# ALMANAQUE ASTRONÔMICO BRASILEIRO

# 2011

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*CEAMIG*

# ALMANAQUE ASTRONÔMICO BRASILEIRO

# 2011

# 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.

# II - Índice

## III - Apresentação

Nobres amigos (as),

Uma mudança ocorreu. Com ela também, tivemos uma mudança significativa até mesmo no próprio nome da publicação seriada do “Almanaque Astronômico”. Muito embora a presente publicação tenha o mesmo propósito e características das séries anteriores, ela sofreu algumas mudanças que consideramos oportunas.

A inclusão do nascer e ocaso do Sol para todas as capitais brasileiras, é sem dúvida uma inovação audaz, sendo esse aspecto um fator *sine qua non* para a mudança de: "**Almanaque Astronômico**" para "**Almanaque Astronômico Brasileiro**". Essa iniciativa que se iniciou em 2003 e que chega em 2011, terá como escopo a divulgação e disseminação da Ciência Astronômica, em seu aspecto simples. Assim, continuam inseridos os fenômenos corriqueiros que ocorrerão na abóbada celeste neste ano, bem como detalhes de nosso calendário.

Continuamos com os dados, que sempre são úteis às observações astronômicas sem, contudo, abrir mão de outras informações que valiosas na prática observacional do céu.

Como praxe, em seu início são vislumbrados de forma bem eclética os feriados para o ano de 2011 e para que isto ocorresse, consta nesta publicação inserida datas fixas, móveis e também algumas de caráter eclesiástico.

Outras apresentadas são as comemorativas. Entretanto, ciente que nem todas aí estão, continuamos solicitando a todos que conheçam outras igualmente importantes e sugestivas que envie com uma pequena sinopse para o CEAMIG (Centro de Estudos Astronômicos de Minas Gerais), para que possamos incluir as mesmas nas próximas edições que certamente ocorrerão nos próximos anos.

Inclui também as fases da Lua não levando em consideração, contudo, o período de vigência do horário de verão assim sendo, solicito que quando da vigência do mesmo, sejam inseridos nos horários de Brasília (Hora Legal), a quantidade de tempo definida pelo Decreto do Horário de Verão; geralmente adianta-se 60 minutos a hora oficial nos estados brasileiros citado no referido decreto (veja início e término na pág. 10).

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 (inserindo também Plutão) apresentando os diagramas e efemérides para os satélites jovianos e saturnianos também (até outubro, quando terá fim este o ciclo – iniciado em 2007 - de interrentes eventos); as ocorrências das chuvas de meteoros estão apresentadas para que possamos visualizar da melhor forma possível estes eventos.

As informações de nascer e ocaso do Sol provocado pela rotação da Terra, serão válidos somente para as capitais dos estados do Brasil, onde foram utilizadas as coordenas geográficas descritas abaixo das respectivas localidades, bem como sua localização no fuso horário.

Inclui também para a utilização em nosso dia a dia, tabelas com fusos horários de diversas nações a qual o Brasil possui relações diplomáticas; 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; símbolos e abreviaturas utilizadas neste almanaque.

Cordialmente,

## IV - Calendário 2011

### Feriados

| | | | |
|---|---|---|---|
| Confraternização Universal | 01 janeiro | Carnaval | 08 março |
| Domingo de Ramos | 16 abril | Sexta-feira da Paixão | 22 abril |
| Páscoa | 24 abril | Tiradentes | 21 abril |
| Dia de trabalho | 01 maio | Dia de Nossa Senhora | 15 agosto |
| Corpus Christi | 23 junho | Nossa Senhora Aparecida | 12 outubro |
| Independência do Brasil | 07 setembro | Proclamação da República | 15 novembro |
| Finados | 02 novembro | Natal | 25 dezembro |

### Datas Comemorativas

## Janeiro

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

## Fevereiro

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

## Março

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

## Abril

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

## Maio

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

## Junho

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

## Julho

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

## Agosto

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

## Setembro

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

## Outubro

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

## Novembro

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

## Dezembro

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

## V – Fases da Lua - 2011

Hora legal do Fuso de –03:00 horas

| Lua Nova | | | Quarto Crescente | | | Lua Cheia | | | Minguante | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mês | Dia | Hora/Minuto | Mês | Dia | Hora/Minuto | Mês | Dia | Hora/Minuto | Mês | Dia | Hora/Minuto |
| Jan | 04 | 06:05 | Jan | 12 | 08:33 | Jan | 19 | 18:23 | Jan | 26 | 09:59 |
| Fev | 02 | 23:33 | Fev | 11 | 04:20 | Fev | 18 | 05:37 | Fev | 24 | 20:28 |
| Mar | 04 | 17:48 | Mar | 12 | 20:46 | Mar | 19 | 15:11 | Mar | 26 | 09:08 |
| Abr | 03 | 11:34 | Abr | 11 | 09:06 | Abr | 17 | 23:44 | Abr | 24 | 23:47 |
| Mai | 03 | 03:51 | Mai | 10 | 17:33 | Mai | 17 | 08:08 | Mai | 24 | 15:52 |
| Jun | 01 | 18:03 | Jun | 08 | 23:10 | Jun | 15 | 17:13 | Jun | 23 | 08:49 |
| Jul | 01 | 05:54 | Jul | 08 | 03:30 | Jul | 15 | 03:39 | Jul | 23 | 02:04 |
| Jul | 30 | 15:40 | Ago | 06 | 08:09 | Ago | 13 | 15:58 | Ago | 21 | 18:57 |
| Ago | 29 | 00:04 | Set | 04 | 14:40 | Set | 12 | 06:27 | Set | 20 | 10:40 |
| Set | 27 | 08:09 | Out | 04 | 00:16 | Out | 11 | 23:07 | Out | 20 | 00:32 |
| Out | 26 | 16:57 | Nov | 02 | 13:39 | Nov | 10 | 17:18 | Nov | 18 | 12:10 |
| Nov | 25 | 03:11 | Dez | 02 | 06:53 | Dez | 10 | 11:38 | Dez | 17 | 21:49 |
| Dez | 24 | 15:08 | | | | | | | | | |

**Horário de Verão**

**Início** – 00:00 hora de 16 de outubro de 2011. **Término** = 00:00 hora de 26 de fevereiro de 2012.

### Apsides lunares

00:00 Hora – Tempo Universal

| Data | Hora | Apside | Distância (km) | Diâmetro |
|---|---|---|---|---|
| 10/01/2011 | 06:00 | Apogeu | 404.977 | 0,4918° |
| 22/01/2011 | 00:00 | Perigeu | 362.792 | 0,5490° |
| 06/02/2011 | 23:00 | Apogeu | 405.911 | 0,4906° |
| 19/02/2011 | 07:00 | Perigeu | 358.273 | 0,5559° |
| 03/03/2011 | 08:00 | Apogeu | 406.586 | 0,4898° |
| 19/03/2011 | 19:00 | Perigeu | 356.600 | 0,5585° |
| 02/04/2011 | 09:00 | Apogeu | 406.656 | 0,4897° |
| 17/04/2011 | 06:00 | Perigeu | 358.101 | 0,5561° |
| 29/04/2011 | 18:00 | Apogeu | 406.045 | 0,4905° |
| 15/05/2011 | 11:00 | Perigeu | 362.139 | 0,5499° |
| 27/05/2011 | 10:00 | Apogeu | 405.018 | 0,4917° |
| 12/06/2011 | 02:00 | Perigeu | 367.185 | 0,5424° |
| 24/06/2011 | 04:00 | Apogeu | 404.282 | 0,4926° |
| 07/07/2011 | 14:00 | Perigeu | 369.558 | 0,5389° |
| 21/07/2011 | 23:00 | Apogeu | 404.370 | 0,4925° |
| 02/08/2011 | 21:00 | Perigeu | 365.772 | 0,5445° |
| 18/08/2011 | 16:00 | Apogeu | 405.177 | 0,4915° |
| 30/08/2011 | 18:00 | Perigeu | 360.868 | 0,5519° |
| 15/09/2011 | 07:00 | Apogeu | 406.064 | 0,4905° |
| 28/09/2011 | 01:00 | Perigeu | 357.566 | 0,5570° |
| 12/10/2011 | 12:00 | Apogeu | 406.432 | 0,4900° |
| 26/10/2011 | 13:00 | Perigeu | 357.066 | 0,5578° |
| 08/11/2011 | 13:00 | Apogeu | 406.181 | 0,4903° |
| 23/11/2011 | 23:00 | Perigeu | 359.702 | 0,5537° |
| 06/12/2011 | 01:00 | Apogeu | 405.410 | 0,4912° |
| 22/12/2011 | 03:00 | Perigeu | 364.798 | 0,5459° |

# Efemérides da Lua

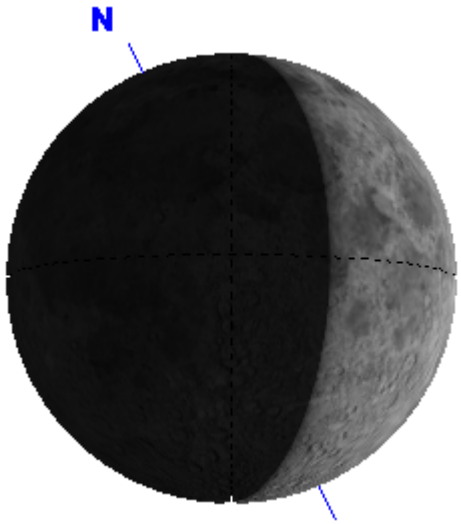
00:00 Hora – Tempo Universal

## Janeiro

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 1 | 41.0 | 138.9 | 0.123 | -7.6 |
| 2 | 28.6 | 151.3 | 0.061 | -6.7 |
| 3 | 16.4 | 163.6 | 0.020 | -5.6 |
| 4 | 4.5 | 175.5 | 0.002 | -4.4 |
| 5 | 7.5 | 172.5 | 0.004 | -4.7 |
| 6 | 19.0 | 161.0 | 0.027 | -5.9 |
| 7 | 30.3 | 30.3 | 0.069 | -6.8 |
| 8 | 41.4 | 138.5 | 0.125 | -7.7 |
| 9 | 52.3 | 127.6 | 0.195 | -8.3 |
| 10 | 63.1 | 116.7 | 0.275 | -9.0 |
| 11 | 73.9 | 105.9 | 0.363 | -9.5 |
| 12 | 84.8 | 95.1 | 0.456 | -9.9 |
| 13 | 95.7 | 84.1 | 0.551 | -10.3 |
| 14 | 106.9 | 73.0 | 0.647 | -10.7 |
| 15 | 118.4 | 61.5 | 0.739 | -11.1 |
| 16 | 130.2 | 49.7 | 0.823 | -11.4 |
| 17 | 142.4 | 37.5 | 0.897 | -11.7 |
| 18 | 155.1 | 24.9 | 0.954 | -12.1 |
| 19 | 168.0 | 11.9 | 0.989 | -12.4 |
| 20 | 177.1 | 2.9 | 0.999 | -12.7 |
| 21 | 164.5 | 15.5 | 0.982 | -12.3 |
| 22 | 150.8 | 29.2 | 0.937 | -12.0 |
| 23 | 137.1 | 42.9 | 0.867 | -11.6 |
| 24 | 123.5 | 56.4 | 0.777 | -11.2 |
| 25 | 110.1 | 69.8 | 0.673 | -10.8 |
| 26 | 97.0 | 82.9 | 0.562 | -10.4 |
| 27 | 84.1 | 95.7 | 0.450 | -9.9 |
| 28 | 71.6 | 108.3 | 0.343 | -9.4 |
| 29 | 59.3 | 120.6 | 0.246 | -8.7 |
| 30 | 47.3 | 132.6 | 0.161 | -8.0 |
| 31 | 35.5 | 144.4 | 0.093 | -7.2 |

## Fevereiro

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 1 | 23.9 | 156.0 | 0.043 | -6.3 |
| 2 | 12.7 | 167.3 | 0.012 | -5.2 |
| 3 | 3.5 | 176.4 | 0.001 | -4.3 |
| 4 | 10.8 | 169.2 | 0.009 | -5.0 |
| 5 | 21.5 | 158.5 | 0.035 | -6.1 |
| 6 | 32.3 | 147.7 | 0.078 | -7.0 |
| 7 | 43.0 | 136.9 | 0.135 | -7.8 |
| 8 | 53.8 | 126.1 | 0.205 | -8.4 |
| 9 | 64.6 | 115.3 | 0.286 | -9.0 |
| 10 | 75.5 | 104.4 | 0.376 | -9.5 |
| 11 | 86.6 | 93.3 | 0.471 | -10.0 |
| 12 | 98.0 | 81.9 | 0.570 | -10.4 |
| 13 | 109.7 | 70.2 | 0.670 | -10.8 |
| 14 | 121.8 | 58.1 | 0.765 | -11.2 |
| 15 | 134.4 | 45.5 | 0.851 | -11.5 |
| 16 | 147.4 | 32.5 | 0.922 | -11.9 |
| 17 | 160.8 | 19.2 | 0.972 | -12.2 |
| 18 | 173.5 | 6.4 | 0.997 | -12.6 |
| 19 | 169.8 | 10.2 | 0.992 | -12.5 |
| 20 | 156.2 | 23.8 | 0.958 | -12.1 |
| 21 | 142.3 | 37.6 | 0.896 | -11.7 |
| 22 | 128.6 | 51.3 | 0.813 | -11.4 |
| 23 | 115.2 | 64.6 | 0.714 | -11.0 |
| 24 | 102.3 | 77.6 | 0.607 | -10.6 |
| 25 | 89.7 | 90.1 | 0.499 | -10.1 |
| 26 | 77.5 | 102.3 | 0.393 | -9.6 |
| 27 | 65.7 | 114.2 | 0.295 | -9.1 |
| 28 | 54.1 | 125.8 | 0.208 | -8.4 |




Apogeu

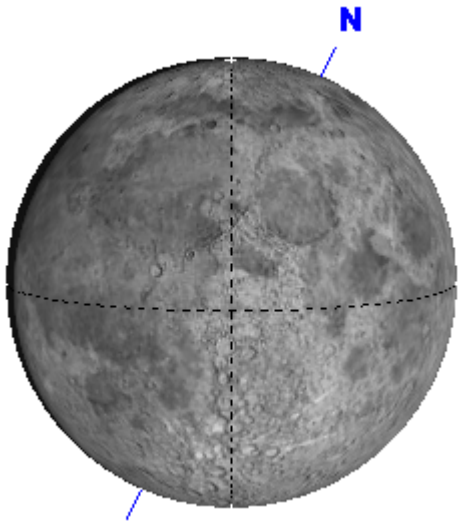
**Janeiro**

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 10 | 63.1 | 116.7 | 0.275 | -9.0 |

# Efemérides da Lua

00:00 Hora – Tempo Universal

| Março | | | | | Abril | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Dia | Elong. | Ang. PH | Fase | Mag. | Dia | Elong. | Ang. PH | Fase | Mag. |
| 1 | 42.8 | 137.1 | 0.134 | -7.8 | 1 | 28.7 | 151.2 | 0.062 | -6.7 |
| 2 | 31.7 | 148.3 | 0.075 | -6.9 | 2 | 18.1 | 161.8 | 0.025 | -5.8 |
| 3 | 20.8 | 159.1 | 0.033 | -6.0 | 3 | 8.2 | 171.8 | 0.005 | -4.8 |
| 4 | 10.5 | 169.5 | 0.008 | -5.0 | 4 | 6.3 | 173.6 | 0.003 | -4.6 |
| 5 | 5.1 | 174.9 | 0.002 | -4.4 | 5 | 15.8 | 164.2 | 0.019 | -5.5 |
| 6 | 13.3 | 166.6 | 0.014 | -5.3 | 6 | 26.5 | 153.4 | 0.053 | -6.5 |
| 7 | 23.7 | 156.2 | 0.042 | -6.3 | 7 | 37.5 | 142.4 | 0.104 | -7.4 |
| 8 | 34.4 | 145.6 | 0.088 | -7.2 | 8 | 48.7 | 131.2 | 0.171 | -8.1 |
| 9 | 45.1 | 134.7 | 0.148 | -7.9 | 9 | 60.1 | 119.8 | 0.252 | -8.8 |
| 10 | 56.1 | 123.8 | 0.222 | -8.6 | 10 | 71.8 | 108.1 | 0.345 | -9.4 |
| 11 | 67.1 | 112.7 | 0.307 | -9.2 | 11 | 83.8 | 96.0 | 0.447 | -9.9 |
| 12 | 78.5 | 101.4 | 0.401 | -9.7 | 12 | 96.2 | 83.7 | 0.555 | -10.4 |
| 13 | 90.1 | 89.7 | 0.502 | -10.1 | 13 | 109.0 | 70.9 | 0.664 | -10.8 |
| 14 | 102.2 | 77.7 | 0.607 | -10.6 | 14 | 122.2 | 57.7 | 0.767 | -11.2 |
| 15 | 114.6 | 65.3 | 0.709 | -11.0 | 15 | 135.7 | 44.2 | 0.859 | -11.6 |
| 16 | 127.5 | 52.4 | 0.805 | -11.3 | 16 | 149.5 | 30.4 | 0.931 | -11.9 |
| 17 | 140.9 | 39.0 | 0.888 | -11.7 | 17 | 163.4 | 16.5 | 0.979 | -12.3 |
| 18 | 154.5 | 25.4 | 0.952 | -12.1 | 18 | 175.4 | 4.6 | 0.998 | -12.6 |
| 19 | 168.1 | 11.9 | 0.989 | -12.4 | 19 | 167.0 | 12.9 | 0.987 | -12.4 |
| 20 | 173.9 | 6.1 | 0.997 | -12.6 | 20 | 153.6 | 26.3 | 0.948 | -12.0 |
| 21 | 161.6 | 18.4 | 0.974 | -12.3 | 21 | 140.3 | 39.6 | 0.885 | -11.7 |
| 22 | 147.8 | 32.1 | 0.924 | -11.9 | 22 | 127.4 | 52.5 | 0.804 | -11.3 |
| 23 | 134.3 | 45.6 | 0.850 | -11.5 | 23 | 115.0 | 64.9 | 0.712 | -11.0 |
| 24 | 121.1 | 58.8 | 0.759 | -11.2 | 24 | 102.9 | 76.9 | 0.613 | -10.6 |
| 25 | 108.3 | 71.5 | 0.658 | -10.8 | 25 | 91.3 | 88.5 | 0.513 | -10.2 |
| 26 | 96.0 | 83.8 | 0.554 | -10.4 | 26 | 80.0 | 99.8 | 0.415 | -9.7 |
| 27 | 84.2 | 84.2 | 95.7 | 0.450 | 27 | 68.9 | 110.9 | 0.322 | -9.2 |
| 28 | 72.6 | 107.2 | 0.352 | -9.4 | 28 | 58.0 | 121.8 | 0.236 | -8.7 |
| 29 | 61.4 | 118.5 | 0.261 | -8.9 | 29 | 47.2 | 132.7 | 0.161 | -8.0 |
| 30 | 50.3 | 129.5 | 0.182 | -8.2 | 30 | 36.4 | 143.5 | 0.098 | -7.3 |
| 31 | 39.5 | 140.4 | 0.115 | -7.5 | | | | | |




Perigeu

**Abril**

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 17 | 163.4 | 16.5 | 0.979 | -12.3 |

# Efemérides da Lua

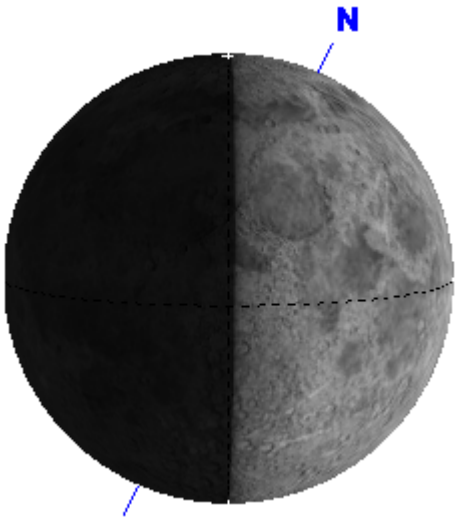
00:00 Hora – Tempo Universal

## Maio

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 1 | 25.6 | 154.3 | 0.050 | -6.5 |
| 2 | 14.9 | 165.1 | 0.017 | -5.5 |
| 3 | 4.8 | 175.2 | 0.002 | -4.4 |
| 4 | 8.5 | 171.5 | 0.006 | -4.8 |
| 5 | 19.4 | 160.5 | 0.029 | -5.9 |
| 6 | 30.9 | 149.1 | 0.071 | -6.9 |
| 7 | 42.5 | 137.3 | 0.132 | -7.7 |
| 8 | 54.5 | 125.4 | 0.210 | -8.5 |
| 9 | 66.7 | 113.2 | 0.303 | -9.1 |
| 10 | 79.1 | 100.7 | 0.407 | -9.7 |
| 11 | 91.9 | 88.0 | 0.517 | -10.2 |
| 12 | 104.9 | 75.0 | 0.630 | -10.7 |
| 13 | 118.3 | 61.6 | 0.738 | -11.1 |
| 14 | 131.9 | 48.0 | 0.834 | -11.5 |
| 15 | 145.6 | 34.3 | 0.913 | -11.8 |
| 16 | 159.5 | 20.5 | 0.968 | -12.2 |
| 17 | 173.0 | 7.0 | 0.996 | -12.5 |
| 18 | 172.5 | 7.5 | 0.996 | -12.5 |
| 19 | 159.4 | 20.5 | 0.968 | -12.2 |
| 20 | 146.5 | 33.4 | 0.917 | -11.9 |
| 21 | 134.0 | 45.9 | 0.848 | -11.5 |
| 22 | 121.9 | 58.0 | 0.765 | -11.2 |
| 23 | 110.2 | 69.7 | 0.673 | -10.8 |
| 24 | 98.8 | 81.1 | 0.577 | -10.4 |
| 25 | 87.6 | 92.2 | 0.481 | -10.0 |
| 26 | 76.7 | 103.2 | 0.386 | -9.6 |
| 27 | 65.8 | 114.1 | 0.296 | -9.1 |
| 28 | 54.9 | 124.9 | 0.214 | -8.5 |
| 29 | 44.0 | 135.9 | 0.141 | -7.8 |
| 30 | 33.0 | 147.0 | 0.081 | -7.0 |
| 31 | 21.8 | 158.2 | 0.036 | -6.1 |

## Junho

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 1 | 10.4 | 169.6 | 0.008 | -5.0 |
| 2 | 1.8 | 178.2 | 0.000 | -4.0 |
| 3 | 13.3 | 166.7 | 0.013 | -5.3 |
| 4 | 25.3 | 154.6 | 0.048 | -6.4 |
| 5 | 37.6 | 142.3 | 0.105 | -7.4 |
| 6 | 50.2 | 129.7 | 0.180 | -8.2 |
| 7 | 62.9 | 117.0 | 0.273 | -8.9 |
| 8 | 75.8 | 104.1 | 0.378 | -9.6 |
| 9 | 88.8 | 91.0 | 0.491 | -10.1 |
| 10 | 102.0 | 77.8 | 0.605 | -10.6 |
| 11 | 115.4 | 64.5 | 0.715 | -11.0 |
| 12 | 128.8 | 51.1 | 0.814 | -11.4 |
| 13 | 142.3 | 37.6 | 0.896 | -11.7 |
| 14 | 155.7 | 24.2 | 0.956 | -12.1 |
| 15 | 169.0 | 11.0 | 0.991 | -12.4 |
| 16 | 177.9 | 2.0 | 1.000 | -12.7 |
| 17 | 165.2 | 14.8 | 0.983 | -12.3 |
| 18 | 152.8 | 27.2 | 0.945 | -12.0 |
| 19 | 140.7 | 39.2 | 0.887 | -11.7 |
| 20 | 129.0 | 50.9 | 0.815 | -11.4 |
| 21 | 117.5 | 62.3 | 0.732 | -11.0 |
| 22 | 106.4 | 73.5 | 0.642 | -10.7 |
| 23 | 95.4 | 84.5 | 0.548 | -10.3 |
| 24 | 84.5 | 95.4 | 0.453 | -9.9 |
| 25 | 73.6 | 106.3 | 0.360 | -9.5 |
| 26 | 62.6 | 117.3 | 0.271 | -8.9 |
| 27 | 51.5 | 128.4 | 0.189 | -8.3 |
| 28 | 40.2 | 139.8 | 0.118 | -7.6 |
| 29 | 28.6 | 151.4 | 0.061 | -6.7 |
| 30 | 16.7 | 163.3 | 0.021 | -5.6 |




Quarto Crescente

**Junho**

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 8 | 75.8 | 104.1 | 0.378 | -9.6 |

# Efemérides da Lua

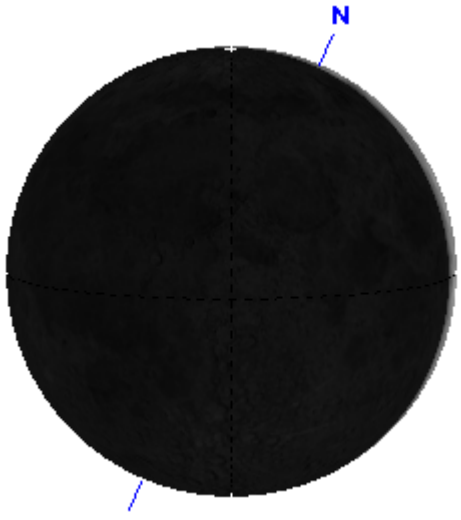
00:00 Hora – Tempo Universal

## Julho

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 1 | 4.7 | 175.3 | 0.002 | -4.4 |
| 2 | 8.2 | 171.8 | 0.005 | -4.8 |
| 3 | 20.8 | 159.1 | 0.033 | -6.0 |
| 4 | 33.7 | 146.2 | 0.084 | -7.1 |
| 5 | 46.8 | 133.1 | 0.158 | -8.0 |
| 6 | 60.0 | 119.9 | 0.251 | -8.8 |
| 7 | 73.2 | 106.7 | 0.357 | -9.4 |
| 8 | 86.4 | 93.4 | 0.470 | -10.0 |
| 9 | 99.6 | 80.2 | 0.585 | -10.5 |
| 10 | 112.8 | 67.1 | 0.695 | -10.9 |
| 11 | 125.9 | 54.0 | 0.794 | -11.3 |
| 12 | 138.9 | 41.0 | 0.877 | -11.7 |
| 13 | 151.7 | 28.3 | 0.940 | -12.0 |
| 14 | 164.2 | 15.7 | 0.981 | -12.3 |
| 15 | 175.9 | 4.1 | 0.999 | -12.6 |
| 16 | 170.7 | 9.3 | 0.993 | -12.5 |
| 17 | 159.0 | 20.9 | 0.967 | -12.2 |
| 18 | 147.5 | 32.5 | 0.922 | -11.9 |
| 19 | 136.1 | 43.8 | 0.861 | -11.6 |
| 20 | 125.0 | 54.9 | 0.788 | -11.3 |
| 21 | 114.0 | 65.8 | 0.705 | -10.9 |
| 22 | 103.2 | 76.7 | 0.615 | -10.6 |
| 23 | 92.3 | 87.6 | 0.521 | -10.2 |
| 24 | 81.3 | 98.5 | 0.426 | -9.8 |
| 25 | 70.2 | 109.6 | 0.332 | -9.3 |
| 26 | 58.9 | 121.0 | 0.242 | -8.7 |
| 27 | 47.2 | 132.7 | 0.161 | -8.0 |
| 28 | 35.3 | 144.7 | 0.092 | -7.2 |
| 29 | 23.0 | 157.0 | 0.040 | -6.2 |
| 30 | 10.5 | 169.4 | 0.008 | -5.0 |
| 31 | 4.8 | 175.2 | 0.002 | -4.4 |

## Agosto

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 1 | 16.9 | 163.0 | 0.022 | -5.7 |
| 2 | 30.3 | 149.7 | 0.068 | -6.8 |
| 3 | 43.8 | 136.1 | 0.140 | -7.8 |
| 4 | 57.3 | 122.6 | 0.231 | -8.6 |
| 5 | 70.7 | 109.2 | 0.336 | -9.3 |
| 6 | 83.9 | 95.9 | 0.448 | -9.9 |
| 7 | 97.0 | 82.9 | 0.562 | -10.4 |
| 8 | 109.8 | 70.1 | 0.671 | -10.8 |
| 9 | 122.4 | 57.5 | 0.769 | -11.2 |
| 10 | 134.8 | 45.1 | 0.853 | -11.5 |
| 11 | 147.0 | 33.0 | 0.920 | -11.9 |
| 12 | 158.8 | 21.1 | 0.966 | -12.2 |
| 13 | 170.1 | 9.9 | 0.993 | -12.5 |
| 14 | 174.9 | 5.1 | 0.998 | -12.6 |
| 15 | 165.3 | 14.6 | 0.984 | -12.3 |
| 16 | 154.4 | 25.5 | 0.951 | -12.1 |
| 17 | 143.5 | 36.4 | 0.902 | -11.8 |
| 18 | 132.6 | 47.3 | 0.839 | -11.5 |
| 19 | 121.8 | 58.1 | 0.764 | -11.2 |
| 20 | 111.0 | 68.9 | 0.680 | -10.8 |
| 21 | 100.1 | 79.8 | 0.589 | -10.5 |
| 22 | 89.0 | 90.8 | 0.493 | -10.1 |
| 23 | 77.7 | 102.1 | 0.395 | -9.6 |
| 24 | 66.1 | 113.7 | 0.299 | -9.1 |
| 25 | 54.1 | 125.7 | 0.208 | -8.5 |
| 26 | 41.8 | 138.1 | 0.128 | -7.7 |
| 27 | 29.0 | 150.9 | 0.063 | -6.7 |
| 28 | 16.0 | 163.9 | 0.020 | -5.6 |
| 29 | 5.1 | 174.9 | 0.002 | -4.4 |
| 30 | 13.2 | 166.8 | 0.013 | -5.3 |
| 31 | 26.6 | 153.3 | 0.053 | -6.5 |




Perigeu

**Agosto**

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 30 | 13.2 | 166.8 | 0.013 | -5.3 |

# Efemérides da Lua

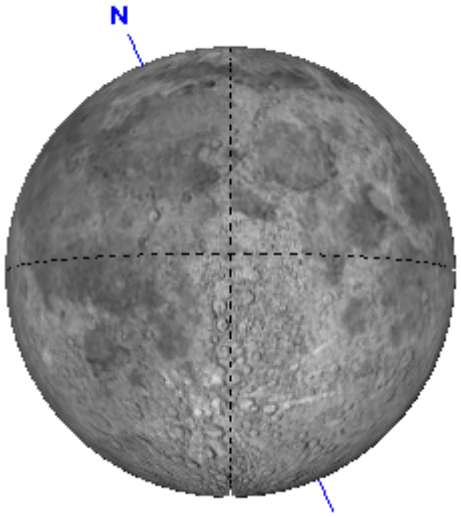
00:00 Hora – Tempo Universal

## Setembro

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 1 | 40.4 | 139.5 | 0.120 | -7.6 |
| 2 | 54.1 | 125.8 | 0.207 | -8.4 |
| 3 | 67.5 | 112.4 | 0.310 | -9.2 |
| 4 | 80.6 | 99.3 | 0.419 | -9.8 |
| 5 | 93.4 | 86.5 | 0.530 | -10.3 |
| 6 | 105.8 | 74.1 | 0.637 | -10.7 |
| 7 | 117.9 | 61.9 | 0.735 | -11.1 |
| 8 | 129.8 | 50.1 | 0.821 | -11.4 |
| 9 | 141.4 | 38.5 | 0.891 | -11.7 |
| 10 | 152.7 | 27.2 | 0.945 | -12.0 |
| 11 | 163.7 | 16.2 | 0.980 | -12.3 |
| 12 | 173.4 | 6.6 | 0.997 | -12.6 |
| 13 | 171.7 | 8.3 | 0.995 | -12.5 |
| 14 | 161.7 | 18.3 | 0.975 | -12.3 |
| 15 | 151.1 | 28.8 | 0.938 | -12.0 |
| 16 | 140.4 | 39.5 | 0.886 | -11.7 |
| 17 | 129.6 | 50.3 | 0.820 | -11.4 |
| 18 | 118.8 | 61.1 | 0.742 | -11.1 |
| 19 | 107.7 | 72.1 | 0.654 | -10.7 |
| 20 | 96.5 | 83.3 | 0.558 | -10.4 |
| 21 | 85.0 | 94.9 | 0.458 | -9.9 |
| 22 | 73.1 | 106.8 | 0.356 | -9.4 |
| 23 | 60.8 | 119.1 | 0.257 | -8.8 |
| 24 | 48.0 | 131.9 | 0.166 | -8.1 |
| 25 | 34.8 | 145.1 | 0.090 | -7.2 |
| 26 | 21.3 | 158.7 | 0.034 | -6.1 |
| 27 | 8.3 | 171.7 | 0.005 | -4.8 |
| 28 | 8.9 | 171.1 | 0.006 | -4.9 |
| 29 | 22.2 | 157.7 | 0.037 | -6.2 |
| 30 | 36.1 | 143.8 | 0.096 | -7.3 |

## Outubro

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 1 | 49.7 | 130.2 | 0.177 | -8.2 |
| 2 | 63.0 | 116.9 | 0.274 | -8.9 |
| 3 | 75.9 | 104.0 | 0.379 | -9.6 |
| 4 | 88.4 | 91.5 | 0.487 | -10.1 |
| 5 | 100.4 | 79.4 | 0.592 | -10.5 |
| 6 | 112.1 | 67.7 | 0.690 | -10.9 |
| 7 | 123.6 | 56.3 | 0.778 | -11.2 |
| 8 | 134.8 | 45.1 | 0.853 | -11.5 |
| 9 | 145.8 | 34.1 | 0.914 | -11.8 |
| 10 | 156.7 | 23.2 | 0.959 | -12.1 |
| 11 | 167.2 | 12.7 | 0.988 | -12.4 |
| 12 | 175.6 | 4.4 | 0.999 | -12.6 |
| 13 | 169.4 | 10.5 | 0.992 | -12.5 |
| 14 | 159.0 | 20.9 | 0.967 | -12.2 |
| 15 | 148.3 | 31.6 | 0.926 | -11.9 |
| 16 | 137.4 | 42.5 | 0.869 | -11.6 |
| 17 | 126.3 | 53.5 | 0.797 | -11.3 |
| 18 | 115.1 | 64.8 | 0.713 | -11.0 |
| 19 | 103.6 | 76.3 | 0.619 | -10.6 |
| 20 | 91.8 | 88.1 | 0.517 | -10.2 |
| 21 | 79.5 | 100.3 | 0.411 | -9.7 |
| 22 | 66.9 | 113.0 | 0.305 | -9.1 |
| 23 | 53.8 | 126.1 | 0.206 | -8.4 |
| 24 | 40.3 | 139.6 | 0.119 | -7.6 |
| 25 | 26.5 | 153.4 | 0.053 | -6.5 |
| 26 | 12.6 | 167.4 | 0.012 | -5.2 |
| 27 | 4.1 | 175.9 | 0.001 | -4.3 |
| 28 | 16.7 | 163.2 | 0.021 | -5.6 |
| 29 | 30.5 | 149.4 | 0.070 | -6.9 |
| 30 | 44.0 | 135.9 | 0.141 | -7.8 |
| 31 | 57.1 | 122.8 | 0.229 | -8.6 |




Apogeu

## Outubro

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 12 | 175.6 | 4.4 | 0.999 | -12,6 |

# Efemérides da Lua

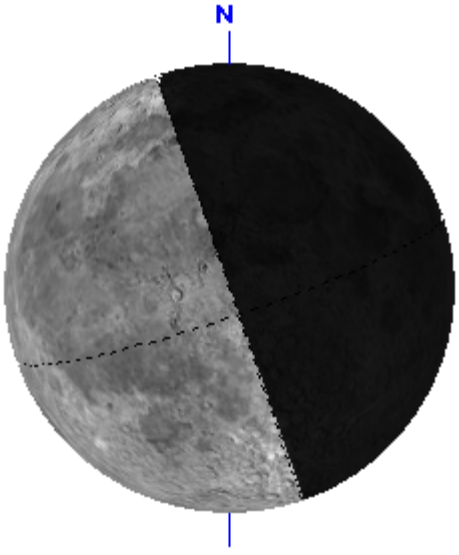
00:00 Hora – Tempo Universal

## Novembro

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 1 | 69.7 | 110.2 | 0.327 | -9.3 |
| 2 | 81.8 | 98.0 | 0.430 | -9.8 |
| 3 | 93.6 | 86.3 | 0.532 | -10.3 |
| 4 | 105.0 | 74.9 | 0.631 | -10.7 |
| 5 | 116.2 | 63.7 | 0.722 | -11.0 |
| 6 | 127.1 | 52.7 | 0.803 | -11.3 |
| 7 | 138.0 | 41.9 | 0.872 | -11.6 |
| 8 | 148.8 | 31.1 | 0.928 | -11.9 |
| 9 | 159.6 | 20.4 | 0.969 | -12.2 |
| 10 | 170.3 | 9.7 | 0.993 | -12.5 |
| 11 | 177.2 | 2.7 | 0.999 | -12.7 |
| 12 | 167.3 | 12.7 | 0.988 | -12.4 |
| 13 | 156.2 | 23.7 | 0.958 | -12.1 |
| 14 | 145.0 | 34.9 | 0.910 | -11.8 |
| 15 | 133.6 | 46.3 | 0.845 | -11.5 |
| 16 | 121.9 | 57.9 | 0.765 | -11.2 |
| 17 | 110.0 | 69.8 | 0.672 | -10.8 |
| 18 | 97.9 | 82.0 | 0.570 | -10.4 |
| 19 | 85.3 | 94.5 | 0.461 | -10.0 |
| 20 | 72.5 | 107.4 | 0.350 | -9.4 |
| 21 | 59.2 | 120.7 | 0.245 | -8.7 |
| 22 | 45.6 | 134.3 | 0.151 | -7.9 |
| 23 | 31.8 | 148.2 | 0.075 | -6.9 |
| 24 | 17.7 | 162.2 | 0.024 | -5.7 |
| 25 | 3.8 | 176.2 | 0.001 | -4.3 |
| 26 | 10.3 | 169.7 | 0.008 | -5.0 |
| 27 | 23.8 | 156.1 | 0.043 | -6.3 |
| 28 | 37.0 | 142.9 | 0.101 | -7.3 |
| 29 | 49.8 | 130.1 | 0.178 | -8.2 |
| 30 | 62.0 | 117.8 | 0.267 | -8.9 |

## Dezembro

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 1 | 73.9 | 106.0 | 0.363 | -9.5 |
| 2 | 85.4 | 94.5 | 0.461 | -10.0 |
| 3 | 96.6 | 83.3 | 0.558 | -10.4 |
| 4 | 107.5 | 72.3 | 0.652 | -10.7 |
| 5 | 118.4 | 61.5 | 0.739 | -11.1 |
| 6 | 129.2 | 50.7 | 0.817 | -11.4 |
| 7 | 140.0 | 39.9 | 0.884 | -11.7 |
| 8 | 150.9 | 29.0 | 0.937 | -12.0 |
| 9 | 162.0 | 18.0 | 0.976 | -12.3 |
| 10 | 173.1 | 6.8 | 0.996 | -12.6 |
| 11 | 175.5 | 4.5 | 0.998 | -12.6 |
| 12 | 163.9 | 16.0 | 0.981 | -12.3 |
| 13 | 152.2 | 27.7 | 0.943 | -12.0 |
| 14 | 140.3 | 39.6 | 0.885 | -11.7 |
| 15 | 128.1 | 51.8 | 0.810 | -11.4 |
| 16 | 115.8 | 64.1 | 0.719 | -11.0 |
| 17 | 103.2 | 76.6 | 0.616 | -10.6 |
| 18 | 90.4 | 89.4 | 0.505 | -10.1 |
| 19 | 77.4 | 102.5 | 0.392 | -9.6 |
| 20 | 64.1 | 115.7 | 0.283 | -9.0 |
| 21 | 50.7 | 129.2 | 0.184 | -8.3 |
| 22 | 37.1 | 142.8 | 0.102 | -7.4 |
| 23 | 23.5 | 156.4 | 0.042 | -6.3 |
| 24 | 10.1 | 169.9 | 0.008 | -5.0 |
| 25 | 3.8 | 176.2 | 0.001 | -4.3 |
| 26 | 16.6 | 163.4 | 0.021 | -5.6 |
| 27 | 29.2 | 150.7 | 0.064 | -6.7 |
| 28 | 41.5 | 138.4 | 0.126 | -7.7 |
| 29 | 53.4 | 126.5 | 0.203 | -8.4 |
| 30 | 64.9 | 114.9 | 0.289 | -9.0 |
| 31 | 76.2 | 103.7 | 0.382 | -9.6 |




Minguante

## Novembro

| Dia | Elong. | Ang. PH | Fase | Mag. |
|---|---|---|---|---|
| 18 | 97.9 | 82.0 | 0.570 | -10,4 |

## VI - Efemérides do Sol

00:00 Hora – Tempo Universal

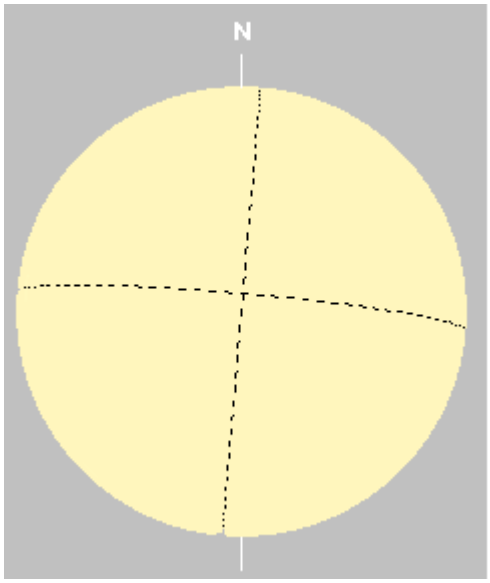
### Janeiro

| Dia | ∅ " | DT (UA)* | P.H |
|---|---|---|---|
| 1 | 1951.75 | 0.9833559 | 8.94" |
| 2 | 1951.76 | 0.9833472 | 8.94" |
| 3 | 1951.77 | 0.9833424 | 8.94" |
| 4 | 1951.77 | 0.9833414 | 8.94" |
| 5 | 1951.77 | 0.9833441 | 8.94" |
| 6 | 1951.76 | 0.9833506 | 8.94" |
| 7 | 1951.73 | 0.9833610 | 8.94" |
| 8 | 1951.71 | 0.9833755 | 8.94" |
| 9 | 1951.67 | 0.9833940 | 8.94" |
| 10 | 1951.62 | 0.9834169 | 8.94" |
| 11 | 1951.57 | 0.9834443 | 8.94" |
| 12 | 1951.51 | 0.9834764 | 8.94" |
| 13 | 1951.43 | 0.9835135 | 8.94" |
| 14 | 1951.35 | 0.9835557 | 8.94" |
| 15 | 1951.25 | 0.9836033 | 8.94" |
| 16 | 1951.15 | 0.9836565 | 8.94" |
| 17 | 1951.03 | 0.9837156 | 8.94" |
| 18 | 1950.90 | 0.9837807 | 8.94" |
| 19 | 1950.76 | 0.9838522 | 8.94" |
| 20 | 1950.61 | 0.9839300 | 8.94" |
| 21 | 1950.44 | 0.9840143 | 8.94" |
| 22 | 1950.26 | 0.9841049 | 8.94" |
| 23 | 1950.07 | 0.9842018 | 8.94" |
| 24 | 1949.86 | 0.9843046 | 8.94" |
| 25 | 1949.65 | 0.9844130 | 8.94" |
| 26 | 1949.42 | 0.9845267 | 8.94" |
| 27 | 1949.19 | 0.9846453 | 8.94" |
| 28 | 1948.95 | 0.9847684 | 8.94" |
| 29 | 1948.69 | 0.9848956 | 8.94" |
| 30 | 1948.43 | 0.9850268 | 8.94" |
| 31 | 1948.17 | 0.9851615 | 8.94" |

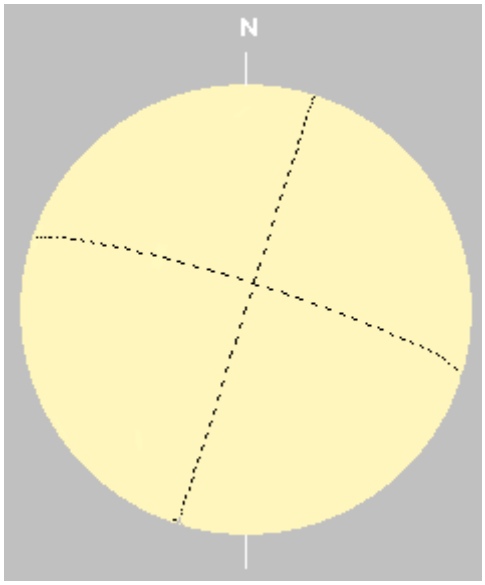
### Fevereiro

| Dia | ∅ " | DT (UA)* | P.H |
|---|---|---|---|
| 1 | 1947.89 | 0.9852997 | 8.94" |
| 2 | 1947.62 | 0.9854411 | 8.94" |
| 3 | 1947.33 | 0.9855858 | 8.94" |
| 4 | 1947.04 | 0.9857335 | 8.94" |
| 5 | 1946.74 | 0.9858843 | 8.94" |
| 6 | 1946.44 | 0.9860383 | 8.94" |
| 7 | 1946.13 | 0.9861954 | 8.94" |
| 8 | 1945.81 | 0.9863558 | 8.94" |
| 9 | 1945.49 | 0.9865197 | 8.94" |
| 10 | 1945.16 | 0.9866870 | 8.94" |
| 11 | 1944.82 | 0.9868581 | 8.94" |
| 12 | 1944.47 | 0.9870330 | 8.94" |
| 13 | 1944.12 | 0.9872120 | 8.94" |
| 14 | 1943.76 | 0.9873953 | 8.94" |
| 15 | 1943.39 | 0.9875832 | 8.94" |
| 16 | 1943.01 | 0.9877757 | 8.94" |
| 17 | 1942.62 | 0.9879733 | 8.94" |
| 18 | 1942.23 | 0.9881759 | 8.94" |
| 19 | 1941.82 | 0.9883836 | 8.94" |
| 20 | 1941.40 | 0.9885964 | 8.94" |
| 21 | 1940.97 | 0.9888140 | 8.94" |
| 22 | 1940.54 | 0.9890363 | 8.94" |
| 23 | 1940.09 | 0.9892628 | 8.94" |
| 24 | 1939.64 | 0.9894931 | 8.94" |
| 25 | 1939.18 | 0.9897268 | 8.94" |
| 26 | 1938.72 | 0.9899636 | 8.94" |
| 27 | 1938.25 | 0.9902031 | 8.94" |
| 28 | 1937.78 | 0.9904448 | 8.94" |
| 29 | 1937.30 | 0.9906887 | 8.94" |

15 Jan = 12:00 TU -




15 Fev = 12:00 TU



## Efemérides do Sol

00:00 Hora – Tempo Universal

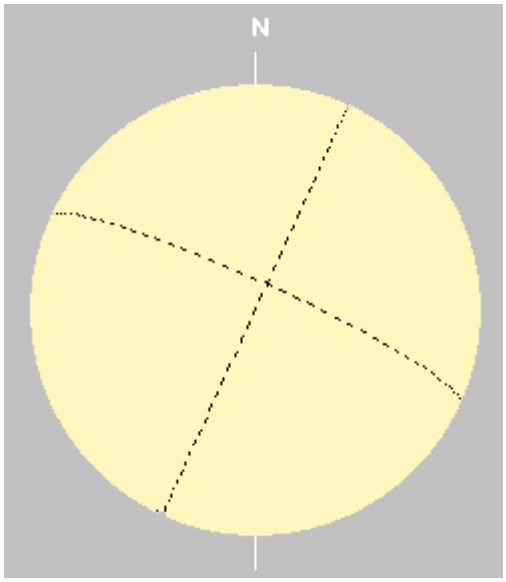
### Março

| Dia | ∅ " | DT (UA)* | P.H |
|---|---|---|---|
| 1 | 1937.30 | 0.9906887 | 8.94" |
| 2 | 1936.82 | 0.9909344 | 8.94" |
| 3 | 1936.34 | 0.9911816 | 8.94" |
| 4 | 1935.85 | 0.9914303 | 8.94" |
| 5 | 1935.36 | 0.9916803 | 8.94" |
| 6 | 1934.87 | 0.9919316 | 8.94" |
| 7 | 1934.38 | 0.9921840 | 8.94" |
| 8 | 1933.88 | 0.9924376 | 8.94" |
| 9 | 1933.39 | 0.9926924 | 8.94" |
| 10 | 1932.89 | 0.9929484 | 8.94" |
| 11 | 1932.39 | 0.9932058 | 8.94" |
| 12 | 1931.89 | 0.9934647 | 8.94" |
| 13 | 1931.38 | 0.9937252 | 8.94" |
| 14 | 1930.87 | 0.9939875 | 8.94" |
| 15 | 1930.36 | 0.9942518 | 8.94" |
| 16 | 1929.84 | 0.9945183 | 8.94" |
| 17 | 1929.32 | 0.9947873 | 8.94" |
| 18 | 1928.79 | 0.9950591 | 8.94" |
| 19 | 1928.26 | 0.9953336 | 8.94" |
| 20 | 1927.72 | 0.9956111 | 8.94" |
| 21 | 1927.18 | 0.9958914 | 8.94" |
| 22 | 1926.63 | 0.9961745 | 8.94" |
| 23 | 1926.08 | 0.9964599 | 8.94" |
| 24 | 1925.52 | 0.9967474 | 8.94" |
| 25 | 1924.96 | 0.9970365 | 8.94" |
| 26 | 1924.40 | 0.9973268 | 8.94" |
| 27 | 1923.84 | 0.9976181 | 8.94" |
| 28 | 1923.28 | 0.9979098 | 8.94" |
| 29 | 1922.72 | 0.9982016 | 8.94" |
| 30 | 1922.16 | 0.9984933 | 8.94" |
| 31 | 1921.60 | 0.9987846 | 8.94" |

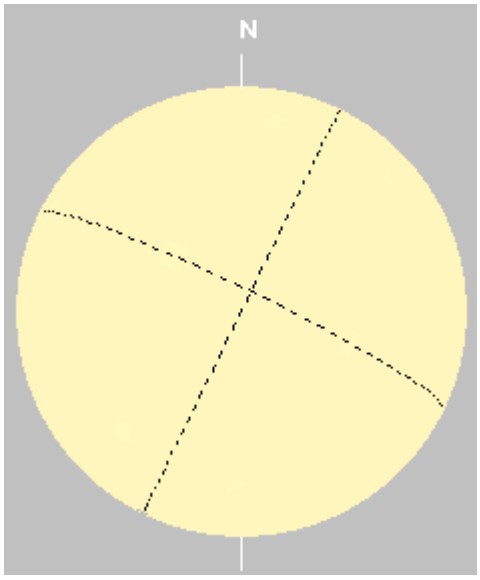
### Abril

| Dia | ∅ " | DT (UA)* | P.H |
|---|---|---|---|
| 1 | 1921.04 | 0.9990752 | 8.94" |
| 2 | 1920.48 | 0.9993649 | 8.94" |
| 3 | 1919.93 | 0.9996536 | 8.94" |
| 4 | 1919.37 | 0.9999411 | 8.94" |
| 5 | 1918.82 | 1.0002273 | 8.94" |
| 6 | 1918.28 | 1.0005122 | 8.94" |
| 7 | 1917.73 | 1.0007957 | 8.94" |
| 8 | 1917.19 | 1.0010779 | 8.94" |
| 9 | 1916.66 | 1.0013588 | 8.94" |
| 10 | 1916.12 | 1.0016386 | 8.94" |
| 11 | 1915.59 | 1.0019175 | 8.94" |
| 12 | 1915.06 | 1.0021955 | 8.94" |
| 13 | 1914.53 | 1.0024729 | 8.94" |
| 14 | 1914.00 | 1.0027500 | 8.94" |
| 15 | 1913.47 | 1.0030270 | 8.94" |
| 16 | 1912.94 | 1.0033042 | 8.94" |
| 17 | 1912.41 | 1.0035817 | 8.94" |
| 18 | 1911.88 | 1.0038597 | 8.94" |
| 19 | 1911.35 | 1.0041380 | 8.94" |
| 20 | 1910.82 | 1.0044166 | 8.94" |
| 21 | 1910.29 | 1.0046953 | 8.94" |
| 22 | 1909.76 | 1.0049736 | 8.94" |
| 23 | 1909.23 | 1.0052513 | 8.94" |
| 24 | 1908.71 | 1.0055280 | 8.94" |
| 25 | 1908.19 | 1.0058033 | 8.94" |
| 26 | 1907.67 | 1.0060768 | 8.94" |
| 27 | 1907.15 | 1.0063483 | 8.94" |
| 28 | 1906.64 | 1.0066174 | 8.94" |
| 29 | 1906.14 | 1.0068838 | 8.94" |
| 30 | 1905.64 | 1.0071473 | 8.94" |

15 Mar = 12:00 TU -




15 Abr = 12:00 TU



## Efemérides do Sol

00:00 Hora – Tempo Universal

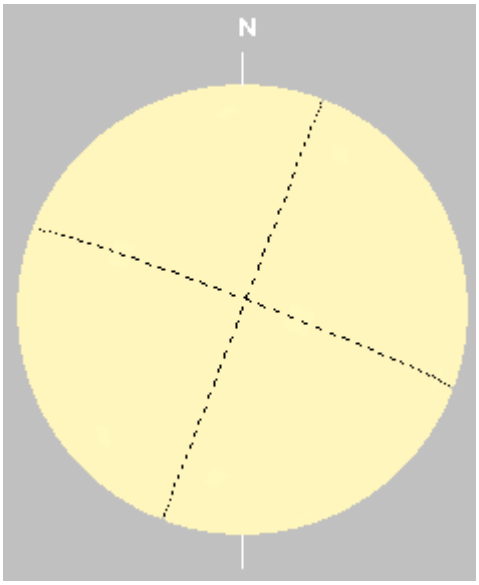
### Maio

| Dia | ∅ " | DT (UA)* | P.H |
|---|---|---|---|
| 1 | 1905.15 | 1.0074077 | 8.94" |
| 2 | 1904.66 | 1.0076648 | 8.94" |
| 3 | 1904.18 | 1.0079183 | 8.94" |
| 4 | 1903.71 | 1.0081683 | 8.94" |
| 5 | 1903.25 | 1.0084146 | 8.94" |
| 6 | 1902.79 | 1.0086571 | 8.94" |
| 7 | 1902.34 | 1.0088959 | 8.94" |
| 8 | 1901.89 | 1.0091311 | 8.94" |
| 9 | 1901.46 | 1.0093627 | 8.94" |
| 10 | 1901.03 | 1.0095910 | 8.94" |
| 11 | 1900.60 | 1.0098162 | 8.94" |
| 12 | 1900.18 | 1.0100386 | 8.94" |
| 13 | 1899.77 | 1.0102583 | 8.94" |
| 14 | 1899.36 | 1.0104758 | 8.94" |
| 15 | 1898.96 | 1.0106912 | 8.94" |
| 16 | 1898.56 | 1.0109048 | 8.94" |
| 17 | 1898.16 | 1.0111167 | 8.94" |
| 18 | 1897.76 | 1.0113269 | 8.94" |
| 19 | 1897.37 | 1.0115352 | 8.94" |
| 20 | 1896.99 | 1.0117416 | 8.94" |
| 21 | 1896.60 | 1.0119458 | 8.94" |
| 22 | 1896.23 | 1.0121475 | 8.94" |
| 23 | 1895.85 | 1.0123463 | 8.94" |
| 24 | 1895.49 | 1.0125420 | 8.94" |
| 25 | 1895.13 | 1.0127342 | 8.94" |
| 26 | 1894.77 | 1.0129227 | 8.94" |
| 27 | 1894.43 | 1.0131071 | 8.94" |
| 28 | 1894.09 | 1.0132871 | 8.94" |
| 29 | 1893.76 | 1.0134626 | 8.94" |
| 30 | 1893.45 | 1.0136334 | 8.94" |
| 31 | 1893.14 | 1.0137991 | 8.94" |

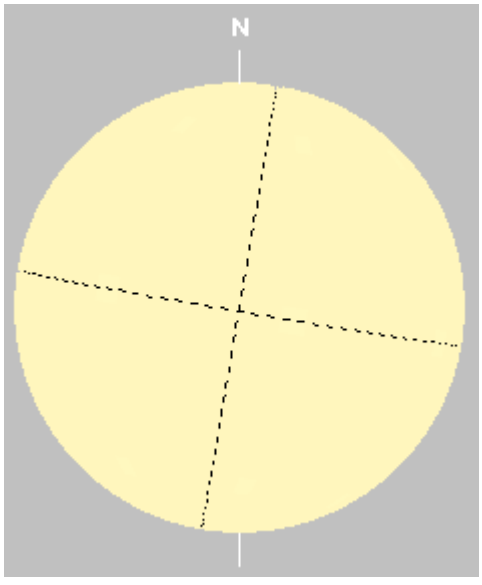
### Junho

| Dia | ∅ " | DT (UA)* | P.H |
|---|---|---|---|
| 1 | 1892.84 | 1.0139596 | 8.94" |
| 2 | 1892.55 | 1.0141147 | 8.94" |
| 3 | 1892.27 | 1.0142645 | 8.94" |
| 4 | 1892.00 | 1.0144088 | 8.94" |
| 5 | 1891.74 | 1.0145477 | 8.94" |
| 6 | 1891.49 | 1.0146813 | 8.94" |
| 7 | 1891.25 | 1.0148097 | 8.94" |
| 8 | 1891.02 | 1.0149331 | 8.94" |
| 9 | 1890.80 | 1.0150519 | 8.94" |
| 10 | 1890.59 | 1.0151663 | 8.94" |
| 11 | 1890.38 | 1.0152766 | 8.94" |
| 12 | 1890.18 | 1.0153832 | 8.94" |
| 13 | 1889.99 | 1.0154864 | 8.94" |
| 14 | 1889.80 | 1.0155863 | 8.94" |
| 15 | 1889.62 | 1.0156831 | 8.94" |
| 16 | 1889.45 | 1.0157768 | 8.94" |
| 17 | 1889.28 | 1.0158675 | 8.94" |
| 18 | 1889.12 | 1.0159550 | 8.94" |
| 19 | 1888.96 | 1.0160392 | 8.94" |
| 20 | 1888.81 | 1.0161198 | 8.94" |
| 21 | 1888.67 | 1.0161966 | 8.94" |
| 22 | 1888.53 | 1.0162694 | 8.94" |
| 23 | 1888.41 | 1.0163378 | 8.94" |
| 24 | 1888.29 | 1.0164016 | 8.94" |
| 25 | 1888.18 | 1.0164607 | 8.94" |
| 26 | 1888.08 | 1.0165146 | 8.94" |
| 27 | 1887.99 | 1.0165633 | 8.94" |
| 28 | 1887.91 | 1.0166064 | 8.94" |
| 29 | 1887.84 | 1.0166437 | 8.94" |
| 30 | 1887.78 | 1.0166751 | 8.94" |
| | | | 8.94" |

15 Mai = 12:00 TU -




15 Jun = 12:00 TU



## Efemérides do Sol

00:00 Hora – Tempo Universal

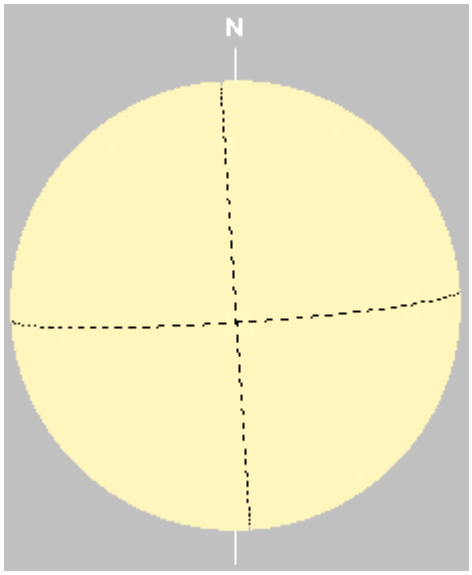
### Julho

| Dia | ∅ " | DT (UA)* | P.H |
|---|---|---|---|
| 1 | 1887.73 | 1.0167004 | 8.94" |
| 2 | 1887.70 | 1.0167196 | 8.94" |
| 3 | 1887.67 | 1.0167325 | 8.94" |
| 4 | 1887.66 | 1.0167392 | 8.94" |
| 5 | 1887.66 | 1.0167400 | 8.94" |
| 6 | 1887.67 | 1.0167349 | 8.94" |
| 7 | 1887.69 | 1.0167242 | 8.94" |
| 8 | 1887.72 | 1.0167083 | 8.94" |
| 9 | 1887.76 | 1.0166875 | 8.94" |
| 10 | 1887.80 | 1.0166622 | 8.94" |
| 11 | 1887.86 | 1.0166327 | 8.94" |
| 12 | 1887.92 | 1.0165993 | 8.94" |
| 13 | 1887.99 | 1.0165623 | 8.94" |
| 14 | 1888.07 | 1.0165218 | 8.94" |
| 15 | 1888.15 | 1.0164779 | 8.94" |
| 16 | 1888.23 | 1.0164307 | 8.94" |
| 17 | 1888.33 | 1.0163802 | 8.94" |
| 18 | 1888.43 | 1.0163261 | 8.94" |
| 19 | 1888.54 | 1.0162685 | 8.94" |
| 20 | 1888.65 | 1.0162071 | 8.94" |
| 21 | 1888.77 | 1.0161418 | 8.94" |
| 22 | 1888.90 | 1.0160724 | 8.94" |
| 23 | 1889.04 | 1.0159986 | 8.94" |
| 24 | 1889.18 | 1.0159202 | 8.94" |
| 25 | 1889.34 | 1.0158371 | 8.94" |
| 26 | 1889.50 | 1.0157491 | 8.94" |
| 27 | 1889.68 | 1.0156558 | 8.94" |
| 28 | 1889.86 | 1.0155571 | 8.94" |
| 29 | 1890.05 | 1.0154527 | 8.94" |
| 30 | 1890.26 | 1.0153426 | 8.94" |
| 31 | 1890.47 | 1.0152267 | 8.94" |

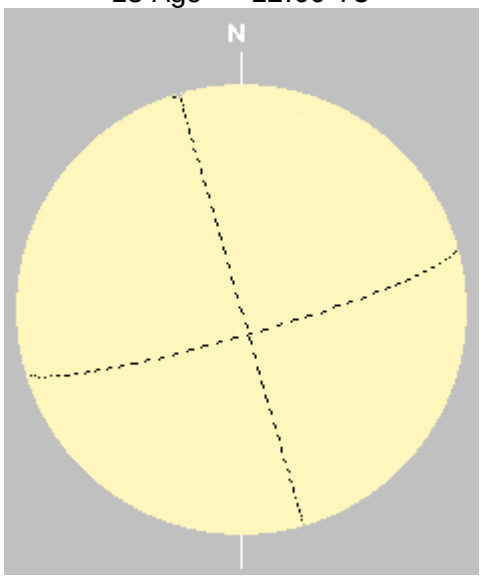
### Agosto

| Dia | ∅ " | DT (UA)* | P.H |
|---|---|---|---|
| 1 | 1890.70 | 1.0151048 | 8.94" |
| 2 | 1890.94 | 1.0149771 | 8.94" |
| 3 | 1891.19 | 1.0148438 | 8.94" |
| 4 | 1891.45 | 1.0147050 | 8.94" |
| 5 | 1891.71 | 1.0145612 | 8.94" |
| 6 | 1891.99 | 1.0144126 | 8.94" |
| 7 | 1892.28 | 1.0142597 | 8.94" |
| 8 | 1892.57 | 1.0141029 | 8.94" |
| 9 | 1892.87 | 1.0139425 | 8.94" |
| 10 | 1893.17 | 1.0137788 | 8.94" |
| 11 | 1893.49 | 1.0136121 | 8.94" |
| 12 | 1893.80 | 1.0134427 | 8.94" |
| 13 | 1894.12 | 1.0132705 | 8.94" |
| 14 | 1894.45 | 1.0130959 | 8.94" |
| 15 | 1894.78 | 1.0129187 | 8.94" |
| 16 | 1895.12 | 1.0127390 | 8.94" |
| 17 | 1895.46 | 1.0125567 | 8.94" |
| 18 | 1895.81 | 1.0123717 | 8.94" |
| 19 | 1896.16 | 1.0121840 | 8.94" |
| 20 | 1896.51 | 1.0119934 | 8.94" |
| 21 | 1896.88 | 1.0117997 | 8.94" |
| 22 | 1897.25 | 1.0116027 | 8.94" |
| 23 | 1897.62 | 1.0114024 | 8.94" |
| 24 | 1898.01 | 1.0111984 | 8.94" |
| 25 | 1898.40 | 1.0109906 | 8.94" |
| 26 | 1898.79 | 1.0107788 | 8.94" |
| 27 | 1899.20 | 1.0105627 | 8.94" |
| 28 | 1899.61 | 1.0103422 | 8.94" |
| 29 | 1900.04 | 1.0101172 | 8.94" |
| 30 | 1900.47 | 1.0098876 | 8.94" |
| 31 | 1900.91 | 1.0096536 | 8.94" |

15 Jul = 12:00 TU -




15 Ago = 12:00 TU



## Efemérides do Sol

00:00 Hora – Tempo Universal

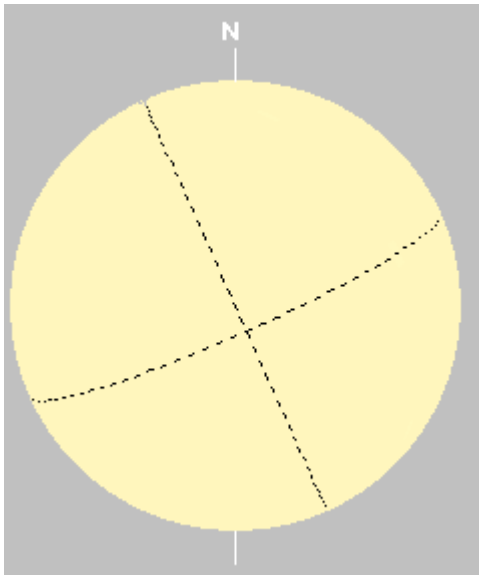
### Setembro

| Dia | ∅ " | DT (UA)* | P.H |
|---|---|---|---|
| 1 | 1901.36 | 1.0094153 | 8.94" |
| 2 | 1901.81 | 1.0091730 | 8.94" |
| 3 | 1902.28 | 1.0089270 | 8.94" |
| 4 | 1902.75 | 1.0086778 | 8.94" |
| 5 | 1903.22 | 1.0084258 | 8.94" |
| 6 | 1903.70 | 1.0081714 | 8.94" |
| 7 | 1904.19 | 1.0079149 | 8.94" |
| 8 | 1904.68 | 1.0076567 | 8.94" |
| 9 | 1905.17 | 1.0073971 | 8.94" |
| 10 | 1905.66 | 1.0071363 | 8.94" |
| 11 | 1906.16 | 1.0068745 | 8.94" |
| 12 | 1906.65 | 1.0066119 | 8.94" |
| 13 | 1907.15 | 1.0063485 | 8.94" |
| 14 | 1907.65 | 1.0060844 | 8.94" |
| 15 | 1908.16 | 1.0058196 | 8.94" |
| 16 | 1908.66 | 1.0055541 | 8.94" |
| 17 | 1909.16 | 1.0052879 | 8.94" |
| 18 | 1909.67 | 1.0050209 | 8.94" |
| 19 | 1910.18 | 1.0047529 | 8.94" |
| 20 | 1910.69 | 1.0044839 | 8.94" |
| 21 | 1911.21 | 1.0042136 | 8.94" |
| 22 | 1911.72 | 1.0039419 | 8.94" |
| 23 | 1912.24 | 1.0036686 | 8.94" |
| 24 | 1912.77 | 1.0033935 | 8.94" |
| 25 | 1913.30 | 1.0031162 | 8.94" |
| 26 | 1913.83 | 1.0028368 | 8.94" |
| 27 | 1914.37 | 1.0025549 | 8.94" |
| 28 | 1914.91 | 1.0022707 | 8.94" |
| 29 | 1915.46 | 1.0019841 | 8.94" |
| 30 | 1916.01 | 1.0016953 | 8.94" |

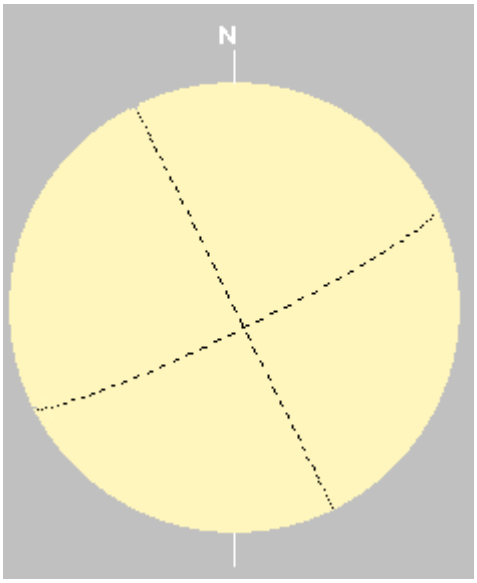
### Outubro

| Dia | ∅ " | DT (UA)* | P.H |
|---|---|---|---|
| 1 | 1916.57 | 1.0014047 | 8.94" |
| 2 | 1917.13 | 1.0011126 | 8.94" |
| 3 | 1917.69 | 1.0008194 | 8.94" |
| 4 | 1918.25 | 1.0005256 | 8.94" |
| 5 | 1918.82 | 1.0002315 | 8.94" |
| 6 | 1919.38 | 0.9999375 | 8.94" |
| 7 | 1919.94 | 0.9996440 | 8.94" |
| 8 | 1920.51 | 0.9993512 | 8.94" |
| 9 | 1921.07 | 0.9990594 | 8.94" |
| 10 | 1921.63 | 0.9987689 | 8.94" |
| 11 | 1922.18 | 0.9984799 | 8.94" |
| 12 | 1922.74 | 0.9981923 | 8.94" |
| 13 | 1923.29 | 0.9979065 | 8.94" |
| 14 | 1923.83 | 0.9976225 | 8.94" |
| 15 | 1924.38 | 0.9973402 | 8.94" |
| 16 | 1924.92 | 0.9970596 | 8.94" |
| 17 | 1925.46 | 0.9967809 | 8.94" |
| 18 | 1925.99 | 0.9965037 | 8.94" |
| 19 | 1926.53 | 0.9962281 | 8.94" |
| 20 | 1927.06 | 0.9959539 | 8.94" |
| 21 | 1927.59 | 0.9956809 | 8.94" |
| 22 | 1928.11 | 0.9954089 | 8.94" |
| 23 | 1928.64 | 0.9951376 | 8.94" |
| 24 | 1929.16 | 0.9948668 | 8.94" |
| 25 | 1929.69 | 0.9945962 | 8.94" |
| 26 | 1930.21 | 0.9943258 | 8.94" |
| 27 | 1930.74 | 0.9940555 | 8.94" |
| 28 | 1931.26 | 0.9937852 | 8.94" |
| 29 | 1931.79 | 0.9935153 | 8.94" |
| 30 | 1932.31 | 0.9932458 | 8.94" |
| 31 | 1932.83 | 0.9929773 | 8.94" |

15 Set = 12:00 TU -




15 Out = 12:00 TU



## Efemérides do Sol

00:00 Hora – Tempo Universal

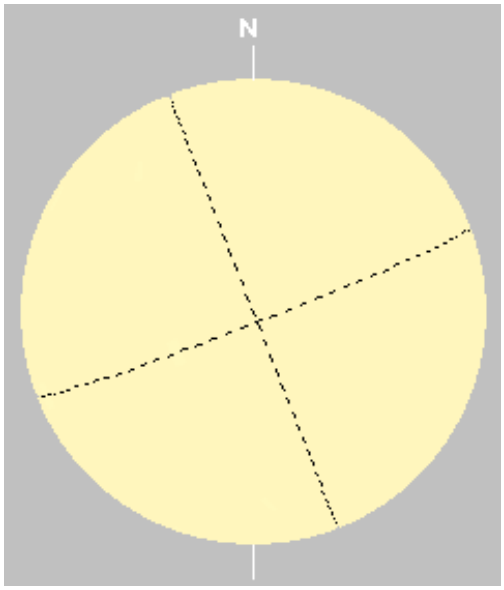
### Novembro

| Dia | ∅ " | DT (UA)* | P.H |
|---|---|---|---|
| 1 | 933.35 | 0.9927100 | 8.94" |
| 2 | 1933.87 | 0.9924443 | 8.94" |
| 3 | 1934.39 | 0.9921807 | 8.94" |
| 4 | 1934.89 | 0.9919195 | 8.94" |
| 5 | 1935.40 | 0.9916610 | 8.94" |
| 6 | 1935.90 | 0.9914056 | 8.94" |
| 7 | 1936.39 | 0.9911534 | 8.94" |
| 8 | 1936.88 | 0.9909047 | 8.94" |
| 9 | 1937.36 | 0.9906598 | 8.94" |
| 10 | 1937.83 | 0.9904188 | 8.94" |
| 11 | 1938.29 | 0.9901818 | 8.94" |
| 12 | 1938.75 | 0.9899490 | 8.94" |
| 13 | 1939.19 | 0.9897204 | 8.94" |
| 14 | 1939.63 | 0.9894960 | 8.94" |
| 15 | 1940.07 | 0.9892759 | 8.94" |
| 16 | 1940.49 | 0.9890598 | 8.94" |
| 17 | 1940.91 | 0.9888477 | 8.94" |
| 18 | 1941.31 | 0.9886394 | 8.94" |
| 19 | 1941.72 | 0.9884348 | 8.94" |
| 20 | 1942.11 | 0.9882335 | 8.94" |
| 21 | 1942.50 | 0.9880353 | 8.94" |
| 22 | 1942.89 | 0.9878399 | 8.94" |
| 23 | 1943.27 | 0.9876470 | 8.94" |
| 24 | 1943.64 | 0.9874566 | 8.94" |
| 25 | 1944.01 | 0.9872684 | 8.94" |
| 26 | 1944.38 | 0.9870825 | 8.94" |
| 27 | 1944.74 | 0.9868989 | 8.94" |
| 28 | 1945.10 | 0.9867179 | 8.94" |
| 29 | 1945.45 | 0.9865397 | 8.94" |
| 30 | 1945.79 | 0.9863647 | 8.94" |

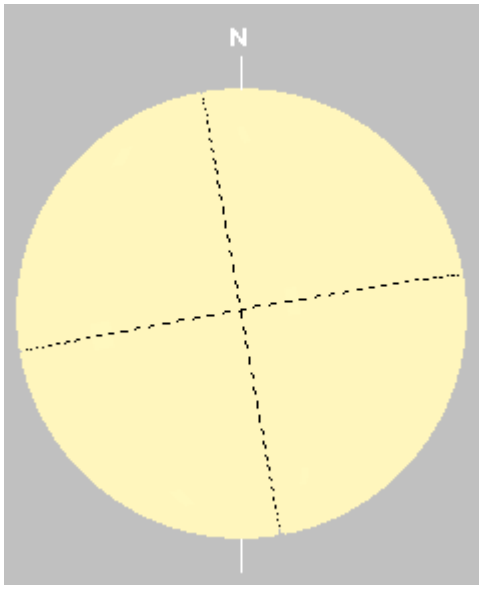
### Dezembro

| Dia | ∅ " | DT (UA)* | P.H |
|---|---|---|---|
| 1 | 1946.13 | 0.9861932 | 8.94" |
| 2 | 1946.46 | 0.9860255 | 8.94" |
| 3 | 1946.78 | 0.9858619 | 8.94" |
| 4 | 1947.10 | 0.9857028 | 8.94" |
| 5 | 1947.40 | 0.9855484 | 8.94" |
| 6 | 1947.70 | 0.9853990 | 8.94" |
| 7 | 1947.98 | 0.9852548 | 8.94" |
| 8 | 1948.26 | 0.9851160 | 8.94" |
| 9 | 1948.52 | 0.9849828 | 8.94" |
| 10 | 1948.77 | 0.9848553 | 8.94" |
| 11 | 1949.01 | 0.9847337 | 8.94" |
| 12 | 1949.24 | 0.9846181 | 8.94" |
| 13 | 1949.46 | 0.9845084 | 8.94" |
| 14 | 1949.67 | 0.9844046 | 8.94" |
| 15 | 1949.86 | 0.9843066 | 8.94" |
| 16 | 1950.04 | 0.9842142 | 8.94" |
| 17 | 1950.22 | 0.9841273 | 8.94" |
| 18 | 1950.38 | 0.9840456 | 8.94" |
| 19 | 1950.53 | 0.9839687 | 8.94" |
| 20 | 1950.67 | 0.9838965 | 8.94" |
| 21 | 1950.81 | 0.9838285 | 8.94" |
| 22 | 1950.93 | 0.9837644 | 8.94" |
| 23 | 1951.05 | 0.9837041 | 8.94" |
| 24 | 1951.17 | 0.9836473 | 8.94" |
| 25 | 1951.27 | 0.9835941 | 8.94" |
| 26 | 1951.37 | 0.9835443 | 8.94" |
| 27 | 1951.46 | 0.9834983 | 8.94" |
| 28 | 1951.55 | 0.9834560 | 8.94" |
| 29 | 1951.62 | 0.9834177 | 8.94" |
| 30 | 1951.69 | 0.9833838 | 8.94" |
| 31 | 1951.75 | 0.9833544 | 8.94" |

15 Nov = 12:00 TU -




15 Dez = 12:00 TU



## Estações do ano Hemisfério Sul

Hora legal do Fuso de –03:00 horas

| Data | Hora | Evento | Duração |
|---|---|---|---|
| 20/03/2011 | 20:19 | Início do Outono | 88,99 dias |
| 21/06/2011 | 14:15 | Início do Inverno | 92,75 dias |
| 23/09/2011 | 06:03 | Início da Primavera | 93,66 dias |
| 22/12/2011 | 02:31 | Início do Verão | 89,85 dias |

## Eclipses

### Eclipse Solar em 04/01/2011

| | |
|---|---|
| Nascer do sol: | 05:22 |
| Ocaso do de sol: | 18:39 |
| Hora máxima do eclipse: | 05:55 |
| O eclipse é parcial, magnitude máxima: | 0,86 |

O eclipse é visível no hemisfério norte nos continentes da África, Europa e Ásia Central.

### Eclipse Solar em 01/06/2011

| | |
|---|---|
| Nascer do sol: | 06:23 |
| Ocaso do sol: | 17:24 |
| Hora máxima do eclipse: | 18:16 |
| O eclipse é parcial, magnitude máxima: | 0,60 |

O eclipse é visível no hemisfério norte no leste da Ásia, Alasca, norte do Canadá e Groenlândia.

### Eclipse da Lua em 15/06/2011

| | |
|---|---|
| Nascer da lua: | 17:22 |
| Ocaso da lua: | 06:05 |
| Magnitude: | 1,71 |
| Início da Fase parcial: | 15:25 |
| Início da Fase total: | 16:25 |
| Instante máximo do eclipse: | 17:14 |
| Fim da fase total: | 18:04 |
| Fim da fase parcial: | 19:04 |

O eclipse é visível na América do Sul, Europa, África, Ásia e Austrália. (Figura Pág. 24)

### Eclipse Solar em 01/07/2011

| | |
|---|---|
| Nascer do sol: | 06:31 |
| Ocaso do sol: | 17:28 |
| Hora máxima do eclipse: | 05:37 |
| O eclipse é parcial, magnitude máxima: | 0,10 |

O eclipse é visível no sul do Oceano Índico, próximo a Antártida.

### Eclipse Solar em 25/11/2011

| | |
|---|---|
| Nascer do sol: | 05:08 |
| Ocaso do sol: | 18:18 |
| Hora máxima do eclipse: | 03:24 |
| O eclipse é parcial, magnitude máxima: | 0,90 |

O eclipse é visível no extremo sul da Namíbia, África do Sul, Antártica, Nova Zelância e Tasmânia

### Eclipse da Lua em 10/12/2011

| | |
|---|---|
| Nascer da lua: | 18:38 |
| Ocaso da lua: | 05:00 |
| Magnitude: | 1,11 |
| Início da Fase parcial: | 09:46 |
| Início da Fase total: | 11:06 |
| Instante máximo do eclipse: | 11:31 |
| Fim da fase total: | 11:57 |
| Fim da fase parcial: | 13:17 |

O eclipse é visível no leste da África, Europa, Àsia, Austrália, Oceano Pacífico e América do Norte.

# Eclipse Total Lunar em 15 junho 2011

Ecliptic Conjunction = 20:14:41.4 TD ( = 20:13:34.1 UT )
Greatest Eclipse = 20:13:43.5 TD ( = 20:12:36.2 UT )

Penumbral Magnitude = 2.6868 P. Radius = 1.2504° Gamma = 0.0897
Umbral Magnitude = 1.6999 U. Radius = 0.7256° Axis = 0.0875°

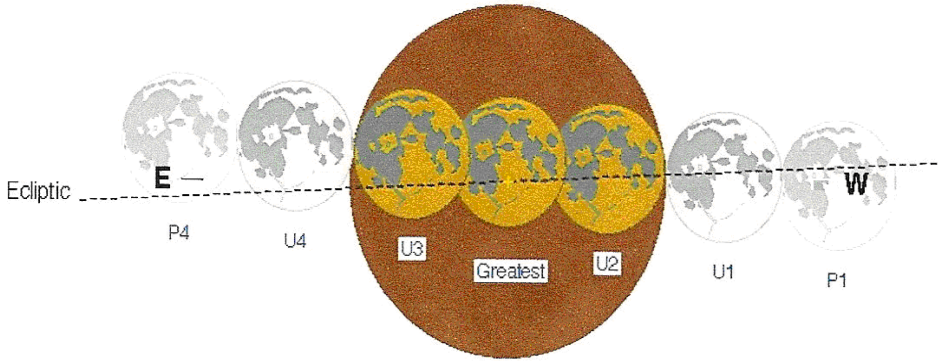
Saros Series = 130 Member = 34 of 72

**Sun at Greatest Eclipse**
(Geocentric Coordinates)

R.A. = 05h35m33.6s
Dec. = +23°19'06.1"
S.D. = 00°15'44.7"
H.P. = 00°00'08.7"

**Moon at Greatest Eclipse**
(Geocentric Coordinates)

R.A. = 17h35m32.3s
Dec. = -23°13'51.6"
S.D. = 00°15'57.2"
H.P. = 00°58'33.0"




**Eclipse Durations**

Penumbral = 05h36m05s
Umbral = 03h39m17s
Total = 01h40m12s

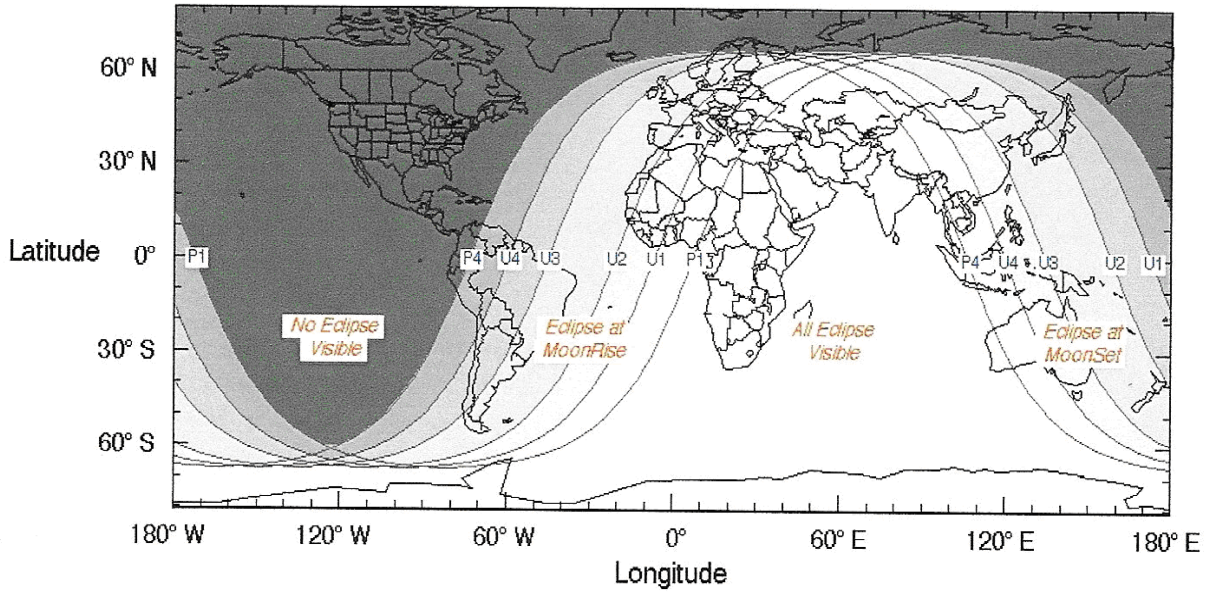
ΔT = 67 s
Rule = CdT (Danjon)
Eph. = VSOP87/ELP2000-85

Earth´s Penumbra
S
0 15 30 45 60
Arc-Minutes

*F. Espenak, NASA's GSFC*
eclipse.gsfc.nasa.gov/eclipse.html

**Eclipse Contacts**

P1 = 17:24:37 UT
U1 = 18:22:57 UT
U2 = 19:22:29 UT
U3 = 21:02:42 UT
U4 = 22:02:14 UT
P4 = 23:00:41 UT




*Fonte F. Espenak, NASA's GSFC*

## Nascer e Ocaso do Sol

Região Sudeste

| | Rio de Janeiro – RJ | | São Paulo – SP | | Belo Horizonte – MG | | Vitória – ES | |
|---|---|---|---|---|---|---|---|---|
| | TU – 03:00 | | TU – 03:00 | | TU – 03:00 | | TU – 03:00 | |
| Coorde- | φ = 22°49'0.06"S | | φ = 23°37'35.58"S | | φ = 19°51'0.86"S | | φ = 20°15'26.24"S | |
| nadas | L = 43°15'11.26"W | | L = 46°39'23.69"W | | L = 43°57'5.08"W | | L = 40°17'11.47"W | |
| | Altitude = 7 Mts | | Altitude = 798 Mts | | Altitude = 786 Mts. | | Altitude = 1 Mt. | |
| **Data** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** |
| 01 Jan | 05:10:32 | 18:41:24 | 05:22:28 | 18:56:43 | 05:19:21 | 18:38:12 | 05:03:52 | 18:24:20 |
| 08 Jan | 05:15:11 | 18:43:06 | 05:27:10 | 18:58:21 | 05:23:47 | 18:40:07 | 05:08:20 | 18:26:14 |
| 15 Jan | 05:20:08 | 18:43:42 | 05:32:12 | 18:58:51 | 05:28:26 | 18:41:01 | 05:13:01 | 18:27:06 |
| 22 Jan | 05:25:09 | 18:43:08 | 05:37:20 | 18:58:10 | 05:33:04 | 18:40:51 | 05:17:42 | 18:26:52 |
| 29 Jan | 05:30:06 | 18:41:26 | 05:42:25 | 18:56:20 | 05:37:32 | 18:39:38 | 05:22:15 | 18:25:35 |
| 05 Fev | 05:34:50 | 18:38:40 | 05:47:18 | 18:53:25 | 05:41:44 | 18:37:24 | 05:26:31 | 18:23:17 |
| 12 Fev | 05:39:14 | 18:34:55 | 05:51:52 | 18:49:30 | 05:45:34 | 18:34:13 | 05:30:26 | 18:20:02 |
| 19 Fev | 05:43:15 | 18:30:17 | 05:56:03 | 18:44:42 | 05:48:58 | 18:30:12 | 05:33:55 | 18:15:56 |
| 26 Fev | 05:46:53 | 18:24:56 | 05:59:51 | 18:39:10 | 05:51:58 | 18:25:29 | 05:36:59 | 18:11:08 |
| 05 Mar | 05:50:10 | 18:19:01 | 06:03:19 | 18:33:04 | 05:54:36 | 18:20:14 | 05:39:42 | 18:05:47 |
| 12 Mar | 05:53:08 | 18:12:41 | 06:06:29 | 18:26:33 | 05:56:55 | 18:14:33 | 05:42:07 | 18:00:01 |
| 19 Mar | 05:55:52 | 18:06:04 | 06:09:23 | 18:19:45 | 05:58:59 | 18:08:36 | 05:44:16 | 17:53:59 |
| 26 Mar | 05:58:26 | 17:59:20 | 06:12:08 | 18:12:50 | 06:00:53 | 18:02:31 | 05:46:16 | 17:47:49 |
| 02 Abr | 06:00:55 | 17:52:39 | 06:14:49 | 18:05:57 | 06:02:43 | 17:56:29 | 05:48:12 | 17:41:41 |
| 09 Abr | 06:03:26 | 17:46:08 | 06:17:30 | 17:59:16 | 06:04:35 | 17:50:36 | 05:50:09 | 17:35:44 |
| 16 Abr | 06:05:59 | 17:39:56 | 06:20:15 | 17:52:54 | 06:06:31 | 17:45:02 | 05:52:10 | 17:30:04 |
| 23 Abr | 06:08:40 | 17:34:11 | 06:23:05 | 17:46:59 | 06:08:35 | 17:39:54 | 05:54:18 | 17:24:51 |
| 30 Abr | 06:11:30 | 17:29:02 | 06:26:05 | 17:41:40 | 06:10:50 | 17:35:19 | 05:56:38 | 17:20:12 |
| 07 Mai | 06:14:29 | 17:24:35 | 06:29:14 | 17:37:04 | 06:13:17 | 17:31:25 | 05:59:10 | 17:16:13 |
| 14 Mai | 06:17:36 | 17:20:56 | 06:32:28 | 17:33:16 | 06:15:54 | 17:28:15 | 06:01:51 | 17:12:59 |
| 21 Mai | 06:20:45 | 17:18:08 | 06:35:45 | 17:30:21 | 06:18:37 | 17:25:53 | 06:04:37 | 17:10:33 |
| 28 Mai | 06:23:53 | 17:16:15 | 06:38:59 | 17:28:23 | 06:21:23 | 17:24:22 | 06:07:26 | 17:08:59 |
| 04 Jun | 06:26:52 | 17:15:19 | 06:42:03 | 17:27:21 | 06:24:05 | 17:23:43 | 06:10:10 | 17:08:18 |
| 11 Jun | 06:29:33 | 17:15:15 | 06:44:47 | 17:27:15 | 06:26:33 | 17:23:51 | 06:12:40 | 17:08:25 |
| 18 Jun | 06:31:45 | 17:16:01 | 06:47:01 | 17:27:58 | 06:28:38 | 17:24:43 | 06:14:46 | 17:09:15 |
| 25 Jun | 06:33:21 | 17:17:29 | 06:48:37 | 17:29:27 | 06:30:13 | 17:26:12 | 06:16:21 | 17:10:44 |
| 02 Jul | 06:34:12 | 17:19:34 | 06:49:27 | 17:31:33 | 06:31:10 | 17:28:11 | 06:17:17 | 17:12:44 |
| 09 Jul | 06:34:12 | 17:22:04 | 06:49:24 | 17:34:06 | 06:31:21 | 17:30:30 | 06:17:27 | 17:15:04 |
| 16 Jul | 06:33:16 | 17:24:50 | 06:48:23 | 17:36:57 | 06:30:41 | 17:32:59 | 06:16:45 | 17:17:36 |
| 23 Jul | 06:31:23 | 17:27:44 | 06:46:24 | 17:39:57 | 06:29:09 | 17:35:32 | 06:15:10 | 17:20:11 |
| 30 Jul | 06:28:34 | 17:30:39 | 06:43:28 | 17:42:59 | 06:26:45 | 17:38:01 | 06:12:43 | 17:22:44 |
| 06 Ago | 06:24:51 | 17:33:29 | 06:39:37 | 17:45:57 | 06:23:30 | 17:40:22 | 06:09:24 | 17:25:09 |
| 13 Ago | 06:20:17 | 17:36:09 | 06:34:54 | 17:48:45 | 06:19:28 | 17:42:31 | 06:05:18 | 17:27:22 |
| 20 Ago | 06:15:00 | 17:38:37 | 06:29:27 | 17:51:24 | 06:14:44 | 17:44:26 | 06:00:30 | 17:29:22 |
| 27 Ago | 06:09:06 | 17:40:56 | 06:23:23 | 17:53:53 | 06:09:26 | 17:46:09 | 05:55:07 | 17:31:10 |
| 03 Set | 06:02:43 | 17:43:07 | 06:16:50 | 17:56:14 | 06:03:39 | 17:47:43 | 05:49:15 | 17:32:48 |
| 10 Set | 05:55:57 | 17:45:11 | 06:09:54 | 17:58:28 | 05:57:32 | 17:49:09 | 05:43:03 | 17:34:20 |
| 17 Set | 05:48:58 | 17:47:12 | 06:02:44 | 18:00:41 | 05:51:11 | 17:50:32 | 05:36:37 | 17:35:48 |
| 24 Set | 05:41:55 | 17:49:17 | 05:55:30 | 18:02:56 | 05:44:47 | 17:51:58 | 05:30:08 | 17:37:19 |
| 01 Out | 05:34:57 | 17:51:31 | 05:48:21 | 18:05:21 | 05:38:28 | 17:53:32 | 05:23:43 | 17:38:59 |
| 08 Out | 05:28:12 | 17:53:57 | 05:41:25 | 18:07:58 | 05:32:21 | 17:55:19 | 05:17:31 | 17:40:51 |
| 15 Out | 05:21:48 | 17:56:40 | 05:34:50 | 18:10:52 | 05:26:36 | 17:57:23 | 05:11:41 | 17:43:00 |
| 22 Out | 05:15:56 | 17:59:44 | 05:28:47 | 18:14:07 | 05:21:22 | 17:59:50 | 05:06:22 | 17:45:32 |
| 29 Out | 05:10:45 | 18:03:13 | 05:23:26 | 18:17:46 | 05:16:48 | 18:02:42 | 05:01:42 | 17:48:29 |
| 05 Nov | 05:06:22 | 18:07:06 | 05:18:54 | 18:21:49 | 05:13:01 | 18:06:01 | 04:57:50 | 17:51:52 |
| 12 Nov | 05:02:56 | 18:11:22 | 05:15:19 | 18:26:14 | 05:10:07 | 18:09:43 | 04:54:53 | 17:55:39 |
| 19 Nov | 05:00:34 | 18:15:56 | 05:12:48 | 18:30:57 | 05:08:15 | 18:13:48 | 04:52:56 | 17:59:48 |
| 26 Nov | 04:59:20 | 18:20:44 | 05:11:27 | 18:35:51 | 05:07:27 | 18:18:10 | 04:52:05 | 18:04:13 |
| 03 Dez | 04:59:18 | 18:25:33 | 05:11:19 | 18:40:47 | 05:07:46 | 18:22:39 | 04:52:20 | 18:08:45 |
| 10 Dez | 05:00:24 | 18:30:12 | 05:12:21 | 18:45:30 | 05:09:08 | 18:27:03 | 04:53:40 | 18:13:11 |
| 17 Dez | 05:02:37 | 18:34:28 | 05:14:31 | 18:49:48 | 05:11:29 | 18:31:10 | 04:56:00 | 18:17:20 |
| 24 Dez | 05:05:48 | 18:38:08 | 05:17:41 | 18:53:29 | 05:14:42 | 18:34:49 | 04:59:13 | 18:20:59 |
| 31 Dez | 05:09:47 | 18:41:00 | 05:21:42 | 18:56:19 | 05:18:37 | 18:37:46 | 05:03:08 | 18:23:55 |

## Nascer e Ocaso do Sol

Região Sul

| | Porto Alegre – RS | | Curitiba – PR | | Florianópolis – SC | |
|---|---|---|---|---|---|---|
| | TU – 03:00 | | TU – 03:00 | | TU – 03:00 | |
| Coorde- | φ = 29°56'45.13"S | | φ = 25°24'18.51"S | | φ = 27°40'32.45"S | |
| nadas | L = 51° 8'39.48"W | | L = 49°13'55.06"W | | L = 48°33'55.58"W | |
| | Altitude = 8 Mts | | Altitude = 928 Mts | | Altitude = 5 Mts | |
| **Data** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** |
| 01 Jan | 05:26:15 | 19:28:49 | 05:28:58 | 19:10:49 | 05:21:14 | 19:13:12 |
| 08 Jan | 05:31:26 | 19:29:56 | 05:33:48 | 19:12:19 | 05:26:15 | 19:14:31 |
| 15 Jan | 05:37:13 | 19:29:40 | 05:39:01 | 19:12:37 | 05:31:44 | 19:14:33 |
| 22 Jan | 05:43:18 | 19:28:02 | 05:44:25 | 19:11:40 | 05:37:28 | 19:13:16 |
| 29 Jan | 05:49:29 | 19:25:04 | 05:49:48 | 19:09:32 | 05:43:15 | 19:10:43 |
| 05 Fev | 05:55:38 | 19:20:53 | 05:55:01 | 19:06:17 | 05:48:54 | 19:07:01 |
| 12 Fev | 06:01:33 | 19:15:36 | 05:59:57 | 19:02:00 | 05:54:19 | 19:02:14 |
| 19 Fev | 06:07:10 | 19:09:22 | 06:04:31 | 18:56:48 | 05:59:24 | 18:56:33 |
| 26 Fev | 06:12:27 | 19:02:21 | 06:08:43 | 18:50:53 | 06:04:08 | 18:50:05 |
| 05 Mar | 06:17:26 | 18:54:45 | 06:12:35 | 18:44:22 | 06:08:33 | 18:43:02 |
| 12 Mar | 06:22:07 | 18:46:41 | 06:16:10 | 18:37:26 | 06:12:40 | 18:35:34 |
| 19 Mar | 06:26:34 | 18:38:21 | 06:19:29 | 18:30:13 | 06:16:33 | 18:27:48 |
| 26 Mar | 06:30:51 | 18:29:54 | 06:22:39 | 18:22:53 | 06:20:15 | 18:19:55 |
| 02 Abr | 06:35:03 | 18:21:31 | 06:25:45 | 18:15:36 | 06:23:54 | 18:12:05 |
| 09 Abr | 06:39:14 | 18:13:20 | 06:28:50 | 18:08:31 | 06:27:31 | 18:04:28 |
| 16 Abr | 06:43:26 | 18:05:30 | 06:31:58 | 18:01:45 | 06:31:10 | 17:57:11 |
| 23 Abr | 06:47:42 | 17:58:11 | 06:35:12 | 17:55:27 | 06:34:54 | 17:50:23 |
| 30 Abr | 06:52:03 | 17:51:31 | 06:38:33 | 17:49:46 | 06:38:45 | 17:44:13 |
| 07 Mai | 06:56:28 | 17:45:40 | 06:42:02 | 17:44:50 | 06:42:41 | 17:38:50 |
| 14 Mai | 07:00:52 | 17:40:43 | 06:45:36 | 17:40:44 | 06:46:40 | 17:34:19 |
| 21 Mai | 07:05:11 | 17:36:46 | 06:49:10 | 17:37:32 | 06:50:35 | 17:30:45 |
| 28 Mai | 07:09:18 | 17:33:56 | 06:52:38 | 17:35:20 | 06:54:22 | 17:28:14 |
| 04 Jun | 07:13:04 | 17:32:13 | 06:55:53 | 17:34:08 | 06:57:52 | 17:26:47 |
| 11 Jun | 07:16:17 | 17:31:39 | 06:58:45 | 17:33:53 | 07:00:55 | 17:26:23 |
| 18 Jun | 07:18:46 | 17:32:07 | 07:01:03 | 17:34:33 | 07:03:18 | 17:26:57 |
| 25 Jun | 07:20:23 | 17:33:35 | 07:02:39 | 17:36:02 | 07:04:55 | 17:28:26 |
| 02 Jul | 07:21:01 | 17:35:55 | 07:03:25 | 17:38:11 | 07:05:37 | 17:30:40 |
| 09 Jul | 07:20:31 | 17:38:55 | 07:03:15 | 17:40:52 | 07:05:18 | 17:33:30 |
| 16 Jul | 07:18:52 | 17:42:25 | 07:02:04 | 17:43:53 | 07:03:53 | 17:36:45 |
| 23 Jul | 07:16:03 | 17:46:15 | 06:59:52 | 17:47:06 | 07:01:22 | 17:40:17 |
| 30 Jul | 07:12:07 | 17:50:17 | 06:56:39 | 17:50:24 | 06:57:49 | 17:43:56 |
| 06 Ago | 07:07:08 | 17:54:23 | 06:52:30 | 17:53:41 | 06:53:16 | 17:47:37 |
| 13 Ago | 07:01:12 | 17:58:26 | 06:47:28 | 17:56:49 | 06:47:47 | 17:51:12 |
| 20 Ago | 06:54:27 | 18:02:23 | 06:41:40 | 17:59:49 | 06:41:31 | 17:54:40 |
| 27 Ago | 06:47:00 | 18:06:15 | 06:35:13 | 18:02:40 | 06:34:35 | 17:58:01 |
| 03 Set | 06:39:01 | 18:10:02 | 06:28:17 | 18:05:24 | 06:27:08 | 18:01:15 |
| 10 Set | 06:30:37 | 18:13:45 | 06:20:57 | 18:08:03 | 06:19:17 | 18:04:25 |
| 17 Set | 06:21:58 | 18:17:26 | 06:13:23 | 18:10:39 | 06:11:11 | 18:07:34 |
| 24 Set | 06:13:14 | 18:21:13 | 06:05:45 | 18:13:20 | 06:03:01 | 18:10:46 |
| 01 Out | 06:04:34 | 18:25:08 | 05:58:11 | 18:16:09 | 05:54:54 | 18:14:08 |
| 08 Out | 05:56:07 | 18:29:16 | 05:50:50 | 18:19:10 | 05:47:01 | 18:17:42 |
| 15 Out | 05:48:03 | 18:33:40 | 05:43:51 | 18:22:28 | 05:39:30 | 18:21:32 |
| 22 Out | 05:40:32 | 18:38:24 | 05:37:25 | 18:26:07 | 05:32:32 | 18:25:43 |
| 29 Out | 05:33:44 | 18:43:29 | 05:31:40 | 18:30:10 | 05:26:17 | 18:30:16 |
| 05 Nov | 05:27:50 | 18:48:55 | 05:26:46 | 18:34:35 | 05:20:53 | 18:35:11 |
| 12 Nov | 05:22:57 | 18:54:36 | 05:22:50 | 18:39:21 | 05:16:30 | 18:40:23 |
| 19 Nov | 05:19:16 | 19:00:29 | 05:20:01 | 18:44:22 | 05:13:15 | 18:45:50 |
| 26 Nov | 05:16:54 | 19:06:24 | 05:18:24 | 18:49:33 | 05:11:16 | 18:51:22 |
| 03 Dez | 05:15:55 | 19:12:09 | 05:18:02 | 18:54:41 | 05:10:36 | 18:56:48 |
| 10 Dez | 05:16:21 | 19:17:27 | 05:18:54 | 18:59:34 | 05:11:15 | 19:01:54 |
| 17 Dez | 05:18:09 | 19:22:06 | 05:20:58 | 19:03:58 | 05:13:12 | 19:06:25 |
| 24 Dez | 05:21:14 | 19:25:51 | 05:24:07 | 19:07:39 | 05:16:19 | 19:10:08 |
| 31 Dez | 05:25:25 | 19:28:29 | 05:28:11 | 19:10:26 | 05:20:26 | 19:12:51 |

## Nascer e Ocaso do Sol

Região Norte – Parte I

| | Rio Branco – AC | | Macapá – AP | | Manaus – AM | | Porto Velho – RO | |
|---|---|---|---|---|---|---|---|---|
| | TU – 05:00 | | TU – 03:00 | | TU – 04:00 | | TU – 04:00 | |
| Coorde- | φ = 9°59'30.88"S | | φ = 0° 3'3.78"N | | φ = 3° 8'44.84"S | | φ = 8°42'32.04"S | |
| nadas | L = 67°48'3.96"W | | L = 51° 4'16.68"W | | L = 59°59'6.11"W | | L = 63°54'8.68"W | |
| | Altitude = 137 Mts | | Altitude = 15 Mts | | Altitude = 72 Mts | | Altitude = 88 Mts | |
| **Data** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** |
| 01 Jan | 05:13:12 | 17:55:15 | 05:23:38 | 17:30:57 | 02:41:33 | 21:23:57 | 05:59:52 | 18:37:23 |
| 08 Jan | 05:17:00 | 17:57:49 | 05:26:52 | 17:34:08 | 02:53:30 | 21:17:58 | 06:03:36 | 18:40:02 |
| 15 Jan | 05:20:43 | 17:59:40 | 05:29:42 | 17:36:53 | 03:08:46 | 21:07:58 | 06:07:11 | 18:42:00 |
| 22 Jan | 05:24:09 | 18:00:43 | 05:32:00 | 17:39:05 | 03:26:13 | 20:54:49 | 06:10:28 | 18:43:12 |
| 29 Jan | 05:27:11 | 18:00:56 | 05:33:42 | 17:40:40 | 03:44:58 | 20:39:15 | 06:13:20 | 18:43:36 |
| 05 Fev | 05:29:46 | 18:00:19 | 05:34:44 | 17:41:37 | 04:04:16 | 20:21:55 | 06:15:43 | 18:43:11 |
| 12 Fev | 05:31:49 | 17:58:54 | 05:35:07 | 17:41:53 | 04:23:37 | 20:03:15 | 06:17:33 | 18:42:00 |
| 19 Fev | 05:33:20 | 17:56:46 | 05:34:52 | 17:41:33 | 04:42:40 | 19:43:39 | 06:18:51 | 18:40:05 |
| 26 Fev | 05:34:22 | 17:54:00 | 05:34:03 | 17:40:39 | 05:01:18 | 19:23:21 | 06:19:38 | 18:37:34 |
| 05 Mar | 05:35:00 | 17:50:44 | 05:32:45 | 17:39:18 | 05:19:30 | 19:02:36 | 06:20:01 | 18:34:33 |
| 12 Mar | 05:35:17 | 17:47:06 | 05:31:05 | 17:37:37 | 05:37:15 | 18:41:34 | 06:20:02 | 18:31:10 |
| 19 Mar | 05:35:17 | 17:43:11 | 05:29:09 | 17:35:40 | 05:54:37 | 18:20:24 | 06:19:48 | 18:27:30 |
| 26 Mar | 05:35:09 | 17:39:09 | 05:27:03 | 17:33:35 | 06:11:42 | 17:59:13 | 06:19:24 | 18:23:43 |
| 02 Abr | 05:34:58 | 17:35:08 | 05:24:56 | 17:31:30 | 06:28:37 | 17:38:10 | 06:18:58 | 18:19:58 |
| 09 Abr | 05:34:50 | 17:31:15 | 05:22:53 | 17:29:31 | 06:45:28 | 17:17:24 | 06:18:36 | 18:16:20 |
| 16 Abr | 05:34:50 | 17:27:37 | 05:21:01 | 17:27:44 | 07:02:16 | 16:57:02 | 06:18:21 | 18:12:56 |
| 23 Abr | 05:35:02 | 17:24:20 | 05:19:26 | 17:26:14 | 07:19:02 | 16:37:16 | 06:18:19 | 18:09:53 |
| 30 Abr | 05:35:30 | 17:21:32 | 05:18:12 | 17:25:08 | 07:35:45 | 16:18:18 | 06:18:34 | 18:07:18 |
| 07 Mai | 05:36:18 | 17:19:17 | 05:17:25 | 17:24:27 | 07:52:17 | 16:00:24 | 06:19:09 | 18:05:16 |
| 14 Mai | 05:37:24 | 17:17:38 | 05:17:04 | 17:24:13 | 08:08:20 | 15:43:52 | 06:20:04 | 18:03:47 |
| 21 Mai | 05:38:47 | 17:16:36 | 05:17:10 | 17:24:27 | 08:23:32 | 15:29:07 | 06:21:17 | 18:02:55 |
| 28 Mai | 05:40:25 | 17:16:13 | 05:17:44 | 17:25:06 | 08:37:23 | 15:16:37 | 06:22:46 | 18:02:40 |
| 04 Jun | 05:42:13 | 17:16:26 | 05:18:42 | 17:26:09 | 08:49:13 | 15:06:55 | 06:24:28 | 18:03:00 |
| 11 Jun | 05:44:04 | 17:17:11 | 05:19:57 | 17:27:28 | 08:58:20 | 15:00:31 | 06:26:14 | 18:03:49 |
| 18 Jun | 05:45:49 | 17:18:22 | 05:21:24 | 17:28:57 | 09:04:04 | 14:57:51 | 06:27:57 | 18:05:02 |
| 25 Jun | 05:47:22 | 17:19:52 | 05:22:55 | 17:30:28 | 09:05:58 | 14:59:07 | 06:29:30 | 18:06:33 |
| 02 Jul | 05:48:34 | 17:21:34 | 05:24:22 | 17:31:53 | 09:03:53 | 15:04:14 | 06:30:44 | 18:08:13 |
| 09 Jul | 05:49:18 | 17:23:19 | 05:25:38 | 17:33:05 | 08:57:59 | 15:12:43 | 06:31:32 | 18:09:53 |
| 16 Jul | 05:49:28 | 17:24:58 | 05:26:34 | 17:33:57 | 08:48:41 | 15:23:56 | 06:31:48 | 18:11:26 |
| 23 Jul | 05:48:59 | 17:26:25 | 05:27:06 | 17:34:23 | 08:36:31 | 15:37:11 | 06:31:27 | 18:12:45 |
| 30 Jul | 05:47:51 | 17:27:37 | 05:27:11 | 17:34:21 | 08:22:01 | 15:51:51 | 06:30:29 | 18:13:48 |
| 06 Ago | 05:46:04 | 17:28:30 | 05:26:48 | 17:33:50 | 08:05:41 | 16:07:22 | 06:28:52 | 18:14:29 |
| 13 Ago | 05:43:38 | 17:29:01 | 05:25:54 | 17:32:49 | 07:47:55 | 16:23:18 | 06:26:38 | 18:14:49 |
| 20 Ago | 05:40:37 | 17:29:12 | 05:24:32 | 17:31:21 | 07:29:02 | 16:39:26 | 06:23:51 | 18:14:47 |
| 27 Ago | 05:37:07 | 17:29:06 | 05:22:47 | 17:29:30 | 07:09:20 | 16:55:38 | 06:20:34 | 18:14:27 |
| 03 Set | 05:33:14 | 17:28:45 | 05:20:43 | 17:27:20 | 06:48:59 | 17:11:50 | 06:16:56 | 18:13:52 |
| 10 Set | 05:29:03 | 17:28:14 | 05:18:24 | 17:24:57 | 06:28:12 | 17:27:59 | 06:12:59 | 18:13:06 |
| 17 Set | 05:24:42 | 17:27:38 | 05:15:56 | 17:22:27 | 06:07:07 | 17:44:11 | 06:08:52 | 18:12:15 |
| 24 Set | 05:20:18 | 17:27:03 | 05:13:28 | 17:19:57 | 05:45:52 | 18:00:33 | 06:04:43 | 18:11:26 |
| 01 Out | 05:16:00 | 17:26:37 | 05:11:05 | 17:17:35 | 05:24:35 | 18:17:10 | 06:00:40 | 18:10:44 |
| 08 Out | 05:11:54 | 17:26:23 | 05:08:55 | 17:15:25 | 05:03:24 | 18:34:06 | 05:56:49 | 18:10:16 |
| 15 Out | 05:08:08 | 17:26:28 | 05:07:03 | 17:13:36 | 04:42:26 | 18:51:28 | 05:53:19 | 18:10:06 |
| 22 Out | 05:04:51 | 17:26:58 | 05:05:37 | 17:12:15 | 04:21:52 | 19:09:19 | 05:50:16 | 18:10:21 |
| 29 Out | 05:02:11 | 17:27:58 | 05:04:44 | 17:11:27 | 04:01:54 | 19:27:40 | 05:47:49 | 18:11:07 |
| 05 Nov | 05:00:12 | 17:29:29 | 05:04:27 | 17:11:16 | 03:42:46 | 19:46:23 | 05:46:04 | 18:12:25 |
| 12 Nov | 04:58:59 | 17:31:33 | 05:04:50 | 17:11:45 | 03:24:46 | 20:05:14 | 05:45:04 | 18:14:16 |
| 19 Nov | 04:58:38 | 17:34:08 | 05:05:53 | 17:12:55 | 03:08:21 | 20:23:50 | 05:44:53 | 18:16:40 |
| 26 Nov | 04:59:09 | 17:37:13 | 05:07:39 | 17:14:46 | 02:54:04 | 20:41:35 | 05:45:34 | 18:19:35 |
| 03 Dez | 05:00:32 | 17:40:39 | 05:10:01 | 17:17:14 | 02:42:37 | 20:57:37 | 05:47:05 | 18:22:54 |
| 10 Dez | 05:02:41 | 17:44:18 | 05:12:53 | 17:20:10 | 02:34:49 | 21:10:51 | 05:49:19 | 18:26:28 |
| 17 Dez | 05:05:30 | 17:48:00 | 05:16:08 | 17:23:28 | 02:31:28 | 21:20:14 | 05:52:12 | 18:30:06 |
| 24 Dez | 05:08:51 | 17:51:33 | 05:19:35 | 17:26:56 | 02:33:09 | 21:24:55 | 05:55:33 | 18:33:38 |
| 31 Dez | 05:12:32 | 17:54:45 | 05:23:03 | 17:30:22 | 02:39:53 | 21:24:32 | 05:59:13 | 18:36:52 |

## Nascer e Ocaso do Sol

Região Norte – Parte - II

| | Boa Vista – RR | | Belém – PA | | Palmas – TO | |
|---|---|---|---|---|---|---|
| | TU – 04:00 | | TU – 03:00 | | TU – 03:00 | |
| Coorde- | φ = 2°50'49.86"N | | φ = 1°22'46.09"S | | φ = 10°17'27.78"SS | |
| nadas | L = 60°41'18.08"W | | L = 48°28'34.50"W | | L = 48°21'27.98"W | |
| | Altitude = 79 Mts | | Altitude = 8 Mts | | Altitude = 225 Mts | |
| **Data** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** |
| 01 Jan | 06:06:54 | 18:04:41 | 06:10:49 | 18:23:01 | 05:54:51 | 18:37:59 |
| 08 Jan | 06:09:57 | 18:08:01 | 06:14:08 | 18:26:06 | 05:58:41 | 18:40:32 |
| 15 Jan | 06:12:33 | 18:11:01 | 06:17:05 | 18:28:43 | 06:02:25 | 18:42:22 |
| 22 Jan | 06:14:32 | 18:13:32 | 06:19:32 | 18:30:46 | 06:05:53 | 18:43:23 |
| 29 Jan | 06:15:51 | 18:15:29 | 06:21:25 | 18:32:10 | 06:08:59 | 18:43:34 |
| 05 Fev | 06:16:28 | 18:16:51 | 06:22:41 | 18:32:53 | 06:11:36 | 18:42:55 |
| 12 Fev | 06:16:24 | 18:17:36 | 06:23:18 | 18:32:56 | 06:13:43 | 18:41:27 |
| 19 Fev | 06:15:38 | 18:17:44 | 06:23:18 | 18:32:20 | 06:15:18 | 18:39:16 |
| 26 Fev | 06:14:18 | 18:17:21 | 06:22:44 | 18:31:10 | 06:16:23 | 18:36:27 |
| 05 Mar | 06:12:29 | 18:16:32 | 06:21:43 | 18:29:34 | 06:17:05 | 18:33:08 |
| 12 Mar | 06:10:17 | 18:15:23 | 06:20:20 | 18:27:35 | 06:17:25 | 18:29:26 |
| 19 Mar | 06:07:48 | 18:13:58 | 06:18:40 | 18:25:22 | 06:17:30 | 18:25:28 |
| 26 Mar | 06:05:10 | 18:12:25 | 06:16:51 | 18:23:00 | 06:17:25 | 18:21:22 |
| 02 Abr | 06:02:30 | 18:10:53 | 06:15:00 | 18:20:39 | 06:17:17 | 18:17:17 |
| 09 Abr | 05:59:56 | 18:09:26 | 06:13:14 | 18:18:24 | 06:17:13 | 18:13:21 |
| 16 Abr | 05:57:34 | 18:08:09 | 06:11:37 | 18:16:22 | 06:17:16 | 18:09:39 |
| 23 Abr | 05:55:29 | 18:07:09 | 06:10:17 | 18:14:37 | 06:17:31 | 18:06:19 |
| 30 Abr | 05:53:47 | 18:06:31 | 06:09:18 | 18:13:16 | 06:18:02 | 18:03:28 |
| 07 Mai | 05:52:34 | 18:06:16 | 06:08:43 | 18:12:22 | 06:18:53 | 18:01:10 |
| 14 Mai | 05:51:49 | 18:06:26 | 06:08:35 | 18:11:56 | 06:20:01 | 17:59:28 |
| 21 Mai | 05:51:35 | 18:07:00 | 06:08:52 | 18:11:59 | 06:21:26 | 17:58:23 |
| 28 Mai | 05:51:50 | 18:07:58 | 06:09:35 | 18:12:29 | 06:23:06 | 17:57:58 |
| 04 Jun | 05:52:34 | 18:09:14 | 06:10:39 | 18:13:25 | 06:24:56 | 17:58:09 |
| 11 Jun | 05:53:40 | 18:10:43 | 06:12:00 | 18:14:39 | 06:26:48 | 17:58:53 |
| 18 Jun | 05:55:02 | 18:12:16 | 06:13:29 | 18:16:05 | 06:28:34 | 18:00:03 |
| 25 Jun | 05:56:32 | 18:13:47 | 06:15:00 | 18:17:36 | 06:30:07 | 18:01:33 |
| 02 Jul | 05:58:03 | 18:15:08 | 06:16:26 | 18:19:04 | 06:31:19 | 18:03:16 |
| 09 Jul | 05:59:28 | 18:16:11 | 06:17:37 | 18:20:21 | 06:32:02 | 18:05:01 |
| 16 Jul | 06:00:37 | 18:16:49 | 06:18:27 | 18:21:19 | 06:32:10 | 18:06:42 |
| 23 Jul | 06:01:26 | 18:16:58 | 06:18:50 | 18:21:54 | 06:31:40 | 18:08:11 |
| 30 Jul | 06:01:51 | 18:16:36 | 06:18:45 | 18:22:02 | 06:30:30 | 18:09:25 |
| 06 Ago | 06:01:50 | 18:15:42 | 06:18:10 | 18:21:43 | 06:28:41 | 18:10:21 |
| 13 Ago | 06:01:21 | 18:14:15 | 06:17:03 | 18:20:55 | 06:26:12 | 18:10:55 |
| 20 Ago | 06:00:27 | 18:12:19 | 06:15:28 | 18:19:41 | 06:23:09 | 18:11:09 |
| 27 Ago | 05:59:11 | 18:09:59 | 06:13:28 | 18:18:05 | 06:19:36 | 18:11:06 |
| 03 Set | 05:57:36 | 18:07:20 | 06:11:08 | 18:16:11 | 06:15:40 | 18:10:49 |
| 10 Set | 05:55:48 | 18:04:26 | 06:08:33 | 18:14:03 | 06:11:26 | 18:10:21 |
| 17 Set | 05:53:52 | 18:01:24 | 06:05:50 | 18:11:49 | 06:07:01 | 18:09:49 |
| 24 Set | 05:51:55 | 17:58:22 | 06:03:05 | 18:09:36 | 06:02:33 | 18:09:18 |
| 01 Out | 05:50:05 | 17:55:28 | 06:00:26 | 18:07:29 | 05:58:11 | 18:08:55 |
| 08 Out | 05:48:26 | 17:52:47 | 05:57:59 | 18:05:37 | 05:54:02 | 18:08:44 |
| 15 Out | 05:47:06 | 17:50:27 | 05:55:52 | 18:04:04 | 05:50:13 | 18:08:53 |
| 22 Out | 05:46:11 | 17:48:35 | 05:54:10 | 18:02:58 | 05:46:52 | 18:09:26 |
| 29 Out | 05:45:48 | 17:47:17 | 05:53:02 | 18:02:25 | 05:44:08 | 18:10:29 |
| 05 Nov | 05:45:59 | 17:46:38 | 05:52:31 | 18:02:28 | 05:42:05 | 18:12:03 |
| 12 Nov | 05:46:48 | 17:46:41 | 05:52:39 | 18:03:10 | 05:40:50 | 18:14:09 |
| 19 Nov | 05:48:15 | 17:47:28 | 05:53:31 | 18:04:32 | 05:40:25 | 18:16:47 |
| 26 Nov | 05:50:21 | 17:49:00 | 05:55:06 | 18:06:34 | 05:40:54 | 18:19:53 |
| 03 Dez | 05:53:00 | 17:51:11 | 05:57:20 | 18:09:10 | 05:42:14 | 18:23:21 |
| 10 Dez | 05:56:04 | 17:53:56 | 06:00:06 | 18:12:12 | 05:44:22 | 18:27:02 |
| 17 Dez | 05:59:26 | 17:57:07 | 06:03:17 | 18:15:33 | 05:47:10 | 18:30:44 |
| 24 Dez | 06:02:55 | 18:00:34 | 06:06:43 | 18:19:02 | 05:50:30 | 18:34:17 |
| 31 Dez | 06:06:19 | 18:04:04 | 06:10:13 | 18:22:26 | 05:54:12 | 18:37:29 |

## Nascer e Ocaso do Sol

Região Nordeste – Parte I

| | **Salvador – BA** | | **Aracajú – SE** | | **Maceió – AL** | |
|---|---|---|---|---|---|---|
| | TU – 03:00 | | TU – 03:00 | | TU – 03:00 | |
| Coorde- | φ = 12°54'30.67"S | | φ = 10°59'2.69"S | | φ = 9°30'38.70"S | |
| nadas | L = 38°19'19.31"W | | L = 37° 4'13.62"W | | L = 35°47'32.57"W | |
| | Altitude = 10 Mts | | Altitude = 5 Mts | | Altitude = 117 Mts | |
| **Data** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** |
| 01 Jan | 05:09:59 | 18:02:32 | 05:08:27 | 17:54:04 | 05:05:58 | 17:46:20 |
| 08 Jan | 05:13:58 | 18:04:55 | 05:12:20 | 17:56:34 | 05:09:45 | 17:48:56 |
| 15 Jan | 05:17:57 | 18:06:31 | 05:16:07 | 17:58:20 | 05:13:25 | 17:50:50 |
| 22 Jan | 05:21:43 | 18:07:13 | 05:19:40 | 17:59:17 | 05:16:48 | 17:51:57 |
| 29 Jan | 05:25:11 | 18:07:02 | 05:22:51 | 17:59:22 | 05:19:46 | 17:52:14 |
| 05 Fev | 05:28:13 | 18:05:58 | 05:25:36 | 17:58:36 | 05:22:17 | 17:51:43 |
| 12 Fev | 05:30:47 | 18:04:04 | 05:27:50 | 17:57:02 | 05:24:16 | 17:50:24 |
| 19 Fev | 05:32:51 | 18:01:24 | 05:29:32 | 17:54:43 | 05:25:42 | 17:48:21 |
| 26 Fev | 05:34:27 | 17:58:05 | 05:30:46 | 17:51:47 | 05:26:39 | 17:45:41 |
| 05 Mar | 05:35:39 | 17:54:15 | 05:31:35 | 17:48:20 | 05:27:11 | 17:42:32 |
| 12 Mar | 05:36:31 | 17:50:01 | 05:32:04 | 17:44:29 | 05:27:23 | 17:38:59 |
| 19 Mar | 05:37:07 | 17:45:32 | 05:32:17 | 17:40:23 | 05:27:18 | 17:35:10 |
| 26 Mar | 05:37:34 | 17:40:54 | 05:32:20 | 17:36:09 | 05:27:04 | 17:31:13 |
| 02 Abr | 05:37:58 | 17:36:18 | 05:32:21 | 17:31:56 | 05:26:47 | 17:27:18 |
| 09 Abr | 05:38:24 | 17:31:51 | 05:32:25 | 17:27:51 | 05:26:34 | 17:23:31 |
| 16 Abr | 05:38:57 | 17:27:40 | 05:32:36 | 17:24:02 | 05:26:28 | 17:19:58 |
| 23 Abr | 05:39:41 | 17:23:51 | 05:32:58 | 17:20:34 | 05:26:34 | 17:16:46 |
| 30 Abr | 05:40:40 | 17:20:32 | 05:33:37 | 17:17:36 | 05:26:57 | 17:14:03 |
| 07 Mai | 05:41:56 | 17:17:48 | 05:34:34 | 17:15:11 | 05:27:40 | 17:11:52 |
| 14 Mai | 05:43:28 | 17:15:43 | 05:35:49 | 17:13:22 | 05:28:42 | 17:10:16 |
| 21 Mai | 05:45:13 | 17:14:18 | 05:37:19 | 17:12:12 | 05:30:01 | 17:09:18 |
| 28 Mai | 05:47:10 | 17:13:35 | 05:39:03 | 17:11:42 | 05:31:35 | 17:08:57 |
| 04 Jun | 05:49:14 | 17:13:33 | 05:40:57 | 17:11:50 | 05:33:21 | 17:09:12 |
| 11 Jun | 05:51:15 | 17:14:07 | 05:42:51 | 17:12:31 | 05:35:10 | 17:09:59 |
| 18 Jun | 05:53:07 | 17:15:12 | 05:44:39 | 17:13:40 | 05:36:55 | 17:11:10 |
| 25 Jun | 05:54:40 | 17:16:42 | 05:46:12 | 17:15:10 | 05:38:27 | 17:12:40 |
| 02 Jul | 05:55:48 | 17:18:29 | 05:47:23 | 17:16:53 | 05:39:41 | 17:14:21 |
| 09 Jul | 05:56:23 | 17:20:23 | 05:48:04 | 17:18:41 | 05:40:27 | 17:16:04 |
| 16 Jul | 05:56:19 | 17:22:17 | 05:48:09 | 17:20:25 | 05:40:39 | 17:17:41 |
| 23 Jul | 05:55:32 | 17:24:03 | 05:47:35 | 17:21:59 | 05:40:14 | 17:19:06 |
| 30 Jul | 05:54:03 | 17:25:37 | 05:46:20 | 17:23:18 | 05:39:10 | 17:20:14 |
| 06 Ago | 05:51:51 | 17:26:55 | 05:44:25 | 17:24:20 | 05:37:27 | 17:21:03 |
| 13 Ago | 05:48:58 | 17:27:54 | 05:41:50 | 17:25:01 | 05:35:06 | 17:21:30 |
| 20 Ago | 05:45:28 | 17:28:35 | 05:38:40 | 17:25:22 | 05:32:11 | 17:21:36 |
| 27 Ago | 05:41:28 | 17:29:00 | 05:35:00 | 17:25:26 | 05:28:46 | 17:21:25 |
| 03 Set | 05:37:02 | 17:29:13 | 05:30:56 | 17:25:17 | 05:24:59 | 17:20:59 |
| 10 Set | 05:32:18 | 17:29:15 | 05:26:34 | 17:24:57 | 05:20:54 | 17:20:23 |
| 17 Set | 05:27:22 | 17:29:13 | 05:22:01 | 17:24:33 | 05:16:38 | 17:19:41 |
| 24 Set | 05:22:24 | 17:29:13 | 05:17:25 | 17:24:10 | 05:12:19 | 17:19:01 |
| 01 Out | 05:17:31 | 17:29:21 | 05:12:55 | 17:23:55 | 05:08:07 | 17:18:29 |
| 08 Out | 05:12:50 | 17:29:42 | 05:08:37 | 17:23:53 | 05:04:06 | 17:18:09 |
| 15 Out | 05:08:30 | 17:30:21 | 05:04:40 | 17:24:09 | 05:00:26 | 17:18:09 |
| 22 Out | 05:04:40 | 17:31:24 | 05:01:11 | 17:24:50 | 04:57:14 | 17:18:33 |
| 29 Out | 05:01:26 | 17:32:56 | 04:58:19 | 17:26:01 | 04:54:38 | 17:19:27 |
| 05 Nov | 04:58:56 | 17:34:57 | 04:56:09 | 17:27:42 | 04:52:44 | 17:20:53 |
| 12 Nov | 04:57:14 | 17:37:29 | 04:54:47 | 17:29:54 | 04:51:35 | 17:22:51 |
| 19 Nov | 04:56:26 | 17:40:30 | 04:54:16 | 17:32:38 | 04:51:17 | 17:25:22 |
| 26 Nov | 04:56:35 | 17:43:56 | 04:54:39 | 17:35:50 | 04:51:52 | 17:28:22 |
| 03 Dez | 04:57:39 | 17:47:40 | 04:55:55 | 17:39:22 | 04:53:17 | 17:31:46 |
| 10 Dez | 04:59:34 | 17:51:32 | 04:57:59 | 17:43:05 | 04:55:27 | 17:35:23 |
| 17 Dez | 05:02:15 | 17:55:20 | 05:00:45 | 17:46:49 | 04:58:17 | 17:39:03 |
| 24 Dez | 05:05:33 | 17:58:55 | 05:04:05 | 17:50:23 | 05:01:38 | 17:42:36 |
| 31 Dez | 05:09:18 | 18:02:03 | 05:07:47 | 17:53:34 | 05:05:18 | 17:45:49 |

## Nascer e Ocaso do Sol

Região Nordeste – Parte II

| | Recife – PE | | João Pessoa – PB | | Natal – RN | |
|---|---|---|---|---|---|---|
| | TU – 03:00 | | TU – 03:00 | | TU – 03:00 | |
| Coorde- | φ = 8° 7'36.55"S | | φ = 7° 8'53.48"S | | φ = 5°54'38.48"S | |
| nadas | L = 34°55'23.09"W | | L = 34°57'3.71"W | | L = 35°14'40.13"W | |
| | Altitude = 14 Mts | | Altitude = 64 Mts | | Altitude = 50 Mts | |
| **Data** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** |
| 01 Jan | 05:04:56 | 17:40:25 | 05:06:45 | 17:38:49 | 05:10:05 | 17:37:51 |
| 08 Jan | 05:08:38 | 17:43:06 | 05:10:24 | 17:41:34 | 05:13:39 | 17:40:40 |
| 15 Jan | 05:12:10 | 17:45:08 | 05:13:51 | 17:43:41 | 05:17:00 | 17:42:53 |
| 22 Jan | 05:15:24 | 17:46:24 | 05:16:58 | 17:45:04 | 05:19:58 | 17:44:25 |
| 29 Jan | 05:18:11 | 17:46:53 | 05:19:37 | 17:45:41 | 05:22:28 | 17:45:13 |
| 05 Fev | 05:20:29 | 17:46:35 | 05:21:46 | 17:45:32 | 05:24:25 | 17:45:15 |
| 12 Fev | 05:22:13 | 17:45:30 | 05:23:21 | 17:44:37 | 05:25:47 | 17:44:32 |
| 19 Fev | 05:23:25 | 17:43:42 | 05:24:22 | 17:43:00 | 05:26:35 | 17:43:08 |
| 26 Fev | 05:24:06 | 17:41:18 | 05:24:52 | 17:40:47 | 05:26:52 | 17:41:09 |
| 05 Mar | 05:24:22 | 17:38:25 | 05:24:57 | 17:38:04 | 05:26:42 | 17:38:41 |
| 12 Mar | 05:24:17 | 17:35:08 | 05:24:40 | 17:34:59 | 05:26:11 | 17:35:50 |
| 19 Mar | 05:23:56 | 17:31:36 | 05:24:08 | 17:31:38 | 05:25:24 | 17:32:44 |
| 26 Mar | 05:23:26 | 17:27:56 | 05:23:26 | 17:28:10 | 05:24:27 | 17:29:30 |
| 02 Abr | 05:22:53 | 17:24:16 | 05:22:41 | 17:24:42 | 05:23:29 | 17:26:16 |
| 09 Abr | 05:22:23 | 17:20:45 | 05:22:01 | 17:21:22 | 05:22:34 | 17:23:10 |
| 16 Abr | 05:22:02 | 17:17:28 | 05:21:28 | 17:18:15 | 05:21:48 | 17:20:18 |
| 23 Abr | 05:21:53 | 17:14:31 | 05:21:09 | 17:15:29 | 05:21:15 | 17:17:45 |
| 30 Abr | 05:22:02 | 17:12:02 | 05:21:08 | 17:13:10 | 05:21:02 | 17:15:38 |
| 07 Mai | 05:22:32 | 17:10:04 | 05:21:28 | 17:11:22 | 05:21:10 | 17:14:01 |
| 14 Mai | 05:23:21 | 17:08:41 | 05:22:09 | 17:10:07 | 05:21:40 | 17:12:57 |
| 21 Mai | 05:24:29 | 17:07:52 | 05:23:10 | 17:09:26 | 05:22:32 | 17:12:26 |
| 28 Mai | 05:25:55 | 17:07:41 | 05:24:29 | 17:09:20 | 05:23:43 | 17:12:28 |
| 04 Jun | 05:27:34 | 17:08:03 | 05:26:03 | 17:09:47 | 05:25:10 | 17:13:01 |
| 11 Jun | 05:29:18 | 17:08:54 | 05:27:43 | 17:10:42 | 05:26:47 | 17:14:00 |
| 18 Jun | 05:31:00 | 17:10:08 | 05:29:23 | 17:11:58 | 05:28:24 | 17:15:18 |
| 25 Jun | 05:32:32 | 17:11:38 | 05:30:56 | 17:13:28 | 05:29:56 | 17:16:48 |
| 02 Jul | 05:33:48 | 17:13:17 | 05:32:13 | 17:15:05 | 05:31:15 | 17:18:23 |
| 09 Jul | 05:34:38 | 17:14:55 | 05:33:06 | 17:16:40 | 05:32:13 | 17:19:55 |
| 16 Jul | 05:34:57 | 17:16:25 | 05:33:29 | 17:18:06 | 05:32:41 | 17:21:14 |
| 23 Jul | 05:34:40 | 17:17:42 | 05:33:18 | 17:19:16 | 05:32:38 | 17:22:17 |
| 30 Jul | 05:33:46 | 17:18:40 | 05:32:32 | 17:20:07 | 05:32:01 | 17:22:59 |
| 06 Ago | 05:32:15 | 17:19:17 | 05:31:09 | 17:20:36 | 05:30:48 | 17:23:17 |
| 13 Ago | 05:30:07 | 17:19:31 | 05:29:10 | 17:20:41 | 05:29:00 | 17:23:11 |
| 20 Ago | 05:27:25 | 17:19:23 | 05:26:38 | 17:20:23 | 05:26:40 | 17:22:41 |
| 27 Ago | 05:24:16 | 17:18:58 | 05:23:39 | 17:19:47 | 05:23:54 | 17:21:52 |
| 03 Set | 05:20:43 | 17:18:17 | 05:20:17 | 17:18:56 | 05:20:46 | 17:20:47 |
| 10 Set | 05:16:54 | 17:17:25 | 05:16:38 | 17:17:53 | 05:17:21 | 17:19:30 |
| 17 Set | 05:12:54 | 17:16:27 | 05:12:49 | 17:16:44 | 05:13:46 | 17:18:07 |
| 24 Set | 05:08:52 | 17:15:31 | 05:08:59 | 17:15:36 | 05:10:09 | 17:16:45 |
| 01 Out | 05:04:55 | 17:14:42 | 05:05:13 | 17:14:36 | 05:06:39 | 17:15:31 |
| 08 Out | 05:01:11 | 17:14:07 | 05:01:41 | 17:13:49 | 05:03:20 | 17:14:30 |
| 15 Out | 04:57:46 | 17:13:50 | 04:58:27 | 17:13:21 | 05:00:21 | 17:13:48 |
| 22 Out | 04:54:50 | 17:13:59 | 04:55:42 | 17:13:19 | 04:57:49 | 17:13:32 |
| 29 Out | 04:52:29 | 17:14:38 | 04:53:32 | 17:13:48 | 04:55:52 | 17:13:47 |
| 05 Nov | 04:50:49 | 17:15:49 | 04:52:02 | 17:14:49 | 04:54:35 | 17:14:36 |
| 12 Nov | 04:49:54 | 17:17:34 | 04:51:16 | 17:16:25 | 04:54:01 | 17:16:00 |
| 19 Nov | 04:49:48 | 17:19:53 | 04:51:18 | 17:18:35 | 04:54:14 | 17:18:00 |
| 26 Nov | 04:50:33 | 17:22:43 | 04:52:10 | 17:21:19 | 04:55:15 | 17:20:34 |
| 03 Dez | 04:52:06 | 17:25:59 | 04:53:50 | 17:24:28 | 04:57:02 | 17:23:36 |
| 10 Dez | 04:54:23 | 17:29:29 | 04:56:11 | 17:27:54 | 04:59:29 | 17:26:57 |
| 17 Dez | 04:57:17 | 17:33:06 | 04:59:07 | 17:31:29 | 05:02:28 | 17:30:29 |
| 24 Dez | 05:00:38 | 17:36:38 | 05:02:29 | 17:35:01 | 05:05:51 | 17:34:00 |
| 31 Dez | 05:04:17 | 17:39:54 | 05:06:07 | 17:38:17 | 05:09:27 | 17:37:18 |

## Nascer e Ocaso do Sol

Região Nordeste – Parte III

| | Fortaleza – CE | | Teresina – PI | | São Luís – MA | |
|---|---|---|---|---|---|---|
| | TU – 03:00 | | TU – 03:00 | | TU – 03:00 | |
| Coorde- | φ = 3°46'36.01"S | | φ = 5° 3'31.61"S | | φ = 2°35'8.95"S | |
| nadas | L = 38°31'52.90"W | | L = 42°49'25.90"W | | L = 44°14'4.78"W | |
| | Altitude = 22 Mts | | Altitude = 60 Mts | | Altitude = 40 Mts | |
| **Data** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** |
| 01 Jan | 05:26:55 | 17:47:19 | 05:41:53 | 18:06:42 | 05:51:47 | 18:08:06 |
| 08 Jan | 05:30:22 | 17:50:16 | 05:45:24 | 18:09:34 | 05:55:10 | 18:11:07 |
| 15 Jan | 05:33:32 | 17:52:41 | 05:48:41 | 18:11:52 | 05:58:13 | 18:13:38 |
| 22 Jan | 05:36:15 | 17:54:27 | 05:51:33 | 18:13:30 | 06:00:49 | 18:15:33 |
| 29 Jan | 05:38:28 | 17:55:32 | 05:53:55 | 18:14:24 | 06:02:52 | 18:16:47 |
| 05 Fev | 05:40:05 | 17:55:54 | 05:55:45 | 18:14:34 | 06:04:18 | 18:17:19 |
| 12 Fev | 05:41:06 | 17:55:32 | 05:56:59 | 18:14:00 | 06:05:07 | 18:17:10 |
| 19 Fev | 05:41:31 | 17:54:31 | 05:57:37 | 18:12:45 | 06:05:20 | 18:16:21 |
| 26 Fev | 05:41:24 | 17:52:55 | 05:57:44 | 18:10:55 | 06:05:00 | 18:14:58 |
| 05 Mar | 05:40:51 | 17:50:52 | 05:57:25 | 18:08:36 | 06:04:12 | 18:13:08 |
| 12 Mar | 05:39:55 | 17:48:26 | 05:56:44 | 18:05:55 | 06:03:03 | 18:10:56 |
| 19 Mar | 05:38:43 | 17:45:44 | 05:55:47 | 18:02:59 | 06:01:37 | 18:08:28 |
| 26 Mar | 05:37:21 | 17:42:55 | 05:54:40 | 17:59:55 | 06:00:01 | 18:05:53 |
| 02 Abr | 05:35:58 | 17:40:06 | 05:53:32 | 17:56:51 | 05:58:24 | 18:03:18 |
| 09 Abr | 05:34:39 | 17:37:25 | 05:52:27 | 17:53:55 | 05:56:52 | 18:00:50 |
| 16 Abr | 05:33:29 | 17:34:55 | 05:51:32 | 17:51:12 | 05:55:29 | 17:58:34 |
| 23 Abr | 05:32:34 | 17:32:45 | 05:50:50 | 17:48:48 | 05:54:21 | 17:56:36 |
| 30 Abr | 05:31:59 | 17:31:00 | 05:50:28 | 17:46:50 | 05:53:34 | 17:55:03 |
| 07 Mai | 05:31:47 | 17:29:43 | 05:50:28 | 17:45:22 | 05:53:11 | 17:53:57 |
| 14 Mai | 05:31:59 | 17:28:57 | 05:50:51 | 17:44:24 | 05:53:13 | 17:53:21 |
| 21 Mai | 05:32:34 | 17:28:42 | 05:51:36 | 17:43:59 | 05:53:39 | 17:53:15 |
| 28 Mai | 05:33:32 | 17:28:58 | 05:52:42 | 17:44:07 | 05:54:29 | 17:53:38 |
| 04 Jun | 05:34:48 | 17:29:41 | 05:54:05 | 17:44:45 | 05:55:40 | 17:54:28 |
| 11 Jun | 05:36:17 | 17:30:48 | 05:55:39 | 17:45:47 | 05:57:05 | 17:55:38 |
| 18 Jun | 05:37:51 | 17:32:09 | 05:57:15 | 17:47:06 | 05:58:36 | 17:57:02 |
| 25 Jun | 05:39:22 | 17:33:40 | 05:58:47 | 17:48:36 | 06:00:08 | 17:58:33 |
| 02 Jul | 05:40:44 | 17:35:12 | 06:00:07 | 17:50:10 | 06:01:31 | 18:00:03 |
| 09 Jul | 05:41:48 | 17:36:36 | 06:01:06 | 17:51:39 | 06:02:39 | 18:01:23 |
| 16 Jul | 05:42:27 | 17:37:45 | 06:01:39 | 17:52:54 | 06:03:23 | 18:02:27 |
| 23 Jul | 05:42:37 | 17:38:35 | 06:01:41 | 17:53:51 | 06:03:39 | 18:03:09 |
| 30 Jul | 05:42:14 | 17:39:01 | 06:01:10 | 17:54:27 | 06:03:26 | 18:03:27 |
| 06 Ago | 05:41:19 | 17:39:02 | 06:00:04 | 17:54:39 | 06:02:40 | 18:03:17 |
| 13 Ago | 05:39:51 | 17:38:36 | 05:58:24 | 17:54:24 | 06:01:23 | 18:02:40 |
| 20 Ago | 05:37:52 | 17:37:45 | 05:56:12 | 17:53:46 | 05:59:36 | 18:01:38 |
| 27 Ago | 05:35:28 | 17:36:34 | 05:53:35 | 17:52:48 | 05:57:23 | 18:00:14 |
| 03 Set | 05:32:43 | 17:35:06 | 05:50:35 | 17:51:34 | 05:54:51 | 17:58:33 |
| 10 Set | 05:29:41 | 17:33:25 | 05:47:20 | 17:50:07 | 05:52:03 | 17:56:39 |
| 17 Set | 05:26:31 | 17:31:38 | 05:43:55 | 17:48:35 | 05:49:06 | 17:54:39 |
| 24 Set | 05:23:19 | 17:29:52 | 05:40:28 | 17:47:03 | 05:46:07 | 17:52:39 |
| 01 Out | 05:20:12 | 17:28:13 | 05:37:07 | 17:45:39 | 05:43:14 | 17:50:47 |
| 08 Out | 05:17:18 | 17:26:47 | 05:33:58 | 17:44:28 | 05:40:34 | 17:49:07 |
| 15 Out | 05:14:43 | 17:25:41 | 05:31:09 | 17:43:36 | 05:38:13 | 17:47:48 |
| 22 Out | 05:12:35 | 17:25:02 | 05:28:47 | 17:43:11 | 05:36:18 | 17:46:55 |
| 29 Out | 05:11:01 | 17:24:54 | 05:26:59 | 17:43:17 | 05:34:57 | 17:46:35 |
| 05 Nov | 05:10:06 | 17:25:21 | 05:25:51 | 17:43:57 | 05:34:13 | 17:46:50 |
| 12 Nov | 05:09:52 | 17:26:25 | 05:25:25 | 17:45:14 | 05:34:11 | 17:47:44 |
| 19 Nov | 05:10:23 | 17:28:07 | 05:25:45 | 17:47:07 | 05:34:52 | 17:49:16 |
| 26 Nov | 05:11:40 | 17:30:26 | 05:26:53 | 17:49:35 | 05:36:18 | 17:51:26 |
| 03 Dez | 05:13:40 | 17:33:16 | 05:28:45 | 17:52:32 | 05:38:24 | 17:54:09 |
| 10 Dez | 05:16:15 | 17:36:28 | 05:31:15 | 17:55:50 | 05:41:05 | 17:57:16 |
| 17 Dez | 05:19:20 | 17:39:54 | 05:34:17 | 17:59:19 | 05:44:13 | 18:00:40 |
| 24 Dez | 05:22:45 | 17:43:24 | 05:37:41 | 18:02:50 | 05:47:39 | 18:04:09 |
| 31 Dez | 05:26:18 | 17:46:46 | 05:41:15 | 18:06:09 | 05:51:10 | 18:07:32 |

## Nascer e Ocaso do Sol

Região Centro-Oeste

| | Brasília – DF | | Goiânia – GO | | Campo Grande – MS | | Cuiabá – MT | |
|---|---|---|---|---|---|---|---|---|
| | TU – 03:00 | | TU – 03:00 | | TU – 04:00 | | TU – 04:00 | |
| Coorde- | φ = 15°51'45.54"S | | φ = 16°37'54.44"S | | φ = 20°28'12.14"S | | φ = 15°39'14.90"S | |
| nadas | L = 47°54'46.51" | | L = 49°13'17.08"W | | L = 54°40'26.08"W | | L = 56° 6'57.97"W | |
| | Altitude = 1055 | | Altitude = 742 Mts | | Altitude = 556 Mts | | Altitude = 181 Mts | |
| **Data** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** | **Nascer** | **Ocaso** |
| 01 Jan | 05:42:54 | 18:46:22 | 05:46:41 | 18:53:03 | 05:01:01 | 18:22:20 | 05:16:07 | 18:18:48 |
| 08 Jan | 05:47:04 | 18:48:33 | 05:50:54 | 18:55:11 | 05:05:30 | 18:24:12 | 05:20:17 | 18:21:00 |
| 15 Jan | 05:51:19 | 18:49:52 | 05:55:14 | 18:56:25 | 05:10:12 | 18:25:02 | 05:24:30 | 18:22:19 |
| 22 Jan | 05:55:27 | 18:50:12 | 05:59:27 | 18:56:40 | 05:14:55 | 18:24:47 | 05:28:37 | 18:22:41 |
| 29 Jan | 05:59:20 | 18:49:35 | 06:03:27 | 18:55:56 | 05:19:30 | 18:23:27 | 05:32:27 | 18:22:06 |
| 05 Fev | 06:02:51 | 18:48:02 | 06:07:06 | 18:54:15 | 05:23:48 | 18:21:06 | 05:35:57 | 18:20:34 |
| 12 Fev | 06:05:56 | 18:45:36 | 06:10:19 | 18:51:40 | 05:27:45 | 18:17:48 | 05:39:00 | 18:18:10 |
| 19 Fev | 06:08:34 | 18:42:22 | 06:13:05 | 18:48:17 | 05:31:16 | 18:13:40 | 05:41:34 | 18:14:59 |
| 26 Fev | 06:10:44 | 18:38:28 | 06:15:25 | 18:44:14 | 05:34:24 | 18:08:49 | 05:43:42 | 18:11:07 |
| 05 Mar | 06:12:32 | 18:34:02 | 06:17:22 | 18:39:39 | 05:37:09 | 18:03:25 | 05:45:27 | 18:06:44 |
| 12 Mar | 06:14:00 | 18:29:12 | 06:19:00 | 18:34:39 | 05:39:37 | 17:57:36 | 05:46:53 | 18:01:56 |
| 19 Mar | 06:15:13 | 18:24:06 | 06:20:23 | 18:29:23 | 05:41:49 | 17:51:31 | 05:48:03 | 17:56:53 |
| 26 Mar | 06:16:16 | 18:18:52 | 06:21:36 | 18:24:00 | 05:43:51 | 17:45:18 | 05:49:04 | 17:51:41 |
| 02 Abr | 06:17:16 | 18:13:40 | 06:22:45 | 18:18:39 | 05:45:50 | 17:39:07 | 05:50:01 | 17:46:32 |
| 09 Abr | 06:18:18 | 18:08:38 | 06:23:57 | 18:13:27 | 05:47:49 | 17:33:08 | 05:51:01 | 17:41:32 |
| 16 Abr | 06:19:26 | 18:03:52 | 06:25:13 | 18:08:32 | 05:49:53 | 17:27:26 | 05:52:06 | 17:36:49 |
| 23 Abr | 06:20:43 | 17:59:30 | 06:26:39 | 18:04:01 | 05:52:04 | 17:22:10 | 05:53:21 | 17:32:29 |
| 30 Abr | 06:22:14 | 17:55:40 | 06:28:19 | 18:00:02 | 05:54:27 | 17:17:28 | 05:54:49 | 17:28:41 |
| 07 Mai | 06:23:59 | 17:52:26 | 06:30:12 | 17:56:41 | 05:57:01 | 17:13:27 | 05:56:33 | 17:25:31 |
| 14 Mai | 06:25:58 | 17:49:54 | 06:32:18 | 17:54:02 | 05:59:44 | 17:10:11 | 05:58:30 | 17:23:00 |
| 21 Mai | 06:28:08 | 17:48:06 | 06:34:34 | 17:52:07 | 06:02:32 | 17:07:44 | 06:00:37 | 17:21:14 |
| 28 Mai | 06:30:25 | 17:47:03 | 06:36:57 | 17:50:59 | 06:05:22 | 17:06:09 | 06:02:53 | 17:20:13 |
| 04 Jun | 06:32:44 | 17:46:46 | 06:39:20 | 17:50:38 | 06:08:08 | 17:05:27 | 06:05:11 | 17:19:57 |
| 11 Jun | 06:34:57 | 17:47:10 | 06:41:36 | 17:50:59 | 06:10:38 | 17:05:33 | 06:07:23 | 17:20:21 |
| 18 Jun | 06:36:54 | 17:48:09 | 06:43:34 | 17:51:57 | 06:12:45 | 17:06:24 | 06:09:20 | 17:21:21 |
| 25 Jun | 06:38:28 | 17:49:39 | 06:45:09 | 17:53:26 | 06:14:20 | 17:07:53 | 06:10:54 | 17:22:51 |
| 02 Jul | 06:39:31 | 17:51:30 | 06:46:11 | 17:55:20 | 06:15:15 | 17:09:53 | 06:11:57 | 17:24:42 |
| 09 Jul | 06:39:56 | 17:53:35 | 06:46:33 | 17:57:27 | 06:15:24 | 17:12:14 | 06:12:23 | 17:26:46 |
| 16 Jul | 06:39:37 | 17:55:43 | 06:46:10 | 17:59:39 | 06:14:41 | 17:14:47 | 06:12:05 | 17:28:54 |
| 23 Jul | 06:38:32 | 17:57:49 | 06:44:59 | 18:01:50 | 06:13:04 | 17:17:24 | 06:11:00 | 17:30:58 |
| 30 Jul | 06:36:39 | 17:59:46 | 06:43:01 | 18:03:53 | 06:10:34 | 17:19:59 | 06:09:09 | 17:32:53 |
| 06 Ago | 06:34:01 | 18:01:30 | 06:40:16 | 18:05:44 | 06:07:14 | 17:22:26 | 06:06:33 | 17:34:35 |
| 13 Ago | 06:30:39 | 18:02:58 | 06:36:46 | 18:07:20 | 06:03:05 | 17:24:40 | 06:03:13 | 17:36:01 |
| 20 Ago | 06:26:39 | 18:04:10 | 06:32:37 | 18:08:40 | 05:58:14 | 17:26:42 | 05:59:14 | 17:37:11 |
| 27 Ago | 06:22:05 | 18:05:08 | 06:27:56 | 18:09:46 | 05:52:48 | 17:28:33 | 05:54:43 | 17:38:06 |
| 03 Set | 06:17:06 | 18:05:54 | 06:22:47 | 18:10:41 | 05:46:54 | 17:30:14 | 05:49:47 | 17:38:50 |
| 10 Set | 06:11:47 | 18:06:31 | 06:17:19 | 18:11:28 | 05:40:39 | 17:31:48 | 05:44:30 | 17:39:25 |
| 17 Set | 06:06:16 | 18:07:05 | 06:11:39 | 18:12:11 | 05:34:10 | 17:33:19 | 05:39:01 | 17:39:56 |
| 24 Set | 06:00:42 | 18:07:40 | 06:05:55 | 18:12:56 | 05:27:38 | 17:34:53 | 05:33:30 | 17:40:29 |
| 01 Out | 05:55:13 | 18:08:25 | 06:00:17 | 18:13:50 | 05:21:11 | 17:36:36 | 05:28:03 | 17:41:11 |
| 08 Out | 05:49:57 | 18:09:21 | 05:54:51 | 18:14:56 | 05:14:56 | 17:38:31 | 05:22:50 | 17:42:05 |
| 15 Out | 05:45:01 | 18:10:36 | 05:49:46 | 18:16:20 | 05:09:03 | 17:40:43 | 05:17:57 | 17:43:17 |
| 22 Out | 05:40:36 | 18:12:14 | 05:45:11 | 18:18:07 | 05:03:42 | 17:43:17 | 05:13:34 | 17:44:52 |
| 29 Out | 05:36:49 | 18:14:19 | 05:41:15 | 18:20:21 | 04:59:00 | 17:46:17 | 05:09:50 | 17:46:55 |
| 05 Nov | 05:33:47 | 18:16:53 | 05:38:05 | 18:23:03 | 04:55:06 | 17:49:43 | 05:06:50 | 17:49:27 |
| 12 Nov | 05:31:35 | 18:19:54 | 05:35:46 | 18:26:12 | 04:52:06 | 17:53:32 | 05:04:41 | 17:52:26 |
| 19 Nov | 05:30:21 | 18:23:21 | 05:34:24 | 18:29:47 | 04:50:07 | 17:57:44 | 05:03:28 | 17:55:51 |
| 26 Nov | 05:30:06 | 18:27:11 | 05:34:03 | 18:33:42 | 04:49:15 | 18:02:11 | 05:03:16 | 17:59:39 |
| 03 Dez | 05:30:51 | 18:31:13 | 05:34:43 | 18:37:50 | 04:49:29 | 18:06:44 | 05:04:03 | 18:03:41 |
| 10 Dez | 05:32:33 | 18:35:18 | 05:36:21 | 18:41:59 | 04:50:48 | 18:11:11 | 05:05:45 | 18:07:45 |
| 17 Dez | 05:35:06 | 18:39:15 | 05:38:52 | 18:45:57 | 04:53:08 | 18:15:20 | 05:08:19 | 18:11:41 |
| 24 Dez | 05:38:23 | 18:42:51 | 05:42:08 | 18:49:34 | 04:56:21 | 18:18:59 | 05:11:36 | 18:15:17 |
| 31 Dez | 05:42:11 | 18:45:54 | 05:45:58 | 18:52:36 | 05:00:17 | 18:21:54 | 05:15:25 | 18:18:20 |

# VII - Planetas

## Mercúrio

| Distância média (UA) | Período de Revolução | Inclinação Equatorial | Diâmetro |
|---|---|---|---|
| 0,39 | 88 dias | 7º | 4.800 km |

00:00 Hora – Tempo Universal

| Data | α | δ | ∅ | Elong | DT (UA)* | Ang. PH | Fase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 01 jan | 17h 16m 42.36s | -20° 13' 01.2" | 8.03 | 20.6 | 0.8364824 | 103.7 | 0.382 | 0.2 |
| 08 jan | 17h 35m 06.32s | -21° 23' 28.9" | 6.84 | 23.2 | 0.9828740 | 78.5 | 0.600 | -0.2 |
| 15 jan | 18h 07m 55.02s | -22° 34' 02.7" | 6.04 | 22.7 | 1.1117633 | 61.7 | 0.737 | -0.2 |
| 22 jan | 18h 47m 50.10s | -23° 06' 53.5" | 5.53 | 20.6 | 1.2155090 | 49.6 | 0.824 | -0.2 |
| 29 jan | 19h 31m 29.19s | -22° 45' 11.4" | 5.19 | 17.7 | 1.2946954 | 40.1 | 0.883 | -0.3 |
| 05 fev | 20h 17m 10.94s | -21° 21' 05.3" | 4.97 | 14.2 | 1.3508740 | 31.5 | 0.926 | -0.4 |
| 12 fev | 21h 04m 01.40s | -18° 50' 39.9" | 4.85 | 10.2 | 1.3843831 | 22.9 | 0.961 | -0.7 |
| 19 fev | 21h 51m 36.11s | -15° 12' 02.6" | 4.82 | 5.5 | 1.3930613 | 13.0 | 0.987 | -1.1 |
| 26 fev | 22h 39m 47.87s | -10° 25' 35.6" | 4.90 | 1.9 | 1.3707034 | 4.9 | 0.998 | -1.6 |
| 05 mar | 23h 28m 18.85s | -04° 38' 11.5" | 5.15 | 6.9 | 1.3056736 | 20.4 | 0.969 | -1.5 |
| 12 mar | 00h 15m 21.69s | +01° 43' 47.1" | 5.67 | 13.2 | 1.1844754 | 46.2 | 0.846 | -1.2 |
| 19 mar | 00h 55m 31.35s | +07° 36' 16.7" | 6.65 | 17.7 | 1.0104369 | 78.4 | 0.601 | -0.7 |
| 26 mar | 01h 20m 20.66s | +11° 31' 26.2" | 8.17 | 18.1 | 0.8228489 | 112.0 | 0.313 | 0.4 |
| 02 abr | 01h 24m 11.60s | +12° 26' 06.7" | 9.99 | 12.6 | 0.6728256 | 144.2 | 0.095 | 2.4 |
| 09 abr | 01h 10m 47.67s | +10° 17' 09.9" | 11.36 | 2.9 | 0.5915496 | 172.8 | 0.004 | 5.2 |
| 16 abr | 00h 54m 34.83s | +06° 43' 46.7" | 11.51 | 10.5 | 0.5839497 | 155.5 | 0.045 | 3.5 |
| 23 abr | 00h 49m 02.41s | +04° 09' 04.9" | 10.62 | 19.6 | 0.6330288 | 132.9 | 0.160 | 1.8 |
| 30 abr | 00h 57m 28.67s | +03° 35' 57.1" | 9.38 | 24.8 | 0.7162938 | 115.1 | 0.288 | 1.0 |
| 07 mai | 01h 17m 28.76s | +04° 55' 08.7" | 8.21 | 26.5 | 0.8183930 | 100.6 | 0.408 | 0.5 |
| 14 mai | 01h 46m 24.39s | +07° 39' 21.2" | 7.22 | 25.6 | 0.9312467 | 87.4 | 0.523 | 0.2 |
| 21 mai | 02h 23m 05.02s | +11° 22' 56.3" | 6.40 | 22.5 | 1.0496268 | 73.5 | 0.642 | -0.2 |
| 28 mai | 03h 07m 48.38s | +15° 40' 45.6" | 5.76 | 17.6 | 1.1660574 | 56.8 | 0.774 | -0.6 |
| 04 jun | 04h 01m 41.06s | +19° 59' 01.7" | 5.31 | 10.7 | 1.2648537 | 35.1 | 0.909 | -1.2 |
| 11 jun | 05h 04m 31.07s | +23° 24' 23.0" | 5.09 | 2.5 | 1.3190633 | 8.4 | 0.995 | -2.1 |
| 18 jun | 06h 11m 24.82s | +24° 56' 35.0" | 5.14 | 6.3 | 1.3067516 | 20.7 | 0.968 | -1.6 |
| 25 jun | 07h 14m 24.59s | +24° 16' 57.2" | 5.43 | 13.9 | 1.2371152 | 44.3 | 0.858 | -0.9 |
| 02 jul | 08h 08m 39.00s | +21° 56' 19.4" | 5.91 | 19.9 | 1.1374141 | 62.3 | 0.732 | -0.4 |
| 09 jul | 08h 53m 05.23s | +18° 37' 27.8" | 6.54 | 24.1 | 1.0276627 | 76.5 | 0.616 | 0.0 |
| 16 jul | 09h 27m 52.61s | +14° 56' 37.3" | 7.32 | 26.4 | 0.9176636 | 89.1 | 0.508 | 0.3 |
| 23 jul | 09h 52m 42.45s | +11° 25' 09.7" | 8.27 | 26.6 | 0.8124573 | 101.9 | 0.397 | 0.6 |
| 30 jul | 10h 06m 05.60s | +08° 36' 38.0" | 9.37 | 24.1 | 0.7171980 | 116.8 | 0.275 | 1.1 |
| 06 ago | 10h 05m 34.27s | +07° 12' 56.5" | 10.47 | 18.1 | 0.6418337 | 135.6 | 0.143 | 2.0 |
| 13 ago | 09h 50m 40.91s | +07° 54' 29.5" | 11.09 | 8.7 | 0.6056886 | 158.9 | 0.033 | 3.8 |
| 20 ago | 09h 30m 04.25s | +10° 27' 40.0" | 10.58 | 6.6 | 0.6350771 | 162.6 | 0.023 | 4.1 |
| 27 ago | 09h 21m 42.84s | +13° 07' 47.0" | 9.02 | 14.9 | 0.7447522 | 131.8 | 0.167 | 1.5 |
| 03 set | 09h 37m 29.99s | +14° 00' 13.9" | 7.31 | 18.1 | 0.9186988 | 97.3 | 0.436 | -0.1 |
| 10 set | 10h 14m 40.96s | +12° 13' 13.4" | 6.06 | 15.8 | 1.1095658 | 62.9 | 0.728 | -0.9 |
| 17 set | 11h 01m 57.04s | +08° 09' 20.9" | 5.32 | 10.4 | 1.2636365 | 33.5 | 0.917 | -1.3 |
| 24 set | 11h 49m 59.20s | +02° 55' 26.0" | 4.94 | 4.4 | 1.3597908 | 12.1 | 0.989 | -1.5 |
| 01 out | 12h 35m 34.61s | -02° 33' 52.0" | 4.78 | 2.1 | 1.4059909 | 5.1 | 0.998 | -1.4 |
| 08 out | 13h 18m 47.83s | -07° 50' 02.3" | 4.75 | 6.8 | 1.4149871 | 15.6 | 0.982 | -0.9 |
| 15 out | 14h 00m 31.65s | -12° 39' 22.5" | 4.82 | 11.2 | 1.3951604 | 24.9 | 0.954 | -0.6 |
| 22 out | 14h 41m 33.44s | -16° 53' 44.9" | 4.98 | 15.0 | 1.3503753 | 33.5 | 0.917 | -0.4 |
| 29 out | 15h 22m 14.32s | -20° 26' 04.7" | 5.24 | 18.3 | 1.2813459 | 42.7 | 0.867 | -0.3 |
| 05 nov | 16h 02m 06.64s | -23° 08' 21.9" | 5.66 | 21.0 | 1.1868936 | 53.7 | 0.796 | -0.3 |
| 12 nov | 16h 39m 06.11s | -24° 50' 50.9" | 6.31 | 22.6 | 1.0655633 | 68.3 | 0.685 | -0.3 |
| 19 nov | 17h 07m 39.41s | -25° 21' 35.1" | 7.31 | 22.0 | 0.9197649 | 89.5 | 0.505 | -0.1 |
| 26 nov | 17h 15m 31.73s | -24° 23' 41.9" | 8.73 | 16.6 | 0.7695577 | 122.1 | 0.234 | 0.8 |
| 03 dez | 16h 49m 48.63s | -21° 38' 07.2" | 9.88 | 3.4 | 0.6804849 | 169.2 | 0.009 | 4.5 |
| 10 dez | 16h 15m 40.09s | -18° 39' 24.3" | 9.21 | 12.5 | 0.7299750 | 137.4 | 0.132 | 1.6 |
| 17 dez | 16h 12m 20.56s | -18° 21' 48.4" | 7.67 | 20.3 | 0.8766284 | 97.7 | 0.433 | -0.0 |
| 24 dez | 16h 35m 00.19s | -19° 58' 16.6" | 6.50 | 21.8 | 1.0338516 | 71.7 | 0.657 | -0.4 |
| 31 dez | 17h 10m 24.60s | -21° 53' 14.6" | 5.76 | 20.5 | 1.1661673 | 54.5 | 0.790 | -0.4 |

# Vênus

| Distância média (UA) | Período de Revolução | Inclinação Equatorial | Diâmetro |
|---|---|---|---|
| 0,72 | 224,7 dias | 3,4º | 12.100 km |

00:00 Hora – Tempo Universal

| Data | α | δ | ∅ | Elong | DT (UA)* | Ang. PH | Fase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 01 jan | 15h 28m 19.69s | -15° 16' 29.1" | 27.08 | 46.7 | 0.6159952 | 94.6 | 0.460 | -4.5 |
| 08 jan | 15h 56m 20.49s | -16° 49' 56.1" | 24.93 | 47.0 | 0.6691487 | 90.2 | 0.499 | -4.4 |
| 15 jan | 16h 26m 06.41s | -18° 16' 36.0" | 23.09 | 46.8 | 0.7223892 | 86.1 | 0.534 | -4.4 |
| 22 jan | 16h 57m 24.27s | -19° 30' 27.6" | 21.51 | 46.4 | 0.7755079 | 82.2 | 0.568 | -4.3 |
| 29 jan | 17h 30m 00.70s | -20° 26' 15.9" | 20.14 | 45.8 | 0.8282575 | 78.6 | 0.598 | -4.3 |
| 05 fev | 18h 03m 38.74s | -20° 59' 45.1" | 18.95 | 45.0 | 0.8804044 | 75.3 | 0.627 | -4.2 |
| 12 fev | 18h 37m 59.32s | -21° 07' 48.4" | 17.90 | 44.1 | 0.9318486 | 72.0 | 0.654 | -4.2 |
| 19 fev | 19h 12m 43.85s | -20° 48' 30.2" | 16.98 | 43.0 | 0.9825481 | 68.9 | 0.680 | -4.2 |
| 26 fev | 19h 47m 34.67s | -20° 01' 02.5" | 16.16 | 41.9 | 1.0324010 | 65.9 | 0.704 | -4.1 |
| 05 mar | 20h 22m 14.79s | -18° 45' 53.5" | 15.43 | 40.6 | 1.0812453 | 63.0 | 0.727 | -4.1 |
| 12 mar | 20h 56m 30.03s | -17° 04' 37.8" | 14.77 | 39.3 | 1.1290119 | 60.2 | 0.748 | -4.0 |
| 19 mar | 21h 30m 11.67s | -14° 59' 38.3" | 14.19 | 38.0 | 1.1756946 | 57.4 | 0.769 | -4.0 |
| 26 mar | 22h 03m 16.69s | -12° 33' 48.4" | 13.66 | 36.5 | 1.2212437 | 54.7 | 0.789 | -4.0 |
| 02 abr | 22h 35m 45.99s | -09° 50' 31.1" | 13.18 | 35.0 | 1.2655031 | 52.1 | 0.807 | -4.0 |
| 09 abr | 23h 07m 43.50s | -06° 53' 28.0" | 12.75 | 33.5 | 1.3083670 | 49.4 | 0.825 | -4.0 |
| 16 abr | 23h 39m 16.59s | -03° 46' 24.9" | 12.36 | 31.9 | 1.3498004 | 46.8 | 0.842 | -3.9 |
| 23 abr | 00h 10m 35.72s | -00° 33' 03.9" | 12.00 | 30.3 | 1.3897581 | 44.2 | 0.858 | -3.9 |
| 30 abr | 00h 41m 52.76s | +02° 42' 48.7" | 11.68 | 28.7 | 1.4280737 | 41.6 | 0.874 | -3.9 |
| 07 mai | 01h 13m 19.42s | +05° 57' 19.3" | 11.39 | 27.0 | 1.4645864 | 39.0 | 0.889 | -3.9 |
| 14 mai | 01h 45m 07.28s | +09° 06' 33.1" | 11.13 | 25.3 | 1.4992130 | 36.4 | 0.903 | -3.9 |
| 21 mai | 02h 17m 28.02s | +12° 06' 36.4" | 10.89 | 23.5 | 1.5319030 | 33.8 | 0.916 | -3.9 |
| 28 mai | 02h 50m 32.07s | +14° 53' 30.3" | 10.68 | 21.7 | 1.5625017 | 31.1 | 0.928 | -3.9 |
| 04 jun | 03h 24m 26.57s | +17° 23' 09.7" | 10.49 | 19.9 | 1.5908218 | 28.5 | 0.940 | -3.9 |
| 11 jun | 03h 59m 14.45s | +19° 31' 33.6" | 10.32 | 18.1 | 1.6167521 | 25.8 | 0.950 | -3.9 |
| 18 jun | 04h 34m 54.69s | +21° 14' 55.3" | 10.17 | 16.2 | 1.6402595 | 23.1 | 0.960 | -3.9 |
| 25 jun | 05h 11m 21.56s | +22° 29' 52.8" | 10.04 | 14.4 | 1.6612449 | 20.4 | 0.969 | -3.9 |
| 02 jul | 05h 48m 23.59s | +23° 13' 41.0" | 9.93 | 12.5 | 1.6795517 | 17.7 | 0.976 | -3.9 |
| 09 jul | 06h 25m 44.10s | +23° 24' 31.7" | 9.84 | 10.6 | 1.6950836 | 15.0 | 0.983 | -3.9 |
| 16 jul | 07h 03m 04.44s | +23° 01' 42.3" | 9.77 | 8.7 | 1.7078570 | 12.3 | 0.989 | -3.9 |
| 23 jul | 07h 40m 06.64s | +22° 05' 39.4" | 9.71 | 6.8 | 1.7178695 | 9.6 | 0.993 | -3.9 |
| 30 jul | 08h 16m 35.23s | +20° 37' 55.3" | 9.67 | 4.9 | 1.7250491 | 6.9 | 0.996 | -3.9 |
| 06 ago | 08h 52m 18.17s | +18° 41' 04.3" | 9.65 | 3.1 | 1.7293503 | 4.4 | 0.999 | -3.9 |
| 13 ago | 09h 27m 09.04s | +16° 18' 23.5" | 9.64 | 1.6 | 1.7308510 | 2.2 | 1.000 | -3.9 |
| 20 ago | 10h 01m 07.51s | +13° 33' 35.0" | 9.64 | 1.7 | 1.7296531 | 2.3 | 1.000 | -3.9 |
| 27 ago | 10h 34m 18.43s | +10° 30' 36.0" | 9.67 | 3.2 | 1.7257854 | 4.5 | 0.998 | -3.9 |
| 03 set | 11h 06m 49.73s | +07° 13' 36.6" | 9.70 | 5.0 | 1.7192566 | 7.0 | 0.996 | -3.9 |
| 10 set | 11h 38m 52.01s | +03° 46' 49.0" | 9.75 | 6.8 | 1.7101770 | 9.6 | 0.993 | -3.9 |
| 17 set | 12h 10m 38.30s | +00° 14' 21.6" | 9.82 | 8.7 | 1.6987153 | 12.1 | 0.989 | -3.9 |
| 24 set | 12h 42m 23.34s | -03° 19' 39.1" | 9.90 | 10.5 | 1.6849702 | 14.7 | 0.984 | -3.9 |
| 01 out | 13h 14m 21.67s | -06° 50' 59.6" | 9.99 | 12.3 | 1.6689765 | 17.2 | 0.978 | -3.9 |
| 08 out | 13h 46m 46.89s | -10° 15' 19.7" | 10.10 | 14.1 | 1.6508234 | 19.7 | 0.971 | -3.9 |
| 15 out | 14h 19m 51.71s | -13° 28' 15.7" | 10.23 | 15.9 | 1.6306850 | 22.1 | 0.963 | -3.9 |
| 22 out | 14h 53m 47.39s | -16° 25' 21.3" | 10.37 | 17.6 | 1.6086809 | 24.6 | 0.955 | -3.9 |
| 29 out | 15h 28m 41.43s | -19° 02' 03.8" | 10.52 | 19.4 | 1.5848413 | 27.0 | 0.946 | -3.9 |
| 05 nov | 16h 04m 35.68s | -21° 13' 54.9" | 10.70 | 21.1 | 1.5591957 | 29.4 | 0.936 | -3.9 |
| 12 nov | 16h 41m 25.85s | -22° 56' 45.5" | 10.89 | 22.7 | 1.5318743 | 31.7 | 0.925 | -3.9 |
| 19 nov | 17h 19m 01.92s | -24° 07' 04.3" | 11.10 | 24.4 | 1.5029849 | 34.1 | 0.914 | -3.9 |
| 26 nov | 17h 57m 07.66s | -24° 42' 11.7" | 11.33 | 26.0 | 1.4725425 | 36.5 | 0.902 | -3.9 |
| 03 dez | 18h 35m 21.31s | -24° 40' 42.7" | 11.58 | 27.6 | 1.4405144 | 38.9 | 0.889 | -3.9 |
| 10 dez | 19h 13m 18.88s | -24° 02' 35.1" | 11.86 | 29.2 | 1.4069655 | 41.3 | 0.876 | -3.9 |
| 17 dez | 19h 50m 38.91s | -22° 49' 09.2" | 12.16 | 30.7 | 1.3719816 | 43.7 | 0.861 | -4.0 |
| 24 dez | 20h 27m 04.75s | -21° 02' 55.0" | 12.49 | 32.2 | 1.3355722 | 46.2 | 0.846 | -4.0 |
| 31 dez | 21h 02m 25.15s | -18° 47' 22.8" | 12.85 | 33.7 | 1.2976668 | 48.7 | 0.830 | -4.0 |

# Marte

| Distância média (UA) | Período de Revolução | Inclinação Equatorial | Diâmetro |
|---|---|---|---|
| 1,52 | 687 dias | 1,9º | 6.794 km |

00:00 Hora – Tempo Universal

| Data | α | δ | ∅ | Elong | DT (UA)* | Ang. PH | Fase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 01 jan | 19h 20m 10.63s | -23° 09' 33.4" | 3.93 | 8.2 | 2.3789067 | 5.7 | 0.998 | 1.2 |
| 08 jan | 19h 43m 28.16s | -22° 20' 40.2" | 3.93 | 6.5 | 2.3793133 | 4.6 | 0.998 | 1.2 |
| 15 jan | 20h 06m 34.14s | -21° 19' 23.3" | 3.93 | 4.9 | 2.3789500 | 3.4 | 0.999 | 1.1 |
| 22 jan | 20h 29m 24.86s | -20° 06' 23.9" | 3.94 | 3.3 | 2.3779804 | 2.4 | 1.000 | 1.1 |
| 29 jan | 20h 51m 57.84s | -18° 42' 29.5" | 3.94 | 1.9 | 2.3765178 | 1.3 | 1.000 | 1.1 |
| 05 fev | 21h 14m 11.47s | -17° 08' 37.5" | 3.94 | 1.0 | 2.3745548 | 0.7 | 1.000 | 1.1 |
| 12 fev | 21h 36m 04.33s | -15° 25' 52.6" | 3.95 | 2.0 | 2.3721299 | 1.4 | 1.000 | 1.1 |
| 19 fev | 21h 57m 36.30s | -13° 35' 23.6" | 3.95 | 3.4 | 2.3693586 | 2.4 | 1.000 | 1.1 |
| 26 fev | 22h 18m 48.39s | -11° 38' 17.6" | 3.96 | 4.8 | 2.3663269 | 3.4 | 0.999 | 1.1 |
| 05 mar | 22h 39m 42.26s | -09° 35' 44.6" | 3.96 | 6.3 | 2.3629850 | 4.5 | 0.998 | 1.1 |
| 12 mar | 23h 00m 19.40s | -07° 28' 58.6" | 3.97 | 7.7 | 2.3593045 | 5.6 | 0.998 | 1.1 |
| 19 mar | 23h 20m 41.86s | -05° 19' 11.4" | 3.97 | 9.2 | 2.3553348 | 6.6 | 0.997 | 1.1 |
| 26 mar | 23h 40m 52.39s | -03° 07' 30.1" | 3.98 | 10.7 | 2.3511211 | 7.7 | 0.996 | 1.2 |
| 02 abr | 00h 00m 54.03s | -00° 55' 01.1" | 3.99 | 12.1 | 2.3465686 | 8.7 | 0.994 | 1.2 |
| 09 abr | 00h 20m 49.24s | +01° 17' 07.1" | 4.00 | 13.5 | 2.3415790 | 9.7 | 0.993 | 1.2 |
| 16 abr | 00h 40m 40.42s | +03° 27' 49.2" | 4.01 | 15.0 | 2.3361351 | 10.7 | 0.991 | 1.2 |
| 23 abr | 01h 00m 30.38s | +05° 36' 05.2" | 4.02 | 16.4 | 2.3302409 | 11.8 | 0.990 | 1.2 |
| 30 abr | 01h 20m 21.93s | +07° 40' 57.5" | 4.03 | 17.9 | 2.3237673 | 12.8 | 0.988 | 1.2 |
| 07 mai | 01h 40m 17.09s | +09° 41' 27.6" | 4.04 | 19.4 | 2.3165597 | 13.8 | 0.986 | 1.3 |
| 14 mai | 02h 00m 17.29s | +11° 36' 39.4" | 4.05 | 20.9 | 2.3085460 | 14.8 | 0.983 | 1.3 |
| 21 mai | 02h 20m 24.16s | +13° 25' 43.1" | 4.07 | 22.4 | 2.2997006 | 15.8 | 0.981 | 1.3 |
| 28 mai | 02h 40m 39.13s | +15° 07' 52.2" | 4.09 | 23.9 | 2.2898804 | 16.8 | 0.979 | 1.3 |
| 04 jun | 03h 01m 02.68s | +16° 42' 21.0" | 4.11 | 25.5 | 2.2788962 | 17.7 | 0.976 | 1.3 |
| 11 jun | 03h 21m 34.24s | +18° 08' 28.1" | 4.13 | 27.1 | 2.2666406 | 18.7 | 0.974 | 1.3 |
| 18 jun | 03h 42m 13.28s | +19° 25' 38.7" | 4.15 | 28.7 | 2.2530766 | 19.7 | 0.971 | 1.4 |
| 25 jun | 04h 02m 59.04s | +20° 33' 23.6" | 4.18 | 30.4 | 2.2380680 | 20.7 | 0.968 | 1.4 |
| 02 jul | 04h 23m 49.80s | +21° 31' 17.7" | 4.21 | 32.1 | 2.2214165 | 21.7 | 0.965 | 1.4 |
| 09 jul | 04h 44m 42.63s | +22° 19' 03.0" | 4.25 | 33.8 | 2.2030004 | 22.6 | 0.962 | 1.4 |
| 16 jul | 05h 05m 34.79s | +22° 56' 29.1" | 4.29 | 35.7 | 2.1827907 | 23.6 | 0.958 | 1.4 |
| 23 jul | 05h 26m 23.61s | +23° 23' 32.8" | 4.33 | 37.5 | 2.1606771 | 24.6 | 0.955 | 1.4 |
| 30 jul | 05h 47m 05.92s | +23° 40' 17.6" | 4.38 | 39.5 | 2.1364777 | 25.5 | 0.951 | 1.4 |
| 06 ago | 06h 07m 37.60s | +23° 46' 55.7" | 4.44 | 41.5 | 2.1100772 | 26.5 | 0.948 | 1.4 |
| 13 ago | 06h 27m 55.16s | +23° 43' 46.0" | 4.50 | 43.5 | 2.0814731 | 27.4 | 0.944 | 1.4 |
| 20 ago | 06h 47m 55.79s | +23° 31' 12.9" | 4.56 | 45.7 | 2.0506005 | 28.3 | 0.940 | 1.4 |
| 27 ago | 07h 07m 36.76s | +23° 09' 46.9" | 4.64 | 47.9 | 2.0173178 | 29.2 | 0.936 | 1.4 |
| 03 set | 07h 26m 54.69s | +22° 40' 06.4" | 4.72 | 50.2 | 1.9815384 | 30.1 | 0.932 | 1.4 |
| 10 set | 07h 45m 47.07s | +22° 02' 52.5" | 4.82 | 52.6 | 1.9433066 | 31.0 | 0.929 | 1.4 |
| 17 set | 08h 04m 12.36s | +21° 18' 47.9" | 4.92 | 55.0 | 1.9026236 | 31.8 | 0.925 | 1.4 |
| 24 set | 08h 22m 09.29s | +20° 28' 38.9" | 5.03 | 57.6 | 1.8594134 | 32.7 | 0.921 | 1.3 |
| 01 out | 08h 39m 35.84s | +19° 33' 17.6" | 5.16 | 60.3 | 1.8136450 | 33.4 | 0.917 | 1.3 |
| 08 out | 08h 56m 30.56s | +18° 33' 36.5" | 5.30 | 63.1 | 1.7654327 | 34.2 | 0.914 | 1.3 |
| 15 out | 09h 12m 52.81s | +17° 30' 25.1" | 5.46 | 65.9 | 1.7148707 | 34.8 | 0.910 | 1.2 |
| 22 out | 09h 28m 41.98s | +16° 24' 36.0" | 5.63 | 69.0 | 1.6619777 | 35.5 | 0.907 | 1.2 |
| 29 out | 09h 43m 56.29s | +15° 17' 07.4" | 5.83 | 72.1 | 1.6068125 | 36.0 | 0.905 | 1.1 |
| 05 nov | 09h 58m 33.84s | +14° 08' 57.5" | 6.04 | 75.4 | 1.5495920 | 36.4 | 0.902 | 1.1 |
| 12 nov | 10h 12m 33.25s | +13° 01' 00.2" | 6.28 | 78.8 | 1.4905400 | 36.8 | 0.900 | 1.0 |
| 19 nov | 10h 25m 52.64s | +11° 54' 13.0" | 6.55 | 82.4 | 1.4298120 | 37.0 | 0.899 | 0.9 |
| 26 nov | 10h 38m 28.30s | +10° 49' 42.1" | 6.84 | 86.3 | 1.3676074 | 37.1 | 0.899 | 0.8 |
| 03 dez | 10h 50m 15.56s | +09° 48' 35.3" | 7.18 | 90.3 | 1.3043031 | 37.0 | 0.899 | 0.7 |
| 10 dez | 11h 01m 09.71s | +08° 51' 56.7" | 7.55 | 94.5 | 1.2403187 | 36.7 | 0.901 | 0.6 |
| 17 dez | 11h 11m 04.86s | +08° 00' 56.6" | 7.96 | 99.0 | 1.1760276 | 36.1 | 0.904 | 0.5 |
| 24 dez | 11h 19m 52.32s | +07° 16' 58.4" | 8.42 | 103.9 | 1.1118746 | 35.3 | 0.908 | 0.4 |
| 31 dez | 11h 27m 21.39s | +06° 41' 28.7" | 8.93 | 109.1 | 1.0485271 | 34.2 | 0.914 | 0.2 |

## Longitude do Meridiano Central de Marte

00:00 Hora – Tempo Universal

| Data | Jan | Fev | Mar | Abr | Mai | Jun | Jul | Ago | Set | Out | Nov | Dez |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 56.3 | 110.6 | 192.5 | 243.3 | 305.0 | 359.3 | 65.9 | 124.4 | 183.7 | 253.0 | 313.1 | 24.7 |
| 2 | 46.5 | 100.7 | 182.5 | 233.3 | 295.1 | 349.4 | 56.1 | 114.7 | 174.0 | 243.3 | 303.5 | 15.2 |
| 3 | 36.7 | 90.8 | 172.6 | 223.4 | 285.2 | 339.6 | 46.4 | 104.9 | 164.3 | 233.6 | 293.8 | 5.6 |
| 4 | 26.8 | 80.9 | 162.6 | 213.4 | 275.3 | 329.8 | 36.6 | 95.2 | 154.6 | 223.9 | 284.2 | 356.1 |
| 5 | 17.0 | 71.0 | 152.6 | 203.4 | 265.4 | 320.0 | 26.9 | 85.5 | 144.9 | 214.3 | 274.5 | 346.5 |
| 6 | 7.2 | 61.1 | 142.7 | 193.5 | 255.5 | 310.2 | 17.1 | 75.8 | 135.2 | 204.6 | 264.9 | 337.0 |
| 7 | 357.3 | 51.2 | 132.7 | 183.5 | 245.6 | 300.4 | 7.4 | 66.1 | 125.5 | 194.9 | 255.3 | 327.4 |
| 8 | 347.5 | 41.3 | 122.7 | 173.6 | 235.7 | 290.6 | 357.7 | 56.4 | 115.8 | 185.2 | 245.6 | 317.9 |
| 9 | 337.6 | 31.3 | 112.7 | 163.6 | 225.8 | 280.8 | 347.9 | 46.7 | 106.1 | 175.5 | 236.0 | 308.4 |
| 10 | 327.8 | 21.4 | 102.8 | 153.6 | 215.9 | 271.0 | 338.2 | 37.0 | 96.5 | 165.9 | 226.3 | 298.9 |
| 11 | 318.0 | 11.5 | 92.8 | 143.7 | 206.1 | 261.2 | 328.5 | 27.3 | 86.8 | 156.2 | 216.7 | 289.4 |
| 12 | 308.1 | 1.6 | 82.8 | 133.7 | 196.2 | 251.4 | 318.7 | 17.6 | 77.1 | 146.5 | 207.1 | 279.8 |
| 13 | 298.3 | 351.6 | 72.9 | 123.8 | 186.3 | 241.6 | 309.0 | 7.9 | 67.4 | 136.8 | 197.5 | 270.3 |
| 14 | 288.4 | 341.7 | 62.9 | 113.8 | 176.4 | 231.9 | 299.3 | 358.2 | 57.7 | 127.1 | 187.8 | 260.9 |
| 15 | 278.5 | 331.8 | 52.9 | 103.9 | 166.6 | 222.1 | 289.5 | 348.5 | 48.0 | 117.5 | 178.2 | 251.4 |
| 16 | 268.7 | 321.8 | 42.9 | 93.9 | 156.7 | 212.3 | 279.8 | 338.8 | 38.3 | 107.8 | 168.6 | 241.9 |
| 17 | 258.8 | 311.9 | 32.9 | 84.0 | 146.8 | 202.5 | 270.1 | 329.1 | 28.6 | 98.1 | 159.0 | 232.4 |
| 18 | 249.0 | 302.0 | 23.0 | 74.0 | 137.0 | 192.7 | 260.4 | 319.4 | 18.9 | 88.4 | 149.4 | 222.9 |
| 19 | 239.1 | 292.0 | 13.0 | 64.1 | 127.1 | 183.0 | 250.6 | 309.7 | 9.2 | 78.8 | 139.8 | 213.5 |
| 20 | 229.2 | 282.1 | 3.0 | 54.2 | 117.3 | 173.2 | 240.9 | 300.0 | 359.6 | 69.1 | 130.1 | 204.0 |
| 21 | 219.4 | 272.1 | 353.0 | 44.2 | 107.4 | 163.4 | 231.2 | 290.3 | 349.9 | 59.4 | 120.5 | 194.6 |
| 22 | 209.5 | 262.2 | 343.1 | 34.3 | 97.6 | 153.7 | 221.5 | 280.6 | 340.2 | 49.8 | 110.9 | 185.1 |
| 23 | 199.6 | 252.2 | 333.1 | 24.4 | 87.7 | 143.9 | 211.8 | 270.9 | 330.5 | 40.1 | 101.4 | 175.7 |
| 24 | 189.7 | 242.3 | 323.1 | 14.4 | 77.9 | 134.1 | 202.1 | 261.2 | 320.8 | 30.4 | 91.8 | 166.3 |
| 25 | 179.9 | 232.3 | 313.1 | 4.5 | 68.1 | 124.4 | 192.3 | 251.5 | 311.1 | 20.8 | 82.2 | 156.8 |
| 26 | 170.0 | 222.4 | 303.2 | 354.6 | 58.2 | 114.6 | 182.6 | 241.8 | 301.4 | 11.1 | 72.6 | 147.4 |
| 27 | 160.1 | 212.4 | 293.2 | 344.7 | 48.4 | 104.9 | 172.9 | 232.2 | 291.7 | 1.4 | 63.0 | 138.0 |
| 28 | 150.2 | 202.4 | 283.2 | 334.7 | 38.6 | 95.1 | 163.2 | 222.5 | 282.1 | 351.8 | 53.4 | 128.6 |
| 29 | 140.3 | | 273.2 | 324.8 | 28.7 | 85.4 | 153.5 | 212.8 | 272.4 | 342.1 | 43.9 | 119.3 |
| 30 | 130.4 | | 263.3 | 314.9 | 18.9 | 75.6 | 143.8 | 203.1 | 262.7 | 332.5 | 34.3 | 109.9 |
| 31 | 120.5 | | 253.3 | | 9.1 | | 134.1 | 193.4 | | 322.8 | | 100.5 |

## Movimento do Meridiano Central Marciano

00:00 Hora – Tempo Universal

| Minuto | 0h | 1h | 2h | 3h | 4h | 5h | 6h | 7h | 8h | 9h | 10h | 11h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | º | º | º | º | º | º | º | º | º | º | º | 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) | Período de Revolução | Inclinação Equatorial | Diâmetro |
|---|---|---|---|
| 5,20 | 11,86 anos | 1,3º | 143.200 km |

00:00 Hora – Tempo Universal

| Data | α | δ | ∅ | Elong | DT (UA)* | Ang. PH | Fase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 01 jan | 23h 49m 21.31s | -02° 31' 59.0" | 38.69 | 76.4 | 5.0890237 | 11.1 | 0.991 | -2.3 |
| 08 jan | 23h 52m 58.84s | -02° 06' 46.7" | 37.89 | 70.2 | 5.1954086 | 10.8 | 0.991 | -2.3 |
| 15 jan | 23h 57m 01.14s | -01° 38' 59.3" | 37.16 | 64.2 | 5.2978575 | 10.3 | 0.992 | -2.3 |
| 22 jan | 00h 01m 25.69s | -01° 08' 53.9" | 36.49 | 58.3 | 5.3953547 | 9.7 | 0.993 | -2.2 |
| 29 jan | 00h 06m 10.09s | -00° 36' 46.5" | 35.88 | 52.5 | 5.4870632 | 9.1 | 0.994 | -2.2 |
| 05 fev | 00h 11m 12.35s | -00° 02' 51.5" | 35.33 | 46.7 | 5.5721267 | 8.3 | 0.995 | -2.1 |
| 12 fev | 00h 16m 30.18s | +00° 32' 34.2" | 34.85 | 41.1 | 5.6497427 | 7.5 | 0.996 | -2.1 |
| 19 fev | 00h 22m 01.43s | +01° 09' 15.0" | 34.42 | 35.5 | 5.7193098 | 6.7 | 0.997 | -2.1 |
| 26 fev | 00h 27m 44.15s | +01° 46' 56.3" | 34.06 | 30.1 | 5.7803922 | 5.8 | 0.997 | -2.1 |
| 05 mar | 00h 33m 36.74s | +02° 25' 25.2" | 33.76 | 24.6 | 5.8325197 | 4.8 | 0.998 | -2.1 |
| 12 mar | 00h 39m 37.37s | +03° 04' 26.8" | 33.51 | 19.3 | 5.8752711 | 3.8 | 0.999 | -2.1 |
| 19 mar | 00h 45m 44.27s | +03° 43' 47.4" | 33.32 | 14.0 | 5.9084117 | 2.8 | 0.999 | -2.0 |
| 26 mar | 00h 51m 55.86s | +04° 23' 14.4" | 33.19 | 8.7 | 5.9318522 | 1.8 | 1.000 | -2.0 |
| 02 abr | 00h 58m 10.84s | +05° 02' 36.7" | 33.11 | 3.6 | 5.9454510 | 0.7 | 1.000 | -2.0 |
| 09 abr | 01h 04m 27.62s | +05° 41' 41.4" | 33.09 | 2.1 | 5.9491050 | 0.4 | 1.000 | -2.0 |
| 16 abr | 01h 10m 44.62s | +06° 20' 17.1" | 33.13 | 7.0 | 5.9428840 | 1.4 | 1.000 | -2.0 |
| 23 abr | 01h 17m 00.43s | +06° 58' 12.9" | 33.22 | 12.2 | 5.9269834 | 2.5 | 1.000 | -2.0 |
| 30 abr | 01h 23m 13.75s | +07° 35' 19.4" | 33.36 | 17.3 | 5.9015317 | 3.5 | 0.999 | -2.0 |
| 07 mai | 01h 29m 23.06s | +08° 11' 25.8" | 33.56 | 22.4 | 5.8666886 | 4.5 | 0.998 | -2.1 |
| 14 mai | 01h 35m 26.61s | +08° 46' 22.0" | 33.81 | 27.6 | 5.8227798 | 5.4 | 0.998 | -2.1 |
| 21 mai | 01h 41m 22.93s | +09° 19' 59.1" | 34.12 | 32.8 | 5.7702435 | 6.4 | 0.997 | -2.1 |
| 28 mai | 01h 47m 10.47s | +09° 52' 09.0" | 34.48 | 38.0 | 5.7094449 | 7.2 | 0.996 | -2.1 |
| 04 jun | 01h 52m 47.47s | +10° 22' 42.5" | 34.90 | 43.2 | 5.6407823 | 8.1 | 0.995 | -2.1 |
| 11 jun | 01h 58m 11.83s | +10° 51' 30.6" | 35.38 | 48.5 | 5.5648248 | 8.8 | 0.994 | -2.1 |
| 18 jun | 02h 03m 21.73s | +11° 18' 25.8" | 35.91 | 53.8 | 5.4822517 | 9.5 | 0.993 | -2.2 |
| 25 jun | 02h 08m 15.21s | +11° 43' 20.9" | 36.50 | 59.2 | 5.3936739 | 10.2 | 0.992 | -2.2 |
| 02 jul | 02h 12m 50.05s | +12° 06' 07.8" | 37.15 | 64.7 | 5.2997509 | 10.7 | 0.991 | -2.3 |
| 09 jul | 02h 17m 03.65s | +12° 26' 38.1" | 37.85 | 70.3 | 5.2013304 | 11.1 | 0.991 | -2.3 |
| 16 jul | 02h 20m 53.83s | +12° 44' 45.5" | 38.61 | 76.0 | 5.0993774 | 11.5 | 0.990 | -2.3 |
| 23 jul | 02h 24m 18.18s | +13° 00' 23.1" | 39.42 | 81.8 | 4.9948015 | 11.7 | 0.990 | -2.4 |
| 30 jul | 02h 27m 14.21s | +13° 13' 23.9" | 40.27 | 87.7 | 4.8885869 | 11.8 | 0.989 | -2.4 |
| 06 ago | 02h 29m 39.12s | +13° 23' 40.2" | 41.17 | 93.8 | 4.7819260 | 11.8 | 0.989 | -2.5 |
| 13 ago | 02h 31m 30.86s | +13° 31' 07.4" | 42.10 | 100.1 | 4.6761301 | 11.6 | 0.990 | -2.5 |
| 20 ago | 02h 32m 47.43s | +13° 35' 40.5" | 43.06 | 106.5 | 4.5724559 | 11.3 | 0.990 | -2.6 |
| 27 ago | 02h 33m 27.08s | +13° 37' 15.3" | 44.02 | 113.1 | 4.4722436 | 10.8 | 0.991 | -2.6 |
| 03 set | 02h 33m 28.38s | +13° 35' 48.7" | 44.98 | 119.8 | 4.3770238 | 10.2 | 0.992 | -2.7 |
| 10 set | 02h 32m 51.25s | +13° 31' 22.9" | 45.91 | 126.8 | 4.2883881 | 9.4 | 0.993 | -2.7 |
| 17 set | 02h 31m 36.39s | +13° 24' 01.8" | 46.79 | 133.9 | 4.2078000 | 8.4 | 0.995 | -2.8 |
| 24 set | 02h 29m 45.47s | +13° 13' 53.8" | 47.59 | 141.2 | 4.1367236 | 7.3 | 0.996 | -2.8 |
| 01 out | 02h 27m 21.24s | +13° 01' 11.8" | 48.29 | 148.7 | 4.0766761 | 6.0 | 0.997 | -2.8 |
| 08 out | 02h 24m 28.50s | +12° 46' 18.0" | 48.87 | 156.3 | 4.0290349 | 4.6 | 0.998 | -2.9 |
| 15 out | 02h 21m 13.10s | +12° 29' 39.2" | 49.28 | 164.1 | 3.9948436 | 3.2 | 0.999 | -2.9 |
| 22 out | 02h 17m 41.84s | +12° 11' 48.1" | 49.53 | 171.9 | 3.9749420 | 1.6 | 1.000 | -2.9 |
| 29 out | 02h 14m 02.30s | +11° 53' 22.6" | 49.59 | 178.6 | 3.9699872 | 0.3 | 1.000 | -2.9 |
| 05 nov | 02h 10m 23.15s | +11° 35' 07.0" | 49.46 | 172.0 | 3.9802529 | 1.6 | 1.000 | -2.9 |
| 12 nov | 02h 06m 52.71s | +11° 17' 44.0" | 49.15 | 164.1 | 4.0055202 | 3.1 | 0.999 | -2.9 |
| 19 nov | 02h 03m 38.58s | +11° 01' 54.9" | 48.67 | 156.3 | 4.0452881 | 4.6 | 0.998 | -2.9 |
| 26 nov | 02h 00m 47.53s | +10° 48' 17.1" | 48.03 | 148.5 | 4.0988363 | 6.0 | 0.997 | -2.8 |
| 03 dez | 01h 58m 25.72s | +10° 37' 24.5" | 47.27 | 140.8 | 4.1650880 | 7.2 | 0.996 | -2.8 |
| 10 dez | 01h 56m 37.55s | +10° 29' 40.7" | 46.41 | 133.2 | 4.2426238 | 8.3 | 0.995 | -2.7 |
| 17 dez | 01h 55m 25.86s | +10° 25' 21.7" | 45.47 | 125.8 | 4.3299498 | 9.2 | 0.994 | -2.7 |
| 24 dez | 01h 54m 52.39s | +10° 24' 36.1" | 44.49 | 118.6 | 4.4255607 | 10.0 | 0.992 | -2.6 |
| 31 dez | 01h 54m 58.10s | +10° 27' 27.4" | 43.48 | 111.5 | 4.5278047 | 10.6 | 0.991 | -2.6 |

## Longitude do Meridiano Central de Júpiter, Sistema I

00:00 Hora – Tempo Universal

| Data | Jan | Fev | Mar | Abr | Mai | Jun | Jul | Ago | Set | Out | Nov | Dez |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 266.3 | 113.8 | 207.6 | 54.4 | 104.4 | 313.5 | 6.7 | 219.8 | 75.6 | 135.9 | 355.2 | 54.8 |
| 2 | 64.0 | 271.4 | 5.2 | 212.0 | 262.1 | 111.3 | 164.5 | 17.7 | 233.6 | 294.0 | 153.2 | 212.7 |
| 3 | 221.7 | 69.1 | 162.8 | 9.7 | 59.8 | 269.0 | 322.3 | 175.6 | 31.6 | 92.0 | 311.3 | 10.7 |
| 4 | 19.3 | 226.7 | 320.5 | 167.4 | 217.5 | 66.7 | 120.1 | 333.5 | 189.6 | 250.0 | 109.3 | 168.6 |
| 5 | 177.0 | 24.3 | 118.1 | 325.0 | 15.2 | 224.5 | 277.9 | 131.4 | 347.6 | 48.1 | 267.3 | 326.5 |
| 6 | 334.7 | 182.0 | 275.7 | 122.7 | 172.9 | 22.2 | 75.7 | 289.3 | 145.6 | 206.1 | 65.3 | 124.4 |
| 7 | 132.4 | 339.6 | 73.4 | 280.3 | 330.6 | 180.0 | 233.5 | 87.2 | 303.5 | 4.2 | 223.3 | 282.3 |
| 8 | 290.0 | 137.2 | 231.0 | 78.0 | 128.3 | 337.7 | 31.4 | 245.1 | 101.5 | 162.2 | 21.4 | 80.2 |
| 9 | 87.7 | 294.9 | 28.6 | 235.6 | 286.0 | 135.5 | 189.2 | 43.0 | 259.5 | 320.3 | 179.4 | 238.1 |
| 10 | 245.4 | 92.5 | 186.3 | 33.3 | 83.7 | 293.3 | 347.0 | 200.9 | 57.5 | 118.3 | 337.4 | 36.0 |
| 11 | 43.1 | 250.2 | 343.9 | 191.0 | 241.4 | 91.0 | 144.8 | 358.8 | 215.5 | 276.3 | 135.4 | 193.9 |
| 12 | 200.7 | 47.8 | 141.5 | 348.6 | 39.1 | 248.8 | 302.7 | 156.7 | 13.5 | 74.4 | 293.4 | 351.8 |
| 13 | 358.4 | 205.4 | 299.2 | 146.3 | 196.8 | 46.5 | 100.5 | 314.7 | 171.5 | 232.4 | 91.4 | 149.7 |
| 14 | 156.1 | 3.1 | 96.8 | 303.9 | 354.5 | 204.3 | 258.3 | 112.6 | 329.5 | 30.5 | 249.4 | 307.6 |
| 15 | 313.7 | 160.7 | 254.4 | 101.6 | 152.2 | 2.1 | 56.2 | 270.5 | 127.5 | 188.5 | 47.4 | 105.4 |
| 16 | 111.4 | 318.3 | 52.1 | 259.3 | 309.9 | 159.8 | 214.0 | 68.4 | 285.5 | 346.6 | 205.4 | 263.3 |
| 17 | 269.0 | 116.0 | 209.7 | 56.9 | 107.6 | 317.6 | 11.9 | 226.4 | 83.6 | 144.6 | 3.4 | 61.2 |
| 18 | 66.7 | 273.6 | 7.4 | 214.6 | 265.3 | 115.4 | 169.7 | 24.3 | 241.6 | 302.7 | 161.3 | 219.0 |
| 19 | 224.3 | 71.2 | 165.0 | 12.3 | 63.1 | 273.2 | 327.5 | 182.2 | 39.6 | 100.7 | 319.3 | 16.9 |
| 20 | 22.0 | 228.9 | 322.6 | 170.0 | 220.8 | 70.9 | 125.4 | 340.2 | 197.6 | 258.8 | 117.3 | 174.8 |
| 21 | 179.7 | 26.5 | 120.3 | 327.6 | 18.5 | 228.7 | 283.3 | 138.1 | 355.6 | 56.8 | 275.3 | 332.6 |
| 22 | 337.3 | 184.1 | 277.9 | 125.3 | 176.2 | 26.5 | 81.1 | 296.1 | 153.6 | 214.8 | 73.2 | 130.4 |
| 23 | 135.0 | 341.8 | 75.6 | 283.0 | 333.9 | 184.3 | 239.0 | 94.0 | 311.7 | 12.9 | 231.2 | 288.3 |
| 24 | 292.6 | 139.4 | 233.2 | 80.7 | 131.7 | 342.1 | 36.8 | 251.9 | 109.7 | 170.9 | 29.2 | 86.1 |
| 25 | 90.3 | 297.0 | 30.9 | 238.3 | 289.4 | 139.9 | 194.7 | 49.9 | 267.7 | 329.0 | 187.1 | 244.0 |
| 26 | 247.9 | 94.7 | 188.5 | 36.0 | 87.1 | 297.7 | 352.6 | 207.9 | 65.8 | 127.0 | 345.1 | 41.8 |
| 27 | 45.6 | 252.3 | 346.1 | 193.7 | 244.8 | 95.5 | 150.4 | 5.8 | 223.8 | 285.0 | 143.0 | 199.6 |
| 28 | 203.2 | 49.9 | 143.8 | 351.4 | 42.6 | 253.3 | 308.3 | 163.8 | 21.8 | 83.1 | 301.0 | 357.4 |
| 29 | 0.8 | | 301.4 | 149.1 | 200.3 | 51.1 | 106.2 | 321.7 | 179.9 | 241.1 | 98.9 | 155.2 |
| 30 | 158.5 | | 99.1 | 306.7 | 358.0 | 208.9 | 264.1 | 119.7 | 337.9 | 39.1 | 256.9 | 313.1 |
| 31 | 316.1 | | 256.7 | | 155.8 | | 61.9 | 277.7 | | 197.2 | | 110.9 |

## Movimento do Meridiano Central, Sistema I

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

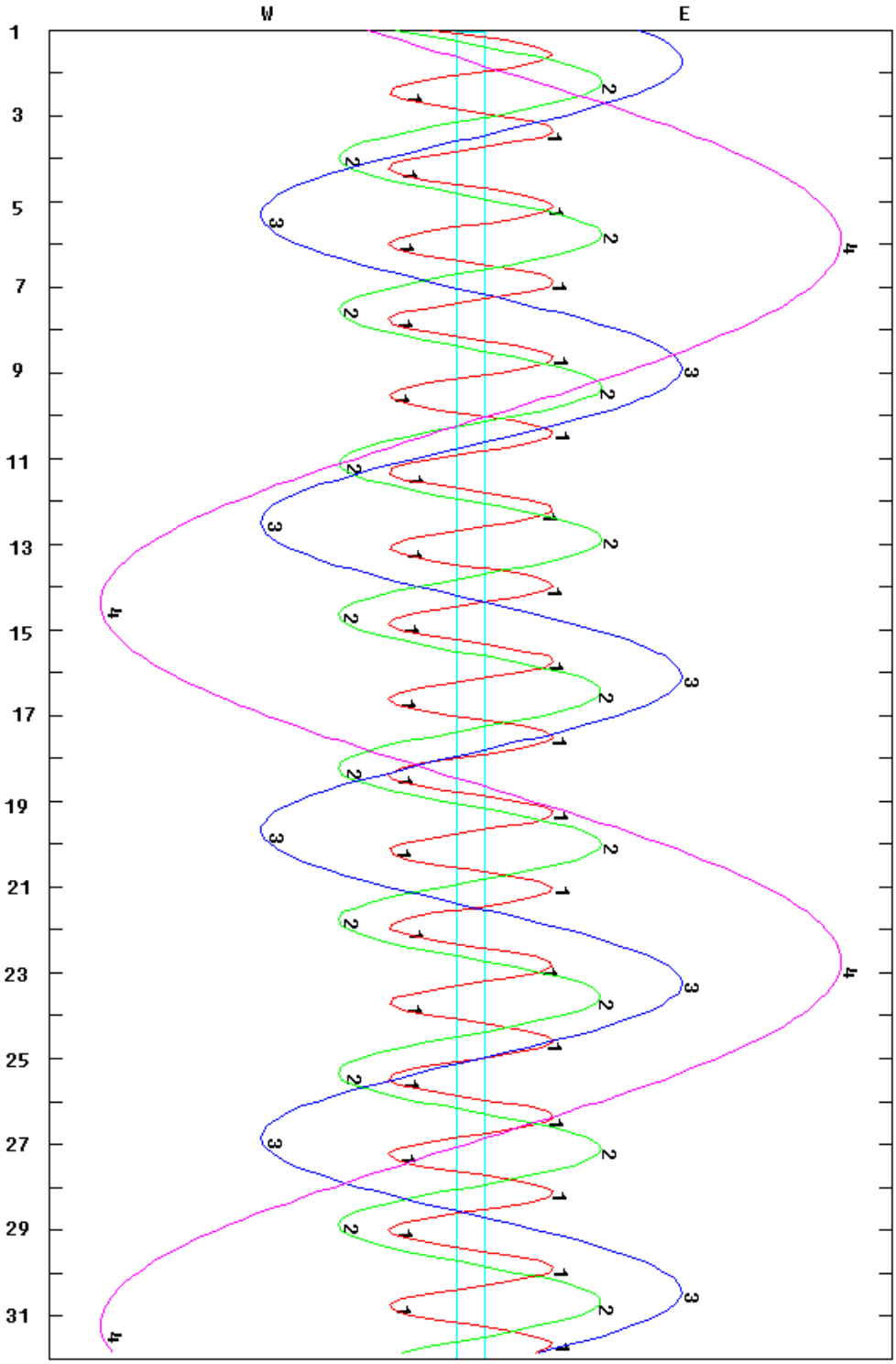
| Data | Jan | Fev | Mar | Abr | Mai | Jun | Jul | Ago | Set | Out | Nov | Dez |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 189.2 | 160.2 | 40.3 | 10.6 | 191.8 | 164.3 | 348.5 | 325.2 | 304.4 | 135.8 | 118.5 | 309.2 |
| 2 | 339.2 | 310.2 | 190.3 | 160.7 | 341.8 | 314.4 | 138.7 | 115.4 | 94.8 | 286.2 | 268.9 | 99.5 |
| 3 | 129.3 | 100.2 | 340.3 | 310.7 | 131.9 | 104.5 | 288.9 | 265.7 | 245.1 | 76.6 | 59.3 | 249.8 |
| 4 | 279.3 | 250.2 | 130.3 | 100.7 | 281.9 | 254.6 | 79.1 | 55.9 | 35.5 | 227.0 | 209.7 | 40.1 |
| 5 | 69.4 | 40.2 | 280.3 | 250.7 | 72.0 | 44.8 | 229.3 | 206.2 | 185.8 | 17.4 | 0.1 | 190.4 |
| 6 | 219.4 | 190.2 | 70.3 | 40.7 | 222.1 | 194.9 | 19.4 | 356.5 | 336.2 | 167.8 | 150.5 | 340.7 |
| 7 | 9.5 | 340.2 | 220.3 | 190.8 | 12.1 | 345.0 | 169.6 | 146.7 | 126.5 | 318.3 | 300.9 | 131.0 |
| 8 | 159.5 | 130.2 | 10.3 | 340.8 | 162.2 | 135.1 | 319.8 | 297.0 | 276.9 | 108.7 | 91.3 | 281.3 |
| 9 | 309.6 | 280.2 | 160.3 | 130.8 | 312.3 | 285.3 | 110.0 | 87.3 | 67.3 | 259.1 | 241.7 | 71.5 |
| 10 | 99.6 | 70.2 | 310.4 | 280.9 | 102.3 | 75.4 | 260.2 | 237.6 | 217.6 | 49.5 | 32.0 | 221.8 |
| 11 | 249.7 | 220.2 | 100.4 | 70.9 | 252.4 | 225.5 | 50.4 | 27.8 | 8.0 | 199.9 | 182.4 | 12.1 |
| 12 | 39.7 | 10.2 | 250.4 | 220.9 | 42.5 | 15.6 | 200.6 | 178.1 | 158.4 | 350.3 | 332.8 | 162.3 |
| 13 | 189.7 | 160.3 | 40.4 | 11.0 | 192.6 | 165.8 | 350.8 | 328.4 | 308.7 | 140.7 | 123.2 | 312.6 |
| 14 | 339.8 | 310.3 | 190.4 | 161.0 | 342.6 | 315.9 | 141.0 | 118.7 | 99.1 | 291.2 | 273.5 | 102.8 |
| 15 | 129.8 | 100.3 | 340.4 | 311.0 | 132.7 | 106.0 | 291.2 | 269.0 | 249.5 | 81.6 | 63.9 | 253.1 |
| 16 | 279.8 | 250.3 | 130.4 | 101.1 | 282.8 | 256.2 | 81.4 | 59.3 | 39.9 | 232.0 | 214.3 | 43.3 |
| 17 | 69.9 | 40.3 | 280.4 | 251.1 | 72.9 | 46.3 | 231.6 | 209.6 | 190.2 | 22.4 | 4.6 | 193.5 |
| 18 | 219.9 | 190.3 | 70.4 | 41.1 | 223.0 | 196.5 | 21.9 | 359.9 | 340.6 | 172.8 | 155.0 | 343.8 |
| 19 | 9.9 | 340.3 | 220.4 | 191.2 | 13.0 | 346.6 | 172.1 | 150.2 | 131.0 | 323.2 | 305.3 | 134.0 |
| 20 | 159.9 | 130.3 | 10.4 | 341.2 | 163.1 | 136.8 | 322.3 | 300.5 | 281.4 | 113.6 | 95.7 | 284.2 |
| 21 | 310.0 | 280.3 | 160.5 | 131.3 | 313.2 | 286.9 | 112.5 | 90.8 | 71.8 | 264.1 | 246.0 | 74.5 |
| 22 | 100.0 | 70.3 | 310.5 | 281.3 | 103.3 | 77.1 | 262.7 | 241.1 | 222.2 | 54.5 | 36.3 | 224.7 |
| 23 | 250.0 | 220.3 | 100.5 | 71.3 | 253.4 | 227.2 | 53.0 | 31.5 | 12.6 | 204.9 | 186.7 | 14.9 |
| 24 | 40.0 | 10.3 | 250.5 | 221.4 | 43.5 | 17.4 | 203.2 | 181.8 | 163.0 | 355.3 | 337.0 | 165.1 |
| 25 | 190.1 | 160.3 | 40.5 | 11.4 | 193.6 | 167.5 | 353.4 | 332.1 | 313.4 | 145.7 | 127.3 | 315.3 |
| 26 | 340.1 | 310.3 | 190.5 | 161.5 | 343.7 | 317.7 | 143.7 | 122.4 | 103.8 | 296.1 | 277.7 | 105.5 |
| 27 | 130.1 | 100.3 | 340.5 | 311.5 | 133.8 | 107.9 | 293.9 | 272.7 | 254.2 | 86.5 | 68.0 | 255.7 |
| 28 | 280.1 | 250.3 | 130.6 | 101.6 | 283.9 | 258.0 | 84.2 | 63.1 | 44.6 | 236.9 | 218.3 | 45.9 |
| 29 | 70.1 | | 280.6 | 251.7 | 74.0 | 48.2 | 234.4 | 213.4 | 195.0 | 27.3 | 8.6 | 196.1 |
| 30 | 220.1 | | 70.6 | 41.7 | 224.1 | 198.4 | 24.7 | 3.7 | 345.4 | 177.7 | 158.9 | 346.2 |
| 31 | 10.1 | | 220.6 | | 14.2 | | 174.9 | 154.1 | | 328.1 | | 136.4 |

## Movimento do Meridiano Central, Sistema II

| Minuto | 0h | 1h | 2h | 3h | 4h | 5h | 6h | 7h | 8h | 9h | 10h | 11h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | º | º | º | º | º | º | º | º | º | º | º | 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 2011**

1 = Io, 2= Europa, 3 = Ganimedes, 4 = Calisto.

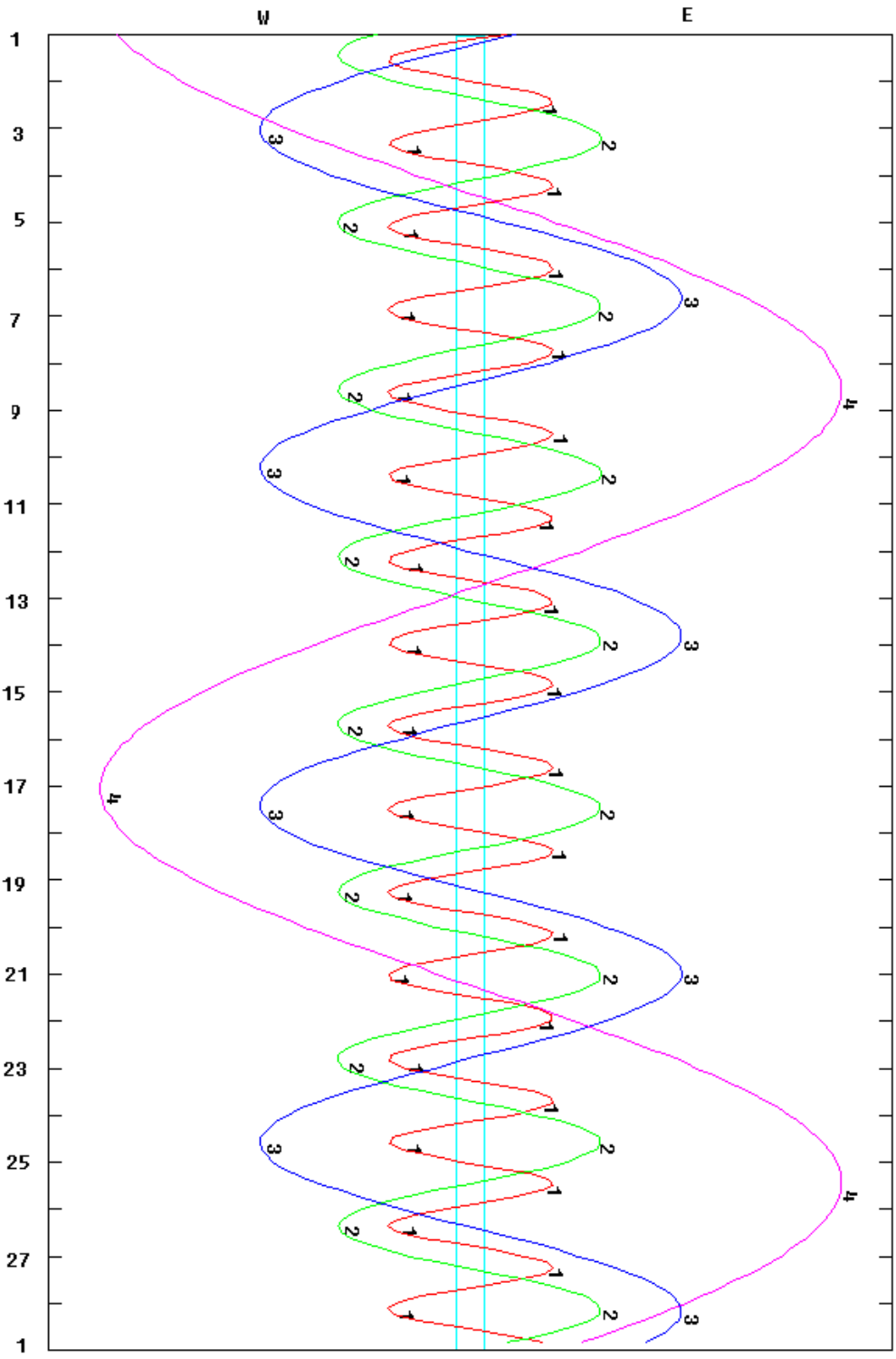


# Eventos mútuos em Janeiro 2011

| | | | |
|---|---|---|---|
| 1 | 2 | 2.2 | 1.Oc.D |
| | 5 | 35.0 | 1.Ec.R |
| | 6 | 42.1 | 2.Oc.D |
| | 12 | 8.0 | 2.Ec.R |
| | 17 | 2.3 | 4.Oc.D |
| | 18 | 51.7 | 4.Oc.R |
| | 23 | 22.3 | 1.Tr.I |
| 2 | 0 | 40.8 | 1.Sh.I |
| | 1 | 36.9 | 1.Tr.E |
| | 2 | 53.8 | 1.Sh.E |
| | 20 | 31.6 | 1.Oc.D |
| 3 | 0 | 3.9 | 1.Ec.R |
| | 1 | 6.7 | 2.Tr.I |
| | 3 | 42.4 | 2.Sh.I |
| | 3 | 51.3 | 2.Tr.E |
| | 6 | 22.4 | 2.Sh.E |
| | 11 | 11.9 | 3.Tr.I |
| | 14 | 18.5 | 3.Tr.E |
| | 16 | 36.6 | 3.Sh.I |
| | 17 | 51.8 | 1.Tr.I |
| | 19 | 9.7 | 1.Sh.I |
| | 19 | 23.6 | 3.Sh.E |
| | 20 | 6.5 | 1.Tr.E |
| | 21 | 22.7 | 1.Sh.E |
| 4 | 15 | 1.1 | 1.Oc.D |
| | 18 | 32.8 | 1.Ec.R |
| | 20 | 4.3 | 2.Oc.D |
| 5 | 1 | 27.4 | 2.Ec.R |
| | 12 | 21.5 | 1.Tr.I |
| | 13 | 38.8 | 1.Sh.I |
| | 14 | 36.1 | 1.Tr.E |
| | 15 | 51.8 | 1.Sh.E |
| 6 | 9 | 30.7 | 1.Oc.D |
| | 13 | 1.6 | 1.Ec.R |
| | 14 | 27.4 | 2.Tr.I |
| | 17 | 0.8 | 2.Sh.I |
| | 17 | 12.1 | 2.Tr.E |
| | 19 | 40.7 | 2.Sh.E |
| 7 | 1 | 3.5 | 3.Oc.D |
| | 4 | 12.1 | 3.Oc.R |
| | 6 | 23.0 | 3.Ec.D |
| | 6 | 51.2 | 1.Tr.I |
| | 8 | 7.7 | 1.Sh.I |
| | 9 | 5.8 | 1.Tr.E |
| | 9 | 11.7 | 3.Ec.R |
| | 10 | 20.7 | 1.Sh.E |
| 8 | 4 | 0.2 | 1.Oc.D |
| | 7 | 30.5 | 1.Ec.R |
| | 9 | 26.2 | 2.Oc.D |
| | 14 | 46.2 | 2.Ec.R |
| 9 | 1 | 20.9 | 1.Tr.I |
| | 2 | 36.8 | 1.Sh.I |
| | 3 | 35.6 | 1.Tr.E |
| | 4 | 49.7 | 1.Sh.E |
| | 22 | 29.9 | 1.Oc.D |
| 10 | 1 | 59.4 | 1.Ec.R |
| | 2 | 44.1 | 4.Tr.I |
| | 3 | 48.6 | 2.Tr.I |
| | 4 | 14.7 | 4.Tr.E |
| | 6 | 19.2 | 2.Sh.I |
| | 6 | 33.3 | 2.Tr.E |
| | 8 | 59.1 | 2.Sh.E |
| | 15 | 25.9 | 3.Tr.I |
| | 18 | 32.1 | 3.Tr.E |
| | 19 | 50.7 | 1.Tr.I |
| | 20 | 39.2 | 3.Sh.I |
| | 21 | 5.7 | 1.Sh.I |
| | 22 | 5.3 | 1.Tr.E |
| | 23 | 18.7 | 1.Sh.E |
| | 23 | 25.1 | 3.Sh.E |
| 11 | 16 | 59.6 | 1.Oc.D |
| | 20 | 28.3 | 1.Ec.R |
| | 22 | 49.1 | 2.Oc.D |
| 12 | 4 | 5.5 | 2.Ec.R |
| | 14 | 20.5 | 1.Tr.I |
| | 15 | 34.7 | 1.Sh.I |
| | 16 | 35.1 | 1.Tr.E |
| | 17 | 47.7 | 1.Sh.E |
| 13 | 11 | 29.3 | 1.Oc.D |
| | 14 | 57.1 | 1.Ec.R |
| | 17 | 10.2 | 2.Tr.I |
| | 19 | 37.5 | 2.Sh.I |
| | 19 | 54.9 | 2.Tr.E |
| | 22 | 17.4 | 2.Sh.E |
| 14 | 5 | 20.0 | 3.Oc.D |
| | 8 | 27.9 | 3.Oc.R |
| | 8 | 50.3 | 1.Tr.I |
| | 10 | 3.7 | 1.Sh.I |
| | 10 | 26.5 | 3.Ec.D |
| | 11 | 5.0 | 1.Tr.E |
| | 12 | 16.6 | 1.Sh.E |
| | 13 | 14.0 | 3.Ec.R |
| 15 | 5 | 59.1 | 1.Oc.D |
| | 9 | 26.0 | 1.Ec.R |
| | 12 | 11.8 | 2.Oc.D |
| | 17 | 24.2 | 2.Ec.R |
| 16 | 3 | 20.3 | 1.Tr.I |
| | 4 | 32.7 | 1.Sh.I |
| | 5 | 34.9 | 1.Tr.E |
| | 6 | 45.6 | 1.Sh.E |
| 17 | 0 | 28.9 | 1.Oc.D |
| | 3 | 54.9 | 1.Ec.R |
| | 6 | 32.1 | 2.Tr.I |
| | 8 | 56.0 | 2.Sh.I |
| | 9 | 16.9 | 2.Tr.E |
| | 11 | 35.8 | 2.Sh.E |
| | 19 | 43.0 | 3.Tr.I |
| | 21 | 50.2 | 1.Tr.I |
| | 22 | 48.7 | 3.Tr.E |
| | 23 | 1.6 | 1.Sh.I |
| 18 | 0 | 4.8 | 1.Tr.E |
| | 0 | 41.7 | 3.Sh.I |
| | 1 | 14.6 | 1.Sh.E |
| | 3 | 26.5 | 3.Sh.E |
| | 12 | 33.5 | 4.Oc.D |
| | 14 | 12.8 | 4.Oc.R |
| | 18 | 58.8 | 1.Oc.D |
| | 22 | 23.8 | 1.Ec.R |
| 19 | 1 | 35.4 | 2.Oc.D |
| | 6 | 43.4 | 2.Ec.R |
| | 16 | 20.2 | 1.Tr.I |
| | 17 | 30.6 | 1.Sh.I |
| | 18 | 34.8 | 1.Tr.E |
| | 19 | 43.6 | 1.Sh.E |
| 20 | 13 | 28.7 | 1.Oc.D |
| | 16 | 52.6 | 1.Ec.R |
| | 19 | 54.5 | 2.Tr.I |
| | 22 | 14.4 | 2.Sh.I |
| | 22 | 39.3 | 2.Tr.E |
| 21 | 0 | 54.2 | 2.Sh.E |
| | 9 | 39.0 | 3.Oc.D |
| | 10 | 50.2 | 1.Tr.I |
| | 11 | 59.6 | 1.Sh.I |
| | 12 | 46.1 | 3.Oc.R |
| | 13 | 4.8 | 1.Tr.E |
| | 14 | 12.5 | 1.Sh.E |
| | 14 | 29.3 | 3.Ec.D |
| | 17 | 15.6 | 3.Ec.R |
| 22 | 7 | 58.6 | 1.Oc.D |
| | 11 | 21.5 | 1.Ec.R |
| | 14 | 58.6 | 2.Oc.D |
| | 20 | 2.0 | 2.Ec.R |
| 23 | 5 | 20.3 | 1.Tr.I |
| | 6 | 28.6 | 1.Sh.I |
| | 7 | 34.9 | 1.Tr.E |
| | 8 | 41.5 | 1.Sh.E |
| 24 | 2 | 28.6 | 1.Oc.D |
| | 5 | 50.4 | 1.Ec.R |
| | 9 | 17.2 | 2.Tr.I |
| | 11 | 32.9 | 2.Sh.I |
| | 12 | 2.1 | 2.Tr.E |
| | 14 | 12.7 | 2.Sh.E |
| | 23 | 50.3 | 1.Tr.I |
| 25 | 0 | 3.4 | 3.Tr.I |
| | 0 | 57.5 | 1.Sh.I |
| | 2 | 5.0 | 1.Tr.E |
| | 3 | 8.3 | 3.Tr.E |
| | 3 | 10.4 | 1.Sh.E |
| | 4 | 44.5 | 3.Sh.I |
| | 7 | 28.2 | 3.Sh.E |
| | 20 | 58.7 | 1.Oc.D |
| 26 | 0 | 19.3 | 1.Ec.R |
| | 4 | 22.8 | 2.Oc.D |
| | 9 | 21.1 | 2.Ec.R |
| | 18 | 20.5 | 1.Tr.I |
| | 19 | 26.5 | 1.Sh.I |
| | 20 | 35.1 | 1.Tr.E |
| | 21 | 39.4 | 1.Sh.E |
| | 22 | 45.7 | 4.Tr.I |
| | 23 | 55.4 | 4.Tr.E |
| 27 | 15 | 28.7 | 1.Oc.D |
| | 18 | 48.1 | 1.Ec.R |
| | 22 | 40.3 | 2.Tr.I |
| 28 | 0 | 51.4 | 2.Sh.I |
| | 1 | 25.1 | 2.Tr.E |
| | 3 | 31.1 | 2.Sh.E |
| | 12 | 50.6 | 1.Tr.I |
| | 13 | 55.4 | 1.Sh.I |
| | 14 | 1.1 | 3.Oc.D |
| | 15 | 5.2 | 1.Tr.E |
| | 16 | 8.3 | 1.Sh.E |
| | 17 | 7.1 | 3.Oc.R |
| | 18 | 32.2 | 3.Ec.D |
| | 21 | 17.2 | 3.Ec.R |
| 29 | 9 | 58.8 | 1.Oc.D |
| | 13 | 17.0 | 1.Ec.R |
| | 17 | 46.7 | 2.Oc.D |
| | 22 | 39.7 | 2.Ec.R |
| 30 | 7 | 20.8 | 1.Tr.I |
| | 8 | 24.3 | 1.Sh.I |
| | 9 | 35.5 | 1.Tr.E |
| | 10 | 37.2 | 1.Sh.E |
| 31 | 4 | 29.0 | 1.Oc.D |
| | 7 | 45.8 | 1.Ec.R |
| | 12 | 3.7 | 2.Tr.I |
| | 14 | 9.9 | 2.Sh.I |
| | 14 | 48.5 | 2.Tr.E |
| | 16 | 49.7 | 2.Sh.E |

**Diagrama dos satélites galileanos**
**Fevereiro 2011**

1 = Io, 2= Europa, 3 = Ganimedes, 4 = Calisto.

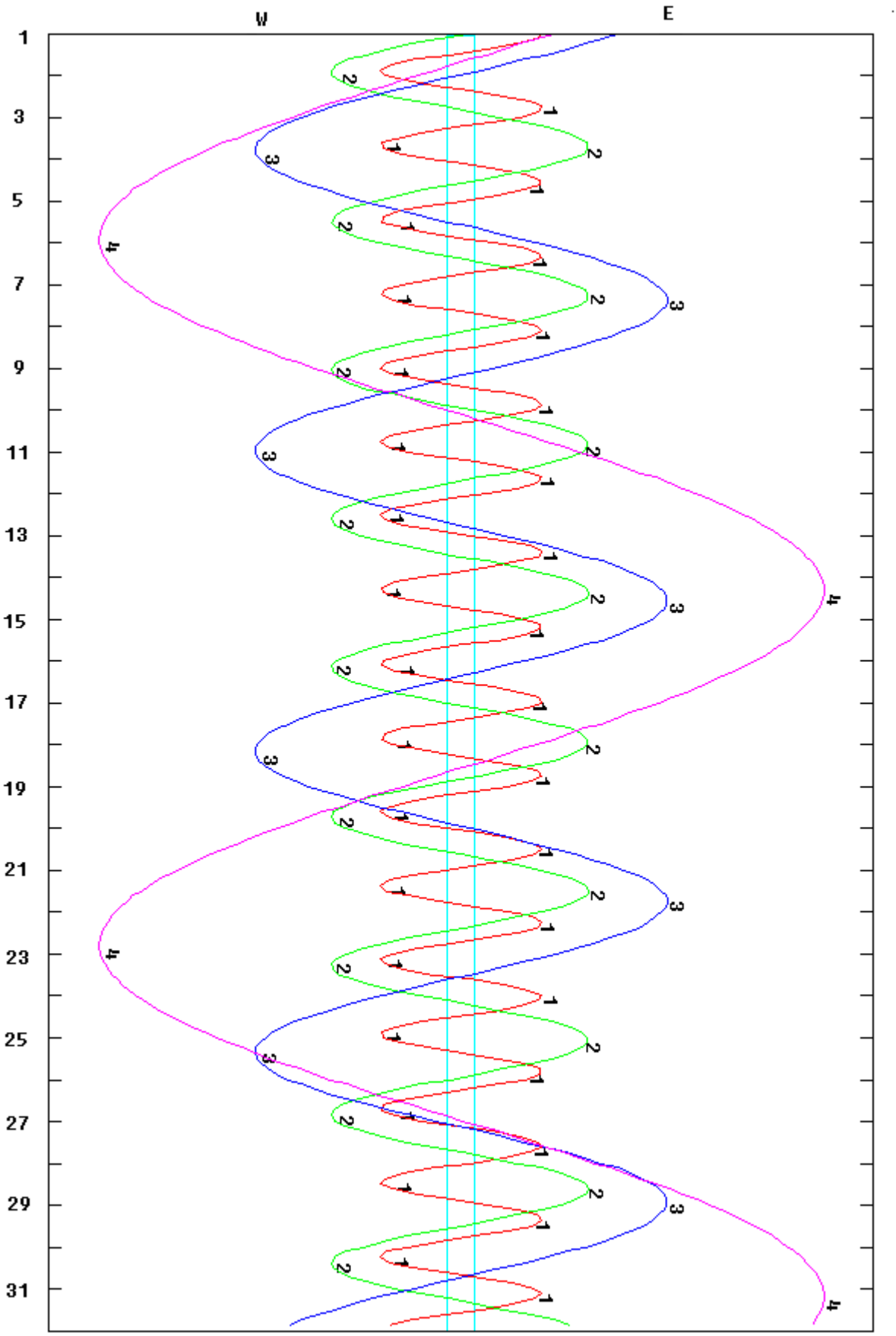


## Eventos mútuos em Fevereiro 2011

| | | | |
|---|---|---|---|
| 1 | 1 | 51.0 | 1.Tr.I |
| | 2 | 53.2 | 1.Sh.I |
| | 4 | 5.6 | 1.Tr.E |
| | 4 | 26.5 | 3.Tr.I |
| | 5 | 6.1 | 1.Sh.E |
| | 7 | 30.4 | 3.Tr.E |
| | 8 | 47.3 | 3.Sh.I |
| | 11 | 30.0 | 3.Sh.E |
| | 22 | 59.2 | 1.Oc.D |
| 2 | 2 | 14.7 | 1.Ec.R |
| | 7 | 11.3 | 2.Oc.D |
| | 11 | 58.6 | 2.Ec.R |
| | 20 | 21.2 | 1.Tr.I |
| | 21 | 22.2 | 1.Sh.I |
| | 22 | 35.9 | 1.Tr.E |
| | 23 | 35.1 | 1.Sh.E |
| 3 | 17 | 29.4 | 1.Oc.D |
| | 20 | 43.6 | 1.Ec.R |
| 4 | 1 | 27.4 | 2.Tr.I |
| | 3 | 28.4 | 2.Sh.I |
| | 4 | 12.2 | 2.Tr.E |
| | 6 | 8.1 | 2.Sh.E |
| | 8 | 48.1 | 4.Oc.D |
| | 10 | 2.3 | 4.Oc.R |
| | 14 | 51.5 | 1.Tr.I |
| | 15 | 51.1 | 1.Sh.I |
| | 17 | 6.1 | 1.Tr.E |
| | 18 | 4.0 | 1.Sh.E |
| | 18 | 24.9 | 3.Oc.D |
| | 21 | 29.7 | 3.Oc.R |
| | 22 | 34.5 | 3.Ec.D |
| 5 | 1 | 18.3 | 3.Ec.R |
| | 11 | 59.6 | 1.Oc.D |
| | 15 | 12.5 | 1.Ec.R |
| | 20 | 35.7 | 2.Oc.D |
| 6 | 1 | 17.1 | 2.Ec.R |
| | 9 | 21.8 | 1.Tr.I |
| | 10 | 20.0 | 1.Sh.I |
| | 11 | 36.4 | 1.Tr.E |
| | 12 | 32.9 | 1.Sh.E |
| 7 | 6 | 29.8 | 1.Oc.D |
| | 9 | 41.3 | 1.Ec.R |
| | 14 | 51.5 | 2.Tr.I |
| | 16 | 47.1 | 2.Sh.I |
| | 17 | 36.2 | 2.Tr.E |
| | 19 | 26.8 | 2.Sh.E |
| 8 | 3 | 52.1 | 1.Tr.I |
| | 4 | 48.9 | 1.Sh.I |
| | 6 | 6.7 | 1.Tr.E |
| | 7 | 1.8 | 1.Sh.E |
| | 8 | 52.8 | 3.Tr.I |
| | 11 | 55.5 | 3.Tr.E |
| | 12 | 51.0 | 3.Sh.I |
| | 15 | 32.5 | 3.Sh.E |
| 9 | 1 | 0.2 | 1.Oc.D |
| | 4 | 10.2 | 1.Ec.R |
| | 10 | 0.7 | 2.Oc.D |
| | 14 | 35.8 | 2.Ec.R |
| | 22 | 22.5 | 1.Tr.I |
| | 23 | 17.8 | 1.Sh.I |
| 10 | 0 | 37.1 | 1.Tr.E |
| | 1 | 30.7 | 1.Sh.E |
| | 19 | 30.5 | 1.Oc.D |
| | 22 | 39.0 | 1.Ec.R |
| | 22 | 39.0 | 1.Ec.R |
| 11 | 4 | 15.7 | 2.Tr.I |
| | 6 | 5.6 | 2.Sh.I |
| | 7 | 0.4 | 2.Tr.E |
| | 8 | 45.2 | 2.Sh.E |
| | 16 | 52.8 | 1.Tr.I |
| | 17 | 46.7 | 1.Sh.I |
| | 19 | 7.4 | 1.Tr.E |
| | 19 | 59.6 | 1.Sh.E |
| | 22 | 50.8 | 3.Oc.D |
| 12 | 1 | 54.1 | 3.Oc.R |
| | 2 | 36.6 | 3.Ec.D |
| | 5 | 19.2 | 3.Ec.R |
| | 14 | 0.8 | 1.Oc.D |
| | 17 | 7.9 | 1.Ec.R |
| | 23 | 25.4 | 2.Oc.D |
| 13 | 3 | 54.3 | 2.Ec.R |
| | 11 | 23.2 | 1.Tr.I |
| | 12 | 15.6 | 1.Sh.I |
| | 13 | 37.8 | 1.Tr.E |
| | 14 | 28.5 | 1.Sh.E |
| 14 | 8 | 31.2 | 1.Oc.D |
| | 11 | 36.7 | 1.Ec.R |
| | 17 | 40.3 | 2.Tr.I |
| | 19 | 24.3 | 2.Sh.I |
| | 20 | 25.0 | 2.Tr.E |
| | 22 | 3.9 | 2.Sh.E |
| 15 | 5 | 53.6 | 1.Tr.I |
| | 6 | 44.4 | 1.Sh.I |
| | 8 | 8.2 | 1.Tr.E |
| | 8 | 57.3 | 1.Sh.E |
| | 13 | 20.3 | 3.Tr.I |
| | 16 | 21.5 | 3.Tr.E |
| | 16 | 53.7 | 3.Sh.I |
| | 19 | 34.2 | 3.Sh.E |
| 16 | 3 | 1.6 | 1.Oc.D |
| | 6 | 5.6 | 1.Ec.R |
| | 12 | 50.7 | 2.Oc.D |
| | 17 | 12.9 | 2.Ec.R |
| 17 | 0 | 24.0 | 1.Tr.I |
| | 1 | 13.3 | 1.Sh.I |
| | 2 | 38.6 | 1.Tr.E |
| | 3 | 26.2 | 1.Sh.E |
| | 21 | 32.0 | 1.Oc.D |
| 18 | 0 | 34.4 | 1.Ec.R |
| | 7 | 5.0 | 2.Tr.I |
| | 8 | 42.8 | 2.Sh.I |
| | 9 | 49.6 | 2.Tr.E |
| | 11 | 22.4 | 2.Sh.E |
| | 18 | 54.4 | 1.Tr.I |
| | 19 | 42.2 | 1.Sh.I |
| | 21 | 9.0 | 1.Tr.E |
| | 21 | 55.1 | 1.Sh.E |
| 19 | 3 | 19.0 | 3.Oc.D |
| | 6 | 20.6 | 3.Oc.R |
| | 6 | 39.2 | 3.Ec.D |
| | 9 | 20.5 | 3.Ec.R |
| | 16 | 2.5 | 1.Oc.D |
| | 19 | 3.3 | 1.Ec.R |
| 20 | 2 | 15.8 | 2.Oc.D |
| | 6 | 31.2 | 2.Ec.R |
| | 13 | 25.0 | 1.Tr.I |
| | 14 | 11.1 | 1.Sh.I |
| | 15 | 39.5 | 1.Tr.E |
| | 16 | 24.0 | 1.Sh.E |
| | 16 | 24.0 | 1.Sh.E |
| 21 | 10 | 32.9 | 1.Oc.D |
| | 13 | 32.1 | 1.Ec.R |
| | 20 | 30.2 | 2.Tr.I |
| | 22 | 1.6 | 2.Sh.I |
| | 23 | 14.7 | 2.Tr.E |
| 22 | 0 | 41.2 | 2.Sh.E |
| | 7 | 55.4 | 1.Tr.I |
| | 8 | 39.9 | 1.Sh.I |
| | 10 | 9.9 | 1.Tr.E |
| | 10 | 52.8 | 1.Sh.E |
| | 17 | 49.6 | 3.Tr.I |
| | 20 | 49.2 | 3.Tr.E |
| | 20 | 56.4 | 3.Sh.I |
| | 23 | 35.7 | 3.Sh.E |
| 23 | 5 | 3.5 | 1.Oc.D |
| | 8 | 1.0 | 1.Ec.R |
| | 15 | 41.3 | 2.Oc.D |
| | 19 | 49.7 | 2.Ec.R |
| 24 | 2 | 25.9 | 1.Tr.I |
| | 3 | 8.8 | 1.Sh.I |
| | 4 | 40.4 | 1.Tr.E |
| | 5 | 21.6 | 1.Sh.E |
| | 23 | 33.9 | 1.Oc.D |
| 25 | 2 | 29.8 | 1.Ec.R |
| | 9 | 55.3 | 2.Tr.I |
| | 11 | 20.1 | 2.Sh.I |
| | 12 | 39.7 | 2.Tr.E |
| | 13 | 59.7 | 2.Sh.E |
| | 20 | 56.4 | 1.Tr.I |
| | 21 | 37.6 | 1.Sh.I |
| | 23 | 10.8 | 1.Tr.E |
| | 23 | 50.4 | 1.Sh.E |
| 26 | 7 | 48.8 | 3.Oc.D |
| | 13 | 21.7 | 3.Ec.R |
| | 18 | 4.5 | 1.Oc.D |
| | 20 | 58.6 | 1.Ec.R |
| 27 | 5 | 6.6 | 2.Oc.D |
| | 9 | 7.9 | 2.Ec.R |
| | 15 | 26.9 | 1.Tr.I |
| | 16 | 6.5 | 1.Sh.I |
| | 17 | 41.4 | 1.Tr.E |
| | 18 | 19.3 | 1.Sh.E |
| 28 | 12 | 35.0 | 1.Oc.D |
| | 15 | 27.4 | 1.Ec.R |
| | 23 | 20.9 | 2.Tr.I |

**Diagrama dos satélites galileanos**
**Março 2011**

1 = Io, 2= Europa, 3 = Ganimedes, 4 = Calisto.

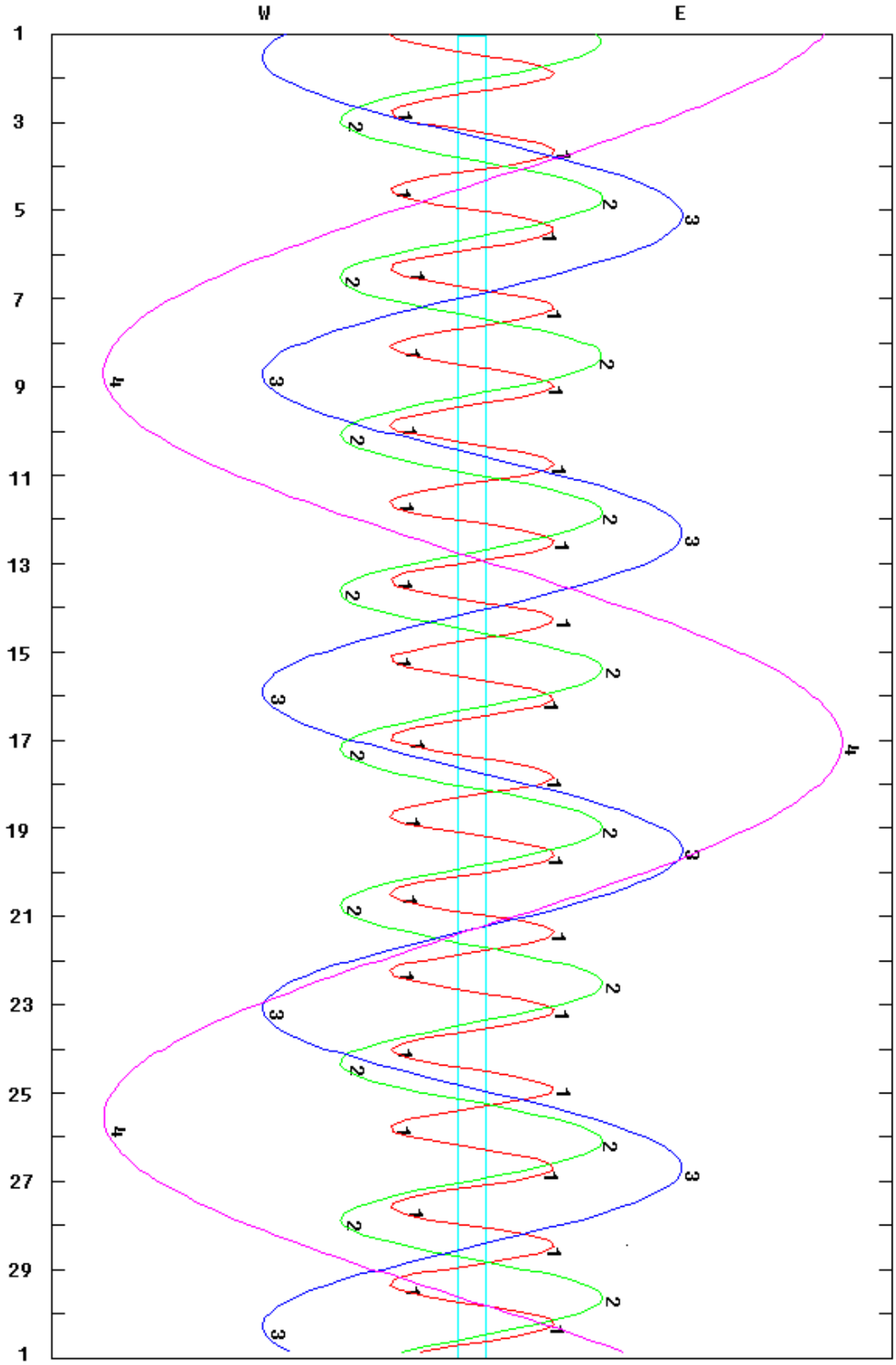


## Eventos mútuos em Março 2011

| | | | |
|---|---|---|---|
| 1 | 0 | 39.0 | 2.Sh.I |
| | 2 | 5.2 | 2.Tr.E |
| | 3 | 18.5 | 2.Sh.E |
| | 9 | 57.4 | 1.Tr.I |
| | 10 | 35.2 | 1.Sh.I |
| | 12 | 11.8 | 1.Tr.E |
| | 12 | 48.1 | 1.Sh.E |
| | 22 | 19.7 | 3.Tr.I |
| 2 | 0 | 58.4 | 3.Sh.I |
| | 1 | 17.4 | 3.Tr.E |
| | 3 | 36.7 | 3.Sh.E |
| | 7 | 5.6 | 1.Oc.D |
| | 9 | 56.3 | 1.Ec.R |
| | 18 | 32.3 | 2.Oc.D |
| | 22 | 26.3 | 2.Ec.R |
| 3 | 4 | 28.0 | 1.Tr.I |
| | 5 | 4.1 | 1.Sh.I |
| | 6 | 42.3 | 1.Tr.E |
| | 7 | 16.9 | 1.Sh.E |
| 4 | 1 | 36.2 | 1.Oc.D |
| | 4 | 25.1 | 1.Ec.R |
| | 12 | 46.4 | 2.Tr.I |
| | 13 | 57.5 | 2.Sh.I |
| | 15 | 30.5 | 2.Tr.E |
| | 16 | 37.0 | 2.Sh.E |
| | 22 | 58.5 | 1.Tr.I |
| | 23 | 32.9 | 1.Sh.I |
| 5 | 1 | 12.8 | 1.Tr.E |
| | 1 | 45.7 | 1.Sh.E |
| | 12 | 20.7 | 3.Oc.D |
| | 17 | 23.7 | 3.Ec.R |
| | 20 | 6.8 | 1.Oc.D |
| | 22 | 54.0 | 1.Ec.R |
| 6 | 7 | 57.8 | 2.Oc.D |
| | 11 | 44.5 | 2.Ec.R |
| | 17 | 29.1 | 1.Tr.I |
| | 18 | 1.7 | 1.Sh.I |
| | 19 | 43.4 | 1.Tr.E |
| | 20 | 14.5 | 1.Sh.E |
| 7 | 14 | 37.3 | 1.Oc.D |
| | 17 | 22.7 | 1.Ec.R |
| 8 | 2 | 12.4 | 2.Tr.I |
| | 3 | 16.5 | 2.Sh.I |
| | 4 | 56.3 | 2.Tr.E |
| | 5 | 55.8 | 2.Sh.E |
| | 11 | 59.6 | 1.Tr.I |
| | 12 | 30.5 | 1.Sh.I |
| | 14 | 13.9 | 1.Tr.E |
| | 14 | 43.3 | 1.Sh.E |
| 9 | 2 | 50.8 | 3.Tr.I |
| | 5 | 0.4 | 3.Sh.I |
| | 5 | 46.6 | 3.Tr.E |
| | 7 | 37.5 | 3.Sh.E |
| | 9 | 8.0 | 1.Oc.D |
| | 11 | 51.6 | 1.Ec.R |
| | 21 | 23.5 | 2.Oc.D |
| 10 | 1 | 2.7 | 2.Ec.R |
| | 6 | 30.2 | 1.Tr.I |
| | 6 | 59.3 | 1.Sh.I |
| | 8 | 44.4 | 1.Tr.E |
| | 9 | 12.1 | 1.Sh.E |
| 11 | 3 | 38.6 | 1.Oc.D |
| | 6 | 20.4 | 1.Ec.R |
| | 15 | 38.2 | 2.Tr.I |
| | 16 | 35.0 | 2.Sh.I |
| | 18 | 21.9 | 2.Tr.E |
| | 19 | 14.3 | 2.Sh.E |
| 12 | 1 | 0.7 | 1.Tr.I |
| | 1 | 28.0 | 1.Sh.I |
| | 3 | 15.0 | 1.Tr.E |
| | 3 | 40.8 | 1.Sh.E |
| | 16 | 52.9 | 3.Oc.D |
| | 21 | 24.8 | 3.Ec.R |
| | 22 | 9.2 | 1.Oc.D |
| 13 | 0 | 49.2 | 1.Ec.R |
| | 10 | 49.1 | 2.Oc.D |
| | 14 | 20.7 | 2.Ec.R |
| | 19 | 31.4 | 1.Tr.I |
| | 19 | 56.8 | 1.Sh.I |
| | 21 | 45.5 | 1.Tr.E |
| | 22 | 9.6 | 1.Sh.E |
| 14 | 16 | 39.8 | 1.Oc.D |
| | 19 | 18.0 | 1.Ec.R |
| 15 | 5 | 4.5 | 2.Tr.I |
| | 5 | 54.0 | 2.Sh.I |
| | 7 | 48.1 | 2.Tr.E |
| | 8 | 33.3 | 2.Sh.E |
| | 14 | 1.9 | 1.Tr.I |
| | 14 | 25.6 | 1.Sh.I |
| | 16 | 16.0 | 1.Tr.E |
| | 16 | 38.3 | 1.Sh.E |
| 16 | 7 | 23.3 | 3.Tr.I |
| | 9 | 2.6 | 3.Sh.I |
| | 10 | 16.8 | 3.Tr.E |
| | 11 | 10.5 | 1.Oc.D |
| | 11 | 38.6 | 3.Sh.E |
| | 13 | 46.8 | 1.Ec.R |
| 17 | 0 | 14.9 | 2.Oc.D |
| | 3 | 38.8 | 2.Ec.R |
| | 8 | 32.5 | 1.Tr.I |
| | 8 | 54.3 | 1.Sh.I |
| | 10 | 46.6 | 1.Tr.E |
| | 11 | 7.1 | 1.Sh.E |
| 18 | 5 | 41.2 | 1.Oc.D |
| | 8 | 15.6 | 1.Ec.R |
| | 18 | 30.5 | 2.Tr.I |
| | 19 | 12.6 | 2.Sh.I |
| | 21 | 13.8 | 2.Tr.E |
| | 21 | 51.7 | 2.Sh.E |
| 19 | 3 | 3.1 | 1.Tr.I |
| | 3 | 23.1 | 1.Sh.I |
| | 5 | 17.1 | 1.Tr.E |
| | 5 | 35.8 | 1.Sh.E |
| | 21 | 26.0 | 3.Oc.D |
| 20 | 0 | 11.9 | 1.Oc.D |
| | 1 | 26.1 | 3.Ec.R |
| | 2 | 44.5 | 1.Ec.R |
| | 13 | 40.6 | 2.Oc.D |
| | 16 | 56.8 | 2.Ec.R |
| | 21 | 33.7 | 1.Tr.I |
| | 21 | 51.9 | 1.Sh.I |
| | 23 | 47.7 | 1.Tr.E |
| 21 | 0 | 4.5 | 1.Sh.E |
| | 18 | 42.5 | 1.Oc.D |
| | 21 | 13.2 | 1.Ec.R |
| 22 | 7 | 57.1 | 2.Tr.I |
| | 8 | 31.6 | 2.Sh.I |
| | 10 | 40.2 | 2.Tr.E |
| | 11 | 10.7 | 2.Sh.E |
| | 16 | 4.3 | 1.Tr.I |
| | 16 | 20.6 | 1.Sh.I |
| | 18 | 18.2 | 1.Tr.E |
| | 18 | 33.2 | 1.Sh.E |
| 23 | 11 | 56.5 | 3.Tr.I |
| | 13 | 4.8 | 3.Sh.I |
| | 13 | 13.2 | 1.Oc.D |
| | 14 | 47.5 | 3.Tr.E |
| | 15 | 39.6 | 3.Sh.E |
| | 15 | 42.0 | 1.Ec.R |
| 24 | 3 | 6.3 | 2.Oc.D |
| | 6 | 14.7 | 2.Ec.R |
| | 10 | 34.9 | 1.Tr.I |
| | 10 | 49.3 | 1.Sh.I |
| | 12 | 48.8 | 1.Tr.E |
| | 13 | 2.0 | 1.Sh.E |
| 25 | 7 | 43.9 | 1.Oc.D |
| | 10 | 10.8 | 1.Ec.R |
| | 21 | 23.3 | 2.Tr.I |
| | 21 | 50.2 | 2.Sh.I |
| 26 | 0 | 6.1 | 2.Tr.E |
| | 0 | 29.2 | 2.Sh.E |
| | 5 | 5.4 | 1.Tr.I |
| | 5 | 18.0 | 1.Sh.I |
| | 7 | 19.3 | 1.Tr.E |
| | 7 | 30.6 | 1.Sh.E |
| 27 | 1 | 59.1 | 3.Oc.D |
| | 2 | 14.6 | 1.Oc.D |
| | 4 | 39.6 | 1.Ec.R |
| | 5 | 26.6 | 3.Ec.R |
| | 16 | 32.0 | 2.Oc.D |
| | 19 | 32.5 | 2.Ec.R |
| | 23 | 36.1 | 1.Tr.I |
| | 23 | 46.8 | 1.Sh.I |
| 28 | 1 | 49.9 | 1.Tr.E |
| | 1 | 59.4 | 1.Sh.E |
| | 20 | 45.2 | 1.Oc.D |
| | 23 | 8.3 | 1.Ec.R |
| 29 | 10 | 50.2 | 2.Tr.I |
| | 11 | 9.4 | 2.Sh.I |
| | 13 | 32.7 | 2.Tr.E |
| | 13 | 48.3 | 2.Sh.E |
| | 18 | 6.6 | 1.Tr.I |
| | 18 | 15.4 | 1.Sh.I |
| | 20 | 20.4 | 1.Tr.E |
| | 20 | 28.0 | 1.Sh.E |
| 30 | 15 | 16.0 | 1.Oc.D |
| | 16 | 30.9 | 3.Tr.I |
| | 17 | 7.8 | 3.Sh.I |
| | 17 | 37.2 | 1.Ec.R |
| | 19 | 19.2 | 3.Tr.E |
| | 19 | 41.3 | 3.Sh.E |
| 31 | 5 | 57.6 | 2.Oc.D |
| | 8 | 50.4 | 2.Ec.R |
| | 12 | 37.2 | 1.Tr.I |
| | 12 | 44.1 | 1.Sh.I |
| | 14 | 50.9 | 1.Tr.E |
| | 14 | 56.7 | 1.Sh.E |

**Diagrama dos satélites galileanos**
**Abril 2011**

1 = Io, 2= Europa, 3 = Ganimedes, 4 = Calisto.

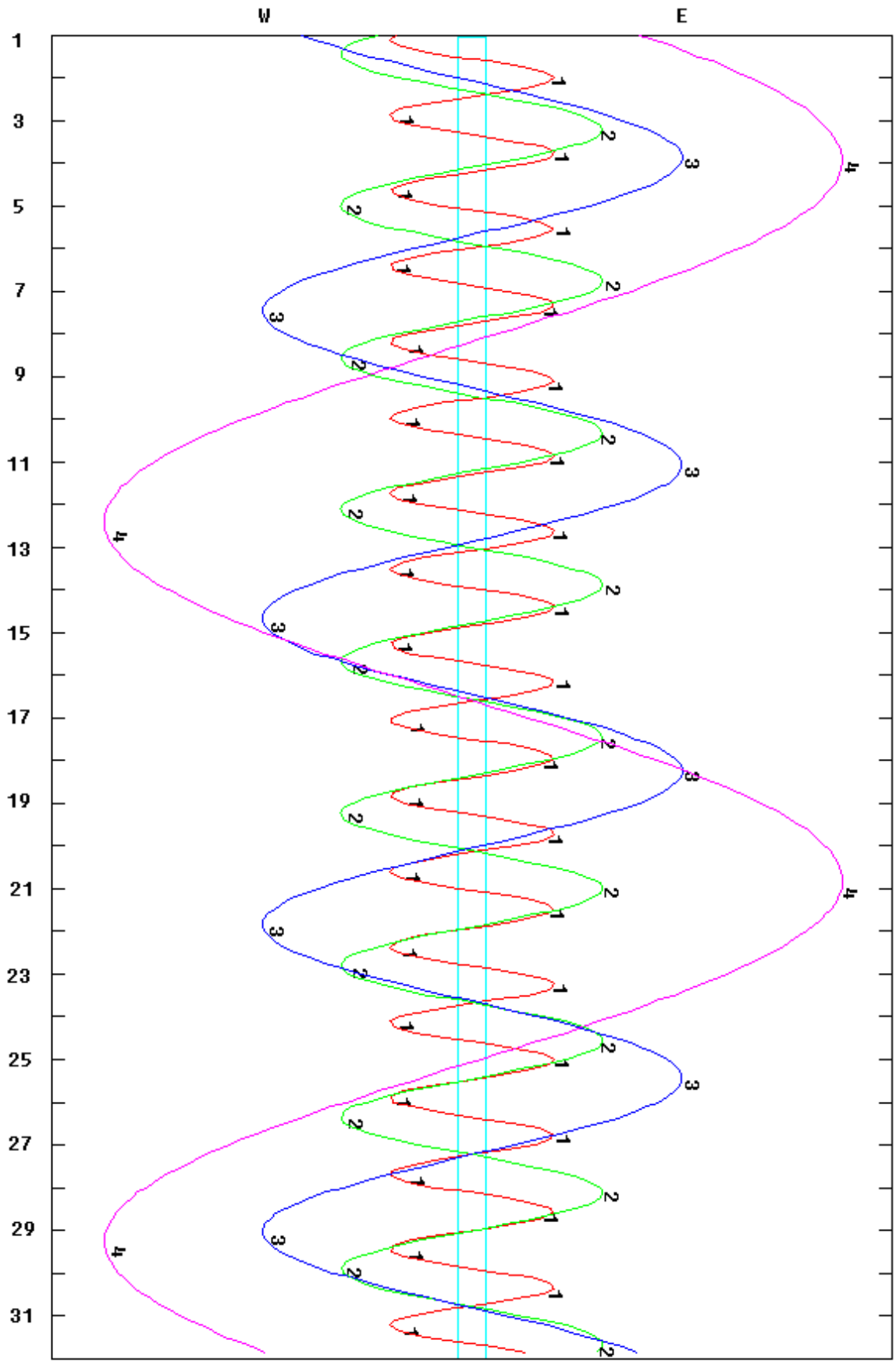


## Eventos mútuos em Abril 2011

| | | | |
|---|---|---|---|
| 1 | 9 | 46.6 | 1.Oc.D |
| | 12 | 5.9 | 1.Ec.R |
| 2 | 0 | 16.5 | 2.Tr.I |
| | 0 | 27.9 | 2.Sh.I |
| | 2 | 58.7 | 2.Tr.E |
| | 3 | 6.7 | 2.Sh.E |
| | 7 | 7.8 | 1.Tr.I |
| | 7 | 12.8 | 1.Sh.I |
| | 9 | 21.4 | 1.Tr.E |
| | 9 | 25.3 | 1.Sh.E |
| 3 | 4 | 17.3 | 1.Oc.D |
| | 6 | 32.4 | 3.Oc.D |
| | 6 | 34.7 | 1.Ec.R |
| | 9 | 27.1 | 3.Ec.R |
| | 19 | 23.2 | 2.Oc.D |
| | 22 | 8.1 | 2.Ec.R |
| 4 | 1 | 38.4 | 1.Tr.I |
| | 1 | 41.5 | 1.Sh.I |
| | 3 | 51.9 | 1.Tr.E |
| | 3 | 54.0 | 1.Sh.E |
| | 22 | 48.0 | 1.Oc.D |
| 5 | 1 | 3.4 | 1.Ec.R |
| | 13 | 43.4 | 2.Tr.I |
| | 13 | 47.1 | 2.Sh.I |
| | 16 | 25.3 | 2.Tr.E |
| | 16 | 25.8 | 2.Sh.E |
| | 20 | 8.9 | 1.Tr.I |
| | 20 | 10.2 | 1.Sh.I |
| | 22 | 22.4 | 1.Tr.E |
| | 22 | 22.7 | 1.Sh.E |
| 6 | 17 | 18.7 | 1.Oc.D |
| | 19 | 32.9 | 1.Oc.R |
| | 21 | 4.7 | 3.Tr.I |
| | 21 | 9.8 | 3.Sh.I |
| | 23 | 42.0 | 3.Sh.E |
| | 23 | 50.1 | 3.Tr.E |
| 7 | 8 | 48.5 | 2.Ec.D |
| | 11 | 29.1 | 2.Oc.R |
| | 14 | 38.9 | 1.Sh.I |
| | 14 | 39.5 | 1.Tr.I |
| | 16 | 51.3 | 1.Sh.E |
| | 16 | 52.9 | 1.Tr.E |
| 8 | 11 | 47.7 | 1.Ec.D |
| | 14 | 3.6 | 1.Oc.R |
| 9 | 3 | 5.6 | 2.Sh.I |
| | 3 | 9.8 | 2.Tr.I |
| | 5 | 44.2 | 2.Sh.E |
| | 5 | 51.3 | 2.Tr.E |
| | 9 | 7.5 | 1.Sh.I |
| | 9 | 10.0 | 1.Tr.I |
| | 11 | 19.9 | 1.Sh.E |
| | 11 | 23.4 | 1.Tr.E |
| 10 | 6 | 16.6 | 1.Ec.D |
| | 8 | 34.2 | 1.Oc.R |
| | 10 | 55.5 | 3.Ec.D |
| | 13 | 51.0 | 3.Oc.R |
| | 22 | 6.4 | 2.Ec.D |
| 11 | 0 | 54.2 | 2.Oc.R |
| | 3 | 36.2 | 1.Sh.I |
| | 3 | 40.6 | 1.Tr.I |
| | 5 | 48.6 | 1.Sh.E |
| | 5 | 53.9 | 1.Tr.E |
| 12 | 0 | 45.3 | 1.Ec.D |
| | 3 | 4.8 | 1.Oc.R |
| | 16 | 24.9 | 2.Sh.I |
| | 16 | 36.8 | 2.Tr.I |
| | 19 | 3.3 | 2.Sh.E |
| | 19 | 18.0 | 2.Tr.E |
| | 22 | 4.9 | 1.Sh.I |
| | 22 | 11.1 | 1.Tr.I |
| 13 | 0 | 17.2 | 1.Sh.E |
| | 0 | 24.4 | 1.Tr.E |
| | 19 | 14.1 | 1.Ec.D |
| | 21 | 35.5 | 1.Oc.R |
| 14 | 1 | 11.7 | 3.Sh.I |
| | 1 | 38.4 | 3.Tr.I |
| | 3 | 42.7 | 3.Sh.E |
| | 4 | 20.8 | 3.Tr.E |
| | 11 | 24.2 | 2.Ec.D |
| | 14 | 19.1 | 2.Oc.R |
| | 16 | 33.5 | 1.Sh.I |
| | 16 | 41.7 | 1.Tr.I |
| | 18 | 45.8 | 1.Sh.E |
| | 18 | 54.8 | 1.Tr.E |
| 15 | 13 | 42.8 | 1.Ec.D |
| | 16 | 6.1 | 1.Oc.R |
| 16 | 5 | 43.5 | 2.Sh.I |
| | 6 | 3.2 | 2.Tr.I |
| | 8 | 21.7 | 2.Sh.E |
| | 8 | 44.0 | 2.Tr.E |
| | 11 | 2.1 | 1.Sh.I |
| | 11 | 12.2 | 1.Tr.I |
| | 13 | 14.4 | 1.Sh.E |
| | 13 | 25.2 | 1.Tr.E |
| 17 | 8 | 11.6 | 1.Ec.D |
| | 10 | 36.7 | 1.Oc.R |
| | 14 | 57.5 | 3.Ec.D |
| | 18 | 21.7 | 3.Oc.R |
| 18 | 0 | 42.0 | 2.Ec.D |
| | 3 | 44.0 | 2.Oc.R |
| | 5 | 30.8 | 1.Sh.I |
| | 5 | 42.7 | 1.Tr.I |
| | 7 | 43.0 | 1.Sh.E |
| | 7 | 55.7 | 1.Tr.E |
| 19 | 2 | 40.3 | 1.Ec.D |
| | 5 | 7.2 | 1.Oc.R |
| | 19 | 2.8 | 2.Sh.I |
| | 19 | 30.3 | 2.Tr.I |
| | 21 | 40.9 | 2.Sh.E |
| | 22 | 10.6 | 2.Tr.E |
| | 23 | 59.4 | 1.Sh.I |
| 20 | 0 | 13.2 | 1.Tr.I |
| | 2 | 11.6 | 1.Sh.E |
| | 2 | 26.1 | 1.Tr.E |
| | 21 | 9.1 | 1.Ec.D |
| | 23 | 37.9 | 1.Oc.R |
| 21 | 5 | 13.1 | 3.Sh.I |
| | 6 | 11.3 | 3.Tr.I |
| | 7 | 42.7 | 3.Sh.E |
| | 8 | 50.5 | 3.Tr.E |
| | 13 | 59.7 | 2.Ec.D |
| | 17 | 8.7 | 2.Oc.R |
| | 18 | 28.0 | 1.Sh.I |
| | 18 | 43.6 | 1.Tr.I |
| | 20 | 40.2 | 1.Sh.E |
| | 20 | 56.5 | 1.Tr.E |
| 22 | 15 | 37.8 | 1.Ec.D |
| | 18 | 8.4 | 1.Oc.R |
| 23 | 8 | 21.4 | 2.Sh.I |
| | 8 | 56.5 | 2.Tr.I |
| | 10 | 59.3 | 2.Sh.E |
| | 11 | 36.5 | 2.Tr.E |
| | 12 | 56.6 | 1.Sh.I |
| | 13 | 14.1 | 1.Tr.I |
| | 15 | 8.8 | 1.Sh.E |
| | 15 | 26.9 | 1.Tr.E |
| 24 | 10 | 6.6 | 1.Ec.D |
| | 12 | 39.0 | 1.Oc.R |
| | 19 | 0.2 | 3.Ec.D |
| | 22 | 52.6 | 3.Oc.R |
| 25 | 3 | 17.4 | 2.Ec.D |
| | 6 | 33.4 | 2.Oc.R |
| | 7 | 25.3 | 1.Sh.I |
| | 7 | 44.5 | 1.Tr.I |
| | 9 | 37.4 | 1.Sh.E |
| | 9 | 57.3 | 1.Tr.E |
| 26 | 4 | 35.2 | 1.Ec.D |
| | 7 | 9.5 | 1.Oc.R |
| | 21 | 40.7 | 2.Sh.I |
| | 22 | 23.5 | 2.Tr.I |
| 27 | 0 | 18.4 | 2.Sh.E |
| | 1 | 3.0 | 2.Tr.E |
| | 1 | 53.9 | 1.Sh.I |
| | 2 | 15.0 | 1.Tr.I |
| | 4 | 5.9 | 1.Sh.E |
| | 4 | 27.6 | 1.Tr.E |
| | 23 | 4.0 | 1.Ec.D |
| 28 | 1 | 40.1 | 1.Oc.R |
| | 9 | 14.3 | 3.Sh.I |
| | 10 | 43.7 | 3.Tr.I |
| | 11 | 42.6 | 3.Sh.E |
| | 13 | 19.5 | 3.Tr.E |
| | 16 | 35.0 | 2.Ec.D |
| | 19 | 57.9 | 2.Oc.R |
| | 20 | 22.5 | 1.Sh.I |
| | 20 | 45.4 | 1.Tr.I |
| | 22 | 34.5 | 1.Sh.E |
| | 22 | 57.9 | 1.Tr.E |
| 29 | 17 | 32.7 | 1.Ec.D |
| | 20 | 10.6 | 1.Oc.R |
| 30 | 10 | 59.3 | 2.Sh.I |
| | 11 | 49.7 | 2.Tr.I |
| | 13 | 36.8 | 2.Sh.E |
| | 14 | 28.7 | 2.Tr.E |
| | 14 | 51.1 | 1.Sh.I |
| | 15 | 15.8 | 1.Tr.I |
| | 17 | 3.0 | 1.Sh.E |
| | 17 | 28.2 | 1.Tr.E |

**Diagrama dos satélites galileanos**
**Maio 2011**

1 = Io, 2= Europa, 3 = Ganimedes, 4 = Calisto.

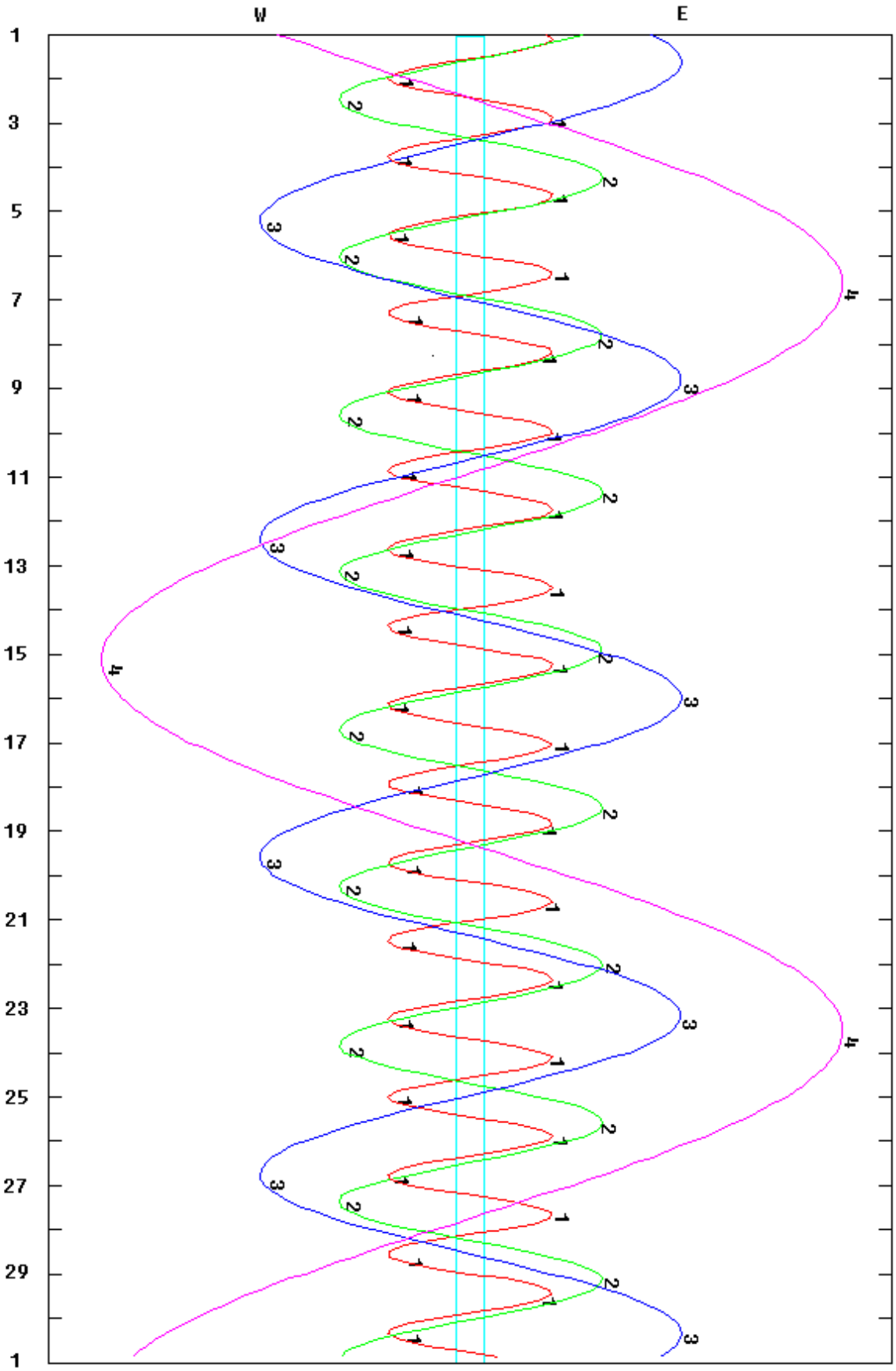


## Eventos mútuos em Maio 2011

| | | | |
|---|---|---|---|
| 1 | 12 | 1.5 | 1.Ec.D |
| | 14 | 41.2 | 1.Oc.R |
| | 23 | 2.2 | 3.Ec.D |
| 2 | 3 | 22.2 | 3.Oc.R |
| | 5 | 52.7 | 2.Ec.D |
| | 9 | 19.7 | 1.Sh.I |
| | 9 | 22.4 | 2.Oc.R |
| | 9 | 46.2 | 1.Tr.I |
| | 11 | 31.6 | 1.Sh.E |
| | 11 | 58.6 | 1.Tr.E |
| 3 | 6 | 30.1 | 1.Ec.D |
| | 9 | 11.6 | 1.Oc.R |
| 4 | 0 | 18.7 | 2.Sh.I |
| | 1 | 16.6 | 2.Tr.I |
| | 2 | 56.1 | 2.Sh.E |
| | 3 | 48.3 | 1.Sh.I |
| | 3 | 55.1 | 2.Tr.E |
| | 4 | 16.5 | 1.Tr.I |
| | 6 | 0.1 | 1.Sh.E |
| | 6 | 28.8 | 1.Tr.E |
| 5 | 0 | 58.9 | 1.Ec.D |
| | 3 | 42.1 | 1.Oc.R |
| | 13 | 16.0 | 3.Sh.I |
| | 15 | 15.9 | 3.Tr.I |
| | 15 | 42.9 | 3.Sh.E |
| | 17 | 48.2 | 3.Tr.E |
| | 19 | 10.2 | 2.Ec.D |
| | 22 | 16.9 | 1.Sh.I |
| | 22 | 46.6 | 2.Oc.R |
| | 22 | 46.8 | 1.Tr.I |
| 6 | 0 | 28.7 | 1.Sh.E |
| | 0 | 59.1 | 1.Tr.E |
| | 19 | 27.6 | 1.Ec.D |
| | 22 | 12.6 | 1.Oc.R |
| 7 | 13 | 37.2 | 2.Sh.I |
| | 14 | 42.5 | 2.Tr.I |
| | 16 | 14.4 | 2.Sh.E |
| | 16 | 45.4 | 1.Sh.I |
| | 17 | 17.2 | 1.Tr.I |
| | 17 | 20.6 | 2.Tr.E |
| | 18 | 57.2 | 1.Sh.E |
| | 19 | 29.3 | 1.Tr.E |
| 8 | 13 | 56.3 | 1.Ec.D |
| | 16 | 43.1 | 1.Oc.R |
| 9 | 3 | 4.1 | 3.Ec.D |
| | 7 | 50.8 | 3.Oc.R |
| | 8 | 27.8 | 2.Ec.D |
| | 11 | 14.0 | 1.Sh.I |
| | 11 | 47.5 | 1.Tr.I |
| | 12 | 10.8 | 2.Oc.R |
| | 13 | 25.7 | 1.Sh.E |
| | 13 | 59.5 | 1.Tr.E |
| 10 | 8 | 25.0 | 1.Ec.D |
| | 11 | 13.4 | 1.Oc.R |
| 11 | 2 | 56.7 | 2.Sh.I |
| | 4 | 9.2 | 2.Tr.I |
| | 5 | 33.6 | 2.Sh.E |
| | 5 | 42.6 | 1.Sh.I |
| | 6 | 17.8 | 1.Tr.I |
| | 6 | 46.8 | 2.Tr.E |
| | 7 | 54.3 | 1.Sh.E |
| | 8 | 29.7 | 1.Tr.E |
| 12 | 2 | 53.7 | 1.Ec.D |
| | 5 | 43.9 | 1.Oc.R |
| | 17 | 17.6 | 3.Sh.I |
| | 19 | 43.2 | 3.Sh.E |
| | 19 | 47.1 | 3.Tr.I |
| | 21 | 45.2 | 2.Ec.D |
| | 22 | 15.7 | 3.Tr.E |
| 13 | 0 | 11.2 | 1.Sh.I |
| | 0 | 48.0 | 1.Tr.I |
| | 1 | 34.8 | 2.Oc.R |
| | 2 | 22.8 | 1.Sh.E |
| | 2 | 59.9 | 1.Tr.E |
| | 21 | 22.4 | 1.Ec.D |
| 14 | 0 | 14.2 | 1.Oc.R |
| | 16 | 15.2 | 2.Sh.I |
| | 17 | 34.9 | 2.Tr.I |
| | 18 | 39.7 | 1.Sh.I |
| | 18 | 52.0 | 2.Sh.E |
| | 19 | 18.2 | 1.Tr.I |
| | 20 | 11.9 | 2.Tr.E |
| | 20 | 51.3 | 1.Sh.E |
| | 21 | 30.0 | 1.Tr.E |
| 15 | 15 | 51.1 | 1.Ec.D |
| | 18 | 44.6 | 1.Oc.R |
| 16 | 7 | 5.4 | 3.Ec.D |
| | 9 | 31.7 | 3.Ec.R |
| | 9 | 49.9 | 3.Oc.D |
| | 11 | 2.7 | 2.Ec.D |
| | 12 | 17.8 | 3.Oc.R |
| | 13 | 8.3 | 1.Sh.I |
| | 13 | 48.5 | 1.Tr.I |
| | 14 | 58.6 | 2.Oc.R |
| | 15 | 19.8 | 1.Sh.E |
| | 16 | 0.2 | 1.Tr.E |
| 17 | 10 | 19.8 | 1.Ec.D |
| | 13 | 14.9 | 1.Oc.R |
| 18 | 5 | 34.7 | 2.Sh.I |
| | 7 | 1.4 | 2.Tr.I |
| | 7 | 36.8 | 1.Sh.I |
| | 8 | 11.2 | 2.Sh.E |
| | 8 | 18.7 | 1.Tr.I |
| | 9 | 37.8 | 2.Tr.E |
| | 9 | 48.3 | 1.Sh.E |
| | 10 | 30.3 | 1.Tr.E |
| 19 | 4 | 48.5 | 1.Ec.D |
| | 7 | 45.3 | 1.Oc.R |
| | 21 | 19.9 | 3.Sh.I |
| | 23 | 44.1 | 3.Sh.E |
| 20 | 0 | 18.1 | 3.Tr.I |
| | 0 | 20.1 | 2.Ec.D |
| | 2 | 5.4 | 1.Sh.I |
| | 2 | 42.9 | 3.Tr.E |
| | 2 | 48.8 | 1.Tr.I |
| | 4 | 16.8 | 1.Sh.E |
| | 4 | 22.2 | 2.Oc.R |
| | 5 | 0.4 | 1.Tr.E |
| | 23 | 17.1 | 1.Ec.D |
| 21 | 2 | 15.5 | 1.Oc.R |
| | 18 | 53.2 | 2.Sh.I |
| | 20 | 26.8 | 2.Tr.I |
| | 20 | 33.9 | 1.Sh.I |
| | 21 | 19.0 | 1.Tr.I |
| | 21 | 29.5 | 2.Sh.E |
| | 22 | 45.3 | 1.Sh.E |
| | 23 | 2.7 | 2.Tr.E |
| | 23 | 30.4 | 1.Tr.E |
| 22 | 17 | 45.9 | 1.Ec.D |
| | 20 | 45.9 | 1.Oc.R |
| 23 | 11 | 6.6 | 3.Ec.D |
| | 13 | 31.7 | 3.Ec.R |
| | 13 | 37.5 | 2.Ec.D |
| | 14 | 19.3 | 3.Oc.D |
| | 15 | 2.5 | 1.Sh.I |
| | 15 | 49.1 | 1.Tr.I |
| | 16 | 43.5 | 3.Oc.R |
| | 17 | 13.8 | 1.Sh.E |
| | 17 | 45.7 | 2.Oc.R |
| | 18 | 0.4 | 1.Tr.E |
| 24 | 12 | 14.5 | 1.Ec.D |
| | 15 | 16.0 | 1.Oc.R |
| 25 | 8 | 12.7 | 2.Sh.I |
| | 9 | 31.0 | 1.Sh.I |
| | 9 | 52.9 | 2.Tr.I |
| | 10 | 19.2 | 1.Tr.I |
| | 10 | 48.7 | 2.Sh.E |
| | 11 | 42.2 | 1.Sh.E |
| | 12 | 28.2 | 2.Tr.E |
| | 12 | 30.5 | 1.Tr.E |
| 26 | 6 | 43.2 | 1.Ec.D |
| | 9 | 46.3 | 1.Oc.R |
| 27 | 1 | 21.3 | 3.Sh.I |
| | 2 | 54.9 | 2.Ec.D |
| | 3 | 44.2 | 3.Sh.E |
| | 3 | 59.5 | 1.Sh.I |
| | 4 | 46.8 | 3.Tr.I |
| | 4 | 49.2 | 1.Tr.I |
| | 6 | 10.7 | 1.Sh.E |
| | 7 | 0.4 | 1.Tr.E |
| | 7 | 7.6 | 3.Tr.E |
| | 7 | 9.0 | 2.Oc.R |
| 28 | 1 | 11.8 | 1.Ec.D |
| | 4 | 16.5 | 1.Oc.R |
| | 21 | 31.2 | 2.Sh.I |
| | 22 | 28.0 | 1.Sh.I |
| | 23 | 17.9 | 2.Tr.I |
| | 23 | 19.3 | 1.Tr.I |
| 29 | 0 | 7.0 | 2.Sh.E |
| | 0 | 39.2 | 1.Sh.E |
| | 1 | 30.4 | 1.Tr.E |
| | 1 | 52.6 | 2.Tr.E |
| | 19 | 40.5 | 1.Ec.D |
| | 22 | 46.7 | 1.Oc.R |
| 30 | 15 | 8.3 | 3.Ec.D |
| | 16 | 12.3 | 2.Ec.D |
| | 16 | 56.6 | 1.Sh.I |
| | 17 | 32.1 | 3.Ec.R |
| | 17 | 49.3 | 1.Tr.I |
| | 18 | 47.9 | 3.Oc.D |
| | 19 | 7.7 | 1.Sh.E |
| | 20 | 0.3 | 1.Tr.E |
| | 20 | 32.0 | 2.Oc.R |
| | 21 | 8.2 | 3.Oc.R |
| 31 | 14 | 9.1 | 1.Ec.D |
| | 17 | 16.7 | 1.Oc.R |

**Diagrama dos satélites galileanos**
**Junho 2011**

1 = Io, 2= Europa, 3 = Ganimedes, 4 = Calisto.

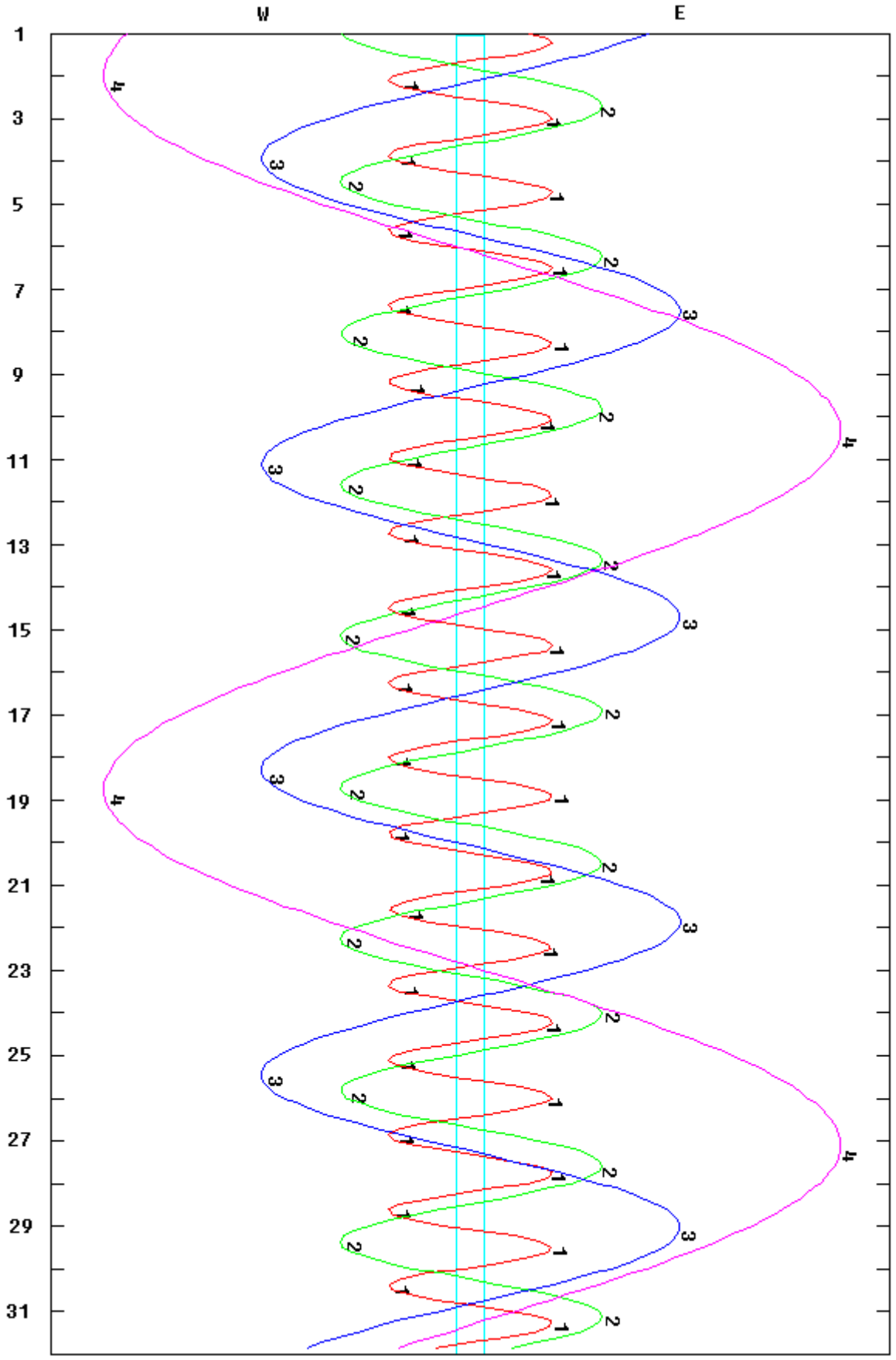


## Eventos mútuos em Junho 2011

| | | | |
|---|---|---|---|
| 1 | 10 | 50.6 | 2.Sh.I |
| | 11 | 25.1 | 1.Sh.I |
| | 12 | 19.3 | 1.Tr.I |
| | 12 | 43.6 | 2.Tr.I |
| | 13 | 26.2 | 2.Sh.E |
| | 13 | 36.1 | 1.Sh.E |
| | 14 | 30.2 | 1.Tr.E |
| | 15 | 17.7 | 2.Tr.E |
| 2 | 8 | 37.8 | 1.Ec.D |
| | 11 | 46.9 | 1.Oc.R |
| 3 | 5 | 22.6 | 3.Sh.I |
| | 5 | 29.6 | 2.Ec.D |
| | 5 | 53.6 | 1.Sh.I |
| | 6 | 49.2 | 1.Tr.I |
| | 7 | 44.1 | 3.Sh.E |
| | 8 | 4.6 | 1.Sh.E |
| | 9 | 0.0 | 1.Tr.E |
| | 9 | 13.8 | 3.Tr.I |
| | 9 | 54.9 | 2.Oc.R |
| | 11 | 30.7 | 3.Tr.E |
| 4 | 3 | 6.4 | 1.Ec.D |
| | 6 | 16.9 | 1.Oc.R |
| 5 | 0 | 9.2 | 2.Sh.I |
| | 0 | 22.1 | 1.Sh.I |
| | 1 | 19.1 | 1.Tr.I |
| | 2 | 8.2 | 2.Tr.I |
| | 2 | 33.0 | 1.Sh.E |
| | 2 | 44.5 | 2.Sh.E |
| | 3 | 29.9 | 1.Tr.E |
| | 4 | 41.7 | 2.Tr.E |
| | 21 | 35.1 | 1.Ec.D |
| 6 | 0 | 47.0 | 1.Oc.R |
| | 18 | 46.9 | 2.Ec.D |
| | 18 | 50.6 | 1.Sh.I |
| | 19 | 9.9 | 3.Ec.D |
| | 19 | 49.0 | 1.Tr.I |
| | 21 | 1.5 | 1.Sh.E |
| | 21 | 32.5 | 3.Ec.R |
| | 21 | 59.7 | 1.Tr.E |
| | 23 | 14.7 | 3.Oc.D |
| | 23 | 17.5 | 2.Oc.R |
| 7 | 1 | 31.0 | 3.Oc.R |
| | 16 | 3.7 | 1.Ec.D |
| | 19 | 16.9 | 1.Oc.R |
| 8 | 13 | 19.1 | 1.Sh.I |
| | 13 | 28.6 | 2.Sh.I |
| | 14 | 18.9 | 1.Tr.I |
| | 15 | 29.9 | 1.Sh.E |
| | 15 | 33.4 | 2.Tr.I |
| | 16 | 3.7 | 2.Sh.E |
| | 16 | 29.4 | 1.Tr.E |
| | 18 | 6.4 | 2.Tr.E |
| 9 | 10 | 32.4 | 1.Ec.D |
| | 13 | 47.0 | 1.Oc.R |
| 10 | 7 | 47.6 | 1.Sh.I |
| | 8 | 4.2 | 2.Ec.D |
| | 8 | 48.7 | 1.Tr.I |
| | 9 | 23.4 | 3.Sh.I |
| | 9 | 58.4 | 1.Sh.E |
| | 10 | 59.2 | 1.Tr.E |
| | 11 | 43.6 | 3.Sh.E |
| | 12 | 39.9 | 2.Oc.R |
| | 13 | 38.7 | 3.Tr.I |
| | 15 | 51.4 | 3.Tr.E |
| 11 | 5 | 1.0 | 1.Ec.D |
| | 8 | 16.9 | 1.Oc.R |
| 12 | 2 | 16.1 | 1.Sh.I |
| | 2 | 47.1 | 2.Sh.I |
| | 3 | 18.5 | 1.Tr.I |
| | 4 | 26.8 | 1.Sh.E |
| | 4 | 57.4 | 2.Tr.I |
| | 5 | 21.9 | 2.Sh.E |
| | 5 | 28.9 | 1.Tr.E |
| | 7 | 29.8 | 2.Tr.E |
| | 23 | 29.7 | 1.Ec.D |
| 13 | 2 | 46.8 | 1.Oc.R |
| | 20 | 44.6 | 1.Sh.I |
| | 21 | 21.5 | 2.Ec.D |
| | 21 | 48.2 | 1.Tr.I |
| | 22 | 55.3 | 1.Sh.E |
| | 23 | 12.1 | 3.Ec.D |
| | 23 | 58.5 | 1.Tr.E |
| 14 | 1 | 33.5 | 3.Ec.R |
| | 2 | 2.1 | 2.Oc.R |
| | 3 | 40.2 | 3.Oc.D |
| | 5 | 52.5 | 3.Oc.R |
| | 17 | 58.3 | 1.Ec.D |
| | 21 | 16.6 | 1.Oc.R |
| 15 | 15 | 13.1 | 1.Sh.I |
| | 16 | 6.4 | 2.Sh.I |
| | 16 | 18.0 | 1.Tr.I |
| | 17 | 23.7 | 1.Sh.E |
| | 18 | 22.1 | 2.Tr.I |
| | 18 | 28.2 | 1.Tr.E |
| | 18 | 41.0 | 2.Sh.E |
| | 20 | 53.8 | 2.Tr.E |
| 16 | 12 | 26.9 | 1.Ec.D |
| | 15 | 46.5 | 1.Oc.R |
| 17 | 9 | 41.6 | 1.Sh.I |
| | 10 | 38.8 | 2.Ec.D |
| | 10 | 47.6 | 1.Tr.I |
| | 11 | 52.1 | 1.Sh.E |
| | 12 | 57.8 | 1.Tr.E |
| | 13 | 24.2 | 3.Sh.I |
| | 15 | 24.0 | 2.Oc.R |
| | 15 | 42.9 | 3.Sh.E |
| | 18 | 1.5 | 3.Tr.I |
| | 20 | 10.0 | 3.Tr.E |
| 18 | 6 | 55.5 | 1.Ec.D |
| | 10 | 16.2 | 1.Oc.R |
| 19 | 4 | 10.0 | 1.Sh.I |
| | 5 | 17.3 | 1.Tr.I |
| | 5 | 24.9 | 2.Sh.I |
| | 6 | 20.6 | 1.Sh.E |
| | 7 | 27.3 | 1.Tr.E |
| | 7 | 45.5 | 2.Tr.I |
| | 7 | 59.2 | 2.Sh.E |
| | 10 | 16.7 | 2.Tr.E |
| 20 | 1 | 24.2 | 1.Ec.D |
| | 4 | 46.0 | 1.Oc.R |
| | 22 | 38.5 | 1.Sh.I |
| | 23 | 46.9 | 1.Tr.I |
| | 23 | 56.0 | 2.Ec.D |
| 21 | 0 | 49.0 | 1.Sh.E |
| | 1 | 56.9 | 1.Tr.E |
| | 3 | 13.6 | 3.Ec.D |
| | 4 | 45.6 | 2.Oc.R |
| | 5 | 33.7 | 3.Ec.R |
| | 8 | 2.8 | 3.Oc.D |
| | 10 | 10.9 | 3.Oc.R |
| | 19 | 52.7 | 1.Ec.D |
| | 23 | 15.7 | 1.Oc.R |
| 22 | 17 | 7.0 | 1.Sh.I |
| | 18 | 16.5 | 1.Tr.I |
| | 18 | 44.3 | 2.Sh.I |
| | 19 | 17.4 | 1.Sh.E |
| | 20 | 26.4 | 1.Tr.E |
| | 21 | 9.6 | 2.Tr.I |
| | 21 | 18.3 | 2.Sh.E |
| | 23 | 40.2 | 2.Tr.E |
| 23 | 14 | 21.4 | 1.Ec.D |
| | 17 | 45.4 | 1.Oc.R |
| 24 | 11 | 35.5 | 1.Sh.I |
| | 12 | 46.0 | 1.Tr.I |
| | 13 | 13.3 | 2.Ec.D |
| | 13 | 45.8 | 1.Sh.E |
| | 14 | 55.8 | 1.Tr.E |
| | 17 | 25.3 | 3.Sh.I |
| | 18 | 6.9 | 2.Oc.R |
| | 19 | 42.8 | 3.Sh.E |
| | 22 | 22.7 | 3.Tr.I |
| 25 | 0 | 26.8 | 3.Tr.E |
| | 8 | 50.0 | 1.Ec.D |
| | 12 | 15.0 | 1.Oc.R |
| 26 | 6 | 3.9 | 1.Sh.I |
| | 7 | 15.5 | 1.Tr.I |
| | 8 | 2.7 | 2.Sh.I |
| | 8 | 14.3 | 1.Sh.E |
| | 9 | 25.2 | 1.Tr.E |
| | 10 | 32.4 | 2.Tr.I |
| | 10 | 36.5 | 2.Sh.E |
| | 13 | 2.4 | 2.Tr.E |
| 27 | 3 | 18.6 | 1.Ec.D |
| | 6 | 44.6 | 1.Oc.R |
| 28 | 0 | 32.4 | 1.Sh.I |
| | 1 | 44.9 | 1.Tr.I |
| | 2 | 30.6 | 2.Ec.D |
| | 2 | 42.7 | 1.Sh.E |
| | 3 | 54.6 | 1.Tr.E |
| | 7 | 15.0 | 3.Ec.D |
| | 7 | 28.0 | 2.Oc.R |
| | 9 | 33.9 | 3.Ec.R |
| | 12 | 22.8 | 3.Oc.D |
| | 14 | 26.7 | 3.Oc.R |
| | 21 | 47.1 | 1.Ec.D |
| 29 | 1 | 14.1 | 1.Oc.R |
| | 19 | 0.9 | 1.Sh.I |
| | 20 | 14.4 | 1.Tr.I |
| | 21 | 11.1 | 1.Sh.E |
| | 21 | 21.9 | 2.Sh.I |
| | 22 | 23.9 | 1.Tr.E |
| | 23 | 55.5 | 2.Sh.E |
| | 23 | 55.7 | 2.Tr.I |
| 30 | 2 | 25.1 | 2.Tr.E |
| | 16 | 15.8 | 1.Ec.D |
| | 19 | 43.6 | 1.Oc.R |

**Diagrama dos satélites galileanos**
**Julho 2011**

1 = Io, 2= Europa, 3 = Ganimedes, 4 = Calisto.

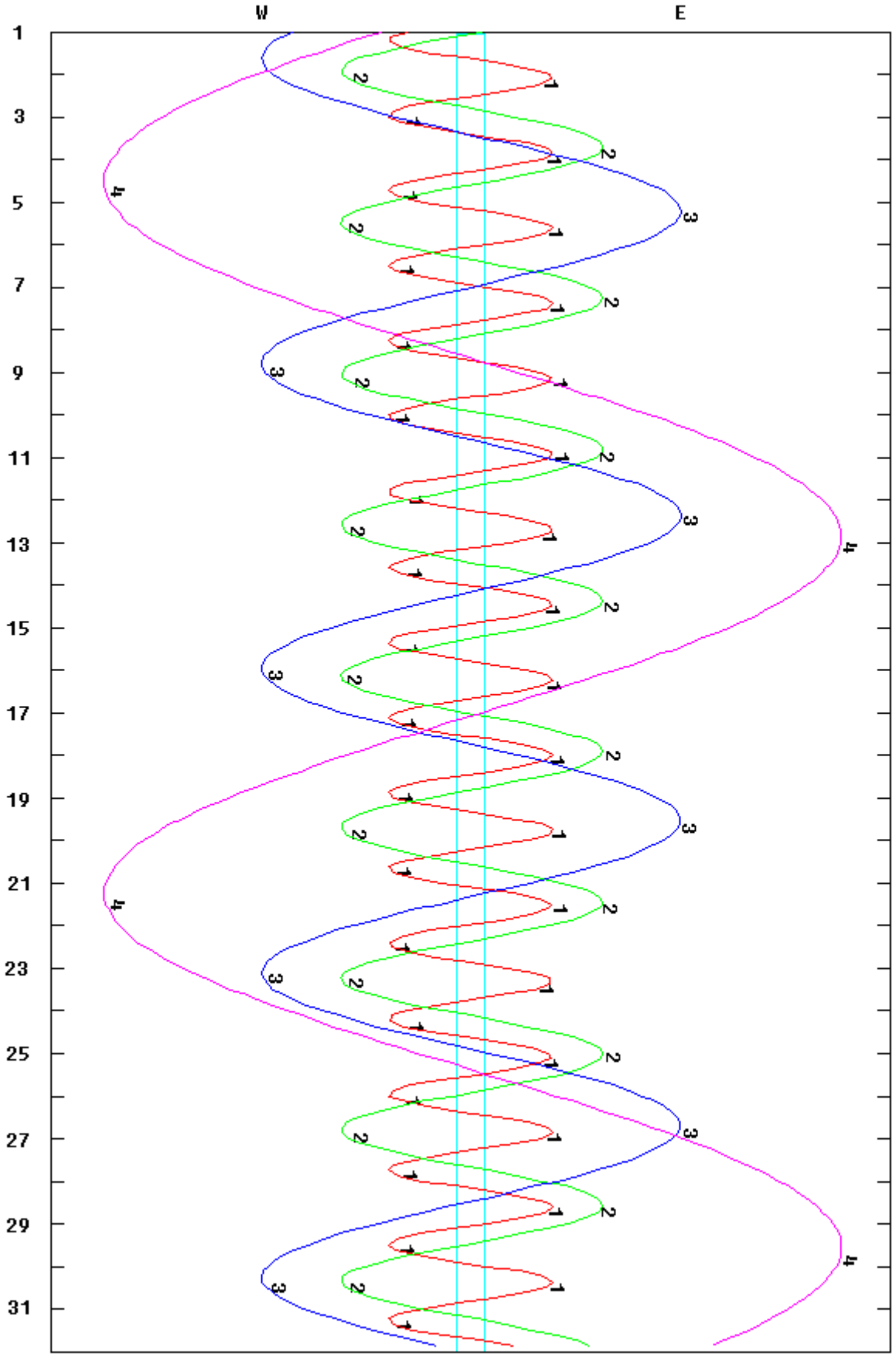


## Eventos mútuos em Julho 2011

| | | | |
|---|---|---|---|
| 1 | 13 | 29.3 | 1.Sh.I |
| | 15 | 39.5 | 1.Sh.E |
| | 15 | 47.9 | 2.Ec.D |
| | 20 | 48.8 | 2.Oc.R |
| | 21 | 26.4 | 3.Sh.I |
| | 23 | 42.6 | 3.Sh.E |
| 2 | 2 | 41.2 | 3.Tr.I |
| | 4 | 40.9 | 3.Tr.E |
| | 10 | 44.3 | 1.Ec.D |
| 3 | 7 | 57.7 | 1.Sh.I |
| | 9 | 13.1 | 1.Tr.I |
| | 10 | 7.9 | 1.Sh.E |
| | 10 | 40.3 | 2.Sh.I |
| | 11 | 22.4 | 1.Tr.E |
| | 13 | 13.6 | 2.Sh.E |
| | 15 | 46.6 | 2.Tr.E |
| 4 | 5 | 13.0 | 1.Ec.D |
| 5 | 2 | 26.2 | 1.Sh.I |
| | 3 | 42.3 | 1.Tr.I |
| | 4 | 36.3 | 1.Sh.E |
| | 5 | 5.1 | 2.Ec.D |
| | 5 | 51.6 | 1.Tr.E |
| | 7 | 38.2 | 2.Ec.R |
| | 7 | 40.4 | 2.Oc.D |
| | 10 | 9.2 | 2.Oc.R |
| | 11 | 15.8 | 3.Ec.D |
| | 13 | 33.5 | 3.Ec.R |
| | 16 | 39.7 | 3.Oc.D |
| | 18 | 39.3 | 3.Oc.R |
| | 23 | 41.5 | 1.Ec.D |
| 6 | 3 | 11.8 | 1.Oc.R |
| | 20 | 54.7 | 1.Sh.I |
| | 22 | 11.6 | 1.Tr.I |
| | 23 | 4.8 | 1.Sh.E |
| | 23 | 59.6 | 2.Sh.I |
| 7 | 0 | 20.8 | 1.Tr.E |
| | 2 | 32.6 | 2.Sh.E |
| | 2 | 40.3 | 2.Tr.I |
| | 5 | 8.5 | 2.Tr.E |
| | 18 | 10.1 | 1.Ec.D |
| | 21 | 41.1 | 1.Oc.R |
| 8 | 15 | 23.1 | 1.Sh.I |
| | 16 | 40.8 | 1.Tr.I |
| | 17 | 33.2 | 1.Sh.E |
| | 18 | 22.4 | 2.Ec.D |
| | 18 | 49.9 | 1.Tr.E |
| | 20 | 55.4 | 2.Ec.R |
| | 21 | 1.0 | 2.Oc.D |
| | 23 | 29.3 | 2.Oc.R |
| 9 | 1 | 28.3 | 3.Sh.I |
| | 3 | 43.2 | 3.Sh.E |
| | 6 | 57.6 | 3.Tr.I |
| | 8 | 52.9 | 3.Tr.E |
| | 12 | 38.7 | 1.Ec.D |
| | 16 | 10.3 | 1.Oc.R |
| 10 | 9 | 51.5 | 1.Sh.I |
| | 11 | 9.9 | 1.Tr.I |
| | 12 | 1.6 | 1.Sh.E |
| | 13 | 17.9 | 2.Sh.I |
| | 16 | 1.6 | 2.Tr.I |
| | 18 | 29.3 | 2.Tr.E |
| 11 | 7 | 7.3 | 1.Ec.D |
| 12 | 4 | 20.0 | 1.Sh.I |
| | 5 | 39.0 | 1.Tr.I |
| | 7 | 39.7 | 2.Ec.D |
| | 7 | 48.0 | 1.Tr.E |
| | 10 | 12.5 | 2.Ec.R |
| | 10 | 21.1 | 2.Oc.D |
| | 12 | 49.0 | 2.Oc.R |
| | 15 | 16.6 | 3.Ec.D |
| | 20 | 53.7 | 3.Oc.D |
| | 22 | 48.8 | 3.Oc.R |
| 13 | 1 | 35.8 | 1.Ec.D |
| | 5 | 8.7 | 1.Oc.R |
| | 22 | 48.4 | 1.Sh.I |
| 14 | 0 | 8.0 | 1.Tr.I |
| | 2 | 17.0 | 1.Tr.E |
| | 2 | 37.0 | 2.Sh.I |
| | 5 | 23.3 | 2.Tr.I |
| | 7 | 50.3 | 2.Tr.E |
| | 20 | 4.4 | 1.Ec.D |
| | 23 | 37.8 | 1.Oc.R |
| 15 | 17 | 16.9 | 1.Sh.I |
| | 18 | 37.0 | 1.Tr.I |
| | 19 | 26.8 | 1.Sh.E |
| | 20 | 45.9 | 1.Tr.E |
| | 20 | 57.1 | 2.Ec.D |
| | 23 | 29.7 | 2.Ec.R |
| | 23 | 40.9 | 2.Oc.D |
| 16 | 2 | 8.4 | 2.Oc.R |
| | 5 | 29.2 | 3.Sh.I |
| | 7 | 42.9 | 3.Sh.E |
| | 11 | 10.0 | 3.Tr.I |
| | 13 | 0.7 | 3.Tr.E |
| | 14 | 33.0 | 1.Ec.D |
| | 18 | 6.8 | 1.Oc.R |
| 17 | 11 | 45.3 | 1.Sh.I |
| | 13 | 6.0 | 1.Tr.I |
| | 13 | 55.2 | 1.Sh.E |
| | 15 | 14.8 | 1.Tr.E |
| | 15 | 55.3 | 2.Sh.I |
| | 18 | 27.6 | 2.Sh.E |
| | 18 | 43.7 | 2.Tr.I |
| | 21 | 10.2 | 2.Tr.E |
| 18 | 9 | 1.6 | 1.Ec.D |
| | 12 | 35.8 | 1.Oc.R |
| 19 | 6 | 13.7 | 1.Sh.I |
| | 7 | 34.8 | 1.Tr.I |
| | 8 | 23.6 | 1.Sh.E |
| | 9 | 43.6 | 1.Tr.E |
| | 10 | 14.4 | 2.Ec.D |
| | 12 | 46.9 | 2.Ec.R |
| | 13 | 0.3 | 2.Oc.D |
| | 15 | 27.3 | 2.Oc.R |
| | 19 | 17.9 | 3.Ec.D |
| | 21 | 33.3 | 3.Ec.R |
| 20 | 1 | 5.1 | 3.Oc.D |
| | 2 | 55.6 | 3.Oc.R |
| | 3 | 30.1 | 1.Ec.D |
| | 7 | 4.7 | 1.Oc.R |
| 21 | 0 | 42.2 | 1.Sh.I |
| | 2 | 52.0 | 1.Sh.E |
| | 4 | 12.4 | 1.Tr.E |
| | 7 | 46.4 | 2.Sh.E |
| | 8 | 4.4 | 2.Tr.I |
| | 10 | 30.3 | 2.Tr.E |
| | 21 | 58.7 | 1.Ec.D |
| 22 | 1 | 33.6 | 1.Oc.R |
| | 19 | 10.6 | 1.Sh.I |
| | 21 | 20.4 | 1.Sh.E |
| | 22 | 41.1 | 1.Tr.E |
| | 23 | 31.7 | 2.Ec.D |
| 23 | 2 | 4.1 | 2.Ec.R |
| | 2 | 19.3 | 2.Oc.D |
| | 4 | 45.9 | 2.Oc.R |
| | 11 | 42.5 | 3.Sh.E |
| | 15 | 18.8 | 3.Tr.I |
| | 17 | 5.0 | 3.Tr.E |
| | 20 | 2.4 | 1.Oc.R |
| 24 | 13 | 39.0 | 1.Sh.I |
| | 15 | 1.2 | 1.Tr.I |
| | 15 | 48.9 | 1.Sh.E |
| | 17 | 9.8 | 1.Tr.E |
| | 18 | 32.6 | 2.Sh.I |
| | 21 | 4.5 | 2.Sh.E |
| | 21 | 23.9 | 2.Tr.I |
| | 23 | 49.4 | 2.Tr.E |
| 25 | 10 | 55.8 | 1.Ec.D |
| | 14 | 31.2 | 1.Oc.R |
| 26 | 8 | 7.4 | 1.Sh.I |
| | 9 | 29.8 | 1.Tr.I |
| | 10 | 17.3 | 1.Sh.E |
| | 11 | 38.4 | 1.Tr.E |
| | 12 | 49.1 | 2.Ec.D |
| | 15 | 21.3 | 2.Ec.R |
| | 15 | 37.9 | 2.Oc.D |
| | 18 | 4.1 | 2.Oc.R |
| | 23 | 19.1 | 3.Ec.D |
| 27 | 1 | 33.3 | 3.Ec.R |
| | 5 | 12.5 | 3.Oc.D |
| | 5 | 24.3 | 1.Ec.D |
| | 6 | 58.5 | 3.Oc.R |
| | 8 | 59.8 | 1.Oc.R |
| 28 | 2 | 35.9 | 1.Sh.I |
| | 3 | 58.5 | 1.Tr.I |
| | 4 | 45.7 | 1.Sh.E |
| | 6 | 7.0 | 1.Tr.E |
| | 7 | 51.5 | 2.Sh.I |
| | 10 | 23.2 | 2.Sh.E |
| | 10 | 43.6 | 2.Tr.I |
| | 13 | 8.5 | 2.Tr.E |
| | 23 | 52.9 | 1.Ec.D |
| 29 | 3 | 28.5 | 1.Oc.R |
| | 21 | 4.3 | 1.Sh.I |
| | 22 | 27.0 | 1.Tr.I |
| | 23 | 14.1 | 1.Sh.E |
| 30 | 0 | 35.5 | 1.Tr.E |
| | 2 | 6.5 | 2.Ec.D |
| | 4 | 38.6 | 2.Ec.R |
| | 13 | 30.5 | 3.Sh.I |
| | 15 | 41.8 | 3.Sh.E |
| | 18 | 21.5 | 1.Ec.D |
| | 19 | 23.6 | 3.Tr.I |
| | 21 | 5.2 | 3.Tr.E |
| | 21 | 57.0 | 1.Oc.R |
| 31 | 15 | 32.7 | 1.Sh.I |
| | 19 | 3.9 | 1.Tr.E |
| | 21 | 9.7 | 2.Sh.I |
| | 23 | 41.2 | 2.Sh.E |

**Diagrama dos satélites galileanos**
**Agosto 2011**

1 = Io, 2= Europa, 3 = Ganimedes, 4 = Calisto.

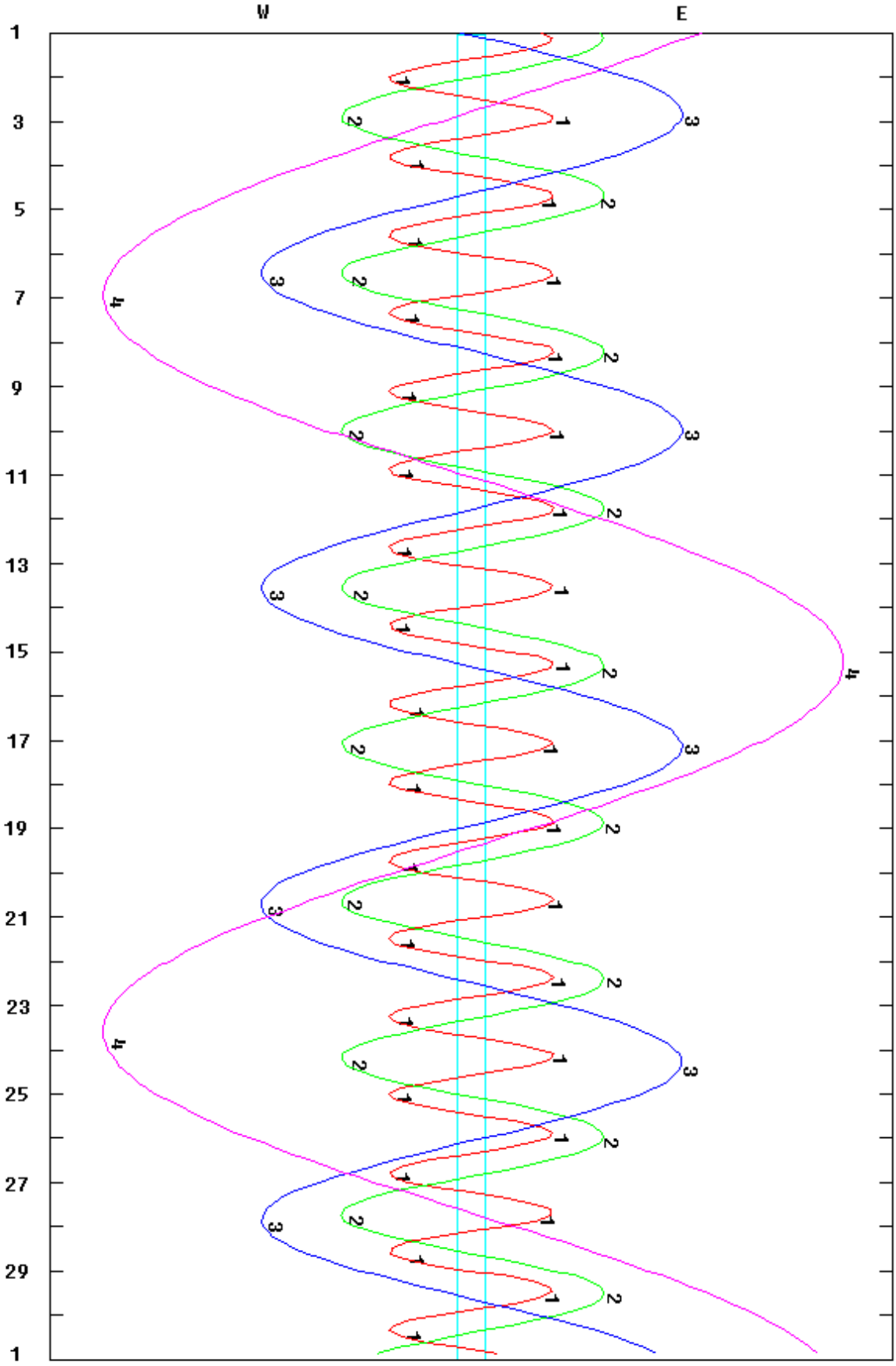


## Eventos mútuos em Agosto 2011

| | | | |
|---|---|---|---|
| 1 | 0 | 2.1 | 2.Tr.I |
| | 2 | 26.5 | 2.Tr.E |
| | 12 | 50.1 | 1.Ec.D |
| | 16 | 25.5 | 1.Oc.R |
| 2 | 10 | 1.1 | 1.Sh.I |
| | 12 | 10.9 | 1.Sh.E |
| | 13 | 32.3 | 1.Tr.E |
| | 15 | 23.9 | 2.Ec.D |
| | 17 | 55.9 | 2.Ec.R |
| | 18 | 13.8 | 2.Oc.D |
| | 20 | 39.1 | 2.Oc.R |
| 3 | 3 | 21.0 | 3.Ec.D |
| | 5 | 34.1 | 3.Ec.R |
| | 9 | 16.7 | 3.Oc.D |
| | 10 | 53.9 | 1.Oc.R |
| 4 | 4 | 29.6 | 1.Sh.I |
| | 5 | 52.4 | 1.Tr.I |
| | 6 | 39.4 | 1.Sh.E |
| | 8 | 0.7 | 1.Tr.E |
| | 10 | 28.5 | 2.Sh.I |
| | 12 | 59.8 | 2.Sh.E |
| | 13 | 20.6 | 2.Tr.I |
| | 15 | 44.5 | 2.Tr.E |
| 5 | 1 | 47.1 | 1.Ec.D |
| | 5 | 22.3 | 1.Oc.R |
| | 22 | 58.0 | 1.Sh.I |
| 6 | 0 | 20.7 | 1.Tr.I |
| | 1 | 7.8 | 1.Sh.E |
| | 2 | 28.9 | 1.Tr.E |
| | 4 | 41.3 | 2.Ec.D |
| | 7 | 31.0 | 2.Oc.D |
| | 9 | 55.9 | 2.Oc.R |
| | 19 | 41.1 | 3.Sh.E |
| | 20 | 15.6 | 1.Ec.D |
| | 23 | 24.5 | 3.Tr.I |
| | 23 | 50.6 | 1.Oc.R |
| 7 | 1 | 1.5 | 3.Tr.E |
| | 17 | 26.4 | 1.Sh.I |
| | 18 | 48.9 | 1.Tr.I |
| | 19 | 36.2 | 1.Sh.E |
| | 20 | 57.2 | 1.Tr.E |
| | 23 | 46.7 | 2.Sh.I |
| 8 | 2 | 17.8 | 2.Sh.E |
| | 2 | 38.0 | 2.Tr.I |
| | 5 | 1.5 | 2.Tr.E |
| | 14 | 44.2 | 1.Ec.D |
| 9 | 11 | 54.8 | 1.Sh.I |
| | 13 | 17.1 | 1.Tr.I |
| | 14 | 4.6 | 1.Sh.E |
| | 15 | 25.3 | 1.Tr.E |
| | 17 | 58.8 | 2.Ec.D |
| | 20 | 30.6 | 2.Ec.R |
| | 20 | 47.7 | 2.Oc.D |
| | 23 | 12.3 | 2.Oc.R |
| 10 | 7 | 22.1 | 3.Ec.D |
| | 9 | 12.7 | 1.Ec.D |
| | 9 | 34.1 | 3.Ec.R |
| | 12 | 47.0 | 1.Oc.R |
| | 13 | 15.8 | 3.Oc.D |
| | 14 | 52.9 | 3.Oc.R |
| 11 | 6 | 23.3 | 1.Sh.I |
| | 7 | 45.2 | 1.Tr.I |
| | 8 | 33.1 | 1.Sh.E |
| | 9 | 53.4 | 1.Tr.E |
| | 13 | 5.5 | 2.Sh.I |
| | 15 | 55.4 | 2.Tr.I |
| | 18 | 18.5 | 2.Tr.E |
| 12 | 3 | 41.3 | 1.Ec.D |
| | 7 | 15.2 | 1.Oc.R |
| 13 | 0 | 51.7 | 1.Sh.I |
| | 2 | 13.3 | 1.Tr.I |
| | 3 | 1.5 | 1.Sh.E |
| | 4 | 21.4 | 1.Tr.E |
| | 9 | 48.0 | 2.Ec.R |
| | 10 | 3.9 | 2.Oc.D |
| | 21 | 31.8 | 3.Sh.I |
| | 22 | 9.8 | 1.Ec.D |
| | 23 | 40.9 | 3.Sh.E |
| 14 | 1 | 43.2 | 1.Oc.R |
| | 3 | 21.7 | 3.Tr.I |
| | 4 | 54.2 | 3.Tr.E |
| | 19 | 20.1 | 1.Sh.I |
| | 20 | 41.3 | 1.Tr.I |
| | 21 | 29.9 | 1.Sh.E |
| | 22 | 49.4 | 1.Tr.E |
| 15 | 2 | 23.5 | 2.Sh.I |
| | 4 | 54.3 | 2.Sh.E |
| | 5 | 11.7 | 2.Tr.I |
| | 7 | 34.4 | 2.Tr.E |
| | 16 | 38.4 | 1.Ec.D |
| 16 | 13 | 48.5 | 1.Sh.I |
| | 15 | 9.2 | 1.Tr.I |
| | 17 | 17.3 | 1.Tr.E |
| | 20 | 33.9 | 2.Ec.D |
| | 23 | 5.5 | 2.Ec.R |
| | 23 | 19.6 | 2.Oc.D |
| 17 | 1 | 43.5 | 2.Oc.R |
| | 11 | 6.9 | 1.Ec.D |
| | 11 | 23.1 | 3.Ec.D |
| | 13 | 34.1 | 3.Ec.R |
| | 14 | 39.0 | 1.Oc.R |
| | 17 | 10.4 | 3.Oc.D |
| | 18 | 43.1 | 3.Oc.R |
| 18 | 8 | 17.0 | 1.Sh.I |
| | 9 | 37.1 | 1.Tr.I |
| | 10 | 26.8 | 1.Sh.E |
| | 15 | 42.2 | 2.Sh.I |
| | 18 | 12.8 | 2.Sh.E |
| | 18 | 27.9 | 2.Tr.I |
| | 20 | 50.2 | 2.Tr.E |
| 19 | 5 | 35.5 | 1.Ec.D |
| | 9 | 6.9 | 1.Oc.R |
| 20 | 2 | 45.4 | 1.Sh.I |
| | 4 | 4.8 | 1.Tr.I |
| | 4 | 55.2 | 1.Sh.E |
| | 6 | 12.9 | 1.Tr.E |
| | 9 | 51.5 | 2.Ec.D |
| | 12 | 23.0 | 2.Ec.R |
| | 12 | 34.8 | 2.Oc.D |
| | 14 | 58.3 | 2.Oc.R |
| 21 | 0 | 4.0 | 1.Ec.D |
| | 1 | 32.7 | 3.Sh.I |
| | 3 | 34.6 | 1.Oc.R |
| | 3 | 40.8 | 3.Sh.E |
| | 7 | 14.0 | 3.Tr.I |
| | 21 | 13.8 | 1.Sh.I |
| | 22 | 32.6 | 1.Tr.I |
| | 23 | 23.7 | 1.Sh.E |
| 22 | 0 | 40.7 | 1.Tr.E |
| | 5 | 0.2 | 2.Sh.I |
| | 7 | 30.6 | 2.Sh.E |
| | 7 | 42.9 | 2.Tr.I |
| | 10 | 4.9 | 2.Tr.E |
| | 22 | 2.3 | 1.Oc.R |
| 23 | 15 | 42.2 | 1.Sh.I |
| | 17 | 52.1 | 1.Sh.E |
| | 19 | 8.3 | 1.Tr.E |
| | 23 | 9.2 | 2.Ec.D |
| 24 | 1 | 40.5 | 2.Ec.R |
| | 1 | 49.4 | 2.Oc.D |
| | 4 | 12.7 | 2.Oc.R |
| | 13 | 1.1 | 1.Ec.D |
| | 15 | 23.8 | 3.Ec.D |
| | 16 | 29.9 | 1.Oc.R |
| | 17 | 33.6 | 3.Ec.R |
| | 20 | 59.8 | 3.Oc.D |
| | 22 | 28.4 | 3.Oc.R |
| 25 | 10 | 10.7 | 1.Sh.I |
| | 11 | 27.8 | 1.Tr.I |
| | 12 | 20.6 | 1.Sh.E |
| | 18 | 18.7 | 2.Sh.I |
| | 20 | 49.1 | 2.Sh.E |
| | 23 | 19.5 | 2.Tr.E |
| 26 | 7 | 29.6 | 1.Ec.D |
| | 10 | 57.5 | 1.Oc.R |
| 27 | 4 | 39.1 | 1.Sh.I |
| | 5 | 55.3 | 1.Tr.I |
| | 6 | 49.1 | 1.Sh.E |
| | 8 | 3.4 | 1.Tr.E |
| | 12 | 26.8 | 2.Ec.D |
| | 14 | 58.1 | 2.Ec.R |
| | 15 | 3.4 | 2.Oc.D |
| | 17 | 26.3 | 2.Oc.R |
| 28 | 1 | 58.1 | 1.Ec.D |
| | 5 | 24.9 | 1.Oc.R |
| | 5 | 34.4 | 3.Sh.I |
| | 11 | 2.3 | 3.Tr.I |
| | 12 | 26.5 | 3.Tr.E |
| | 23 | 7.6 | 1.Sh.I |
| 29 | 0 | 22.8 | 1.Tr.I |
| | 1 | 17.5 | 1.Sh.E |
| | 2 | 30.8 | 1.Tr.E |
| | 7 | 36.7 | 2.Sh.I |
| | 10 | 6.9 | 2.Sh.E |
| | 10 | 11.7 | 2.Tr.I |
| | 12 | 33.1 | 2.Tr.E |
| | 20 | 26.7 | 1.Ec.D |
| | 23 | 52.3 | 1.Oc.R |
| 30 | 17 | 36.0 | 1.Sh.I |
| | 18 | 50.1 | 1.Tr.I |
| | 19 | 46.0 | 1.Sh.E |
| | 20 | 58.2 | 1.Tr.E |
| 31 | 1 | 44.6 | 2.Ec.D |
| | 4 | 15.7 | 2.Ec.R |
| | 4 | 17.0 | 2.Oc.D |
| | 6 | 39.7 | 2.Oc.R |
| | 21 | 33.2 | 3.Ec.R |

**Diagrama dos satélites galileanos**
**Setembro 2011**

1 = Io, 2= Europa, 3 = Ganimedes, 4 = Calisto.

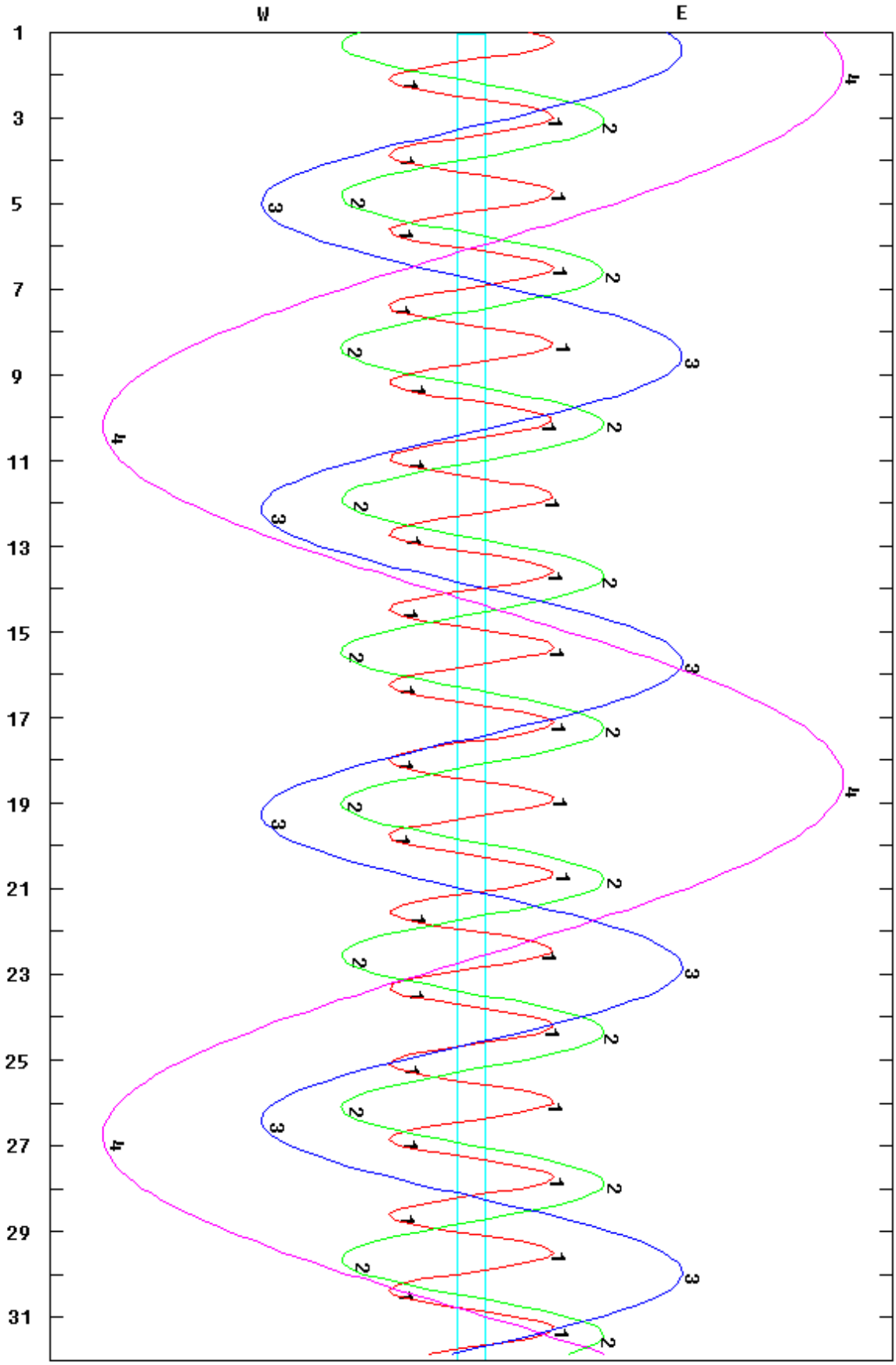


## Eventos mútuos em Setembro 2011

| | | | |
|---|---|---|---|
| 1 | 0 | 44.4 | 3.Oc.D |
| | 2 | 9.1 | 3.Oc.R |
| | 12 | 4.5 | 1.Sh.I |
| | 13 | 17.5 | 1.Tr.I |
| | 14 | 14.5 | 1.Sh.E |
| | 15 | 25.5 | 1.Tr.E |
| | 20 | 55.2 | 2.Sh.I |
| | 23 | 25.2 | 2.Sh.E |
| | 23 | 25.3 | 2.Tr.I |
| 2 | 1 | 46.4 | 2.Tr.E |
| | 9 | 23.8 | 1.Ec.D |
| | 12 | 46.9 | 1.Oc.R |
| 3 | 6 | 32.9 | 1.Sh.I |
| | 7 | 44.7 | 1.Tr.I |
| | 8 | 43.0 | 1.Sh.E |
| | 9 | 52.8 | 1.Tr.E |
| | 15 | 2.3 | 2.Ec.D |
| | 19 | 52.3 | 2.Oc.R |
| 4 | 3 | 52.3 | 1.Ec.D |
| | 7 | 14.0 | 1.Oc.R |
| | 9 | 35.3 | 3.Sh.I |
| | 11 | 41.5 | 3.Sh.E |
| | 14 | 44.7 | 3.Tr.I |
| | 16 | 5.2 | 3.Tr.E |
| 5 | 1 | 1.4 | 1.Sh.I |
| | 2 | 11.9 | 1.Tr.I |
| | 3 | 11.5 | 1.Sh.E |
| | 4 | 20.0 | 1.Tr.E |
| | 10 | 13.1 | 2.Sh.I |
| | 12 | 37.9 | 2.Tr.I |
| | 12 | 43.1 | 2.Sh.E |
| | 14 | 58.8 | 2.Tr.E |
| | 22 | 20.9 | 1.Ec.D |
| 6 | 1 | 41.2 | 1.Oc.R |
| | 19 | 29.8 | 1.Sh.I |
| | 20 | 38.9 | 1.Tr.I |
| | 21 | 39.9 | 1.Sh.E |
| | 22 | 47.0 | 1.Tr.E |
| 7 | 4 | 20.2 | 2.Ec.D |
| | 9 | 4.6 | 2.Oc.R |
| | 16 | 49.4 | 1.Ec.D |
| | 20 | 8.2 | 1.Oc.R |
| | 23 | 25.8 | 3.Ec.D |
| 8 | 1 | 33.5 | 3.Ec.R |
| | 4 | 24.6 | 3.Oc.D |
| | 5 | 45.9 | 3.Oc.R |
| | 13 | 58.3 | 1.Sh.I |
| | 15 | 6.0 | 1.Tr.I |
| | 16 | 8.5 | 1.Sh.E |
| | 17 | 14.1 | 1.Tr.E |
| | 23 | 31.5 | 2.Sh.I |
| 9 | 1 | 50.3 | 2.Tr.I |
| | 2 | 1.3 | 2.Sh.E |
| | 4 | 11.0 | 2.Tr.E |
| | 11 | 18.0 | 1.Ec.D |
| | 14 | 35.2 | 1.Oc.R |
| 10 | 8 | 26.7 | 1.Sh.I |
| | 9 | 33.0 | 1.Tr.I |
| | 10 | 37.0 | 1.Sh.E |
| | 11 | 41.1 | 1.Tr.E |
| | 17 | 38.1 | 2.Ec.D |
| | 22 | 16.0 | 2.Oc.R |
| 11 | 5 | 46.5 | 1.Ec.D |
| | 9 | 2.1 | 1.Oc.R |
| | 13 | 36.1 | 3.Sh.I |
| | 15 | 41.5 | 3.Sh.E |
| | 18 | 21.8 | 3.Tr.I |
| | 19 | 39.4 | 3.Tr.E |
| 12 | 2 | 55.2 | 1.Sh.I |
| | 3 | 59.9 | 1.Tr.I |
| | 5 | 5.5 | 1.Sh.E |
| | 6 | 8.0 | 1.Tr.E |
| | 12 | 49.4 | 2.Sh.I |
| | 15 | 1.7 | 2.Tr.I |
| | 15 | 19.2 | 2.Sh.E |
| | 17 | 22.3 | 2.Tr.E |
| 13 | 0 | 15.1 | 1.Ec.D |
| | 3 | 28.9 | 1.Oc.R |
| | 21 | 23.7 | 1.Sh.I |
| | 22 | 26.7 | 1.Tr.I |
| | 23 | 34.0 | 1.Sh.E |
| 14 | 0 | 34.8 | 1.Tr.E |
| | 6 | 56.1 | 2.Ec.D |
| | 11 | 27.3 | 2.Oc.R |
| | 18 | 43.6 | 1.Ec.D |
| | 21 | 55.7 | 1.Oc.R |
| 15 | 3 | 27.0 | 3.Ec.D |
| | 5 | 33.7 | 3.Ec.R |
| | 7 | 59.4 | 3.Oc.D |
| | 9 | 18.1 | 3.Oc.R |
| | 15 | 52.2 | 1.Sh.I |
| | 16 | 53.5 | 1.Tr.I |
| | 18 | 2.6 | 1.Sh.E |
| | 19 | 1.7 | 1.Tr.E |
| 16 | 2 | 7.7 | 2.Sh.I |
| | 4 | 12.8 | 2.Tr.I |
| | 4 | 37.4 | 2.Sh.E |
| | 6 | 33.2 | 2.Tr.E |
| | 13 | 12.2 | 1.Ec.D |
| | 16 | 22.4 | 1.Oc.R |
| 17 | 10 | 20.7 | 1.Sh.I |
| | 11 | 20.1 | 1.Tr.I |
| | 12 | 31.1 | 1.Sh.E |
| | 13 | 28.4 | 1.Tr.E |
| | 20 | 14.0 | 2.Ec.D |
| 18 | 0 | 37.7 | 2.Oc.R |
| | 7 | 40.8 | 1.Ec.D |
| | 10 | 49.0 | 1.Oc.R |
| | 17 | 36.7 | 3.Sh.I |
| | 19 | 41.1 | 3.Sh.E |
| | 21 | 53.5 | 3.Tr.I |
| | 23 | 8.9 | 3.Tr.E |
| 19 | 4 | 49.2 | 1.Sh.I |
| | 5 | 46.8 | 1.Tr.I |
| | 6 | 59.6 | 1.Sh.E |
| | 7 | 55.0 | 1.Tr.E |
| | 15 | 25.6 | 2.Sh.I |
| | 17 | 23.0 | 2.Tr.I |
| | 17 | 55.2 | 2.Sh.E |
| | 19 | 43.4 | 2.Tr.E |
| 20 | 2 | 9.4 | 1.Ec.D |
| | 5 | 15.6 | 1.Oc.R |
| | 23 | 17.7 | 1.Sh.I |
| 21 | 0 | 13.3 | 1.Tr.I |
| | 1 | 28.1 | 1.Sh.E |
| | 2 | 21.6 | 1.Tr.E |
| | 9 | 32.2 | 2.Ec.D |
| | 13 | 48.0 | 2.Oc.R |
| | 20 | 37.9 | 1.Ec.D |
| | 23 | 42.0 | 1.Oc.R |
| 22 | 7 | 28.9 | 3.Ec.D |
| | 9 | 34.7 | 3.Ec.R |
| | 11 | 29.7 | 3.Oc.D |
| | 12 | 46.8 | 3.Oc.R |
| | 17 | 46.2 | 1.Sh.I |
| | 18 | 39.9 | 1.Tr.I |
| | 19 | 56.7 | 1.Sh.E |
| | 20 | 48.2 | 1.Tr.E |
| 23 | 4 | 43.8 | 2.Sh.I |
| | 6 | 32.9 | 2.Tr.I |
| | 7 | 13.3 | 2.Sh.E |
| | 8 | 53.2 | 2.Tr.E |
| | 15 | 6.5 | 1.Ec.D |
| | 18 | 8.5 | 1.Oc.R |
| 24 | 12 | 14.7 | 1.Sh.I |
| | 13 | 6.3 | 1.Tr.I |
| | 14 | 25.3 | 1.Sh.E |
| | 15 | 14.7 | 1.Tr.E |
| | 22 | 50.2 | 2.Ec.D |
| 25 | 2 | 57.4 | 2.Oc.R |
| | 9 | 35.0 | 1.Ec.D |
| | 12 | 34.9 | 1.Oc.R |
| | 21 | 37.4 | 3.Sh.I |
| | 23 | 41.0 | 3.Sh.E |
| 26 | 1 | 20.5 | 3.Tr.I |
| | 2 | 34.7 | 3.Tr.E |
| | 6 | 43.3 | 1.Sh.I |
| | 7 | 32.7 | 1.Tr.I |
| | 8 | 53.9 | 1.Sh.E |
| | 9 | 41.1 | 1.Tr.E |
| | 18 | 1.7 | 2.Sh.I |
| | 19 | 42.0 | 2.Tr.I |
| | 20 | 31.1 | 2.Sh.E |
| | 22 | 2.4 | 2.Tr.E |
| 27 | 4 | 3.7 | 1.Ec.D |
| | 7 | 1.2 | 1.Oc.R |
| 28 | 1 | 11.8 | 1.Sh.I |
| | 1 | 59.0 | 1.Tr.I |
| | 3 | 22.4 | 1.Sh.E |
| | 4 | 7.4 | 1.Tr.E |
| | 12 | 8.6 | 2.Ec.D |
| | 16 | 6.8 | 2.Oc.R |
| | 22 | 32.2 | 1.Ec.D |
| 29 | 1 | 27.5 | 1.Oc.R |
| | 11 | 30.2 | 3.Ec.D |
| | 13 | 35.0 | 3.Ec.R |
| | 14 | 54.5 | 3.Oc.D |
| | 16 | 11.0 | 3.Oc.R |
| | 19 | 40.4 | 1.Sh.I |
| | 20 | 25.3 | 1.Tr.I |
| | 21 | 51.1 | 1.Sh.E |
| | 22 | 33.8 | 1.Tr.E |
| 30 | 7 | 19.9 | 2.Sh.I |
| | 8 | 50.8 | 2.Tr.I |
| | 9 | 49.2 | 2.Sh.E |
| | 11 | 11.3 | 2.Tr.E |
| | 17 | 0.8 | 1.Ec.D |
| | 19 | 53.7 | 1.Oc.R |

**Diagrama dos satélites galileanos**
**Outubro 2011**

1 = Io, 2= Europa, 3 = Ganimedes, 4 = Calisto.

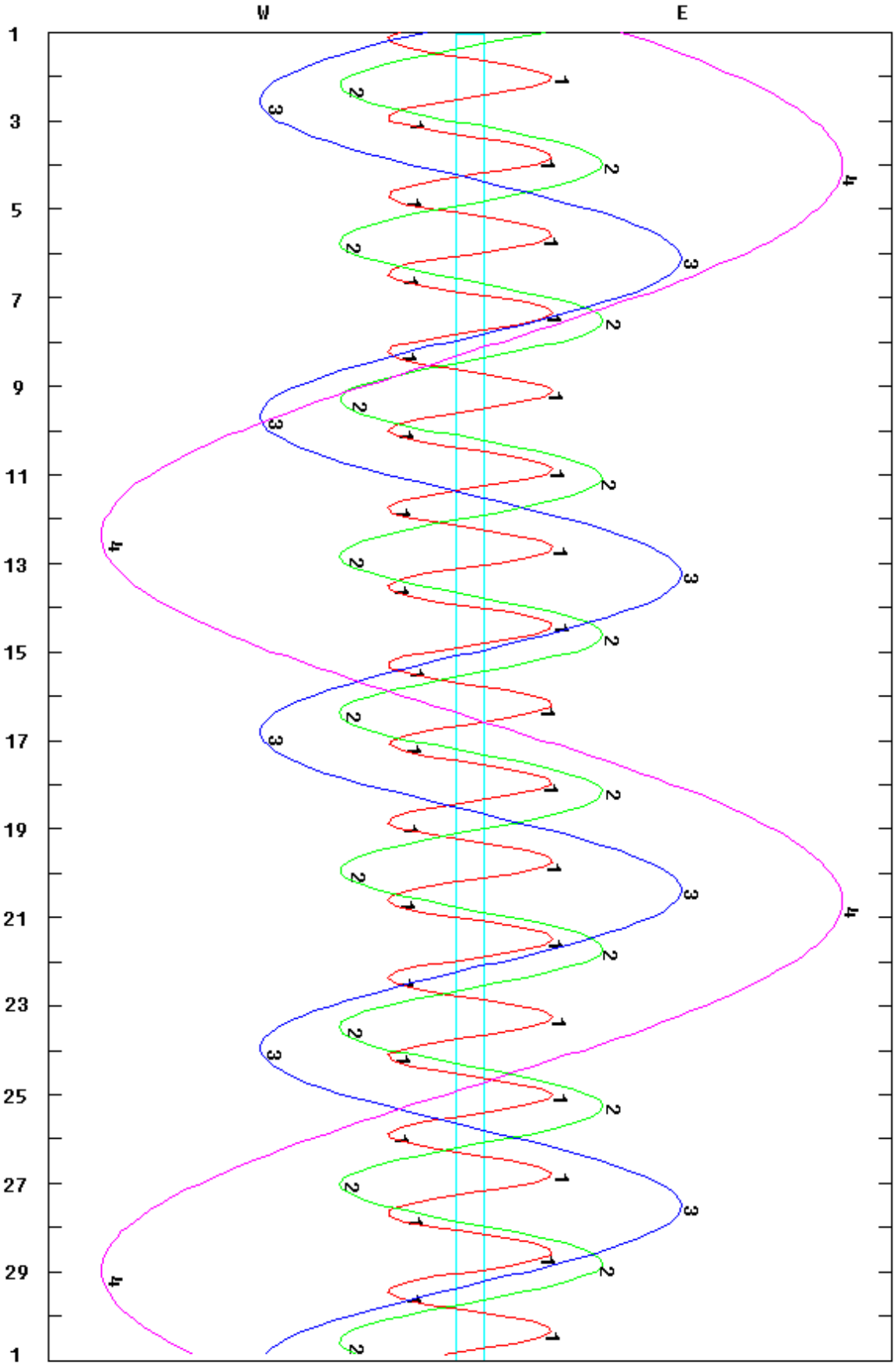


## Eventos mútuos em Outubro 2011

| | | | |
|---|---|---|---|
| 1 | 14 | 8.9 | 1.Sh.I |
| | 14 | 51.5 | 1.Tr.I |
| | 16 | 19.6 | 1.Sh.E |
| | 17 | 0.1 | 1.Tr.E |
| 2 | 1 | 26.7 | 2.Ec.D |
| | 5 | 15.4 | 2.Oc.R |
| | 11 | 29.4 | 1.Ec.D |
| | 14 | 19.9 | 1.Oc.R |
| 3 | 1 | 38.8 | 3.Sh.I |
| | 3 | 41.6 | 3.Sh.E |
| | 4 | 43.6 | 3.Tr.I |
| | 5 | 57.7 | 3.Tr.E |
| | 8 | 37.5 | 1.Sh.I |
| | 9 | 17.7 | 1.Tr.I |
| | 10 | 48.3 | 1.Sh.E |
| | 11 | 26.3 | 1.Tr.E |
| | 20 | 37.8 | 2.Sh.I |
| | 21 | 59.0 | 2.Tr.I |
| | 23 | 7.0 | 2.Sh.E |
| 4 | 0 | 19.5 | 2.Tr.E |
| | 5 | 58.0 | 1.Ec.D |
| | 8 | 46.0 | 1.Oc.R |
| 5 | 3 | 6.0 | 1.Sh.I |
| | 3 | 43.8 | 1.Tr.I |
| | 5 | 16.9 | 1.Sh.E |
| | 5 | 52.5 | 1.Tr.E |
| | 14 | 45.2 | 2.Ec.D |
| | 18 | 24.0 | 2.Oc.R |
| 6 | 0 | 26.6 | 1.Ec.D |
| | 3 | 12.1 | 1.Oc.R |
| | 15 | 31.5 | 3.Ec.D |
| | 17 | 35.3 | 3.Ec.R |
| | 18 | 14.9 | 3.Oc.D |
| | 19 | 32.2 | 3.Oc.R |
| | 21 | 34.7 | 1.Sh.I |
| | 22 | 10.0 | 1.Tr.I |
| | 23 | 45.5 | 1.Sh.E |
| 7 | 0 | 18.7 | 1.Tr.E |
| | 9 | 55.9 | 2.Sh.I |
| | 11 | 6.9 | 2.Tr.I |
| | 12 | 25.0 | 2.Sh.E |
| | 13 | 27.6 | 2.Tr.E |
| | 18 | 55.2 | 1.Ec.D |
| | 21 | 38.1 | 1.Oc.R |
| 8 | 16 | 3.3 | 1.Sh.I |
| | 16 | 36.0 | 1.Tr.I |
| | 18 | 14.1 | 1.Sh.E |
| | 18 | 44.7 | 1.Tr.E |
| 9 | 4 | 3.4 | 2.Ec.D |
| | 7 | 31.9 | 2.Oc.R |
| | 13 | 23.8 | 1.Ec.D |
| | 16 | 4.1 | 1.Oc.R |
| 10 | 5 | 40.2 | 3.Sh.I |
| | 7 | 42.2 | 3.Sh.E |
| | 8 | 2.5 | 3.Tr.I |
| | 9 | 17.9 | 3.Tr.E |
| | 10 | 31.9 | 1.Sh.I |
| | 11 | 2.1 | 1.Tr.I |
| | 12 | 42.8 | 1.Sh.E |
| | 13 | 10.8 | 1.Tr.E |
| | 23 | 13.8 | 2.Sh.I |
| 11 | 0 | 14.2 | 2.Tr.I |
| | 1 | 42.8 | 2.Sh.E |
| | 2 | 35.1 | 2.Tr.E |
| | 7 | 52.5 | 1.Ec.D |
| | 10 | 30.1 | 1.Oc.R |
| 12 | 5 | 0.5 | 1.Sh.I |
| | 5 | 28.0 | 1.Tr.I |
| | 7 | 11.4 | 1.Sh.E |
| | 7 | 36.8 | 1.Tr.E |
| | 17 | 22.1 | 2.Ec.D |
| | 20 | 40.0 | 2.Oc.R |
| 13 | 2 | 21.1 | 1.Ec.D |
| | 4 | 56.0 | 1.Oc.R |
| | 19 | 32.5 | 3.Ec.D |
| | 22 | 50.7 | 3.Oc.R |
| | 23 | 29.2 | 1.Sh.I |
| | 23 | 54.0 | 1.Tr.I |
| 14 | 1 | 40.1 | 1.Sh.E |
| | 2 | 2.9 | 1.Tr.E |
| | 12 | 31.9 | 2.Sh.I |
| | 13 | 21.4 | 2.Tr.I |
| | 15 | 0.8 | 2.Sh.E |
| | 15 | 42.5 | 2.Tr.E |
| | 20 | 49.7 | 1.Ec.D |
| | 23 | 22.0 | 1.Oc.R |
| 15 | 17 | 57.8 | 1.Sh.I |
| | 18 | 19.9 | 1.Tr.I |
| | 20 | 8.8 | 1.Sh.E |
| | 20 | 28.8 | 1.Tr.E |
| 16 | 6 | 40.4 | 2.Ec.D |
| | 9 | 47.3 | 2.Oc.R |
| | 15 | 18.3 | 1.Ec.D |
| | 17 | 47.8 | 1.Oc.R |
| 17 | 9 | 42.6 | 3.Sh.I |
| | 11 | 19.0 | 3.Tr.I |
| | 11 | 43.7 | 3.Sh.E |
| | 12 | 26.5 | 1.Sh.I |
| | 12 | 37.0 | 3.Tr.E |
| | 12 | 45.9 | 1.Tr.I |
| | 14 | 37.5 | 1.Sh.E |
| | 14 | 54.8 | 1.Tr.E |
| 18 | 1 | 49.9 | 2.Sh.I |
| | 2 | 28.3 | 2.Tr.I |
| | 4 | 18.6 | 2.Sh.E |
| | 4 | 49.6 | 2.Tr.E |
| | 9 | 47.0 | 1.Ec.D |
| | 12 | 13.8 | 1.Oc.R |
| 19 | 6 | 55.1 | 1.Sh.I |
| | 7 | 11.7 | 1.Tr.I |
| | 9 | 6.1 | 1.Sh.E |
| | 9 | 20.7 | 1.Tr.E |
| | 19 | 59.3 | 2.Ec.D |
| | 22 | 55.1 | 2.Oc.R |
| 20 | 4 | 15.6 | 1.Ec.D |
| | 6 | 39.6 | 1.Oc.R |
| | 23 | 33.6 | 3.Ec.D |
| 21 | 1 | 23.9 | 1.Sh.I |
| | 1 | 37.6 | 1.Tr.I |
| | 2 | 7.7 | 3.Oc.R |
| | 3 | 34.9 | 1.Sh.E |
| | 3 | 46.7 | 1.Tr.E |
| | 15 | 7.9 | 2.Sh.I |
| | 15 | 34.9 | 2.Tr.I |
| | 17 | 36.5 | 2.Sh.E |
| | 17 | 56.5 | 2.Tr.E |
| | 22 | 44.3 | 1.Ec.D |
| 22 | 1 | 5.4 | 1.Oc.R |
| | 19 | 52.5 | 1.Sh.I |
| | 20 | 3.5 | 1.Tr.I |
| | 22 | 3.6 | 1.Sh.E |
| | 22 | 12.6 | 1.Tr.E |
| 23 | 9 | 17.7 | 2.Ec.D |
| | 12 | 2.2 | 2.Oc.R |
| | 17 | 12.9 | 1.Ec.D |
| | 19 | 31.3 | 1.Oc.R |
| 24 | 13 | 44.3 | 3.Sh.I |
| | 14 | 21.3 | 1.Sh.I |
| | 14 | 29.4 | 1.Tr.I |
| | 14 | 32.5 | 3.Tr.I |
| | 15 | 44.5 | 3.Sh.E |
| | 15 | 54.1 | 3.Tr.E |
| | 16 | 32.3 | 1.Sh.E |
| | 16 | 38.5 | 1.Tr.E |
| 25 | 4 | 25.9 | 2.Sh.I |
| | 4 | 41.4 | 2.Tr.I |
| | 6 | 54.4 | 2.Sh.E |
| | 7 | 3.3 | 2.Tr.E |
| | 11 | 41.6 | 1.Ec.D |
| | 13 | 57.1 | 1.Oc.R |
| 26 | 8 | 50.0 | 1.Sh.I |
| | 8 | 55.2 | 1.Tr.I |
| | 11 | 1.0 | 1.Sh.E |
| | 11 | 4.4 | 1.Tr.E |
| | 22 | 36.7 | 2.Ec.D |
| 27 | 1 | 9.8 | 2.Oc.R |
| | 6 | 10.2 | 1.Ec.D |
| | 8 | 23.0 | 1.Oc.R |
| 28 | 3 | 18.8 | 1.Sh.I |
| | 3 | 21.1 | 1.Tr.I |
| | 3 | 35.5 | 3.Ec.D |
| | 5 | 29.8 | 1.Sh.E |
| | 5 | 30.3 | 1.Tr.E |
| | 5 | 36.6 | 3.Ec.R |
| | 17 | 44.0 | 2.Sh.I |
| | 17 | 47.9 | 2.Tr.I |
| | 20 | 10.1 | 2.Tr.E |
| | 20 | 12.3 | 2.Sh.E |
| 29 | 0 | 38.9 | 1.Ec.D |
| | 2 | 49.7 | 1.Ec.R |
| | 21 | 46.9 | 1.Tr.I |
| | 21 | 47.5 | 1.Sh.I |
| | 23 | 56.2 | 1.Tr.E |
| | 23 | 58.5 | 1.Sh.E |
| 30 | 11 | 53.3 | 2.Oc.D |
| | 14 | 24.7 | 2.Ec.R |
| | 19 | 5.6 | 1.Oc.D |
| | 21 | 18.3 | 1.Ec.R |
| 31 | 16 | 12.8 | 1.Tr.I |
| | 16 | 16.3 | 1.Sh.I |
| | 18 | 22.2 | 1.Tr.E |
| | 18 | 27.3 | 1.Sh.E |
| | 19 | 11.2 | 3.Tr.E |

**Diagrama dos satélites galileanos**
**Novembro 2011**

1 = Io, 2= Europa, 3 = Ganimedes, 4 = Calisto.

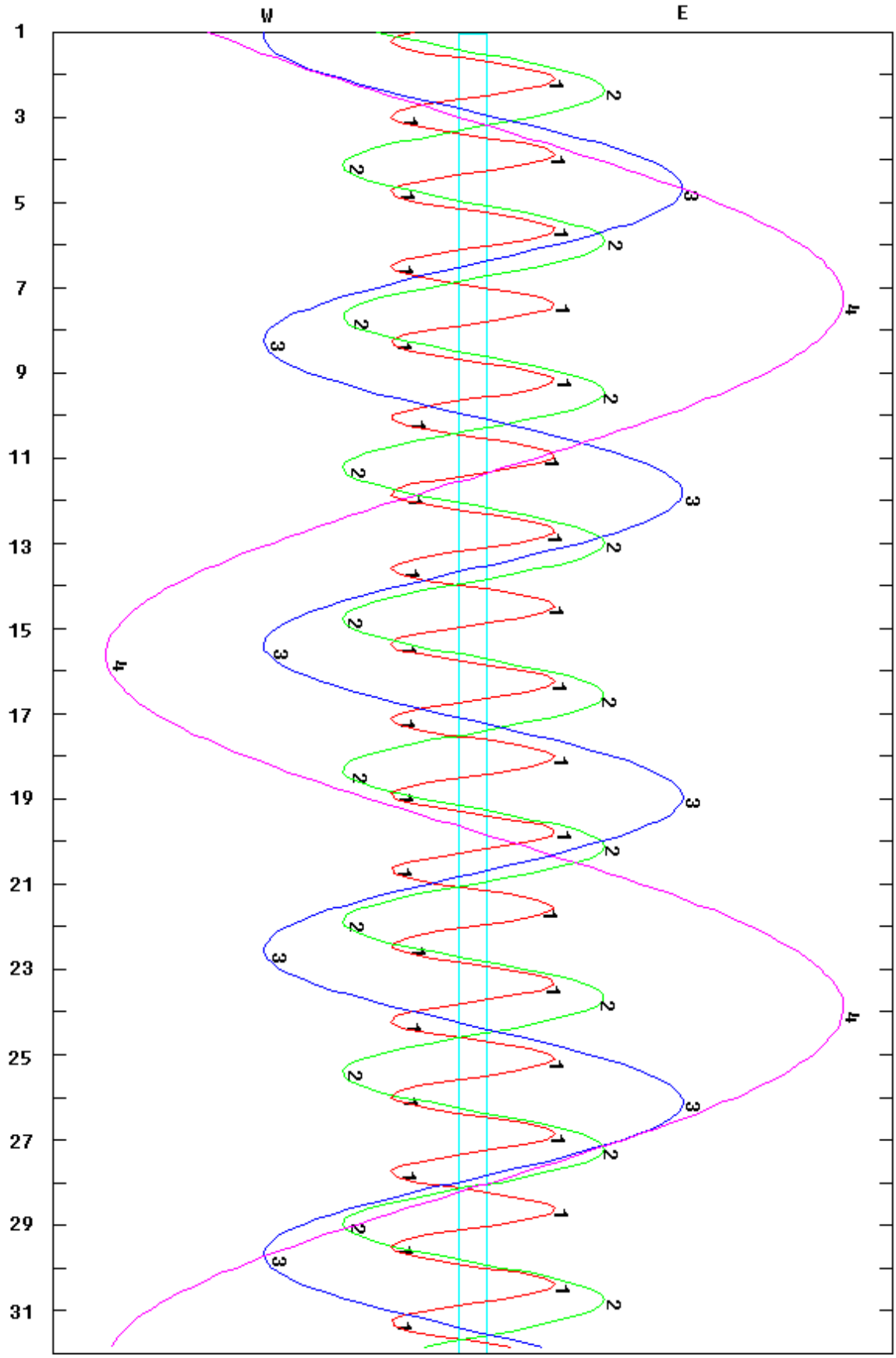


## Eventos mútuos em Novembro 2011

| | | | |
|---|---|---|---|
| 1 | 6 | 54.3 | 2.Tr.I |
| | 7 | 2.0 | 2.Sh.I |
| | 9 | 16.9 | 2.Tr.E |
| | 9 | 30.1 | 2.Sh.E |
| | 13 | 31.4 | 1.Oc.D |
| | 15 | 47.0 | 1.Ec.R |
| 2 | 10 | 38.7 | 1.Tr.I |
| | 10 | 45.0 | 1.Sh.I |
| | 12 | 48.1 | 1.Tr.E |
| | 12 | 56.1 | 1.Sh.E |
| 3 | 1 | 0.7 | 2.Oc.D |
| | 3 | 43.8 | 2.Ec.R |
| | 7 | 57.3 | 1.Oc.D |
| | 10 | 15.7 | 1.Ec.R |
| 4 | 5 | 4.7 | 1.Tr.I |
| | 5 | 13.8 | 1.Sh.I |
| | 7 | 11.3 | 3.Oc.D |
| | 7 | 14.1 | 1.Tr.E |
| | 7 | 24.9 | 1.Sh.E |
| | 9 | 37.6 | 3.Ec.R |
| | 20 | 0.9 | 2.Tr.I |
| | 20 | 20.1 | 2.Sh.I |
| | 22 | 23.8 | 2.Tr.E |
| | 22 | 48.0 | 2.Sh.E |
| 5 | 2 | 23.1 | 1.Oc.D |
| | 4 | 44.3 | 1.Ec.R |
| | 23 | 30.6 | 1.Tr.I |
| | 23 | 42.6 | 1.Sh.I |
| 6 | 1 | 40.1 | 1.Tr.E |
| | 1 | 53.6 | 1.Sh.E |
| | 14 | 7.6 | 2.Oc.D |
| | 17 | 2.3 | 2.Ec.R |
| | 20 | 49.0 | 1.Oc.D |
| | 23 | 13.0 | 1.Ec.R |
| 7 | 17 | 56.6 | 1.Tr.I |
| | 18 | 11.4 | 1.Sh.I |
| | 20 | 6.1 | 1.Tr.E |
| | 20 | 22.5 | 1.Sh.E |
| | 20 | 57.6 | 3.Tr.I |
| | 21 | 47.6 | 3.Sh.I |
| | 22 | 28.7 | 3.Tr.E |
| | 23 | 46.1 | 3.Sh.E |
| 8 | 9 | 7.5 | 2.Tr.I |
| | 9 | 38.1 | 2.Sh.I |
| | 11 | 30.8 | 2.Tr.E |
| | 12 | 5.8 | 2.Sh.E |
| | 15 | 14.9 | 1.Oc.D |
| | 17 | 41.7 | 1.Ec.R |
| 9 | 12 | 22.6 | 1.Tr.I |
| | 12 | 40.2 | 1.Sh.I |
| | 14 | 32.1 | 1.Tr.E |
| | 14 | 51.2 | 1.Sh.E |
| 10 | 3 | 15.3 | 2.Oc.D |
| | 6 | 21.6 | 2.Ec.R |
| | 9 | 40.9 | 1.Oc.D |
| | 12 | 10.4 | 1.Ec.R |
| 11 | 6 | 48.7 | 1.Tr.I |
| | 7 | 9.1 | 1.Sh.I |
| | 8 | 58.3 | 1.Tr.E |
| | 9 | 20.0 | 1.Sh.E |
| | 10 | 25.5 | 3.Oc.D |
| | 13 | 39.3 | 3.Ec.R |
| | 22 | 14.4 | 2.Tr.I |
| | 22 | 56.1 | 2.Sh.I |
| 12 | 0 | 38.0 | 2.Tr.E |
| | 1 | 23.6 | 2.Sh.E |
| | 4 | 6.8 | 1.Oc.D |
| | 6 | 39.1 | 1.Ec.R |
| 13 | 1 | 14.7 | 1.Tr.I |
| | 1 | 37.9 | 1.Sh.I |
| | 3 | 24.4 | 1.Tr.E |
| | 3 | 48.8 | 1.Sh.E |
| | 16 | 22.7 | 2.Oc.D |
| | 19 | 40.2 | 2.Ec.R |
| | 22 | 32.8 | 1.Oc.D |
| 14 | 1 | 7.8 | 1.Ec.R |
| | 19 | 40.9 | 1.Tr.I |
| | 20 | 6.8 | 1.Sh.I |
| | 21 | 50.6 | 1.Tr.E |
| | 22 | 17.7 | 1.Sh.E |
| 15 | 0 | 11.8 | 3.Tr.I |
| | 1 | 48.2 | 3.Tr.E |
| | 1 | 49.4 | 3.Sh.I |
| | 3 | 47.0 | 3.Sh.E |
| | 11 | 21.6 | 2.Tr.I |
| | 12 | 14.2 | 2.Sh.I |
| | 13 | 45.6 | 2.Tr.E |
| | 14 | 41.5 | 2.Sh.E |
| | 16 | 58.9 | 1.Oc.D |
| | 19 | 36.5 | 1.Ec.R |
| 16 | 14 | 7.0 | 1.Tr.I |
| | 14 | 35.5 | 1.Sh.I |
| | 16 | 16.8 | 1.Tr.E |
| | 16 | 46.4 | 1.Sh.E |
| 17 | 5 | 31.0 | 2.Oc.D |
| | 8 | 59.6 | 2.Ec.R |
| | 11 | 25.0 | 1.Oc.D |
| | 14 | 5.3 | 1.Ec.R |
| 18 | 8 | 33.3 | 1.Tr.I |
| | 9 | 4.5 | 1.Sh.I |
| | 10 | 43.1 | 1.Tr.E |
| | 11 | 15.3 | 1.Sh.E |
| | 13 | 41.0 | 3.Oc.D |
| | 15 | 22.2 | 3.Oc.R |
| | 15 | 41.7 | 3.Ec.D |
| | 17 | 40.4 | 3.Ec.R |
| 19 | 0 | 29.1 | 2.Tr.I |
| | 1 | 32.2 | 2.Sh.I |
| | 2 | 53.5 | 2.Tr.E |
| | 3 | 59.3 | 2.Sh.E |
| | 5 | 51.2 | 1.Oc.D |
| | 8 | 34.0 | 1.Ec.R |
| 20 | 2 | 59.6 | 1.Tr.I |
| | 3 | 33.3 | 1.Sh.I |
| | 5 | 9.4 | 1.Tr.E |
| | 5 | 44.1 | 1.Sh.E |
| | 18 | 39.1 | 2.Oc.D |
| | 22 | 18.3 | 2.Ec.R |
| 21 | 0 | 17.4 | 1.Oc.D |
| | 3 | 2.7 | 1.Ec.R |
| | 21 | 26.0 | 1.Tr.I |
| | 22 | 2.2 | 1.Sh.I |
| | 23 | 35.8 | 1.Tr.E |
| 22 | 0 | 13.0 | 1.Sh.E |
| | 3 | 29.2 | 3.Tr.I |
| | 5 | 10.8 | 3.Tr.E |
| | 5 | 51.9 | 3.Sh.I |
| | 7 | 48.5 | 3.Sh.E |
| | 13 | 37.0 | 2.Tr.I |
| | 14 | 50.3 | 2.Sh.I |
| | 16 | 1.7 | 2.Tr.E |
| | 17 | 17.1 | 2.Sh.E |
| | 18 | 43.6 | 1.Oc.D |
| | 21 | 31.5 | 1.Ec.R |
| 23 | 15 | 52.4 | 1.Tr.I |
| | 16 | 31.0 | 1.Sh.I |
| | 18 | 2.2 | 1.Tr.E |
| | 18 | 41.8 | 1.Sh.E |
| 24 | 7 | 48.3 | 2.Oc.D |
| | 11 | 37.8 | 2.Ec.R |
| | 13 | 10.0 | 1.Oc.D |
| | 16 | 0.2 | 1.Ec.R |
| 25 | 10 | 18.9 | 1.Tr.I |
| | 11 | 0.0 | 1.Sh.I |
| | 12 | 28.8 | 1.Tr.E |
| | 13 | 10.7 | 1.Sh.E |
| | 16 | 59.6 | 3.Oc.D |
| | 18 | 46.1 | 3.Oc.R |
| | 19 | 43.6 | 3.Ec.D |
| | 21 | 41.6 | 3.Ec.R |
| 26 | 2 | 45.3 | 2.Tr.I |
| | 4 | 8.3 | 2.Sh.I |
| | 5 | 10.4 | 2.Tr.E |
| | 6 | 34.9 | 2.Sh.E |
| | 7 | 36.3 | 1.Oc.D |
| | 10 | 29.0 | 1.Ec.R |
| 27 | 4 | 45.4 | 1.Tr.I |
| | 5 | 28.9 | 1.Sh.I |
| | 6 | 55.3 | 1.Tr.E |
| | 7 | 39.5 | 1.Sh.E |
| | 20 | 57.3 | 2.Oc.D |
| 28 | 0 | 56.7 | 2.Ec.R |
| | 2 | 2.8 | 1.Oc.D |
| | 4 | 57.7 | 1.Ec.R |
| | 23 | 12.1 | 1.Tr.I |
| | 23 | 57.8 | 1.Sh.I |
| 29 | 1 | 22.0 | 1.Tr.E |
| | 2 | 8.4 | 1.Sh.E |
| | 6 | 50.1 | 3.Tr.I |
| | 8 | 36.8 | 3.Tr.E |
| | 9 | 54.3 | 3.Sh.I |
| | 11 | 50.0 | 3.Sh.E |
| | 15 | 54.1 | 2.Tr.I |
| | 17 | 26.3 | 2.Sh.I |
| | 18 | 19.5 | 2.Tr.E |
| | 19 | 52.7 | 2.Sh.E |
| | 20 | 29.3 | 1.Oc.D |
| | 23 | 26.5 | 1.Ec.R |
| 30 | 17 | 38.7 | 1.Tr.I |
| | 18 | 26.7 | 1.Sh.I |
| | 19 | 48.6 | 1.Tr.E |
| | 20 | 37.2 | 1.Sh.E |

**Diagrama dos satélites galileanos**
**Dezembro 2011**

1 = Io, 2= Europa, 3 = Ganimedes, 4 = Calisto.



## Eventos mútuos em Dezembro 2011

| | | | |
|---|---|---|---|
| 1 | 10 | 7.5 | 2.Oc.D |
| | 14 | 16.3 | 2.Ec.R |
| | 14 | 55.9 | 1.Oc.D |
| | 17 | 55.2 | 1.Ec.R |
| 2 | 12 | 5.5 | 1.Tr.I |
| | 12 | 55.7 | 1.Sh.I |
| | 14 | 15.5 | 1.Tr.E |
| | 15 | 6.2 | 1.Sh.E |
| | 20 | 21.8 | 3.Oc.D |
| | 22 | 13.3 | 3.Oc.R |
| | 23 | 45.2 | 3.Ec.D |
| 3 | 1 | 42.4 | 3.Ec.R |
| | 5 | 3.4 | 2.Tr.I |
| | 6 | 44.3 | 2.Sh.I |
| | 7 | 29.2 | 2.Tr.E |
| | 9 | 10.5 | 2.Sh.E |
| | 9 | 22.5 | 1.Oc.D |
| | 12 | 24.0 | 1.Ec.R |
| 4 | 6 | 32.3 | 1.Tr.I |
| | 7 | 24.5 | 1.Sh.I |
| | 8 | 42.3 | 1.Tr.E |
| | 9 | 35.0 | 1.Sh.E |
| | 23 | 17.6 | 2.Oc.D |
| 5 | 3 | 35.2 | 2.Ec.R |
| | 3 | 49.2 | 1.Oc.D |
| | 6 | 52.8 | 1.Ec.R |
| 6 | 0 | 59.2 | 1.Tr.I |
| | 1 | 53.5 | 1.Sh.I |
| | 3 | 9.3 | 1.Tr.E |
| | 4 | 4.0 | 1.Sh.E |
| | 10 | 16.2 | 3.Tr.I |
| | 12 | 7.7 | 3.Tr.E |
| | 13 | 57.6 | 3.Sh.I |
| | 15 | 52.5 | 3.Sh.E |
| | 18 | 13.3 | 2.Tr.I |
| | 20 | 2.4 | 2.Sh.I |
| | 20 | 39.4 | 2.Tr.E |
| | 22 | 16.0 | 1.Oc.D |
| | 22 | 28.3 | 2.Sh.E |
| 7 | 1 | 21.6 | 1.Ec.R |
| | 19 | 26.2 | 1.Tr.I |
| | 20 | 22.4 | 1.Sh.I |
| | 21 | 36.2 | 1.Tr.E |
| | 22 | 32.8 | 1.Sh.E |
| 8 | 12 | 29.1 | 2.Oc.D |
| | 16 | 42.9 | 1.Oc.D |
| | 16 | 54.9 | 2.Ec.R |
| | 19 | 50.4 | 1.Ec.R |
| 9 | 13 | 53.3 | 1.Tr.I |
| | 14 | 51.4 | 1.Sh.I |
| | 16 | 3.4 | 1.Tr.E |
| | 17 | 1.8 | 1.Sh.E |
| | 23 | 48.6 | 3.Oc.D |
| 10 | 1 | 44.8 | 3.Oc.R |
| | 3 | 46.9 | 3.Ec.D |
| | 5 | 43.4 | 3.Ec.R |
| | 7 | 23.7 | 2.Tr.I |
| | 9 | 20.4 | 2.Sh.I |
| | 9 | 50.1 | 2.Tr.E |
| | 11 | 9.9 | 1.Oc.D |
| | 11 | 46.1 | 2.Sh.E |
| | 14 | 19.1 | 1.Ec.R |
| 11 | 8 | 20.4 | 1.Tr.I |
| | 9 | 20.3 | 1.Sh.I |
| | 10 | 30.5 | 1.Tr.E |
| | 11 | 30.6 | 1.Sh.E |
| 12 | 1 | 40.4 | 2.Oc.D |
| | 5 | 36.9 | 1.Oc.D |
| | 6 | 13.8 | 2.Ec.R |
| | 8 | 47.9 | 1.Ec.R |
| 13 | 2 | 47.6 | 1.Tr.I |
| | 3 | 49.4 | 1.Sh.I |
| | 4 | 57.8 | 1.Tr.E |
| | 5 | 59.6 | 1.Sh.E |
| | 13 | 46.3 | 3.Tr.I |
| | 15 | 42.2 | 3.Tr.E |
| | 18 | 0.1 | 3.Sh.I |
| | 19 | 54.1 | 3.Sh.E |
| | 20 | 34.8 | 2.Tr.I |
| | 22 | 38.5 | 2.Sh.I |
| | 23 | 1.5 | 2.Tr.E |
| 14 | 0 | 4.0 | 1.Oc.D |
| | 1 | 3.9 | 2.Sh.E |
| | 3 | 16.7 | 1.Ec.R |
| | 21 | 14.9 | 1.Tr.I |
| | 22 | 18.3 | 1.Sh.I |
| | 23 | 25.0 | 1.Tr.E |
| 15 | 0 | 28.4 | 1.Sh.E |
| | 14 | 53.1 | 2.Oc.D |
| | 18 | 31.2 | 1.Oc.D |
| | 19 | 33.7 | 2.Ec.R |
| | 21 | 45.5 | 1.Ec.R |
| 16 | 15 | 42.3 | 1.Tr.I |
| | 16 | 47.3 | 1.Sh.I |
| | 17 | 52.5 | 1.Tr.E |
| | 18 | 57.4 | 1.Sh.E |
| 17 | 3 | 21.1 | 3.Oc.D |
| | 5 | 21.5 | 3.Oc.R |
| | 7 | 49.4 | 3.Ec.D |
| | 9 | 45.2 | 3.Ec.R |
| | 9 | 46.4 | 2.Tr.I |
| | 11 | 56.5 | 2.Sh.I |
| | 12 | 13.4 | 2.Tr.E |
| | 12 | 58.4 | 1.Oc.D |
| | 14 | 21.7 | 2.Sh.E |
| | 16 | 14.3 | 1.Ec.R |
| 18 | 10 | 9.7 | 1.Tr.I |
| | 11 | 16.2 | 1.Sh.I |
| | 12 | 19.9 | 1.Tr.E |
| | 13 | 26.3 | 1.Sh.E |
| 19 | 4 | 5.7 | 2.Oc.D |
| | 7 | 25.7 | 1.Oc.D |
| | 8 | 52.6 | 2.Ec.R |
| | 10 | 43.1 | 1.Ec.R |
| 20 | 4 | 37.3 | 1.Tr.I |
| | 5 | 45.3 | 1.Sh.I |
| | 6 | 47.6 | 1.Tr.E |
| | 7 | 55.3 | 1.Sh.E |
| | 17 | 21.6 | 3.Tr.I |
| | 19 | 21.5 | 3.Tr.E |
| | 22 | 2.4 | 3.Sh.I |
| | 22 | 58.7 | 2.Tr.I |
| | 23 | 55.8 | 3.Sh.E |
| 21 | 1 | 14.6 | 2.Sh.I |
| | 1 | 25.9 | 2.Tr.E |
| | 1 | 53.2 | 1.Oc.D |
| | 3 | 39.6 | 2.Sh.E |
| | 5 | 12.0 | 1.Ec.R |
| | 23 | 4.9 | 1.Tr.I |
| 22 | 0 | 14.2 | 1.Sh.I |
| | 1 | 15.1 | 1.Tr.E |
| | 2 | 24.2 | 1.Sh.E |
| | 17 | 19.8 | 2.Oc.D |
| | 20 | 20.7 | 1.Oc.D |
| | 22 | 12.5 | 2.Ec.R |
| | 23 | 40.8 | 1.Ec.R |
| 23 | 17 | 32.7 | 1.Tr.I |
| | 18 | 43.2 | 1.Sh.I |
| | 19 | 42.9 | 1.Tr.E |
| | 20 | 53.2 | 1.Sh.E |
| 24 | 6 | 58.8 | 3.Oc.D |
| | 9 | 2.9 | 3.Oc.R |
| | 11 | 51.7 | 3.Ec.D |
| | 12 | 11.5 | 2.Tr.I |
| | 13 | 46.8 | 3.Ec.R |
| | 14 | 32.6 | 2.Sh.I |
| | 14 | 39.0 | 2.Tr.E |
| | 14 | 48.3 | 1.Oc.D |
| | 16 | 57.4 | 2.Sh.E |
| | 18 | 9.6 | 1.Ec.R |
| 25 | 12 | 0.4 | 1.Tr.I |
| | 13 | 12.2 | 1.Sh.I |
| | 14 | 10.7 | 1.Tr.E |
| | 15 | 22.1 | 1.Sh.E |
| 26 | 6 | 33.8 | 2.Oc.D |
| | 9 | 15.9 | 1.Oc.D |
| | 11 | 31.5 | 2.Ec.R |
| | 12 | 38.4 | 1.Ec.R |
| 27 | 6 | 28.3 | 1.Tr.I |
| | 7 | 41.3 | 1.Sh.I |
| | 8 | 38.6 | 1.Tr.E |
| | 9 | 51.2 | 1.Sh.E |
| | 21 | 2.0 | 3.Tr.I |
| | 23 | 5.3 | 3.Tr.E |
| 28 | 1 | 25.0 | 2.Tr.I |
| | 2 | 4.6 | 3.Sh.I |
| | 3 | 43.7 | 1.Oc.D |
| | 3 | 50.6 | 2.Sh.I |
| | 3 | 52.8 | 2.Tr.E |
| | 3 | 57.2 | 3.Sh.E |
| | 6 | 15.3 | 2.Sh.E |
| | 7 | 7.3 | 1.Ec.R |
| 29 | 0 | 56.2 | 1.Tr.I |
| | 2 | 10.2 | 1.Sh.I |
| | 3 | 6.6 | 1.Tr.E |
| | 4 | 20.1 | 1.Sh.E |
| | 19 | 49.3 | 2.Oc.D |
| | 22 | 11.5 | 1.Oc.D |
| | 22 | 20.5 | 2.Oc.R |
| | 22 | 23.7 | 2.Ec.D |
| 30 | 0 | 51.5 | 2.Ec.R |
| | 1 | 36.1 | 1.Ec.R |
| | 19 | 24.3 | 1.Tr.I |
| | 20 | 39.2 | 1.Sh.I |
| | 21 | 34.7 | 1.Tr.E |
| | 22 | 49.1 | 1.Sh.E |
| 31 | 10 | 42.7 | 3.Oc.D |
| | 19 | 33.1 | 2.Sh.E |
| | 20 | 4.9 | 1.Ec.R |

# Saturno

| Distância média (UA) | Período de Revolução | Inclinação Equatorial | Diâmetro |
|---|---|---|---|
| 9,54 | 29,46 anos | 2,5º | 120.000 km |

00:00 Hora – Tempo Universal

| Data | α | δ | ∅ | Elong | DT (UA)* | Ang. PH | Fase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 01 jan | 13h 05m 07.07s | -04° 19' 22.8" | 17.15 | 83.6 | 9.6456222 | 5.9 | 0.997 | 0.8 |
| 08 jan | 13h 06m 09.78s | -04° 23' 45.1" | 17.36 | 90.4 | 9.5295378 | 5.9 | 0.997 | 0.7 |
| 15 jan | 13h 06m 53.65s | -04° 26' 08.0" | 17.58 | 97.4 | 9.4136006 | 5.8 | 0.997 | 0.7 |
| 22 jan | 13h 07m 18.33s | -04° 26' 31.3" | 17.79 | 104.4 | 9.2995372 | 5.7 | 0.998 | 0.7 |
| 29 jan | 13h 07m 23.46s | -04° 24' 54.7" | 18.01 | 111.5 | 9.1889992 | 5.5 | 0.998 | 0.6 |
| 05 fev | 13h 07m 09.05s | -04° 21' 20.4" | 18.21 | 118.7 | 9.0837393 | 5.2 | 0.998 | 0.6 |
| 12 fev | 13h 06m 35.48s | -04° 15' 53.1" | 18.41 | 125.9 | 8.9855605 | 4.8 | 0.998 | 0.6 |
| 19 fev | 13h 05m 43.85s | -04° 08' 41.7" | 18.60 | 133.2 | 8.8961040 | 4.3 | 0.999 | 0.5 |
| 26 fev | 13h 04m 35.40s | -03° 59' 55.1" | 18.77 | 140.5 | 8.8168034 | 3.8 | 0.999 | 0.5 |
| 05 mar | 13h 03m 11.79s | -03° 49' 45.9" | 18.91 | 147.9 | 8.7490613 | 3.1 | 0.999 | 0.5 |
| 12 mar | 13h 01m 35.19s | -03° 38' 28.9" | 19.03 | 155.4 | 8.6941556 | 2.5 | 1.000 | 0.4 |
| 19 mar | 12h 59m 48.32s | -03° 26' 22.6" | 19.12 | 162.7 | 8.6530398 | 1.8 | 1.000 | 0.4 |
| 26 mar | 12h 57m 53.95s | -03° 13' 44.7" | 19.18 | 170.0 | 8.6263374 | 1.0 | 1.000 | 0.4 |
| 02 abr | 12h 55m 55.02s | -03° 00' 54.6" | 19.21 | 176.6 | 8.6145352 | 0.4 | 1.000 | 0.4 |
| 09 abr | 12h 53m 54.73s | -02° 48' 13.0" | 19.20 | 174.0 | 8.6178776 | 0.6 | 1.000 | 0.4 |
| 16 abr | 12h 51m 56.41s | -02° 36' 00.7" | 19.16 | 167.0 | 8.6362128 | 1.3 | 1.000 | 0.4 |
| 23 abr | 12h 50m 03.07s | -02° 24' 35.6" | 19.09 | 159.8 | 8.6690588 | 2.1 | 1.000 | 0.5 |
| 30 abr | 12h 48m 17.41s | -02° 14' 14.7" | 18.98 | 152.5 | 8.7158219 | 2.8 | 0.999 | 0.5 |
| 07 mai | 12h 46m 42.14s | -02° 05' 13.8" | 18.85 | 145.3 | 8.7756921 | 3.4 | 0.999 | 0.6 |
| 14 mai | 12h 45m 19.59s | -01° 57' 46.3" | 18.70 | 138.2 | 8.8475408 | 4.0 | 0.999 | 0.6 |
| 21 mai | 12h 44m 11.57s | -01° 52' 01.8" | 18.53 | 131.2 | 8.9300457 | 4.5 | 0.998 | 0.7 |
| 28 mai | 12h 43m 19.39s | -01° 48' 06.9" | 18.34 | 124.3 | 9.0219041 | 5.0 | 0.998 | 0.7 |
| 04 jun | 12h 42m 44.26s | -01° 46' 07.7" | 18.14 | 117.4 | 9.1217117 | 5.4 | 0.998 | 0.7 |
| 11 jun | 12h 42m 26.93s | -01° 46' 06.8" | 17.93 | 110.7 | 9.2278827 | 5.7 | 0.998 | 0.8 |
| 18 jun | 12h 42m 27.70s | -01° 48' 03.8" | 17.72 | 104.0 | 9.3387975 | 5.9 | 0.997 | 0.8 |
| 25 jun | 12h 42m 46.44s | -01° 51' 56.4" | 17.50 | 97.4 | 9.4529787 | 6.0 | 0.997 | 0.8 |
| 02 jul | 12h 43m 23.11s | -01° 57' 42.5" | 17.29 | 90.9 | 9.5689387 | 6.1 | 0.997 | 0.9 |
| 09 jul | 12h 44m 17.25s | -02° 05' 17.2" | 17.08 | 84.5 | 9.6851062 | 6.0 | 0.997 | 0.9 |
| 16 jul | 12h 45m 28.19s | -02° 14' 34.6" | 16.88 | 78.2 | 9.7999789 | 5.9 | 0.997 | 0.9 |
| 23 jul | 12h 46m 54.97s | -02° 25' 27.1" | 16.69 | 71.9 | 9.9122567 | 5.7 | 0.997 | 0.9 |
| 30 jul | 12h 48m 36.88s | -02° 37' 48.8" | 16.51 | 65.7 | 10.0206668 | 5.5 | 0.998 | 0.9 |
| 06 ago | 12h 50m 32.88s | -02° 51' 31.5" | 16.34 | 59.5 | 10.1238982 | 5.2 | 0.998 | 0.9 |
| 13 ago | 12h 52m 41.88s | -03° 06' 26.9" | 16.19 | 53.4 | 10.2207594 | 4.8 | 0.998 | 0.9 |
| 20 ago | 12h 55m 02.59s | -03° 22' 25.6" | 16.05 | 47.4 | 10.3102782 | 4.4 | 0.999 | 0.9 |
| 27 ago | 12h 57m 34.06s | -03° 39' 20.6" | 15.92 | 41.3 | 10.3915173 | 4.0 | 0.999 | 0.9 |
| 03 set | 13h 00m 15.00s | -03° 57' 02.3" | 15.81 | 35.3 | 10.4635232 | 3.5 | 0.999 | 0.9 |
| 10 set | 13h 03m 04.19s | -04° 15' 21.9" | 15.72 | 29.3 | 10.5254908 | 2.9 | 0.999 | 0.9 |
| 17 set | 13h 06m 00.21s | -04° 34' 09.7" | 15.64 | 23.3 | 10.5768390 | 2.4 | 1.000 | 0.8 |
| 24 set | 13h 09m 01.99s | -04° 53' 18.3" | 15.58 | 17.3 | 10.6170246 | 1.8 | 1.000 | 0.8 |
| 01 out | 13h 12m 08.18s | -05° 12' 38.0" | 15.54 | 11.4 | 10.6455083 | 1.2 | 1.000 | 0.8 |
| 08 out | 13h 15m 17.40s | -05° 31' 59.8" | 15.52 | 5.6 | 10.6619257 | 0.6 | 1.000 | 0.7 |
| 15 out | 13h 18m 28.17s | -05° 51' 14.0" | 15.51 | 2.5 | 10.6661448 | 0.3 | 1.000 | 0.7 |
| 22 out | 13h 21m 39.33s | -06° 10' 13.8" | 15.52 | 7.4 | 10.6580779 | 0.8 | 1.000 | 0.7 |
| 29 out | 13h 24m 49.38s | -06° 28' 49.0" | 15.55 | 13.4 | 10.6376655 | 1.4 | 1.000 | 0.7 |
| 05 nov | 13h 27m 56.83s | -06° 46' 51.1" | 15.60 | 19.5 | 10.6050519 | 2.0 | 1.000 | 0.7 |
| 12 nov | 13h 31m 00.12s | -07° 04' 11.2" | 15.67 | 25.7 | 10.5606232 | 2.5 | 1.000 | 0.7 |
| 19 nov | 13h 33m 57.91s | -07° 20' 42.0" | 15.75 | 31.9 | 10.5048166 | 3.1 | 0.999 | 0.7 |
| 26 nov | 13h 36m 48.64s | -07° 36' 14.6" | 15.85 | 38.2 | 10.4381183 | 3.6 | 0.999 | 0.7 |
| 03 dez | 13h 39m 30.69s | -07° 50' 41.1" | 15.97 | 44.6 | 10.3612412 | 4.1 | 0.999 | 0.7 |
| 10 dez | 13h 42m 02.47s | -08° 03' 53.6" | 16.10 | 51.0 | 10.2751380 | 4.5 | 0.998 | 0.7 |
| 17 dez | 13h 44m 22.63s | -08° 15' 45.9" | 16.25 | 57.5 | 10.1808056 | 4.9 | 0.998 | 0.7 |
| 24 dez | 13h 46m 29.63s | -08° 26' 10.8" | 16.42 | 64.1 | 10.0792913 | 5.2 | 0.998 | 0.7 |
| 31 dez | 13h 48m 21.96s | -08° 35' 02.1" | 16.59 | 70.7 | 9.9718702 | 5.5 | 0.998 | 0.7 |

## Longitude do Meridiano Central de Saturno, Sistema I

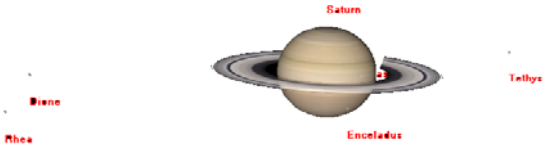
00:00 Hora – Tempo Universal

| Data | Jan | Fev | Mar | Abr | Mai | Jun | Jul | Ago | Set | Out | Nov | Dez |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 350.6 | 245.8 | 128.7 | 24.8 | 155.3 | 48.1 | 174.7 | 64.2 | 313.0 | 77.9 | 327.8 | 94.8 |
| 2 | 114.9 | 10.1 | 253.1 | 149.2 | 279.6 | 172.4 | 298.9 | 188.3 | 77.2 | 202.1 | 92.0 | 219.1 |
| 3 | 239.2 | 134.5 | 17.5 | 273.5 | 43.9 | 296.6 | 63.1 | 312.5 | 201.3 | 326.2 | 216.2 | 343.3 |
| 4 | 3.6 | 258.9 | 141.9 | 37.9 | 168.2 | 60.8 | 187.3 | 76.6 | 325.5 | 90.4 | 340.4 | 107.6 |
| 5 | 127.9 | 23.3 | 266.3 | 162.3 | 292.5 | 185.1 | 311.5 | 200.8 | 89.6 | 214.6 | 104.6 | 231.8 |
| 6 | 252.3 | 147.7 | 30.7 | 286.6 | 56.8 | 309.3 | 75.7 | 325.0 | 213.8 | 338.8 | 228.8 | 356.1 |
| 7 | 16.6 | 272.1 | 155.1 | 51.0 | 181.2 | 73.6 | 199.9 | 89.1 | 337.9 | 102.9 | 353.1 | 120.4 |
| 8 | 141.0 | 36.5 | 279.5 | 175.4 | 305.5 | 197.8 | 324.0 | 213.3 | 102.1 | 227.1 | 117.3 | 244.7 |
| 9 | 265.3 | 160.8 | 43.9 | 299.7 | 69.8 | 322.0 | 88.2 | 337.4 | 226.3 | 351.3 | 241.5 | 8.9 |
| 10 | 29.7 | 285.2 | 168.3 | 64.1 | 194.1 | 86.3 | 212.4 | 101.6 | 350.4 | 115.5 | 5.7 | 133.2 |
| 11 | 154.0 | 49.6 | 292.7 | 188.5 | 318.4 | 210.5 | 336.6 | 225.7 | 114.6 | 239.7 | 130.0 | 257.5 |
| 12 | 278.4 | 174.0 | 57.1 | 312.8 | 82.7 | 334.7 | 100.8 | 349.9 | 238.7 | 3.8 | 254.2 | 21.8 |
| 13 | 42.7 | 298.4 | 181.5 | 77.2 | 207.0 | 99.0 | 225.0 | 114.1 | 2.9 | 128.0 | 18.4 | 146.0 |
| 14 | 167.1 | 62.8 | 305.9 | 201.5 | 331.2 | 223.2 | 349.1 | 238.2 | 127.1 | 252.2 | 142.6 | 270.3 |
| 15 | 291.5 | 187.2 | 70.3 | 325.9 | 95.5 | 347.4 | 113.3 | 2.4 | 251.2 | 16.4 | 266.9 | 34.6 |
| 16 | 55.8 | 311.6 | 194.6 | 90.2 | 219.8 | 111.6 | 237.5 | 126.5 | 15.4 | 140.6 | 31.1 | 158.9 |
| 17 | 180.2 | 76.0 | 319.0 | 214.6 | 344.1 | 235.8 | 1.7 | 250.7 | 139.5 | 264.8 | 155.3 | 283.2 |
| 18 | 304.5 | 200.4 | 83.4 | 338.9 | 108.4 | 0.1 | 125.8 | 14.8 | 263.7 | 29.0 | 279.6 | 47.5 |
| 19 | 68.9 | 324.8 | 207.8 | 103.3 | 232.7 | 124.3 | 250.0 | 139.0 | 27.9 | 153.2 | 43.8 | 171.8 |
| 20 | 193.3 | 89.2 | 332.2 | 227.6 | 356.9 | 248.5 | 14.2 | 263.1 | 152.0 | 277.4 | 168.1 | 296.0 |
| 21 | 317.6 | 213.6 | 96.6 | 352.0 | 121.2 | 12.7 | 138.3 | 27.3 | 276.2 | 41.6 | 292.3 | 60.3 |
| 22 | 82.0 | 338.0 | 221.0 | 116.3 | 245.5 | 136.9 | 262.5 | 151.5 | 40.4 | 165.7 | 56.5 | 184.6 |
| 23 | 206.4 | 102.3 | 345.4 | 240.6 | 9.8 | 261.1 | 26.7 | 275.6 | 164.5 | 289.9 | 180.8 | 308.9 |
| 24 | 330.8 | 226.7 | 109.8 | 5.0 | 134.0 | 25.3 | 150.8 | 39.8 | 288.7 | 54.1 | 305.0 | 73.2 |
| 25 | 95.1 | 351.1 | 234.1 | 129.3 | 258.3 | 149.5 | 275.0 | 163.9 | 52.9 | 178.3 | 69.3 | 197.5 |
| 26 | 219.5 | 115.5 | 358.5 | 253.7 | 22.6 | 273.7 | 39.2 | 288.1 | 177.0 | 302.5 | 193.5 | 321.8 |
| 27 | 343.9 | 239.9 | 122.9 | 18.0 | 146.8 | 37.9 | 163.3 | 52.2 | 301.2 | 66.7 | 317.8 | 86.1 |
| 28 | 108.2 | 4.3 | 247.3 | 142.3 | 271.1 | 162.1 | 287.5 | 176.4 | 65.4 | 190.9 | 82.0 | 210.5 |
| 29 | 232.6 | | 11.7 | 266.6 | 35.3 | 286.3 | 51.7 | 300.5 | 189.5 | 315.2 | 206.3 | 334.8 |
| 30 | 357.0 | | 136.0 | 31.0 | 159.6 | 50.5 | 175.8 | 64.7 | 313.7 | 79.4 | 330.5 | 99.1 |
| 31 | 121.4 | | 260.4 | | 283.9 | | 300.0 | 188.8 | | 203.6 | | 223.4 |

## Movimento do Meridiano Central

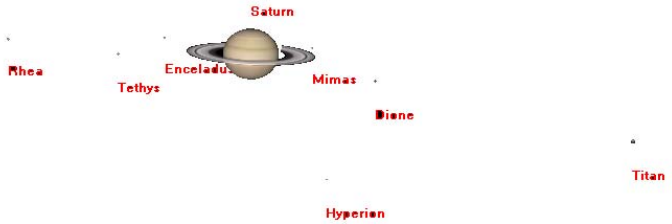
| Minuto | 0h | 1h | 2h | 3h | 4h | 5h | 6h | 7h | 8h | 9h | 10h | 11h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | º | º | º | º | º | º | º | º | º | º | º | º |
| 0 | 0.0 | 35.2 | 70.4 | 105.5 | 140.7 | 175.9 | 211.1 | 246.3 | 281.4 | 316.6 | 351.8 | 27.0 |
| 10 | 5.9 | 41.0 | 76.2 | 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 | 62.1 |

**Configuração dos Principais satélites saturnianos em 15 Janeiro 2011 – 00:00 TU**




| Data | Hora | Evento |
|---|---|---|
| 1 | 0 22.9 | 3.Sh.I |
| | 1 25.6 | 3.Tr.I |
| | 2 46.5 | 3.Sh.E |
| | 3 4.0 | 3.Tr.E |
| | 19 2.9 | 4.Sh.I |
| | 20 30.7 | 4.Sh.E |
| | 23 1.5 | 3.Ec.D |
| 2 | 1 43.1 | 3.Oc.R |
| | 21 41.6 | 3.Sh.I |
| | 22 44.6 | 3.Tr.I |
| 3 | 0 4.9 | 3.Sh.E |
| | 0 22.4 | 3.Tr.E |
| | 3 58.6 | 4.Ec.D |
| | 5 24.8 | 4.Ec.R |
| | 20 20.2 | 3.Ec.D |
| | 23 1.5 | 3.Oc.R |
| 4 | 12 45.6 | 4.Sh.I |
| | 14 11.4 | 4.Sh.E |
| | 19 0.4 | 3.Sh.I |
| | 20 3.6 | 3.Tr.I |
| | 21 23.4 | 3.Sh.E |
| | 21 40.8 | 3.Tr.E |
| 5 | 17 39.0 | 3.Ec.D |
| | 20 20.0 | 3.Oc.R |
| | 21 41.3 | 4.Ec.D |
| | 23 5.4 | 4.Ec.R |
| 6 | 16 19.1 | 3.Sh.I |
| | 17 22.5 | 3.Tr.I |
| | 18 41.8 | 3.Sh.E |
| | 18 59.2 | 3.Tr.E |
| 7 | 6 28.3 | 4.Sh.I |
| | 7 52.0 | 4.Sh.E |
| | 14 57.7 | 3.Ec.D |
| | 17 38.4 | 3.Oc.R |
| 8 | 13 37.8 | 3.Sh.I |
| | 14 41.3 | 3.Tr.I |
| | 15 24.1 | 4.Ec.D |
| | 16 0.2 | 3.Sh.E |
| | 16 17.6 | 3.Tr.E |
| | 16 46.0 | 4.Ec.R |
| 9 | 12 16.4 | 3.Ec.D |
| | 14 56.8 | 3.Oc.R |
| 10 | 0 11.1 | 4.Sh.I |
| | 1 32.6 | 4.Sh.E |
| | 10 56.6 | 3.Sh.I |
| | 12 0.1 | 3.Tr.I |
| | 13 18.7 | 3.Sh.E |
| | 13 36.0 | 3.Tr.E |
| 11 | 9 6.9 | 4.Ec.D |
| | 9 35.2 | 3.Ec.D |
| | 10 26.5 | 4.Ec.R |
| | 12 15.1 | 3.Oc.R |
| 12 | 8 15.3 | 3.Sh.I |
| | 9 18.8 | 3.Tr.I |
| | 10 37.1 | 3.Sh.E |
| | 10 54.4 | 3.Tr.E |
| | 17 53.9 | 4.Sh.I |
| | 19 13.1 | 4.Sh.E |
| 13 | 6 53.9 | 3.Ec.D |
| | 9 33.5 | 3.Oc.R |
| 14 | 2 49.8 | 4.Ec.D |
| | 4 7.0 | 4.Ec.R |
| | 5 34.1 | 3.Sh.I |
| | 6 37.4 | 3.Tr.I |
| | 7 55.5 | 3.Sh.E |
| | 8 12.7 | 3.Tr.E |
| 15 | 4 12.7 | 3.Ec.D |
| | 6 51.9 | 3.Oc.R |
| | 11 36.8 | 4.Sh.I |
| | 12 53.6 | 4.Sh.E |
| 16 | 2 52.8 | 3.Sh.I |
| | 3 55.9 | 3.Tr.I |
| | 5 14.0 | 3.Sh.E |
| | 5 31.1 | 3.Tr.E |
| | 20 32.7 | 4.Ec.D |
| | 21 47.4 | 4.Ec.R |
| 17 | 1 31.4 | 3.Ec.D |
| | 4 10.2 | 3.Oc.R |
| 18 | 0 11.5 | 3.Sh.I |
| | 1 14.3 | 3.Tr.I |
| | 2 32.4 | 3.Sh.E |
| | 2 49.5 | 3.Tr.E |
| | 5 19.7 | 4.Sh.I |
| | 6 34.1 | 4.Sh.E |
| | 22 50.2 | 3.Ec.D |
| 19 | 1 28.6 | 3.Oc.R |
| | 14 15.7 | 4.Ec.D |
| | 15 27.8 | 4.Ec.R |
| | 21 30.3 | 3.Sh.I |
| | 22 32.7 | 3.Tr.I |
| | 23 50.8 | 3.Sh.E |
| 20 | 0 7.8 | 3.Tr.E |
| | 20 8.9 | 3.Ec.D |
| | 22 46.9 | 3.Oc.R |
| | 23 2.6 | 4.Sh.I |
| 21 | 0 14.5 | 4.Sh.E |
| | 18 49.0 | 3.Sh.I |
| | 19 51.0 | 3.Tr.I |
| | 21 9.3 | 3.Sh.E |
| | 21 26.2 | 3.Tr.E |
| 22 | 7 58.7 | 4.Ec.D |
| | 9 8.2 | 4.Ec.R |
| | 17 27.7 | 3.Ec.D |
| | 20 5.3 | 3.Oc.R |
| 23 | 16 7.8 | 3.Sh.I |
| | 16 45.7 | 4.Sh.I |
| | 17 9.2 | 3.Tr.I |
| | 17 54.9 | 4.Sh.E |
| | 18 27.7 | 3.Sh.E |
| | 18 44.5 | 3.Tr.E |
| 24 | 14 46.5 | 3.Ec.D |
| | 17 23.6 | 3.Oc.R |
| 25 | 1 41.8 | 4.Ec.D |
| | 2 48.5 | 4.Ec.R |
| | 13 26.6 | 3.Sh.I |
| | 14 27.3 | 3.Tr.I |
| | 15 46.1 | 3.Sh.E |
| | 16 2.8 | 3.Tr.E |
| 26 | 10 28.7 | 4.Sh.I |
| | 11 35.2 | 4.Sh.E |
| | 12 5.2 | 3.Ec.D |
| | 14 42.0 | 3.Oc.R |
| 27 | 10 45.3 | 3.Sh.I |
| | 11 45.4 | 3.Tr.I |
| | 13 4.6 | 3.Sh.E |
| | 13 21.2 | 3.Tr.E |
| | 19 25.0 | 4.Ec.D |
| | 20 28.7 | 4.Ec.R |
| 28 | 9 24.0 | 3.Ec.D |
| | 12 0.3 | 3.Oc.R |
| 29 | 4 11.9 | 4.Sh.I |
| | 5 15.4 | 4.Sh.E |
| | 8 4.1 | 3.Sh.I |
| | 9 3.4 | 3.Tr.I |
| | 10 23.0 | 3.Sh.E |
| | 10 39.5 | 3.Tr.E |
| 30 | 6 42.8 | 3.Ec.D |
| | 9 18.6 | 3.Oc.R |
| | 13 8.3 | 4.Ec.D |
| | 14 8.8 | 4.Ec.R |
| 31 | 5 22.8 | 3.Sh.I |
| | 6 21.3 | 3.Tr.I |
| | 7 41.5 | 3.Sh.E |
| | 7 57.8 | 3.Tr.E |
| | 21 55.2 | 4.Sh.I |
| | 22 55.6 | 4.Sh.E |

**Configuração dos Principais satélites saturnianos em 15 Fevereiro 2011 – 00:00 TU**

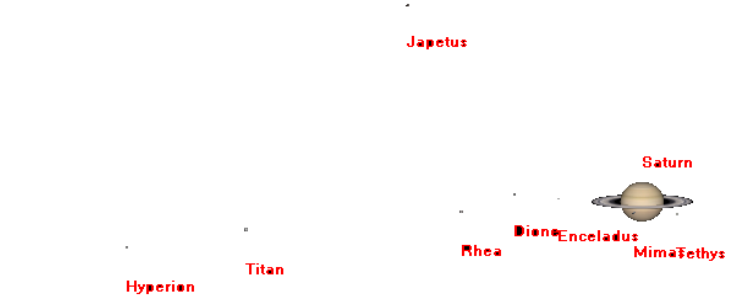



| Data | Hora | Evento |
|---|---|---|
| 1 | 4 1.6 | 3.Ec.D |
| | 6 36.9 | 3.Oc.R |
| 2 | 2 41.6 | 3.Sh.I |
| | 3 39.1 | 3.Tr.I |
| | 4 59.9 | 3.Sh.E |
| | 5 16.1 | 3.Tr.E |
| | 6 51.7 | 4.Ec.D |
| | 7 48.8 | 4.Ec.R |
| 3 | 1 20.3 | 3.Ec.D |
| | 3 55.2 | 3.Oc.R |
| | 15 38.5 | 4.Sh.I |
| | 16 35.7 | 4.Sh.E |
| 4 | 0 0.4 | 3.Sh.I |
| | 0 56.8 | 3.Tr.I |
| | 2 18.3 | 3.Sh.E |
| | 2 34.4 | 3.Tr.E |
| | 22 39.1 | 3.Ec.D |
| 5 | 0 35.2 | 4.Ec.D |
| | 1 13.5 | 3.Oc.R |
| | 1 28.7 | 4.Ec.R |
| | 21 19.2 | 3.Sh.I |
| | 22 14.5 | 3.Tr.I |
| | 23 36.8 | 3.Sh.E |
| | 23 52.7 | 3.Tr.E |
| 6 | 9 22.0 | 4.Sh.I |
| | 10 15.6 | 4.Sh.E |
| | 19 57.9 | 3.Ec.D |
| | 22 31.8 | 3.Oc.R |
| 7 | 18 18.9 | 4.Ec.D |
| | 18 38.0 | 3.Sh.I |
| | 19 8.5 | 4.Ec.R |
| | 19 32.2 | 3.Tr.I |
| | 20 55.2 | 3.Sh.E |
| | 21 11.0 | 3.Tr.E |
| 8 | 17 16.7 | 3.Ec.D |
| | 19 50.1 | 3.Oc.R |
| 9 | 3 5.7 | 4.Sh.I |
| | 3 55.4 | 4.Sh.E |
| | 15 56.8 | 3.Sh.I |
| | 16 49.7 | 3.Tr.I |
| | 18 13.7 | 3.Sh.E |
| | 18 29.3 | 3.Tr.E |
| 10 | 12 2.7 | 4.Ec.D |
| | 12 48.1 | 4.Ec.R |
| | 14 35.6 | 3.Ec.D |
| 11 | 13 15.6 | 3.Sh.I |
| | 14 7.2 | 3.Tr.I |
| | 15 32.1 | 3.Sh.E |
| | 15 47.5 | 3.Tr.E |
| | 20 49.5 | 4.Sh.I |
| | 21 35.1 | 4.Sh.E |
| 12 | 11 54.4 | 3.Ec.D |
| | 14 26.6 | 3.Oc.R |
| 13 | 5 46.9 | 4.Ec.D |
| | 6 27.5 | 4.Ec.R |
| | 10 34.4 | 3.Sh.I |
| | 11 24.6 | 3.Tr.I |
| | 12 50.6 | 3.Sh.E |
| | 13 5.8 | 3.Tr.E |
| 14 | 9 13.2 | 3.Ec.D |
| | 11 44.8 | 3.Oc.R |
| | 14 33.6 | 4.Sh.I |
| | 15 14.5 | 4.Sh.E |
| 15 | 7 53.2 | 3.Sh.I |
| | 8 42.0 | 3.Tr.I |
| | 10 9.1 | 3.Sh.E |
| | 10 24.0 | 3.Tr.E |
| | 23 31.4 | 4.Ec.D |
| 16 | 0 6.4 | 4.Ec.R |
| | 6 32.0 | 3.Ec.D |
| | 9 3.0 | 3.Oc.R |
| 17 | 5 12.0 | 3.Sh.I |
| | 5 59.3 | 3.Tr.I |
| | 7 27.5 | 3.Sh.E |
| | 7 42.3 | 3.Tr.E |
| | 8 18.1 | 4.Sh.I |
| | 8 53.6 | 4.Sh.E |
| 18 | 3 50.9 | 3.Ec.D |
| | 6 21.3 | 3.Oc.R |
| | 17 16.6 | 4.Ec.D |
| | 17 44.8 | 4.Ec.R |
| 19 | 2 30.8 | 3.Sh.I |
| | 3 16.6 | 3.Tr.I |
| | 4 46.0 | 3.Sh.E |
| | 5 0.5 | 3.Tr.E |
| 20 | 1 9.7 | 3.Ec.D |
| | 2 3.1 | 4.Sh.I |
| | 2 32.1 | 4.Sh.E |
| | 3 39.5 | 3.Oc.R |
| | 23 49.7 | 3.Sh.I |
| | 17 8.3 | 3.Oc.R |
| 21 | 0 33.8 | 3.Tr.I |
| | 2 4.5 | 3.Sh.E |
| | 2 18.7 | 3.Tr.E |
| | 11 3.0 | 4.Ec.D |
| | 11 21.9 | 4.Ec.R |
| | 22 28.6 | 3.Ec.D |
| 22 | 0 57.7 | 3.Oc.R |
| | 19 49.3 | 4.Sh.I |
| | 20 9.4 | 4.Sh.E |
| | 21 8.5 | 3.Sh.I |
| | 21 51.0 | 3.Tr.I |
| | 23 23.0 | 3.Sh.E |
| | 23 36.9 | 3.Tr.E |
| 23 | 19 47.4 | 3.Ec.D |
| | 22 15.8 | 3.Oc.R |
| 24 | 18 27.4 | 3.Sh.I |
| | 19 8.1 | 3.Tr.I |
| | 20 41.5 | 3.Sh.E |
| | 20 55.0 | 3.Tr.E |
| 25 | 17 6.3 | 3.Ec.D |
| | 19 34.0 | 3.Oc.R |
| 26 | 15 46.2 | 3.Sh.I |
| | 16 25.2 | 3.Tr.I |
| | 17 59.9 | 3.Sh.E |
| | 18 13.2 | 3.Tr.E |
| 27 | 14 25.2 | 3.Ec.D |
| | 16 52.1 | 3.Oc.R |
| 28 | 13 5.1 | 3.Sh.I |
| | 13 42.2 | 3.Tr.I |
| | 15 18.4 | 3.Sh.E |
| | 15 31.4 | 3.Tr.E |

**Configuração dos Principais satélites saturnianos em 15 Março 2011 – 00:00 TU**


| Data | Hora | Evento |
|---|---|---|
| 1 | 11 44.1 | 3.Ec.D |
| | 14 10.3 | 3.Oc.R |
| 2 | 10 24.0 | 3.Sh.I |
| | 10 59.2 | 3.Tr.I |
| | 12 36.9 | 3.Sh.E |
| | 12 49.5 | 3.Tr.E |
| 3 | 9 3.0 | 3.Ec.D |
| | 11 28.4 | 3.Oc.R |
| 4 | 7 42.9 | 3.Sh.I |
| | 8 16.2 | 3.Tr.I |
| | 9 55.5 | 3.Sh.E |
| | 10 7.6 | 3.Tr.E |
| 5 | 6 21.9 | 3.Ec.D |
| | 8 46.5 | 3.Oc.R |
| 6 | 5 1.8 | 3.Sh.I |
| | 5 33.1 | 3.Tr.I |
| | 7 14.0 | 3.Sh.E |
| | 7 25.7 | 3.Tr.E |
| 7 | 3 40.8 | 3.Ec.D |
| | 6 4.6 | 3.Oc.R |
| 8 | 2 20.7 | 3.Sh.I |
| | 2 50.1 | 3.Tr.I |
| | 4 32.5 | 3.Sh.E |
| | 4 43.8 | 3.Tr.E |
| 9 | 0 59.8 | 3.Ec.D |
| | 3 22.7 | 3.Oc.R |
| | 23 39.6 | 3.Sh.I |
| 10 | 0 7.0 | 3.Tr.I |
| | 1 51.0 | 3.Sh.E |
| | 2 1.9 | 3.Tr.E |
| | 22 18.7 | 3.Ec.D |
| 11 | 0 40.7 | 3.Oc.R |
| | 20 58.6 | 3.Sh.I |
| | 21 23.8 | 3.Tr.I |
| | 23 9.5 | 3.Sh.E |
| | 23 19.9 | 3.Tr.E |
| 12 | 19 37.7 | 3.Ec.D |
| | 21 58.8 | 3.Oc.R |
| 13 | 18 17.5 | 3.Sh.I |
| | 18 40.7 | 3.Tr.I |
| | 20 28.1 | 3.Sh.E |
| | 20 38.0 | 3.Tr.E |
| 14 | 16 56.6 | 3.Ec.D |
| | 19 16.8 | 3.Oc.R |
| 15 | 15 36.5 | 3.Sh.I |
| | 15 57.6 | 3.Tr.I |
| | 17 46.6 | 3.Sh.E |
| | 17 56.0 | 3.Tr.E |
| 16 | 14 15.6 | 3.Ec.D |
| | 16 34.8 | 3.Oc.R |
| 17 | 12 55.4 | 3.Sh.I |
| | 13 14.4 | 3.Tr.I |
| | 15 5.2 | 3.Sh.E |
| | 15 14.0 | 3.Tr.E |
| 18 | 11 34.6 | 3.Ec.D |
| | 13 52.8 | 3.Oc.R |
| 19 | 10 14.4 | 3.Sh.I |
| | 10 31.2 | 3.Tr.I |
| | 12 23.7 | 3.Sh.E |
| | 12 32.0 | 3.Tr.E |
| 20 | 8 53.6 | 3.Ec.D |
| | 11 10.8 | 3.Oc.R |
| 21 | 7 33.4 | 3.Sh.I |
| | 7 48.1 | 3.Tr.I |
| | 9 42.3 | 3.Sh.E |
| | 9 50.0 | 3.Tr.E |
| 22 | 6 12.6 | 3.Ec.D |
| | 8 28.8 | 3.Oc.R |
| 23 | 4 52.4 | 3.Sh.I |
| | 5 4.9 | 3.Tr.I |
| | 7 0.9 | 3.Sh.E |
| | 7 8.0 | 3.Tr.E |
| 24 | 3 31.6 | 3.Ec.D |
| | 5 46.8 | 3.Oc.R |
| 25 | 2 11.4 | 3.Sh.I |
| | 2 21.7 | 3.Tr.I |
| | 4 19.5 | 3.Sh.E |
| | 4 26.0 | 3.Tr.E |
| 26 | 0 50.6 | 3.Ec.D |
| | 3 4.7 | 3.Oc.R |
| | 23 30.5 | 3.Sh.I |
| | 23 38.6 | 3.Tr.I |
| 27 | 1 38.0 | 3.Sh.E |
| | 1 43.9 | 3.Tr.E |
| | 22 9.6 | 3.Ec.D |
| 28 | 0 22.7 | 3.Oc.R |
| | 20 49.5 | 3.Sh.I |
| | 20 55.4 | 3.Tr.I |
| | 22 56.6 | 3.Sh.E |
| | 23 1.9 | 3.Tr.E |
| 29 | 19 28.7 | 3.Ec.D |
| | 21 40.6 | 3.Oc.R |
| 30 | 18 8.5 | 3.Sh.I |
| | 18 12.3 | 3.Tr.I |
| | 20 15.2 | 3.Sh.E |
| | 20 19.8 | 3.Tr.E |
| 31 | 16 47.8 | 3.Ec.D |
| | 18 58.6 | 3.Oc.R |

**Configuração dos Principais satélites saturnianos em 15 Abril 2011 – 00:00 TU**




| Data | Hora | Evento |
|---|---|---|
| 1 | 15 27.6 | 3.Sh.I |
| | 15 29.1 | 3.Tr.I |
| | 17 33.8 | 3.Sh.E |
| | 17 37.7 | 3.Tr.E |
| 2 | 14 6.8 | 3.Ec.D |
| | 16 16.5 | 3.Oc.R |
| 3 | 12 46.0 | 3.Tr.I |
| | 12 46.7 | 3.Sh.I |
| | 14 52.5 | 3.Sh.E |
| | 14 55.7 | 3.Tr.E |
| 4 | 11 24.2 | 3.Oc.D |
| | 13 34.4 | 3.Oc.R |
| 5 | 10 2.9 | 3.Tr.I |
| | 10 5.8 | 3.Sh.I |
| | 12 11.1 | 3.Sh.E |
| | 12 13.6 | 3.Tr.E |
| 6 | 8 41.1 | 3.Oc.D |
| | 10 52.4 | 3.Oc.R |
| 7 | 7 19.9 | 3.Tr.I |
| | 7 24.9 | 3.Sh.I |
| | 9 29.7 | 3.Sh.E |
| | 9 31.5 | 3.Tr.E |
| 8 | 5 58.0 | 3.Oc.D |
| | 8 10.3 | 3.Oc.R |
| 9 | 4 36.8 | 3.Tr.I |
| | 4 44.0 | 3.Sh.I |
| | 6 48.3 | 3.Sh.E |
| | 6 49.5 | 3.Tr.E |
| 10 | 3 15.0 | 3.Oc.D |
| | 5 28.2 | 3.Oc.R |
| 11 | 1 53.8 | 3.Tr.I |
| | 2 3.1 | 3.Sh.I |
| | 4 7.0 | 3.Sh.E |
| | 4 7.4 | 3.Tr.E |
| 12 | 0 32.0 | 3.Oc.D |
| | 2 46.2 | 3.Oc.R |
| | 23 10.8 | 3.Tr.I |
| | 23 22.2 | 3.Sh.I |
| 13 | 1 25.3 | 3.Tr.E |
| | 1 25.6 | 3.Sh.E |
| | 2 18.4 | 4.Tr.I |
| | 2 34.4 | 4.Tr.E |
| | 21 49.0 | 3.Oc.D |
| 14 | 0 4.8 | 3.Ec.R |
| | 11 8.7 | 4.Oc.D |
| | 11 30.6 | 4.Oc.R |
| | 20 27.9 | 3.Tr.I |
| | 20 41.4 | 3.Sh.I |
| | 22 43.3 | 3.Tr.E |
| | 22 44.3 | 3.Sh.E |
| 15 | 19 6.1 | 3.Oc.D |
| | 19 48.0 | 4.Tr.I |
| | 20 23.1 | 4.Tr.E |
| | 21 23.4 | 3.Ec.R |
| 16 | 17 44.9 | 3.Tr.I |
| | 18 0.5 | 3.Sh.I |
| | 20 1.2 | 3.Tr.E |
| | 20 2.9 | 3.Sh.E |
| 17 | 4 39.9 | 4.Oc.D |
| | 5 17.8 | 4.Oc.R |
| | 16 23.2 | 3.Oc.D |
| | 18 42.1 | 3.Ec.R |
| 18 | 13 21.7 | 4.Tr.I |
| | 14 7.9 | 4.Tr.E |
| | 15 2.1 | 3.Tr.I |
| | 15 19.7 | 3.Sh.I |
| | 17 19.1 | 3.Tr.E |
| | 17 21.6 | 3.Sh.E |
| 19 | 13 40.3 | 3.Oc.D |
| | 16 0.8 | 3.Ec.R |
| | 22 13.9 | 4.Oc.D |
| | 23 2.2 | 4.Oc.R |
| 20 | 12 19.2 | 3.Tr.I |
| | 12 38.9 | 3.Sh.I |
| | 14 37.1 | 3.Tr.E |
| | 14 40.3 | 3.Sh.E |
| 21 | 6 56.7 | 4.Tr.I |
| | 7 51.4 | 4.Tr.E |
| | 10 57.5 | 3.Oc.D |
| | 13 19.5 | 3.Ec.R |
| 22 | 9 36.4 | 3.Tr.I |
| | 9 58.1 | 3.Sh.I |
| | 11 55.0 | 3.Tr.E |
| | 11 58.9 | 3.Sh.E |
| | 15 49.2 | 4.Oc.D |
| | 16 45.6 | 4.Oc.R |
| 23 | 8 14.7 | 3.Oc.D |
| | 10 38.1 | 3.Ec.R |
| 24 | 0 32.6 | 4.Tr.I |
| | 1 34.3 | 4.Tr.E |
| | 6 53.6 | 3.Tr.I |
| | 7 17.3 | 3.Sh.I |
| | 9 13.0 | 3.Tr.E |
| | 9 17.6 | 3.Sh.E |
| 25 | 5 32.0 | 3.Oc.D |
| | 7 56.8 | 3.Ec.R |
| | 9 25.2 | 4.Oc.D |
| | 10 28.3 | 4.Oc.R |
| 26 | 4 10.9 | 3.Tr.I |
| | 4 36.5 | 3.Sh.I |
| | 6 31.0 | 3.Tr.E |
| | 6 36.3 | 3.Sh.E |
| | 18 9.1 | 4.Tr.I |
| | 19 16.7 | 4.Tr.E |
| 27 | 2 49.2 | 3.Oc.D |
| | 5 15.5 | 3.Ec.R |
| 28 | 1 28.2 | 3.Tr.I |
| | 1 55.7 | 3.Sh.I |
| | 3 1.8 | 4.Oc.D |
| | 3 49.0 | 3.Tr.E |
| | 3 55.0 | 3.Sh.E |
| | 4 10.6 | 4.Oc.R |
| 29 | 0 6.6 | 3.Oc.D |
| | 2 34.2 | 3.Ec.R |
| | 11 46.1 | 4.Tr.I |
| | 12 58.7 | 4.Tr.E |
| | 22 45.6 | 3.Tr.I |
| | 23 14.9 | 3.Sh.I |
| 30 | 1 7.0 | 3.Tr.E |
| | 1 13.7 | 3.Sh.E |
| | 20 38.8 | 4.Oc.D |
| | 21 24.0 | 3.Oc.D |
| | 21 52.6 | 4.Oc.R |
| | 23 52.9 | 3.Ec.R |

**Configuração dos Principais satélites saturnianos em 15 Maio 2011 – 00:00 TU**


| Data | Hora | Evento |
|---|---|---|
| 1 | 20 3.0 | 3.Tr.I |
| | 20 34.1 | 3.Sh.I |
| | 22 25.0 | 3.Tr.E |
| | 22 32.4 | 3.Sh.E |
| 2 | 5 23.4 | 4.Tr.I |
| | 6 40.6 | 4.Tr.E |
| | 18 41.4 | 3.Oc.D |
| | 21 11.6 | 3.Ec.R |
| 3 | 14 16.3 | 4.Oc.D |
| | 15 34.4 | 4.Oc.R |
| | 17 20.5 | 3.Tr.I |
| | 17 53.4 | 3.Sh.I |
| | 19 43.1 | 3.Tr.E |
| | 19 51.1 | 3.Sh.E |
| 4 | 15 58.9 | 3.Oc.D |
| | 18 30.4 | 3.Ec.R |
| | 23 1.1 | 4.Tr.I |
| 5 | 0 22.3 | 4.Tr.E |
| | 14 38.0 | 3.Tr.I |
| | 15 12.7 | 3.Sh.I |
| | 17 1.2 | 3.Tr.E |
| | 17 9.8 | 3.Sh.E |
| 6 | 7 54.1 | 4.Oc.D |
| | 9 16.0 | 4.Oc.R |
| | 13 16.4 | 3.Oc.D |
| | 15 49.1 | 3.Ec.R |
| 7 | 11 55.5 | 3.Tr.I |
| | 12 31.9 | 3.Sh.I |
| | 14 19.2 | 3.Tr.E |
| | 14 28.5 | 3.Sh.E |
| | 16 39.2 | 4.Tr.I |
| | 18 3.8 | 4.Tr.E |
| 8 | 10 34.0 | 3.Oc.D |
| | 13 7.8 | 3.Ec.R |
| 9 | 1 32.2 | 4.Oc.D |
| | 2 57.5 | 4.Oc.R |
| | 9 13.2 | 3.Tr.I |
| | 9 51.2 | 3.Sh.I |
| | 11 37.3 | 3.Tr.E |
| | 11 47.2 | 3.Sh.E |
| 10 | 7 51.6 | 3.Oc.D |
| | 10 17.6 | 4.Tr.I |
| | 10 26.5 | 3.Ec.R |
| | 11 45.3 | 4.Tr.E |
| 11 | 6 30.8 | 3.Tr.I |
| | 7 10.5 | 3.Sh.I |
| | 8 55.5 | 3.Tr.E |
| | 9 5.9 | 3.Sh.E |
| | 19 10.6 | 4.Oc.D |
| | 20 38.9 | 4.Oc.R |
| 12 | 5 9.3 | 3.Oc.D |
| | 7 45.3 | 3.Ec.R |
| 13 | 3 48.6 | 3.Tr.I |
| | 3 56.2 | 4.Tr.I |
| | 4 29.8 | 3.Sh.I |
| | 5 26.7 | 4.Tr.E |
| | 6 13.6 | 3.Tr.E |
| | 6 24.6 | 3.Sh.E |
| 14 | 2 27.1 | 3.Oc.D |
| | 5 4.0 | 3.Ec.R |
| | 12 49.3 | 4.Oc.D |
| | 14 20.3 | 4.Oc.R |
| 15 | 1 6.3 | 3.Tr.I |
| | 1 49.1 | 3.Sh.I |
| | 3 31.8 | 3.Tr.E |
| | 3 43.3 | 3.Sh.E |
| | 21 35.1 | 4.Tr.I |
| | 23 8.0 | 4.Tr.E |
| | 23 44.8 | 3.Oc.D |
| 16 | 2 22.7 | 3.Ec.R |
| | 22 24.2 | 3.Tr.I |
| | 23 8.4 | 3.Sh.I |
| 17 | 0 50.0 | 3.Tr.E |
| | 1 2.1 | 3.Sh.E |
| | 6 28.3 | 4.Oc.D |
| | 8 1.6 | 4.Oc.R |
| | 21 2.7 | 3.Oc.D |
| | 23 41.5 | 3.Ec.R |
| 18 | 15 14.3 | 4.Tr.I |
| | 16 49.3 | 4.Tr.E |
| | 19 42.0 | 3.Tr.I |
| | 20 27.8 | 3.Sh.I |
| | 22 8.2 | 3.Tr.E |
| | 22 20.8 | 3.Sh.E |
| 19 | 18 20.6 | 3.Oc.D |
| | 21 0.2 | 3.Ec.R |
| 20 | 0 7.6 | 4.Oc.D |
| | 1 42.8 | 4.Oc.R |
| | 17 0.0 | 3.Tr.I |
| | 17 47.1 | 3.Sh.I |
| | 19 26.4 | 3.Tr.E |
| | 19 39.5 | 3.Sh.E |
| 21 | 8 53.8 | 4.Tr.I |
| | 10 30.5 | 4.Tr.E |
| | 15 38.6 | 3.Oc.D |
| | 18 19.0 | 3.Ec.R |
| 22 | 14 18.0 | 3.Tr.I |
| | 15 6.4 | 3.Sh.I |
| | 16 44.7 | 3.Tr.E |
| | 16 58.3 | 3.Sh.E |
| | 17 47.1 | 4.Oc.D |
| | 19 24.1 | 4.Oc.R |
| 23 | 12 56.6 | 3.Oc.D |
| | 15 37.7 | 3.Ec.R |
| 24 | 2 33.5 | 4.Tr.I |
| | 4 11.7 | 4.Tr.E |
| | 11 36.1 | 3.Tr.I |
| | 12 25.8 | 3.Sh.I |
| | 14 3.0 | 3.Tr.E |
| | 14 17.0 | 3.Sh.E |
| 25 | 10 14.7 | 3.Oc.D |
| | 11 26.9 | 4.Oc.D |
| | 12 56.5 | 3.Ec.R |
| | 13 5.3 | 4.Oc.R |
| 26 | 8 54.2 | 3.Tr.I |
| | 9 45.2 | 3.Sh.I |
| | 11 21.3 | 3.Tr.E |
| | 11 35.7 | 3.Sh.E |
| | 20 13.5 | 4.Tr.I |
| | 21 53.0 | 4.Tr.E |
| 27 | 7 32.8 | 3.Oc.D |
| | 10 15.2 | 3.Ec.R |
| 28 | 5 7.0 | 4.Oc.D |
| | 6 12.3 | 3.Tr.I |
| | 6 46.5 | 4.Oc.R |
| | 7 4.5 | 3.Sh.I |
| | 8 39.6 | 3.Tr.E |
| | 8 54.5 | 3.Sh.E |
| 29 | 4 51.0 | 3.Oc.D |
| | 7 34.0 | 3.Ec.R |
| | 13 53.8 | 4.Tr.I |
| | 15 34.2 | 4.Tr.E |
| 30 | 3 30.6 | 3.Tr.I |
| | 4 23.9 | 3.Sh.I |
| | 5 58.0 | 3.Tr.E |
| | 6 13.2 | 3.Sh.E |
| | 22 47.3 | 4.Oc.D |
| 31 | 0 27.7 | 4.Oc.R |
| | 2 9.2 | 3.Oc.D |
| | 4 52.7 | 3.Ec.R |

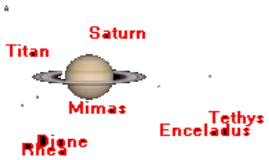
**Configuração dos Principais satélites saturnianos em 15 Junho 2011 – 00:00 TU**


| Data | Hora | Evento |
|---|---|---|
| 1 | 0 48.9 | 3.Tr.I |
| | 1 43.3 | 3.Sh.I |
| | 3 16.4 | 3.Tr.E |
| | 3 32.0 | 3.Sh.E |
| | 7 34.2 | 4.Tr.I |
| | 9 15.4 | 4.Tr.E |
| | 23 27.6 | 3.Oc.D |
| 2 | 2 11.5 | 3.Ec.R |
| | 16 27.9 | 4.Oc.D |
| | 18 8.9 | 4.Oc.R |
| | 22 7.2 | 3.Tr.I |
| | 23 2.7 | 3.Sh.I |
| 3 | 0 34.8 | 3.Tr.E |
| | 0 50.7 | 3.Sh.E |
| | 20 45.9 | 3.Oc.D |
| | 23 30.2 | 3.Ec.R |
| 4 | 1 15.0 | 4.Tr.I |
| | 2 56.6 | 4.Tr.E |
| | 19 25.6 | 3.Tr.I |
| | 20 22.1 | 3.Sh.I |
| | 21 53.3 | 3.Tr.E |
| | 22 9.4 | 3.Sh.E |
| 5 | 10 8.7 | 4.Oc.D |
| | 11 50.1 | 4.Oc.R |
| | 18 4.4 | 3.Oc.D |
| | 20 49.0 | 3.Ec.R |
| 6 | 16 44.1 | 3.Tr.I |
| | 17 41.5 | 3.Sh.I |
| | 18 56.0 | 4.Tr.I |
| | 19 11.8 | 3.Tr.E |
| | 19 28.2 | 3.Sh.E |
| | 20 37.9 | 4.Tr.E |
| 7 | 15 22.8 | 3.Oc.D |
| | 18 7.7 | 3.Ec.R |
| 8 | 3 49.8 | 4.Oc.D |
| | 5 31.3 | 4.Oc.R |
| | 14 2.6 | 3.Tr.I |
| | 15 0.9 | 3.Sh.I |
| | 16 30.3 | 3.Tr.E |
| | 16 46.9 | 3.Sh.E |
| 9 | 12 37.2 | 4.Tr.I |
| | 12 41.4 | 3.Oc.D |
| | 14 19.1 | 4.Tr.E |
| | 15 26.5 | 3.Ec.R |
| 10 | 11 21.2 | 3.Tr.I |
| | 12 20.3 | 3.Sh.I |
| | 13 48.8 | 3.Tr.E |
| | 14 5.7 | 3.Sh.E |
| | 21 31.1 | 4.Oc.D |
| | 23 12.6 | 4.Oc.R |

| Data | Hora | Evento |
|---|---|---|
| 11 | 10 0.0 | 3.Oc.D |
| | 12 45.2 | 3.Ec.R |
| 12 | 6 18.7 | 4.Tr.I |
| | 8 0.4 | 4.Tr.E |
| | 8 39.8 | 3.Tr.I |
| | 9 39.8 | 3.Sh.I |
| | 11 7.4 | 3.Tr.E |
| | 11 24.4 | 3.Sh.E |
| 13 | 7 18.7 | 3.Oc.D |
| | 10 4.0 | 3.Ec.R |
| | 15 12.7 | 4.Oc.D |
| | 16 53.8 | 4.Oc.R |
| 14 | 5 58.5 | 3.Tr.I |
| | 6 59.2 | 3.Sh.I |
| | 8 26.0 | 3.Tr.E |
| | 8 43.2 | 3.Sh.E |
| 15 | 0 0.4 | 4.Tr.I |
| | 1 41.6 | 4.Tr.E |
| | 4 37.4 | 3.Oc.D |
| | 7 22.7 | 3.Ec.R |
| 16 | 3 17.3 | 3.Tr.I |
| | 4 18.7 | 3.Sh.I |
| | 5 44.6 | 3.Tr.E |
| | 6 1.9 | 3.Sh.E |
| | 8 54.6 | 4.Oc.D |
| | 10 35.0 | 4.Oc.R |
| 17 | 1 56.2 | 3.Oc.D |
| | 4 41.5 | 3.Ec.R |
| | 17 42.4 | 4.Tr.I |
| | 19 22.9 | 4.Tr.E |
| 18 | 0 36.1 | 3.Tr.I |
| | 1 38.1 | 3.Sh.I |
| | 3 3.2 | 3.Tr.E |
| | 3 20.6 | 3.Sh.E |
| | 23 15.0 | 3.Oc.D |
| 19 | 2 0.2 | 3.Ec.R |
| | 2 36.6 | 4.Oc.D |
| | 4 16.3 | 4.Oc.R |
| | 21 55.0 | 3.Tr.I |
| | 22 57.6 | 3.Sh.I |
| 20 | 0 21.9 | 3.Tr.E |
| | 0 39.4 | 3.Sh.E |
| | 11 24.6 | 4.Tr.I |
| | 13 4.2 | 4.Tr.E |
| | 20 33.9 | 3.Oc.D |
| | 23 19.0 | 3.Ec.R |

| Data | Hora | Evento |
|---|---|---|
| 21 | 19 13.9 | 3.Tr.I |
| | 20 17.0 | 3.Sh.I |
| | 20 19.0 | 4.Oc.D |
| | 21 40.6 | 3.Tr.E |
| | 21 57.5 | 4.Oc.R |
| | 21 58.1 | 3.Sh.E |
| 22 | 17 52.9 | 3.Oc.D |
| | 20 37.7 | 3.Ec.R |
| 23 | 5 7.1 | 4.Tr.I |
| | 6 45.4 | 4.Tr.E |
| | 16 32.9 | 3.Tr.I |
| | 17 36.5 | 3.Sh.I |
| | 18 59.3 | 3.Tr.E |
| | 19 16.8 | 3.Sh.E |
| 24 | 14 1.6 | 4.Oc.D |
| | 15 11.9 | 3.Oc.D |
| | 15 38.7 | 4.Oc.R |
| | 17 56.4 | 3.Ec.R |
| 25 | 13 51.9 | 3.Tr.I |
| | 14 56.0 | 3.Sh.I |
| | 16 18.1 | 3.Tr.E |
| | 16 35.6 | 3.Sh.E |
| | 22 49.9 | 4.Tr.I |
| 26 | 0 26.7 | 4.Tr.E |
| | 12 31.0 | 3.Oc.D |
| | 15 15.2 | 3.Ec.R |
| 27 | 7 44.5 | 4.Oc.D |
| | 9 19.9 | 4.Oc.R |
| | 11 11.0 | 3.Tr.I |
| | 12 15.4 | 3.Sh.I |
| | 13 36.9 | 3.Tr.E |
| | 13 54.3 | 3.Sh.E |
| 28 | 9 50.1 | 3.Oc.D |
| | 12 33.9 | 3.Ec.R |
| | 16 32.9 | 4.Tr.I |
| | 18 7.9 | 4.Tr.E |
| 29 | 8 30.2 | 3.Tr.I |
| | 9 34.9 | 3.Sh.I |
| | 10 55.7 | 3.Tr.E |
| | 11 13.0 | 3.Sh.E |
| 30 | 1 27.7 | 4.Oc.D |
| | 3 1.1 | 4.Oc.R |
| | 7 9.3 | 3.Oc.D |
| | 9 52.6 | 3.Ec.R |

**Configuração dos Principais satélites saturnianos em 15 Julho 2011 – 00:00 TU**

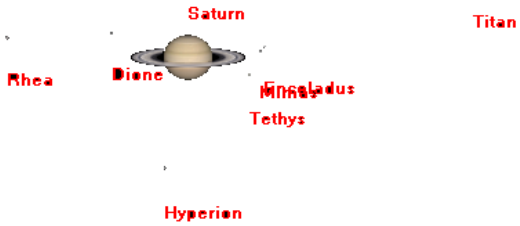



| Data | Hora | Evento |
|---|---|---|
| 1 | 5 49.4 | 3.Tr.I |
| | 6 54.4 | 3.Sh.I |
| | 8 14.5 | 3.Tr.E |
| | 8 31.7 | 3.Sh.E |
| | 10 16.2 | 4.Tr.I |
| | 11 49.1 | 4.Tr.E |
| 2 | 4 28.5 | 3.Oc.D |
| | 7 11.3 | 3.Ec.R |
| | 19 11.1 | 4.Oc.D |
| | 20 42.3 | 4.Oc.R |
| 3 | 3 8.7 | 3.Tr.I |
| | 4 13.9 | 3.Sh.I |
| | 5 33.3 | 3.Tr.E |
| | 5 50.4 | 3.Sh.E |
| 4 | 1 47.8 | 3.Oc.D |
| | 3 59.7 | 4.Tr.I |
| | 4 30.0 | 3.Ec.R |
| | 5 30.3 | 4.Tr.E |
| 5 | 0 28.0 | 3.Tr.I |
| | 1 33.4 | 3.Sh.I |
| | 2 52.2 | 3.Tr.E |
| | 3 9.1 | 3.Sh.E |
| | 12 54.9 | 4.Oc.D |
| | 14 23.4 | 4.Oc.R |
| | 23 7.2 | 3.Oc.D |
| 6 | 1 48.7 | 3.Ec.R |
| | 21 43.6 | 4.Tr.I |
| | 21 47.4 | 3.Tr.I |
| | 22 52.9 | 3.Sh.I |
| | 23 11.4 | 4.Tr.E |
| 7 | 0 11.1 | 3.Tr.E |
| | 0 27.8 | 3.Sh.E |
| | 20 26.6 | 3.Oc.D |
| | 23 7.4 | 3.Ec.R |
| 8 | 6 38.9 | 4.Oc.D |
| | 8 4.4 | 4.Oc.R |
| | 19 6.8 | 3.Tr.I |
| | 20 12.4 | 3.Sh.I |
| | 21 30.0 | 3.Tr.E |
| | 21 46.5 | 3.Sh.E |
| 9 | 15 27.8 | 4.Tr.I |
| | 16 52.4 | 4.Tr.E |
| | 17 46.1 | 3.Oc.D |
| | 20 26.1 | 3.Ec.R |
| 10 | 16 26.3 | 3.Tr.I |
| | 17 31.9 | 3.Sh.I |
| | 18 48.9 | 3.Tr.E |
| | 19 5.2 | 3.Sh.E |
| 11 | 0 23.3 | 4.Oc.D |
| | 1 45.3 | 4.Oc.R |
| | 15 5.6 | 3.Oc.D |
| | 17 44.8 | 3.Ec.R |
| 12 | 9 12.3 | 4.Tr.I |
| | 10 33.4 | 4.Tr.E |
| | 13 45.8 | 3.Tr.I |
| | 14 51.5 | 3.Sh.I |
| | 16 7.8 | 3.Tr.E |
| | 16 23.9 | 3.Sh.E |
| 13 | 12 25.2 | 3.Oc.D |
| | 15 3.5 | 3.Ec.R |
| | 18 8.1 | 4.Oc.D |
| | 19 26.1 | 4.Oc.R |
| 14 | 11 5.4 | 3.Tr.I |
| | 12 11.0 | 3.Sh.I |
| | 13 26.8 | 3.Tr.E |
| | 13 42.6 | 3.Sh.E |
| 15 | 2 57.1 | 4.Tr.I |
| | 4 14.1 | 4.Tr.E |
| | 9 44.8 | 3.Oc.D |
| | 12 22.2 | 3.Ec.R |
| 16 | 8 25.1 | 3.Tr.I |
| | 9 30.5 | 3.Sh.I |
| | 10 45.8 | 3.Tr.E |
| | 11 1.2 | 3.Sh.E |
| | 11 53.2 | 4.Oc.D |
| | 13 6.7 | 4.Oc.R |
| 17 | 7 4.5 | 3.Oc.D |
| | 9 40.8 | 3.Ec.R |
| | 20 42.4 | 4.Tr.I |
| | 21 54.7 | 4.Tr.E |
| 18 | 5 44.8 | 3.Tr.I |
| | 6 50.1 | 3.Sh.I |
| | 8 4.7 | 3.Tr.E |
| | 8 19.9 | 3.Sh.E |
| 19 | 4 24.2 | 3.Oc.D |
| | 5 38.8 | 4.Oc.D |
| | 6 47.0 | 4.Oc.R |
| | 6 59.5 | 3.Ec.R |
| 20 | 3 4.6 | 3.Tr.I |
| | 4 9.6 | 3.Sh.I |
| | 5 23.7 | 3.Tr.E |
| | 5 38.5 | 3.Sh.E |
| | 14 28.1 | 4.Tr.I |
| | 15 35.1 | 4.Tr.E |
| 21 | 1 44.0 | 3.Oc.D |
| | 4 18.1 | 3.Ec.R |
| | 23 24.9 | 4.Oc.D |
| 22 | 0 24.4 | 3.Tr.I |
| | 0 27.0 | 4.Oc.R |
| | 1 29.1 | 3.Sh.I |
| | 2 42.8 | 3.Tr.E |
| | 2 57.2 | 3.Sh.E |
| | 23 3.9 | 3.Oc.D |
| 23 | 1 36.8 | 3.Ec.R |
| | 8 14.4 | 4.Tr.I |
| | 9 15.0 | 4.Tr.E |
| | 21 44.2 | 3.Tr.I |
| | 22 48.7 | 3.Sh.I |
| 24 | 0 1.8 | 3.Tr.E |
| | 0 15.8 | 3.Sh.E |
| | 17 11.8 | 4.Oc.D |
| | 18 6.6 | 4.Oc.R |
| | 20 23.8 | 3.Oc.D |
| | 22 55.4 | 3.Ec.R |
| 25 | 19 4.1 | 3.Tr.I |
| | 20 8.2 | 3.Sh.I |
| | 21 20.8 | 3.Tr.E |
| | 21 34.4 | 3.Sh.E |
| 26 | 2 1.5 | 4.Tr.I |
| | 2 54.4 | 4.Tr.E |
| | 17 43.7 | 3.Oc.D |
| | 20 14.0 | 3.Ec.R |
| 27 | 10 59.7 | 4.Oc.D |
| | 11 45.3 | 4.Oc.R |
| | 16 24.1 | 3.Tr.I |
| | 17 27.8 | 3.Sh.I |
| | 18 39.8 | 3.Tr.E |
| | 18 53.1 | 3.Sh.E |
| 28 | 15 3.7 | 3.Oc.D |
| | 17 32.6 | 3.Ec.R |
| | 19 49.6 | 4.Tr.I |
| | 20 32.9 | 4.Tr.E |
| 29 | 13 44.1 | 3.Tr.I |
| | 14 47.4 | 3.Sh.I |
| | 15 58.9 | 3.Tr.E |
| | 16 11.7 | 3.Sh.E |
| 30 | 4 49.4 | 4.Oc.D |
| | 5 22.3 | 4.Oc.R |
| | 12 23.8 | 3.Oc.D |
| | 14 51.2 | 3.Ec.R |
| 31 | 11 4.2 | 3.Tr.I |
| | 12 6.9 | 3.Sh.I |
| | 13 17.9 | 3.Tr.E |
| | 13 30.2 | 3.Sh.E |
| | 13 39.9 | 4.Tr.I |
| | 14 9.4 | 4.Tr.E |

**Configuração dos Principais satélites saturnianos em 15 Agosto 2011 – 00:00 TU**


| Data | Hora | Evento |
|---|---|---|
| 1 | 9 43.9 | 3.Oc.D |
| | 12 9.8 | 3.Ec.R |
| 2 | 8 24.3 | 3.Tr.I |
| | 9 26.5 | 3.Sh.I |
| | 10 37.0 | 3.Tr.E |
| | 10 48.8 | 3.Sh.E |
| 3 | 7 4.0 | 3.Oc.D |
| | 9 28.3 | 3.Ec.R |
| 4 | 5 44.5 | 3.Tr.I |
| | 6 46.1 | 3.Sh.I |
| | 7 56.0 | 3.Tr.E |
| | 8 7.4 | 3.Sh.E |
| 5 | 4 24.3 | 3.Oc.D |
| | 6 46.9 | 3.Ec.R |
| 6 | 3 4.7 | 3.Tr.I |
| | 4 5.7 | 3.Sh.I |
| | 5 15.1 | 3.Tr.E |
| | 5 25.9 | 3.Sh.E |
| 7 | 1 44.5 | 3.Oc.D |
| | 4 5.5 | 3.Ec.R |
| 8 | 0 25.0 | 3.Tr.I |
| | 1 25.3 | 3.Sh.I |
| | 2 34.1 | 3.Tr.E |
| | 2 44.5 | 3.Sh.E |
| | 23 4.8 | 3.Oc.D |
| 9 | 1 24.0 | 3.Ec.R |
| | 21 45.3 | 3.Tr.I |
| | 22 44.9 | 3.Sh.I |
| | 23 53.2 | 3.Tr.E |
| 10 | 0 3.0 | 3.Sh.E |
| | 20 25.2 | 3.Oc.D |
| | 22 42.5 | 3.Ec.R |
| 11 | 19 5.7 | 3.Tr.I |
| | 20 4.5 | 3.Sh.I |
| | 21 12.2 | 3.Tr.E |
| | 21 21.5 | 3.Sh.E |
| 12 | 17 45.6 | 3.Oc.D |
| | 20 1.0 | 3.Ec.R |
| 13 | 16 26.1 | 3.Tr.I |
| | 17 24.1 | 3.Sh.I |
| | 18 31.3 | 3.Tr.E |
| | 18 40.0 | 3.Sh.E |
| 14 | 15 6.1 | 3.Oc.D |
| | 17 19.5 | 3.Ec.R |
| 15 | 13 46.6 | 3.Tr.I |
| | 14 43.7 | 3.Sh.I |
| | 15 50.3 | 3.Tr.E |
| | 15 58.5 | 3.Sh.E |
| 16 | 12 26.6 | 3.Oc.D |
| | 14 38.0 | 3.Ec.R |
| 17 | 11 7.2 | 3.Tr.I |
| | 12 3.3 | 3.Sh.I |
| | 13 9.3 | 3.Tr.E |
| | 13 16.9 | 3.Sh.E |
| 18 | 9 47.2 | 3.Oc.D |
| | 11 56.4 | 3.Ec.R |
| 19 | 8 27.8 | 3.Tr.I |
| | 9 22.9 | 3.Sh.I |
| | 10 28.3 | 3.Tr.E |
| | 10 35.4 | 3.Sh.E |
| 20 | 7 7.8 | 3.Oc.D |
| | 9 14.8 | 3.Ec.R |
| 21 | 5 48.4 | 3.Tr.I |
| | 6 42.6 | 3.Sh.I |
| | 7 47.3 | 3.Tr.E |
| | 7 53.8 | 3.Sh.E |
| 22 | 4 28.5 | 3.Oc.D |
| | 6 33.3 | 3.Ec.R |
| 23 | 3 9.1 | 3.Tr.I |
| | 4 2.2 | 3.Sh.I |
| | 5 6.3 | 3.Tr.E |
| | 5 12.2 | 3.Sh.E |
| 24 | 1 49.2 | 3.Oc.D |
| | 3 51.7 | 3.Ec.R |
| 25 | 0 29.9 | 3.Tr.I |
| | 1 21.9 | 3.Sh.I |
| | 2 25.3 | 3.Tr.E |
| | 2 30.6 | 3.Sh.E |
| | 23 10.0 | 3.Oc.D |
| 26 | 1 10.0 | 3.Ec.R |
| | 21 50.7 | 3.Tr.I |
| | 22 41.6 | 3.Sh.I |
| | 23 44.2 | 3.Tr.E |
| | 23 49.0 | 3.Sh.E |
| 27 | 20 30.9 | 3.Oc.D |
| | 22 28.4 | 3.Ec.R |
| 28 | 19 11.5 | 3.Tr.I |
| | 20 1.2 | 3.Sh.I |
| | 21 3.1 | 3.Tr.E |
| | 21 7.3 | 3.Sh.E |
| 29 | 17 51.8 | 3.Oc.D |
| | 19 46.7 | 3.Ec.R |
| 30 | 16 32.5 | 3.Tr.I |
| | 17 20.9 | 3.Sh.I |
| | 18 22.0 | 3.Tr.E |
| | 18 25.6 | 3.Sh.E |
| 31 | 15 12.8 | 3.Oc.D |
| | 17 5.0 | 3.Ec.R |

**Configuração dos Principais satélites saturnianos em 15 Setembro 2011 – 00:00 TU**




| Data | Hora | Evento |
|---|---|---|
| 1 | 13 53.5 | 3.Tr.I |
| | 14 40.6 | 3.Sh.I |
| | 15 40.8 | 3.Tr.E |
| | 15 43.9 | 3.Sh.E |
| 2 | 12 33.8 | 3.Oc.D |
| | 14 23.3 | 3.Ec.R |
| 3 | 11 14.5 | 3.Tr.I |
| | 12 0.4 | 3.Sh.I |
| | 12 59.7 | 3.Tr.E |
| | 13 2.2 | 3.Sh.E |
| 4 | 9 54.9 | 3.Oc.D |
| | 11 41.6 | 3.Ec.R |
| 5 | 8 35.6 | 3.Tr.I |
| | 9 20.1 | 3.Sh.I |
| | 10 18.4 | 3.Tr.E |
| | 10 20.4 | 3.Sh.E |
| 6 | 7 16.0 | 3.Oc.D |
| | 8 59.8 | 3.Ec.R |
| 7 | 5 56.8 | 3.Tr.I |
| | 6 39.8 | 3.Sh.I |
| | 7 37.2 | 3.Tr.E |
| | 7 38.6 | 3.Sh.E |
| 8 | 4 37.3 | 3.Oc.D |
| | 6 18.0 | 3.Ec.R |
| 9 | 3 18.1 | 3.Tr.I |
| | 3 59.6 | 3.Sh.I |
| | 4 55.9 | 3.Tr.E |
| | 4 56.8 | 3.Sh.E |
| 10 | 1 58.5 | 3.Oc.D |
| | 3 36.2 | 3.Ec.R |
| 11 | 0 39.4 | 3.Tr.I |
| | 1 19.4 | 3.Sh.I |
| | 2 14.5 | 3.Tr.E |
| | 2 14.9 | 3.Sh.E |
| | 23 19.9 | 3.Oc.D |
| 12 | 0 54.3 | 3.Ec.R |
| | 22 0.8 | 3.Tr.I |
| | 22 39.2 | 3.Sh.I |
| | 23 33.0 | 3.Sh.E |
| | 23 33.1 | 3.Tr.E |
| 13 | 20 41.4 | 3.Oc.D |
| | 22 12.4 | 3.Oc.R |
| 14 | 19 22.3 | 3.Tr.I |
| | 19 59.1 | 3.Sh.I |
| | 20 51.1 | 3.Sh.E |
| | 20 51.6 | 3.Tr.E |
| 15 | 18 2.9 | 3.Oc.D |
| | 19 30.9 | 3.Oc.R |
| 16 | 16 43.9 | 3.Tr.I |
| | 17 19.0 | 3.Sh.I |
| | 18 9.1 | 3.Sh.E |
| | 18 10.0 | 3.Tr.E |
| 17 | 15 24.5 | 3.Oc.D |
| | 16 49.3 | 3.Oc.R |
| 18 | 14 5.6 | 3.Tr.I |
| | 14 38.9 | 3.Sh.I |
| | 15 27.1 | 3.Sh.E |
| | 15 28.3 | 3.Tr.E |
| 19 | 12 46.3 | 3.Oc.D |
| | 14 7.6 | 3.Oc.R |
| 20 | 11 27.3 | 3.Tr.I |
| | 11 58.8 | 3.Sh.I |
| | 12 45.0 | 3.Sh.E |
| | 12 46.6 | 3.Tr.E |
| 21 | 10 8.1 | 3.Oc.D |
| | 11 25.8 | 3.Oc.R |
| 22 | 8 49.3 | 3.Tr.I |
| | 9 18.8 | 3.Sh.I |
| | 10 2.8 | 3.Sh.E |
| | 10 4.7 | 3.Tr.E |
| 23 | 7 30.1 | 3.Oc.D |
| | 8 43.9 | 3.Oc.R |
| 24 | 6 11.3 | 3.Tr.I |
| | 6 38.9 | 3.Sh.I |
| | 7 20.6 | 3.Sh.E |
| | 7 22.7 | 3.Tr.E |
| 25 | 4 52.2 | 3.Oc.D |
| | 6 1.8 | 3.Oc.R |
| 26 | 3 33.6 | 3.Tr.I |
| | 3 59.0 | 3.Sh.I |
| | 4 38.3 | 3.Sh.E |
| | 4 40.5 | 3.Tr.E |
| 27 | 2 14.5 | 3.Oc.D |
| | 3 19.6 | 3.Oc.R |
| 28 | 0 56.0 | 3.Tr.I |
| | 1 19.2 | 3.Sh.I |
| | 1 55.9 | 3.Sh.E |
| | 1 58.1 | 3.Tr.E |
| | 23 37.1 | 3.Oc.D |
| 29 | 0 37.1 | 3.Oc.R |
| | 22 18.7 | 3.Tr.I |
| | 22 39.5 | 3.Sh.I |
| | 23 13.3 | 3.Sh.E |
| | 23 15.5 | 3.Tr.E |
| 30 | 20 59.9 | 3.Oc.D |
| | 21 54.4 | 3.Oc.R |

**Configuração dos Principais satélites saturnianos em 15 Outubro 2011 – 00:00 TU**


| Data | Hora | Evento |
|---|---|---|
| 1 | 19 41.7 | 3.Tr.I |
| | 20 0.0 | 3.Sh.I |
| | 20 30.6 | 3.Sh.E |
| | 20 32.5 | 3.Tr.E |
| 2 | 18 23.1 | 3.Oc.D |
| | 19 11.2 | 3.Oc.R |
| 3 | 17 5.2 | 3.Tr.I |
| | 17 20.6 | 3.Sh.I |
| | 17 47.7 | 3.Sh.E |
| | 17 49.1 | 3.Tr.E |
| 4 | 15 46.8 | 3.Oc.D |
| | 16 27.5 | 3.Oc.R |
| 5 | 14 29.5 | 3.Tr.I |
| | 14 41.6 | 3.Sh.I |
| | 15 4.5 | 3.Sh.E |
| | 15 4.8 | 3.Tr.E |
| 6 | 13 11.6 | 3.Oc.D |
| | 13 43.6 | 3.Ec.R |
| 7 | 11 55.4 | 3.Tr.I |
| | 12 3.0 | 3.Sh.I |
| | 12 18.9 | 3.Tr.E |
| | 12 20.7 | 3.Sh.E |
| 8 | 10 39.0 | 3.Oc.D |
| | 10 59.6 | 3.Ec.R |
| 9 | 9 26.0 | 3.Sh.I |
| | 9 35.0 | 3.Sh.E |
| 10 | 8 6.5 | 3.Ec.D |
| | 8 12.9 | 3.Ec.R |

# Urano

| Distância média (UA) | Período de Revolução | Inclinação Equatorial | Diâmetro |
|---|---|---|---|
| 19,18 | 84 anos | 0,8º | 52.290 km |

00:00 Hora – Tempo Universal

| Data | α | δ | ∅ | Elong | DT (UA)* | Ang. PH | Fase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 01 jan | 23h 50m 00.45s | -01° 53' 06.0" | 3.45 | 76.8 | 20.291926 | 2.7 | 0.999 | 5.9 |
| 08 jan | 23h 50m 38.11s | -01° 48' 43.9" | 3.43 | 69.8 | 20.407720 | 2.6 | 0.999 | 5.9 |
| 15 jan | 23h 51m 23.99s | -01° 43' 29.4" | 3.41 | 62.9 | 20.518483 | 2.5 | 1.000 | 5.9 |
| 22 jan | 23h 52m 17.59s | -01° 37' 25.7" | 3.40 | 56.0 | 20.622677 | 2.3 | 1.000 | 5.9 |
| 29 jan | 23h 53m 18.18s | -01° 30' 37.7" | 3.38 | 49.2 | 20.718964 | 2.1 | 1.000 | 5.9 |
| 05 fev | 23h 54m 25.19s | -01° 23' 09.3" | 3.37 | 42.4 | 20.806012 | 1.9 | 1.000 | 5.9 |
| 12 fev | 23h 55m 37.75s | -01° 15' 06.2" | 3.35 | 35.6 | 20.882601 | 1.6 | 1.000 | 5.9 |
| 19 fev | 23h 56m 55.09s | -01° 06' 33.7" | 3.34 | 28.9 | 20.947785 | 1.4 | 1.000 | 5.9 |
| 26 fev | 23h 58m 16.29s | -00° 57' 37.5" | 3.34 | 22.2 | 21.000849 | 1.1 | 1.000 | 5.9 |
| 05 mar | 23h 59m 40.58s | -00° 48' 23.0" | 3.33 | 15.6 | 21.041120 | 0.8 | 1.000 | 5.9 |
| 12 mar | 00h 01m 07.00s | -00° 38' 56.3" | 3.32 | 9.0 | 21.068075 | 0.4 | 1.000 | 5.9 |
| 19 mar | 00h 02m 34.68s | -00° 29' 23.3" | 3.32 | 2.5 | 21.081487 | 0.1 | 1.000 | 5.9 |
| 26 mar | 00h 04m 02.68s | -00° 19' 49.9" | 3.32 | 4.2 | 21.081347 | 0.2 | 1.000 | 5.9 |
| 02 abr | 00h 05m 30.22s | -00° 10' 21.4" | 3.32 | 10.7 | 21.067677 | 0.5 | 1.000 | 5.9 |
| 09 abr | 00h 06m 56.36s | -00° 01' 03.8" | 3.33 | 17.2 | 21.040658 | 0.8 | 1.000 | 5.9 |
| 16 abr | 00h 08m 20.26s | +00° 07' 57.3" | 3.34 | 23.7 | 21.000749 | 1.2 | 1.000 | 5.9 |
| 23 abr | 00h 09m 41.10s | +00° 16' 36.8" | 3.34 | 30.2 | 20.948588 | 1.4 | 1.000 | 5.9 |
| 30 abr | 00h 10m 58.11s | +00° 24' 49.7" | 3.35 | 36.6 | 20.884815 | 1.7 | 1.000 | 5.9 |
| 07 mai | 00h 12m 10.54s | +00° 32' 31.1" | 3.37 | 43.1 | 20.810214 | 2.0 | 1.000 | 5.9 |
| 14 mai | 00h 13m 17.62s | +00° 39' 36.3" | 3.38 | 49.6 | 20.725816 | 2.2 | 1.000 | 5.9 |
| 21 mai | 00h 14m 18.73s | +00° 46' 01.4" | 3.39 | 56.0 | 20.632778 | 2.4 | 1.000 | 5.9 |
| 28 mai | 00h 15m 13.26s | +00° 51' 42.5" | 3.41 | 62.5 | 20.532221 | 2.6 | 0.999 | 5.9 |
| 04 jun | 00h 16m 00.66s | +00° 56' 36.3" | 3.43 | 69.0 | 20.425388 | 2.7 | 0.999 | 5.9 |
| 11 jun | 00h 16m 40.37s | +01° 00' 39.3" | 3.45 | 75.5 | 20.313724 | 2.8 | 0.999 | 5.9 |
| 18 jun | 00h 17m 12.09s | +01° 03' 49.8" | 3.47 | 82.1 | 20.198742 | 2.9 | 0.999 | 5.9 |
| 25 jun | 00h 17m 35.43s | +01° 06' 05.6" | 3.49 | 88.7 | 20.081866 | 2.9 | 0.999 | 5.8 |
| 02 jul | 00h 17m 50.22s | +01° 07' 25.6" | 3.51 | 95.3 | 19.964613 | 2.9 | 0.999 | 5.8 |
| 09 jul | 00h 17m 56.22s | +01° 07' 48.8" | 3.53 | 101.9 | 19.848643 | 2.8 | 0.999 | 5.8 |
| 16 jul | 00h 17m 53.57s | +01° 07' 16.1" | 3.55 | 108.6 | 19.735596 | 2.7 | 0.999 | 5.8 |
| 23 jul | 00h 17m 42.29s | +01° 05' 48.1" | 3.57 | 115.3 | 19.626969 | 2.6 | 0.999 | 5.8 |
| 30 jul | 00h 17m 22.69s | +01° 03' 26.9" | 3.59 | 122.1 | 19.524288 | 2.5 | 1.000 | 5.8 |
| 06 ago | 00h 16m 55.04s | +01° 00' 14.4" | 3.60 | 128.9 | 19.429143 | 2.3 | 1.000 | 5.8 |
| 13 ago | 00h 16m 20.01s | +00° 56' 15.4" | 3.62 | 135.8 | 19.342991 | 2.0 | 1.000 | 5.8 |
| 20 ago | 00h 15m 38.16s | +00° 51' 33.6" | 3.64 | 142.7 | 19.267069 | 1.7 | 1.000 | 5.7 |
| 27 ago | 00h 14m 50.36s | +00° 46' 14.8" | 3.65 | 149.7 | 19.202560 | 1.5 | 1.000 | 5.7 |
| 03 set | 00h 13m 57.40s | +00° 40' 24.3" | 3.66 | 156.7 | 19.150608 | 1.1 | 1.000 | 5.7 |
| 10 set | 00h 13m 00.49s | +00° 34' 10.3" | 3.66 | 163.7 | 19.112105 | 0.8 | 1.000 | 5.7 |
| 17 set | 00h 12m 00.65s | +00° 27' 39.3" | 3.67 | 170.8 | 19.087640 | 0.5 | 1.000 | 5.7 |
| 24 set | 00h 10m 59.15s | +00° 20' 59.6" | 3.67 | 177.9 | 19.077683 | 0.1 | 1.000 | 5.7 |
| 01 out | 00h 09m 57.15s | +00° 14' 19.0" | 3.67 | 174.8 | 19.082567 | 0.3 | 1.000 | 5.7 |
| 08 out | 00h 08m 56.08s | +00° 07' 46.8" | 3.67 | 167.7 | 19.102294 | 0.6 | 1.000 | 5.7 |
| 15 out | 00h 07m 57.12s | +00° 01' 30.4" | 3.66 | 160.5 | 19.136531 | 0.9 | 1.000 | 5.7 |
| 22 out | 00h 07m 01.56s | -00° 04' 21.9" | 3.65 | 153.3 | 19.184811 | 1.3 | 1.000 | 5.7 |
| 29 out | 00h 06m 10.48s | -00° 09' 42.9" | 3.64 | 146.1 | 19.246507 | 1.6 | 1.000 | 5.7 |
| 05 nov | 00h 05m 25.12s | -00° 14' 24.9" | 3.63 | 138.9 | 19.320657 | 1.9 | 1.000 | 5.8 |
| 12 nov | 00h 04m 46.34s | -00° 18' 22.6" | 3.61 | 131.7 | 19.406025 | 2.1 | 1.000 | 5.8 |
| 19 nov | 00h 04m 15.02s | -00° 21' 30.4" | 3.59 | 124.5 | 19.501307 | 2.3 | 1.000 | 5.8 |
| 26 nov | 00h 03m 51.79s | -00° 23' 44.5" | 3.57 | 117.4 | 19.605102 | 2.5 | 1.000 | 5.8 |
| 03 dez | 00h 03m 37.29s | -00° 25' 00.9" | 3.55 | 110.2 | 19.715755 | 2.6 | 0.999 | 5.8 |
| 10 dez | 00h 03m 31.82s | -00° 25' 18.1" | 3.53 | 103.1 | 19.831470 | 2.7 | 0.999 | 5.8 |
| 17 dez | 00h 03m 35.58s | -00° 24' 35.1" | 3.51 | 96.0 | 19.950507 | 2.8 | 0.999 | 5.8 |
| 24 dez | 00h 03m 48.60s | -00° 22' 51.7" | 3.49 | 88.9 | 20.071142 | 2.8 | 0.999 | 5.8 |
| 31 dez | 00h 04m 10.87s | -00° 20' 08.5" | 3.47 | 81.9 | 20.191513 | 2.8 | 0.999 | 5.8 |

# Netuno

| Distância média (UA) | Período de Revolução | Inclinação Equatorial | Diâmetro |
|---|---|---|---|
| 30,06 | 165 anos | 1,8º | 50.450 km |

00:00 Hora – Tempo Universal

| Data | α | δ | ∅ | Elong | DT (UA)* | Ang. PH | Fase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 01 jan | 21h 56m 30.12s | -13° 03' 20.1" | 2.18 | 46.5 | 30.681900 | 1.4 | 1.000 | 8.0 |
| 08 jan | 21h 57m 18.22s | -12° 59' 04.2" | 2.18 | 39.6 | 30.764792 | 1.2 | 1.000 | 8.0 |
| 15 jan | 21h 58m 10.13s | -12° 54' 27.9" | 2.17 | 32.7 | 30.836508 | 1.0 | 1.000 | 8.0 |
| 22 jan | 21h 59m 05.32s | -12° 49' 34.1" | 2.17 | 25.8 | 30.896115 | 0.8 | 1.000 | 8.0 |
| 29 jan | 22h 00m 03.05s | -12° 44' 26.3" | 2.17 | 18.9 | 30.942875 | 0.6 | 1.000 | 8.0 |
| 05 fev | 22h 01m 02.75s | -12° 39' 08.0" | 2.16 | 12.1 | 30.976096 | 0.4 | 1.000 | 8.0 |
| 12 fev | 22h 02m 03.63s | -12° 33' 43.0" | 2.16 | 5.3 | 30.995315 | 0.2 | 1.000 | 8.0 |
| 19 fev | 22h 03m 05.04s | -12° 28' 15.1" | 2.16 | 1.7 | 31.000384 | 0.1 | 1.000 | 8.0 |
| 26 fev | 22h 04m 06.27s | -12° 22' 47.6" | 2.16 | 8.3 | 30.991352 | 0.3 | 1.000 | 8.0 |
| 05 mar | 22h 05m 06.69s | -12° 17' 24.6" | 2.16 | 15.1 | 30.968317 | 0.5 | 1.000 | 8.0 |
| 12 mar | 22h 06m 05.54s | -12° 12' 09.8" | 2.17 | 21.8 | 30.931618 | 0.7 | 1.000 | 8.0 |
| 19 mar | 22h 07m 02.24s | -12° 07' 06.9" | 2.17 | 28.6 | 30.881887 | 0.9 | 1.000 | 8.0 |
| 26 mar | 22h 07m 56.15s | -12° 02' 19.0" | 2.17 | 35.3 | 30.819905 | 1.1 | 1.000 | 8.0 |
| 02 abr | 22h 08m 46.71s | -11° 57' 49.6" | 2.18 | 42.0 | 30.746473 | 1.3 | 1.000 | 8.0 |
| 09 abr | 22h 09m 33.36s | -11° 53' 41.8" | 2.19 | 48.7 | 30.662604 | 1.4 | 1.000 | 7.9 |
| 16 abr | 22h 10m 15.61s | -11° 49' 58.5" | 2.19 | 55.4 | 30.569550 | 1.6 | 1.000 | 7.9 |
| 23 abr | 22h 10m 53.05s | -11° 46' 41.8" | 2.20 | 62.0 | 30.468639 | 1.7 | 1.000 | 7.9 |
| 30 abr | 22h 11m 25.27s | -11° 43' 54.4" | 2.21 | 68.7 | 30.361165 | 1.8 | 1.000 | 7.9 |
| 07 mai | 22h 11m 51.96s | -11° 41' 37.8" | 2.21 | 75.4 | 30.248588 | 1.9 | 1.000 | 7.9 |
| 14 mai | 22h 12m 12.83s | -11° 39' 54.0" | 2.22 | 82.1 | 30.132534 | 1.9 | 1.000 | 7.9 |
| 21 mai | 22h 12m 27.76s | -11° 38' 43.1" | 2.23 | 88.7 | 30.014616 | 1.9 | 1.000 | 7.9 |
| 28 mai | 22h 12m 36.58s | -11° 38' 06.6" | 2.24 | 95.4 | 29.896353 | 1.9 | 1.000 | 7.9 |
| 04 jun | 22h 12m 39.30s | -11° 38' 04.0" | 2.25 | 102.1 | 29.779370 | 1.9 | 1.000 | 7.9 |
| 11 jun | 22h 12m 35.89s | -11° 38' 35.6" | 2.26 | 108.9 | 29.665374 | 1.8 | 1.000 | 7.9 |
| 18 jun | 22h 12m 26.60s | -11° 39' 39.6" | 2.27 | 115.6 | 29.555960 | 1.7 | 1.000 | 7.9 |
| 25 jun | 22h 12m 11.56s | -11° 41' 15.5" | 2.27 | 122.3 | 29.452570 | 1.6 | 1.000 | 7.9 |
| 02 jul | 22h 11m 51.10s | -11° 43' 20.9" | 2.28 | 129.1 | 29.356678 | 1.5 | 1.000 | 7.9 |
| 09 jul | 22h 11m 25.56s | -11° 45' 54.1" | 2.29 | 135.9 | 29.269751 | 1.4 | 1.000 | 7.8 |
| 16 jul | 22h 10m 55.50s | -11° 48' 51.3" | 2.30 | 142.7 | 29.193043 | 1.2 | 1.000 | 7.8 |
| 23 jul | 22h 10m 21.38s | -11° 52' 10.1" | 2.30 | 149.5 | 29.127594 | 1.0 | 1.000 | 7.8 |
| 30 jul | 22h 09m 43.88s | -11° 55' 46.5" | 2.30 | 156.4 | 29.074409 | 0.8 | 1.000 | 7.8 |
| 06 ago | 22h 09m 03.58s | -11° 59' 37.0" | 2.31 | 163.2 | 29.034395 | 0.6 | 1.000 | 7.8 |
| 13 ago | 22h 08m 21.37s | -12° 03' 36.6" | 2.31 | 170.1 | 29.008161 | 0.3 | 1.000 | 7.8 |
| 20 ago | 22h 07m 37.89s | -12° 07' 41.7" | 2.31 | 177.0 | 28.996059 | 0.1 | 1.000 | 7.8 |
| 27 ago | 22h 06m 54.02s | -12° 11' 47.3" | 2.31 | 176.0 | 28.998362 | 0.1 | 1.000 | 7.8 |
| 03 set | 22h 06m 10.51s | -12° 15' 49.3" | 2.31 | 169.0 | 29.015179 | 0.4 | 1.000 | 7.8 |
| 10 set | 22h 05m 28.31s | -12° 19' 42.6" | 2.31 | 162.1 | 29.046272 | 0.6 | 1.000 | 7.8 |
| 17 set | 22h 04m 48.10s | -12° 23' 23.5" | 2.30 | 155.1 | 29.091155 | 0.8 | 1.000 | 7.8 |
| 24 set | 22h 04m 10.73s | -12° 26' 47.6" | 2.30 | 148.1 | 29.149254 | 1.0 | 1.000 | 7.8 |
| 01 out | 22h 03m 36.86s | -12° 29' 51.2" | 2.29 | 141.1 | 29.219824 | 1.2 | 1.000 | 7.8 |
| 08 out | 22h 03m 07.29s | -12° 32' 30.5" | 2.29 | 134.0 | 29.301784 | 1.4 | 1.000 | 7.9 |
| 15 out | 22h 02m 42.48s | -12° 34' 42.9" | 2.28 | 127.0 | 29.393870 | 1.5 | 1.000 | 7.9 |
| 22 out | 22h 02m 23.05s | -12° 36' 25.5" | 2.27 | 120.0 | 29.494782 | 1.6 | 1.000 | 7.9 |
| 29 out | 22h 02m 09.33s | -12° 37' 36.5" | 2.26 | 113.0 | 29.603095 | 1.7 | 1.000 | 7.9 |
| 05 nov | 22h 02m 01.79s | -12° 38' 13.8" | 2.25 | 105.9 | 29.717127 | 1.8 | 1.000 | 7.9 |
| 12 nov | 22h 02m 00.52s | -12° 38' 16.9" | 2.25 | 98.9 | 29.835123 | 1.9 | 1.000 | 7.9 |
| 19 nov | 22h 02m 05.72s | -12° 37' 45.0" | 2.24 | 91.9 | 29.955392 | 1.9 | 1.000 | 7.9 |
| 26 nov | 22h 02m 17.36s | -12° 36' 38.1" | 2.23 | 84.8 | 30.076206 | 1.9 | 1.000 | 7.9 |
| 03 dez | 22h 02m 35.44s | -12° 34' 56.5" | 2.22 | 77.8 | 30.195692 | 1.8 | 1.000 | 7.9 |
| 10 dez | 22h 02m 59.71s | -12° 32' 41.6" | 2.21 | 70.8 | 30.312041 | 1.8 | 1.000 | 7.9 |
| 17 dez | 22h 03m 29.93s | -12° 29' 54.7" | 2.20 | 63.9 | 30.423619 | 1.7 | 1.000 | 7.9 |
| 24 dez | 22h 04m 05.73s | -12° 26' 37.4" | 2.19 | 56.9 | 30.528847 | 1.6 | 1.000 | 7.9 |
| 31 dez | 22h 04m 46.74s | -12° 22' 52.2" | 2.19 | 49.9 | 30.626118 | 1.4 | 1.000 | 7.9 |

## VIII – Planetas Anões  Ceres

| Distância média (UA) | Período de Revolução | Inclinação Equatorial | Diâmetro |
|---|---|---|---|
| 2.55 – 2.98 | 4.60 | 10.6° | 932.6 km |

00:00 Hora – Tempo Universal

| Data | α | δ | ∅ | Elong | DT (UA)* | Ang. PH | Fase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 01 jan | 20h 10m 57.9s | -25° 55' 04" | 0.00 | 19.9 | 3.8575 | 6.5 | 0.997 | 9.1 |
| 08 jan | 20h 22m 49.5s | -25° 23' 24" | 0.00 | 15.8 | 3.8887 | 5.2 | 0.998 | 9.1 |
| 15 jan | 20h 34m 39.6s | -24° 49' 06" | 0.00 | 11.9 | 3.9126 | 3.9 | 0.999 | 9.0 |
| 22 jan | 20h 46m 26.5s | -24° 12' 24" | 0.00 | 8.4 | 3.9293 | 2.8 | 0.999 | 9.0 |
| 29 jan | 20h 58m 08.8s | -23° 33' 29" | 0.00 | 6.3 | 3.9386 | 2.1 | 1.000 | 8.9 |
| 05 fev | 21h 09m 45.4s | -22° 52' 36" | 0.00 | 6.8 | 3.9404 | 2.3 | 1.000 | 8.9 |
| 12 fev | 21h 21m 14.8s | -22° 10' 03" | 0.00 | 9.5 | 3.9348 | 3.2 | 0.999 | 9.0 |
| 19 fev | 21h 32m 35.6s | -21° 26' 07" | 0.00 | 13.1 | 3.9220 | 4.3 | 0.999 | 9.1 |
| 26 fev | 21h 43m 47.0s | -20° 41' 04" | 0.00 | 17.1 | 3.9019 | 5.6 | 0.998 | 9.1 |
| 05 mar | 21h 54m 48.4s | -19° 55' 14" | 0.00 | 21.1 | 3.8748 | 6.9 | 0.996 | 9.2 |
| 12 mar | 22h 05m 38.4s | -19° 08' 59" | 0.00 | 25.3 | 3.8407 | 8.2 | 0.995 | 9.2 |
| 19 mar | 22h 16m 16.2s | -18° 22' 39" | 0.00 | 29.5 | 3.8000 | 9.5 | 0.993 | 9.3 |
| 26 mar | 22h 26m 41.0s | -17° 36' 34" | 0.00 | 33.8 | 3.7528 | 10.7 | 0.991 | 9.3 |
| 02 abr | 22h 36m 52.1s | -16° 51' 06" | 0.00 | 38.1 | 3.6995 | 11.9 | 0.989 | 9.3 |
| 09 abr | 22h 46m 48.4s | -16° 06' 38" | 0.00 | 42.4 | 3.6402 | 13.1 | 0.987 | 9.3 |
| 16 abr | 22h 56m 28.5s | -15° 23' 35" | 0.00 | 46.8 | 3.5755 | 14.2 | 0.985 | 9.3 |
| 23 abr | 23h 05m 51.6s | -14° 42' 18" | 0.00 | 51.2 | 3.5056 | 15.2 | 0.982 | 9.3 |
| 30 abr | 23h 14m 56.5s | -14° 03' 10" | 0.00 | 55.6 | 3.4309 | 16.2 | 0.980 | 9.3 |
| 07 mai | 23h 23m 41.4s | -13° 26' 40" | 0.00 | 60.2 | 3.3519 | 17.1 | 0.978 | 9.3 |
| 14 mai | 23h 32m 04.4s | -12° 53' 13" | 0.00 | 64.8 | 3.2690 | 17.9 | 0.976 | 9.3 |
| 21 mai | 23h 40m 03.7s | -12° 23' 12" | 0.00 | 69.4 | 3.1828 | 18.5 | 0.974 | 9.2 |
| 28 mai | 23h 47m 37.1s | -11° 57' 06" | 0.00 | 74.2 | 3.0938 | 19.1 | 0.973 | 9.2 |
| 04 jun | 23h 54m 41.7s | -11° 35' 23" | 0.00 | 79.1 | 3.0025 | 19.5 | 0.971 | 9.1 |
| 11 jun | 00h 01m 14.3s | -11° 18' 31" | 0.00 | 84.1 | 2.9097 | 19.8 | 0.970 | 9.1 |
| 18 jun | 00h 07m 11.6s | -11° 06' 55" | 0.00 | 89.3 | 2.8161 | 19.9 | 0.970 | 9.0 |
| 25 jun | 00h 12m 30.0s | -11° 01' 01" | 0.00 | 94.6 | 2.7224 | 19.9 | 0.970 | 8.9 |
| 02 jul | 00h 17m 04.9s | -11° 01' 16" | 0.00 | 100.1 | 2.6296 | 19.6 | 0.971 | 8.8 |
| 09 jul | 00h 20m 51.7s | -11° 07' 59" | 0.00 | 105.8 | 2.5385 | 19.2 | 0.972 | 8.8 |
| 16 jul | 00h 23m 45.9s | -11° 21' 20" | 0.00 | 111.7 | 2.4503 | 18.5 | 0.974 | 8.6 |
| 23 jul | 00h 25m 43.2s | -11° 41' 24" | 0.00 | 117.8 | 2.3661 | 17.6 | 0.977 | 8.5 |
| 30 jul | 00h 26m 39.0s | -12° 08' 05" | 0.00 | 124.2 | 2.2870 | 16.4 | 0.980 | 8.4 |
| 06 ago | 00h 26m 29.5s | -12° 40' 57" | 0.00 | 130.7 | 2.2145 | 15.0 | 0.983 | 8.3 |
| 13 ago | 00h 25m 13.6s | -13° 19' 05" | 0.00 | 137.4 | 2.1499 | 13.3 | 0.987 | 8.2 |
| 20 ago | 00h 22m 51.7s | -14° 01' 19" | 0.00 | 144.2 | 2.0944 | 11.5 | 0.990 | 8.1 |
| 27 ago | 00h 19m 26.6s | -14° 46' 03" | 0.00 | 150.8 | 2.0495 | 9.5 | 0.993 | 7.9 |
| 03 set | 00h 15m 04.8s | -15° 31' 13" | 0.00 | 157.1 | 2.0163 | 7.6 | 0.996 | 7.8 |
| 10 set | 00h 09m 57.8s | -16° 14' 25" | 0.00 | 162.0 | 1.9957 | 6.0 | 0.997 | 7.7 |
| 17 set | 00h 04m 19.9s | -16° 53' 22" | 0.00 | 164.1 | 1.9883 | 5.3 | 0.998 | 7.7 |
| 24 set | 23h 58m 27.7s | -17° 25' 56" | 0.00 | 162.3 | 1.9944 | 5.9 | 0.997 | 7.7 |
| 01 out | 23h 52m 39.4s | -17° 50' 17" | 0.00 | 157.5 | 2.0139 | 7.4 | 0.996 | 7.8 |
| 08 out | 23h 47m 13.9s | -18° 05' 10" | 0.00 | 151.2 | 2.0463 | 9.3 | 0.993 | 7.9 |
| 15 out | 23h 42m 27.2s | -18° 10' 04" | 0.00 | 144.4 | 2.0908 | 11.3 | 0.990 | 8.0 |
| 22 out | 23h 38m 31.6s | -18° 05' 02" | 0.00 | 137.5 | 2.1460 | 13.2 | 0.987 | 8.2 |
| 29 out | 23h 35m 36.3s | -17° 50' 27" | 0.00 | 130.5 | 2.2110 | 14.8 | 0.983 | 8.3 |
| 05 nov | 23h 33m 47.2s | -17° 27' 01" | 0.00 | 123.7 | 2.2842 | 16.2 | 0.980 | 8.4 |
| 12 nov | 23h 33m 05.8s | -16° 55' 45" | 0.00 | 117.0 | 2.3641 | 17.4 | 0.977 | 8.5 |
| 19 nov | 23h 33m 30.9s | -16° 17' 34" | 0.00 | 110.6 | 2.4494 | 18.3 | 0.975 | 8.6 |
| 26 nov | 23h 34m 59.9s | -15° 33' 19" | 0.00 | 104.4 | 2.5388 | 19.0 | 0.973 | 8.7 |
| 03 dez | 23h 37m 29.3s | -14° 43' 51" | 0.00 | 98.3 | 2.6310 | 19.4 | 0.972 | 8.8 |
| 10 dez | 23h 40m 54.0s | -13° 49' 55" | 0.00 | 92.5 | 2.7247 | 19.6 | 0.971 | 8.9 |
| 17 dez | 23h 45m 08.8s | -12° 52' 12" | 0.00 | 86.8 | 2.8189 | 19.6 | 0.971 | 9.0 |
| 24 dez | 23h 50m 08.9s | -11° 51' 13" | 0.00 | 81.3 | 2.9127 | 19.4 | 0.972 | 9.0 |
| 31 dez | 23h 55m 50.0s | -10° 47' 27" | 0.00 | 76.0 | 3.0052 | 19.0 | 0.973 | 9.1 |

# Plutão

| Distância média (UA) | Período de Revolução | Inclinação Equatorial | Diâmetro |
|---|---|---|---|
| 39,44 | 248 anos | 17,2º | 2200-2300 |

00:00 Hora – Tempo Universal

| Data | α | δ | ∅ | Elong | DT (UA)* | Ang. PH | Fase | Mag. |
|---|---|---|---|---|---|---|---|---|
| 01 jan | 18h 22m 27.82s | -18° 49' 36.8" | 0.13 | 6.6 | 32.932073 | 0.2 | 1.000 | 14.1 |
| 08 jan | 18h 23m 31.15s | -18° 49' 33.3" | 0.13 | 12.6 | 32.918313 | 0.4 | 1.000 | 14.1 |
| 15 jan | 18h 24m 33.12s | -18° 49' 22.0" | 0.13 | 19.2 | 32.890495 | 0.6 | 1.000 | 14.1 |
| 22 jan | 18h 25m 33.15s | -18° 49' 03.9" | 0.13 | 25.9 | 32.849151 | 0.8 | 1.000 | 14.1 |
| 29 jan | 18h 26m 30.47s | -18° 48' 39.5" | 0.13 | 32.7 | 32.794916 | 1.0 | 1.000 | 14.1 |
| 05 fev | 18h 27m 24.48s | -18° 48' 10.3" | 0.13 | 39.5 | 32.728526 | 1.1 | 1.000 | 14.1 |
| 12 fev | 18h 28m 14.45s | -18° 47' 37.0" | 0.13 | 46.4 | 32.651017 | 1.3 | 1.000 | 14.1 |
| 19 fev | 18h 28m 59.92s | -18° 47' 01.3" | 0.13 | 53.2 | 32.563643 | 1.4 | 1.000 | 14.1 |
| 26 fev | 18h 29m 40.33s | -18° 46' 23.8" | 0.13 | 60.1 | 32.467697 | 1.5 | 1.000 | 14.1 |
| 05 mar | 18h 30m 15.26s | -18° 45' 46.3" | 0.13 | 67.0 | 32.364525 | 1.6 | 1.000 | 14.1 |
| 12 mar | 18h 30m 44.28s | -18° 45' 09.6" | 0.13 | 73.8 | 32.255708 | 1.7 | 1.000 | 14.1 |
| 19 mar | 18h 31m 07.15s | -18° 44' 35.4" | 0.13 | 80.7 | 32.142948 | 1.8 | 1.000 | 14.1 |
| 26 mar | 18h 31m 23.67s | -18° 44' 04.2" | 0.13 | 87.5 | 32.027889 | 1.8 | 1.000 | 14.1 |
| 02 abr | 18h 31m 33.69s | -18° 43' 37.9" | 0.13 | 94.4 | 31.912154 | 1.8 | 1.000 | 14.0 |
| 09 abr | 18h 31m 37.16s | -18° 43' 16.6" | 0.13 | 101.3 | 31.797513 | 1.8 | 1.000 | 14.0 |
| 16 abr | 18h 31m 34.19s | -18° 43' 02.1" | 0.13 | 108.1 | 31.685740 | 1.7 | 1.000 | 14.0 |
| 23 abr | 18h 31m 24.97s | -18° 42' 54.1" | 0.13 | 115.0 | 31.578448 | 1.6 | 1.000 | 14.0 |
| 30 abr | 18h 31m 09.68s | -18° 42' 54.2" | 0.13 | 121.8 | 31.477150 | 1.5 | 1.000 | 14.0 |
| 07 mai | 18h 30m 48.70s | -18° 43' 02.0" | 0.13 | 128.7 | 31.383411 | 1.4 | 1.000 | 14.0 |
| 14 mai | 18h 30m 22.46s | -18° 43' 18.7" | 0.13 | 135.5 | 31.298695 | 1.3 | 1.000 | 14.0 |
| 21 mai | 18h 29m 51.54s | -18° 43' 43.4" | 0.13 | 142.3 | 31.224207 | 1.1 | 1.000 | 14.0 |
| 28 mai | 18h 29m 16.45s | -18° 44' 17.0" | 0.13 | 149.1 | 31.160995 | 0.9 | 1.000 | 14.0 |
| 04 jun | 18h 28m 37.88s | -18° 44' 58.8" | 0.13 | 155.9 | 31.110083 | 0.7 | 1.000 | 14.0 |
| 11 jun | 18h 27m 56.55s | -18° 45' 49.2" | 0.13 | 162.6 | 31.072306 | 0.5 | 1.000 | 14.0 |
| 18 jun | 18h 27m 13.29s | -18° 46' 47.0" | 0.13 | 169.0 | 31.048178 | 0.3 | 1.000 | 14.0 |
| 25 jun | 18h 26m 28.78s | -18° 47' 52.6" | 0.13 | 174.5 | 31.038037 | 0.2 | 1.000 | 14.0 |
| 02 jul | 18h 25m 43.92s | -18° 49' 04.9" | 0.13 | 174.2 | 31.042149 | 0.2 | 1.000 | 14.0 |
| 09 jul | 18h 24m 59.46s | -18° 50' 23.8" | 0.13 | 168.5 | 31.060550 | 0.4 | 1.000 | 14.0 |
| 16 jul | 18h 24m 16.35s | -18° 51' 48.0" | 0.13 | 162.0 | 31.092935 | 0.6 | 1.000 | 14.0 |
| 23 jul | 18h 23m 35.21s | -18° 53' 17.3" | 0.13 | 155.4 | 31.138851 | 0.8 | 1.000 | 14.0 |
| 30 jul | 18h 22m 56.91s | -18° 54' 50.7" | 0.13 | 148.6 | 31.197772 | 0.9 | 1.000 | 14.0 |
| 06 ago | 18h 22m 22.08s | -18° 56' 27.7" | 0.13 | 141.9 | 31.268939 | 1.1 | 1.000 | 14.0 |
| 13 ago | 18h 21m 51.50s | -18° 58' 07.1" | 0.13 | 135.1 | 31.351294 | 1.3 | 1.000 | 14.0 |
| 20 ago | 18h 21m 25.57s | -18° 59' 48.3" | 0.13 | 128.3 | 31.443696 | 1.4 | 1.000 | 14.0 |
| 27 ago | 18h 21m 04.94s | -19° 01' 30.3" | 0.13 | 121.5 | 31.544966 | 1.5 | 1.000 | 14.0 |
| 03 set | 18h 20m 49.95s | -19° 03' 12.3" | 0.13 | 114.7 | 31.653740 | 1.6 | 1.000 | 14.0 |
| 10 set | 18h 20m 41.04s | -19° 04' 53.4" | 0.13 | 107.9 | 31.768429 | 1.7 | 1.000 | 14.0 |
| 17 set | 18h 20m 38.30s | -19° 06' 32.7" | 0.13 | 101.1 | 31.887454 | 1.8 | 1.000 | 14.1 |
| 24 set | 18h 20m 42.01s | -19° 08' 09.4" | 0.13 | 94.3 | 32.009268 | 1.8 | 1.000 | 14.1 |
| 01 out | 18h 20m 52.15s | -19° 09' 42.4" | 0.13 | 87.5 | 32.132205 | 1.8 | 1.000 | 14.1 |
| 08 out | 18h 21m 08.80s | -19° 11' 11.0" | 0.13 | 80.7 | 32.254473 | 1.8 | 1.000 | 14.1 |
| 15 out | 18h 21m 31.68s | -19° 12' 34.3" | 0.13 | 73.8 | 32.374401 | 1.7 | 1.000 | 14.1 |
| 22 out | 18h 22m 00.71s | -19° 13' 51.8" | 0.13 | 67.0 | 32.490419 | 1.6 | 1.000 | 14.1 |
| 29 out | 18h 22m 35.52s | -19° 15' 02.3" | 0.13 | 60.2 | 32.600925 | 1.5 | 1.000 | 14.1 |
| 05 nov | 18h 23m 15.85s | -19° 16' 05.6" | 0.13 | 53.4 | 32.704291 | 1.4 | 1.000 | 14.1 |
| 12 nov | 18h 24m 01.10s | -19° 17' 00.8" | 0.13 | 46.6 | 32.799118 | 1.3 | 1.000 | 14.1 |
| 19 nov | 18h 24m 50.90s | -19° 17' 47.9" | 0.13 | 39.8 | 32.884176 | 1.1 | 1.000 | 14.1 |
| 26 nov | 18h 25m 44.63s | -19° 18' 26.0" | 0.13 | 32.9 | 32.958277 | 1.0 | 1.000 | 14.1 |
| 03 dez | 18h 26m 41.73s | -19° 18' 55.6" | 0.13 | 26.1 | 33.020308 | 0.8 | 1.000 | 14.1 |
| 10 dez | 18h 27m 41.45s | -19° 19' 15.9" | 0.13 | 19.4 | 33.069456 | 0.6 | 1.000 | 14.1 |
| 17 dez | 18h 28m 43.18s | -19° 19' 27.9" | 0.13 | 12.7 | 33.105138 | 0.4 | 1.000 | 14.1 |
| 24 dez | 18h 29m 46.19s | -19° 19' 30.8" | 0.12 | 6.5 | 33.126855 | 0.2 | 1.000 | 14.1 |
| 31 dez | 18h 30m 49.75s | -19° 19' 25.9" | 0.12 | 4.2 | 33.134247 | 0.1 | 1.000 | 14.1 |

## IX – Asteróides

(7) - Iris ∅ (km) 199.8 DJ = 2455585.5

| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
|---|---|---|---|---|---|---|
| 01 jan | 08h 41m 43.5s | +12° 14' 59" | 1.1958 | 7.35" | 150.0 | 8.3 |
| 24 jan | 08h 18m 11.2s | +12° 25' 28" | 1.1839 | 7.43" | 172.9 | 7.9 |
| 22 fev | 07h 53m 57.5s | +13° 27' 09" | 1.3609 | 6.46" | 144.4 | 8.8 |

(44) - Nysa ∅ (km) 65 DJ = 2455602.5

| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
|---|---|---|---|---|---|---|
| 04 jan | 09h 58m 26.8s | +11° 58' 51" | 1.2535 | 7.02" | 135.6 | 9.8 |
| 10 fev | 09h 36m 34.9s | +15° 28' 23" | 1.1072 | 7.94" | 178.7 | 8.9 |
| 10 mar | 09h 15m 41.3s | +18° 06' 57" | 1.2155 | 7.24" | 146.8 | 9.6 |

(3) - Juno ∅ (km) 233.9 DJ = 2455632.5

| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
|---|---|---|---|---|---|---|
| 12 fev | 11h 48m 52.5s | -00° 24' 17" | 1.8338 | 4.80" | 145.1 | 9.4 |
| 12 mar | 11h 29m 08.7s | +03° 50' 32" | 1.7825 | 4.93" | 179.3 | 8.8 |
| 12 abr | 11h 08m 51.7s | +08° 04' 45" | 1.9849 | 4.43" | 143.4 | 9.7 |

(18) - Melpomene ∅ (km) 150 DJ = 2455637.5

| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
|---|---|---|---|---|---|---|
| 07 fev | 12h 24m 06.5s | +02° 21' 47" | 1.9322 | 4.55" | 132.9 | 10.9 |
| 17 mar | 11h 59m 37.3s | +07° 41' 14" | 1.7533 | 5.02" | 172.9 | 10.2 |
| 17 abr | 11h 35m 10.5s | +11° 14' 22" | 1.9027 | 4.62" | 142.6 | 10.8 |

(11) - Parthenope ∅ (km) 150 DJ = 2455657.5

| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
|---|---|---|---|---|---|---|
| 20 fev | 13h 30m 35.8s | -03° 31' 28" | 1.8822 | 4.67" | 128.4 | 10.9 |
| 06 abr | 13h 06m 21.0s | +00° 36' 47" | 1.5800 | 5.57" | 172.9 | 9.9 |
| 21 mai | 12h 37m 53.0s | +02° 58' 16" | 1.7835 | 4.93" | 127.8 | 10.8 |

(19) - Fortuna ∅ (km) 215 DJ = 2455658.5

| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
|---|---|---|---|---|---|---|
| 27 fev | 13h 27m 17.1s | -10° 02' 38" | 2.0007 | 4.40" | 134.0 | 11.7 |
| 07 abr | 13h 00m 22.9s | -07° 06' 37" | 1.8042 | 4.87" | 179.4 | 10.7 |
| 16 mai | 12h 34m 06.4s | -03° 58' 31" | 2.0157 | 4.36" | 134.7 | 11.8 |

(51) - Nemausa ∅ (km) 147.9 DJ = 2455663.5

| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
|---|---|---|---|---|---|---|
| 25 fev | 13h 49m 56.6s | -08° 05' 14" | 1.4604 | 6.02" | 127.4 | 11.0 |
| 12 abr | 13h 31m 41.8s | -01° 05' 51" | 1.2187 | 7.22" | 172.1 | 9.9 |
| 28 mai | 13h 08m 56.9s | +03° 14' 40" | 1.4637 | 6.01" | 127.8 | 11.1 |

(10) - Hygeia ∅ (km) 407.1 DJ = 2455694.5

| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
|---|---|---|---|---|---|---|
| 30 mar | 15h 38m 14.7s | -24° 12' 49" | 2.0259 | 4.34" | 130.7 | 10.1 |
| 13 mai | 15h 14m 07.5s | -22° 53' 32" | 1.7654 | 4.98" | 175.3 | 9.1 |
| 28 jun | 14h 50m 47.5s | -20° 01' 59" | 2.0059 | 4.38" | 130.3 | 10.0 |

(21) - Lutetia ∅ (km) 115 DJ = 2455746.5

| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
|---|---|---|---|---|---|---|
| 22 mai | 19h 16m 51.0s | -22° 52' 12" | 1.3922 | 6.32" | 132.8 | 10.8 |
| 04 jul | 18h 52m 52.3s | -24° 58' 11" | 1.1271 | 7.80" | 177.9 | 9.4 |
| 16 ago | 18h 24m 44.2s | -26° 15' 19" | 1.2665 | 6.94" | 132.8 | 10.5 |

| (9) - Metis | | ∅ (km) 151 | | DJ = 2455770.5 | | |
|---|---|---|---|---|---|---|
| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
| 10 jun | 21h 02m 05.4s | -22° 35' 26" | 1.8602 | 4.73" | 127.0 | 10.6 |
| 28 jul | 20h 33m 24.7s | -26° 36' 59" | 1.5455 | 5.69" | 172.4 | 9.6 |
| 12 set | 20h 00m 10.7s | -27° 58' 37" | 1.7622 | 4.99" | 127.4 | 10.4 |

| (48) - Doris | | ∅ (km) 221.8 | | DJ = 2455827.5 | | |
|---|---|---|---|---|---|---|
| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
| 14 ago | 00h 18m 50.2s | +03° 56' 28" | 2.2838 | 3.85" | 134.8 | 11.9 |
| 23 set | 23h 58m 21.0s | +00° 34' 15" | 2.0500 | 4.29" | 179.2 | 11.0 |
| 02 nov | 23h 37m 36.4s | -03° 00' 00" | 2.2443 | 3.92" | 134.6 | 11.8 |

| (27) - Euterpe | | ∅ (km) 108 | | DJ = 2455838.5 | | |
|---|---|---|---|---|---|---|
| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
| 23 ago | 01h 06m 16.1s | +04° 25' 37" | 1.4939 | 5.89" | 132.4 | 10.7 |
| 04 out | 00h 42m 14.2s | +01° 25' 22" | 1.2178 | 7.22" | 177.1 | 9.3 |
| 14 nov | 00h 14m 42.9s | -01° 00' 18" | 1.3487 | 6.52" | 131.8 | 10.3 |

| (31) - Euphrosina | | ∅ (km) 255.9 | | DJ = 2455868.5 | | |
|---|---|---|---|---|---|---|
| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
| 19 set | 03h 01m 37.2s | +16° 48' 47" | 1.9741 | 4.45" | 127.8 | 11.3 |
| 03 nov | 02h 23m 09.2s | +21° 54' 23" | 1.6372 | 5.37" | 172.7 | 10.2 |
| 16 dez | 01h 43m 02.7s | +24° 33' 22" | 1.8273 | 4.81" | 128.1 | 11.0 |

| (40) - Harmonia | | ∅ (km) 107.6 | | DJ = 2455877.5 | | |
|---|---|---|---|---|---|---|
| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
| 30 set | 03h 42m 06.9s | +13° 51' 00" | 1.3957 | 6.30" | 129.6 | 10.4 |
| 12 nov | 03h 13m 00.5s | +12° 12' 53" | 1.2025 | 7.31" | 174.5 | 9.4 |
| 25 dez | 2h 43m 20.0s | +12° 13' 06" | 1.4480 | 6.07" | 129.5 | 10.5 |

| (14) - Irene | | ∅ (km) 158 | | DJ = 2455878.5 | | |
|---|---|---|---|---|---|---|
| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
| 28 set | 03h 46m 41.0s | +11° 00' 33" | 2.1809 | 4.03" | 126.9 | 11.2 |
| 13 nov | 03h 16m 46.3s | +09° 27' 08" | 1.8575 | 4.73" | 171.6 | 10.2 |
| 27 dez | 02h 44m 44.8s | +09° 50' 58" | 2.0742 | 4.24" | 126.9 | 11.0 |

| (68) - Leto | | ∅ (km) 122.6 | | DJ = 2455876.5 | | |
|---|---|---|---|---|---|---|
| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
| 03 out | 03h 31m 46.7s | +17° 37' 56" | 1.5767 | 5.58" | 134.3 | 10.7 |
| 11 nov | 03h 02m 00.0s | +18° 10' 03" | 1.4568 | 6.04" | 179.0 | 9.6 |
| 20 dez | 02h 35m 01.9s | +18° 11' 43" | 1.7258 | 5.10" | 134.5 | 11.0 |

| (63) - Ausonia | | ∅ (km) 103.1 | | DJ = 2455889.5 | | |
|---|---|---|---|---|---|---|
| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
| 09 out | 04h 23m 04.6s | +29° 19' 18" | 1.8798 | 4.68" | 126.0 | 11.8 |
| 24 nov | 03h 45m 43.2s | +29° 15' 28" | 1.6560 | 5.31" | 170.8 | 11.0 |
| 31 dez | 03h 16m 04.5s | +26° 37' 32" | 1.8789 | 4.68" | 134.3 | 11.8 |

| (12) - Victoria | | ∅ (km) 126 | | DJ = 2455901.5 | | |
|---|---|---|---|---|---|---|
| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | P.H | Elong. | Mag. |
| 27 out | 05h 27m 45.0s | +21° 15' 33" | 1.7297 | 5.08" | 130.5 | 11.3 |
| 06 dez | 04h 53m 47.8s | +18° 14' 30" | 1.5933 | 5.52" | 175.6 | 10.5 |
| 31 dez | 04h 29m 42.4s | +16° 36' 39" | 1.7312 | 5.08" | 149.2 | 11.2 |

## X – Cometas

P/2006 T1 (Levy) 00:00 TU (J2000)
T 2012 Jan 12.4260 TT
q 1.005533 Peri. 179.6754
a 3.029864 Node 279.7822
e 0.668126 Incl. 18.2803
Ref: MPC 65937

| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | Ang. P.H | Elong. | Mag. |
|---|---|---|---|---|---|---|
| 01 jan | 20h 30m 04.8s | -10° 02' 31" | 4.4532 | 7.5 | 28.5 | 19.3 |
| 08 jan | 20h 37m 32.3s | -09° 31' 53" | 4.4616 | 6.3 | 23.7 | 19.3 |
| 15 jan | 20h 45m 12.5s | -08° 58' 03" | 4.4601 | 5.2 | 19.0 | 19.2 |
| 22 jan | 20h 53m 03.6s | -08° 21' 05" | 4.4488 | 4.1 | 14.8 | 19.2 |
| 29 jan | 21h 01m 03.7s | -07° 40' 57" | 4.4277 | 3.2 | 11.2 | 19.1 |
| 05 fev | 21h 09m 11.3s | -06° 57' 42" | 4.3968 | 2.6 | 9.2 | 19.1 |
| 12 fev | 21h 17m 24.7s | -06° 11' 23" | 4.3561 | 2.8 | 9.6 | 19.0 |
| 19 fev | 21h 25m 42.3s | -05° 22' 03" | 4.3060 | 3.5 | 12.1 | 18.9 |
| 26 fev | 21h 34m 03.0s | -04° 29' 45" | 4.2467 | 4.6 | 15.6 | 18.8 |
| 05 mar | 21h 42m 25.7s | -03° 34' 31" | 4.1784 | 5.9 | 19.7 | 18.7 |
| 12 mar | 21h 50m 49.0s | -02° 36' 25" | 4.1016 | 7.2 | 23.9 | 18.6 |
| 19 mar | 21h 59m 11.9s | -01° 35' 32" | 4.0167 | 8.5 | 28.3 | 18.5 |
| 26 mar | 22h 07m 33.5s | -00° 31' 52" | 3.9242 | 9.9 | 32.6 | 18.4 |
| 02 abr | 22h 15m 53.1s | +00° 34' 31" | 3.8246 | 11.2 | 37.0 | 18.3 |
| 09 abr | 22h 24m 09.5s | +01° 43' 36" | 3.7184 | 12.6 | 41.4 | 18.2 |
| 16 abr | 22h 32m 21.8s | +02° 55' 19" | 3.6061 | 13.9 | 45.8 | 18.1 |
| 23 abr | 22h 40m 29.2s | +04° 09' 40" | 3.4885 | 15.2 | 50.1 | 17.9 |
| 30 abr | 22h 48m 30.9s | +05° 26' 42" | 3.3661 | 16.4 | 54.5 | 17.8 |
| 07 mai | 22h 56m 25.8s | +06° 46' 22" | 3.2395 | 17.6 | 58.8 | 17.6 |
| 14 mai | 23h 04m 12.4s | +08° 08' 43" | 3.1093 | 18.8 | 63.1 | 17.4 |
| 21 mai | 23h 11m 49.8s | +09° 33' 47" | 2.9763 | 19.9 | 67.4 | 17.3 |
| 28 mai | 23h 19m 16.7s | +11° 01' 41" | 2.8410 | 20.9 | 71.7 | 17.1 |
| 04 jun | 23h 26m 31.0s | +12° 32' 28" | 2.7041 | 21.8 | 76.0 | 16.9 |
| 11 jun | 23h 33m 30.4s | +14° 06' 13" | 2.5664 | 22.7 | 80.3 | 16.7 |
| 18 jun | 23h 40m 12.9s | +15° 43' 06" | 2.4285 | 23.4 | 84.6 | 16.5 |
| 25 jun | 23h 46m 35.6s | +17° 23' 16" | 2.2911 | 24.1 | 89.0 | 16.3 |
| 02 jul | 23h 52m 34.4s | +19° 06' 51" | 2.1547 | 24.6 | 93.3 | 16.0 |
| 09 jul | 23h 58m 04.6s | +20° 53' 57" | 2.0202 | 25.1 | 97.7 | 15.8 |
| 16 jul | 00h 03m 01.3s | +22° 44' 42" | 1.8882 | 25.3 | 102.0 | 15.5 |
| 23 jul | 00h 07m 18.0s | +24° 39' 13" | 1.7594 | 25.5 | 106.4 | 15.3 |
| 30 jul | 00h 10m 46.2s | +26° 37' 26" | 1.6344 | 25.4 | 110.8 | 15.0 |
| 06 ago | 00h 13m 15.6s | +28° 39' 02" | 1.5139 | 25.3 | 115.1 | 14.7 |
| 13 ago | 00h 14m 35.4s | +30° 43' 32" | 1.3987 | 25.0 | 119.4 | 14.4 |
| 20 ago | 00h 14m 32.3s | +32° 50' 05" | 1.2892 | 24.5 | 123.6 | 14.1 |
| 27 ago | 00h 12m 50.3s | +34° 57' 06" | 1.1862 | 24.0 | 127.5 | 13.8 |
| 03 set | 00h 09m 12.7s | +37° 02' 01" | 1.0900 | 23.4 | 131.1 | 13.5 |
| 10 set | 00h 03m 26.2s | +39° 01' 24" | 1.0014 | 23.0 | 134.2 | 13.2 |
| 17 set | 23h 55m 20.8s | +40° 50' 48" | 0.9204 | 22.8 | 136.4 | 12.8 |
| 24 set | 23h 44m 55.1s | +42° 24' 24" | 0.8472 | 23.1 | 137.6 | 12.5 |
| 01 out | 23h 32m 25.0s | +43° 35' 41" | 0.7819 | 24.0 | 137.6 | 12.2 |
| 08 out | 23h 18m 31.0s | +44° 18' 58" | 0.7241 | 25.6 | 136.2 | 11.9 |
| 15 out | 23h 04m 12.3s | +44° 30' 34" | 0.6731 | 28.0 | 133.6 | 11.5 |
| 22 out | 22h 50m 39.8s | +44° 09' 24" | 0.6280 | 31.0 | 130.0 | 11.2 |
| 29 out | 22h 39m 08.0s | +43° 17' 39" | 0.5877 | 34.7 | 125.7 | 10.9 |
| 05 nov | 22h 30m 40.0s | +42° 00' 54" | 0.5509 | 38.7 | 121.0 | 10.5 |
| 12 nov | 22h 25m 55.0s | +40° 25' 45" | 0.5162 | 43.0 | 116.2 | 10.2 |
| 19 nov | 22h 25m 14.3s | +38° 37' 34" | 0.4822 | 47.5 | 111.4 | 9.9 |
| 26 nov | 22h 28m 52.2s | +36° 39' 43" | 0.4480 | 52.1 | 106.9 | 9.5 |
| 03 dez | 22h 37m 01.2s | +34° 33' 03" | 0.4127 | 56.8 | 102.7 | 9.2 |
| 10 dez | 22h 49m 54.0s | +32° 13' 43" | 0.3758 | 61.5 | 98.9 | 8.8 |
| 17 dez | 23h 07m 56.2s | +29° 31' 31" | 0.3376 | 66.1 | 95.6 | 8.4 |
| 24 dez | 23h 31m 56.2s | +26° 08' 32" | 0.2989 | 70.5 | 92.8 | 8.1 |
| 31 dez | 00h 03m 05.6s | +21° 37' 18" | 0.2614 | 74.3 | 90.8 | 7.7 |

45P/Honda-Mrkos-Pajdusakova 00:00 TU (J2000)
T 2012 Set 28.7534 TT
q 0.529644 Peri. 326.2449
a 3.021410 Node 89.0080
e 0.824634 Incl. 4.2533
Ref: OAA: CSC NK 1357

| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | Ang. P.H | Elong. | Mag. |
|---|---|---|---|---|---|---|
| 01 jan | 17h 55m 02.0s | -23° 14' 12" | 4.3117 | 3.3 | 11.2 | 27.2 |
| 08 jan | 18h 04m 15.3s | -23° 16' 22" | 4.2339 | 4.8 | 16.2 | 27.0 |
| 15 jan | 18h 13m 35.9s | -23° 16' 32" | 4.1461 | 6.3 | 21.2 | 26.8 |
| 22 jan | 18h 23m 02.5s | -23° 14' 39" | 4.0490 | 7.8 | 26.2 | 26.6 |
| 29 jan | 18h 32m 33.7s | -23° 10' 40" | 3.9429 | 9.3 | 31.1 | 26.4 |
| 05 fev | 18h 42m 08.2s | -23° 04' 36" | 3.8283 | 10.8 | 36.0 | 26.2 |
| 12 fev | 18h 51m 44.0s | -22° 56' 30" | 3.7058 | 12.3 | 40.9 | 26.0 |
| 19 fev | 19h 01m 20.0s | -22° 46' 24" | 3.5761 | 13.8 | 45.7 | 25.7 |
| 26 fev | 19h 10m 55.0s | -22° 34' 21" | 3.4399 | 15.2 | 50.5 | 25.5 |
| 05 mar | 19h 20m 27.7s | -22° 20' 29" | 3.2977 | 16.6 | 55.4 | 25.2 |
| 12 mar | 19h 29m 56.5s | -22° 04' 56" | 3.1503 | 18.0 | 60.2 | 24.9 |
| 19 mar | 19h 39m 20.1s | -21° 47' 51" | 2.9986 | 19.3 | 64.9 | 24.6 |
| 26 mar | 19h 48m 37.7s | -21° 29' 25" | 2.8432 | 20.5 | 69.7 | 24.3 |
| 02 abr | 19h 57m 48.1s | -21° 09' 52" | 2.6849 | 21.7 | 74.5 | 23.9 |
| 09 abr | 20h 06m 49.6s | -20° 49' 28" | 2.5244 | 22.8 | 79.2 | 23.6 |
| 16 abr | 20h 15m 41.1s | -20° 28' 32" | 2.3627 | 23.8 | 84.0 | 23.2 |
| 23 abr | 20h 24m 21.8s | -20° 07' 21" | 2.2004 | 24.8 | 88.8 | 22.8 |
| 30 abr | 20h 32m 50.3s | -19° 46' 23" | 2.0383 | 25.6 | 93.6 | 22.4 |
| 07 mai | 20h 41m 04.8s | -19° 26' 06" | 1.8772 | 26.2 | 98.4 | 21.9 |
| 14 mai | 20h 49m 03.8s | -19° 07' 07" | 1.7177 | 26.8 | 103.3 | 21.5 |
| 21 mai | 20h 56m 46.7s | -18° 50' 03" | 1.5607 | 27.1 | 108.2 | 20.9 |
| 28 mai | 21h 04m 11.7s | -18° 35' 47" | 1.4067 | 27.3 | 113.1 | 20.4 |
| 04 jun | 21h 11m 16.5s | -18° 25' 26" | 1.2563 | 27.3 | 118.2 | 19.8 |
| 11 jun | 21h 17m 59.6s | -18° 20' 25" | 1.1104 | 27.0 | 123.3 | 19.2 |
| 18 jun | 21h 24m 21.1s | -18° 22' 30" | 0.9692 | 26.4 | 128.6 | 18.5 |
| 25 jun | 21h 30m 20.2s | -18° 34' 21" | 0.8334 | 25.5 | 133.9 | 17.7 |
| 02 jul | 21h 35m 57.0s | -19° 00' 04" | 0.7032 | 24.2 | 139.4 | 16.9 |
| 09 jul | 21h 41m 16.2s | -19° 45' 56" | 0.5791 | 22.5 | 144.9 | 16.0 |
| 16 jul | 21h 46m 32.9s | -21° 03' 10" | 0.4612 | 20.5 | 150.4 | 15.0 |
| 23 jul | 21h 52m 21.4s | -23° 15' 29" | 0.3494 | 18.3 | 155.5 | 13.8 |
| 30 jul | 22h 00m 21.2s | -27° 23' 04" | 0.2440 | 17.3 | 158.6 | 12.3 |
| 06 ago | 22h 17m 53.6s | -36° 53' 20" | 0.1461 | 22.9 | 153.9 | 10.5 |
| 13 ago | 00h 44m 38.1s | -68° 07' 45" | 0.0685 | 58.4 | 118.3 | 8.1 |
| 20 ago | 08h 50m 47.7s | -25° 43' 39" | 0.0897 | 134.9 | 41.5 | 7.8 |
| 27 ago | 09h 20m 11.8s | -04° 10' 46" | 0.1785 | 154.8 | 20.9 | 8.3 |
| 03 set | 09h 30m 53.2s | +03° 02' 28" | 0.2819 | 153.5 | 19.3 | 8.2 |
| 10 set | 09h 39m 40.9s | +06° 31' 00" | 0.3975 | 143.6 | 22.9 | 7.9 |
| 17 set | 09h 50m 49.7s | +08° 17' 09" | 0.5281 | 129.0 | 26.9 | 7.5 |
| 20 set | 09h 56m 59.3s | +08° 40' 20" | 0.5897 | 121.5 | 28.4 | 7.3 |
| 24 set | 10h 06m 23.9s | +08° 52' 09" | 0.6738 | 111.1 | 30.1 | 7.3 |
| 01 out | 10h 26m 39.1s | +08° 27' 34" | 0.8285 | 92.2 | 32.1 | 7.6 |
| 08 out | 10h 49m 53.4s | +07° 17' 31" | 0.9808 | 75.2 | 33.1 | 8.5 |
| 15 out | 11h 13m 42.9s | +05° 41' 06" | 1.1212 | 62.2 | 34.0 | 9.7 |
| 22 out | 11h 36m 28.5s | +03° 54' 57" | 1.2454 | 53.0 | 35.0 | 11.1 |
| 29 out | 11h 57m 29.2s | +02° 09' 29" | 1.3532 | 46.8 | 36.5 | 12.3 |
| 05 nov | 12h 16m 37.0s | +00° 29' 57" | 1.4457 | 42.7 | 38.5 | 13.5 |
| 12 nov | 12h 33m 58.2s | -01° 01' 23" | 1.5240 | 39.9 | 40.9 | 14.5 |
| 19 nov | 12h 49m 42.5s | -02° 23' 44" | 1.5892 | 38.0 | 43.8 | 15.4 |
| 26 nov | 13h 03m 58.3s | -03° 36' 53" | 1.6420 | 36.7 | 47.1 | 16.2 |
| 03 dez | 13h 16m 51.2s | -04° 40' 51" | 1.6831 | 35.8 | 50.9 | 17.0 |
| 10 dez | 13h 28m 25.6s | -05° 35' 53" | 1.7132 | 35.1 | 54.9 | 17.6 |
| 17 dez | 13h 38m 44.2s | -06° 22' 10" | 1.7330 | 34.5 | 59.4 | 18.2 |
| 24 dez | 13h 47m 47.2s | -06° 59' 50" | 1.7430 | 34.0 | 64.2 | 18.7 |
| 31 dez | 13h 55m 32.4s | -07° 28' 52" | 1.7442 | 33.4 | 69.3 | 19.2 |

C/2009 P1 (Garradd) 00:00 TU (J2000)
T 2011 Dez 25.0276 TT
q 1.554686 Peri. 90.7059
z 0.000076 Node 325.8894
e 0.999882 Incl. 106.3370
Ref: MPC 67147

| Data | $\alpha_{(J2000,0)}$ | $\delta_{(J2000,0)}$ | DT (UA)* | Ang. P.H | Elong. | Mag. |
|---|---|---|---|---|---|---|
| 01 jan | 21h 58m 56.0s | -27° 41' 19" | 5.1479 | 8.8 | 44.0 | 14.1 |
| 08 jan | 22h 01m 12.7s | -26° 41' 47" | 5.1617 | 7.9 | 38.0 | 14.0 |
| 15 jan | 22h 03m 53.5s | -25° 42' 01" | 5.1649 | 6.9 | 32.1 | 14.0 |
| 22 jan | 22h 06m 54.7s | -24° 42' 03" | 5.1569 | 5.8 | 26.4 | 13.9 |
| 29 jan | 22h 10m 13.0s | -23° 41' 53" | 5.1372 | 4.8 | 20.9 | 13.8 |
| 05 fev | 22h 13m 45.5s | -22° 41' 30" | 5.1053 | 3.7 | 15.8 | 13.7 |
| 12 fev | 22h 17m 28.9s | -21° 40' 56" | 5.0608 | 2.8 | 11.7 | 13.7 |
| 19 fev | 22h 21m 20.3s | -20° 40' 07" | 5.0036 | 2.4 | 9.7 | 13.6 |
| 26 fev | 22h 25m 16.9s | -19° 39' 01" | 4.9339 | 2.7 | 10.9 | 13.5 |
| 05 mar | 22h 29m 16.4s | -18° 37' 33" | 4.8516 | 3.6 | 14.5 | 13.3 |
| 12 mar | 22h 33m 15.7s | -17° 35' 42" | 4.7569 | 4.9 | 19.2 | 13.2 |
| 19 mar | 22h 37m 12.2s | -16° 33' 21" | 4.6502 | 6.2 | 24.3 | 13.1 |
| 26 mar | 22h 41m 03.2s | -15° 30' 25" | 4.5320 | 7.7 | 29.6 | 13.0 |
| 02 abr | 22h 44m 46.1s | -14° 26' 45" | 4.4027 | 9.1 | 35.0 | 12.8 |
| 09 abr | 22h 48m 17.6s | -13° 22' 14" | 4.2630 | 10.5 | 40.6 | 12.7 |
| 16 abr | 22h 51m 34.1s | -12° 16' 43" | 4.1136 | 12.0 | 46.2 | 12.5 |
| 23 abr | 22h 54m 32.3s | -11° 09' 55" | 3.9555 | 13.3 | 51.8 | 12.3 |
| 30 abr | 22h 57m 07.8s | -10° 01' 34" | 3.7893 | 14.7 | 57.6 | 12.2 |
| 07 mai | 22h 59m 15.7s | -08° 51' 23" | 3.6161 | 15.9 | 63.4 | 12.0 |
| 14 mai | 23h 00m 49.8s | -07° 38' 57" | 3.4370 | 17.1 | 69.3 | 11.8 |
| 21 mai | 23h 01m 43.7s | -06° 23' 44" | 3.2533 | 18.1 | 75.4 | 11.6 |
| 28 mai | 23h 01m 49.1s | -05° 05' 08" | 3.0663 | 19.0 | 81.6 | 11.3 |
| 04 jun | 23h 00m 55.5s | -03° 42' 25" | 2.8775 | 19.6 | 87.9 | 11.1 |
| 11 jun | 22h 58m 50.3s | -02° 14' 44" | 2.6885 | 20.1 | 94.6 | 10.8 |
| 18 jun | 22h 55m 18.8s | -00° 41' 01" | 2.5014 | 20.2 | 101.4 | 10.6 |
| 25 jun | 22h 50m 02.5s | +00° 59' 52" | 2.3184 | 20.0 | 108.5 | 10.3 |
| 02 jul | 22h 42m 38.8s | +02° 48' 59" | 2.1420 | 19.5 | 116.0 | 10.0 |
| 09 jul | 22h 32m 41.7s | +04° 47' 09" | 1.9753 | 18.4 | 123.7 | 9.8 |
| 16 jul | 22h 19m 43.9s | +06° 54' 36" | 1.8219 | 17.0 | 131.5 | 9.5 |
| 23 jul | 22h 03m 18.5s | +09° 10' 04" | 1.6858 | 15.2 | 139.1 | 9.2 |
| 30 jul | 21h 43m 06.7s | +11° 29' 53" | 1.5713 | 13.4 | 145.5 | 8.9 |
| 06 ago | 21h 19m 10.4s | +13° 47' 09" | 1.4827 | 12.5 | 149.0 | 8.7 |
| 13 ago | 20h 52m 05.5s | +15° 52' 22" | 1.4234 | 13.3 | 147.9 | 8.5 |
| 20 ago | 20h 23m 05.9s | +17° 35' 21" | 1.3948 | 15.8 | 142.2 | 8.3 |
| 27 ago | 19h 53m 54.7s | +18° 48' 54" | 1.3964 | 19.3 | 133.5 | 8.2 |
| 03 set | 19h 26m 18.8s | +19° 31' 43" | 1.4248 | 22.9 | 123.7 | 8.1 |
| 10 set | 19h 01m 39.1s | +19° 48' 28" | 1.4750 | 26.1 | 113.7 | 8.1 |
| 17 set | 18h 40m 35.5s | +19° 46' 40" | 1.5410 | 28.6 | 104.1 | 8.0 |
| 24 set | 18h 23m 14.1s | +19° 34' 00" | 1.6170 | 30.3 | 95.1 | 8.0 |
| 01 out | 18h 09m 19.4s | +19° 16' 54" | 1.6979 | 31.3 | 86.8 | 8.0 |
| 08 out | 17h 58m 24.9s | +19° 00' 11" | 1.7791 | 31.7 | 79.2 | 8.0 |
| 15 out | 17h 50m 00.9s | +18° 46' 56" | 1.8569 | 31.5 | 72.2 | 7.9 |
| 22 out | 17h 43m 40.7s | +18° 39' 08" | 1.9283 | 30.8 | 65.9 | 7.9 |
| 29 out | 17h 39m 01.2s | +18° 38' 12" | 1.9908 | 29.9 | 60.3 | 7.9 |
| 05 nov | 17h 35m 42.3s | +18° 45' 14" | 2.0423 | 28.9 | 55.4 | 7.8 |
| 12 nov | 17h 33m 26.4s | +19° 01' 01" | 2.0814 | 27.9 | 51.3 | 7.8 |
| 19 nov | 17h 31m 59.9s | +19° 26' 18" | 2.1067 | 27.0 | 48.1 | 7.7 |
| 26 nov | 17h 31m 11.2s | +20° 02' 00" | 2.1176 | 26.4 | 46.0 | 7.7 |
| 03 dez | 17h 30m 49.6s | +20° 49' 20" | 2.1132 | 26.2 | 44.9 | 7.6 |
| 10 dez | 17h 30m 44.9s | +21° 49' 35" | 2.0937 | 26.5 | 45.1 | 7.5 |
| 17 dez | 17h 30m 48.3s | +23° 04' 27" | 2.0591 | 27.3 | 46.4 | 7.5 |
| 24 dez | 17h 30m 50.6s | +24° 36' 14" | 2.0101 | 28.5 | 48.8 | 7.4 |
| 31 dez | 17h 30m 40.3s | +26° 27' 53" | 1.9478 | 30.0 | 52.2 | 7.4 |

## XI - Meteoros

00:00 Hora – Tempo Universal

| Data | Chuva de Meteoro | TZ* | α | δ | Frac. Illum. | Longitude º |
|---|---|---|---|---|---|---|
| 03/01 | Quadrantideas | 80 | 15h28m | 50° | 0,00 | 283 |
| 11/04 | Virginideas | 5 | 14h04m | -9° | 0,54 | 22 |
| 22/04 | Lyridas | 12 | 18h08m | 32° | 0,72 | 32 |
| 28/04 | alpa-Scorpiideas | 5 | 16h32m | -24° | 0,17 | 38 |
| 05/05 | eta-Aquarideas | 35 | 22h20m | -1° | 0,06 | 45 |
| 12/05 | alpa-Scorpiideas | 5 | 16h04m | -24° | 0,72 | 52 |
| 09/06 | Opiucideas | 5 | 17h56m | -23° | 0,59 | 79 |
| 20/06 | Opiucideas | 5 | 17h20m | -20° | 0,74 | 89 |
| 08/07 | Capricornideas | 5 | | | 0,57 | 106 |
| 15/07 | Capricornideas | 5 | 20h44m | -15° | 1,00 | 113 |
| 20/07 | alpa-Cygnideas | 5 | 21h00m | 48° | 0,72 | 118 |
| 25/07 | Capricornideas | 5 | 21h00m | -15° | 0,25 | 123 |
| 29/07 | delta-Aquarideas | 20 | 22h36m | -17° | 0,01 | 126 |
| 31/07 | Piscis Australideas | 5 | 22h40m | -30° | 0,02 | 128 |
| 02/08 | alpa-Capricornideas | 5 | 20h36m | -10° | 0,13 | 130 |
| 06/08 | iota-Aquarideas | 8 | 22h10m | -15° | 0,55 | 134 |
| 12/08 | Perseidas | 75 | 3h04m | 58° | 0,99 | 140 |
| 21/08 | alpa-Cygnideas | 5 | 21h00m | 48° | 0,50 | 148 |
| 08/09 | Piscideas | 10 | 0h36m | 7° | 0,88 | 166 |
| 20/09 | Piscideas | 5 | 0h24m | 0° | 0,47 | 178 |
| 13/10 | Piscideas | ?? | 1h44m | 14° | 0,97 | 200 |
| 22/10 | Orionideas | 25 | 6h24m | 15° | 0,22 | 209 |
| 03/11 | Taurideas | 8 | 3h44m | 14° | 0,62 | 221 |
| 17/11 | Leonideas | 10 | 10h08m | 22° | 0,58 | 235 |
| 09/12 | Puppideas-Velideas | 15 | 9h00m | -48° | 0,99 | 257 |
| 14/12 | Geminideas | 75 | 7h28m | 32° | 0,82 | 262 |
| 22/12 | Ursídeas | 5 | 14h28m | 78° | 0,05 | 271 |
| 25/12 | Puppideas-Velideas | 15 | 9h20m | -65° | 0,02 | 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.

## XII - Tabelas, Textos e Símbolos

Horário Mundial

Diferença horária entre o Brasil e outros países

| | | | | | |
|---|---|---|---|---|---|
| África do Sul | +5:00 | Canadá | | Estados Unidos | |
| Alemanha | | Zona Central | | Zona Central | -3:00 |
| (Boom, Frankfurt, | +4:00 | (Winnipeg) | -3:00 | (Chicago, New | |
| Dusseldorf, Hamburgo | | | | Orleans) | |
| e Munique | | 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 |
| Áustria | +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, | | Zona Este | | México | - 3:00 |
| Otawa, Quebec e | -2:00 | (Boston, | | Noruega | + 4:00 |
| Toronto) | | Philadelphia, New | | Panamá | - 2:00 |
| | | York, Washington) | -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 unidade 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.

## MULTIPLOS E SUBMÚLTIPLOS DECIMAIS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| exa | E | 1.000 000 000 000 000 000 | de unidades | deci | d | 0,1 | unidades |
| peta | P | 1.000 000 000 000 000 | de unidades | centi | c | 0,01 | unidades |
| tera | T | 1.000 000 000 000 | de unidades | mili | m | 0,001 | unidades |
| giga | G | 1.000 000 000 | de unidades | micro | $\mu$ | 0,000 001 | unidades |
| mega | M | 1.000 000 | de unidades | nano | n | 0,000 000 001 | unidades |
| kilo | k | 1.000 | unidades | pico | p | 0,000 000 000 001 | unidades |
| ecto | | 100 | unidades | femto | f | 0,000 000 000 000 001 | unidades |
| deca | da | 10 | unidades | atto | a | 0,000 000 000 000 000 001 | 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 | | $2\pi$rad |
| grado* | | $\pi$/200rad |
| grau | | $\pi$/180rad |
| minuto | | $\pi$/10.800rad |
| segundo | | $\pi$/648.000rad |

## II– UNIDADES DE MASSA

| | | |
|---|---|---|
| Massa | | |
| KILOGRAMA | | |
| (os prefixos associam à unidade grama) | Kg | |
| Tonelada | t | 1000Kg |
| GRAMA | g | 0,001g |
| Quilate métrico* | | 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 |
| ora | | 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 | $2\pi$r/60rad/s |
| Rotação por segundo | rps | $2\pi$r/3.600rad/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 | AMPÉRE | A | Força eletromotriz diferença de potencial (ou tensão) | VOLT | V |
| Potência WATT | W | | Potência aparente volt ampére | VA | |
| Potência reativa var | Var | | Resistência elétrica OM | Ω | |
| Condutância elétrica SIEMENS | S | | Intensidade de campo elétrico VOLT POR METRO | V/m | |
| Quantidade de eletricidade, carga elétrica | | | | | |
| COULOMB | | C | | | |
| Ampére-hora | | A | | 3.600 C | |
| Capacidade elétrica | | FARAD | | F | |
| Indutância elétrica | | ENRY | | | |
| Fluxo de indução magnética | | TESLA | | T | |
| Intensidade de campo magnético | | AMPÉRE POR METRO | | A/m | |
| Força magnetomotriz | | AMPÉRE | | A | |
| **VI – UNIDADES TÉRMICAS** | | | | | |
| Temperatura termodinâmica | | KELVIN | | K | |
| Temperatura Celsius | | **GRAU CELSIUS** | | ºC | |
| 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 $\delta$) | |
| **VIII – UNIDADES DE RADIOATIVIDADE** | | | | | |
| Atividade radionuclear | | BECQUEREL | | Bq | |
| Curie* | | Ci | | $3,7.10^{10}$Bq | |
| Exposição de raios X ou $\gamma$ | | | | | |
| COULOMB POR KILOGRAMA | | C/kg | | | |
| röntgen* | | R | | $2.58.10^{-4}$ C/kg | |
| Dose absorvida | | GRAY | | Gy | |
| Rad* | | rf | | 0,01Gy | |
| Equivalente de dose | | SIEVERT | | Sv | |
| Rem* | | rem | | 0,01Sv | |
| **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 H.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 Légua Sesmaria | 6.000 metros |
| 1 Alqueire Mineiro | 48,400 m quadrados | 1 Légua 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 | ο | 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:

**MALE = 6.5 + 5 log D (cm)**

**Onde: D = Diâmetro do telescópio.**

**6.5 = Limite de magnitude estrelar 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 |
| | H | Horas |
| | M | Minutos de tempo |
| | S | Segundos de tempo |
| | ° | 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 | DT (UA)* | Distância a Terra em U.A |
| fev | Fevereiro | ∅ | Diâmetro |
| mar | Março | %ill | Percentual Iluminado |
| abr | Abril | P.H | Paralaxe Horizontal |
| mai | Maio | Mag. | Magnitude |
| jun | Junho | Elong. | Elongação |
| jul | Julho | Ang. PH | Ângulo de Fase |
| ago | Agosto | MC | Meridiano Central |
| set | Setembro | TT | Tempo Terrestre |
| out | Outubro | $\alpha_{(J2000,0)}$ | Ascensão reta no Equinócio J2000,0 |
| nov | Novembro | $\delta_{(J2000,0)}$ | Declinação no Equinócio J2000,0 |
| dez | Dezembro | Mag. Máx. Opp. | Magnitude máxima em Oposição |
| T | Data de passagem no Periélio | q | Distância do periélio (UA) do |
| Peri | Argumento do Periélio (graus) | a | Semi-eixo maior orbital de cometa |
| Node | Longitude de Nodo Ascendente | e | Excentricidade orbital |
| Incl. | Inclinação Orbital (graus) | Ref MPC | Referência do Minor Planet Center |
| (15) – Eunomia | Número e Nome de Asteróide | P/2006 T1 (Levy) | Designação e Nome de Cometa periódico (> 200 anos). |

**Nota:** (UA)* Unidade Astronômica. Unidade de distância equivalente a 149.600 x 106m. Convencionou-se, para definir a unidade de distância astronômica, tornar-se como comprimento de referência o semi-eixo maior que teria a órbita de um planeta ideal de m=0, não perturbado, e cujo período de revolução fosse igual ao da Terra.

## Numeração utilizada para identificação dos satélites jovianos e saturnianos

| | | | |
|---|---|---|---|
| SATÉLITES DE JÚPITER | 1 | = | Io, |
| | 2 | = | Europa, |
| | 3 | = | Ganimedes, |
| | 4 | = | Callisto. |
| SATÉLITES DE SATURNO | 1 | = | Mimas, |
| | 2 | = | Enceladus, |
| | 3 | = | Tethys, |
| | 4 | = | Dione, |
| | 5 | = | Rhea, |
| | 6 | = | Titan, |
| | 7 | = | Hyperion, |
| | 8 | = | Iapetus. |

**Nota. 1-** 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.

**Nota. 2**- Em função da distância à Terra, os satélites saturnianos apresentam as seguintes magnitudes: Mimas = 12.9; Enceladus = 11.7, Tethys = 10.2, Dione = 10.4, Rhea = 9.7, Titan = 8.3, Hyperion = 14.2 e Iapetus = 11.1

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