

target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-04-29T16:34:05.390
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068702685188835584
 2Mass ID (if available) : 17521776-2253402

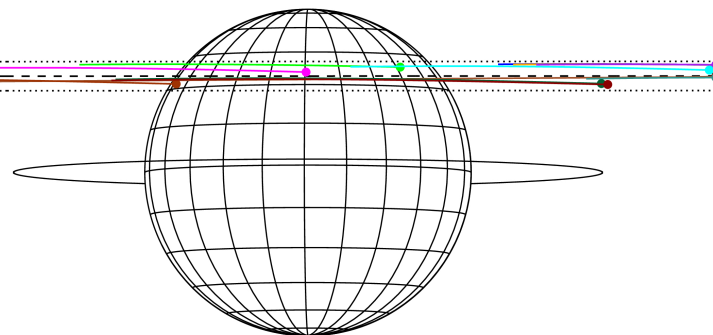
Jupiter 2031-04-29T16:34:05 K9.10 G14.87 Pgt

ICRS Star Coord at Epoch: 17h 52m 17.75952s -22:53:40.37327s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 9.096
 G magnitude : 14.875
 RP magnitude : 13.488
 BP magnitude : 17.316
 DUPflag : 0
 Distance (au) : 4.586
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -6.12
 Sun-Target sep (deg) : 130.51
 Sun-Moon sep (deg) : 140.57
 B (ring opening deg) : -2.61
 PA of pole (deg) : -0.01
 Pole direction: RA (deg): 268.05696
 Dec (deg): 64.49651
 C/A sky separation (") : 12.699
 C/A sky separation (km) : 42242.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



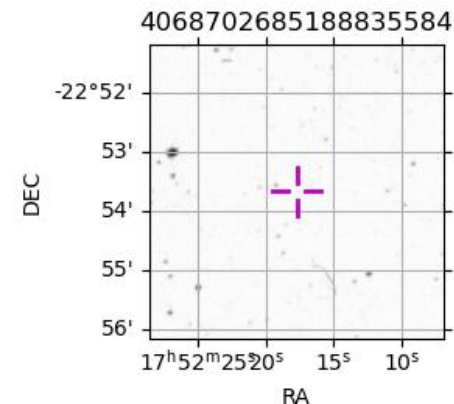
2031-04-29T16:34:05.3900 α: 17 52 17.7595 δ: -22 53 40.373 C/A ***** PA 180.02 deg v_sky - 6.12 km/s D 04.59 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 PMO
 KPNO
 MCD
 TEN
 IRTF
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



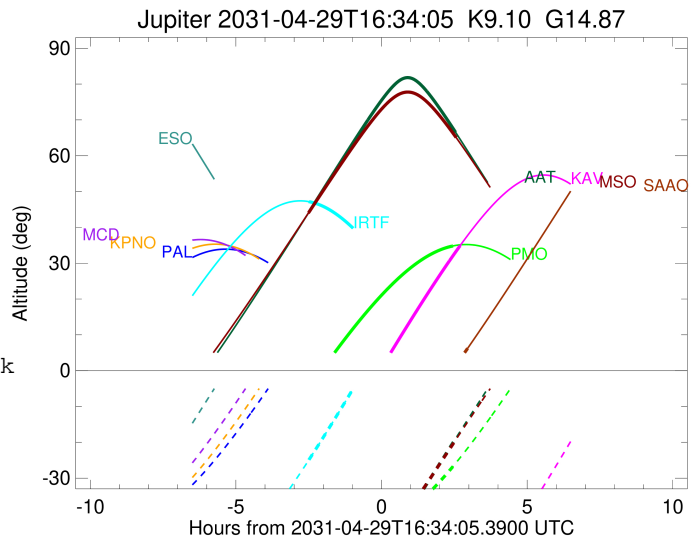
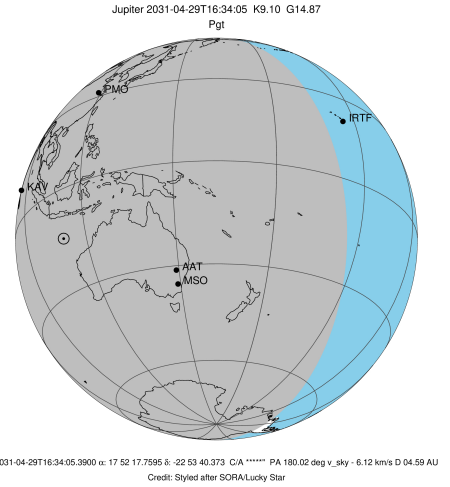
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
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	+	APR 29 19:01 - APR 29 19:01	Pne
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	APR 29 14:04 - APR 29 14:04	Pin
KAV	Kavalur Observatory	12.6	78.8	+	APR 29 19:15 - APR 29 19:15	Pne
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	+	APR 29 14:04 - APR 29 19:06	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	APR 29 19:31 - APR 29 19:31	Pne
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	APR 29 14:03 - APR 29 19:07	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-29T16:41:51.450
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : PMO
Location            : Purple Mtn Obs. Nanking
Latitude (deg)      : 32.06667
E. Longitude (deg)  : 118.82089
Altitude (km)       : 0.364
Gaia source ID      : 4068702685188835584
2Mass ID (if available) : 17521776-2253402
ICRS Star Coord at Epoch: 17h 52m 17.75952s -22:53:40.37327s
RUWE (>1.4 is poor) : 1.04
K magnitude          : 9.096
G magnitude          : 14.875
RP magnitude         : 13.488
BP magnitude         : 17.316
DUPflag             : 0
Distance (au)       : 4.586
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.12
Sun-Target sep (deg) : 130.51
Sun-Moon sep (deg)  : 141.12
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.01
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (" ) : 14.109
C/A sky separation (km) : 46929.7
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
    
```

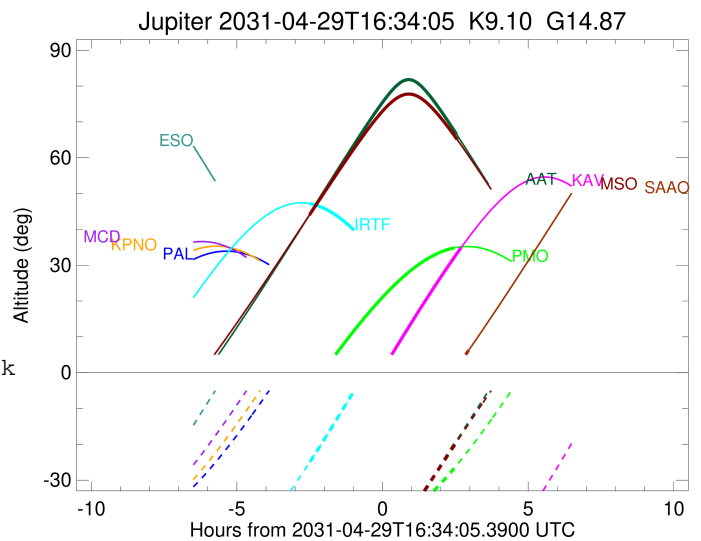
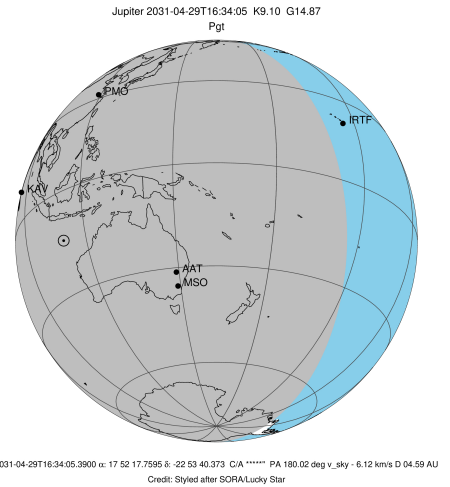


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-29T14:18:29.991	-2.28x	-37.36	71488.2	39.82	43.53
Jupiter	E	2031-04-29T19:01:06.589	34.81	-26.77	71487.9	41.49	45.21

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-04-29T16:25:42.740
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       : 4068702685188835584
2Mass ID (if available) : 17521776-2253402
ICRS Star Coord at Epoch: 17h 52m 17.75952s -22:53:40.37327s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 9.096
G magnitude           : 14.875
RP magnitude         : 13.488
BP magnitude         : 17.316
DUPflag              : 0
Distance (au)        : 4.586
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.12
Sun-Target sep (deg) : 130.51
Sun-Moon sep (deg)   : 140.38
B (ring opening deg) : -2.61
PA of pole (deg)     : -0.01
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 13.833
C/A sky separation (km): 46013.5
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
    
```

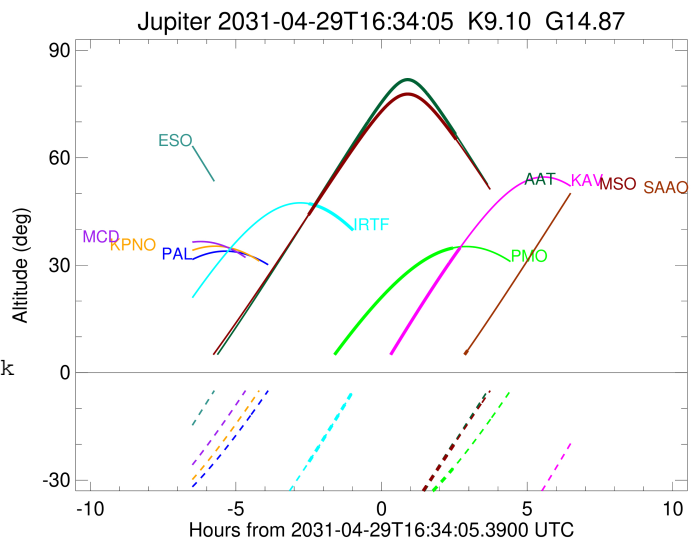
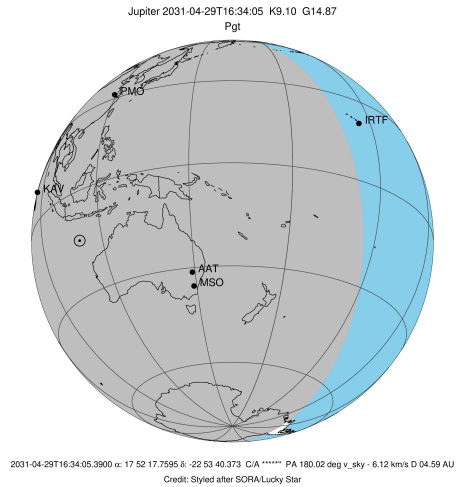


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-29T14:04:27.265	47.17	-24.91	71488.1	40.61	44.32
Jupiter	E	2031-04-29T18:49:40.500	4.56x	39.86x	71488.4	38.70	42.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-29T16:47:26.530
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : KAV
Location            : Kavalur Observatory
Latitude (deg)      : 12.57556
E. Longitude (deg)  : 78.83167
Altitude (km)       : 0.722
Gaia source ID      : 4068702685188835584
2Mass ID (if available) : 17521776-2253402
ICRS Star Coord at Epoch: 17h 52m 17.75952s -22:53:40.37327s
RUWE (>1.4 is poor) : 1.04
K magnitude          : 9.096
G magnitude          : 14.875
RP magnitude         : 13.488
BP magnitude         : 17.316
DUPflag             : 0
Distance (au)       : 4.586
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.12
Sun-Target sep (deg) : 130.51
Sun-Moon sep (deg)  : 141.24
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.01
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 13.214
C/A sky separation (km): 43953.1
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
    
```

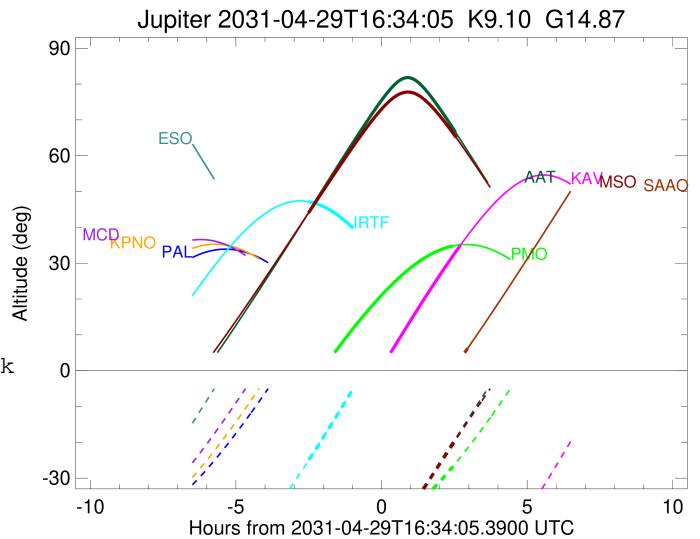
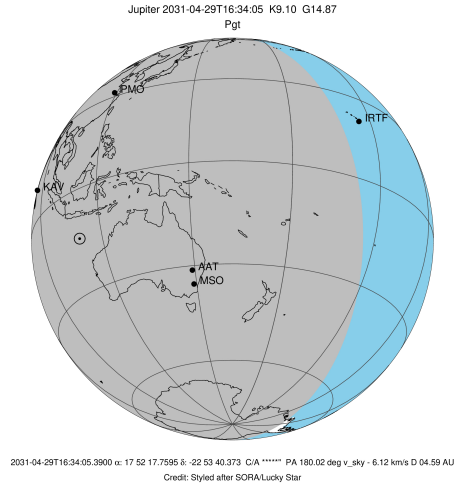


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-29T14:11:25.929	-31.82x	-17.76	71488.7	36.30	39.93
Jupiter	E	2031-04-29T19:15:51.181	34.85	-61.65	71488.3	39.24	42.93

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-29T16:36:49.560
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : AAT
Location            : Siding Spring (AAT)
Latitude (deg)      : -31.27703
E. Longitude (deg)  : 149.06608
Altitude (km)       : 1.164
Gaia source ID      : 4068702685188835584
2Mass ID (if available) : 17521776-2253402
ICRS Star Coord at Epoch: 17h 52m 17.75952s -22:53:40.37327s
RUWE (>1.4 is poor) : 1.04
K magnitude          : 9.096
G magnitude          : 14.875
RP magnitude         : 13.488
BP magnitude         : 17.316
DUPflag             : 0
Distance (au)       : 4.586
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -6.12
Sun-Target sep (deg) : 130.51
Sun-Moon sep (deg)  : 141.27
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.01
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (" ) : 12.411
C/A sky separation (km) : 41283.7
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
    
```

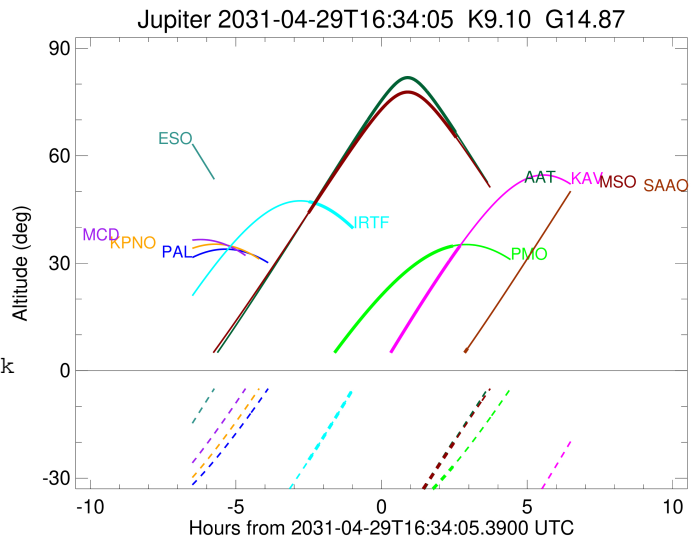
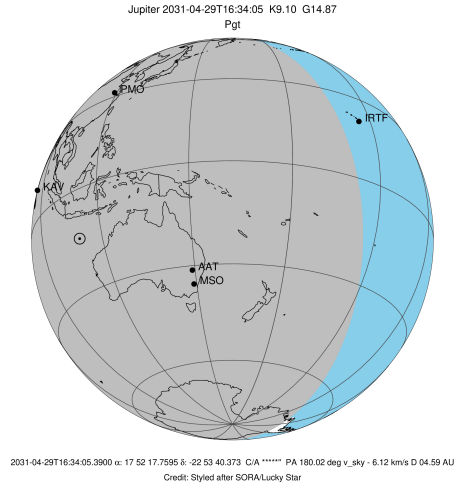


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-29T14:04:44.467	44.25	-73.39	71489.0	34.55	38.13
Jupiter	E	2031-04-29T19:06:43.413	66.53	-18.96	71488.9	35.05	38.65

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-04-29T16:41:51.460
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : SAAO
Location             : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)       : -32.37953
E. Longitude (deg)   : 20.81070
Altitude (km)        : 1.768
Gaia source ID       : 4068702685188835584
2Mass ID (if available) : 17521776-2253402
ICRS Star Coord at Epoch: 17h 52m 17.75952s -22:53:40.37327s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 9.096
G magnitude           : 14.875
RP magnitude         : 13.488
BP magnitude         : 17.316
DUPflag              : 0
Distance (au)        : 4.586
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.12
Sun-Target sep (deg) : 130.51
Sun-Moon sep (deg)   : 140.76
B (ring opening deg) : -2.61
PA of pole (deg)     : -0.01
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 11.282
C/A sky separation (km) : 37525.7
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
    
```

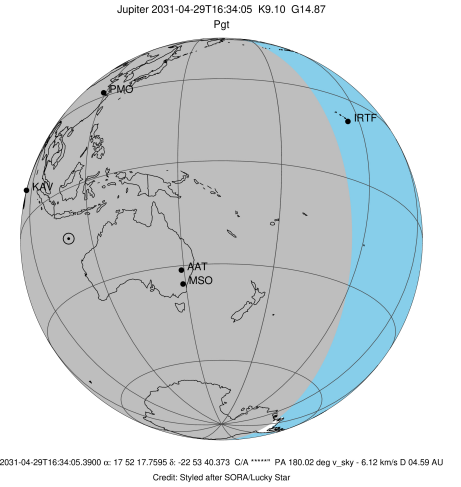


x: target alt < 5.0 deg or sun > -5.0 deg

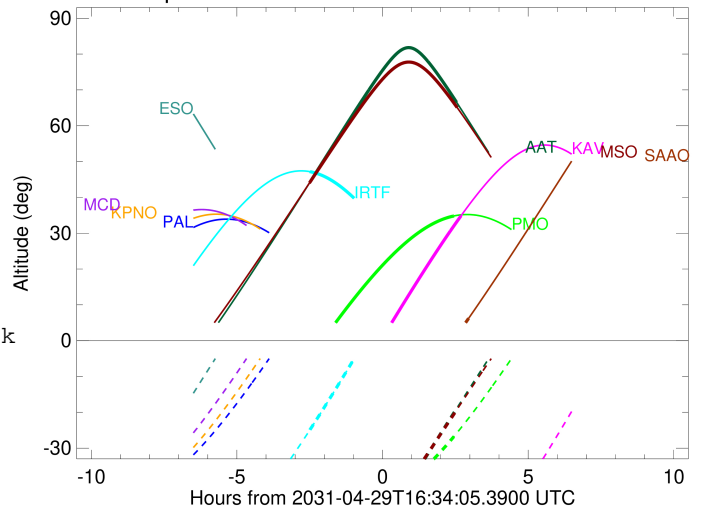
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-29T13:45:50.363	-34.76x	24.54x	71489.5	31.17	34.61
Jupiter	E	2031-04-29T19:31:32.614	6.24	-44.97	71489.3	32.86	36.38

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-04-29T16:36:43.630
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : MSO
Location              : Mt. Stromlo Observatory
Latitude (deg)        : -35.32000
E. Longitude (deg)    : 149.00833
Altitude (km)         : 0.770
Gaia source ID        : 4068702685188835584
2Mass ID (if available) : 17521776-2253402
ICRS Star Coord at Epoch: 17h 52m 17.75952s -22:53:40.37327s
RUWE (>1.4 is poor)  : 1.04
K magnitude           : 9.096
G magnitude           : 14.875
RP magnitude          : 13.488
BP magnitude          : 17.316
DUPflag              : 0
Distance (au)         : 4.586
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -6.12
Sun-Target sep (deg)  : 130.51
Sun-Moon sep (deg)   : 141.26
B (ring opening deg) : -2.61
PA of pole (deg)     : -0.01
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 12.279
C/A sky separation (km) : 40844.3
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 2031-04-29T16:34:05 K9.10 G14.87



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	2031-04-29T14:03:29.797	44.00	-69.38	71489.1	34.15	37.71
Jupiter	E	2031-04-29T19:07:46.926	65.08	-19.16	71489.0	34.63	38.21