

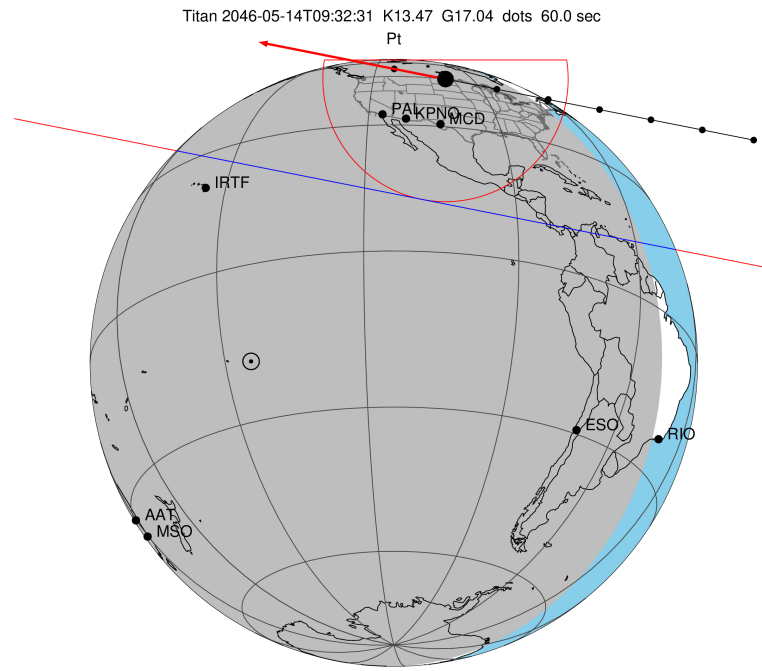
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2046-05-14T09:32:31.840  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 4115063176239991680  
 2Mass ID (if available) : 17214818-2134504

ICRS Star Coord at Epoch: 17h 21m 48.17778s -21:34:50.68594s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 13.469  
 G magnitude : 17.042  
 RP magnitude : 16.037  
 BP magnitude : 18.062  
 DUPflag : 0  
 Distance (au) : 9.127  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -18.32  
 Sun-Target sep (deg) : 151.97  
 Sun-Moon sep (deg) : 105.38  
 B (ring opening deg) : 26.47  
 PA of pole (deg) : 4.81  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.917  
 C/A sky separation (km) : 6070.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

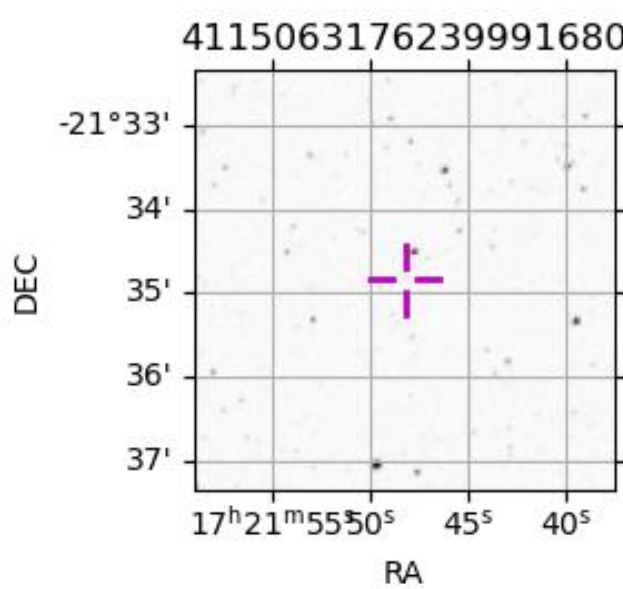
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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	+ +	MAY 14 09:31 - MAY 14 09:35	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 14 09:31 - MAY 14 09:35	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 14 09:30 - MAY 14 09:34	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

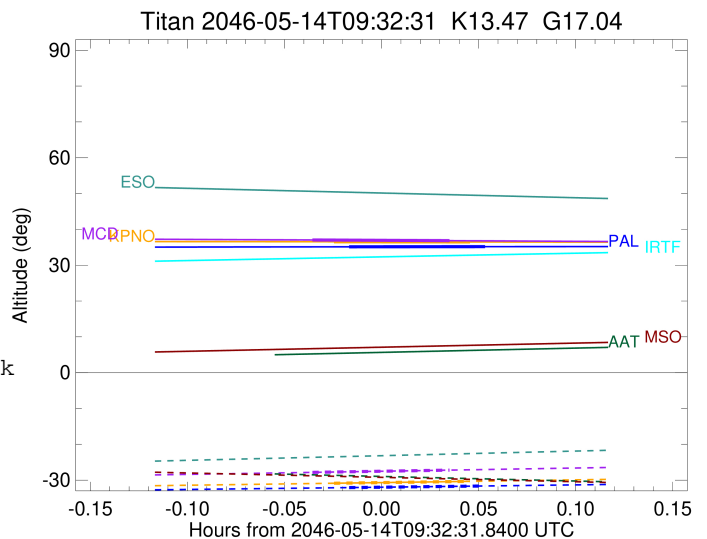


2046-05-14T09:32:31.8400 α: 17 21 48.1778 δ: -21 34 50.686 C/A 0.915" PA 11.20 deg v\_sky -18.32 km/s D 09.13 AU  
 Credit: Styled after SORA/Lucky Star



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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2046-05-14T09:33:37.330
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        : 4115063176239991680
2Mass ID (if available) : 17214818-2134504
ICRS Star Coord at Epoch: 17h 21m 48.17778s -21:34:50.68594s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 13.469
G magnitude           : 17.042
RP magnitude          : 16.037
BP magnitude          : 18.062
DUPflag              : 0
Distance (au)         : 9.127
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -18.32
Sun-Target sep (deg) : 151.97
Sun-Moon sep (deg)   : 105.94
B (ring opening deg) : 26.47
PA of pole (deg)     : 4.81
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.151
C/A sky separation (km) : 998.9
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
    
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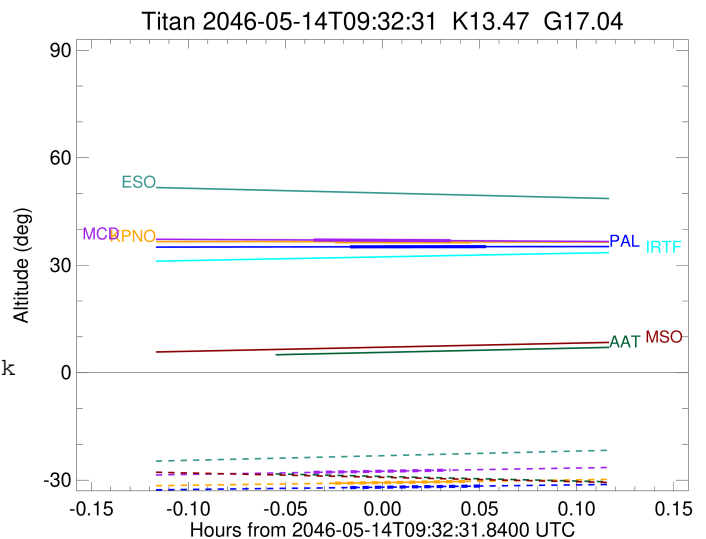
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2046-05-14T09:31:30.409	35.13	-32.08	2575.1	-14.88	-14.89
Titan	E	2046-05-14T09:35:44.259	35.17	-31.63	2575.1	-25.70	-25.72

target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2046-05-14T09:33:10.430  
 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 : 4115063176239991680  
 2Mass ID (if available) : 17214818-2134504  
 ICRS Star Coord at Epoch: 17h 21m 48.17778s -21:34:50.68594s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 13.469  
 G magnitude : 17.042  
 RP magnitude : 16.037  
 BP magnitude : 18.062  
 DUPflag : 0  
 Distance (au) : 9.127  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -18.32  
 Sun-Target sep (deg) : 151.97  
 Sun-Moon sep (deg) : 105.94  
 B (ring opening deg) : 26.47  
 PA of pole (deg) : 4.81  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.151  
 C/A sky separation (km) : 996.3  
 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	2046-05-14T09:31:03.517	36.54	-30.87	2575.1	-14.79	-14.80
Titan	E	2046-05-14T09:35:17.361	36.49	-30.33	2575.1	-25.68	-25.69



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2046-05-14T09:32:31.150  
 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 : 4115063176239991680  
 2Mass ID (if available) : 17214818-2134504  
 ICRS Star Coord at Epoch: 17h 21m 48.17778s -21:34:50.68594s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 13.469  
 G magnitude : 17.042  
 RP magnitude : 16.037  
 BP magnitude : 18.062  
 DUPflag : 0  
 Distance (au) : 9.127  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -18.32  
 Sun-Target sep (deg) : 151.97  
 Sun-Moon sep (deg) : 105.92  
 B (ring opening deg) : 26.47  
 PA of pole (deg) : 4.81  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.147  
 C/A sky separation (km) : 976.1  
 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	2046-05-14T09:30:23.820	37.04	-27.83	2575.1	-14.31	-14.32
Titan	E	2046-05-14T09:34:38.508	36.85	-27.20	2575.1	-25.31	-25.32

