

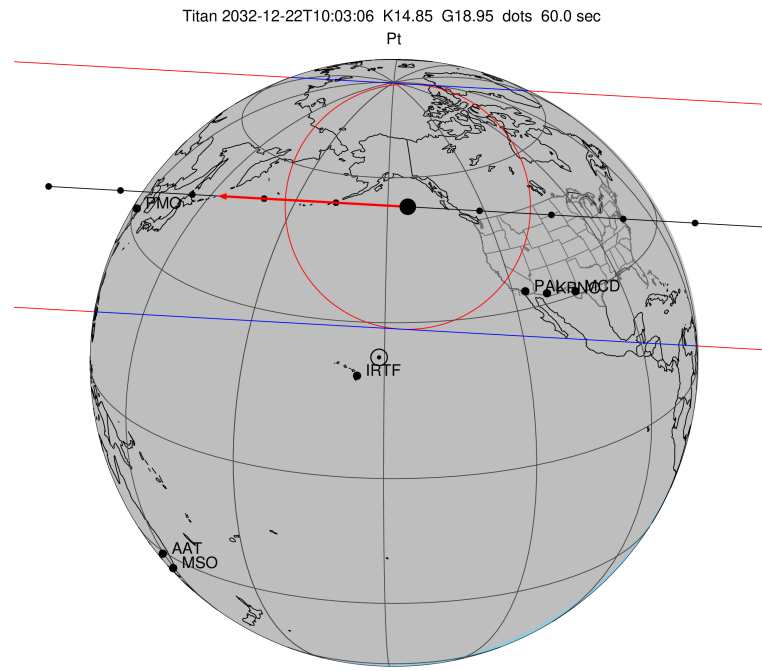
target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2032-12-22T10:03:06.620
 Event type : Pt
 : Titan occs: topocentric, not geocentric
 : Not a ringed target
 Gaia source ID : 3376977238312223872
 2Mass ID (if available) : 06145746+2226396

ICRS Star Coord at Epoch: 06h 14m 57.47972s +22:26:39.48759s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 14.847
 G magnitude : 18.950
 RP magnitude : 17.773
 BP magnitude : 20.270
 DUPflag : 0
 Distance (au) : 8.026
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -25.17
 Sun-Target sep (deg) : 177.04
 Sun-Moon sep (deg) : 60.79
 B (ring opening deg) : -26.17
 PA of pole (deg) : -5.94
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.563
 C/A sky separation (km) : 3280.0
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk

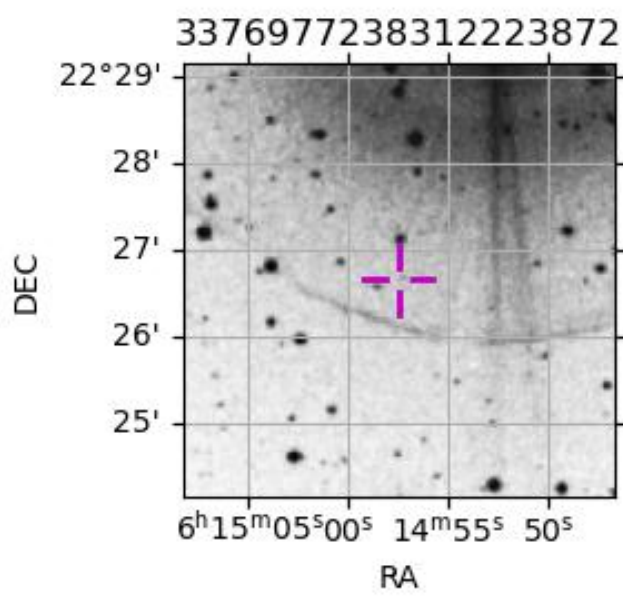
URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp

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 | + + | DEC 22 10:00 - DEC 22 10:02 | Pie |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | + + | DEC 22 10:05 - DEC 22 10:08 | Pie |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | + + | DEC 22 09:59 - DEC 22 10:02 | Pie |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | + + | DEC 22 09:59 - DEC 22 10:02 | 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 |

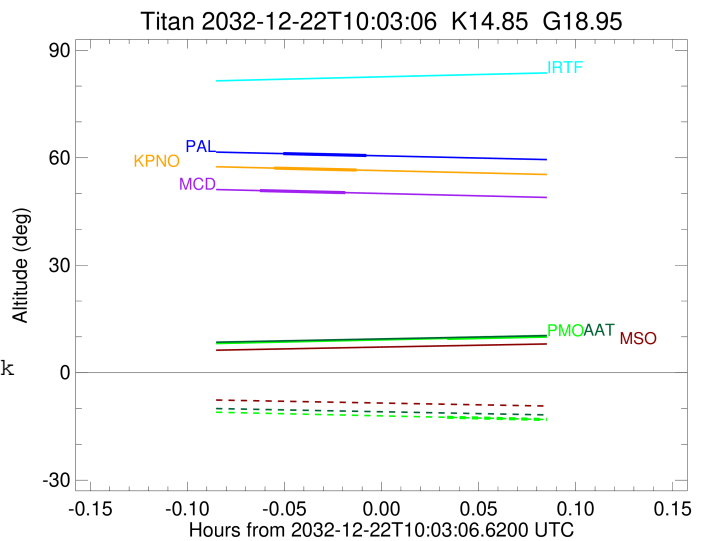


2032-12-22T10:03:06.6200 α: 06 14 57.4797 δ: +22 26 39.488 C/A 0.563" PA 3.24 deg v_sky -25.17 km/s D 08.03 AU
 Credit: Styled after SORA/Lucky Star



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2032-12-22T10:01:22.200
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        : 3376977238312223872
2Mass ID (if available) : 06145746+2226396
ICRS Star Coord at Epoch: 06h 14m 57.47972s +22:26:39.48759s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 14.847
G magnitude           : 18.950
RP magnitude          : 17.773
BP magnitude          : 20.270
DUPflag              : 0
Distance (au)         : 8.026
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -25.17
Sun-Target sep (deg)  : 177.04
Sun-Moon sep (deg)    : 61.30
B (ring opening deg) : -26.17
PA of pole (deg)      : -5.94
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.282
C/A sky separation (km) : 1643.4
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 | 2032-12-22T10:00:04.454 | 61.14 | -59.12 | 2575.1 | -27.25 | -27.26 |
| Titan | E | 2032-12-22T10:02:39.939 | 60.61 | -58.58 | 2575.1 | -42.34 | -42.35 |

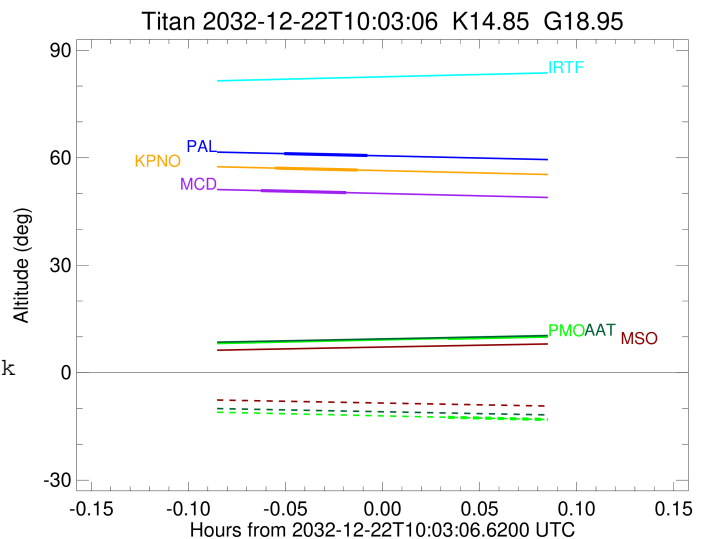
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2032-12-22T10:06:48.510
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : PMO
Location             : Purple Mtn Obs. Nanking
Latitude (deg)       : 32.06667
E. Longitude (deg)   : 118.82089
Altitude (km)        : 0.364
Gaia source ID       : 3376977238312223872
2Mass ID (if available) : 06145746+2226396
ICRS Star Coord at Epoch: 06h 14m 57.47972s +22:26:39.48759s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 14.847
G magnitude          : 18.950
RP magnitude         : 17.773
BP magnitude         : 20.270
DUPflag             : 0
Distance (au)        : 8.026
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -25.17
Sun-Target sep (deg) : 177.04
Sun-Moon sep (deg)   : 61.30
B (ring opening deg) : -26.17
PA of pole (deg)     : -5.94
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.072
C/A sky separation (km) : 420.0
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 | 2032-12-22T10:05:07.563 | 9.55 | -12.46 | 2575.2 | 0.14 | 0.14 |
| Titan | E | 2032-12-22T10:08:29.446 | 10.22 | -13.13 | 2575.1 | -16.90 | -16.91 |



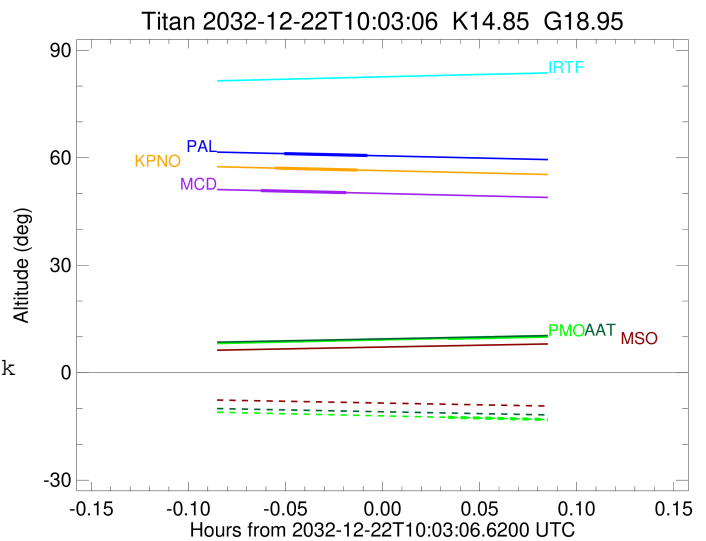
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2032-12-22T10:01:04.180
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        : 3376977238312223872
2Mass ID (if available) : 06145746+2226396
ICRS Star Coord at Epoch: 06h 14m 57.47972s +22:26:39.48759s
RUWE (>1.4 is poor)  : 0.98
K magnitude           : 14.847
G magnitude           : 18.950
RP magnitude          : 17.773
BP magnitude          : 20.270
DUPflag              : 0
Distance (au)         : 8.026
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -25.17
Sun-Target sep (deg)  : 177.04
Sun-Moon sep (deg)    : 61.24
B (ring opening deg) : -26.17
PA of pole (deg)      : -5.94
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.285
C/A sky separation (km) : 1660.7
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 | 2032-12-22T09:59:46.955 | 57.10 | -54.93 | 2575.1 | -27.71 | -27.72 |
| Titan | E | 2032-12-22T10:02:21.401 | 56.55 | -54.39 | 2575.1 | -42.72 | -42.73 |



target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2032-12-22T10:00:40.700
 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 : 3376977238312223872
 2Mass ID (if available) : 06145746+2226396
 ICRS Star Coord at Epoch: 06h 14m 57.47972s +22:26:39.48759s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 14.847
 G magnitude : 18.950
 RP magnitude : 17.773
 BP magnitude : 20.270
 DUPflag : 0
 Distance (au) : 8.026
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -25.17
 Sun-Target sep (deg) : 177.04
 Sun-Moon sep (deg) : 61.14
 B (ring opening deg) : -26.17
 PA of pole (deg) : -5.94
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.273
 C/A sky separation (km) : 1586.4
 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 | 2032-12-22T09:59:21.015 | 50.82 | -48.57 | 2575.1 | -25.89 | -25.90 |
| Titan | E | 2032-12-22T10:02:00.380 | 50.25 | -47.99 | 2575.1 | -40.98 | -40.99 |

