

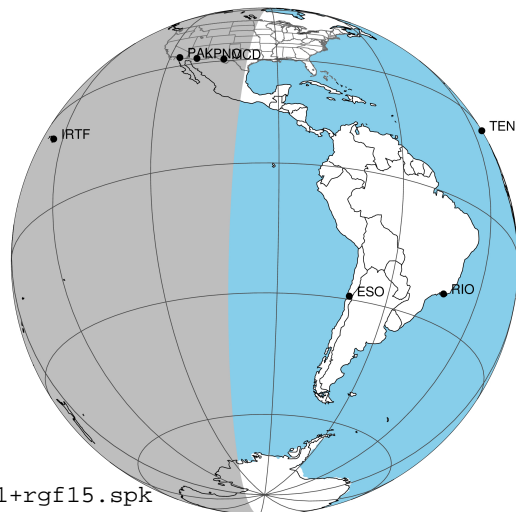
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-09T12:51:31.970
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116891526646872320
 2Mass ID (if available) : 17444572-2251117

Jupiter 2031-03-09T12:51:31 K8.41 G13.09 Pgt

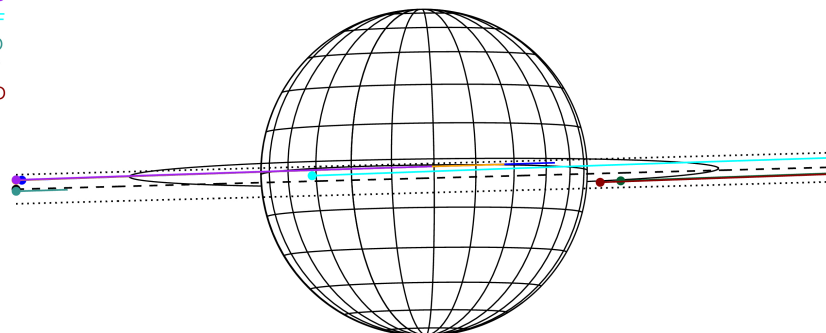
ICRS Star Coord at Epoch: 17h 44m 45.72953s -22:51:11.95068s

RUWE (>1.4 is poor) : 0.78
 K magnitude : 8.412
 G magnitude : 13.094
 RP magnitude : 11.865
 BP magnitude : 14.765
 DUPflag : 0
 Distance (au) : 5.362
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 17.37
 Sun-Target sep (deg) : 81.83
 Sun-Moon sep (deg) : 93.99
 B (ring opening deg) : -2.64
 PA of pole (deg) : 0.80
 Pole direction: RA (deg): 268.05700
 Dec (deg): 64.49651
 C/A sky separation (") : 0.646
 C/A sky separation (km) : 2512.3
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-03-09T12:51:31 K8.41 G13.09
 Pgt



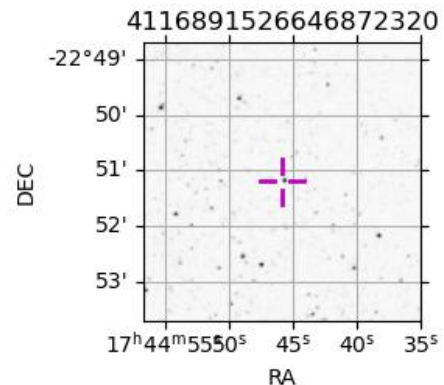
Earth
 PAL
 KPNO
 MCD
 IRTF
 ESO
 AAT
 MSO



2031-03-09T12:51:31.9700 a: 17 44 45.7295 l: -22 51 11.951 C/A 0.656" PA 1.55 deg v_sky +17.37 km/s D 05.36 AU
 Credit: Styled after SORA/Lucky Star

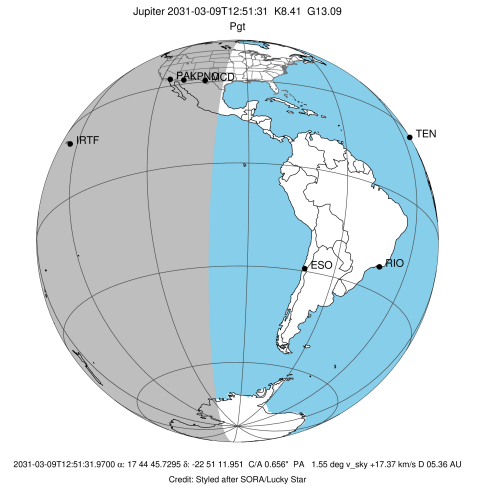
Observable events with sun below -5 deg and altitude above 5 deg

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	+	MAR 09 11:39 - MAR 09 11:39	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAR 09 11:39 - MAR 09 11:39	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAR 09 11:40 - MAR 09 11:40	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	MAR 09 13:55 - MAR 09 13:55	Pne
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			Pnn
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

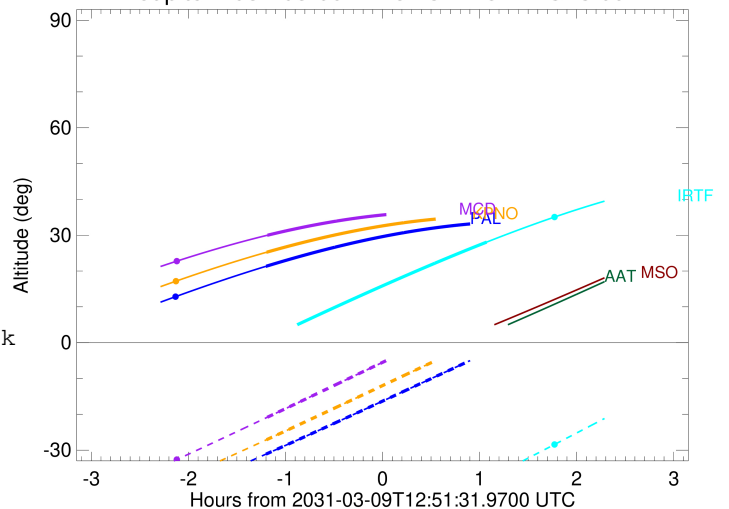


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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-09T12:49:18.670
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)   : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 4116891526646872320
2Mass ID (if available) : 17444572-2251117
ICRS Star Coord at Epoch: 17h 44m 45.72953s -22:51:11.95068s
RUWE (>1.4 is poor) : 0.78
K magnitude          : 8.412
G magnitude          : 13.094
RP magnitude         : 11.865
BP magnitude         : 14.765
DUPflag             : 0
Distance (au)        : 5.362
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 17.37
Sun-Target sep (deg) : 81.83
Sun-Moon sep (deg)   : 94.47
B (ring opening deg) : -2.64
PA of pole (deg)     : 0.80
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation ("): 0.653
C/A sky separation (km): 2539.3
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 2031-03-09T12:51:31 K8.41 G13.09

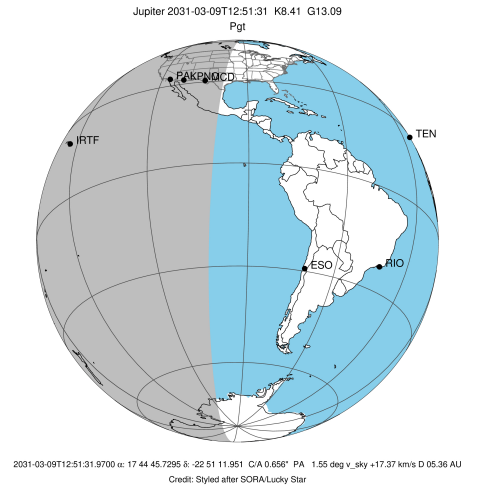


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-09T11:39:30.519	21.31	-31.12	71492.0	0.99	1.13
Jupiter	E	2031-03-09T13:59:25.128	33.60	-2.13x	71492.0	2.94	3.36

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-09T12:49:44.000
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      : 4116891526646872320
2Mass ID (if available) : 17444572-2251117
ICRS Star Coord at Epoch: 17h 44m 45.72953s -22:51:11.95068s
RUWE (>1.4 is poor) : 0.78
K magnitude          : 8.412
G magnitude          : 13.094
RP magnitude         : 11.865
BP magnitude         : 14.765
DUPflag             : 0
Distance (au)       : 5.362
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 17.37
Sun-Target sep (deg) : 81.83
Sun-Moon sep (deg)  : 94.51
B (ring opening deg) : -2.64
PA of pole (deg)    : 0.80
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 0.651
C/A sky separation (km) : 2532.0
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
    
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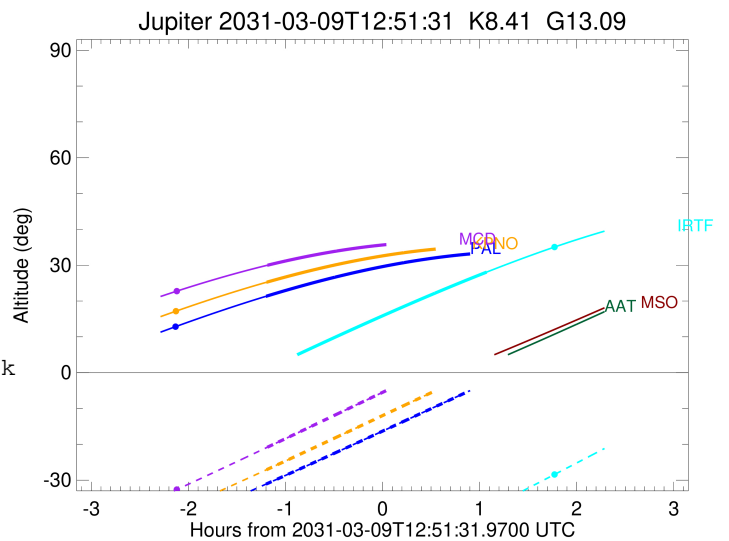
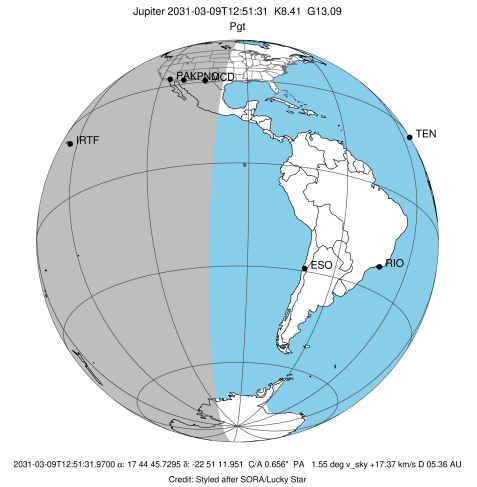


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-09T11:39:49.908	25.23	-27.10	71492.0	1.02	1.17
Jupiter	E	2031-03-09T13:59:54.079	35.33	2.53x	71492.0	2.89	3.30

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-09T12:50:24.060
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       : 4116891526646872320
2Mass ID (if available) : 17444572-2251117
ICRS Star Coord at Epoch: 17h 44m 45.72953s -22:51:11.95068s
RUWE (>1.4 is poor) : 0.78
K magnitude           : 8.412
G magnitude           : 13.094
RP magnitude          : 11.865
BP magnitude          : 14.765
DUPflag              : 0
Distance (au)        : 5.362
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 17.37
Sun-Target sep (deg) : 81.83
Sun-Moon sep (deg)   : 94.54
B (ring opening deg) : -2.64
PA of pole (deg)     : 0.80
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 0.652
C/A sky separation (km) : 2537.2
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
    
```

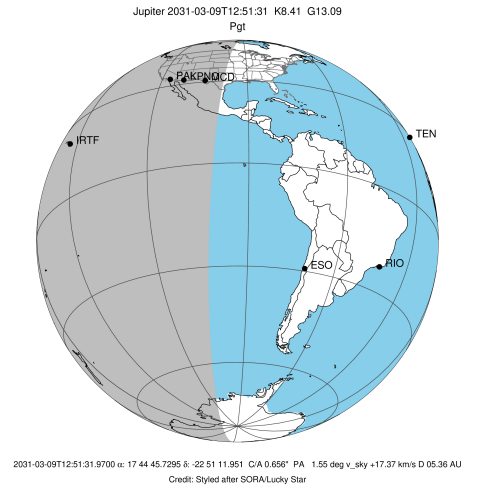


x: target alt < 5.0 deg or sun > -5.0 deg

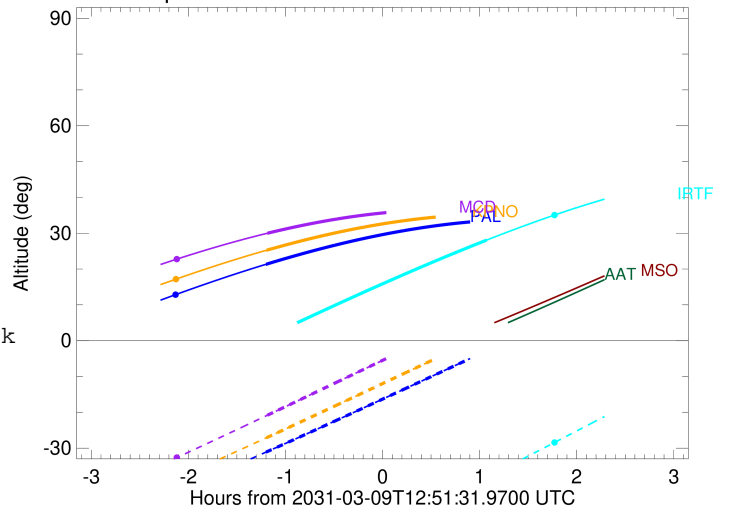
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-09T11:40:23.272	29.99	-20.81	71492.0	1.08	1.24
Jupiter	E	2031-03-09T14:00:37.075	36.27	9.28x	71492.0	2.82	3.23

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-09T12:46:18.190
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        : 4116891526646872320
2Mass ID (if available) : 17444572-2251117
ICRS Star Coord at Epoch: 17h 44m 45.72953s -22:51:11.95068s
RUWE (>1.4 is poor) : 0.78
K magnitude           : 8.412
G magnitude           : 13.094
RP magnitude          : 11.865
BP magnitude          : 14.765
DUPflag              : 0
Distance (au)         : 5.362
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 17.37
Sun-Target sep (deg)  : 81.83
Sun-Moon sep (deg)    : 94.30
B (ring opening deg) : -2.64
PA of pole (deg)      : 0.80
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 0.098
C/A sky separation (km) : 381.9
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
    
```



Jupiter 2031-03-09T12:51:31 K8.41 G13.09



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	2031-03-09T11:37:15.000	0.40x	-68.06	71492.0	-0.98	-1.12
Jupiter	E	2031-03-09T13:55:56.044	28.08	-38.19	71492.0	1.53	1.75