

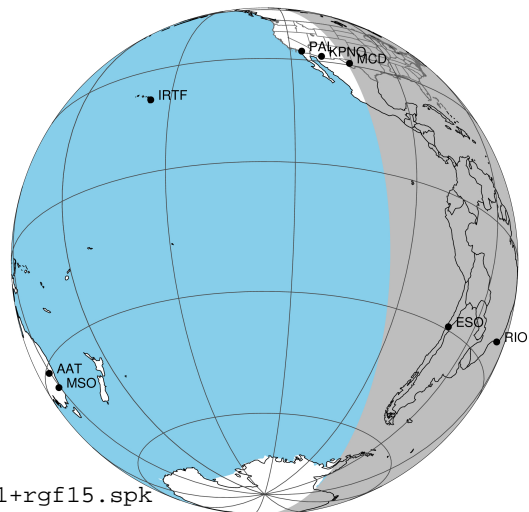
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-10-18T00:19:30.660  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116679733215150080  
 2Mass ID (if available) : 17350450-2310297

Jupiter 2031-10-18T00:19:30 K9.56 G14.74 Pgt

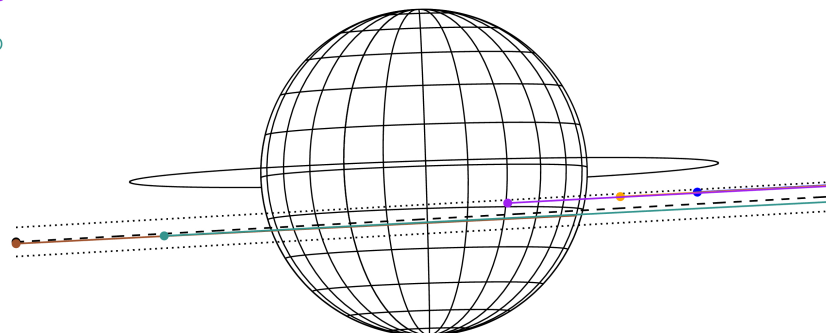
ICRS Star Coord at Epoch: 17h 35m 04.49556s -23:10:29.79697s

RUWE (>1.4 is poor) : 0.99  
 K magnitude : 9.565  
 G magnitude : 14.742  
 RP magnitude : 13.462  
 BP magnitude : 16.604  
 DUPflag : 0  
 Distance (au) : 5.659  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 27.93  
 Sun-Target sep (deg) : 60.29  
 Sun-Moon sep (deg) : 39.43  
 B (ring opening deg) : -2.26  
 PA of pole (deg) : 1.85  
 Pole direction: RA (deg): 268.05682  
 Dec (deg): 64.49652  
 C/A sky separation (") : 4.977  
 C/A sky separation (km) : 20427.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-10-18T00:19:30 K9.56 G14.74  
 Pgt



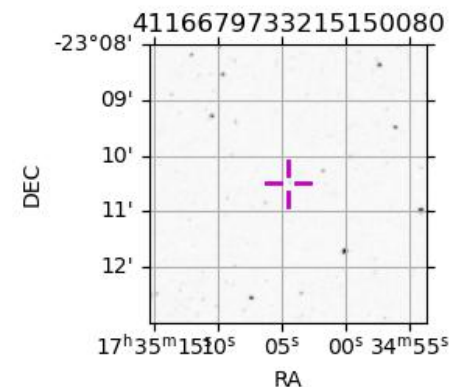
Earth  
 PAL  
 KPNO  
 MCD  
 RIO  
 ESO



2031-10-18T00:19:30.6600 az: 17.35 04.4956 δ: -23 10 29.797 C/A 4.986" PA 3.19 deg v\_sky +27.93 km/s D 05.66 AU  
 Credit: Styled after SORA/Lucky Star

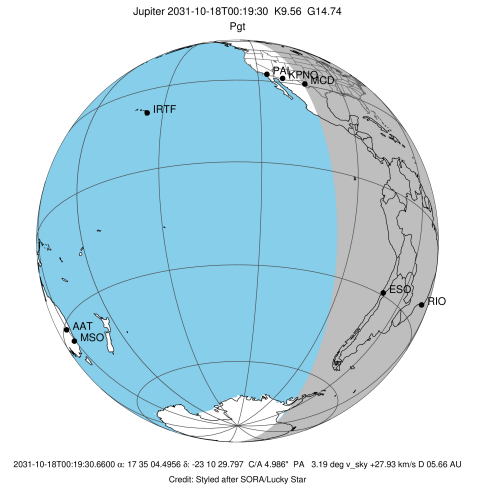
Observable events with sun below -5 deg and altitude above 5 deg

| 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 |        |                             | Pnn   |
| PMO  | Purple Mtn Obs. Nanking           | 32.1  | 118.8 |        |                             | Pnn   |
| KPNO | Kitt Peak Natl Obs                | 32.0  | 248.4 |        |                             | Pnn   |
| MCD  | McDonald Obs. 2.7m                | 30.7  | 256.0 | +      | OCT 18 01:02 - OCT 18 01:02 | Pne   |
| 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 | +      | OCT 17 23:42 - OCT 17 23:42 | Pin   |
| ESO  | European Southern Obs. (3.6m)     | -29.3 | 289.3 | +      | OCT 17 23:41 - OCT 18 01:03 | Pie   |
| 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   |

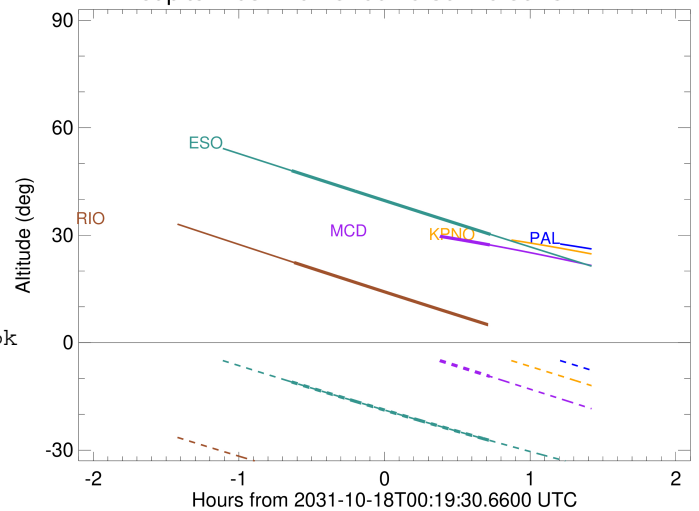


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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-10-18T00:20:37.870
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)        : 30.67158
E. Longitude (deg)    : 255.97844
Altitude (km)         : 2.075
Gaia source ID        : 4116679733215150080
2Mass ID (if available) : 17350450-2310297
ICRS Star Coord at Epoch: 17h 35m 04.49556s -23:10:29.79697s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 9.565
G magnitude           : 14.742
RP magnitude          : 13.462
BP magnitude          : 16.604
DUPflag              : 0
Distance (au)         : 5.659
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 27.93
Sun-Target sep (deg) : 60.29
Sun-Moon sep (deg)   : 40.00
B (ring opening deg) : -2.26
PA of pole (deg)     : 1.85
Pole direction: RA (deg): 268.05682
Dec (deg): 64.49652
C/A sky separation (") : 3.742
C/A sky separation (km) : 15359.2
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 2031-10-18T00:19:30 K9.56 G14.74

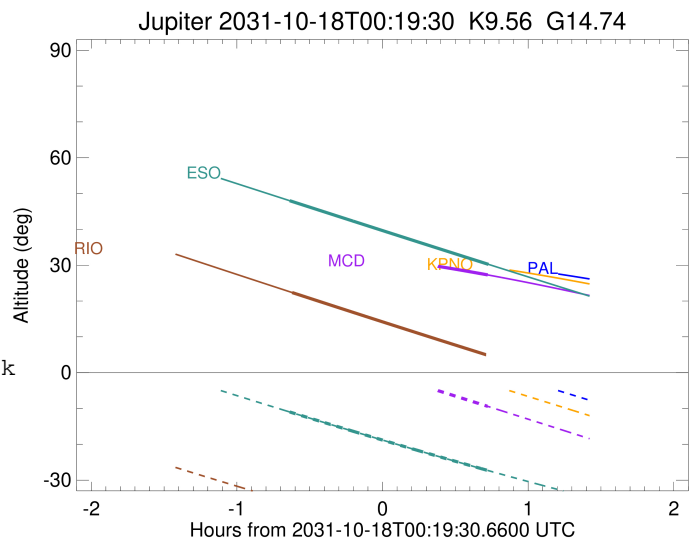
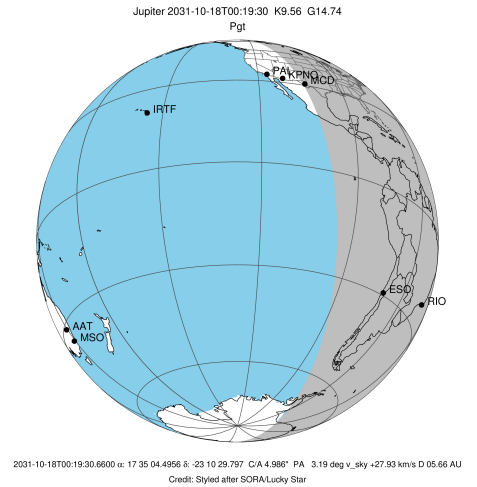


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2031-10-17T23:38:22.831 | 34.96 | 8.46x   | 71491.6 | -13.68  | -15.54       |
| Jupiter | E   | 2031-10-18T01:02:49.182 | 27.29 | -9.39   | 71491.7 | -11.17  | -12.72       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-10-18T00:22:59.040
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : RIO
Location              : Rio de Janeiro
Latitude (deg)        : -22.89506
E. Longitude (deg)    : 316.77708
Altitude (km)         : 0.033
Gaia source ID        : 4116679733215150080
2Mass ID (if available) : 17350450-2310297
ICRS Star Coord at Epoch: 17h 35m 04.49556s -23:10:29.79697s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 9.565
G magnitude           : 14.742
RP magnitude          : 13.462
BP magnitude          : 16.604
DUPflag              : 0
Distance (au)         : 5.659
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 27.93
Sun-Target sep (deg) : 60.29
Sun-Moon sep (deg)   : 40.27
B (ring opening deg) : -2.26
PA of pole (deg)     : 1.85
Pole direction: RA (deg): 268.05682
Dec (deg): 64.49652
C/A sky separation (") : 5.401
C/A sky separation (km) : 22167.8
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
    
```

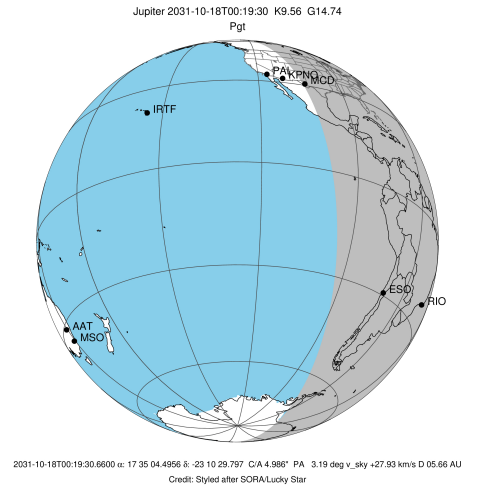


x: target alt < 5.0 deg or sun > -5.0 deg

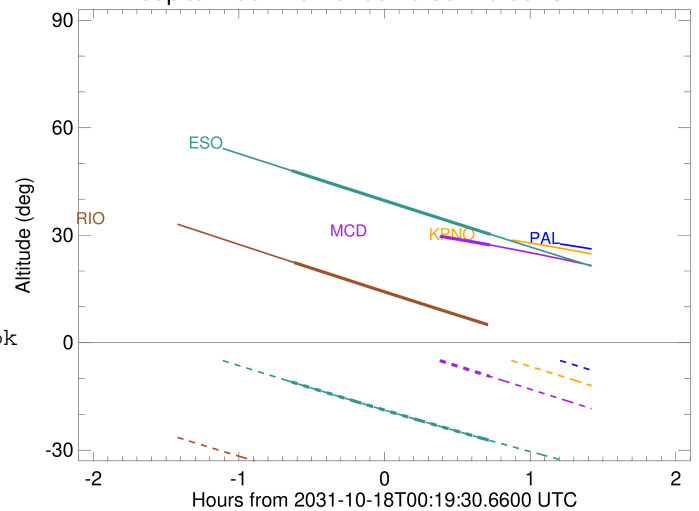
| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2031-10-17T23:42:17.531 | 22.36 | -36.24  | 71491.3 | -19.06  | -21.54       |
| Jupiter | E   | 2031-10-18T01:03:32.898 | 4.71x | -50.31  | 71491.4 | -17.05  | -19.32       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-10-18T00:22:17.170
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       : 4116679733215150080
2Mass ID (if available) : 17350450-2310297
ICRS Star Coord at Epoch: 17h 35m 04.49556s -23:10:29.79697s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 9.565
G magnitude           : 14.742
RP magnitude         : 13.462
BP magnitude         : 16.604
DUPflag              : 0
Distance (au)        : 5.659
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 27.93
Sun-Target sep (deg) : 60.29
Sun-Moon sep (deg)   : 40.38
B (ring opening deg) : -2.26
PA of pole (deg)     : 1.85
Pole direction: RA (deg): 268.05682
Dec (deg): 64.49652
C/A sky separation (") : 5.320
C/A sky separation (km) : 21833.7
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 2031-10-18T00:19:30 K9.56 G14.74



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   | 2031-10-17T23:41:16.818 | 48.00 | -10.97  | 71491.3 | -18.88  | -21.34       |
| Jupiter | E   | 2031-10-18T01:03:11.110 | 30.23 | -27.35  | 71491.4 | -16.70  | -18.92       |