

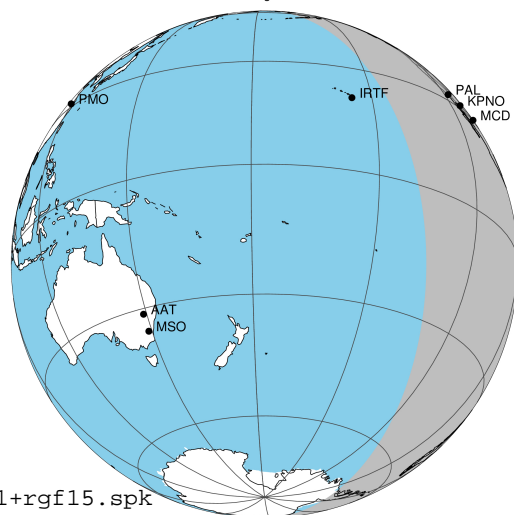
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-10-30T03:00:55.870
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068812808126238208
 2Mass ID (if available) : 17441362-2316280

Jupiter 2031-10-30T03:00:55 K9.24 G14.79 Pgt

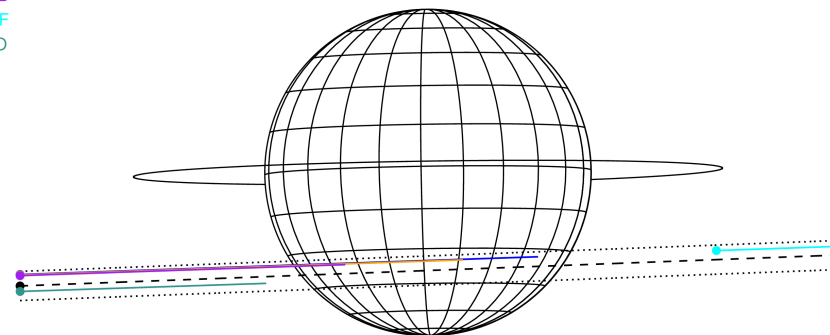
ICRS Star Coord at Epoch: 17h 44m 13.60318s -23:16:28.27460s

RUWE (>1.4 is poor) : 1.40
 K magnitude : 9.241
 G magnitude : 14.793
 RP magnitude : 13.347
 BP magnitude : 16.803
 DUPflag : 0
 Distance (au) : 5.810
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 32.23
 Sun-Target sep (deg) : 50.33
 Sun-Moon sep (deg) : 127.34
 B (ring opening deg) : -2.22
 PA of pole (deg) : 0.86
 Pole direction: RA (deg): 268.05681
 Dec (deg): 64.49652
 C/A sky separation (") : 10.183
 C/A sky separation (km) : 42911.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-10-30T03:00:55 K9.24 G14.79
 Pgt



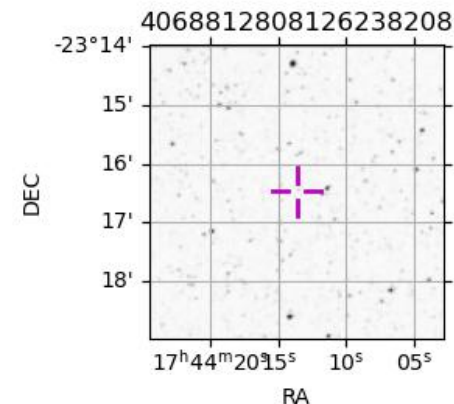
Earth
 PAL
 KPNO
 MCD
 IRTF
 ESO



2031-10-30T03:00:55.8700 α: 17 44 13.6032 δ: -23 16 28.275 C/A ***** PA 2.16 deg v_sky +32.23 km/s D 05.81 AU
 Credit: Styled after SORA/Lucky Star

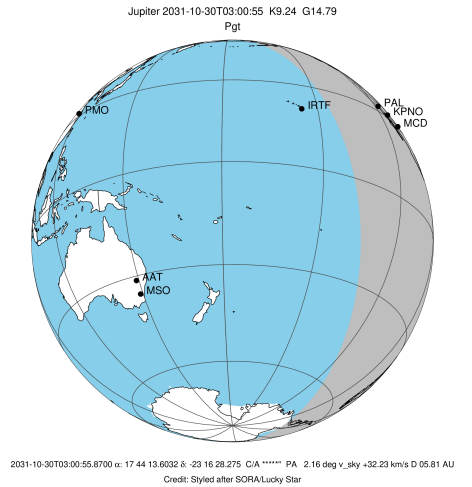
Observable events with sun below -5 deg and altitude above 5 deg

| Obs | Location | lat | Elon | Target | Observed Events Interval | OEncode |
|------|-----------------------------------|-------|-------|--------|-----------------------------|---------|
| PIC | Pic du Midi | 42.9 | 0.1 | | | Pnn |
| PAL | Palomar Mt (200") | 33.4 | 243.1 | + | OCT 30 02:31 - OCT 30 02:31 | Pin |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | | | Pnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | + | OCT 30 02:32 - OCT 30 02:32 | Pin |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | + | OCT 30 02:32 - OCT 30 02:32 | Pin |
| 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 | | | 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 |

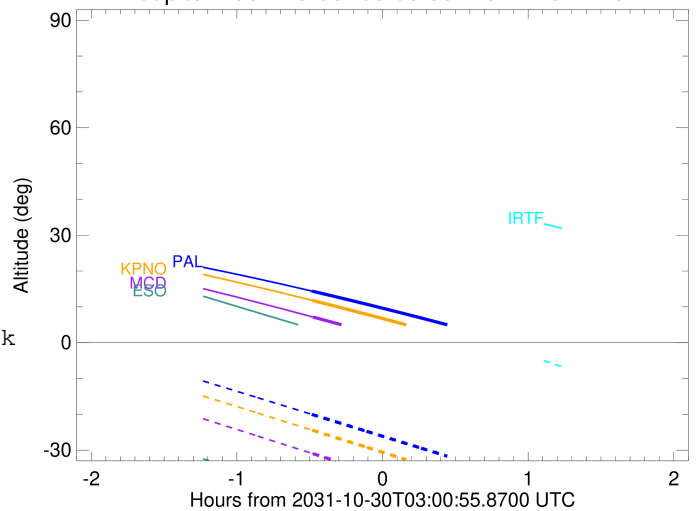


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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-10-30T03:03:10.760
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PAL
Location              : Palomar Mt (200")
Latitude (deg)        : 33.35622
E. Longitude (deg)   : 243.13601
Altitude (km)         : 1.706
Gaia source ID        : 4068812808126238208
2Mass ID (if available) : 17441362-2316280
ICRS Star Coord at Epoch: 17h 44m 13.60318s -23:16:28.27460s
RUWE (>1.4 is poor) : 1.40
K magnitude           : 9.241
G magnitude           : 14.793
RP magnitude          : 13.347
BP magnitude          : 16.803
DUPflag              : 0
Distance (au)         : 5.810
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 32.23
Sun-Target sep (deg)  : 50.33
Sun-Moon sep (deg)   : 127.89
B (ring opening deg) : -2.22
PA of pole (deg)     : 0.86
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (" ) : 9.140
C/A sky separation (km) : 38516.8
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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Jupiter 2031-10-30T03:00:55 K9.24 G14.79

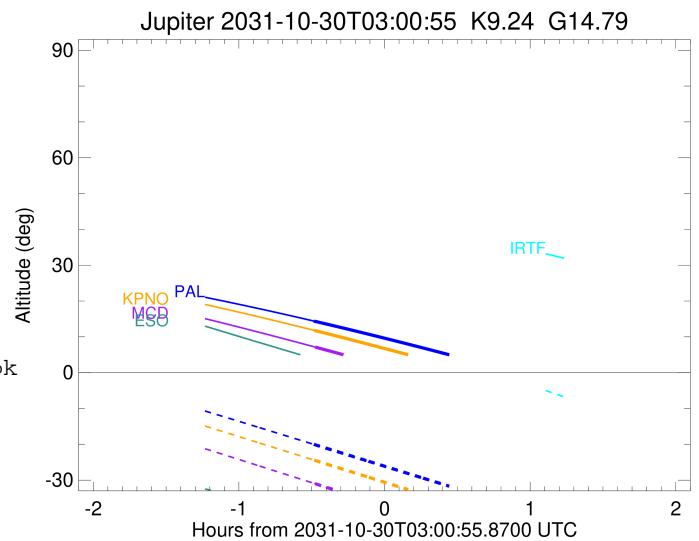
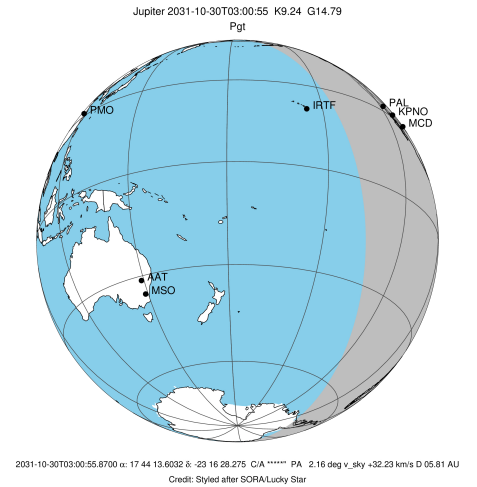


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2031-10-30T02:31:49.370 | 14.40 | -20.02 | 71489.9 | -33.66 | -37.21 |
| Jupiter | E | 2031-10-30T03:34:28.993 | 3.77x | -33.12 | 71490.2 | -31.51 | -34.96 |

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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-10-30T03:03:19.920
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        : 4068812808126238208
2Mass ID (if available) : 17441362-2316280
ICRS Star Coord at Epoch: 17h 44m 13.60318s -23:16:28.27460s
RUWE (>1.4 is poor) : 1.40
K magnitude           : 9.241
G magnitude           : 14.793
RP magnitude          : 13.347
BP magnitude          : 16.803
DUPflag              : 0
Distance (au)         : 5.810
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 32.23
Sun-Target sep (deg) : 50.33
Sun-Moon sep (deg)   : 127.88
B (ring opening deg) : -2.22
PA of pole (deg)     : 0.86
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation ("): 9.204
C/A sky separation (km): 38786.5
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
    
```

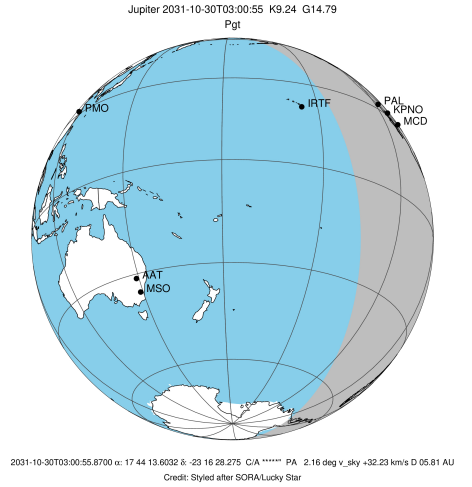


x: target alt < 5.0 deg or sun > -5.0 deg

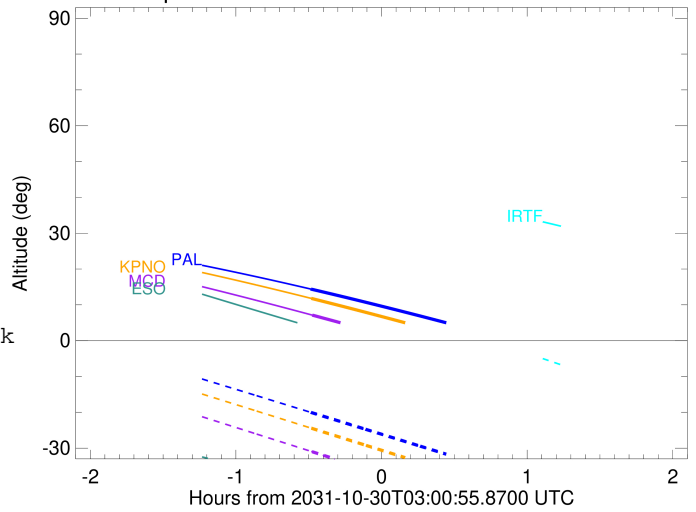
| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2031-10-30T02:32:05.552 | 11.78 | -24.45 | 71489.9 | -33.90 | -37.45 |
| Jupiter | E | 2031-10-30T03:34:30.980 | 0.58x | -37.69 | 71490.1 | -31.78 | -35.25 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-10-30T03:03:29.810
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       : 4068812808126238208
2Mass ID (if available) : 17441362-2316280
ICRS Star Coord at Epoch: 17h 44m 13.60318s -23:16:28.27460s
RUWE (>1.4 is poor) : 1.40
K magnitude           : 9.241
G magnitude           : 14.793
RP magnitude         : 13.347
BP magnitude         : 16.803
DUPflag              : 0
Distance (au)        : 5.810
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 32.23
Sun-Target sep (deg) : 50.33
Sun-Moon sep (deg)   : 127.84
B (ring opening deg) : -2.22
PA of pole (deg)     : 0.86
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation ("): 9.289
C/A sky separation (km): 39146.5
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
    
```



Jupiter 2031-10-30T03:00:55 K9.24 G14.79



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 | 2031-10-30T02:32:25.367 | 7.13 | -31.01 | 71489.9 | -34.22 | -37.79 |
| Jupiter | E | 2031-10-30T03:34:30.791 | -4.67x | -44.30 | 71490.1 | -32.14 | -35.63 |