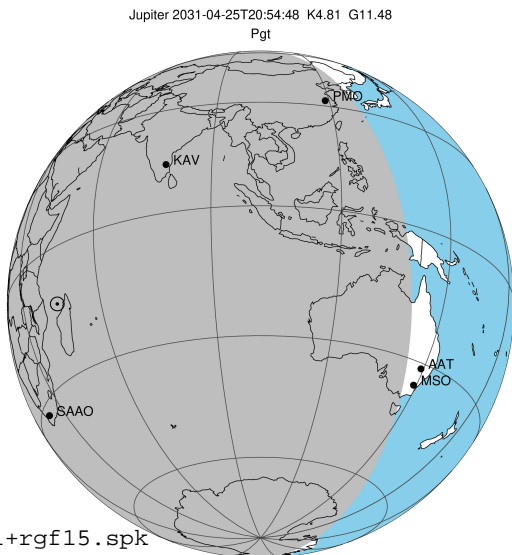


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-04-25T20:54:48.130
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4070200249968817792
 2Mass ID (if available) : 17525594-2253376

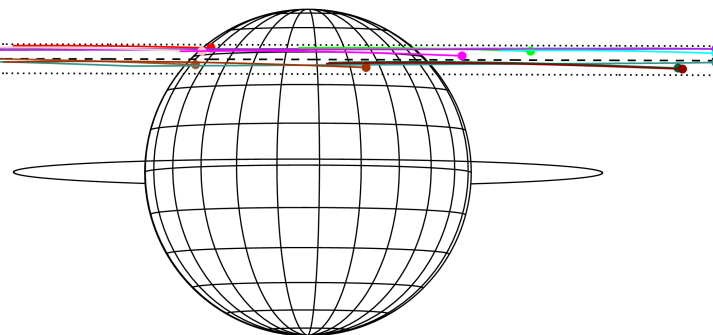
Jupiter 2031-04-25T20:54:48 K4.81 G11.48 Pgt

ICRS Star Coord at Epoch: 17h 52m 55.94041s -22:53:37.68078s
 RUWE (>1.4 is poor) : 0.84
 K magnitude : 4.807
 G magnitude : 11.483
 RP magnitude : 9.945
 BP magnitude : 15.277
 DUPflag : 1
 Distance (au) : 4.635
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -4.56
 Sun-Target sep (deg) : 126.65
 Sun-Moon sep (deg) : 173.53
 B (ring opening deg) : -2.61
 PA of pole (deg) : -0.08
 Pole direction: RA (deg): 268.05696
 Dec (deg): 64.49651
 C/A sky separation (") : 14.726
 C/A sky separation (km) : 49504.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



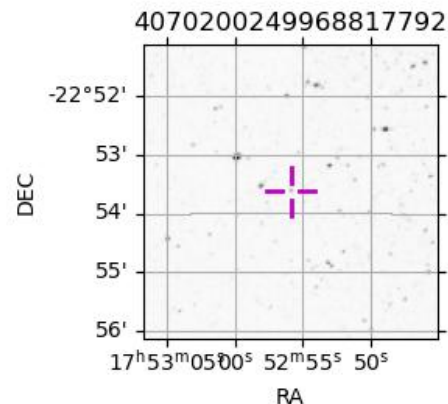
2031-04-25T20:54:48.1300 α: 17 52 55.9404 δ: -22 53 37.681 C/A ***** PA 179.85 deg v_sky - 4.56 km/s D 04.63 AU
 Credit: Styled after SORA/Lucky Star

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



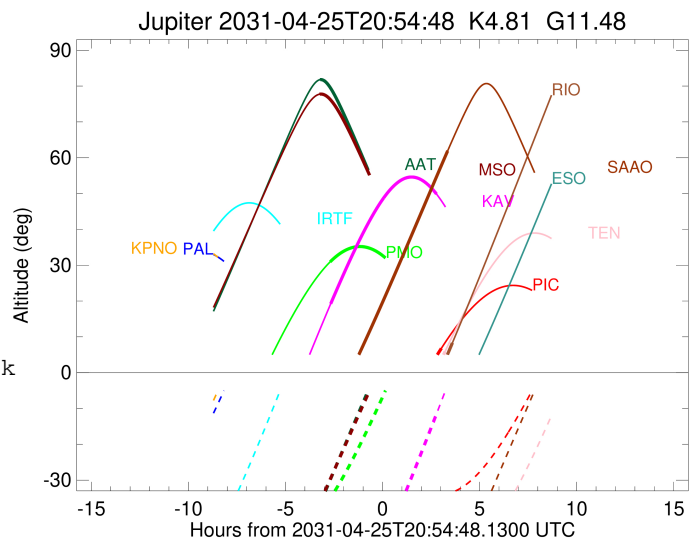
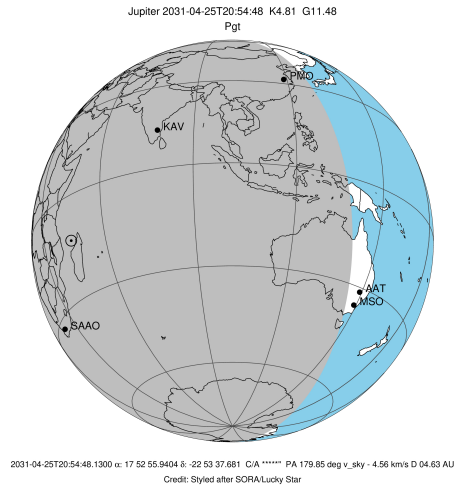
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	APR 25 23:56 - APR 25 23:56	Pne
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	APR 25 18:12 - APR 25 18:12	Pin
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	+	APR 26 00:07 - APR 26 00:07	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	APR 25 18:14 - APR 25 23:41	Pie
RIO	Rio de Janeiro	-22.9	316.8	+	APR 26 00:30 - APR 26 00:30	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	APR 25 17:42 - APR 25 17:42	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	APR 26 00:16 - APR 26 00:16	Pne
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	APR 25 17:40 - APR 25 17:40	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-04-25T21:05:57.510
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PIC
Location              : Pic du Midi
Latitude (deg)        : 42.93656
E. Longitude (deg)    : 0.14231
Altitude (km)         : 2.890
Gaia source ID        : 4070200249968817792
2Mass ID (if available) : 17525594-2253376
ICRS Star Coord at Epoch: 17h 52m 55.94041s -22:53:37.68078s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 4.807
G magnitude           : 11.483
RP magnitude          : 9.945
BP magnitude          : 15.277
DUPflag              : 1
Distance (au)         : 4.635
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -4.56
Sun-Target sep (deg) : 126.65
Sun-Moon sep (deg)   : 172.72
B (ring opening deg) : -2.61
PA of pole (deg)     : -0.08
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 15.848
C/A sky separation (km) : 53272.7
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
    
```

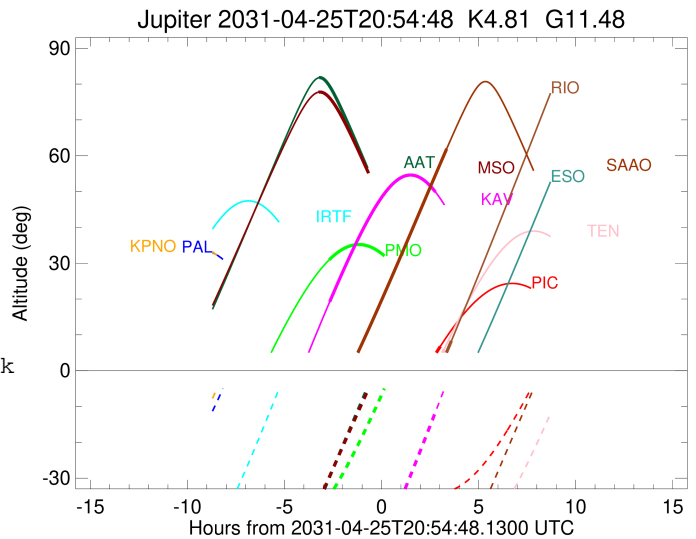
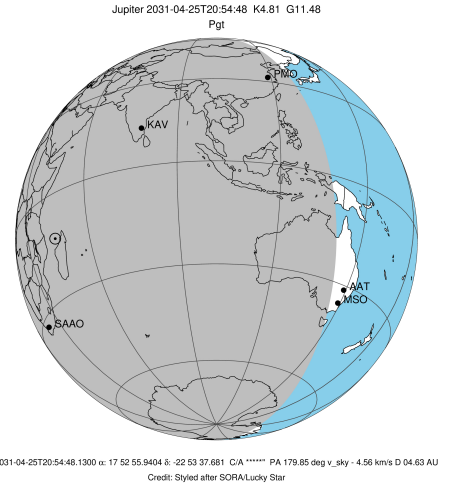


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-25T18:04:51.516	-54.09x	7.64x	71487.1	46.57	50.25
Jupiter	E	2031-04-25T23:56:39.296	6.78	-33.87	71486.6	49.73	53.32

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-04-25T20:50:55.450
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        : 4070200249968817792
2Mass ID (if available) : 17525594-2253376
ICRS Star Coord at Epoch: 17h 52m 55.94041s -22:53:37.68078s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 4.807
G magnitude           : 11.483
RP magnitude          : 9.945
BP magnitude          : 15.277
DUPflag              : 1
Distance (au)         : 4.635
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -4.56
Sun-Target sep (deg)  : 126.65
Sun-Moon sep (deg)    : 173.57
B (ring opening deg) : -2.61
PA of pole (deg)      : -0.08
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 16.247
C/A sky separation (km) : 54617.3
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
    
```

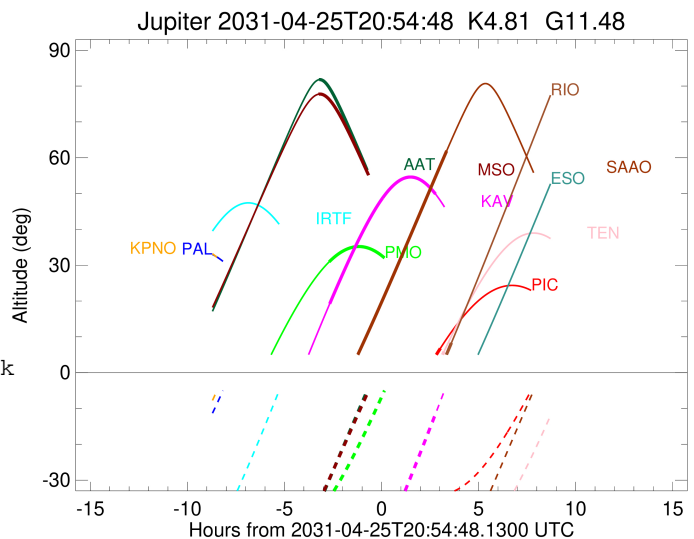
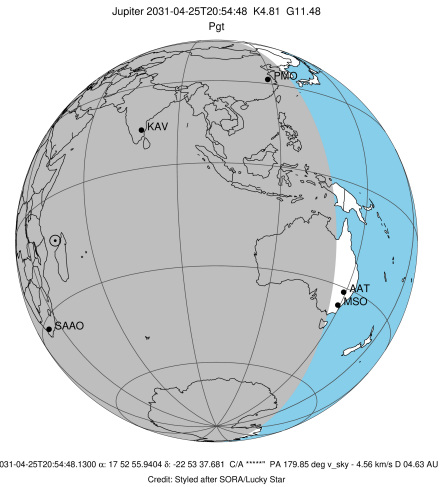


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-25T18:12:51.005	30.91	-35.10	71486.6	49.59	53.19
Jupiter	E	2031-04-25T23:29:45.125	13.17	25.38x	71486.7	48.75	52.38

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-25T21:07:10.970
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : TEN
Location            : Teide Obs./Tenerife
Latitude (deg)      : 28.30050
E. Longitude (deg)  : 343.48909
Altitude (km)       : 2.395
Gaia source ID      : 4070200249968817792
2Mass ID (if available) : 17525594-2253376
ICRS Star Coord at Epoch: 17h 52m 55.94041s -22:53:37.68078s
RUWE (>1.4 is poor) : 0.84
K magnitude          : 4.807
G magnitude          : 11.483
RP magnitude         : 9.945
BP magnitude         : 15.277
DUPflag             : 1
Distance (au)       : 4.635
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -4.56
Sun-Target sep (deg) : 126.65
Sun-Moon sep (deg)  : 172.72
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.08
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (" ) : 15.296
C/A sky separation (km) : 51417.7
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
    
```

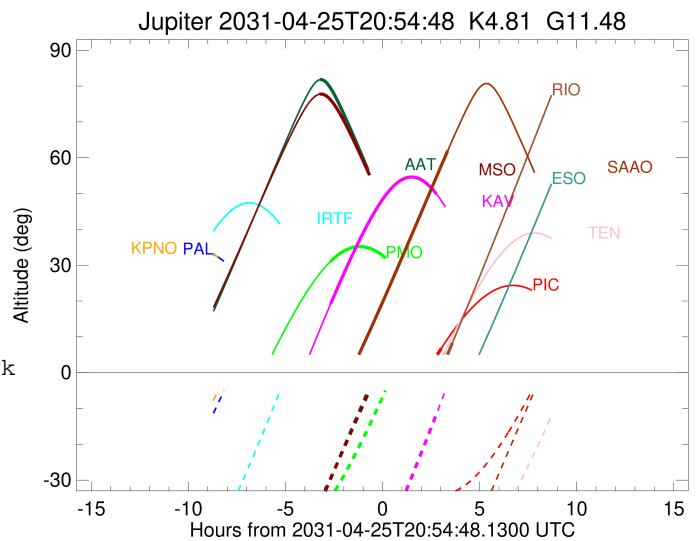
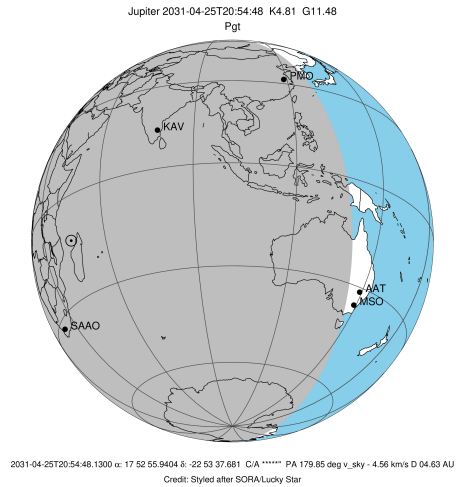


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-25T17:53:42.250	-74.00x	21.56x	71487.4	44.46	48.16
Jupiter	E	2031-04-26T00:07:49.004	5.85	-46.32	71486.9	47.94	51.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-25T21:00:31.900
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      : 4070200249968817792
2Mass ID (if available) : 17525594-2253376
ICRS Star Coord at Epoch: 17h 52m 55.94041s -22:53:37.68078s
RUWE (>1.4 is poor) : 0.84
K magnitude          : 4.807
G magnitude          : 11.483
RP magnitude         : 9.945
BP magnitude         : 15.277
DUPflag             : 1
Distance (au)       : 4.635
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -4.56
Sun-Target sep (deg) : 126.65
Sun-Moon sep (deg)  : 173.15
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.08
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (" ) : 15.782
C/A sky separation (km) : 53053.7
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
    
```

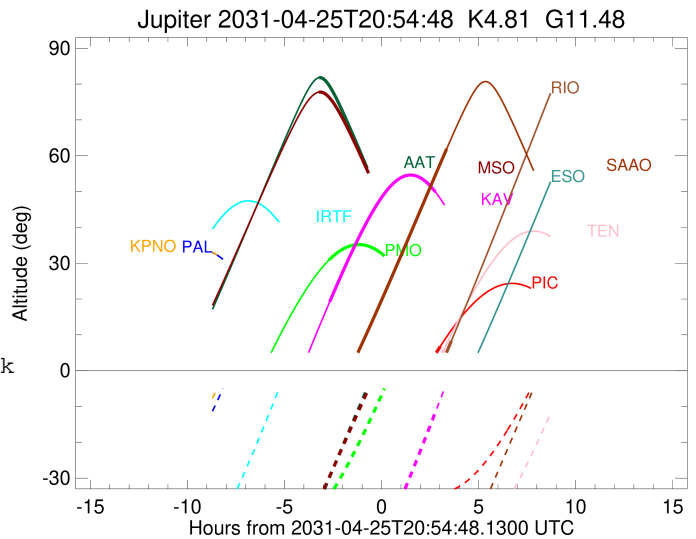
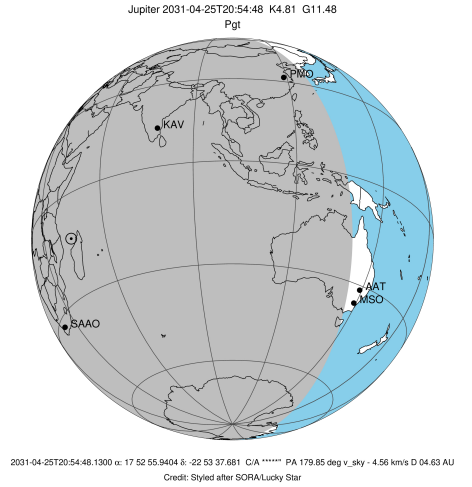


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-25T18:14:37.686	19.21	-63.28	71487.1	46.44	50.12
Jupiter	E	2031-04-25T23:41:27.143	49.88	-11.56	71486.9	47.92	51.56

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-25T21:03:56.720
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       : 4070200249968817792
2Mass ID (if available) : 17525594-2253376
ICRS Star Coord at Epoch: 17h 52m 55.94041s -22:53:37.68078s
RUWE (>1.4 is poor) : 0.84
K magnitude          : 4.807
G magnitude          : 11.483
RP magnitude         : 9.945
BP magnitude         : 15.277
DUPflag             : 1
Distance (au)        : 4.635
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -4.56
Sun-Target sep (deg) : 126.65
Sun-Moon sep (deg)  : 173.13
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.08
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 13.523
C/A sky separation (km): 45459.4
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
    
```

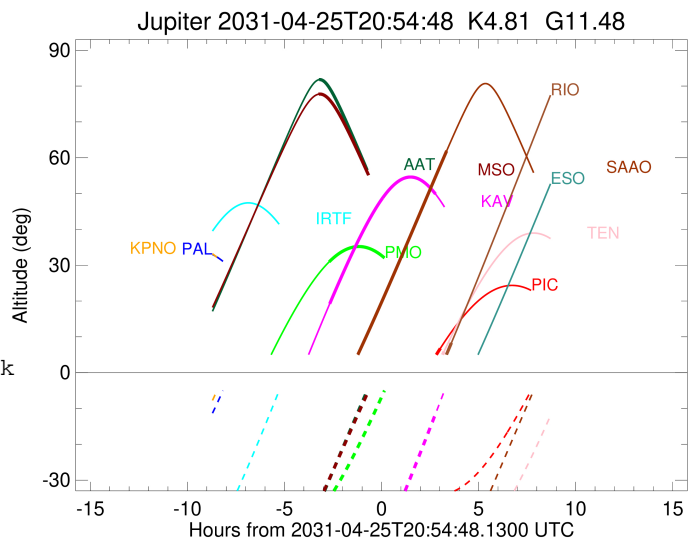
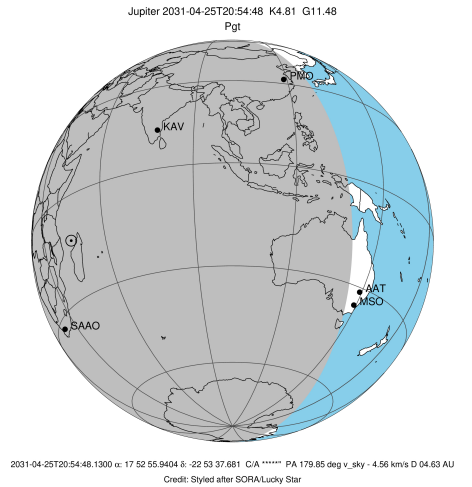


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-25T17:24:17.855	-41.33x	37.93x	71488.3	38.92	42.62
Jupiter	E	2031-04-26T00:30:55.098	8.34	-55.55	71487.9	41.40	45.11

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-25T20:44:43.270
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      : 4070200249968817792
2Mass ID (if available) : 17525594-2253376
ICRS Star Coord at Epoch: 17h 52m 55.94041s -22:53:37.68078s
RUWE (>1.4 is poor) : 0.84
K magnitude          : 4.807
G magnitude          : 11.483
RP magnitude         : 9.945
BP magnitude         : 15.277
DUPflag             : 1
Distance (au)       : 4.635
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -4.56
Sun-Target sep (deg) : 126.65
Sun-Moon sep (deg)  : 174.21
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.08
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 14.266
C/A sky separation (km) : 47956.5
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
    
```

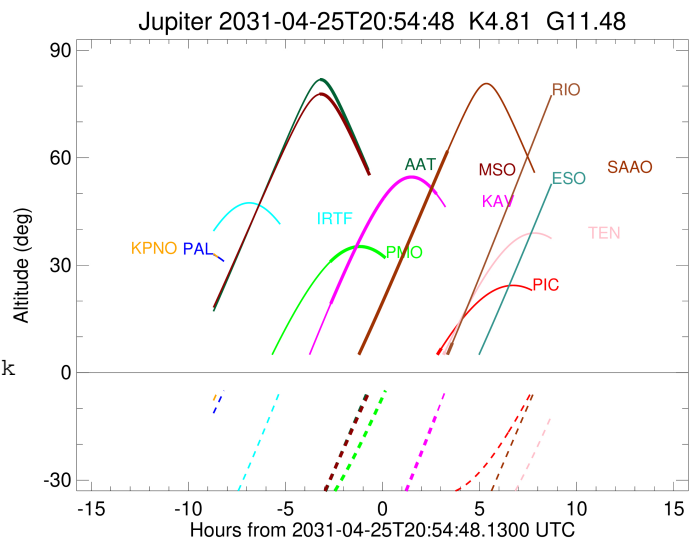
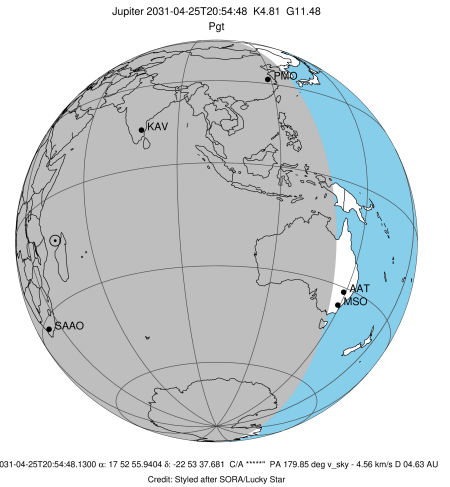


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-25T17:42:17.462	81.78	-36.52	71487.7	42.69	46.41
Jupiter	E	2031-04-25T23:52:50.888	9.69	35.82x	71488.1	40.44	44.15

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-25T21:08:35.520
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       : 4070200249968817792
2Mass ID (if available) : 17525594-2253376
ICRS Star Coord at Epoch: 17h 52m 55.94041s -22:53:37.68078s
RUWE (>1.4 is poor) : 0.84
K magnitude          : 4.807
G magnitude          : 11.483
RP magnitude         : 9.945
BP magnitude         : 15.277
DUPflag             : 1
Distance (au)        : 4.635
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -4.56
Sun-Target sep (deg) : 126.65
Sun-Moon sep (deg)   : 172.92
B (ring opening deg) : -2.61
PA of pole (deg)     : -0.08
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 13.952
C/A sky separation (km) : 46900.4
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
    
```

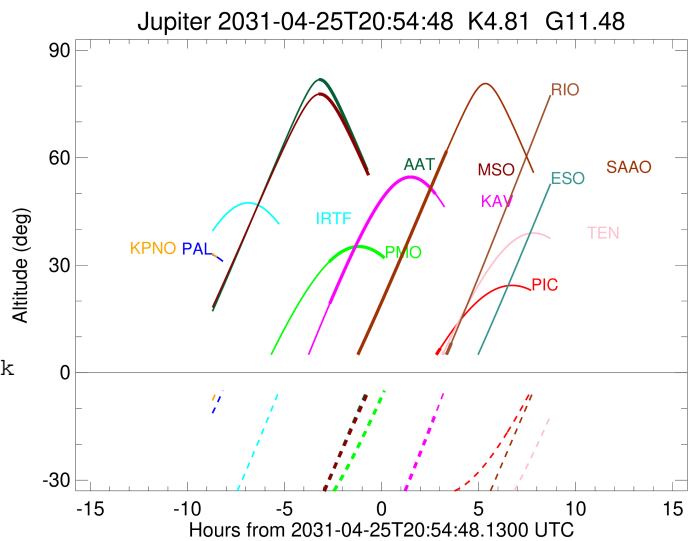
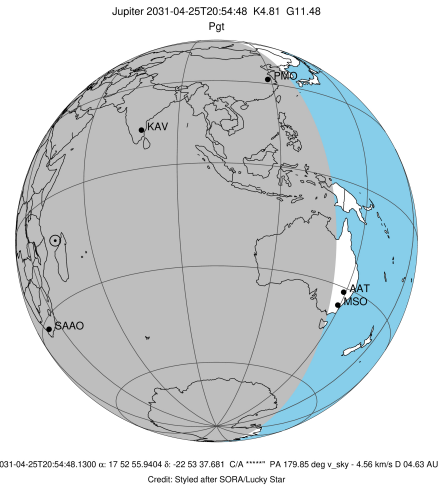


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-25T17:46:48.531	-15.59x	-22.17	71488.3	39.01	42.70
Jupiter	E	2031-04-26T00:16:19.444	61.94	-60.10	71487.8	42.42	46.14


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-04-25T20:45:09.320
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        : 4070200249968817792
2Mass ID (if available) : 17525594-2253376
ICRS Star Coord at Epoch: 17h 52m 55.94041s -22:53:37.68078s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 4.807
G magnitude           : 11.483
RP magnitude          : 9.945
BP magnitude          : 15.277
DUPflag              : 1
Distance (au)         : 4.635
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -4.56
Sun-Target sep (deg) : 126.65
Sun-Moon sep (deg)   : 174.20
B (ring opening deg) : -2.61
PA of pole (deg)     : -0.08
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 14.142
C/A sky separation (km) : 47542.5
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	2031-04-25T17:40:55.691	77.74	-36.28	71487.8	42.21	45.93
Jupiter	E	2031-04-25T23:54:50.333	10.77	32.90x	71488.1	40.07	43.78