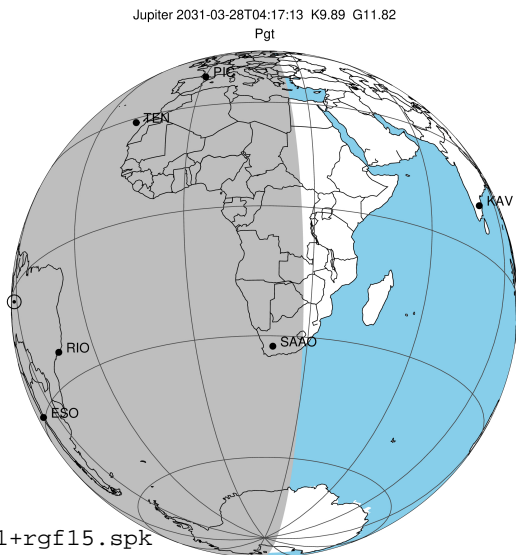


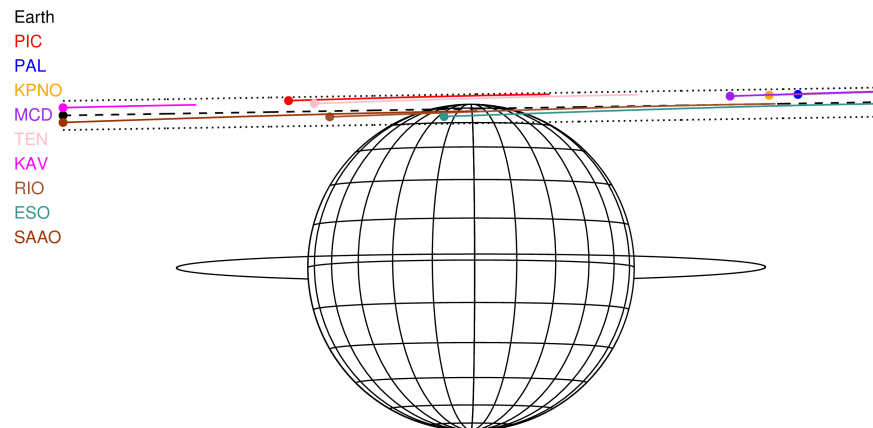
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-03-28T04:17:13.500  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068713607167214080  
 2Mass ID (if available) : 17512549-2252504

Jupiter 2031-03-28T04:17:13 K9.89 G11.82 Pgt

ICRS Star Coord at Epoch: 17h 51m 25.50792s -22:52:50.62987s  
 RUWE (>1.4 is poor) : 1.10  
 K magnitude : 9.889  
 G magnitude : 11.824  
 RP magnitude : 11.157  
 BP magnitude : 12.317  
 DUPflag : 0  
 Distance (au) : 5.061  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 8.57  
 Sun-Target sep (deg) : 98.84  
 Sun-Moon sep (deg) : 157.86  
 B (ring opening deg) : -2.62  
 PA of pole (deg) : 0.09  
 Pole direction: RA (deg): 268.05699  
 Dec (deg): 64.49651  
 C/A sky separation (") : 18.938  
 C/A sky separation (km) : 69512.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

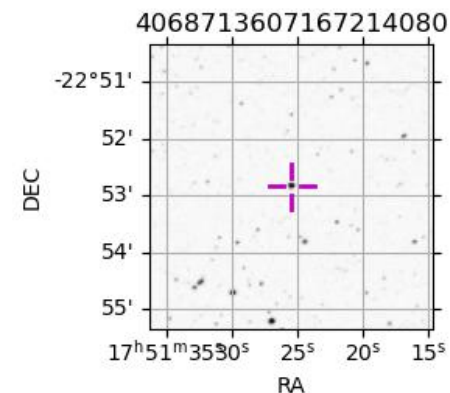


2031-03-28T04:17:13.5000 α: 17 51 25.5079 δ: -22 52 50.630 C/A \*\*\*\*\* PA 180.94 deg v\_sky + 8.57 km/s D 05.06 AU  
 Credit: Styled after SORA/Lucky Star



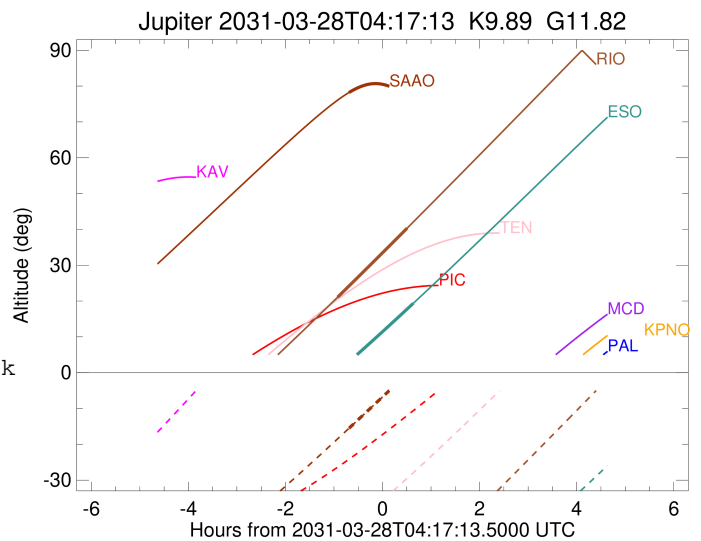
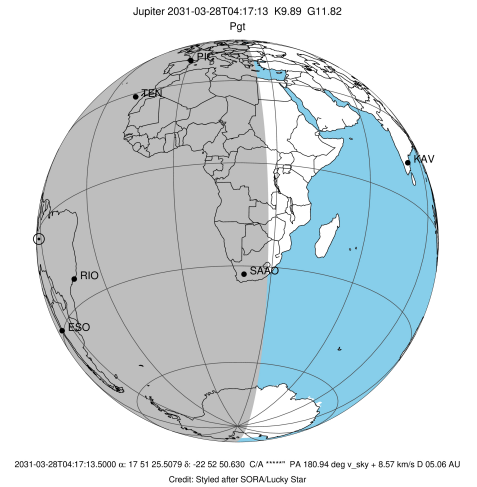
Observable events with sun below -5 deg and altitude above 5 deg

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				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				Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAR 28 03:21 -	MAR 28 04:47	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3		+ MAR 28 04:55 -	MAR 28 04:55	Pne
AAT	Siding Spring (AAT)	-31.3	149.1				Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8		+ MAR 28 03:35 -	MAR 28 03:35	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0				Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-28T04:04:28.010
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      : 4068713607167214080
2Mass ID (if available) : 17512549-2252504
ICRS Star Coord at Epoch: 17h 51m 25.50792s -22:52:50.62987s
RUWE (>1.4 is poor) : 1.10
K magnitude         : 9.889
G magnitude         : 11.824
RP magnitude        : 11.157
BP magnitude        : 12.317
DUPflag            : 0
Distance (au)       : 5.061
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 8.57
Sun-Target sep (deg) : 98.84
Sun-Moon sep (deg)  : 157.37
B (ring opening deg) : -2.62
PA of pole (deg)    : 0.09
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 18.565
C/A sky separation (km) : 68147.7
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
    
```

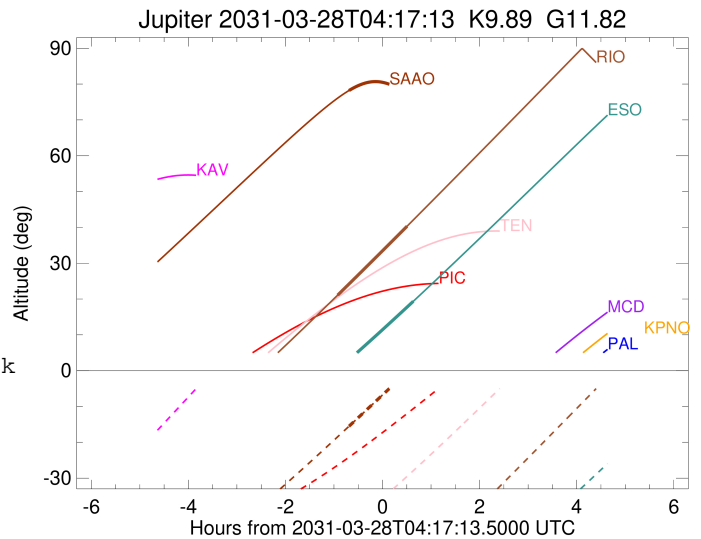
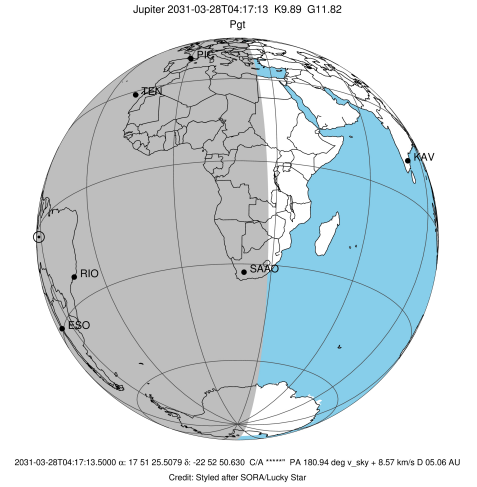


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-28T03:21:45.967	21.08	-69.32	71483.7	70.33	72.52
Jupiter	E	2031-03-28T04:47:38.895	40.33	-56.86	71483.3	74.07	75.88

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-28T04:04:06.240
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      : 4068713607167214080
2Mass ID (if available) : 17512549-2252504
ICRS Star Coord at Epoch: 17h 51m 25.50792s -22:52:50.62987s
RUWE (>1.4 is poor) : 1.10
K magnitude          : 9.889
G magnitude          : 11.824
RP magnitude         : 11.157
BP magnitude         : 12.317
DUPflag             : 0
Distance (au)       : 5.061
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 8.57
Sun-Target sep (deg) : 98.84
Sun-Moon sep (deg)  : 157.20
B (ring opening deg) : -2.62
PA of pole (deg)    : 0.09
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (" ) : 18.115
C/A sky separation (km) : 66495.7
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
    
```

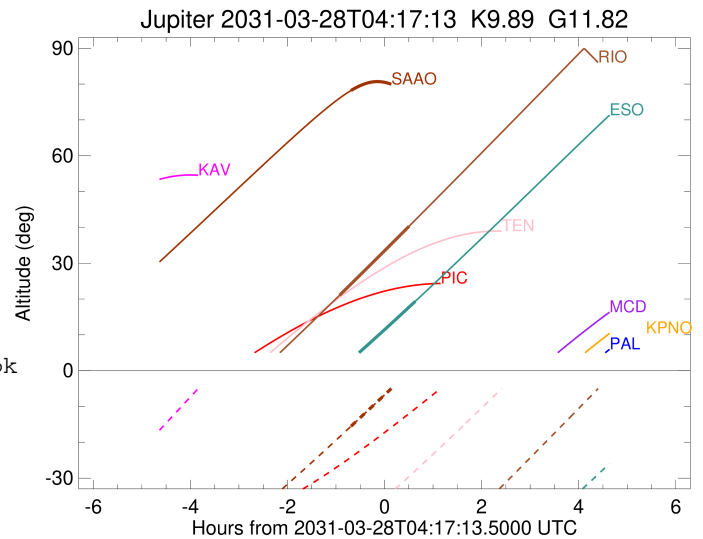
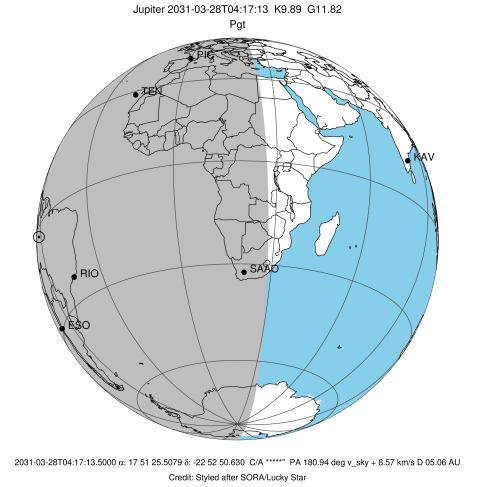


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-28T03:13:35.062	-1.34x	-55.48	71484.1	66.46	69.01
Jupiter	E	2031-03-28T04:55:17.818	19.36	-63.76	71483.7	70.21	72.41

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch             : 2031-03-28T04:17:41.350
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        : 4068713607167214080
2Mass ID (if available) : 17512549-2252504
ICRS Star Coord at Epoch: 17h 51m 25.50792s -22:52:50.62987s
RUWE (>1.4 is poor)  : 1.10
K magnitude           : 9.889
G magnitude           : 11.824
RP magnitude          : 11.157
BP magnitude          : 12.317
DUPflag              : 0
Distance (au)         : 5.061
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : 8.57
Sun-Target sep (deg)  : 98.84
Sun-Moon sep (deg)    : 158.22
B (ring opening deg)  : -2.62
PA of pole (deg)      : 0.09
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 18.657
C/A sky separation (km) : 68481.8
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	2031-03-28T03:35:41.483	78.18	-15.54	71483.5	72.21	74.21
Jupiter	E	2031-03-28T04:59:44.925	75.31	2.20x	71483.3	73.87	75.70