

target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2029-11-09T06:42:11.830
 Event type : Pgt
 : Titan occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 54408959239143680
 2Mass ID (if available) : 03185743+1543028

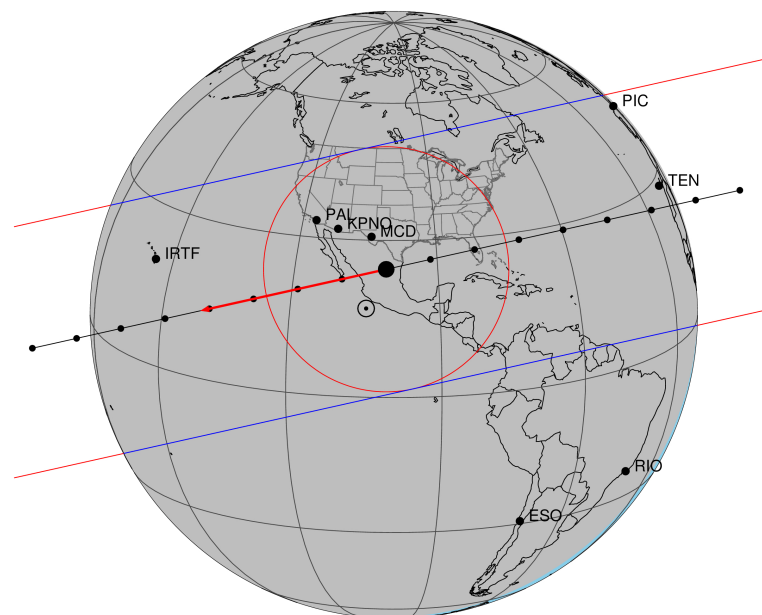
ICRS Star Coord at Epoch: 03h 18m 57.44049s +15:43:02.70943s
 RUWE (>1.4 is poor) : 1.20
 K magnitude : 13.770
 G magnitude : 15.439
 RP magnitude : 14.853
 BP magnitude : 15.853
 DUPflag : 0
 Distance (au) : 8.152
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.86
 Sun-Target sep (deg) : 174.63
 Sun-Moon sep (deg) : 141.61
 B (ring opening deg) : -22.18
 PA of pole (deg) : -1.26
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.163
 C/A sky separation (km) : 961.8
 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

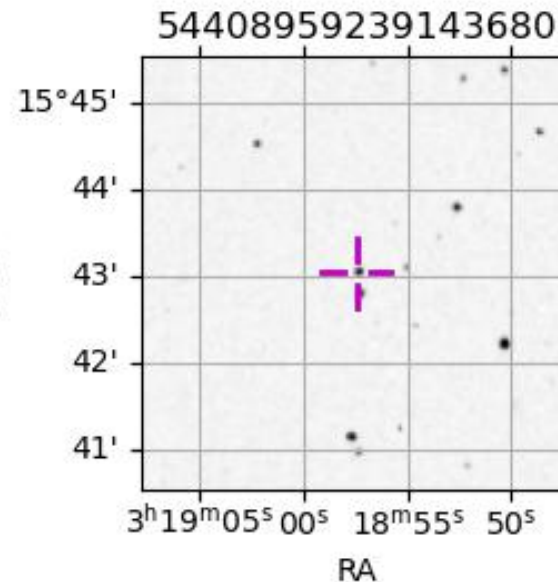
Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	NOV 09 06:41 - NOV 09 06:45	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	NOV 09 06:40 - NOV 09 06:45	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	NOV 09 06:39 - NOV 09 06:44	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	NOV 09 06:33 - NOV 09 06:38	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	NOV 09 06:44 - NOV 09 06:49	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 2029-11-09T06:42:11 K13.77 G15.44 dots 60.0 sec
 Pgt



2029-11-09T06:42:11.8300 α: 03 18 57.4405 δ: +15 43 02.709 C/A 0.164" PA 347.44 deg v_sky -15.85 km/s D 08.15 AU

Credit: Styled after SORA/Lucky Star



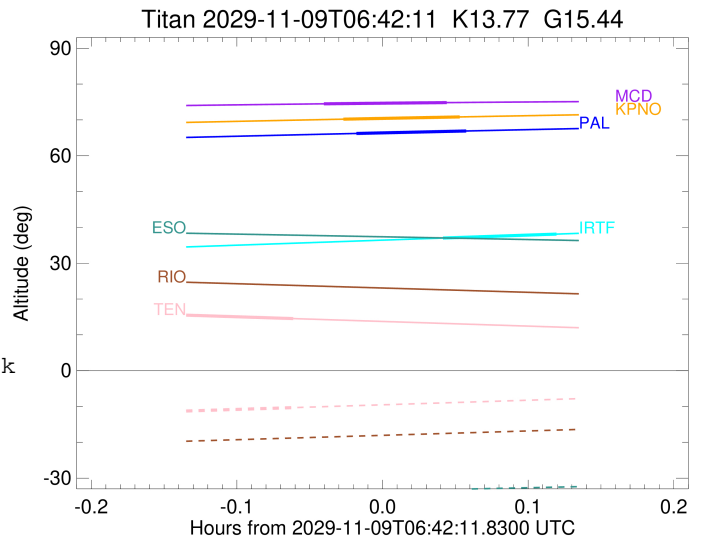
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2029-11-09T06:43:24.090
Event type           : Pgt
: Titan occs: geocentric, topocentric
: 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       : 54408959239143680
2Mass ID (if available) : 03185743+1543028
ICRS Star Coord at Epoch: 03h 18m 57.44049s +15:43:02.70943s
RUWE (>1.4 is poor) : 1.20
K magnitude          : 13.770
G magnitude          : 15.439
RP magnitude         : 14.853
BP magnitude         : 15.853
DUPflag             : 0
Distance (au)        : 8.152
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.86
Sun-Target sep (deg) : 174.63
Sun-Moon sep (deg)  : 142.28
B (ring opening deg) : -22.18
PA of pole (deg)    : -1.26
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.221
C/A sky separation (km) : 1304.8
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

```

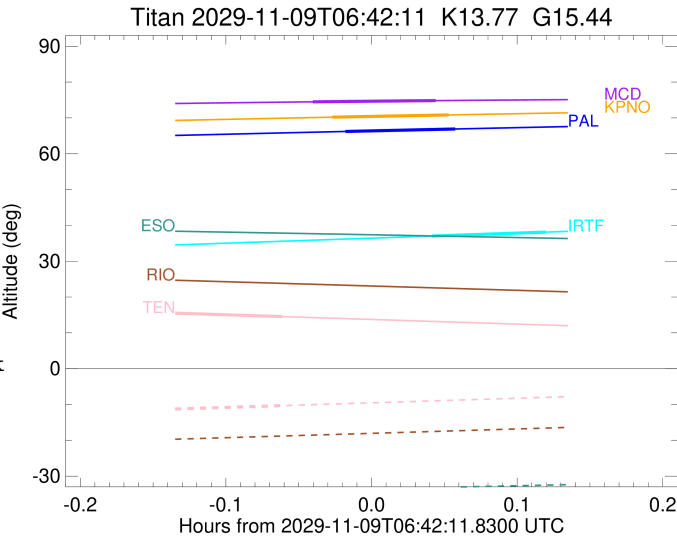
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2029-11-09T06:41:07.123	66.21	-70.23	2575.1	18.01	18.02
Titan	E	2029-11-09T06:45:41.018	66.90	-70.80	2575.1	37.74	37.76



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2029-11-09T06:42:58.920
Event type          : Pgt
                    : Titan occs: geocentric, topocentric
                    : 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      : 54408959239143680
2Mass ID (if available) : 03185743+1543028
ICRS Star Coord at Epoch: 03h 18m 57.44049s +15:43:02.70943s
RUWE (>1.4 is poor) : 1.20
K magnitude          : 13.770
G magnitude          : 15.439
RP magnitude         : 14.853
BP magnitude         : 15.853
DUPflag             : 0
Distance (au)        : 8.152
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.86
Sun-Target sep (deg) : 174.63
Sun-Moon sep (deg)  : 142.25
B (ring opening deg) : -22.18
PA of pole (deg)    : -1.26
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.175
C/A sky separation (km) : 1032.0
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
    
```

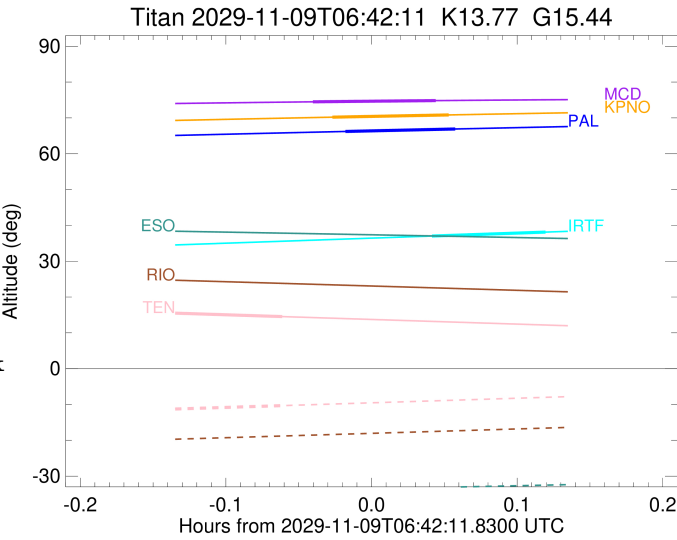


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2029-11-09T06:40:33.514	70.19	-73.71	2575.2	11.71	11.72
Titan	E	2029-11-09T06:45:24.298	70.82	-74.13	2575.1	31.71	31.72

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2029-11-09T06:42:18.770
Event type           : Pgt
: Titan occs: geocentric, topocentric
: 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       : 54408959239143680
2Mass ID (if available) : 03185743+1543028
ICRS Star Coord at Epoch: 03h 18m 57.44049s +15:43:02.70943s
RUWE (>1.4 is poor) : 1.20
K magnitude           : 13.770
G magnitude           : 15.439
RP magnitude          : 14.853
BP magnitude          : 15.853
DUPflag              : 0
Distance (au)         : 8.152
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.86
Sun-Target sep (deg) : 174.63
Sun-Moon sep (deg)   : 142.19
B (ring opening deg) : -22.18
PA of pole (deg)     : -1.26
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.122
C/A sky separation (km) : 721.3
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
    
```

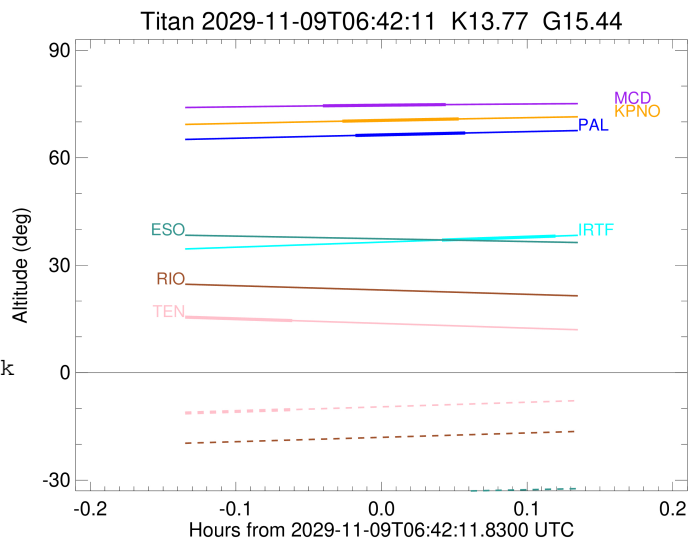


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2029-11-09T06:39:46.560	74.48	-76.45	2575.1	4.88	4.88
Titan	E	2029-11-09T06:44:50.955	74.82	-76.41	2575.1	25.10	25.11

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2029-11-09T06:35:53.410
Event type           : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code        : TEN
Location             : Teide Obs./Tenerife
Latitude (deg)       : 28.30050
E. Longitude (deg)  : 343.48909
Altitude (km)        : 2.395
Gaia source ID       : 54408959239143680
2Mass ID (if available) : 03185743+1543028
ICRS Star Coord at Epoch: 03h 18m 57.44049s +15:43:02.70943s
RUWE (>1.4 is poor) : 1.20
K magnitude           : 13.770
G magnitude           : 15.439
RP magnitude          : 14.853
BP magnitude          : 15.853
DUPflag              : 0
Distance (au)         : 8.152
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.86
Sun-Target sep (deg) : 174.63
Sun-Moon sep (deg)   : 141.01
B (ring opening deg) : -22.18
PA of pole (deg)     : -1.26
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.073
C/A sky separation (km) : 430.6
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	2029-11-09T06:33:14.083	15.69	-11.45	2575.2	-1.91	-1.92
Titan	E	2029-11-09T06:38:32.759	14.53	-10.31	2575.1	19.66	19.67

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2029-11-09T06:47:00.640
Event type            : Pgt
: Titan occs: geocentric, topocentric
: 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       : 54408959239143680
2Mass ID (if available) : 03185743+1543028
ICRS Star Coord at Epoch: 03h 18m 57.44049s +15:43:02.70943s
RUWE (>1.4 is poor) : 1.20
K magnitude           : 13.770
G magnitude           : 15.439
RP magnitude          : 14.853
BP magnitude          : 15.853
DUPflag              : 0
Distance (au)        : 8.152
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.86
Sun-Target sep (deg) : 174.63
Sun-Moon sep (deg)   : 142.51
B (ring opening deg) : -22.18
PA of pole (deg)     : -1.26
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.204
C/A sky separation (km) : 1208.0
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	2029-11-09T06:44:39.203	37.01	-42.37	2575.1	15.88	15.88
Titan	E	2029-11-09T06:49:22.018	38.12	-43.48	2575.1	35.43	35.45

