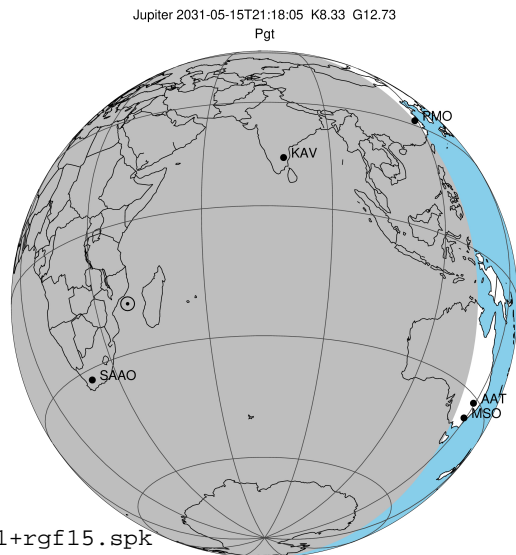


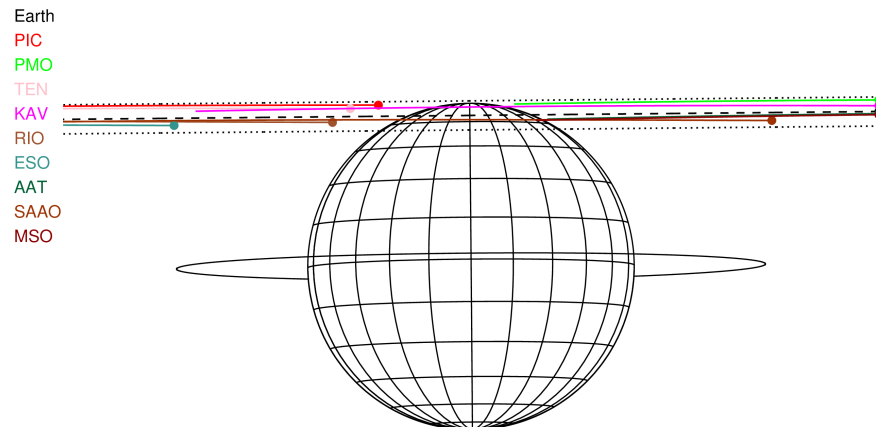
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-05-15T21:18:05.070  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068934372857812224  
 2Mass ID (if available) : 17473535-2253112

Jupiter 2031-05-15T21:18:05 K8.33 G12.73 Pgt

ICRS Star Coord at Epoch: 17h 47m 35.35692s -22:53:11.23966s  
 RUWE (>1.4 is poor) : 1.15  
 K magnitude : 8.334  
 G magnitude : 12.734  
 RP magnitude : 11.581  
 BP magnitude : 14.133  
 DUPflag : 0  
 Distance (au) : 4.412  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -11.76  
 Sun-Target sep (deg) : 147.27  
 Sun-Moon sep (deg) : 83.74  
 B (ring opening deg) : -2.61  
 PA of pole (deg) : 0.50  
 Pole direction: RA (deg): 268.05694  
 Dec (deg): 64.49651  
 C/A sky separation (") : 20.681  
 C/A sky separation (km) : 66177.5  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

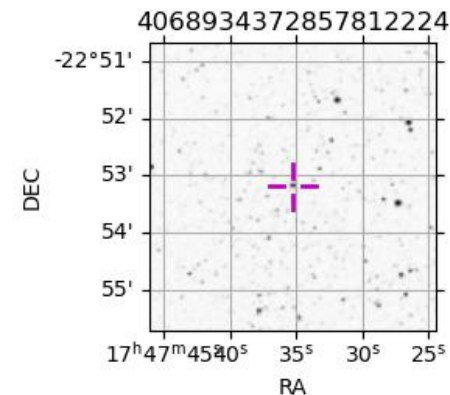


2031-05-15T21:18:05.0700 a: 17 47 35.3569 8: -22 53 11.240 C/A \*\*\*\*\* PA 180.55 deg v\_sky -11.76 km/s D 0.41 AU  
 Credit: Styled after SORA/Lucky Star



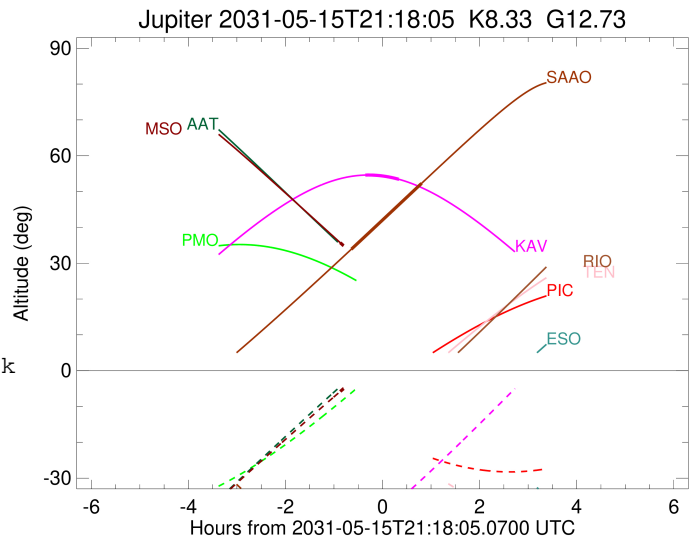
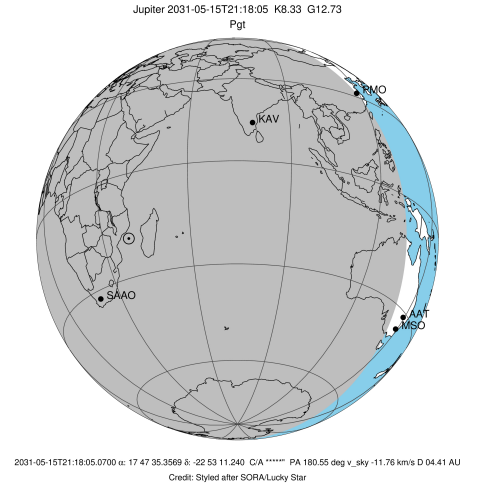
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	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			Pnn
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			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	MAY 15 20:56 - MAY 15 21:38	Pie
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	+ +	MAY 15 20:39 - MAY 15 22:06	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAY 15 20:25 - MAY 15 20:25	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-15T21:17:32.770
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        : 4068934372857812224
2Mass ID (if available) : 17473535-2253112
ICRS Star Coord at Epoch: 17h 47m 35.35692s -22:53:11.23966s
RUWE (>1.4 is poor) : 1.15
K magnitude           : 8.334
G magnitude           : 12.734
RP magnitude          : 11.581
BP magnitude          : 14.133
DUPflag              : 0
Distance (au)         : 4.412
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.76
Sun-Target sep (deg) : 147.27
Sun-Moon sep (deg)    : 84.50
B (ring opening deg) : -2.61
PA of pole (deg)      : 0.50
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (" ) : 21.834
C/A sky separation (km) : 69867.2
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
    
```

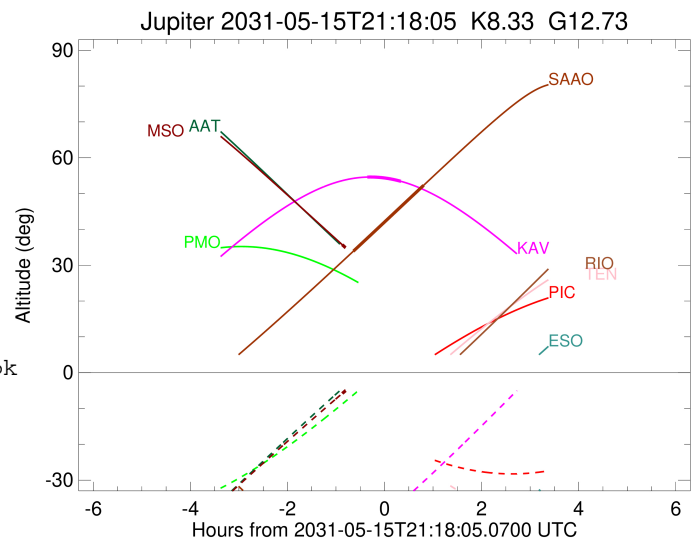
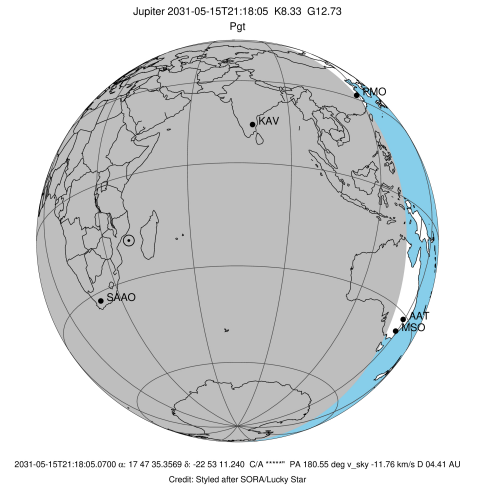


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-15T20:56:51.400	54.59	-44.07	71483.1	77.58	79.02
Jupiter	E	2031-05-15T21:38:14.035	53.42	-36.19	71483.1	77.39	78.85

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-15T21:23:11.290
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       : 4068934372857812224
2Mass ID (if available) : 17473535-2253112
ICRS Star Coord at Epoch: 17h 47m 35.35692s -22:53:11.23966s
RUWE (>1.4 is poor) : 1.15
K magnitude           : 8.334
G magnitude           : 12.734
RP magnitude          : 11.581
BP magnitude          : 14.133
DUPflag              : 0
Distance (au)        : 4.412
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.76
Sun-Target sep (deg) : 147.27
Sun-Moon sep (deg)   : 84.44
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.50
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 20.096
C/A sky separation (km): 64306.2
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
    
```

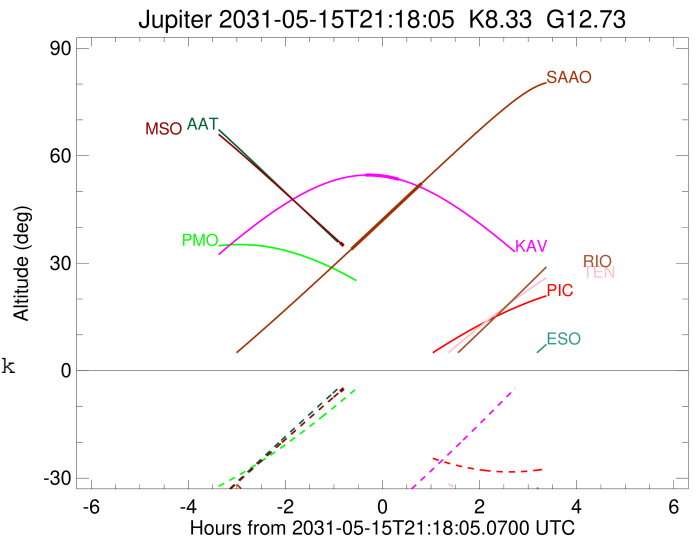
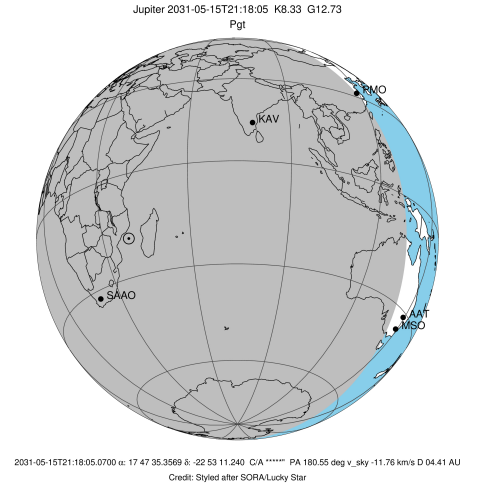


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-15T20:39:38.405	33.91	-61.32	71484.6	63.41	66.22
Jupiter	E	2031-05-15T22:06:30.192	52.30	-75.49	71484.4	64.47	67.19

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-15T21:12:03.670
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      : 4068934372857812224
2Mass ID (if available) : 17473535-2253112
ICRS Star Coord at Epoch: 17h 47m 35.35692s -22:53:11.23966s
RUWE (>1.4 is poor) : 1.15
K magnitude          : 8.334
G magnitude          : 12.734
RP magnitude         : 11.581
BP magnitude         : 14.133
DUPflag             : 0
Distance (au)       : 4.412
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.76
Sun-Target sep (deg) : 147.27
Sun-Moon sep (deg)  : 84.07
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.50
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 19.821
C/A sky separation (km): 63425.6
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	2031-05-15T20:25:50.804	35.72	-5.81	71484.6	63.11	65.95
Jupiter	E	2031-05-15T21:58:30.849	17.07	11.19x	71484.8	61.67	64.61