	Jul	19	14	16	21.4	-23	56	5	1.159	1.709	103.3	35.4	7.6	1.73	169.5
2017	Jul	20	14	16	55.6	-24	36	25	1.173	1.713	102.7	35.4	7.7	1.70	168.6
2017	Jul	21	14	17	32.2	-25	16	0	1.187	1.717	102.1	35.4	7.7	1.67	167.7
2017	Jul	22	14	18	11.0	-25	54	50	1.201	1.721	101.5	35.3	7.8	1.65	166.9
2017	Jul	23	14	18	52.1	-26	32	56	1.215	1.725	100.9	35.3	7.8	1.62	166.0
2017	Jul	24	14	19	35.3	-27	10	21	1.229	1.729	100.3	35.3	7.8	1.60	165.1
2017	Jul	25	14	20	20.8	-27	47	4	1.244	1.734	99.7	35.3	7.9	1.58	164.2
2017	Jul	26	14	21	8.4	-28	23	6	1.258	1.738	99.1	35.2	7.9	1.55	163.3
2017	Jul	27	14	21	58.1	-28	58	29	1.273	1.742	98.6	35.2	7.9	1.53	162.4
2017	Jul	28	14	22	49.9	-29	33	14	1.287	1.747	98.0	35.1	8.0	1.51	161.5
2017	Jul	29	14	23	43.8	-30	7	20	1.302	1.752	97.4	35.1	8.0	1.49	160.6
2017	Jul	30	14	24	39.8	-30	40	50	1.317	1.756	96.9	35.0	8.0	1.47	159.7
2017	Jul	31	14	25	37.7	-31	13	45	1.332	1.761	96.3	34.9	8.1	1.46	158.9
2017	Ago	1	14	26	37.7	-31	46	4	1.347	1.766	95.8	34.9	8.1	1.44	158.0
2017	Ago	2	14	27	39.7	-32	17	49	1.363	1.771	95.2	34.8	8.2	1.42	157.1
2017	Ago	3	14	28	43.5	-32	49	0	1.378	1.776	94.7	34.7	8.2	1.41	156.2
2017	Ago	4	14	29	49.4	-33	19	39	1.393	1.781	94.1	34.6	8.2	1.39	155.3
2017	Ago	5	14	30	57.1	-33	49	47	1.409	1.787	93.6	34.5	8.3	1.38	154.5
2017	Ago	6	14	32	6.8	-34	19	23	1.424	1.792	93.1	34.4	8.3	1.37	153.6
2017	Ago	7	14	33	18.3	-34	48	29	1.440	1.797	92.5	34.3	8.3	1.35	152.7
2017	Ago	8	14	34	31.7	-35	17	5	1.455	1.803	92.0	34.2	8.4	1.34	151.9
2017	Ago	9	14	35	46.9	-35	45	13	1.471	1.808	91.5	34.1	8.4	1.33	151.0
2017	Ago	10	14	37	3.9	-36	12	52	1.487	1.814	91.0	34.0	8.4	1.32	150.2
2017	Ago	11	14	38	22.8	-36	40	4	1.503	1.820	90.5	33.8	8.5	1.31	149.3
2017	Ago	12	14	39	43.5	-37	6	48	1.518	1.825	90.0	33.7	8.5	1.30	148.5
2017	Ago	13	14	41	6.0	-37	33	7	1.534	1.831	89.5	33.6	8.6	1.29	147.6
2017	Ago	14	14	42	30.3	-37	58	59	1.550	1.837	89.0	33.5	8.6	1.28	146.8
2017	Ago	15	14	43	56.4	-38	24	26	1.566	1.843	88.5	33.3	8.6	1.27	146.0
2017	Ago	16	14	45	24.2	-38	49	29	1.582	1.849	88.0	33.2	8.7	1.26	145.2
2017	Ago	17	14	46	53.8	-39	14	8	1.598	1.855	87.6	33.0	8.7	1.25	144.4
2017	Ago	18	14	48	25.2	-39	38	23	1.615	1.861	87.1	32.9	8.7	1.25	143.6
2017	Ago	19	14	49	58.4	-40	2	15	1.631	1.868	86.6	32.7	8.8	1.24	142.8
2017	Ago	20	14	51	33.2	-40	25	45	1.647	1.874	86.1	32.6	8.8	1.23	142.0
2017	Ago	21	14	53	9.9	-40	48	52	1.663	1.880	85.7	32.4	8.8	1.23	141.2
2017	Ago	22	14	54	48.2	-41	11	39	1.679	1.887	85.2	32.3	8.9	1.22	140.4
2017	Ago	23	14	56	28.3	-41	34	4	1.696	1.893	84.7	32.1	8.9	1.22	139.7
2017	Ago	24	14	58	10.1	-41	56	8	1.712	1.900	84.3	32.0	9.0	1.21	138.9
2017	Ago	25	14	59	53.6	-42	17	52	1.728	1.906	83.8	31.8	9.0	1.21	138.2
2017	Ago	26	15	1	38.8	-42	39	16	1.745	1.913	83.4	31.7	9.0	1.20	137.4
2017	Ago	27	15	3	25.7	-43	0	20	1.761	1.920	82.9	31.5	9.1	1.20	136.7
2017	Ago	28	15	5	14.2	-43	21	5	1.778	1.927	82.5	31.3	9.1	1.19	136.0
2017	Ago	29	15	7	4.4	-43	41	32	1.794	1.933	82.1	31.2	9.1	1.19	135.3
2017	Ago	30	15	8	56.3	-44	1	39	1.810	1.940	81.6	31.0	9.2	1.19	134.6
2017	Ago	31	15	10	49.7	-44	21	28	1.827	1.947	81.2	30.8	9.2	1.18	133.9
2017	Set	1	15	12	44.9	-44	40	59	1.843	1.954	80.8	30.6	9.2	1.18	133.2
2017	Set	2	15	14	41.6	-45	0	13	1.860	1.961	80.3	30.5	9.3	1.18	132.5
2017	Set	3	15	16	39.9	-45	19	8	1.876	1.968	79.9	30.3	9.3	1.17	131.9
2017	Set	4	15	18	39.9	-45	37	47	1.893	1.975	79.5	30.1	9.3	1.17	131.2
2017	Set	5	15	20	41.4	-45	56	8	1.909	1.983	79.1	30.0	9.4	1.17	130.6
2017	Set	6	15	22	44.6	-46	14	12	1.926	1.990	78.6	29.8	9.4	1.16	129.9
2017	Set	7	15	24	49.3	-46	31	59	1.942	1.997	78.2	29.6	9.4	1.16	129.3
2017	Set	8	15	26	55.6	-46	49	29	1.959	2.005	77.8	29.4	9.5	1.16	128.6
2017	Set	9	15	29	3.5	-47	6	43	1.975	2.012	77.4	29.2	9.5	1.16	128.0

2017	Set	10	15	31	12.9	-47	23	41	1.992	2.019	77.0	29.1	9.5	1.16	127.4
2017	Set	11	15	33	24.0	-47	40	23	2.008	2.027	76.6	28.9	9.6	1.15	126.7
2017	Set	12	15	35	36.5	-47	56	48	2.025	2.034	76.2	28.7	9.6	1.15	126.1
2017	Set	13	15	37	50.7	-48	12	58	2.041	2.042	75.8	28.5	9.6	1.15	125.5
2017	Set	14	15	40	6.4	-48	28	52	2.058	2.050	75.4	28.4	9.7	1.15	124.9
2017	Set	15	15	42	23.6	-48	44	31	2.074	2.057	75.0	28.2	9.7	1.15	124.3
2017	Set	16	15	44	42.4	-48	59	54	2.091	2.065	74.6	28.0	9.8	1.15	123.7
2017	Set	17	15	47	2.7	-49	15	1	2.107	2.073	74.2	27.8	9.8	1.14	123.1
2017	Set	18	15	49	24.5	-49	29	54	2.124	2.080	73.8	27.6	9.8	1.14	122.5
2017	Set	19	15	51	47.9	-49	44	31	2.140	2.088	73.4	27.5	9.9	1.14	121.9
2017	Set	20	15	54	12.8	-49	58	54	2.157	2.096	73.0	27.3	9.9	1.14	121.3
2017	Set	21	15	56	39.2	-50	13	2	2.173	2.104	72.6	27.1	9.9	1.14	120.8
2017	Set	22	15	59	7.0	-50	26	54	2.190	2.112	72.2	26.9	9.9	1.14	120.2
2017	Set	23	16	1	36.3	-50	40	32	2.206	2.120	71.8	26.7	10.0	1.14	119.6
2017	Set	24	16	4	7.1	-50	53	56	2.223	2.128	71.4	26.5	10.0	1.14	119.0
2017	Set	25	16	6	39.3	-51	7	5	2.239	2.136	71.1	26.4	10.0	1.14	118.5
2017	Set	26	16	9	13.0	-51	19	59	2.256	2.144	70.7	26.2	10.1	1.14	117.9
2017	Set	27	16	11	48.1	-51	32	39	2.272	2.152	70.3	26.0	10.1	1.14	117.4
2017	Set	28	16	14	24.5	-51	45	4	2.288	2.160	69.9	25.8	10.1	1.14	116.8
2017	Set	29	16	17	2.4	-51	57	14	2.305	2.168	69.5	25.7	10.2	1.13	116.3
2017	Set	30	16	19	41.6	-52	9	11	2.321	2.177	69.2	25.5	10.2	1.13	115.7
2017	Out	1	16	22	22.1	-52	20	52	2.337	2.185	68.8	25.3	10.2	1.13	115.2
2017	Out	2	16	25	4.0	-52	32	20	2.354	2.193	68.4	25.1	10.3	1.13	114.6
2017	Out	3	16	27	47.2	-52	43	33	2.370	2.201	68.1	24.9	10.3	1.13	114.1
2017	Out	4	16	30	31.7	-52	54	31	2.386	2.210	67.7	24.8	10.3	1.13	113.6
2017	Out	5	16	33	17.4	-53	5	15	2.403	2.218	67.3	24.6	10.4	1.13	113.0
2017	Out	6	16	36	4.4	-53	15	45	2.419	2.226	66.9	24.4	10.4	1.13	112.5
2017	Out	7	16	38	52.7	-53	26	0	2.435	2.235	66.6	24.2	10.4	1.13	111.9
2017	Out	8	16	41	42.2	-53	36	1	2.451	2.243	66.2	24.1	10.5	1.13	111.4
2017	Out	9	16	44	32.8	-53	45	47	2.468	2.252	65.9	23.9	10.5	1.13	110.9
2017	Out	10	16	47	24.7	-53	55	19	2.484	2.260	65.5	23.7	10.5	1.13	110.3
2017	Out	11	16	50	17.7	-54	4	36	2.500	2.269	65.1	23.5	10.5	1.13	109.8
2017	Out	12	16	53	11.8	-54	13	40	2.516	2.277	64.8	23.4	10.6	1.13	109.3
2017	Out	13	16	56	7.1	-54	22	28	2.532	2.286	64.4	23.2	10.6	1.13	108.8
2017	Out	14	16	59	3.5	-54	31	3	2.548	2.294	64.1	23.0	10.6	1.13	108.2
2017	Out	15	17	2	1.0	-54	39	23	2.564	2.303	63.7	22.8	10.7	1.13	107.7
2017	Out	16	17	4	59.5	-54	47	28	2.580	2.312	63.3	22.7	10.7	1.13	107.2
2017	Out	17	17	7	59.0	-54	55	20	2.596	2.320	63.0	22.5	10.7	1.12	106.7
2017	Out	18	17	10	59.6	-55	2	57	2.612	2.329	62.6	22.3	10.8	1.12	106.1
2017	Out	19	17	14	1.1	-55	10	20	2.628	2.338	62.3	22.2	10.8	1.12	105.6
2017	Out	20	17	17	3.5	-55	17	28	2.644	2.346	61.9	22.0	10.8	1.12	105.1
2017	Out	21	17	20	6.9	-55	24	23	2.660	2.355	61.6	21.8	10.8	1.12	104.6
2017	Out	22	17	23	11.1	-55	31	3	2.676	2.364	61.2	21.7	10.9	1.12	104.1
2017	Out	23	17	26	16.2	-55	37	29	2.692	2.373	60.9	21.5	10.9	1.12	103.6
2017	Out	24	17	29	22.1	-55	43	41	2.708	2.382	60.5	21.3	10.9	1.12	103.1
2017	Out	25	17	32	28.7	-55	49	39	2.723	2.390	60.2	21.2	11.0	1.12	102.5
2017	Out	26	17	35	36.1	-55	55	23	2.739	2.399	59.9	21.0	11.0	1.12	102.0
2017	Out	27	17	38	44.2	-56	0	52	2.755	2.408	59.5	20.8	11.0	1.12	101.5
2017	Out	28	17	41	53.0	-56	6	8	2.771	2.417	59.2	20.7	11.0	1.12	101.0
2017	Out	29	17	45	2.3	-56	11	9	2.786	2.426	58.8	20.5	11.1	1.12	100.5
2017	Out	30	17	48	12.3	-56	15	56	2.802	2.435	58.5	20.3	11.1	1.12	100.0
2017	Out	31	17	51	22.9	-56	20	30	2.817	2.444	58.2	20.2	11.1	1.12	99.5
2017	Nov	1	17	54	33.9	-56	24	49	2.833	2.453	57.8	20.0	11.2	1.12	99.0
2017	Nov	2	17	57	45.5	-56	28	55	2.849	2.462	57.5	19.9	11.2	1.12	98.5
2017	Nov	3	18	0	57.5	-56	32	46	2.864	2.471	57.2	19.7	11.2	1.11	98.0
2017	Nov	4	18	4	9.9	-56	36	24	2.879	2.480	56.8	19.6	11.2	1.11	97.6
2017	Nov	5	18	7	22.7	-56	39	48	2.895	2.489	56.5	19.4	11.3	1.11	97.1
2017	Nov	6	18	10	35.8	-56	42	58	2.910	2.498	56.2	19.2	11.3	1.11	96.6
2017	Nov	7	18	13	49.2	-56	45	54	2.926	2.507	55.8	19.1	11.3	1.11	96.1
2017	Nov	8	18	17	2.9	-56	48	37	2.941	2.516	55.5	18.9	11.3	1.11	95.6
2017	Nov	9	18	20	16.9	-56	51	6	2.956	2.525	55.2	18.8	11.4	1.11	95.1
2017	Nov	10	18	23	31.0	-56	53	22	2.971	2.534	54.8	18.6	11.4	1.11	94.6
2017	Nov	11	18	26	45.3	-56	55	24	2.987	2.543	54.5	18.5	11.4	1.11	94.2
2017	Nov	12	18	29	59.8	-56	57	13	3.002	2.552	54.2	18.3	11.5	1.11	93.7
2017	Nov	13	18	33	14.3	-56	58	49	3.017	2.561	53.9	18.2	11.5	1.11	93.2
2017	Nov	14	18	36	29.0	-57	0	12	3.032	2.571	53.6	18.0	11.5	1.11	92.7
2017	Nov	15	18	39	43.6	-57	1	22	3.047	2.580	53.2	17.9	11.5	1.10	92.3
2017	Nov	16	18	42	58.2	-57	2	18	3.062	2.589	52.9	17.7	11.6	1.10	91.8
2017	Nov	17	18	46	12.8	-57	3	2	3.077	2.598	52.6	17.6	11.6	1.10	91.4
2017	Nov	18	18	49	27.4	-57	3	34	3.092	2.607	52.3	17.5	11.6	1.10	90.9
2017	Nov	19	18	52	41.8	-57	3	53	3.107	2.617	52.0	17.3	11.6	1.10	90.5
2017	Nov	20	18	55	56.0	-57	3	59	3.122	2.626	51.7	17.2	11.7	1.10	90.0
2017	Nov	21	18	59	10.1	-57	3	53	3.136	2.635	51.4	17.0	11.7	1.10	89.6
2017	Nov	22	19	2	23.9	-57	3	35	3.151	2.644	51.1	16.9	11.7	1.10	89.1
2017	Nov	23	19	5	37.5	-57	3	5	3.166	2.653	50.7	16.7	11.7	1.10	88.7
2017	Nov	24	19	8	50.7	-57	2	23	3.180	2.663	50.4	16.6	11.8	1.09	88.3

2017	Nov	25	19	12	3.7	-57	1	30	3.195	2.672	50.1	16.5	11.8	1.09	87.8
2017	Nov	26	19	15	16.2	-57	0	25	3.210	2.681	49.8	16.3	11.8	1.09	87.4
2017	Nov	27	19	18	28.4	-56	59	8	3.224	2.691	49.5	16.2	11.8	1.09	87.0
2017	Nov	28	19	21	40.2	-56	57	40	3.238	2.700	49.2	16.1	11.9	1.09	86.6
2017	Nov	29	19	24	51.5	-56	56	1	3.253	2.709	48.9	15.9	11.9	1.09	86.2
2017	Nov	30	19	28	2.3	-56	54	11	3.267	2.718	48.7	15.8	11.9	1.09	85.8
2017	Dez	1	19	31	12.6	-56	52	10	3.281	2.728	48.4	15.7	11.9	1.09	85.4
2017	Dez	2	19	34	22.4	-56	49	58	3.296	2.737	48.1	15.5	12.0	1.08	85.0
2017	Dez	3	19	37	31.5	-56	47	35	3.310	2.746	47.8	15.4	12.0	1.08	84.6
2017	Dez	4	19	40	40.1	-56	45	2	3.324	2.756	47.5	15.3	12.0	1.08	84.2
2017	Dez	5	19	43	48.1	-56	42	19	3.338	2.765	47.2	15.2	12.0	1.08	83.8
2017	Dez	6	19	46	55.5	-56	39	26	3.352	2.774	46.9	15.0	12.1	1.08	83.4
2017	Dez	7	19	50	2.2	-56	36	23	3.366	2.784	46.7	14.9	12.1	1.08	83.0
2017	Dez	8	19	53	8.2	-56	33	10	3.380	2.793	46.4	14.8	12.1	1.07	82.7
2017	Dez	9	19	56	13.6	-56	29	47	3.394	2.803	46.1	14.7	12.1	1.07	82.3
2017	Dez	10	19	59	18.2	-56	26	15	3.408	2.812	45.9	14.6	12.2	1.07	81.9
2017	Dez	11	20	2	22.1	-56	22	34	3.421	2.821	45.6	14.4	12.2	1.07	81.6
2017	Dez	12	20	5	25.3	-56	18	43	3.435	2.831	45.3	14.3	12.2	1.07	81.2
2017	Dez	13	20	8	27.7	-56	14	44	3.449	2.840	45.1	14.2	12.2	1.07	80.9
2017	Dez	14	20	11	29.3	-56	10	36	3.462	2.850	44.8	14.1	12.2	1.07	80.5
2017	Dez	15	20	14	30.2	-56	6	20	3.476	2.859	44.6	14.0	12.3	1.06	80.2
2017	Dez	16	20	17	30.2	-56	1	55	3.489	2.868	44.3	13.9	12.3	1.06	79.9
2017	Dez	17	20	20	29.4	-55	57	22	3.503	2.878	44.1	13.8	12.3	1.06	79.6
2017	Dez	18	20	23	27.8	-55	52	42	3.516	2.887	43.8	13.6	12.3	1.06	79.2
2017	Dez	19	20	26	25.3	-55	47	53	3.529	2.897	43.6	13.5	12.4	1.06	78.9
2017	Dez	20	20	29	22.0	-55	42	58	3.542	2.906	43.3	13.4	12.4	1.05	78.6
2017	Dez	21	20	32	17.8	-55	37	54	3.555	2.916	43.1	13.3	12.4	1.05	78.3
2017	Dez	22	20	35	12.7	-55	32	44	3.568	2.925	42.9	13.2	12.4	1.05	78.0
2017	Dez	23	20	38	6.7	-55	27	27	3.581	2.934	42.6	13.1	12.4	1.05	77.7
2017	Dez	24	20	40	59.8	-55	22	3	3.594	2.944	42.4	13.0	12.5	1.05	77.5
2017	Dez	25	20	43	52.0	-55	16	32	3.607	2.953	42.2	12.9	12.5	1.04	77.2
2017	Dez	26	20	46	43.2	-55	10	56	3.620	2.963	42.0	12.8	12.5	1.04	76.9
2017	Dez	27	20	49	33.5	-55	5	13	3.633	2.972	41.8	12.7	12.5	1.04	76.6

Efemérides do Cometa 71P/Clark - 00:00 UTC (J2000)

T 2017 Jun 30.0092 TT
q 1.585617 Peri. 208.9202
a 3.137692 Node 59.4635
e 0.494655 Incl. 9.4439
Ref: NK 2721

aaaa/mm./dd	h	m	s	o	'	"	delta	RSol	Elong	Fase	Mag	"/min	AP		
2017 Mai	1	16	42	2.4	-20	2	17	0.740	1.685	148.8	18.0	12.5	0.51	160.1	
2017 Mai	2	16	42	19.1	-20	13	54	0.733	1.682	149.7	17.6	12.5	0.51	162.4	
2017 Mai	3	16	42	34.0	-20	25	43	0.726	1.679	150.6	17.2	12.5	0.51	164.7	
2017 Mai	4	16	42	46.9	-20	37	43	0.719	1.676	151.5	16.7	12.4	0.52	167.0	
2017 Mai	5	16	42	57.9	-20	49	55	0.713	1.673	152.4	16.2	12.4	0.52	169.2	
2017 Mai	6	16	43	7.0	-21	2	17	0.706	1.670	153.3	15.7	12.4	0.53	171.4	
2017 Mai	7	16	43	14.2	-21	14	51	0.700	1.667	154.2	15.3	12.4	0.53	173.5	
2017 Mai	8	16	43	19.4	-21	27	36	0.693	1.664	155.1	14.8	12.3	0.54	175.5	
2017 Mai	9	16	43	22.8	-21	40	31	0.687	1.661	156.1	14.3	12.3	0.54	177.5	
2017 Mai	10	16	43	24.3	-21	53	38	0.681	1.659	157.0	13.8	12.3	0.55	179.5	
2017 Mai	11	16	43	23.9	-22	6	54	0.676	1.656	158.0	13.2	12.2	0.56	181.3	
2017 Mai	12	16	43	21.7	-22	20	21	0.670	1.653	158.9	12.7	12.2	0.56	183.1	
2017 Mai	13	16	43	17.6	-22	33	58	0.665	1.650	159.9	12.2	12.2	0.57	184.8	
2017 Mai	14	16	43	11.7	-22	47	45	0.660	1.648	160.8	11.6	12.2	0.58	186.4	
2017 Mai	15	16	43	4.1	-23	1	41	0.655	1.645	161.8	11.1	12.1	0.59	188.0	
2017 Mai	16	16	42	54.7	-23	15	45	0.650	1.643	162.7	10.5	12.1	0.60	189.4	
2017 Mai	17	16	42	43.7	-23	29	58	0.645	1.640	163.7	10.0	12.1	0.61	190.8	
2017 Mai	18	16	42	30.9	-23	44	20	0.641	1.638	164.6	9.4	12.0	0.61	192.1	
2017 Mai	19	16	42	16.6	-23	58	48	0.636	1.636	165.6	8.9	12.0	0.62	193.4	
2017 Mai	20	16	42	0.7	-24	13	24	0.632	1.633	166.5	8.3	12.0	0.63	194.5	
2017 Mai	21	16	41	43.3	-24	28	6	0.628	1.631	167.5	7.7	12.0	0.64	195.6	
2017 Mai	22	16	41	24.5	-24	42	53	0.625	1.629	168.4	7.2	12.0	0.65	196.6	
2017 Mai	23	16	41	4.3	-24	57	46	0.621	1.627	169.3	6.6	11.9	0.65	197.5	
2017 Mai	24	16	40	42.9	-25	12	44	0.618	1.625	170.2	6.1	11.9	0.66	198.4	
2017 Mai	25	16	40	20.3	-25	27	45	0.614	1.623	171.1	5.6	11.9	0.66	199.1	
2017 Mai	26	16	39	56.6	-25	42	50	0.611	1.621	171.9	5.0	11.9	0.67	199.8	
2017 Mai	27	16	39	32.0	-25	57	57	0.609	1.619	172.7	4.6	11.9	0.67	200.4	
2017 Mai	28	16	39	6.5	-26	13	6	0.606	1.617	173.4	4.1	11.8	0.68	201.0	
2017 Mai	29	16	38	40.2	-26	28	16	0.604	1.615	174.0	3.8	11.8	0.68	201.4	
2017 Mai	30	16	38	13.3	-26	43	27	0.601	1.613	174.4	3.5	11.8	0.68	201.8	
2017 Mai	31	16	37	45.9	-26	58	38	0.599	1.611	174.7	3.3	11.8	0.68	202.1	
2017 Jun	1	16	37	18.0	-27	13	47	0.597	1.610	174.8	3.3	11.8	0.68	202.3	

2017 Jun 2	16 36 49.9	-27 28 55	0.596	1.608	174.6	3.4	11.8	0.68	202.5	
2017 Jun 3	16 36 21.6	-27 44 1	0.594	1.607	174.3	3.6	11.8	0.68	202.6	
2017 Jun 4	16 35 53.2	-27 59 3	0.593	1.605	173.8	3.9	11.7	0.68	202.6	
2017 Jun 5	16 35 24.9	-28 14 2	0.592	1.604	173.2	4.3	11.7	0.67	202.6	
2017 Jun 6	16 34 56.8	-28 28 57	0.591	1.602	172.5	4.8	11.7	0.67	202.5	
2017 Jun 7	16 34 28.9	-28 43 46	0.590	1.601	171.7	5.3	11.7	0.67	202.3	
2017 Jun 8	16 34 1.5	-28 58 29	0.589	1.600	170.8	5.8	11.7	0.66	202.1	
2017 Jun 9	16 33 34.5	-29 13 6	0.589	1.598	170.0	6.4	11.7	0.65	201.8	
2017 Jun 10	16 33 8.2	-29 27 36	0.589	1.597	169.1	6.9	11.7	0.65	201.4	
2017 Jun 11	16 32 42.7	-29 41 58	0.589	1.596	168.1	7.5	11.7	0.64	200.9	
2017 Jun 12	16 32 18.1	-29 56 12	0.589	1.595	167.2	8.1	11.7	0.63	200.3	
2017 Jun 13	16 31 54.4	-30 10 16	0.589	1.594	166.3	8.7	11.7	0.62	199.7	
2017 Jun 14	16 31 31.8	-30 24 12	0.590	1.593	165.3	9.3	11.7	0.61	198.9	
2017 Jun 15	16 31 10.4	-30 37 57	0.590	1.592	164.4	9.9	11.7	0.60	198.1	
2017 Jun 16	16 30 50.4	-30 51 32	0.591	1.591	163.4	10.5	11.7	0.59	197.1	
2017 Jun 17	16 30 31.8	-31 4 55	0.592	1.591	162.5	11.1	11.7	0.58	196.0	
2017 Jun 18	16 30 14.7	-31 18 8	0.593	1.590	161.5	11.7	11.7	0.56	194.8	
2017 Jun 19	16 29 59.3	-31 31 8	0.595	1.589	160.6	12.3	11.7	0.55	193.5	
2017 Jun 20	16 29 45.7	-31 43 57	0.596	1.589	159.6	12.9	11.7	0.54	192.0	
2017 Jun 21	16 29 34.0	-31 56 33	0.598	1.588	158.7	13.5	11.7	0.53	190.4	
2017 Jun 22	16 29 24.2	-32 8 56	0.600	1.587	157.7	14.0	11.7	0.52	188.6	
2017 Jun 23	16 29 16.5	-32 21 6	0.602	1.587	156.8	14.6	11.7	0.51	186.6	
2017 Jun 24	16 29 10.9	-32 33 3	0.604	1.587	155.9	15.2	11.7	0.49	184.5	
2017 Jun 25	16 29 7.7	-32 44 47	0.606	1.586	155.0	15.7	11.7	0.48	182.1	
2017 Jun 26	16 29 6.8	-32 56 17	0.608	1.586	154.1	16.3	11.7	0.47	179.6	
2017 Jun 27	16 29 8.4	-33 7 33	0.611	1.586	153.2	16.8	11.7	0.47	177.0	
2017 Jun 28	16 29 12.5	-33 18 36	0.614	1.586	152.3	17.4	11.7	0.46	174.1	
2017 Jun 29	16 29 19.1	-33 29 25	0.617	1.586	151.4	17.9	11.8	0.45	171.2	
2017 Jun 30	16 29 28.4	-33 40 1	0.620	1.586	150.5	18.4	11.8	0.45	168.1	
2017 Jul 1	16 29 40.4	-33 50 23	0.623	1.586	149.6	18.9	11.8	0.44	164.9	
2017 Jul 2	16 29 55.0	-34 0 31	0.626	1.586	148.8	19.4	11.8	0.44	161.6	
2017 Jul 3	16 30 12.5	-34 10 25	0.630	1.586	147.9	19.9	11.8	0.44	158.3	
2017 Jul 4	16 30 32.7	-34 20 6	0.633	1.586	147.1	20.4	11.8	0.44	155.0	
2017 Jul 5	16 30 55.7	-34 29 32	0.637	1.586	146.3	20.9	11.8	0.44	151.6	
2017 Jul 6	16 31 21.6	-34 38 45	0.641	1.587	145.4	21.3	11.8	0.45	148.4	
2017 Jul 7	16 31 50.2	-34 47 45	0.645	1.587	144.6	21.8	11.9	0.45	145.1	
2017 Jul 8	16 32 21.8	-34 56 30	0.649	1.587	143.8	22.2	11.9	0.46	142.0	
2017 Jul 9	16 32 56.2	-35 5 2	0.653	1.588	143.0	22.6	11.9	0.47	139.0	
2017 Jul 10	16 33 33.4	-35 13 21	0.658	1.589	142.3	23.1	11.9	0.47	136.0	
2017 Jul 11	16 34 13.5	-35 21 25	0.662	1.589	141.5	23.5	11.9	0.48	133.3	
2017 Jul 12	16 34 56.4	-35 29 16	0.667	1.590	140.7	23.9	11.9	0.50	130.6	
2017 Jul 13	16 35 42.1	-35 36 54	0.672	1.591	140.0	24.3	12.0	0.51	128.1	
2017 Jul 14	16 36 30.7	-35 44 18	0.676	1.591	139.2	24.7	12.0	0.52	125.7	
2017 Jul 15	16 37 22.1	-35 51 28	0.681	1.592	138.5	25.0	12.0	0.53	123.4	
2017 Jul 16	16 38 16.3	-35 58 25	0.687	1.593	137.8	25.4	12.0	0.55	121.3	
2017 Jul 17	16 39 13.3	-36 5 9	0.692	1.594	137.1	25.7	12.0	0.56	119.3	
2017 Jul 18	16 40 13.0	-36 11 39	0.697	1.595	136.3	26.1	12.1	0.58	117.4	
2017 Jul 19	16 41 15.6	-36 17 55	0.703	1.596	135.6	26.4	12.1	0.59	115.6	
2017 Jul 20	16 42 20.8	-36 23 59	0.708	1.597	135.0	26.8	12.1	0.61	113.9	
2017 Jul 21	16 43 28.8	-36 29 49	0.714	1.598	134.3	27.1	12.1	0.63	112.3	
2017 Jul 22	16 44 39.4	-36 35 26	0.720	1.600	133.6	27.4	12.1	0.64	110.9	
2017 Jul 23	16 45 52.7	-36 40 50	0.726	1.601	132.9	27.7	12.2	0.66	109.5	
2017 Jul 24	16 47 8.7	-36 46 1	0.732	1.602	132.3	28.0	12.2	0.68	108.2	
2017 Jul 25	16 48 27.3	-36 50 59	0.738	1.604	131.6	28.3	12.2	0.70	106.9	
2017 Jul 26	16 49 48.4	-36 55 44	0.744	1.605	131.0	28.5	12.2	0.71	105.8	
2017 Jul 27	16 51 12.1	-37 0 17	0.750	1.607	130.4	28.8	12.3	0.73	104.7	
2017 Jul 28	16 52 38.3	-37 4 37	0.757	1.608	129.7	29.1	12.3	0.75	103.6	
2017 Jul 29	16 54 6.9	-37 8 44	0.763	1.610	129.1	29.3	12.3	0.76	102.7	
2017 Jul 30	16 55 37.9	-37 12 39	0.770	1.611	128.5	29.5	12.3	0.78	101.7	
2017 Jul 31	16 57 11.2	-37 16 21	0.777	1.613	127.9	29.8	12.4	0.80	100.8	
2017 Ago 1	16 58 46.8	-37 19 51	0.784	1.615	127.3	30.0	12.4	0.81	100.0	
2017 Ago 2	17 0 24.6	-37 23 8	0.791	1.617	126.7	30.2	12.4	0.83	99.2	
2017 Ago 3	17 2 4.6	-37 26 13	0.798	1.619	126.1	30.4	12.4	0.85	98.4	
2017 Ago 4	17 3 46.8	-37 29 6	0.805	1.621	125.6	30.6	12.5	0.86	97.7	
2017 Ago 5	17 5 30.9	-37 31 46	0.812	1.623	125.0	30.8	12.5	0.88	97.0	
2017 Ago 6	17 7 17.1	-37 34 14	0.819	1.625	124.4	31.0	12.5	0.89	96.3	

Efemérides do Cometa 96P/Machholz - 00:00 UTC (J2000)

T 2017 Out 27.9677 TT
 q 0.123891 Peri. 14.7899
 z 0.329540 Node 94.2691
 e 0.959173 Incl. 58.1608
 Ref: NK 2733

aaaa/mm./dd	h	m	s	o	'	"	delta	RSol	Elong	Fase	Mag	"/min	AP
2017 Set 29	13	44	44.2	-51	30	12	1.025	0.892	52.2	62.6	12.5	1.64	355.0
2017 Set 30	13	44	22.0	-50	50	46	1.020	0.870	51.0	63.4	12.3	1.66	354.9
2017 Out 1	13	43	59.1	-50	10	34	1.015	0.848	49.7	64.3	12.2	1.70	354.7
2017 Out 2	13	43	35.3	-49	29	32	1.010	0.825	48.5	65.2	12.0	1.74	354.6
2017 Out 3	13	43	10.4	-48	47	31	1.005	0.803	47.2	66.1	11.9	1.78	354.4
2017 Out 4	13	42	44.2	-48	4	23	0.999	0.779	45.9	67.1	11.7	1.83	354.1
2017 Out 5	13	42	16.7	-47	20	0	0.994	0.756	44.6	68.2	11.5	1.89	353.9
2017 Out 6	13	41	47.5	-46	34	10	0.987	0.732	43.2	69.3	11.3	1.95	353.7
2017 Out 7	13	41	16.7	-45	46	43	0.981	0.708	41.9	70.4	11.2	2.03	353.5
2017 Out 8	13	40	44.0	-44	57	27	0.975	0.683	40.5	71.7	11.0	2.11	353.2
2017 Out 9	13	40	9.3	-44	6	6	0.968	0.658	39.1	73.0	10.8	2.20	353.0
2017 Out 10	13	39	32.5	-43	12	25	0.961	0.633	37.6	74.4	10.5	2.31	352.8
2017 Out 11	13	38	53.4	-42	16	6	0.954	0.607	36.1	75.9	10.3	2.43	352.7
2017 Out 12	13	38	12.2	-41	16	46	0.947	0.581	34.6	77.5	10.0	2.56	352.6
2017 Out 13	13	37	28.6	-40	14	3	0.939	0.554	33.0	79.3	9.8	2.71	352.5
2017 Out 14	13	36	42.8	-39	7	28	0.932	0.526	31.4	81.2	9.5	2.89	352.5
2017 Out 15	13	35	54.9	-37	56	29	0.924	0.498	29.8	83.2	9.2	3.08	352.5
2017 Out 16	13	35	5.1	-36	40	28	0.917	0.470	28.0	85.5	8.9	3.31	352.7
2017 Out 17	13	34	13.9	-35	18	41	0.910	0.440	26.2	88.0	8.5	3.57	352.9
2017 Out 18	13	33	22.0	-33	50	15	0.903	0.411	24.3	90.7	8.1	3.86	353.3
2017 Out 19	13	32	30.5	-32	14	10	0.896	0.380	22.4	93.8	7.7	4.20	353.9
2017 Out 20	13	31	41.1	-30	29	11	0.890	0.348	20.3	97.3	7.3	4.60	354.7
2017 Out 21	13	30	56.5	-28	33	52	0.885	0.316	18.2	101.2	6.7	5.06	355.8
2017 Out 22	13	30	21.0	-26	26	31	0.881	0.283	15.9	105.6	6.2	5.59	357.2
2017 Out 23	13	30	1.7	-24	5	11	0.879	0.250	13.6	110.5	5.5	6.21	359.3
2017 Out 24	13	30	10.1	-21	27	55	0.881	0.217	11.3	115.9	4.8	6.92	2.3
2017 Out 25	13	31	6.6	-18	33	17	0.887	0.184	9.1	121.1	3.9	7.69	6.7
2017 Out 26	13	33	25.8	-15	22	38	0.900	0.155	7.4	123.9	3.0	8.43	13.6
2017 Out 27	13	38	1.0	-12	5	17	0.922	0.132	6.7	119.4	2.3	8.88	24.6
2017 Out 28	13	45	41.3	-9	5	50	0.956	0.124	6.9	104.3	2.0	8.75	40.7
2017 Out 29	13	56	3.0	-6	54	10	0.997	0.133	7.7	84.6	2.5	8.16	58.3
2017 Out 30	14	7	28.4	-5	36	46	1.040	0.156	8.4	68.3	3.4	7.47	72.3
2017 Out 31	14	18	40.3	-4	58	59	1.081	0.186	9.0	57.1	4.4	6.84	81.8
2017 Nov 1	14	29	9.8	-4	45	29	1.120	0.219	9.6	49.6	5.3	6.29	88.1
2017 Nov 2	14	38	52.2	-4	46	20	1.157	0.252	10.2	44.3	6.1	5.81	92.4
2017 Nov 3	14	47	50.7	-4	55	46	1.192	0.285	10.7	40.4	6.8	5.40	95.5
2017 Nov 4	14	56	10.5	-5	10	23	1.225	0.318	11.2	37.4	7.5	5.05	97.8
2017 Nov 5	15	3	56.3	-5	28	9	1.258	0.350	11.7	34.9	8.0	4.73	99.6
2017 Nov 6	15	11	12.5	-5	47	47	1.290	0.381	12.1	32.9	8.5	4.46	100.9
2017 Nov 7	15	18	2.7	-6	8	29	1.320	0.412	12.4	31.2	9.0	4.22	102.0
2017 Nov 8	15	24	29.9	-6	29	41	1.351	0.442	12.7	29.6	9.4	4.00	102.8
2017 Nov 9	15	30	36.7	-6	51	3	1.380	0.471	13.0	28.2	9.8	3.80	103.5
2017 Nov 10	15	36	25.2	-7	12	18	1.410	0.500	13.2	27.0	10.1	3.62	104.1
2017 Nov 11	15	41	57.2	-7	33	18	1.438	0.528	13.4	25.8	10.5	3.46	104.5
2017 Nov 12	15	47	14.4	-7	53	56	1.467	0.555	13.6	24.7	10.8	3.31	104.9
2017 Nov 13	15	52	18.0	-8	14	6	1.494	0.582	13.7	23.7	11.1	3.17	105.2
2017 Nov 14	15	57	9.2	-8	33	46	1.522	0.608	13.8	22.8	11.3	3.05	105.4
2017 Nov 15	16	1	49.2	-8	52	53	1.549	0.634	13.8	21.9	11.6	2.93	105.5
2017 Nov 16	16	6	18.8	-9	11	28	1.576	0.660	13.8	21.0	11.8	2.83	105.7
2017 Nov 17	16	10	38.7	-9	29	29	1.603	0.685	13.8	20.2	12.0	2.73	105.7
2017 Nov 18	16	14	49.8	-9	46	57	1.629	0.709	13.8	19.4	12.3	2.63	105.8
2017 Nov 19	16	18	52.6	-10	3	51	1.655	0.733	13.7	18.6	12.5	2.55	105.8

Efemérides do Cometa 24P/Schaumasse - 00:00 UTC (J2000)

T 2017 Nov 16.7981 TT
 q 1.206298 Peri. 58.0376
 a 4.085434 Node 79.6406
 e 0.704732 Incl. 11.7333
 Ref: MPC 56804

aaaa/mm./dd	h	m	s	o	'	"	delta	RSol	Elong	Fase	Mag	"/min	AP
2017 Set 26	8	44	0.4	20	11	50	1.687	1.380	54.9	36.5	12.5	2.35	97.7
2017 Set 27	8	47	59.0	20	4	9	1.678	1.374	54.9	36.7	12.4	2.36	98.0
2017 Set 28	8	51	58.4	19	56	9	1.670	1.368	54.9	36.9	12.4	2.37	98.2
2017 Set 29	8	55	58.5	19	47	49	1.662	1.362	55.0	37.1	12.3	2.38	98.5
2017 Set 30	8	59	59.3	19	39	9	1.653	1.356	55.0	37.2	12.2	2.39	98.8
2017 Out 1	9	4	0.8	19	30	10	1.646	1.350	55.1	37.4	12.1	2.40	99.1
2017 Out 2	9	8	2.9	19	20	51	1.638	1.345	55.1	37.6	12.1	2.42	99.4
2017 Out 3	9	12	5.7	19	11	13	1.630	1.339	55.1	37.8	12.0	2.43	99.7
2017 Out 4	9	16	9.0	19	1	15	1.623	1.334	55.1	38.0	11.9	2.44	100.0
2017 Out 5	9	20	12.8	18	50	58	1.616	1.328	55.2	38.2	11.9	2.45	100.3
2017 Out 6	9	24	17.1	18	40	21	1.609	1.323	55.2	38.3	11.8	2.45	100.5
2017 Out 7	9	28	21.9	18	29	25	1.602	1.318	55.2	38.5	11.7	2.46	100.8
2017 Out 8	9	32	27.1	18	18	10	1.595	1.313	55.2	38.7	11.7	2.47	101.1
2017 Out 9	9	36	32.6	18	6	36	1.588	1.308	55.2	38.9	11.6	2.48	101.4
2017 Out 10	9	40	38.5	17	54	43	1.582	1.303	55.2	39.0	11.5	2.49	101.6
2017 Out 11	9	44	44.6	17	42	31	1.576	1.298	55.2	39.2	11.5	2.50	101.9
2017 Out 12	9	48	51.0	17	30	1	1.570	1.293	55.2	39.3	11.4	2.50	102.2
2017 Out 13	9	52	57.5	17	17	13	1.564	1.289	55.2	39.5	11.3	2.51	102.4
2017 Out 14	9	57	4.2	17	4	7	1.558	1.284	55.2	39.6	11.3	2.52	102.7
2017 Out 15	10	1	11.0	16	50	43	1.553	1.280	55.2	39.8	11.2	2.52	102.9
2017 Out 16	10	5	17.8	16	37	2	1.547	1.276	55.2	39.9	11.2	2.53	103.2
2017 Out 17	10	9	24.7	16	23	4	1.542	1.272	55.2	40.1	11.1	2.54	103.4
2017 Out 18	10	13	31.4	16	8	49	1.537	1.268	55.2	40.2	11.0	2.54	103.6
2017 Out 19	10	17	38.1	15	54	18	1.532	1.264	55.2	40.3	11.0	2.54	103.9
2017 Out 20	10	21	44.7	15	39	32	1.528	1.260	55.2	40.4	10.9	2.55	104.1
2017 Out 21	10	25	51.0	15	24	29	1.523	1.256	55.1	40.6	10.9	2.55	104.3
2017 Out 22	10	29	57.1	15	9	12	1.519	1.253	55.1	40.7	10.8	2.56	104.6
2017 Out 23	10	34	3.0	14	53	40	1.515	1.249	55.1	40.8	10.8	2.56	104.8
2017 Out 24	10	38	8.5	14	37	54	1.511	1.246	55.1	40.9	10.7	2.56	105.0
2017 Out 25	10	42	13.6	14	21	54	1.507	1.243	55.1	41.0	10.7	2.56	105.2
2017 Out 26	10	46	18.4	14	5	40	1.503	1.240	55.1	41.1	10.7	2.56	105.4
2017 Out 27	10	50	22.7	13	49	15	1.500	1.237	55.1	41.2	10.6	2.56	105.6
2017 Out 28	10	54	26.6	13	32	36	1.497	1.234	55.0	41.3	10.6	2.56	105.8
2017 Out 29	10	58	29.9	13	15	46	1.493	1.231	55.0	41.4	10.5	2.56	106.0
2017 Out 30	11	2	32.7	12	58	45	1.490	1.229	55.0	41.5	10.5	2.56	106.2
2017 Out 31	11	6	34.8	12	41	33	1.488	1.226	55.0	41.5	10.5	2.56	106.3
2017 Nov 1	11	10	36.4	12	24	11	1.485	1.224	55.0	41.6	10.4	2.56	106.5
2017 Nov 2	11	14	37.3	12	6	40	1.482	1.222	55.0	41.7	10.4	2.56	106.7
2017 Nov 3	11	18	37.5	11	48	59	1.480	1.220	54.9	41.7	10.4	2.55	106.8
2017 Nov 4	11	22	37.0	11	31	10	1.478	1.218	54.9	41.8	10.3	2.55	107.0
2017 Nov 5	11	26	35.7	11	13	13	1.476	1.216	54.9	41.8	10.3	2.55	107.1
2017 Nov 6	11	30	33.7	10	55	8	1.474	1.215	54.9	41.9	10.3	2.54	107.3
2017 Nov 7	11	34	30.8	10	36	57	1.472	1.213	54.9	41.9	10.3	2.54	107.4
2017 Nov 8	11	38	27.1	10	18	40	1.470	1.212	54.9	42.0	10.3	2.54	107.5
2017 Nov 9	11	42	22.6	10	0	17	1.469	1.211	54.9	42.0	10.2	2.53	107.7
2017 Nov 10	11	46	17.1	9	41	49	1.468	1.210	54.9	42.1	10.2	2.52	107.8
2017 Nov 11	11	50	10.7	9	23	16	1.466	1.209	54.9	42.1	10.2	2.52	107.9
2017 Nov 12	11	54	3.4	9	4	40	1.465	1.208	54.9	42.1	10.2	2.51	108.0
2017 Nov 13	11	57	55.0	8	46	1	1.464	1.207	54.9	42.1	10.2	2.50	108.1
2017 Nov 14	12	1	45.6	8	27	19	1.463	1.207	54.9	42.1	10.2	2.50	108.2
2017 Nov 15	12	5	35.2	8	8	36	1.463	1.207	54.9	42.2	10.2	2.49	108.3
2017 Nov 16	12	9	23.8	7	49	51	1.462	1.206	55.0	42.2	10.2	2.48	108.4
2017 Nov 17	12	13	11.2	7	31	5	1.461	1.206	55.0	42.2	10.2	2.47	108.5
2017 Nov 18	12	16	57.5	7	12	19	1.461	1.206	55.0	42.2	10.2	2.46	108.5
2017 Nov 19	12	20	42.7	6	53	33	1.461	1.207	55.0	42.2	10.2	2.45	108.6
2017 Nov 20	12	24	26.8	6	34	48	1.461	1.207	55.1	42.2	10.2	2.44	108.7
2017 Nov 21	12	28	9.6	6	16	5	1.460	1.208	55.1	42.1	10.2	2.43	108.7
2017 Nov 22	12	31	51.3	5	57	24	1.460	1.208	55.1	42.1	10.2	2.42	108.8
2017 Nov 23	12	35	31.8	5	38	45	1.461	1.209	55.2	42.1	10.2	2.41	108.8
2017 Nov 24	12	39	11.0	5	20	9	1.461	1.210	55.2	42.1	10.2	2.40	108.8
2017 Nov 25	12	42	49.0	5	1	37	1.461	1.211	55.3	42.1	10.2	2.38	108.9
2017 Nov 26	12	46	25.8	4	43	9	1.461	1.212	55.4	42.0	10.3	2.37	108.9
2017 Nov 27	12	50	1.3	4	24	45	1.462	1.214	55.4	42.0	10.3	2.36	108.9
2017 Nov 28	12	53	35.5	4	6	26	1.462	1.215	55.5	42.0	10.3	2.35	108.9
2017 Nov 29	12	57	8.4	3	48	12	1.463	1.217	55.6	42.0	10.3	2.33	108.9
2017 Nov 30	13	0	40.1	3	30	4	1.464	1.219	55.6	41.9	10.3	2.32	109.0

2017	Dez	1	13	4	10.4	3	12	2	1.464	1.221	55.7	41.9	10.4	2.31	109.0	
2017	Dez	2	13	7	39.5	2	54	7	1.465	1.223	55.8	41.8	10.4	2.29	109.0	
2017	Dez	3	13	11	7.2	2	36	19	1.466	1.225	55.9	41.8	10.4	2.28	108.9	
2017	Dez	4	13	14	33.6	2	18	38	1.467	1.227	56.0	41.7	10.4	2.26	108.9	
2017	Dez	5	13	17	58.7	2	1	4	1.468	1.230	56.1	41.7	10.5	2.25	108.9	
2017	Dez	6	13	21	22.4	1	43	39	1.469	1.232	56.2	41.7	10.5	2.23	108.9	
2017	Dez	7	13	24	44.8	1	26	22	1.470	1.235	56.3	41.6	10.5	2.22	108.9	
2017	Dez	8	13	28	5.8	1	9	13	1.471	1.238	56.5	41.5	10.6	2.20	108.8	
2017	Dez	9	13	31	25.5	0	52	14	1.472	1.241	56.6	41.5	10.6	2.19	108.8	
2017	Dez	10	13	34	43.9	0	35	23	1.473	1.244	56.7	41.4	10.7	2.17	108.7	
2017	Dez	11	13	38	0.8	0	18	43	1.474	1.247	56.9	41.4	10.7	2.16	108.7	
2017	Dez	12	13	41	16.4	0	2	12	1.475	1.251	57.0	41.3	10.7	2.14	108.6	
2017	Dez	13	13	44	30.5	-	0	14	8	1.477	1.254	57.2	41.3	10.8	2.13	108.6
2017	Dez	14	13	47	43.3	-	0	30	19	1.478	1.258	57.3	41.2	10.8	2.11	108.5
2017	Dez	15	13	50	54.7	-	0	46	18	1.479	1.261	57.5	41.1	10.9	2.09	108.5
2017	Dez	16	13	54	4.6	-	1	2	7	1.480	1.265	57.7	41.1	10.9	2.08	108.4
2017	Dez	17	13	57	13.2	-	1	17	45	1.481	1.269	57.8	41.0	11.0	2.06	108.3
2017	Dez	18	14	0	20.3	-	1	33	11	1.483	1.273	58.0	41.0	11.0	2.04	108.2
2017	Dez	19	14	3	25.9	-	1	48	27	1.484	1.277	58.2	40.9	11.1	2.03	108.2
2017	Dez	20	14	6	30.1	-	2	3	30	1.485	1.282	58.4	40.8	11.1	2.01	108.1
2017	Dez	21	14	9	32.9	-	2	18	22	1.486	1.286	58.6	40.8	11.2	1.99	108.0
2017	Dez	22	14	12	34.2	-	2	33	2	1.488	1.291	58.8	40.7	11.2	1.97	107.9
2017	Dez	23	14	15	34.1	-	2	47	30	1.489	1.295	59.0	40.6	11.3	1.96	107.8
2017	Dez	24	14	18	32.5	-	3	1	46	1.490	1.300	59.3	40.6	11.4	1.94	107.7
2017	Dez	25	14	21	29.4	-	3	15	50	1.491	1.305	59.5	40.5	11.4	1.92	107.6
2017	Dez	26	14	24	24.9	-	3	29	41	1.493	1.310	59.7	40.4	11.5	1.90	107.5
2017	Dez	27	14	27	18.9	-	3	43	21	1.494	1.315	60.0	40.4	11.5	1.89	107.4
2017	Dez	28	14	30	11.4	-	3	56	48	1.495	1.320	60.2	40.3	11.6	1.87	107.3
2017	Dez	29	14	33	2.5	-	4	10	2	1.496	1.325	60.5	40.2	11.7	1.85	107.2
2017	Dez	30	14	35	52.0	-	4	23	5	1.497	1.330	60.8	40.2	11.7	1.83	107.1
2017	Dez	31	14	38	40.1	-	4	35	54	1.498	1.336	61.0	40.1	11.8	1.82	107.0

IX - Tabelas, Textos e Símbolos

Horário Mundial Diferença de hora entre o Brasil e outros países

África do Sul	+5:00	Canadá		Estados Unidos	
Alemanha		Zona Central		Zona Central	-3:00
(Boon, Frankfurt, Dusseldorf, Hamburgo e Munique	+4:00	(Winnipeg)	-3:00	(Chicago, New Orleans)	
		Zona das Montanhas		Zona das Montanhas	-4:00
		(Regina)	-4:00	Salt Lake City	
Arábia Saudita	+6:00	Zona do Pacífico		Zona do Pacífico	-5:00
		(Vancouver)	-5:00	São Francisco	
Austrália				Filipinas	+11:00
Zona Ocidental (Pert)	+11:00	Chile	-1:00	França	+ 4:00
Zona Central	+12:30			Grã Bretanha	+ 3:00
(Porto Darwin)		China	+11:00	Grécia	+ 5:00
Zona Oriental	+13:00			Holanda	+ 4:00
(Melbourne, Sidney)		Dinamarca	+4:00	Hungria	+ 4:00
Austria	+4:00	Egito	+5:00	Israel	+ 5:00
Bélgica	+4:00	Equador	-2:00	Itália	+ 4:00
Bolívia	-1:00	Espana	+4:00	Iugoslávia	+ 4:00
Canadá		Estados Unidos		Japão	+12:00
Zona Este (Montreal, Ottawa, Quebec e Toronto)	-2:00	Zona Este		México	- 3:00
		(Boston, Philadelphia, New York, Washington)	-2:00	Noruega	+ 4:00
				Panamá	- 2:00
				Paraguai	- 1:00
				Peru	- 2:00
				Polônia	+ 4:00
				Portugal	+ 3:00
				Romênia	+ 5:00
				Rússia (Moscou)	+ 6:00
				Singapura	+11:00
				Suécia	+ 4:00
				Suíça	+ 4:00
				Tchecoslováquia	+ 4:00
				Turquia	+ 5:00
				União Sul-africana	+ 5:00
				Venezuela	- 01:30

Observação: Argentina, Uruguai, Guianas e o Suriname, não possuem diferenças de fuso horário com o Brasil; assim o mesmo Horário de Brasília, será o horário corrente naquelas respectivas nações.

UNIDADES DE MEDIDA LEGAIS NO BRASIL

As unidades de base do sistema SI são apresentadas em **MAIÚSCULAS em negrito**.

As unidades derivadas do sistema SI estão apresentadas em **pequenas MAIÚSCULAS**.

As unidades admitidas internacionalmente com sistema SI estão apresentadas em minúsculas.

As unidades (não aceitas pelo sistema SI) em crescente desuso estão apresentadas com asterisco.

MÚLTIPLOS E SUBMÚLTIPLOS DECIMAIS

yotta	Y	10^{24}	de unidades	deci	d	10^{-1}	unidades
zetta	Z	10^{21}	de unidades	centi	c	10^{-2}	unidades
Exa	E	10^{18}	de unidades	mili	m	10^{-3}	unidades
peta	P	10^{15}	de unidades	micro	μ	10^{-6}	unidades
tera	T	10^{12}	de unidades	nano	n	10^{-9}	unidades
giga	G	10^9	de unidades	pico	p	10^{-12}	unidades
mega	M	10^6	de unidades	femto	f	10^{-15}	unidades
kilo	k	10^3	unidades	atto	a	10^{-18}	unidades
ecto	h	10^2	unidades	zepto	z	10^{-21}	unidades
deca	da	10^1	unidades	yocto	y	10^{-24}	unidades

I – UNIDADES GEOMÉTRICAS

Comprimento		
METRO		
Milha internacional	M	1.852 m
área ou superfície		
METRO QUADRADO	M ²	
Are	a	100m ²
Hectare	a	10.000m ²
Barn	b	10 ⁻²⁸ m ²
Volume		
METRO CÚBICO	M ³	
Litro	l (ou L)	0,001 m ³
ângulo plano		
RADIANO	rad	
volta ou rotação		2 π rad
grau*		$\pi/200$ rad
grau		$\pi/180$ rad
minuto		$\pi/10.800$ rad
segundo		$\pi/648.000$ rad

II – UNIDADES DE MASSA

Massa	
KILOGRAMA	
(os prefixos associam à unidade grama)	Kg
Tonelada	t 1000Kg
GRAMA	g 0,001g
Quilate métrico*	u 0,0002g
Unidade de Massa atômica	u 1.660 57.10 ⁻²⁷ kg
Massa linear	
KILOGRAMA POR METRO	kg/m
tex	tex 0,000 001 kg/m
Massa superficial	
KILOGRAMA POR METRO QUADRADO	Kg/m ²
Massa específica	
KILOGRAMA POR METRO CÚBICO	Kg/m ³
Volume específico	
METRO CÚBICO POR KILOGRAMA	Kg/m ⁴

III – UNIDADES DE TEMPO

Tempo		
SEGUNDO	s	
minuto	min	60s
hora		3.600s
dia	d	86.400s

IV – UNIDADES MECÂNICAS

Velocidade	
METRO POR SEGUNDO	
nó	m/s 1.852/3.600m/s
Velocidade angular	
RADIANO POR SEGUNDO	rad/s
Rotação por minuto	rpm $2\pi/60$ rad/s
Rotação por segundo	rps $2\pi/3.600$ rad/s
aceleração	
METRO POR SEGUNDO AO QUADRADO	m/s ²
gal*	Gal 0,01 m/s ²
aceleração angular	
RADIANO POR SEGUNDO AO QUADRADO	rad/s ²
Força Newton	N
Momento de uma força NEWTON-METRO	N.m

Continuação

	energia, trabalho, quantidade de energia térmica		
JOULE	J		
Watt-ora	W		3.600J
(somente para eletricidade)			
eletron-volt	eV		1,602 19.19 ⁻¹⁹ J
Potência WATT		W	
Pressão			
PASCAL	Pa		
Bar	bar		100.000 Pa
Milímetro de mercúrio			133.332 Pa
Viscosidade dinâmica			
PASCAL-SEGUNDO	Pa.s		
Poise*	P		0.1 Pa.s
Viscosidade cinemática			
METRO QUADRADO POR SEGUNDO	m/s ²		
stokes*	ST		0,000 1 m/s ²
V – UNIDADES ELÉTRICAS			
Intensidade de corrente elétrica	AMPÈRE	A	Força eletromotriz diferença de potencial (ou tensão)
Potência WATT	W		Potência aparente volt ampère
Potência reativa var	Var		Resistência elétrica OM
Condutância elétrica SIEMENS	S		Intensidade de campo elétrico VOLT POR METRO
Quantidade de eletricidade, carga elétrica			
COULOMB		C	
Ampère-hora		A	3.600 C
Capacidade elétrica		FARAD	F
Indutância elétrica		ENRY	
Fluxo de indução magnética		TESLA	T
Intensidade de campo magnético		AMPÈRE POR METRO	A/m
Força magnetomotriz		AMPÈRE	A
VI – UNIDADES TÉRMICAS			
Temperatura termodinâmica		KELVIN	K
Temperatura Celsius		GRAU CELSIUS	°C
		Quantidade de energia térmica (ver unidades mecânicas (energia))	
Fluxo de energia térmica		WATT	W
Capacidade de energia térmica		JOULE POR KELVIN	J/K
Capacidade de energia térmica (calor específico)		JOULE POR KILOGRAMA-KELVIN	J/(kg.k)
Condutividade térmica		WATT POR METRO-KELVIN	W/(m.K)
VII – UNIDADES ÓPTICAS			
Intensidade luminosa		CANDELA	Cd
Intensidade radiante ou energética		WATT POR ESTERRADIANO	W/sr
Fluxo luminoso		LÚMEN	Lm
Fluxo de energia luminosa		WATT	W
iluminância		LUX	Lx
Taxa de fluência de energia radiante		WATT POR METRO QUADRADO	W/m ²
Luminância		CANDELA POR METRO QUADRADO	Cd//m ²
vergência		1 POR METRO (ou dioptria)	m ⁻¹ (ou δ)
VIII – UNIDADES DE RADIOATIVIDADE			
Atividade radionuclear		BECQUEREL	Bq
Curie*		Ci	3,7.10 ¹⁰ Bq
Exposição de raios X ou γ		C/kg	
COULOMB POR KILOGRAMA		R	2.58.10 ⁻⁴ C/kg
röntgen*		GRAY	Gy
Dose absorvida		rf	0,01Gy
Rad*		SIEVERT	Sv
Equivalente de dose		rem	0,01Sv
Rem*			
VIII – QUANTIDADE DE MATÉRIA			
		MOL	mol

Conversão de Pesos e Medidas

1 grão	0,0648 grama	1 pé quadrado	0,0929 m quadrado
1 quilate (em geral: 5 quilates – 1 gr)	0,205 grama	1 Jarda quadrada	0,8361 m quadrado
1 onça-troy	31,104 gramas	1 milímetro quadrado	0,00155 pol. Quadrada
1 Libra (lb) (1 pound)	453,6 gramas	1 centímetro quadrado	0,155 pol. Quadrada
1 CWT (Ingl.) 112 lbs	50.80 quilos	1 metro quadrado	10.7639 pés quadrado
1 CWT (EE.UU) 100 lbs	45.36 quilos	1 metro quadrado	1.196 jardas quadrada
1 net ton (2000 lbs)	907,2 quilos	1 libra por pé	1.4882 Kg por metro
1 gross ton (2240 lbs)	1016 quilos	1 libra por jarda	0,4691 Kg por metro
1 quilo	2,2046 lbs	1 libra por pol. quadrada	0,0703 Kg por cm quadrado
100 quilos	220,466 lbs	1 libra por pé quadrado	4,88225 Kg por m quadrado
1 metr. ton (1000 kg)	2204,6 lbs	1 quilo por metro	0,6720 libras por pé
1 metr. ton (1000 Kg)	0,9842 gross ton	1 quilo por mm quadrado	1.422,32 libra por pol. quadrada
1 metr. ton (1000 kg)	1,1033 net ton	1 quilo por cm quadrado	14.2232 libra por pol. Quadrada
1 barril	158.984 litros	1 quilo por metro quadrado	0,2048 lbs por pé quadrado
1 barril	42 galões americanos	1 quilo por metro quadrado	1,8433 lbs por jarda quadrada
1 polegada	25,40 milímetros	1 picul (China)	60.453 quilos
1 pé (12 pol.)	30,48 centímetros	1 pood (Rússia)	16.380 quilos
1 jarda (3 pés)	91,44 centímetros	1 libra (Rússia)	409.500 gramas
1 milha (1760 jardas)	1.309,35 metros	1 galão (EE.UU)	3.785 litros
1 milha marítima	1.853 metros	1 galão (Inglaterra)	4,54 litros
1 milímetro	0,03937 pol.	1 bushel	35.23 litros
1 metro	39,37 pol – 3.2808 pés	1 acre (Ingl. - EE.UU)	4047 m quadrados
1 quilometro	0.62137 milha	1 milha quadrada	2.59 Km quadrados
1 quilometro	1.093,6 jardas	1 ha	10.000 m quadrados
1 pol. quadrada	6.4516 cm quadrado	1 Kin (Japão)	0.600 quilo
1 pol. quadrada	645.16 mm quadrado	1 .P	1.014 C.V.

Pesos e Medidas Brasileiras

1 palmo	22 cm	1 Alqueire do Norte	27,225 metros quadrados
1 arroba	14,689 quilos	1 Alqueire Paulista	24.200 metros quadrado
1 quintal	58,328 quilos	1 Léguas Sesmaria	6.000 metros
1 Alqueire Mineiro	48,400 m quadrados	1 Léguas Marítima	5.555,55 metros

Medidas de superfície mais usadas no Brasil

Medidas	Dimensões em metro	Superfícies m ²	Hectares
Metro quadrado	1 x 1	1	-
Braça quadrada	2.20 x 2.20	4.84	-
Hectare	100 x 100	10.000	1.00
Palmo de Sesmaria	0.22 x 6.600	1.452	-
Braça de Sesmaria	2.20 x 6.600	14.520	1.45
Quadra quadrada	132 x 132	17.424	1.74
Alqueire	110 x 220	24.200	2.42
Quadra de sesmaria	132 x 6.600	871.200	87.12
Milhão	1.000 x 1.000	1.000.000	100.00
Data de campo	1.650 x 1.650	2.722.500	272.25
Data de mato	1.650 x 3.300	5.445.000	544.50
Sesmaria de mato	1.650 x 6.600	10.890.000	1.089.00
Légua de sesmaria	6.600 x 6.600	43.560.000	4.356.00
Sesmaria de campo	6.600 x 19.800	130.680.00	13.680.00

Alfabeto Grego

α Alpha	η Eta	ν Nu	τ Tau
β Beta	θ Theta	ξ Xi	υ Upsilon
γ Gamma	ι Iota	\omicron Omicron	ϕ Phi
δ Delta	κ Kappa	π Pi	χ Chi
ϵ Epsilon	λ Lambda	ρ Rho	ψ Psi
ζ Zeta	μ Mu	σ Sigma	ω Omega

Magnitude Limite de um Telescópio

Todos os telescópios tem uma magnitude de limite visual teórica, a qual denominamos como **MALE** (Limite de Magnitude Visual Observado). Em noites com a ausência da Lua, notamos estrelas de até 6.5 magnitude. Você poderá comparar este limite através da observação direta com estrelas de baixa magnitude e a magnitude da estrela mais baixa de seu atlas celeste, ou então determiná-lo através da seguinte fórmula:

$$\text{MALE} = 6.5 + 5 \log D \text{ (cm)}$$

Onde: D = Diâmetro do telescópio.

6.5 = Limite de magnitude estelar observado a olho nu.

Na tabela seguinte, você poderá encontrar uma boa referência sobre a capacidade visual de seu instrumento, bem como seu limite prático de aumento.

Resolução, Limite de Aumento e MALE para pequenos Equipamentos Óticos.

Diâmetro da objetiva (mm)	Diâmetro da objetiva (pol.)	MALE	Resolução (Segundos de arco)	Limite de Aumento	Observações*
30	1.2	9.9	4	-	A
40	4.6	10.5	3	-	A
50	2	11	2.4	-	A
60	2.4	11.4	2	150	B
70	2.8	11.7	1.7	170	B
80	3.1	12	1.5	180	B
100	4	12.5	1.2	240 e 180	C
130	5.1	13	0.9	300 e 230	C
150	6	13.4	0.8	350 e 260	C
180	7	13.7	0.7	360	D
200	8	14	0.6	340	D
250	10	14.5	0.5	400	D
300	12	14.9	0.4	450	D
360	14	15.2	0.3	480	D
400	16	15.5	0.3	500	D

* Observações:

A = Refere-se a binóculos;

B = Refere-se a refratores (lunetas);

C = Refere-se a refratores e refletores;

D = Refere-se somente a refletores.

Símbolos mais utilizados em astronomia

α	Ascensão reta
δ	Declinação
d	Dia
H - h	Horas
M - m	Minutos de tempo
S	Segundos de tempo
$^{\circ}$	Graus
'	Minutos de arco
"	Segundos de arco
N	n Norte
S	s Sul
E	e Leste
W	w Oeste
φ	Latitude
L	Longitude
TU	Tempo Universal

Símbolos & Abreviaturas utilizadas neste Almanaque

Jan	Janeiro	Mag.	Magnitude
Fev	Fevereiro	Elong. °	Elongação
Mar	Março	Ang. PH	Ângulo de Fase
Abr	Abril	MC	Meridiano Central
Mai	Maio	TT	Tempo Terrestre
Jun	Junho	$\alpha(J2000.0)$	Ascensão reta no Equinócio J2000.0
Jul	Julho	$\delta(J2000.0)$	Declinação no Equinócio J2000.0
Ago	Agosto	a	Semi-eixo maior orbital de cometa
Set	Setembro	e	Excentricidade orbital
Out	Outubro	T	Data de passagem no Periélio
Nov	Novembro	Ref: MPC	Referência do Minor Planet Center
Dez	Dezembro	Peri	Argumento do Periélio (graus)
Seg	Segunda-feira	P/2006 T1 (Levy)	Designação e Nome de Cometa periódico (> 200 anos).
Ter	Terça-feira	(15) – Eunomia	Número e Nome de Asteroide
Qua	Quarta-feira	Node	Longitude de Nodo Ascendente
Qui	Quinta-feira	Incl.	Inclinação Orbital (graus)
Sex	Sexta-feira	PO°	Ângulo de posição da extremidade N do disco solar, (+) E; (-) W.
Sab	Sábado	BO°	Latitude heliográfica do centro do disco solar. (+) N; (-) S.
Dom	Domingo	LO°	Longitude heliográfica do meridiano central do Sol.
DT (ua)* ou (ua)	Distância a Terra em ua	NRC	Número de rotação Solar de Carrington série iniciada em novembro 1853 9,946.
\varnothing	Diâmetro	%ill	Percentual Iluminado
%ill	Percentual Iluminado	aaaa/mm./dd	Ano/mês/dia
P.H	Paralaxe Horizontal		

Nota: (ua)* Conforme a Resolução da IAU 2012 B2, acolhendo proposta do grupo de trabalho "Numerical Standards for Fundamental Astronomy", redefiniu-se a unidade astronômica de comprimento correspondendo à distância média da Terra ao Sol equivalendo assim a 149.597.870.700 metros.

Referência:
<http://www.observatorio.iag.usp.br/index.php/mencurio/curiodefin.html> - Acesso em 18 Ago. 2015.

Numeração utilizada para identificação dos satélites galileanos

SATÉLITES DE JÚPITER	1.	= Io;
	2.	= Europa;
	3.	= Ganimedes;
	4.	= Callisto;
FENÔMENOS MÚTUOS	Ec	= Eclipse do satélite pela sombra do disco do planeta;
	Tr	= Trânsito do satélite pelo disco do planeta;
	Sh	= Trânsito da sombra do satélite pelo disco do planeta;
	Oc	= Ocultação do satélite pelo disco do planeta;
	I	= Imersão;
	E	= Emersão;
	D	= Desaparecimento;
	R	= Reaparecimento.

Em função da distância à Terra, os satélites galileanos apresentam as seguintes magnitudes:

Io = 5.5; Europa = 6.1; Ganimedes = 5.1 e Callisto = 6.2.

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