

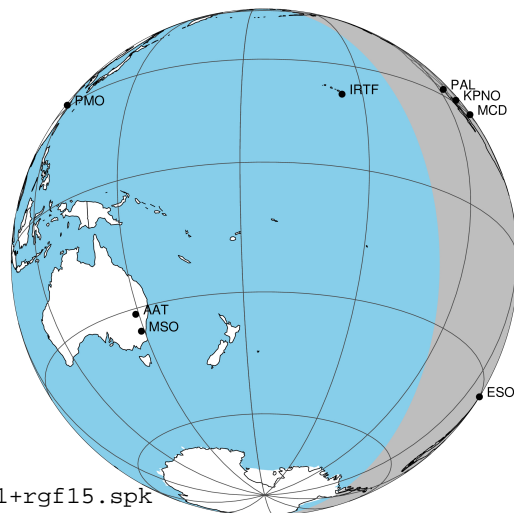
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-11-04T02:35:13.830  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068768518408378624  
 2Mass ID (if available) : 17481721-2318072

Jupiter 2031-11-04T02:35:13 K5.38 G11.03 Pgt

ICRS Star Coord at Epoch: 17h 48m 17.20920s -23:18:07.26401s

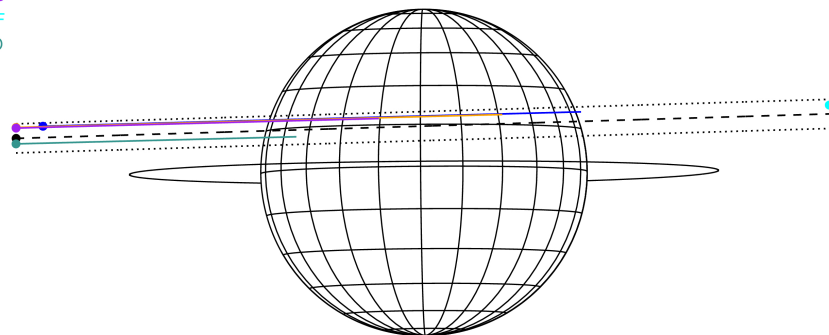
RUWE (>1.4 is poor) : 0.82  
 K magnitude : 5.384  
 G magnitude : 11.027  
 RP magnitude : 9.670  
 BP magnitude : 13.627  
 DUPflag : 0  
 Distance (au) : 5.867  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 33.83  
 Sun-Target sep (deg) : 46.28  
 Sun-Moon sep (deg) : 170.24  
 B (ring opening deg) : -2.20  
 PA of pole (deg) : 0.42  
 Pole direction: RA (deg): 268.05680  
 Dec (deg): 64.49652  
 C/A sky separation (") : 4.775  
 C/A sky separation (km) : 20317.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-11-04T02:35:13 K5.38 G11.03  
 Pgt



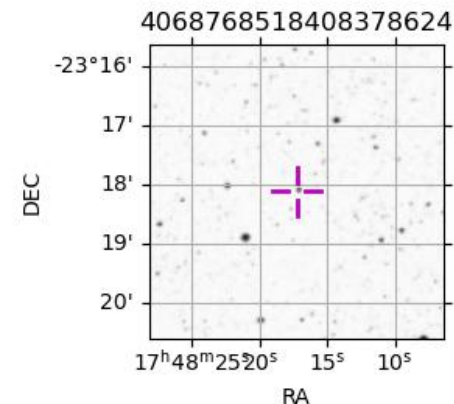
2031-11-04T02:35:13.8300 cr: 17 48 17.2092 s: -23 18 07.264 C/A 4.7677 PA 181.73 deg v\_sky +33.83 km/s D 05.87 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PAL  
 KPNO  
 MCD  
 IRTF  
 ESO



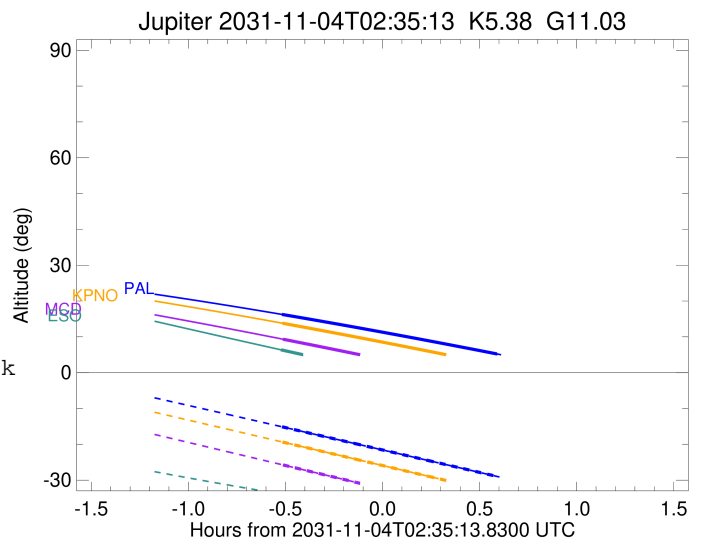
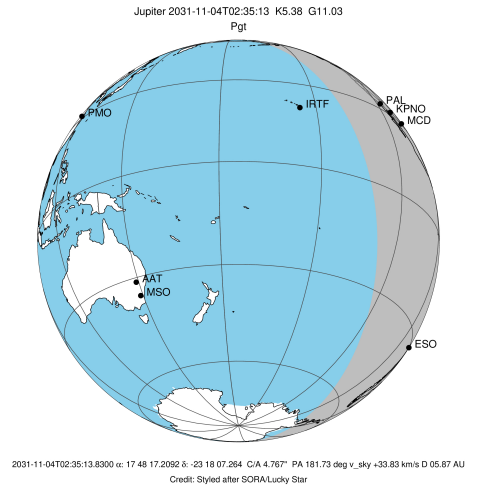
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	NOV 04 02:04 - NOV 04 03:10	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	NOV 04 02:04 - NOV 04 02:04	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	NOV 04 02:04 - NOV 04 02:04	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	+	NOV 04 02:03 - NOV 04 02:03	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



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-11-04T02:37:26.970
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       : 4068768518408378624
2Mass ID (if available) : 17481721-2318072
ICRS Star Coord at Epoch: 17h 48m 17.20920s -23:18:07.26401s
RUWE (>1.4 is poor) : 0.82
K magnitude          : 5.384
G magnitude          : 11.027
RP magnitude         : 9.670
BP magnitude         : 13.627
DUPflag             : 0
Distance (au)        : 5.867
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 33.83
Sun-Target sep (deg) : 46.28
Sun-Moon sep (deg)   : 169.45
B (ring opening deg) : -2.20
PA of pole (deg)     : 0.42
Pole direction: RA (deg): 268.05680
Dec (deg): 64.49652
C/A sky separation ("): 5.818
C/A sky separation (km): 24755.9
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
    
```

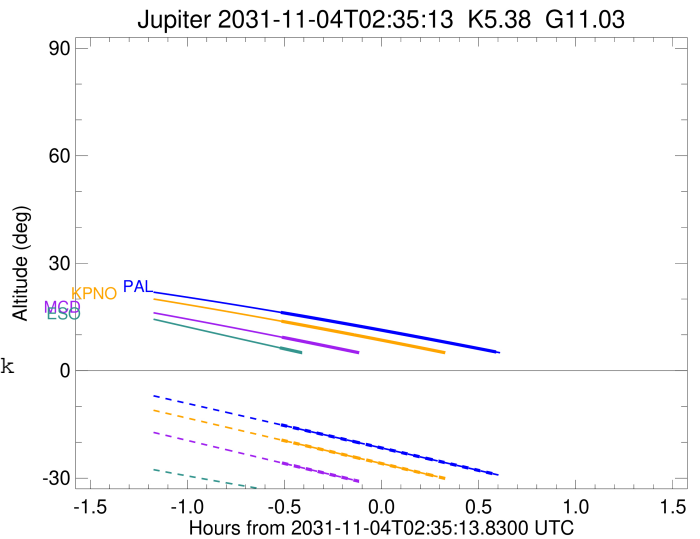
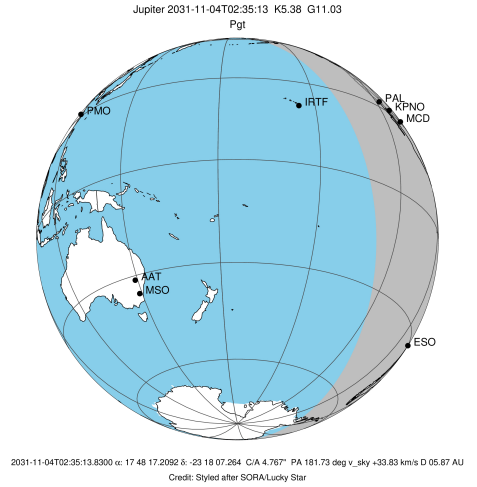


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-11-04T02:04:10.156	16.26	-15.11	71491.3	19.15	21.63
Jupiter	E	2031-11-04T03:10:40.430	5.21	-28.98	71491.1	21.32	24.02

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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-11-04T02:37:36.710
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       : 4068768518408378624
2Mass ID (if available) : 17481721-2318072
ICRS Star Coord at Epoch: 17h 48m 17.20920s -23:18:07.26401s
RUWE (>1.4 is poor) : 0.82
K magnitude          : 5.384
G magnitude          : 11.027
RP magnitude         : 9.670
BP magnitude         : 13.627
DUPflag             : 0
Distance (au)        : 5.867
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 33.83
Sun-Target sep (deg) : 46.28
Sun-Moon sep (deg)   : 169.42
B (ring opening deg) : -2.20
PA of pole (deg)     : 0.42
Pole direction: RA (deg): 268.05680
Dec (deg): 64.49652
C/A sky separation ("): 5.755
C/A sky separation (km): 24489.6
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
    
```

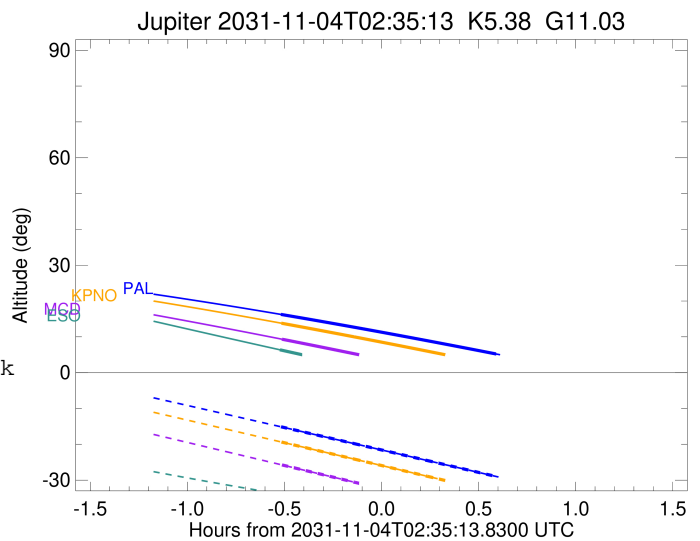
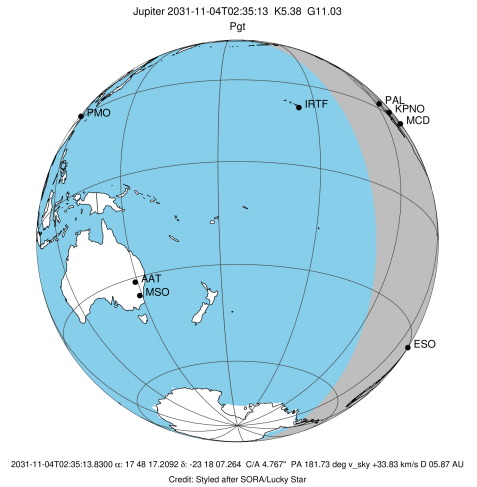


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-11-04T02:04:18.592	13.80	-19.36	71491.3	18.94	21.40
Jupiter	E	2031-11-04T03:10:51.269	2.07x	-33.48	71491.2	21.08	23.76

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-11-04T02:37:47.520
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       : 4068768518408378624
2Mass ID (if available) : 17481721-2318072
ICRS Star Coord at Epoch: 17h 48m 17.20920s -23:18:07.26401s
RUWE (>1.4 is poor) : 0.82
K magnitude          : 5.384
G magnitude          : 11.027
RP magnitude         : 9.670
BP magnitude         : 13.627
DUPflag             : 0
Distance (au)        : 5.867
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 33.83
Sun-Target sep (deg) : 46.28
Sun-Moon sep (deg)   : 169.38
B (ring opening deg) : -2.20
PA of pole (deg)     : 0.42
Pole direction: RA (deg): 268.05680
Dec (deg): 64.49652
C/A sky separation (") : 5.672
C/A sky separation (km) : 24133.5
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
    
```

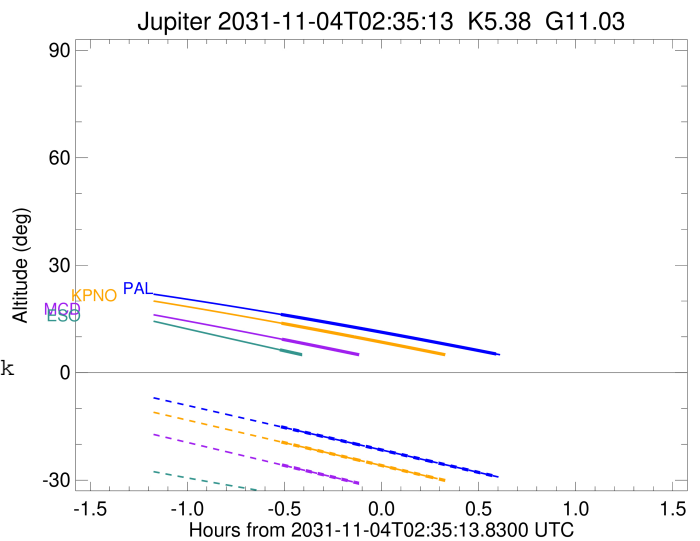
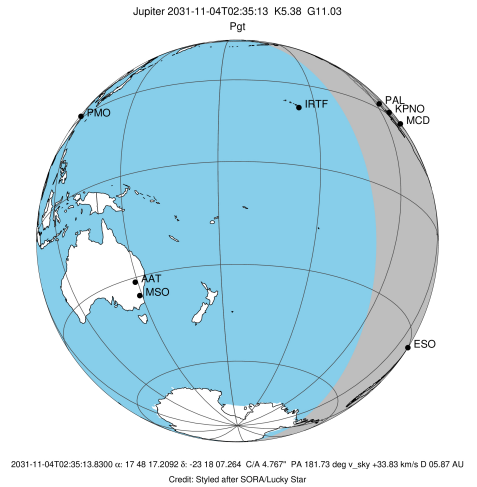


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-11-04T02:04:28.236	9.34	-25.75	71491.3	18.65	21.09
Jupiter	E	2031-11-04T03:11:03.014	-3.14x	-40.08	71491.2	20.76	23.41

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-11-04T02:37:58.350
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        : 4068768518408378624
2Mass ID (if available) : 17481721-2318072
ICRS Star Coord at Epoch: 17h 48m 17.20920s -23:18:07.26401s
RUWE (>1.4 is poor)  : 0.82
K magnitude           : 5.384
G magnitude           : 11.027
RP magnitude          : 9.670
BP magnitude          : 13.627
DUPflag              : 0
Distance (au)         : 5.867
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : 33.83
Sun-Target sep (deg)  : 46.28
Sun-Moon sep (deg)    : 169.69
B (ring opening deg)  : -2.20
PA of pole (deg)      : 0.42
Pole direction: RA (deg): 268.05680
Dec (deg): 64.49652
C/A sky separation (") : 4.011
C/A sky separation (km) : 17069.1
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	2031-11-04T02:03:49.813	6.38	-33.84	71491.7	12.77	14.53
Jupiter	E	2031-11-04T03:12:02.786	-6.88x	-42.12	71491.6	14.84	16.84