

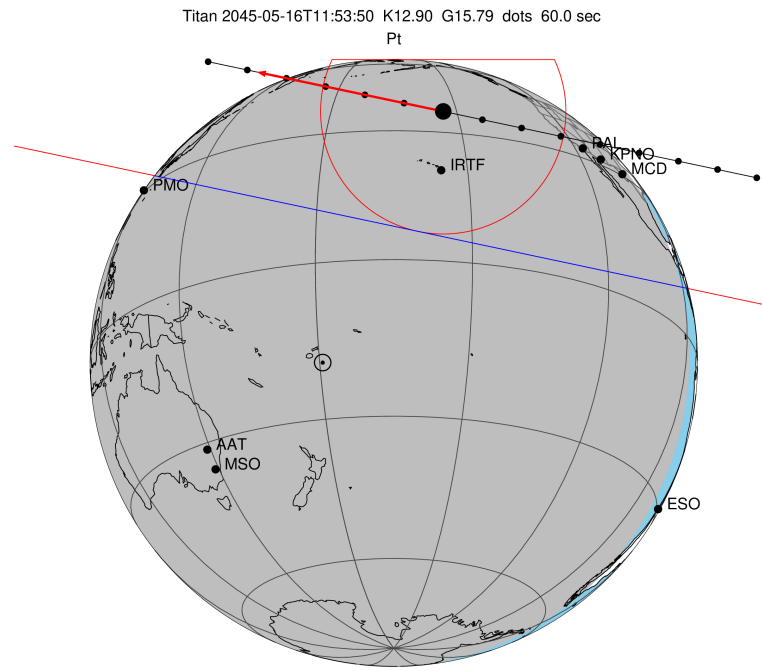
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2045-05-16T11:53:50.190  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 6052823781632780416  
 2Mass ID (if available) : 16293721-1946593

ICRS Star Coord at Epoch: 16h 29m 37.29491s -19:47:00.04319s  
 RUWE (>1.4 is poor) : 1.00  
 K magnitude : 12.900  
 G magnitude : 15.794  
 RP magnitude : 14.901  
 BP magnitude : 16.597  
 DUPflag : 0  
 Distance (au) : 9.020  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -14.02  
 Sun-Target sep (deg) : 166.46  
 Sun-Moon sep (deg) : 161.69  
 B (ring opening deg) : 25.56  
 PA of pole (deg) : 3.41  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.824  
 C/A sky separation (km) : 5387.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

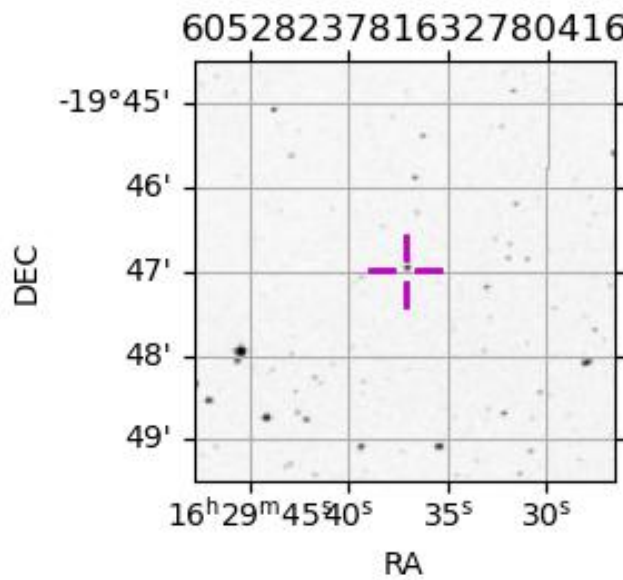
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	MAY 16 11:47 - MAY 16 11:53	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 16 11:46 - MAY 16 11:52	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	MAY 16 11:51 - MAY 16 11:56	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



2045-05-16T11:53:50.1900 α: 16 29 37.2949 δ: -19 47 00.043 C/A 0.823" PA 11.96 deg v\_sky -14.02 km/s D 09.02 AU  
 Credit: Styled after SORA/Lucky Star



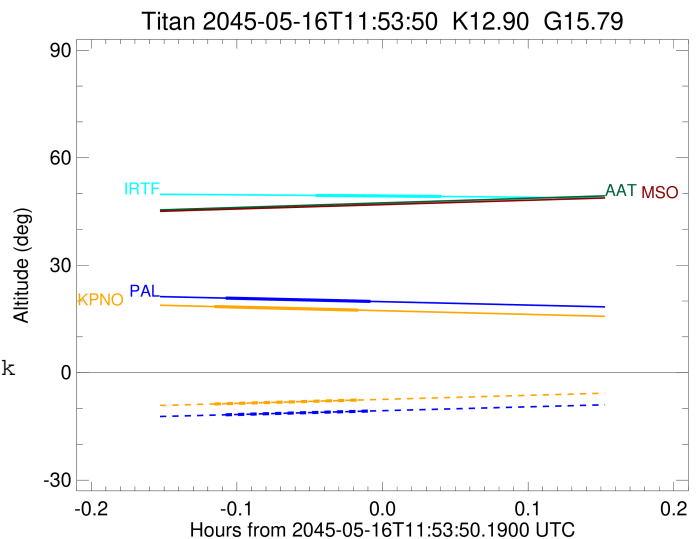
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2045-05-16T11:50:21.660
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)  : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 6052823781632780416
2Mass ID (if available) : 16293721-1946593
ICRS Star Coord at Epoch: 16h 29m 37.29491s -19:47:00.04319s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 12.900
G magnitude           : 15.794
RP magnitude          : 14.901
BP magnitude          : 16.597
DUPflag              : 0
Distance (au)         : 9.020
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.02
Sun-Target sep (deg) : 166.46
Sun-Moon sep (deg)   : 162.50
B (ring opening deg) : 25.56
PA of pole (deg)     : 3.41
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.027
C/A sky separation (km): 176.3
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	2045-05-16T11:47:21.976	20.81	-11.76	2575.1	4.34	4.34
Titan	E	2045-05-16T11:53:21.391	19.89	-10.70	2575.1	-11.38	-11.39



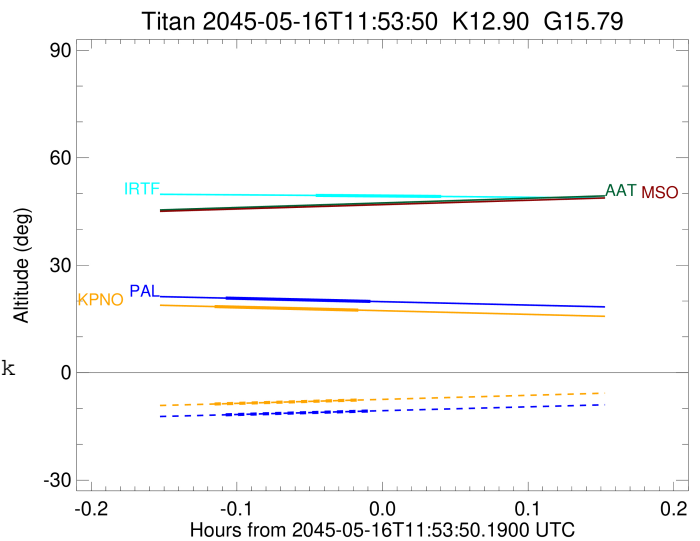
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2045-05-16T11:49:52.100
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 6052823781632780416
2Mass ID (if available) : 16293721-1946593
ICRS Star Coord at Epoch: 16h 29m 37.29491s -19:47:00.04319s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 12.900
G magnitude          : 15.794
RP magnitude         : 14.901
BP magnitude         : 16.597
DUPflag             : 0
Distance (au)        : 9.020
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.02
Sun-Target sep (deg) : 166.46
Sun-Moon sep (deg)   : 162.54
B (ring opening deg) : 25.56
PA of pole (deg)     : 3.41
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.050
C/A sky separation (km) : 324.0
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

```

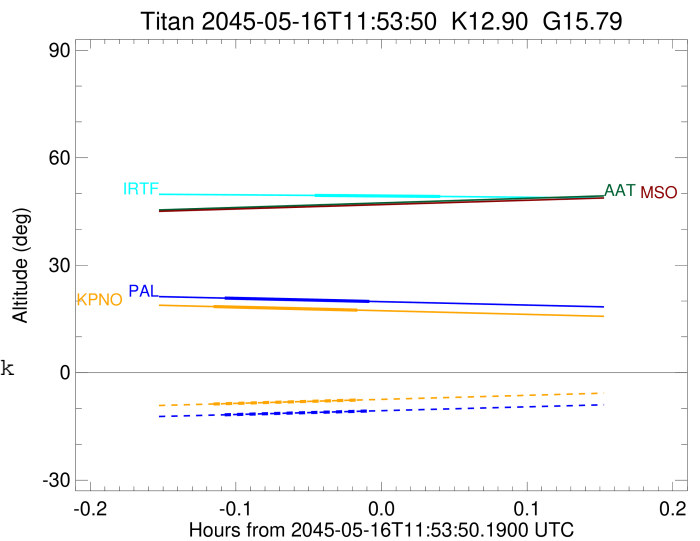
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2045-05-16T11:46:53.180	18.45	-8.75	2575.2	1.40	1.40
Titan	E	2045-05-16T11:52:51.083	17.46	-7.64	2575.1	-14.40	-14.41



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2045-05-16T11:53:39.740
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        : 6052823781632780416
2Mass ID (if available) : 16293721-1946593
ICRS Star Coord at Epoch: 16h 29m 37.29491s -19:47:00.04319s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 12.900
G magnitude           : 15.794
RP magnitude          : 14.901
BP magnitude          : 16.597
DUPflag              : 0
Distance (au)         : 9.020
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.02
Sun-Target sep (deg) : 166.46
Sun-Moon sep (deg)   : 162.19
B (ring opening deg) : 25.56
PA of pole (deg)     : 3.41
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.189
C/A sky separation (km) : 1233.3
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	2045-05-16T11:51:03.255	49.48	-44.88	2575.1	-18.26	-18.27
Titan	E	2045-05-16T11:56:16.239	49.18	-44.22	2575.1	-32.81	-32.82