

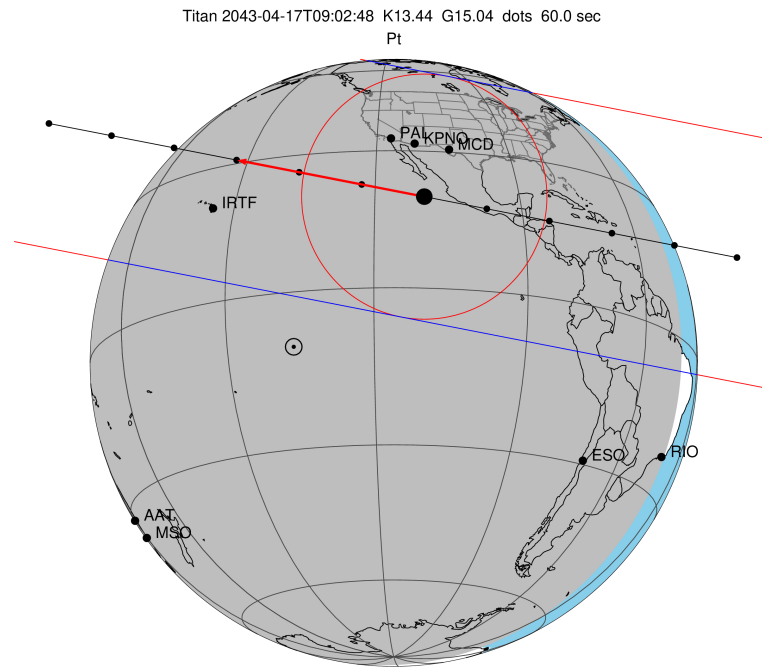
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2043-04-17T09:02:48.060  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 6310378711079638912  
 2Mass ID (if available) : 14570955-1409274

ICRS Star Coord at Epoch: 14h 57m 09.48467s -14:09:27.51035s  
 RUWE (>1.4 is poor) : 1.10  
 K magnitude : 13.442  
 G magnitude : 15.042  
 RP magnitude : 14.473  
 BP magnitude : 15.440  
 DUPflag : 0  
 Distance (au) : 8.912  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -22.29  
 Sun-Target sep (deg) : 160.51  
 Sun-Moon sep (deg) : 97.38  
 B (ring opening deg) : 20.71  
 PA of pole (deg) : 0.59  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.549  
 C/A sky separation (km) : 3547.6  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

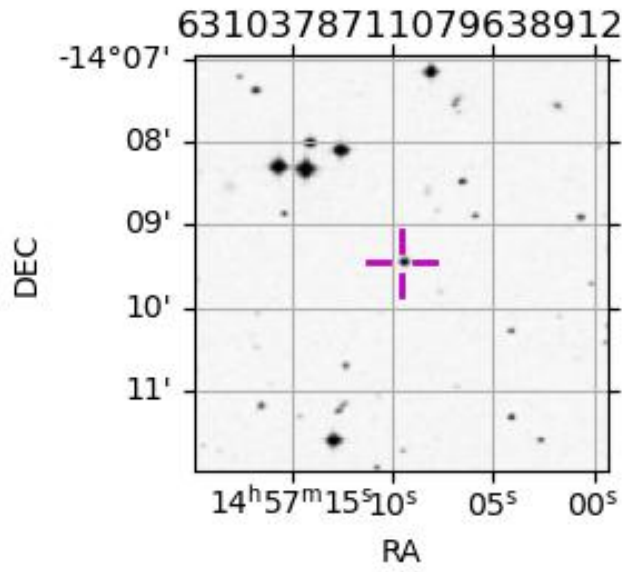
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	APR 17 09:01 - APR 17 09:05	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	APR 17 09:01 - APR 17 09:04	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	APR 17 09:00 - APR 17 09:04	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	APR 17 09:04 - APR 17 09:07	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



2043-04-17T09:02:48.0600 α: 14 57 09.4847 δ: -14 09 27.510 C/A 0.549" PA 11.03 deg v\_sky -22.30 km/s D 08.91 AU  
 Credit: Styled after SORA/Lucky Star



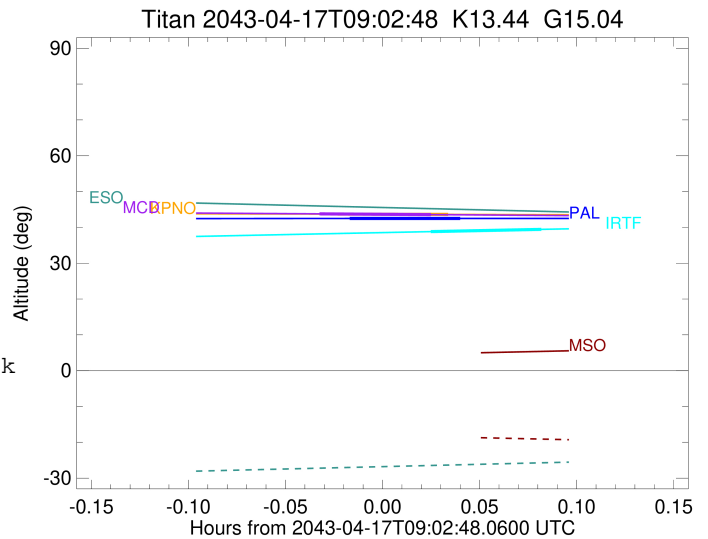
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2043-04-17T09:03:29.510
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       : 6310378711079638912
2Mass ID (if available) : 14570955-1409274
ICRS Star Coord at Epoch: 14h 57m 09.48467s -14:09:27.51035s
RUWE (>1.4 is poor) : 1.10
K magnitude          : 13.442
G magnitude          : 15.042
RP magnitude         : 14.473
BP magnitude         : 15.440
DUPflag             : 0
Distance (au)        : 8.912
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -22.29
Sun-Target sep (deg) : 160.51
Sun-Moon sep (deg)   : 98.05
B (ring opening deg) : 20.71
PA of pole (deg)     : 0.59
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.164
C/A sky separation (km): 1059.9
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	2043-04-17T09:01:46.034	42.48	-42.83	2575.1	32.05	32.07
Titan	E	2043-04-17T09:05:12.971	42.49	-42.52	2575.2	13.12	13.12



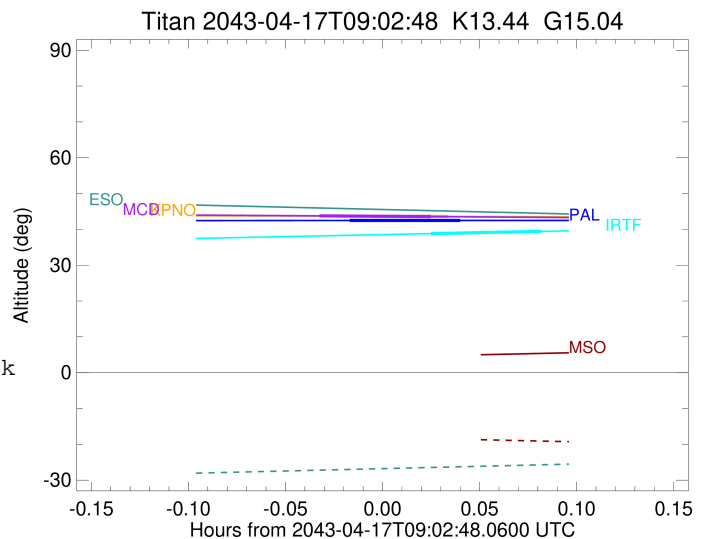
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2043-04-17T09:03:07.120
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       : 6310378711079638912
2Mass ID (if available) : 14570955-1409274
ICRS Star Coord at Epoch: 14h 57m 09.48467s -14:09:27.51035s
RUWE (>1.4 is poor) : 1.10
K magnitude           : 13.442
G magnitude           : 15.042
RP magnitude          : 14.473
BP magnitude          : 15.440
DUPflag              : 0
Distance (au)         : 8.912
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -22.29
Sun-Target sep (deg) : 160.51
Sun-Moon sep (deg)   : 98.05
B (ring opening deg) : 20.71
PA of pole (deg)     : 0.59
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.162
C/A sky separation (km) : 1044.2
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

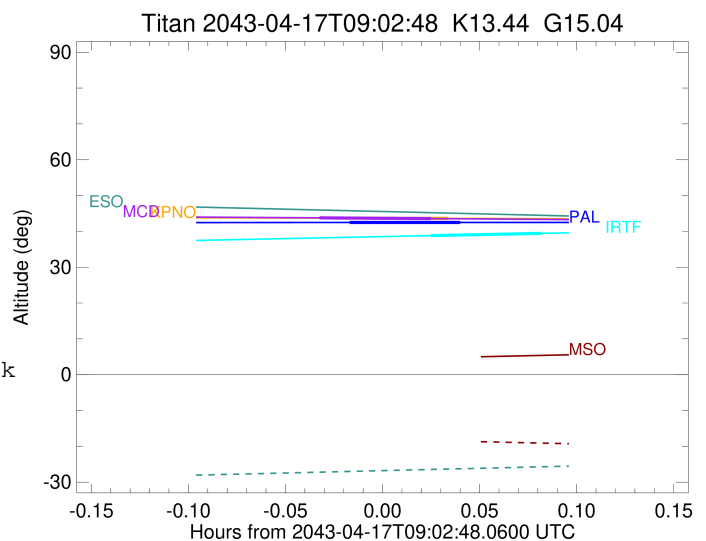
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2043-04-17T09:01:23.363	43.70	-41.94	2575.1	31.72	31.74
Titan	E	2043-04-17T09:04:50.866	43.61	-41.54	2575.2	12.74	12.75



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2043-04-17T09:02:34.750  
 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 : 6310378711079638912  
 2Mass ID (if available) : 14570955-1409274  
 ICRS Star Coord at Epoch: 14h 57m 09.48467s -14:09:27.51035s  
 RUWE (>1.4 is poor) : 1.10  
 K magnitude : 13.442  
 G magnitude : 15.042  
 RP magnitude : 14.473  
 BP magnitude : 15.440  
 DUPflag : 0  
 Distance (au) : 8.912  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -22.29  
 Sun-Target sep (deg) : 160.51  
 Sun-Moon sep (deg) : 98.04  
 B (ring opening deg) : 20.71  
 PA of pole (deg) : 0.59  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.163  
 C/A sky separation (km) : 1054.5  
 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

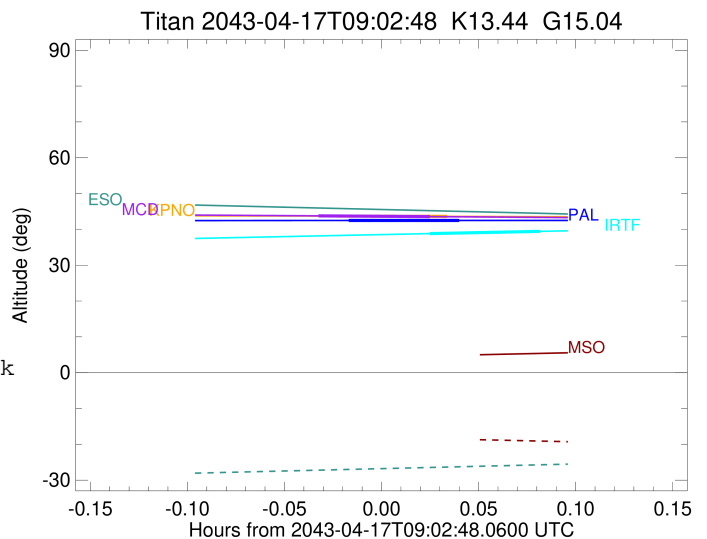
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2043-04-17T09:00:51.192	43.77	-39.15	2575.1	31.98	31.99
Titan	E	2043-04-17T09:04:18.298	43.56	-38.66	2575.2	12.94	12.95



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2043-04-17T09:06:00.210
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       : 6310378711079638912
2Mass ID (if available) : 14570955-1409274
ICRS Star Coord at Epoch: 14h 57m 09.48467s -14:09:27.51035s
RUWE (>1.4 is poor) : 1.10
K magnitude           : 13.442
G magnitude           : 15.042
RP magnitude          : 14.473
BP magnitude          : 15.440
DUPflag              : 0
Distance (au)        : 8.912
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -22.29
Sun-Target sep (deg) : 160.51
Sun-Moon sep (deg)   : 98.06
B (ring opening deg) : 20.71
PA of pole (deg)     : 0.59
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.164
C/A sky separation (km) : 1061.0
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	2043-04-17T09:04:16.510	38.81	-54.32	2575.2	-13.28	-13.28
Titan	E	2043-04-17T09:07:43.894	39.44	-54.76	2575.1	-31.95	-31.96