

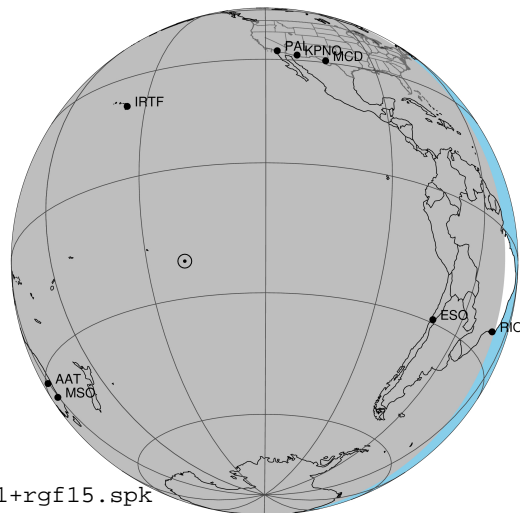
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-29T09:17:41.490
 Event type : Pt
 : Jupiter occs: topocentric, not geocentric
 : Not a ringed target
 Gaia source ID : 4116925370989068416
 2Mass ID (if available) : 17413492-2252453

Jupiter 2031-05-29T09:17:41 K8.37 G14.29 Pt

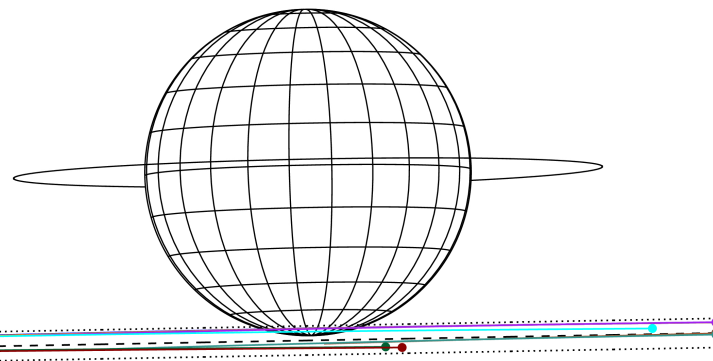
ICRS Star Coord at Epoch: 17h 41m 34.90875s -22:52:45.56602s

RUWE (>1.4 is poor) : 0.79
 K magnitude : 8.371
 G magnitude : 14.287
 RP magnitude : 12.719
 BP magnitude : 16.886
 DUPflag : 0
 Distance (au) : 4.315
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.95
 Sun-Target sep (deg) : 161.64
 Sun-Moon sep (deg) : 109.29
 B (ring opening deg) : -2.60
 PA of pole (deg) : 1.15
 Pole direction: RA (deg): 268.05693
 Dec (deg): 64.49651
 C/A sky separation (") : 23.512
 C/A sky separation (km) : 73578.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-29T09:17:41 K8.37 G14.29 Pt



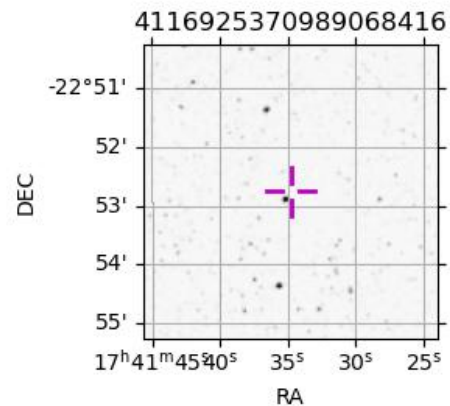
Earth
 PAL
 KPNO
 MCD
 IRTF
 RIO
 ESO
 AAT
 MSO



2031-05-29T09:17:41.4900 α: 17 41 34.9088 δ: -22 52 45.566 C/A ***** PA 1.06 deg v_sky -14.95 km/s D 04.31 AU
 Credit: Styled after SORA/Lucky Star

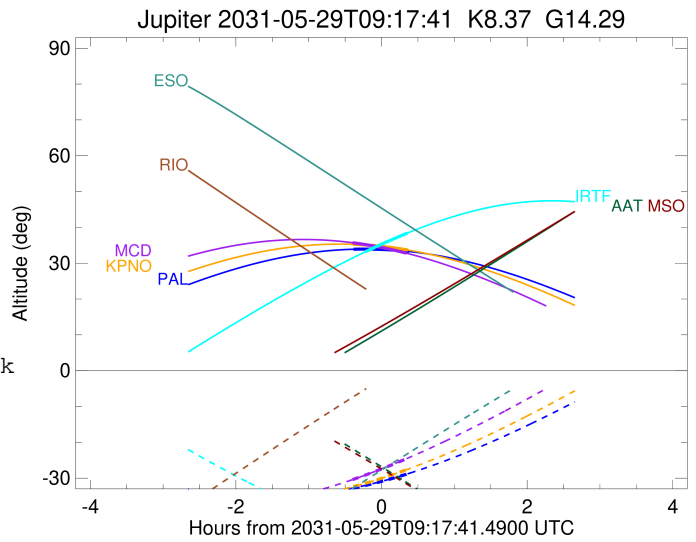
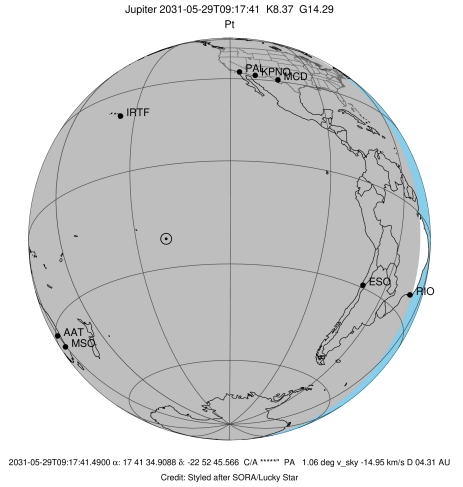
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	MAY 29 08:54 - MAY 29 09:40	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 29 08:54 - MAY 29 09:39	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 29 08:53 - MAY 29 09:38	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	MAY 29 09:04 - MAY 29 09:39	Pie
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            : 2031-05-29T09:17:25.210
Event type           : Pt
: Jupiter occs: topocentric, not geocentric
: 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       : 4116925370989068416
2Mass ID (if available) : 17413492-2252453
ICRS Star Coord at Epoch: 17h 41m 34.90875s -22:52:45.56602s
RUWE (>1.4 is poor) : 0.79
K magnitude           : 8.371
G magnitude           : 14.287
RP magnitude          : 12.719
BP magnitude          : 16.886
DUPflag              : 0
Distance (au)         : 4.315
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.95
Sun-Target sep (deg)  : 161.64
Sun-Moon sep (deg)   : 109.74
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.15
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 21.822
C/A sky separation (km) : 68289.3
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
    
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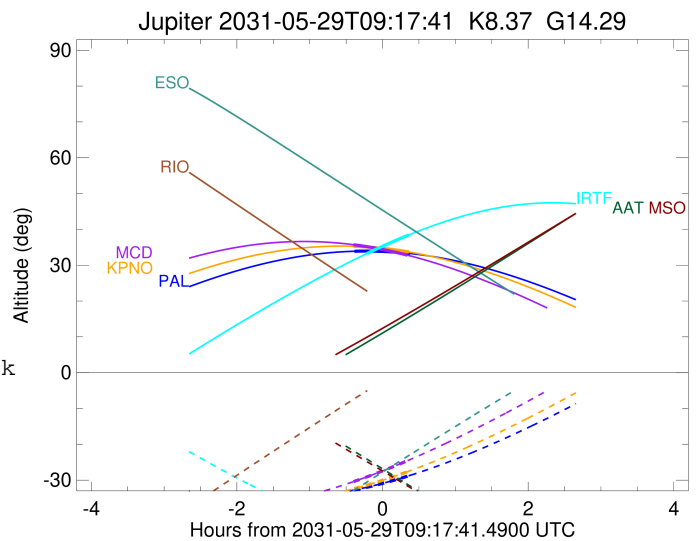
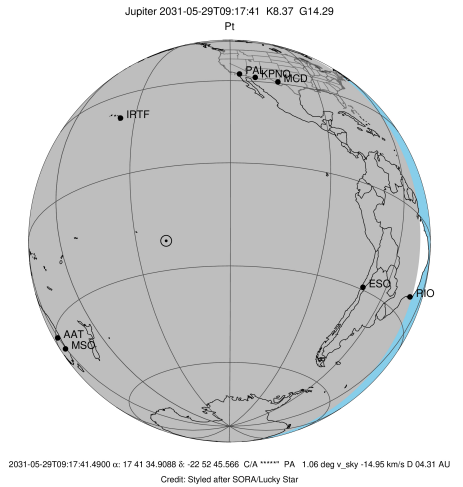


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-29T08:54:29.932	33.89	-32.75	71483.5	-72.72	-74.68
Jupiter	E	2031-05-29T09:40:20.458	33.27	-28.68	71483.5	-72.57	-74.53

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-29T09:16:48.540
Event type          : Pt
                    : Jupiter occs: topocentric, not geocentric
                    : 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      : 4116925370989068416
2Mass ID (if available) : 17413492-2252453
ICRS Star Coord at Epoch: 17h 41m 34.90875s -22:52:45.56601s
RUWE (>1.4 is poor) : 0.79
K magnitude         : 8.371
G magnitude         : 14.287
RP magnitude        : 12.719
BP magnitude        : 16.886
DUPflag            : 0
Distance (au)       : 4.315
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -14.95
Sun-Target sep (deg) : 161.64
Sun-Moon sep (deg)  : 109.73
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.15
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (" ) : 21.854
C/A sky separation (km) : 68388.4
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
    
```

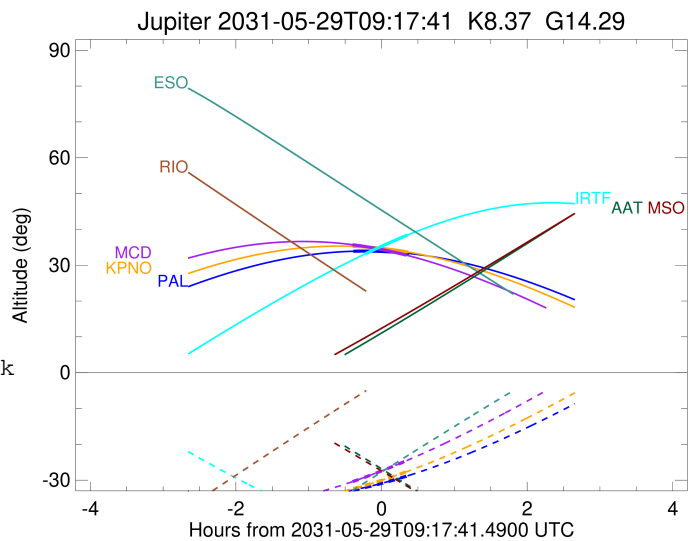
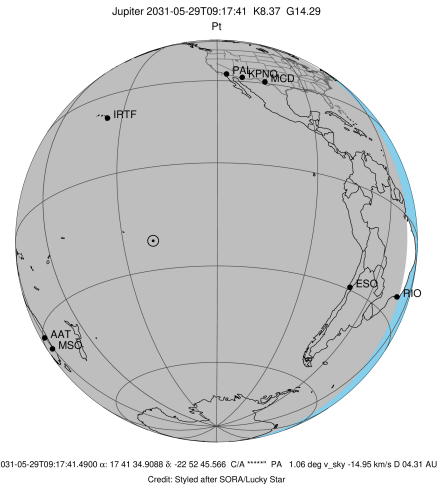


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-29T08:54:14.712	35.26	-32.38	71483.5	-72.94	-74.87
Jupiter	E	2031-05-29T09:39:22.665	33.68	-27.51	71483.5	-72.88	-74.82

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-29T09:15:55.620
Event type            : Pt
: Jupiter occs: topocentric, not geocentric
: 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       : 4116925370989068416
2Mass ID (if available) : 17413492-2252453
ICRS Star Coord at Epoch: 17h 41m 34.90875s -22:52:45.56601s
RUWE (>1.4 is poor) : 0.79
K magnitude           : 8.371
G magnitude           : 14.287
RP magnitude          : 12.719
BP magnitude          : 16.886
DUPflag              : 0
Distance (au)        : 4.315
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.95
Sun-Target sep (deg) : 161.64
Sun-Moon sep (deg)   : 109.69
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.15
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 21.896
C/A sky separation (km): 68519.7
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
    
```

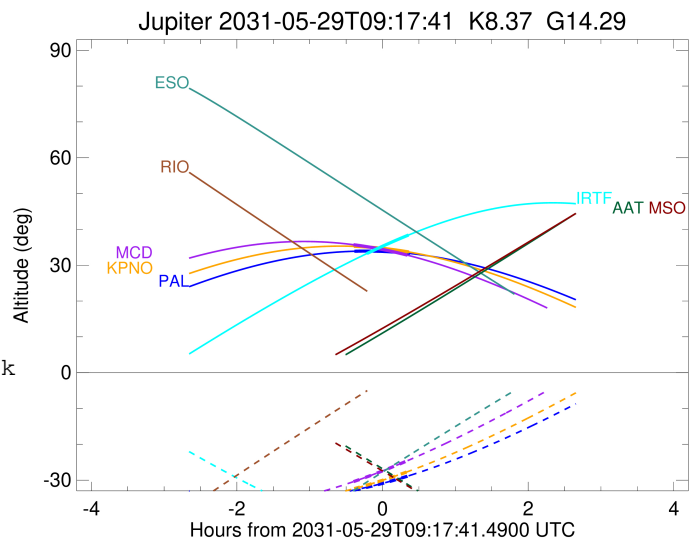
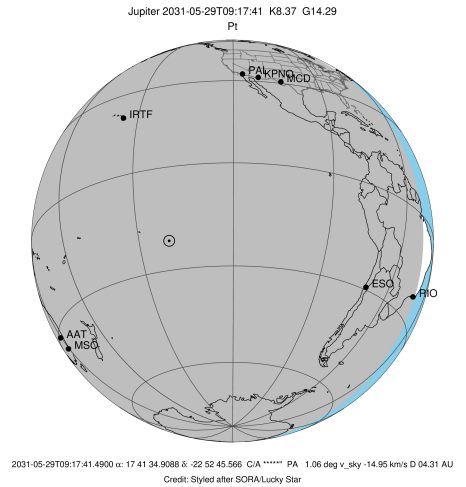


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-29T08:53:49.960	35.71	-30.41	71483.5	-73.23	-75.13
Jupiter	E	2031-05-29T09:38:01.995	32.82	-24.61	71483.5	-73.32	-75.21

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2031-05-29T09:22:01.510
Event type             : Pt
: Jupiter occs: topocentric, not geocentric
: 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         : 4116925370989068416
2Mass ID (if available) : 17413492-2252453
ICRS Star Coord at Epoch: 17h 41m 34.90875s -22:52:45.56602s
RUWE (>1.4 is poor)  : 0.79
K magnitude             : 8.371
G magnitude             : 14.287
RP magnitude           : 12.719
BP magnitude           : 16.886
DUPflag                : 0
Distance (au)          : 4.315
f0 (km)                : 0.00
g0 (km)                : 0.00
skyplane vel. (km/s)   : -14.95
Sun-Target sep (deg)   : 161.64
Sun-Moon sep (deg)     : 109.95
B (ring opening deg)   : -2.60
PA of pole (deg)       : 1.15
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 22.278
C/A sky separation (km) : 69715.0
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
    
```



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	2031-05-29T09:04:50.551	33.25	-44.86	71483.2	-77.45	-78.90
Jupiter	E	2031-05-29T09:39:11.071	38.42	-47.54	71483.2	-76.53	-78.08