

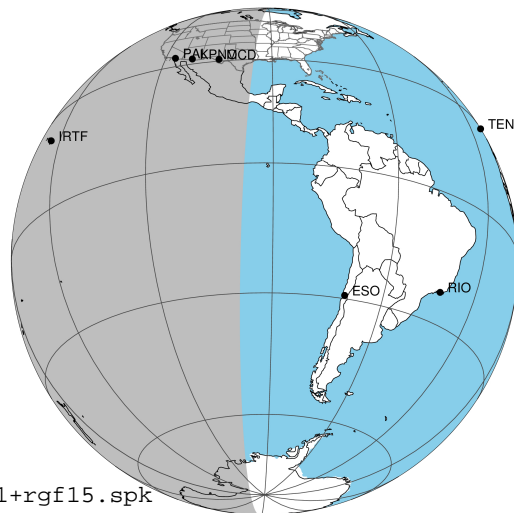
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-12T12:35:53.710
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068856032691540352
 2Mass ID (if available) : 17460618-2251517

Jupiter 2031-03-12T12:35:53 K8.03 G14.31 Pgt

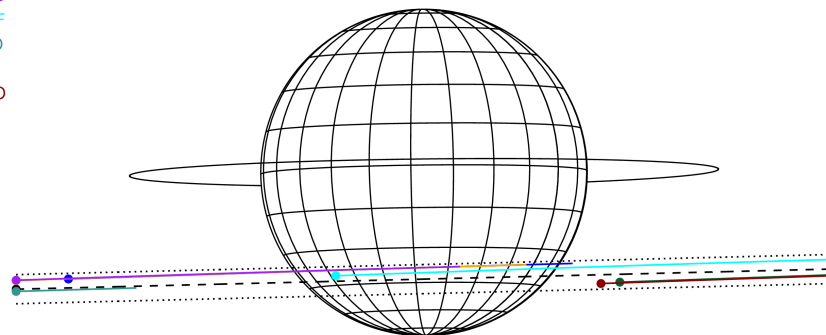
ICRS Star Coord at Epoch: 17h 46m 06.19551s -22:51:52.09982s

RUWE (>1.4 is poor) : 0.91
 K magnitude : 8.031
 G magnitude : 14.315
 RP magnitude : 12.769
 BP magnitude : 17.815
 DUPflag : 0
 Distance (au) : 5.314
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 16.00
 Sun-Target sep (deg) : 84.50
 Sun-Moon sep (deg) : 54.05
 B (ring opening deg) : -2.63
 PA of pole (deg) : 0.66
 Pole direction: RA (deg): 268.05700
 Dec (deg): 64.49651
 C/A sky separation (") : 12.114
 C/A sky separation (km) : 46688.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-03-12T12:35:53 K8.03 G14.31 Pgt



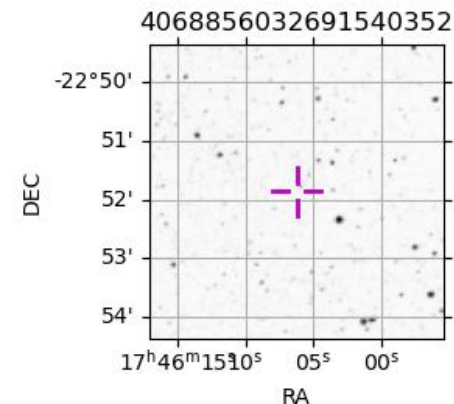
Earth
 PAL
 KPNO
 MCD
 IRTF
 ESO
 AAT
 MSO



2031-03-12T12:35:53.7100 α: 17 46 06.1955 δ: -22 51 52.100 C/A ***** PA 1.42 deg v_sky +16.00 km/s D 05.31 AU
 Credit: Styled after SORA/Lucky Star

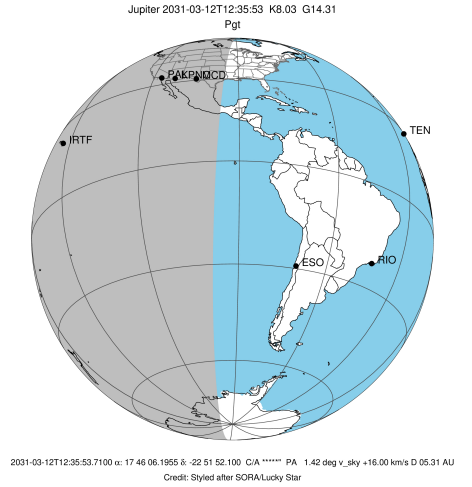
Observable events with sun below -5 deg and altitude above 5 deg

| Obs | Location | lat | Elon | Target | Observed Events Interval | OCode |
|------|-----------------------------------|-------|-------|--------|-----------------------------|-------|
| PIC | Pic du Midi | 42.9 | 0.1 | | | Pnn |
| PAL | Palomar Mt (200") | 33.4 | 243.1 | + + | MAR 12 11:31 - MAR 12 13:35 | Pie |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | | | Pnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | + | MAR 12 11:32 - MAR 12 11:32 | Pin |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | + | MAR 12 11:32 - MAR 12 11:32 | Pin |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | | | Pnn |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | + | MAR 12 13:30 - MAR 12 13:30 | Pne |
| KAV | Kavalur Observatory | 12.6 | 78.8 | | | Pnn |
| RIO | Rio de Janeiro | -22.9 | 316.8 | | | Pnn |
| ESO | European Southern Obs. (3.6m) | -29.3 | 289.3 | | | Pnn |
| AAT | Siding Spring (AAT) | -31.3 | 149.1 | | | Pnn |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8 | | | Pnn |
| MSO | Mt. Stromlo Observatory | -35.3 | 149.0 | | | Pnn |

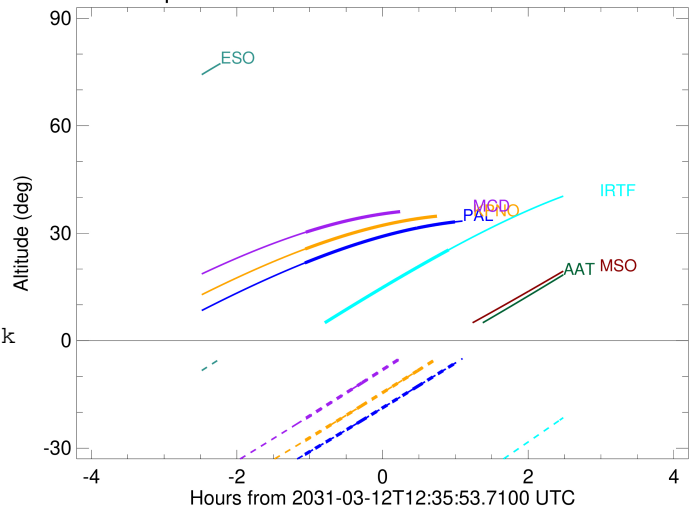


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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-12T12:33:35.480
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)  : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 4068856032691540352
2Mass ID (if available) : 17460618-2251517
ICRS Star Coord at Epoch: 17h 46m 06.19551s -22:51:52.09982s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 8.031
G magnitude          : 14.315
RP magnitude         : 12.769
BP magnitude         : 17.815
DUPflag             : 0
Distance (au)        : 5.314
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 16.00
Sun-Target sep (deg) : 84.50
Sun-Moon sep (deg)  : 54.26
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.66
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation ("): 10.807
C/A sky separation (km): 41653.9
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
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Jupiter 2031-03-12T12:35:53 K8.03 G14.31

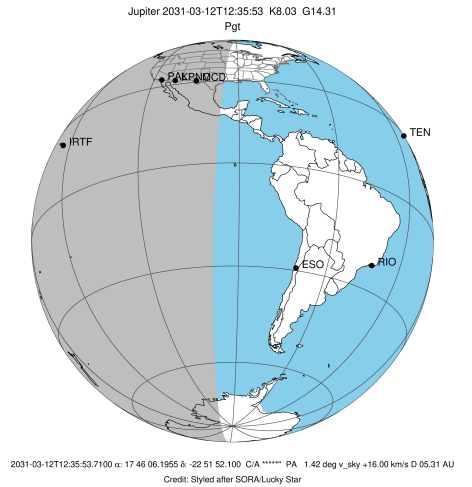


x: target alt < 5.0 deg or sun > -5.0 deg

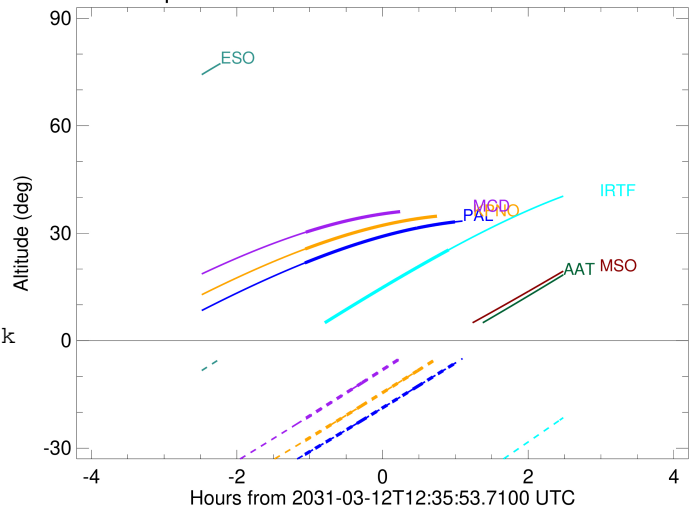
| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2031-03-12T11:31:54.388 | 21.70 | -31.77 | 71488.6 | -36.68 | -40.32 |
| Jupiter | E | 2031-03-12T13:35:32.302 | 33.15 | -6.32 | 71488.9 | -34.64 | -38.23 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-12T12:34:00.530
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : KPNO
Location              : Kitt Peak Natl Obs
Latitude (deg)        : 31.96333
E. Longitude (deg)    : 248.40000
Altitude (km)         : 2.120
Gaia source ID        : 4068856032691540352
2Mass ID (if available) : 17460618-2251517
ICRS Star Coord at Epoch: 17h 46m 06.19551s -22:51:52.09982s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.031
G magnitude           : 14.315
RP magnitude          : 12.769
BP magnitude          : 17.815
DUPflag              : 0
Distance (au)         : 5.314
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 16.00
Sun-Target sep (deg) : 84.50
Sun-Moon sep (deg)   : 54.33
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.66
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 10.809
C/A sky separation (km) : 41658.4
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
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Jupiter 2031-03-12T12:35:53 K8.03 G14.31

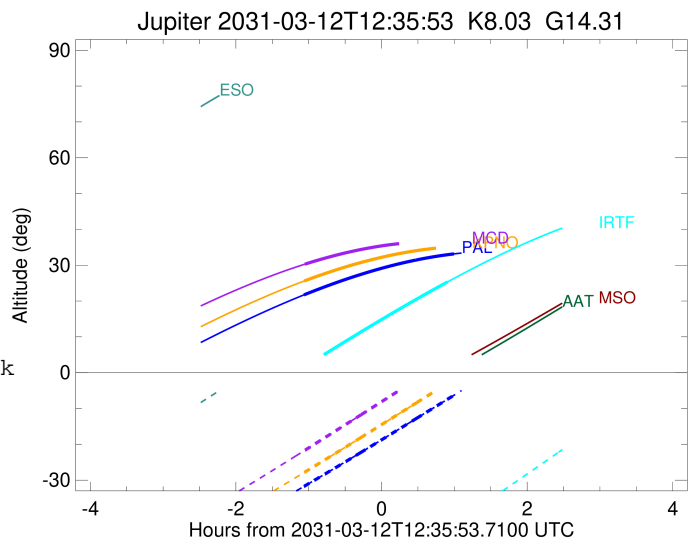
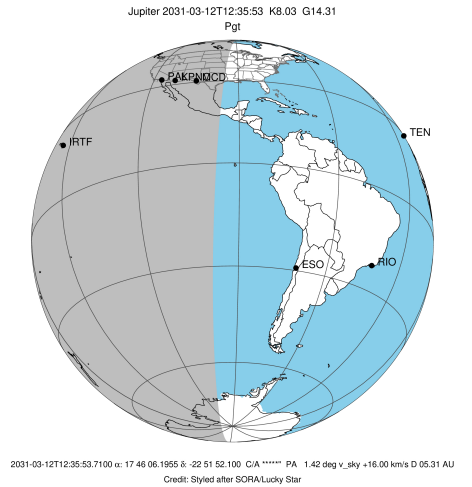


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2031-03-12T11:32:14.147 | 25.59 | -27.85 | 71488.6 | -36.64 | -40.29 |
| Jupiter | E | 2031-03-12T13:36:00.744 | 35.16 | -1.75x | 71488.9 | -34.70 | -38.28 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-12T12:34:40.280
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : MCD
Location            : McDonald Obs. 2.7m
Latitude (deg)      : 30.67158
E. Longitude (deg)  : 255.97844
Altitude (km)       : 2.075
Gaia source ID      : 4068856032691540352
2Mass ID (if available) : 17460618-2251517
ICRS Star Coord at Epoch: 17h 46m 06.19551s -22:51:52.09982s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 8.031
G magnitude          : 14.315
RP magnitude         : 12.769
BP magnitude         : 17.815
DUPflag             : 0
Distance (au)       : 5.314
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 16.00
Sun-Target sep (deg) : 84.50
Sun-Moon sep (deg)  : 54.43
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.66
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 10.806
C/A sky separation (km) : 41648.4
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

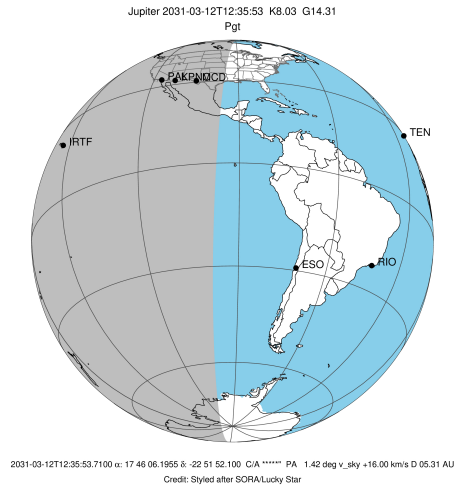


x: target alt < 5.0 deg or sun > -5.0 deg

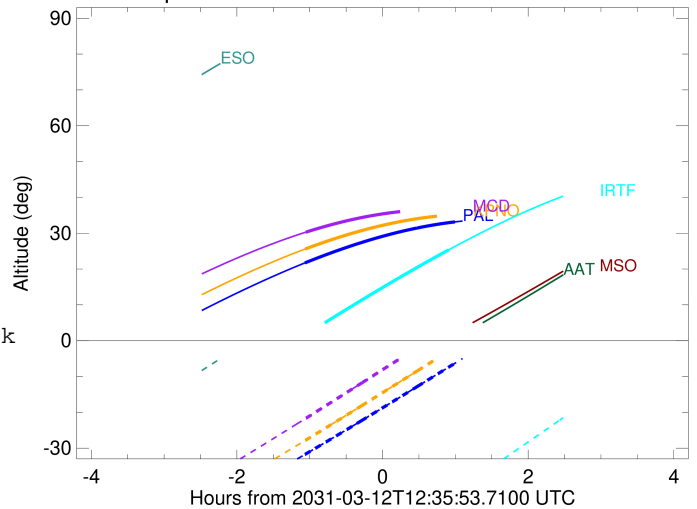
| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2031-03-12T11:32:47.222 | 30.29 | -21.65 | 71488.6 | -36.57 | -40.21 |
| Jupiter | E | 2031-03-12T13:36:44.103 | 36.54 | 4.98x | 71488.9 | -34.76 | -38.35 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-12T12:30:37.330
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : IRTF
Location            : Mauna Kea/IRTF
Latitude (deg)      : 19.82622
E. Longitude (deg)  : 204.52800
Altitude (km)       : 4.168
Gaia source ID      : 4068856032691540352
2Mass ID (if available) : 17460618-2251517
ICRS Star Coord at Epoch: 17h 46m 06.19551s -22:51:52.09982s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 8.031
G magnitude          : 14.315
RP magnitude         : 12.769
BP magnitude         : 17.815
DUPflag             : 0
Distance (au)       : 5.314
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 16.00
Sun-Target sep (deg) : 84.50
Sun-Moon sep (deg)  : 53.78
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.66
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 11.373
C/A sky separation (km) : 43833.4
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```



Jupiter 2031-03-12T12:35:53 K8.03 G14.31



x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2031-03-12T11:31:22.173 | 1.38x | -68.06 | 71488.2 | -39.12 | -42.82 |
| Jupiter | E | 2031-03-12T13:30:19.862 | 25.33 | -43.44 | 71488.6 | -36.48 | -40.12 |