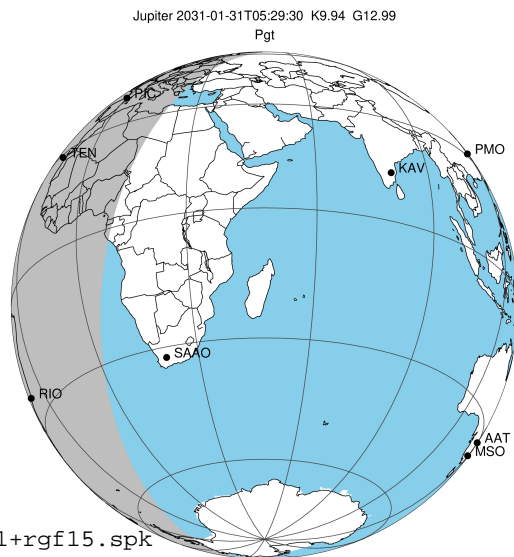


target : Jupiter  
target radius (km) : 71492.00  
C/A epoch : 2031-01-31T05:29:30.800  
Event type : Pgt  
: Jupiter occs: geocentric, topocentric  
: Not a ringed target  
Gaia source ID : 4114707488592150400  
2Mass ID (if available) : 17205432-2235109

Jupiter 2031-01-31T05:29:30 K9.94 G12.99 Pgt

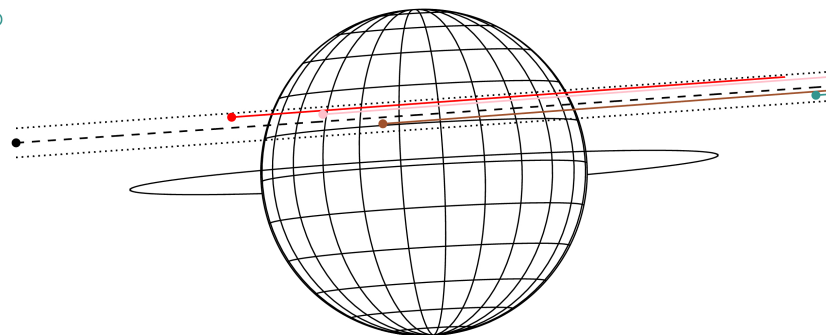
ICRS Star Coord at Epoch: 17h 20m 54.32512s -22:35:10.75326s

RUWE (>1.4 is poor) : 0.91  
K magnitude : 9.940  
G magnitude : 12.990  
RP magnitude : 12.087  
BP magnitude : 13.821  
DUPflag : 0  
Distance (au) : 5.908  
f0 (km) : 0.00  
g0 (km) : 0.00  
skyplane vel. (km/s) : 32.41  
Sun-Target sep (deg) : 49.72  
Sun-Moon sep (deg) : 149.70  
B (ring opening deg) : -2.70  
PA of pole (deg) : 3.37  
Pole direction: RA (deg): 268.05704  
Dec (deg): 64.49651  
C/A sky separation (") : 5.917  
C/A sky separation (km) : 25352.5  
NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



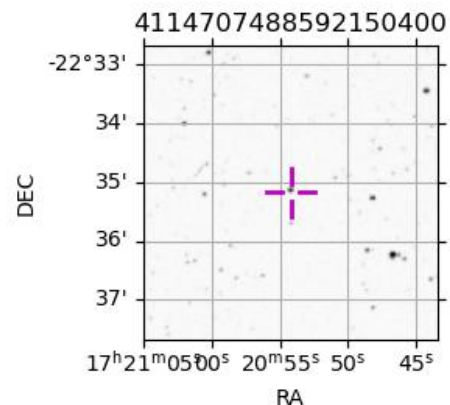
2031-01-31T05:29:30.8000 cr: 17 20 54.3251 s: -22 35 10.753 C/A 5.9077 PA 183.98 deg v\_sky +32.41 km/s D 05.91 AU  
Credit: Styled after SORA/Lucky Star

Earth  
PIC  
TEN  
RIO  
ESO



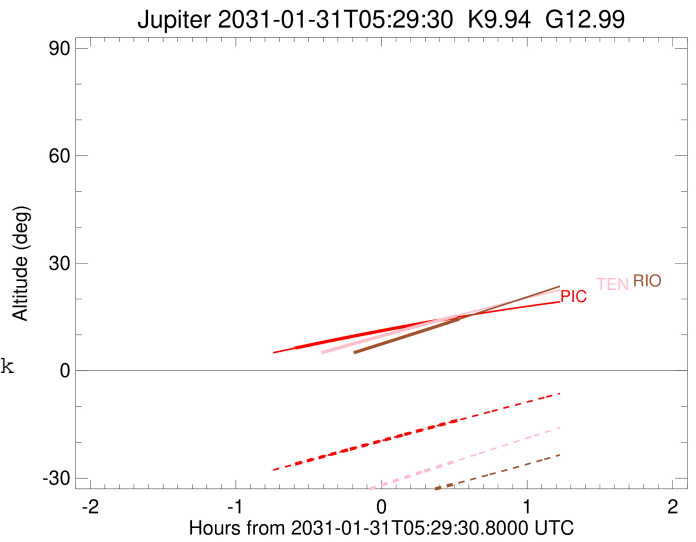
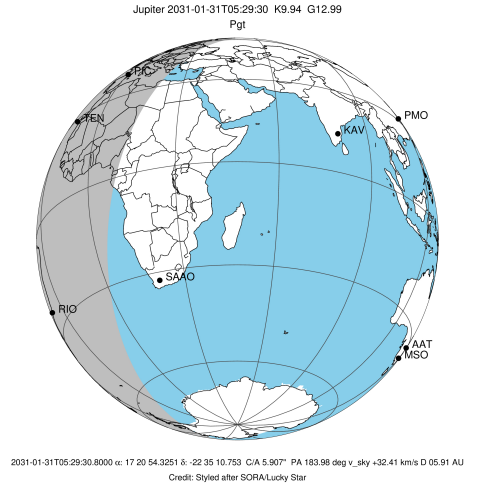
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JAN 31 04:53 - JAN 31 06:01	Pie
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	+	JAN 31 06:00 - JAN 31 06:00	Pne
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	+	JAN 31 06:01 - JAN 31 06:01	Pne
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



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-01-31T05:27:29.180
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      : 4114707488592150400
2Mass ID (if available) : 17205432-2235109
ICRS Star Coord at Epoch: 17h 20m 54.32512s -22:35:10.75326s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.940
G magnitude          : 12.990
RP magnitude         : 12.087
BP magnitude         : 13.821
DUPflag             : 0
Distance (au)        : 5.908
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 32.41
Sun-Target sep (deg) : 49.72
Sun-Moon sep (deg)   : 149.35
B (ring opening deg) : -2.70
PA of pole (deg)     : 3.37
Pole direction: RA (deg): 268.05704
Dec (deg): 64.49651
C/A sky separation ("): 7.070
C/A sky separation (km): 30295.8
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
    
```

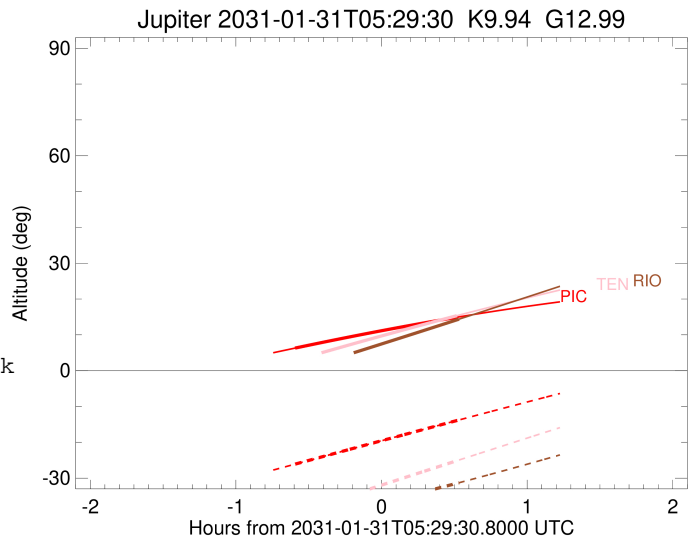
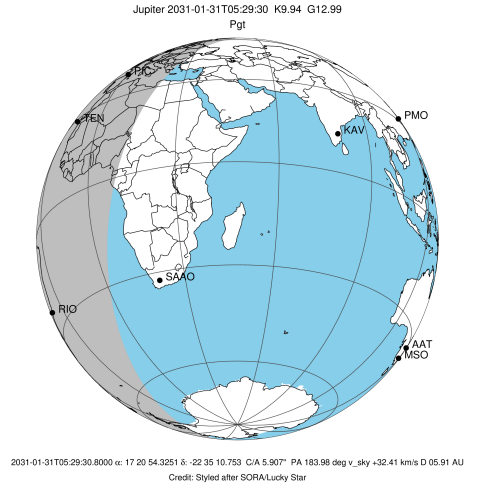


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-01-31T04:53:59.107	6.31	-26.07	71490.3	24.23	27.19
Jupiter	E	2031-01-31T06:01:02.251	14.96	-13.84	71490.1	25.84	28.93

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-01-31T05:26:41.850
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      : 4114707488592150400
2Mass ID (if available) : 17205432-2235109
ICRS Star Coord at Epoch: 17h 20m 54.32512s -22:35:10.75326s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.940
G magnitude          : 12.990
RP magnitude         : 12.087
BP magnitude         : 13.821
DUPflag             : 0
Distance (au)       : 5.908
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 32.41
Sun-Target sep (deg) : 49.72
Sun-Moon sep (deg)  : 149.15
B (ring opening deg) : -2.70
PA of pole (deg)    : 3.37
Pole direction: RA (deg): 268.05704
Dec (deg): 64.49651
C/A sky separation (") : 6.695
C/A sky separation (km) : 28687.0
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
    
```

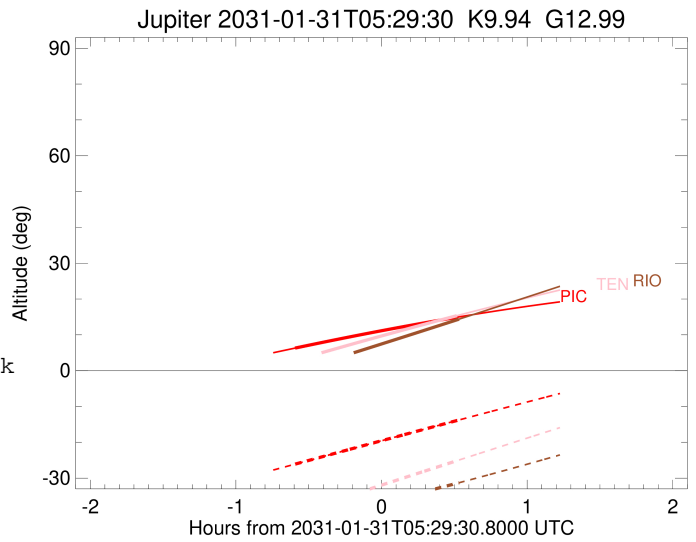
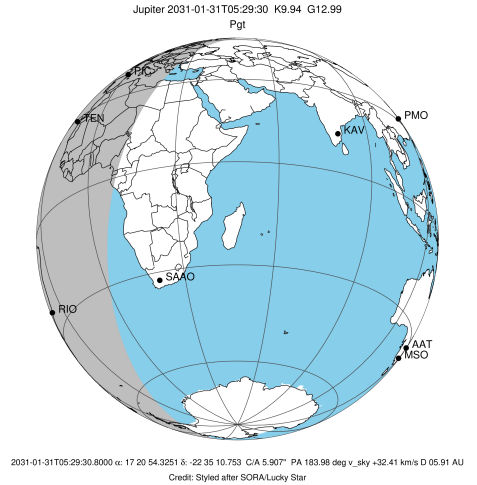


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-01-31T04:52:53.417	2.67x	-40.02	71490.5	22.74	25.58
Jupiter	E	2031-01-31T06:00:34.401	15.35	-25.13	71490.3	24.50	27.49

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-01-31T05:26:31.220
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      : 4114707488592150400
2Mass ID (if available) : 17205432-2235109
ICRS Star Coord at Epoch: 17h 20m 54.32512s -22:35:10.75326s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.940
G magnitude          : 12.990
RP magnitude         : 12.087
BP magnitude         : 13.821
DUPflag             : 0
Distance (au)        : 5.908
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 32.41
Sun-Target sep (deg) : 49.72
Sun-Moon sep (deg)   : 149.04
B (ring opening deg) : -2.70
PA of pole (deg)     : 3.37
Pole direction: RA (deg): 268.05704
Dec (deg): 64.49651
C/A sky separation ("): 5.277
C/A sky separation (km): 22613.1
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	2031-01-31T04:51:42.929	-0.58x	-42.25	71491.1	17.53	19.84
Jupiter	E	2031-01-31T06:01:24.357	14.37	-31.29	71490.9	19.32	21.82