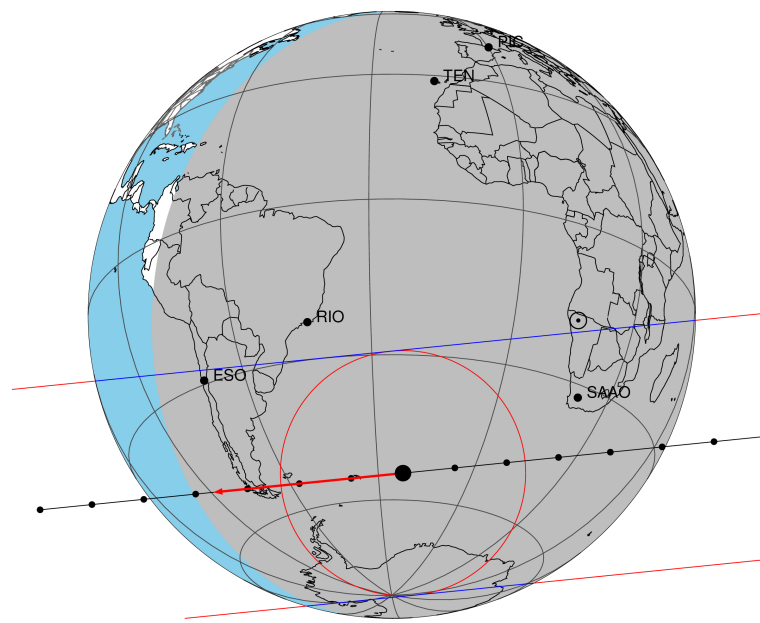


target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2047-07-29T23:07:38.390
 Event type : Pt
 : Titan occs: topocentric, not geocentric
 : Not a ringed target
 Gaia source ID : 4070419258951086848
 2Mass ID (if available) : 17522142-2226323

ICRS Star Coord at Epoch: 17h 52m 21.39905s -22:26:32.60130s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 12.860
 G magnitude : 17.766
 RP magnitude : 16.522
 BP magnitude : 19.580
 DUPflag : 0
 Distance (au) : 9.221
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -18.23
 Sun-Target sep (deg) : 142.11
 Sun-Moon sep (deg) : 51.81
 B (ring opening deg) : 26.69
 PA of pole (deg) : 5.51
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.500
 C/A sky separation (km) : 3345.3
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk

Titan 2047-07-29T23:07:38 K12.86 G17.77 dots 60.0 sec
 Pt

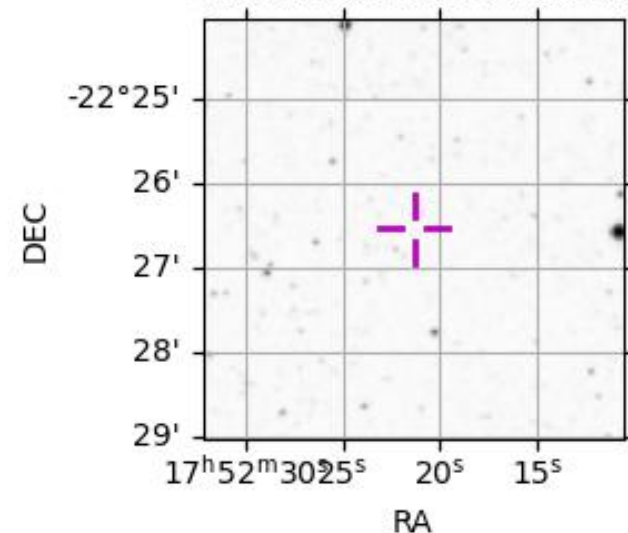


2047-07-29T23:07:38.3900 cc: 17 52 21.3990 s: -22 26 32.601 C/A 0.498" PA 174.23 deg v_sky -18.23 km/s D 09.22 AU
 Credit: Styled after SORA/Lucky Star

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 | | | Pnn |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | | | Pnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | | | Pnn |
| 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 | | | 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 | + + | JUL 29 23:10 - JUL 29 23:12 | Pie |
| AAT | Siding Spring (AAT) | -31.3 | 149.1 | | | Pnn |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8 | + + | JUL 29 23:02 - JUL 29 23:06 | Pie |
| MSO | Mt. Stromlo Observatory | -35.3 | 149.0 | | | Pnn |

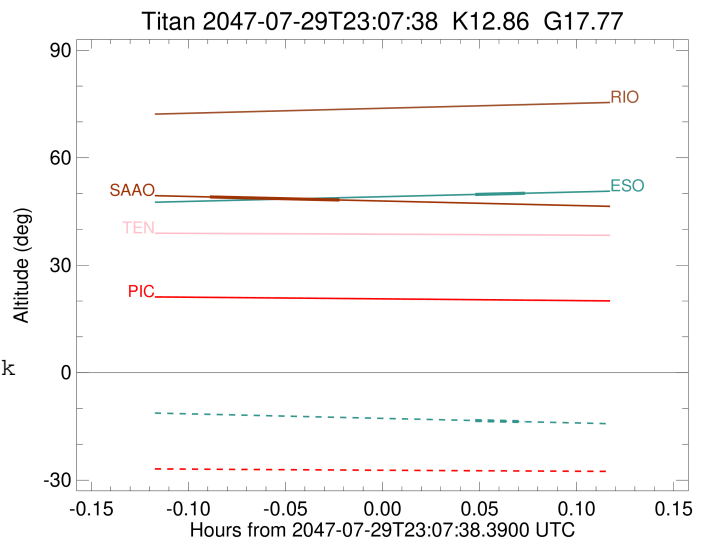
4070419258951086848



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-07-29T23:11:17.290
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : ESO
Location             : European Southern Obs. (3.6m)
Latitude (deg)       : -29.26097
E. Longitude (deg)  : 289.26831
Altitude (km)        : 2.400
Gaia source ID       : 4070419258951086848
2Mass ID (if available) : 17522142-2226323
ICRS Star Coord at Epoch: 17h 52m 21.39905s -22:26:32.60130s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 12.860
G magnitude           : 17.766
RP magnitude         : 16.522
BP magnitude         : 19.580
DUPflag              : 0
Distance (au)        : 9.221
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -18.23
Sun-Target sep (deg) : 142.11
Sun-Moon sep (deg)  : 52.01
B (ring opening deg) : 26.69
PA of pole (deg)    : 5.51
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.362
C/A sky separation (km) : 2423.7
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

```



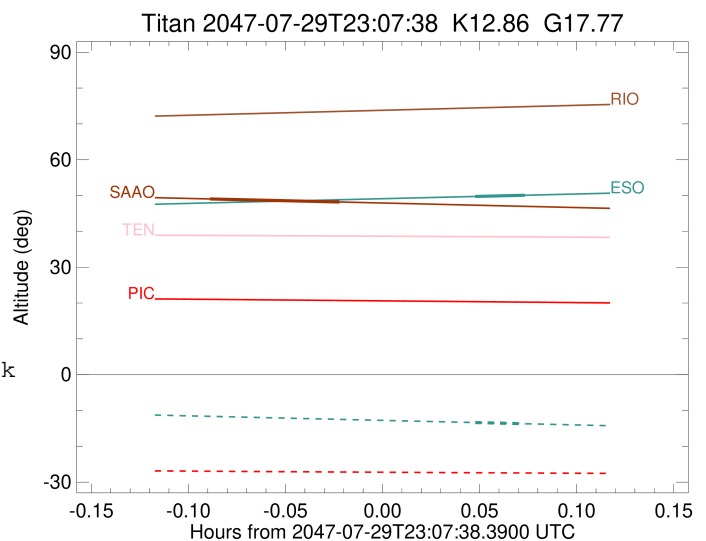
x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|--------|-----|-------------------------|-------|---------|--------|---------|--------------|
| Titan | I | 2047-07-29T23:10:30.356 | 49.74 | -13.37 | 2575.0 | 49.79 | 49.80 |
| Titan | E | 2047-07-29T23:12:04.220 | 50.08 | -13.70 | 2575.0 | 62.16 | 62.17 |

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-07-29T23:04:18.450
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : SAAO
Location             : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)       : -32.37953
E. Longitude (deg)   : 20.81070
Altitude (km)        : 1.768
Gaia source ID       : 4070419258951086848
2Mass ID (if available) : 17522142-2226323
ICRS Star Coord at Epoch: 17h 52m 21.39905s -22:26:32.60130s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 12.860
G magnitude           : 17.766
RP magnitude          : 16.522
BP magnitude          : 19.580
DUPflag              : 0
Distance (au)         : 9.221
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -18.23
Sun-Target sep (deg) : 142.11
Sun-Moon sep (deg)   : 52.74
B (ring opening deg) : 26.69
PA of pole (deg)     : 5.51
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.187
C/A sky separation (km) : 1247.7
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 | 2047-07-29T23:02:16.629 | 49.05 | -75.71 | 2575.1 | 16.11 | 16.12 |
| Titan | E | 2047-07-29T23:06:20.272 | 48.19 | -75.41 | 2575.1 | 34.93 | 34.95 |