

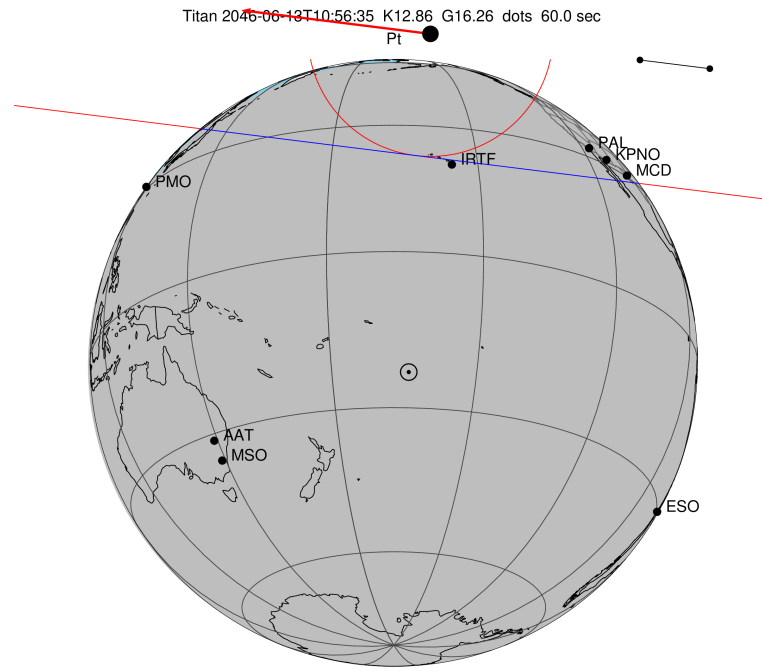
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2046-06-13T10:56:35.860  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 4115816346036807168  
 2Mass ID (if available) : 17125200-2127266

ICRS Star Coord at Epoch: 17h 12m 51.98902s -21:27:26.94223s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 12.864  
 G magnitude : 16.258  
 RP magnitude : 15.313  
 BP magnitude : 17.180  
 DUPflag : 0  
 Distance (au) : 9.014  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -24.62  
 Sun-Target sep (deg) : 176.68  
 Sun-Moon sep (deg) : 63.31  
 B (ring opening deg) : 26.52  
 PA of pole (deg) : 4.59  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 1.064  
 C/A sky separation (km) : 6958.0  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

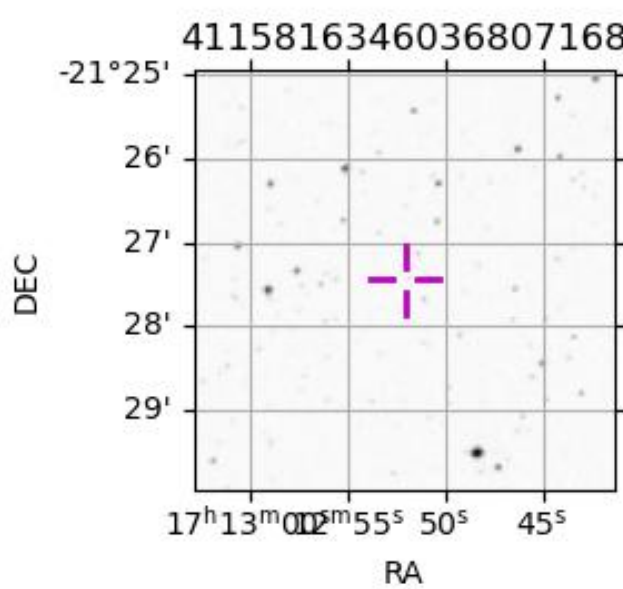
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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	+ +	JUN 13 10:53 - JUN 13 10:55	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 13 10:53 - JUN 13 10:54	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 13 10:53 - JUN 13 10:54	Pie
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			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



2046-06-13T10:56:35.8600 α: 17 12 51.9890 δ: -21 27 26.942 C/A 1.064" PA 7.11 deg v\_sky -24.63 km/s D 09.01 AU  
 Credit: Styled after SORA/Lucky Star



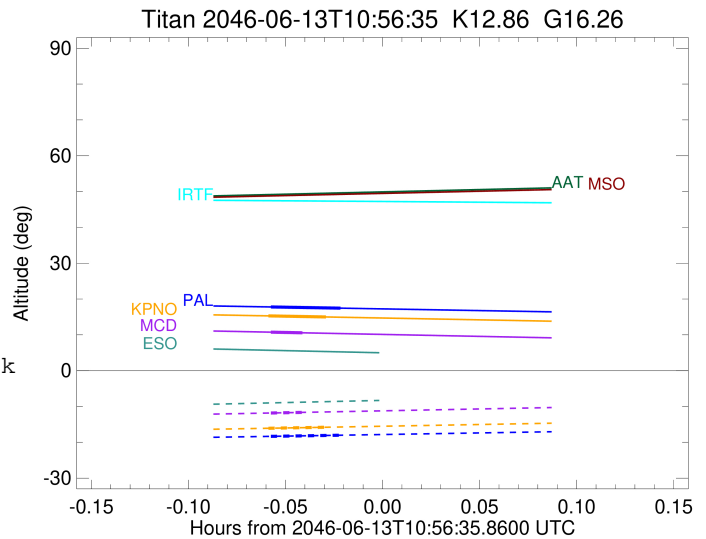
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2046-06-13T10:54:13.300
Event type           : Pt
: Titan 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       : 4115816346036807168
2Mass ID (if available) : 17125200-2127266
ICRS Star Coord at Epoch: 17h 12m 51.98902s -21:27:26.94223s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 12.864
G magnitude          : 16.258
RP magnitude         : 15.313
BP magnitude         : 17.180
DUPflag             : 0
Distance (au)        : 9.014
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -24.62
Sun-Target sep (deg) : 176.68
Sun-Moon sep (deg)   : 63.87
B (ring opening deg) : 26.52
PA of pole (deg)     : 4.59
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.305
C/A sky separation (km) : 1996.4
NAIF SPICE kernels   : RAJobs_U111+rgf16.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
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
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
Titan	I	2046-06-13T10:53:07.956	17.79	-18.34	2575.1	-41.79	-41.80
Titan	E	2046-06-13T10:55:18.648	17.45	-18.02	2575.1	-46.02	-46.03



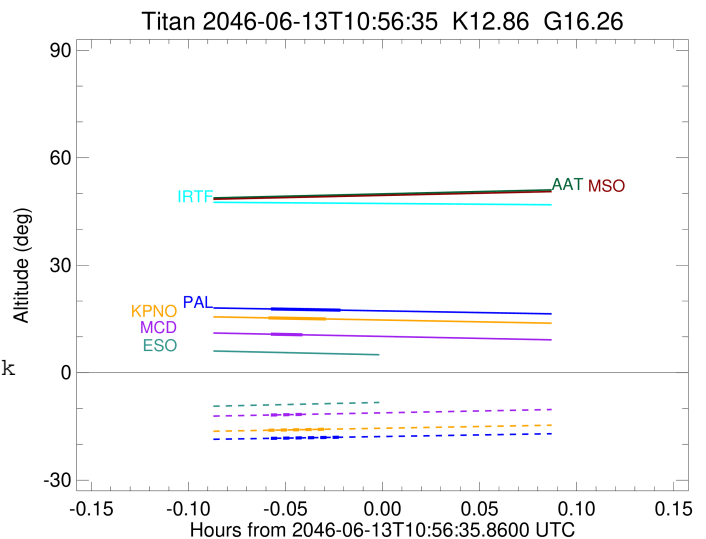
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2046-06-13T10:53:57.370
Event type           : Pt
: Titan 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       : 4115816346036807168
2Mass ID (if available) : 17125200-2127266
ICRS Star Coord at Epoch: 17h 12m 51.98902s -21:27:26.94223s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 12.864
G magnitude           : 16.258
RP magnitude          : 15.313
BP magnitude          : 17.180
DUPflag              : 0
Distance (au)         : 9.014
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -24.62
Sun-Target sep (deg) : 176.68
Sun-Moon sep (deg)   : 63.86
B (ring opening deg) : 26.52
PA of pole (deg)     : 4.59
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.336
C/A sky separation (km) : 2194.9
NAIF SPICE kernels   : RAJobs_U111+rgf16.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
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
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
Titan	I	2046-06-13T10:53:03.222	15.29	-16.08	2575.1	-47.70	-47.71
Titan	E	2046-06-13T10:54:51.524	14.99	-15.79	2575.1	-51.64	-51.65



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2046-06-13T10:53:38.190  
 Event type : Pt  
 : Titan 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 : 4115816346036807168  
 2Mass ID (if available) : 17125200-2127266  
 ICRS Star Coord at Epoch: 17h 12m 51.98902s -21:27:26.94223s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 12.864  
 G magnitude : 16.258  
 RP magnitude : 15.313  
 BP magnitude : 17.180  
 DUPflag : 0  
 Distance (au) : 9.014  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -24.62  
 Sun-Target sep (deg) : 176.68  
 Sun-Moon sep (deg) : 63.81  
 B (ring opening deg) : 26.52  
 PA of pole (deg) : 4.59  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.377  
 C/A sky separation (km) : 2464.2  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.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  
 IAU\_NEPTUNE\_for\_RINGFIT.tpc.BECAREFUL  
 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
Titan	I	2046-06-13T10:53:08.085	10.75	-11.82	2575.1	-57.43	-57.44
Titan	E	2046-06-13T10:54:08.302	10.57	-11.64	2575.1	-60.20	-60.21

