

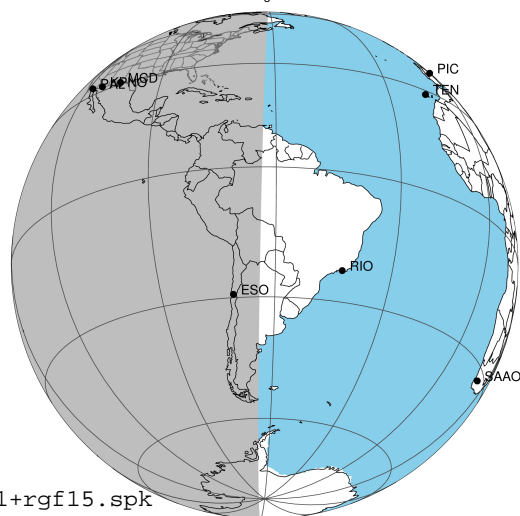
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-17T10:21:16.380
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068887574878978304
 2Mass ID (if available) : 17480524-2252292

Jupiter 2031-03-17T10:21:16 K8.39 G14.05 Pgt

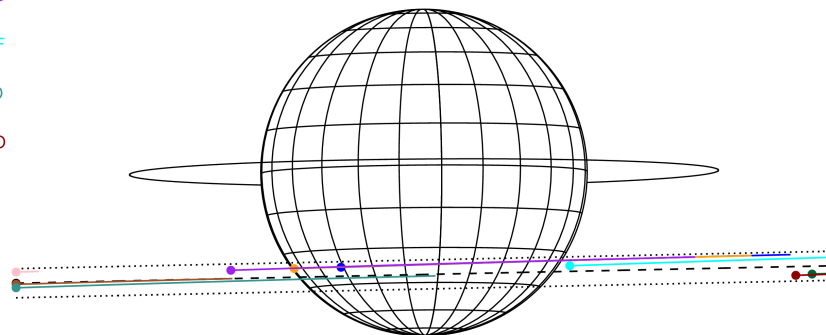
ICRS Star Coord at Epoch: 17h 48m 05.25459s -22:52:29.43549s

RUWE (>1.4 is poor) : 0.88
 K magnitude : 8.394
 G magnitude : 14.046
 RP magnitude : 12.618
 BP magnitude : 16.618
 DUPflag : 0
 Distance (au) : 5.235
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 13.70
 Sun-Target sep (deg) : 88.94
 Sun-Moon sep (deg) : 14.41
 B (ring opening deg) : -2.62
 PA of pole (deg) : 0.45
 Pole direction: RA (deg): 268.05700
 Dec (deg): 64.49651
 C/A sky separation (") : 11.766
 C/A sky separation (km) : 44669.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-03-17T10:21:16 K8.39 G14.05
 Pgt



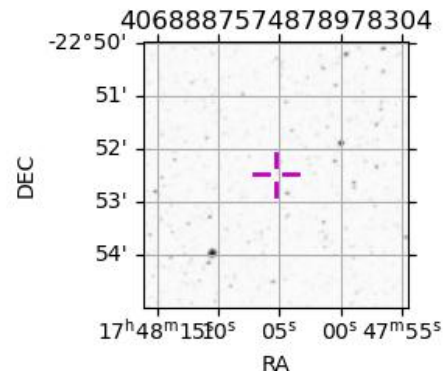
Earth
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 MSO



2031-03-17T10:21:16.3800 α: 17 48 05.2546 δ: -22 52 29.435 C/A ***** PA 1.22 deg v_sky +13.70 km/s D 05.23 AU
 Credit: Styled after SORA/Lucky Star

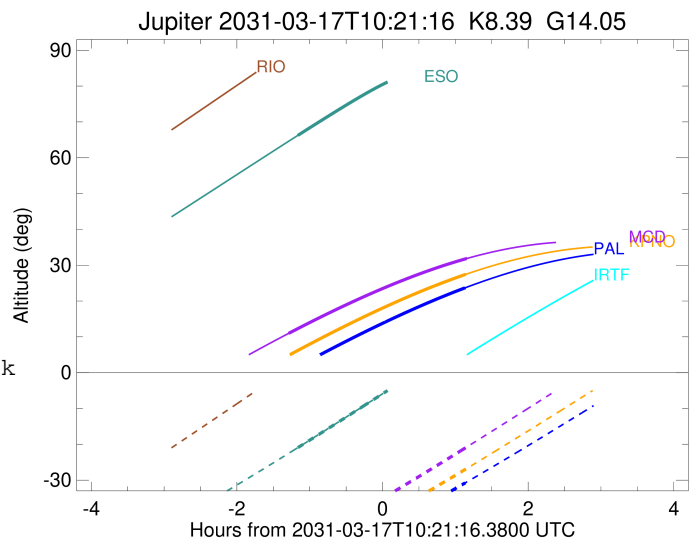
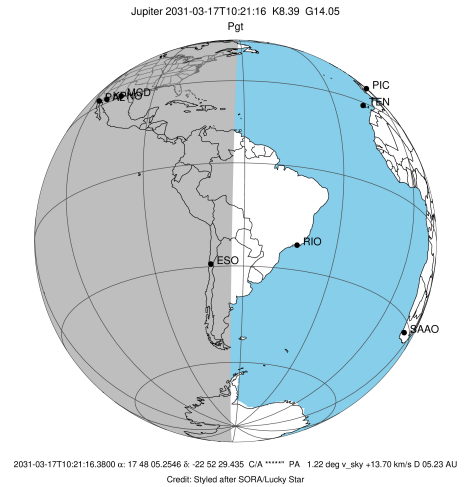
Observable events with sun below -5 deg and altitude above 5 deg

| 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 17 11:29 - MAR 17 11:29 | Pne |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | | | Pnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | + | MAR 17 11:29 - MAR 17 11:29 | Pne |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | + | MAR 17 09:03 - MAR 17 11:30 | Pie |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | | | Pnn |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | | | Pnn |
| 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 | + | MAR 17 09:11 - MAR 17 09:11 | Pin |
| 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 |



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-17T10:16:18.010
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      : 4068887574878978304
2Mass ID (if available) : 17480524-2252292
ICRS Star Coord at Epoch: 17h 48m 05.25459s -22:52:29.43549s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 8.394
G magnitude          : 14.046
RP magnitude         : 12.618
BP magnitude         : 16.618
DUPflag             : 0
Distance (au)       : 5.235
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 13.70
Sun-Target sep (deg) : 88.94
Sun-Moon sep (deg)  : 15.01
B (ring opening deg) : -2.62
PA of pole (deg)    : 0.45
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation ("): 10.631
C/A sky separation (km): 40362.8
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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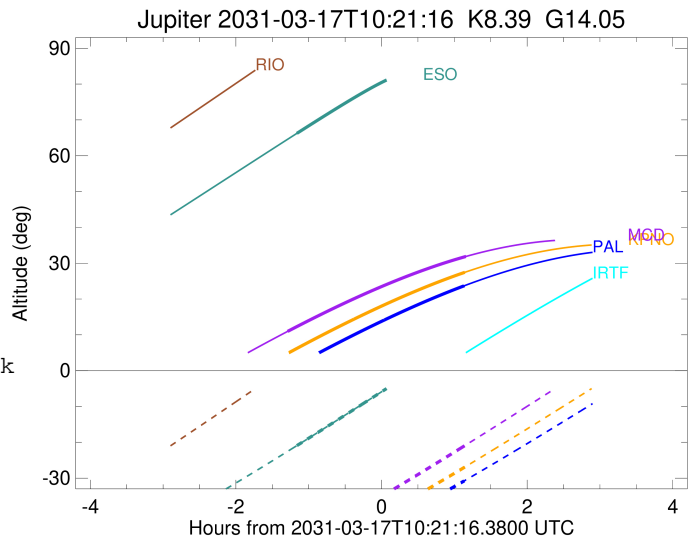
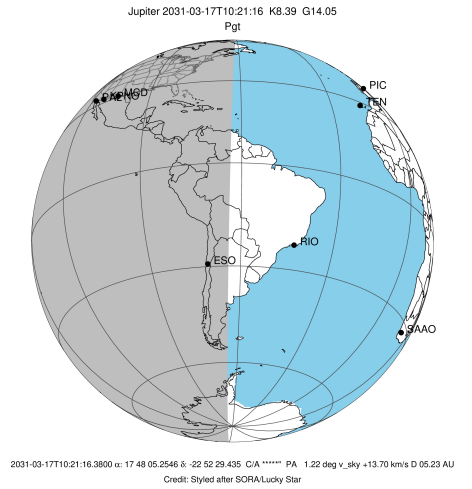


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2031-03-17T09:03:47.195 | 0.24x | -54.41 | 71488.8 | -35.70 | -39.32 |
| Jupiter | E | 2031-03-17T11:29:29.333 | 23.70 | -30.76 | 71489.2 | -33.07 | -36.60 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-17T10:16:33.820
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       : 4068887574878978304
2Mass ID (if available) : 17480524-2252292
ICRS Star Coord at Epoch: 17h 48m 05.25459s -22:52:29.43549s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 8.394
G magnitude          : 14.046
RP magnitude         : 12.618
BP magnitude         : 16.618
DUPflag             : 0
Distance (au)        : 5.235
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 13.70
Sun-Target sep (deg) : 88.94
Sun-Moon sep (deg)   : 14.99
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.45
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 10.616
C/A sky separation (km) : 40303.5
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
    
```

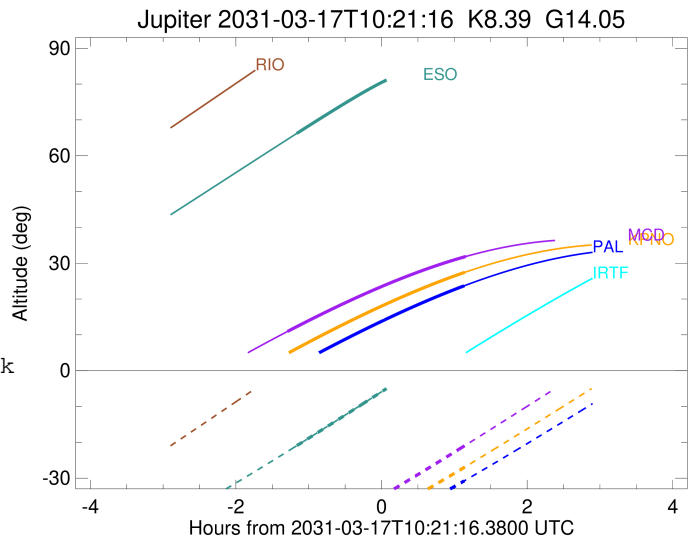
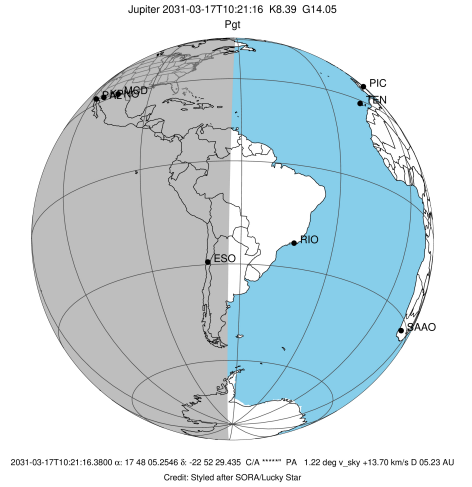


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2031-03-17T09:03:49.273 | 4.80x | -53.03 | 71488.8 | -35.62 | -39.24 |
| Jupiter | E | 2031-03-17T11:29:57.499 | 27.45 | -26.90 | 71489.2 | -33.05 | -36.57 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-17T10:17:04.070
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       : 4068887574878978304
2Mass ID (if available) : 17480524-2252292
ICRS Star Coord at Epoch: 17h 48m 05.25459s -22:52:29.43549s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 8.394
G magnitude           : 14.046
RP magnitude         : 12.618
BP magnitude         : 16.618
DUPflag              : 0
Distance (au)        : 5.235
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 13.70
Sun-Target sep (deg) : 88.94
Sun-Moon sep (deg)   : 14.95
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.45
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 10.584
C/A sky separation (km) : 40181.8
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
    
```

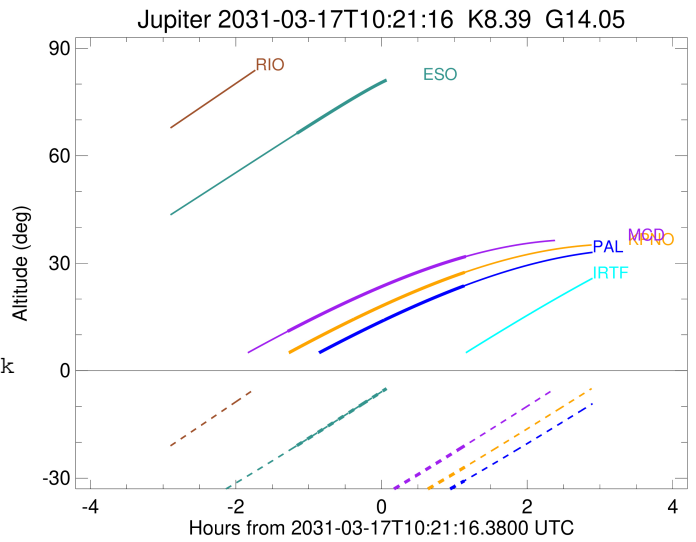
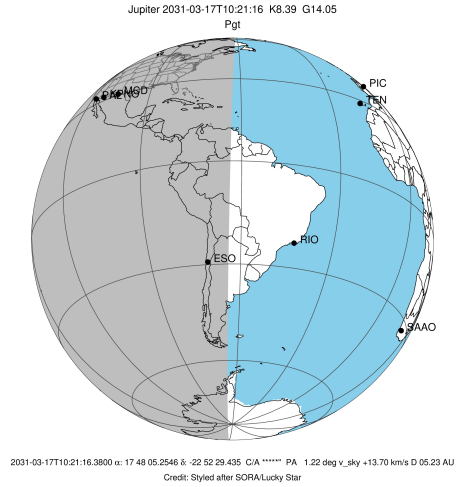


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2031-03-17T09:03:58.811 | 10.97 | -49.38 | 71488.8 | -35.47 | -39.08 |
| Jupiter | E | 2031-03-17T11:30:45.590 | 31.87 | -20.74 | 71489.2 | -32.99 | -36.51 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-17T10:20:26.030
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : ESO
Location             : European Southern Obs. (3.6m)
Latitude (deg)       : -29.26097
E. Longitude (deg)  : 289.26831
Altitude (km)        : 2.400
Gaia source ID       : 4068887574878978304
2Mass ID (if available) : 17480524-2252292
ICRS Star Coord at Epoch: 17h 48m 05.25459s -22:52:29.43549s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 8.394
G magnitude           : 14.046
RP magnitude         : 12.618
BP magnitude         : 16.618
DUPflag              : 0
Distance (au)        : 5.235
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 13.70
Sun-Target sep (deg) : 88.94
Sun-Moon sep (deg)  : 14.80
B (ring opening deg) : -2.62
PA of pole (deg)    : 0.45
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 11.957
C/A sky separation (km) : 45397.4
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 | 2031-03-17T09:11:28.992 | 66.22 | -20.93 | 71488.0 | -40.38 | -44.09 |
| Jupiter | E | 2031-03-17T11:29:36.288 | 79.79 | 9.00x | 71488.3 | -38.57 | -42.26 |