

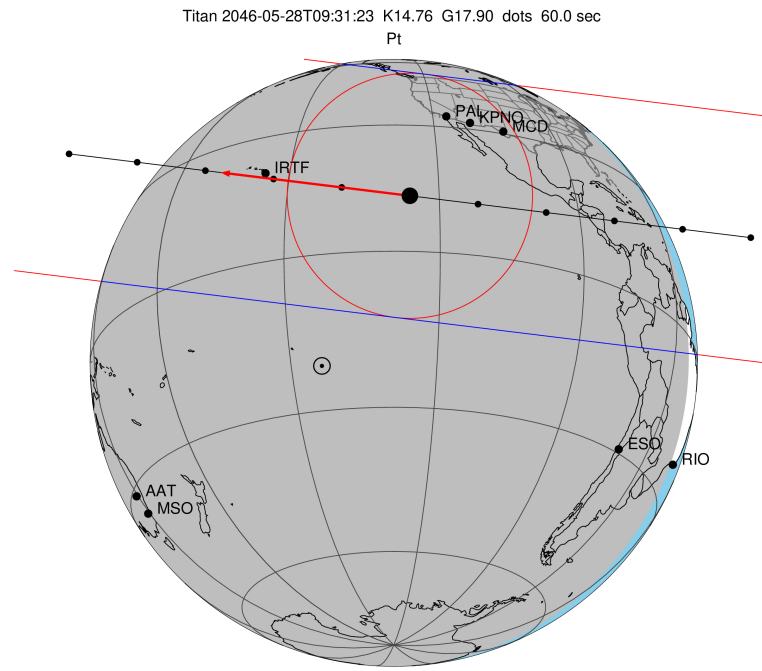
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2046-05-28T09:31:23.520  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 4115018302426246656  
 2Mass ID (if available) : 17175514-2132013

ICRS Star Coord at Epoch: 17h 17m 55.12878s -21:32:01.54843s  
 RUWE (>1.4 is poor) : 0.92  
 K magnitude : 14.763  
 G magnitude : 17.905  
 RP magnitude : 16.963  
 BP magnitude : 18.921  
 DUPflag : 0  
 Distance (au) : 9.040  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -24.03  
 Sun-Target sep (deg) : 166.30  
 Sun-Moon sep (deg) : 83.75  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.72  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.538  
 C/A sky separation (km) : 3529.5  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

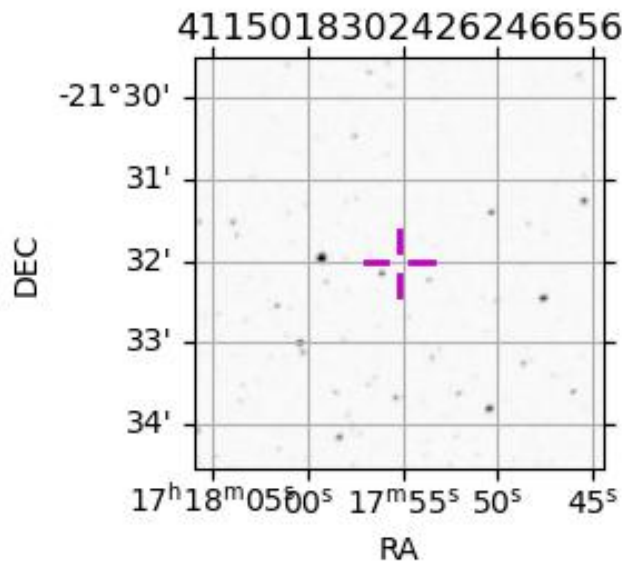
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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 28 09:29 - MAY 28 09:32	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 28 09:29 - MAY 28 09:32	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 28 09:28 - MAY 28 09:31	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	MAY 28 09:31 - MAY 28 09:35	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

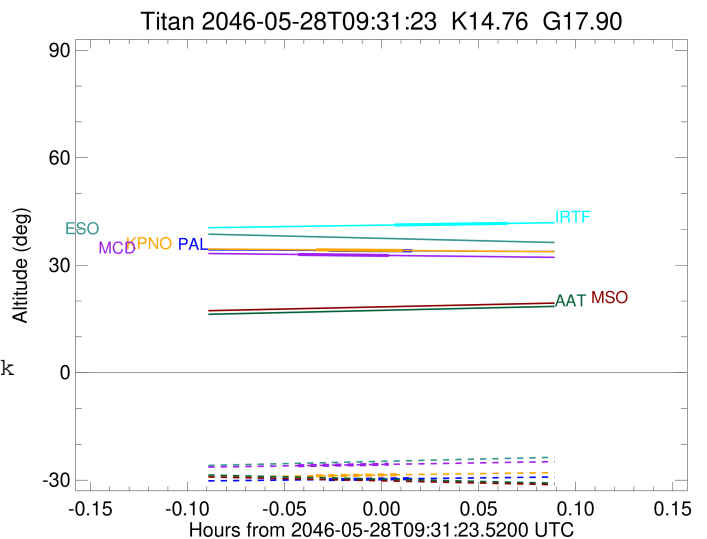


Titan 2046-05-28T09:31:23 K14.76 G17.90 dots 60.0 sec  
 Pt  
 2046-05-28T09:31:23.5200 α: 17 17 55.1288 δ: -21 32 01.548 C/A 0.538" PA 7.01 deg v\_sky -24.04 km/s D 09.04 AU  
 Credit: Styled after SORA/Lucky Star



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2046-05-28T09:31:03.420
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       : 4115018302426246656
2Mass ID (if available) : 17175514-2132013
ICRS Star Coord at Epoch: 17h 17m 55.12878s -21:32:01.54843s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 14.763
G magnitude           : 17.905
RP magnitude          : 16.963
BP magnitude          : 18.921
DUPflag              : 0
Distance (au)         : 9.040
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -24.03
Sun-Target sep (deg) : 166.30
Sun-Moon sep (deg)   : 84.24
B (ring opening deg) : 26.50
PA of pole (deg)     : 4.72
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.263
C/A sky separation (km): 1727.0
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	2046-05-28T09:29:45.189	34.15	-29.84	2575.1	38.75	38.76
Titan	E	2046-05-28T09:32:21.650	34.02	-29.58	2575.1	35.00	35.01

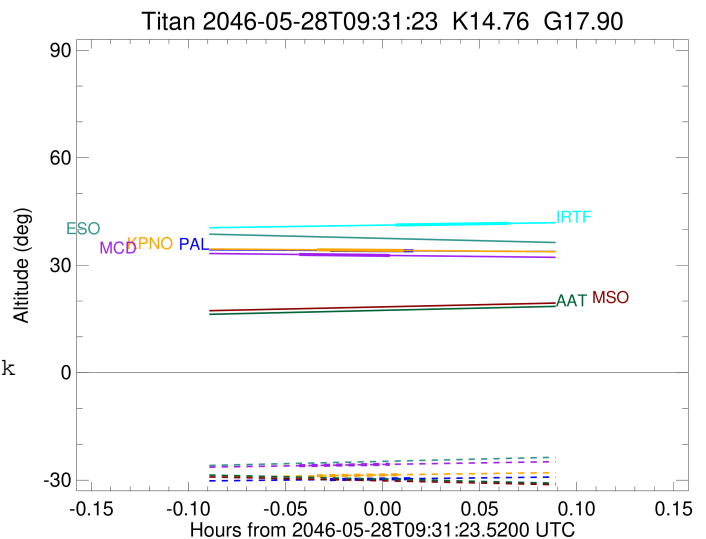
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2046-05-28T09:30:42.510
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 4115018302426246656
2Mass ID (if available) : 17175514-2132013
ICRS Star Coord at Epoch: 17h 17m 55.12878s -21:32:01.54843s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 14.763
G magnitude           : 17.905
RP magnitude          : 16.963
BP magnitude          : 18.921
DUPflag              : 0
Distance (au)        : 9.040
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -24.03
Sun-Target sep (deg) : 166.30
Sun-Moon sep (deg)   : 84.23
B (ring opening deg) : 26.50
PA of pole (deg)     : 4.72
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.252
C/A sky separation (km): 1650.1
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

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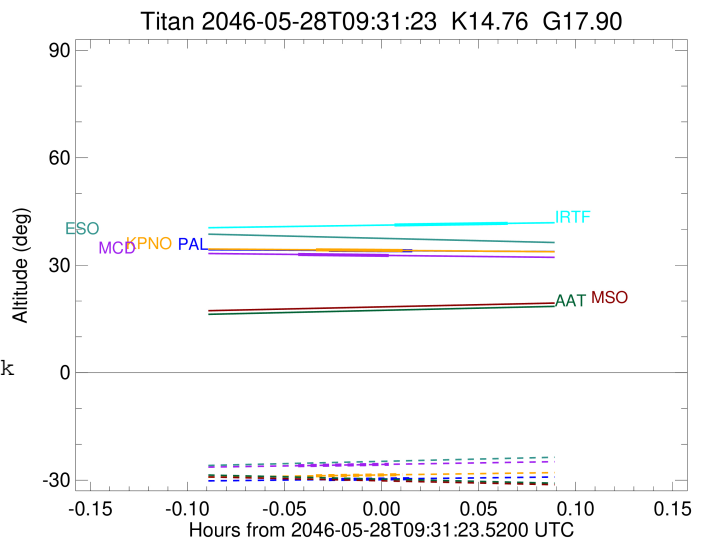
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2046-05-28T09:29:21.536	34.29	-28.79	2575.1	36.90	36.92
Titan	E	2046-05-28T09:32:03.480	34.10	-28.47	2575.1	33.06	33.07



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2046-05-28T09:30:13.180
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       : 4115018302426246656
2Mass ID (if available) : 17175514-2132013
ICRS Star Coord at Epoch: 17h 17m 55.12878s -21:32:01.54843s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 14.763
G magnitude          : 17.905
RP magnitude         : 16.963
BP magnitude         : 18.921
DUPflag             : 0
Distance (au)        : 9.040
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -24.03
Sun-Target sep (deg) : 166.30
Sun-Moon sep (deg)  : 84.20
B (ring opening deg) : 26.50
PA of pole (deg)    : 4.72
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.237
C/A sky separation (km) : 1551.4
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
    
```

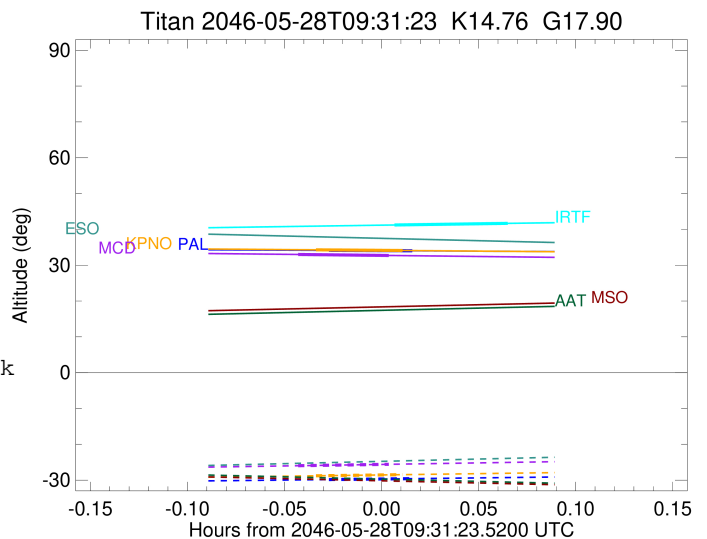


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2046-05-28T09:28:48.970	32.99	-25.97	2575.1	34.60	34.61
Titan	E	2046-05-28T09:31:37.400	32.71	-25.58	2575.1	30.63	30.65

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2046-05-28T09:33:32.260
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        : 4115018302426246656
2Mass ID (if available) : 17175514-2132013
ICRS Star Coord at Epoch: 17h 17m 55.12878s -21:32:01.54843s
RUWE (>1.4 is poor)  : 0.92
K magnitude           : 14.763
G magnitude           : 17.905
RP magnitude          : 16.963
BP magnitude          : 18.921
DUPflag              : 0
Distance (au)         : 9.040
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -24.03
Sun-Target sep (deg)  : 166.30
Sun-Moon sep (deg)    : 84.38
B (ring opening deg) : 26.50
PA of pole (deg)      : 4.72
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.018
C/A sky separation (km) : 116.2
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	2046-05-28T09:31:46.901	41.22	-47.19	2575.1	4.12	4.12
Titan	E	2046-05-28T09:35:17.620	41.67	-47.41	2575.2	0.50	0.50