

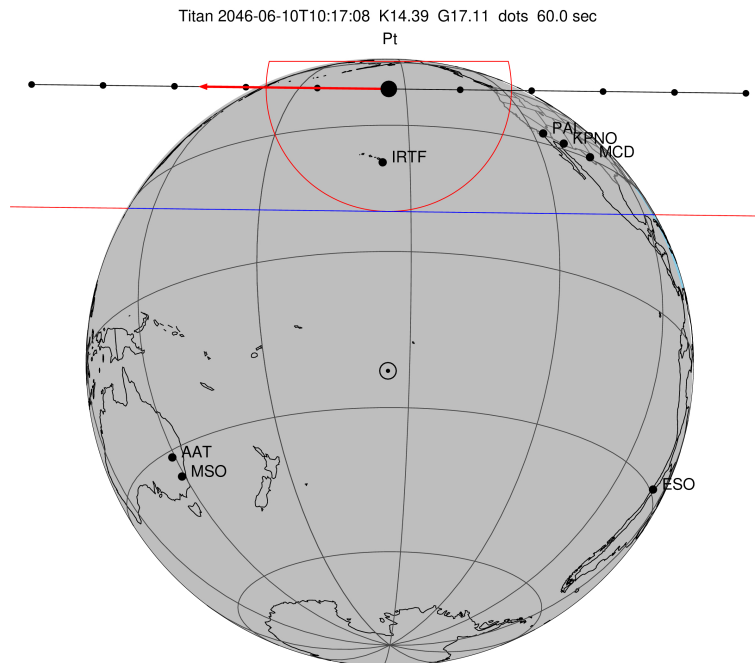
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2046-06-10T10:17:08.330  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 4115807446864228992  
 2Mass ID (if available) : 17140471-2128370

ICRS Star Coord at Epoch: 17h 14m 04.71883s -21:28:37.20020s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 14.393  
 G magnitude : 17.113  
 RP magnitude : 16.273  
 BP magnitude : 17.809  
 DUPflag : 0  
 Distance (au) : 9.013  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -24.99  
 Sun-Target sep (deg) : 178.45  
 Sun-Moon sep (deg) : 106.32  
 B (ring opening deg) : 26.52  
 PA of pole (deg) : 4.62  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.879  
 C/A sky separation (km) : 5748.4  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

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

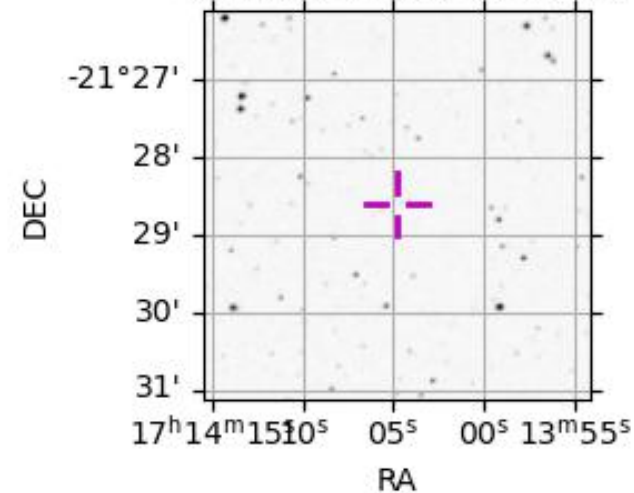
Observable events with sun below -5 deg and altitude above 5 deg

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 10 10:13 - JUN 10 10:16	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 10 10:13 - JUN 10 10:16	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 10 10:12 - JUN 10 10:15	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUN 10 10:15 - JUN 10 10:18	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



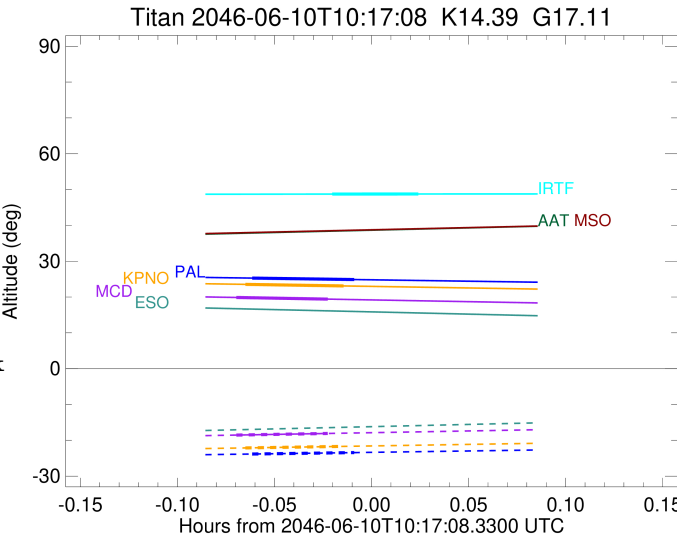
2046-06-10T10:17:08.3300 α: 17 14 04.7188 δ: -21 28 37.200 C/A 0.880" PA 0.70 deg v\_sky -25.00 km/s D 09.01 AU  
 Credit: Styled after SORA/Lucky Star

4115807446864228992



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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2046-06-10T10:15:02.290
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        : 4115807446864228992
2Mass ID (if available) : 17140471-2128370
ICRS Star Coord at Epoch: 17h 14m 04.71883s -21:28:37.20020s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 14.393
G magnitude           : 17.113
RP magnitude          : 16.273
BP magnitude          : 17.809
DUPflag              : 0
Distance (au)         : 9.013
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -24.99
Sun-Target sep (deg) : 178.45
Sun-Moon sep (deg)   : 106.58
B (ring opening deg) : 26.52
PA of pole (deg)     : 4.62
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.139
C/A sky separation (km) : 909.5
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
    
```

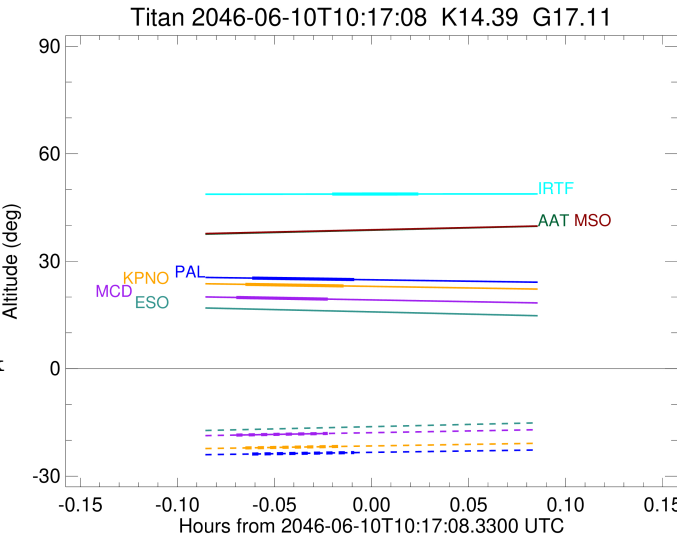


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2046-06-10T10:13:27.108	25.28	-23.83	2575.1	-21.71	-21.72
Titan	E	2046-06-10T10:16:37.481	24.87	-23.42	2575.1	-15.12	-15.13

```

target           : Titan
target radius (km) : 2575.15
C/A epoch       : 2046-06-10T10:14:44.980
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  : 4115807446864228992
2Mass ID (if available) : 17140471-2128370
ICRS Star Coord at Epoch: 17h 14m 04.71883s -21:28:37.20020s
RUWE (>1.4 is poor) : 0.97
K magnitude     : 14.393
G magnitude     : 17.113
RP magnitude    : 16.273
BP magnitude    : 17.809
DUPflag        : 0
Distance (au)   : 9.013
f0 (km)         : 0.00
g0 (km)         : 0.00
skyplane vel. (km/s) : -24.99
Sun-Target sep (deg) : 178.45
Sun-Moon sep (deg) : 106.53
B (ring opening deg) : 26.52
PA of pole (deg) : 4.62
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.171
C/A sky separation (km) : 1116.4
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   2046-06-10T10:13:13.231  23.53  -22.13  2575.1  -26.06  -26.07
Titan   E   2046-06-10T10:16:16.731  23.09  -21.69  2575.1  -19.57  -19.58
    
```

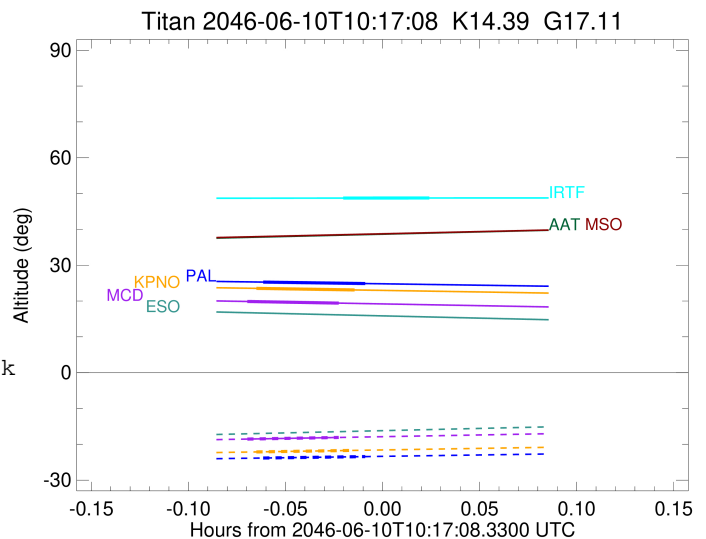
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2046-06-10T10:14:22.760
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        : 4115807446864228992
2Mass ID (if available) : 17140471-2128370
ICRS Star Coord at Epoch: 17h 14m 04.71883s -21:28:37.20020s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 14.393
G magnitude           : 17.113
RP magnitude          : 16.273
BP magnitude          : 17.809
DUPflag              : 0
Distance (au)         : 9.013
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -24.99
Sun-Target sep (deg)  : 178.45
Sun-Moon sep (deg)   : 106.45
B (ring opening deg) : 26.52
PA of pole (deg)     : 4.62
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.213
C/A sky separation (km) : 1393.8
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	2046-06-10T10:12:57.034	19.87	-18.54	2575.1	-32.11	-32.12
Titan	E	2046-06-10T10:15:48.486	19.41	-18.08	2575.1	-25.79	-25.81



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2046-06-10T10:17:15.500  
 Event type : Pt  
 : Titan 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 : 4115807446864228992  
 2Mass ID (if available) : 17140471-2128370  
 ICRS Star Coord at Epoch: 17h 14m 04.71883s -21:28:37.20020s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 14.393  
 G magnitude : 17.113  
 RP magnitude : 16.273  
 BP magnitude : 17.809  
 DUPflag : 0  
 Distance (au) : 9.013  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -24.99  
 Sun-Target sep (deg) : 178.45  
 Sun-Moon sep (deg) : 107.04  
 B (ring opening deg) : 26.52  
 PA of pole (deg) : 4.62  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.236  
 C/A sky separation (km) : 1545.2  
 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	2046-06-10T10:15:54.512	48.73	-47.24	2575.1	-35.79	-35.80
Titan	E	2046-06-10T10:18:36.481	48.75	-47.25	2575.1	-29.12	-29.13

