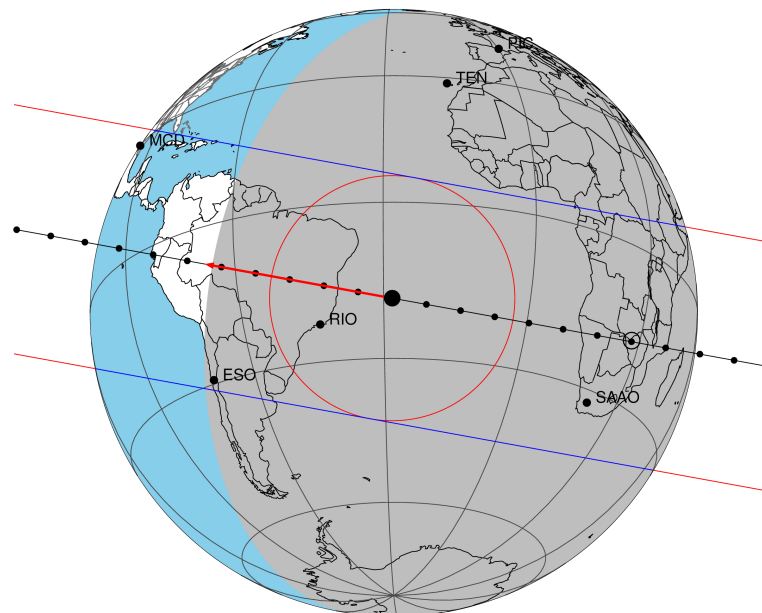


target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2046-07-31T22:16:32.380  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4127831740367080192  
 2Mass ID (if available) : 17004511-2118356

ICRS Star Coord at Epoch: 17h 00m 45.09683s -21:18:35.66546s  
 RUWE (>1.4 is poor) : 0.91  
 K magnitude : 12.993  
 G magnitude : 14.884  
 RP magnitude : 14.251  
 BP magnitude : 15.347  
 DUPflag : 0  
 Distance (au) : 9.375  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -12.15  
 Sun-Target sep (deg) : 127.97  
 Sun-Moon sep (deg) : 148.04  
 B (ring opening deg) : 26.59  
 PA of pole (deg) : 4.28  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.045  
 C/A sky separation (km) : 303.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

Titan 2046-07-31T22:16:32 K12.99 G14.88 dots 60.0 sec  
 Pgt

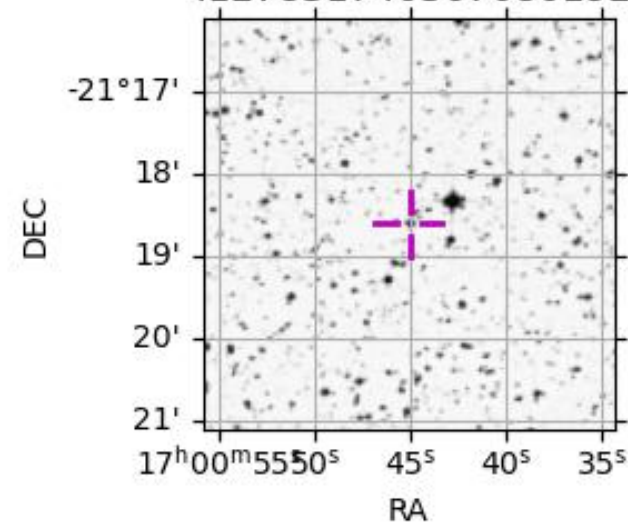


2046-07-31T22:16:32.3800 α: 17 00 45.0968 δ: -21 18 35.665 C/A 0.044" PA 10.32 deg v\_sky -12.15 km/s D 09.38 AU  
 Credit: Styled after SORA/Lucky Star

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

| Obs  | Location                          | lat   | Elon  | Target | Observed Events Interval    | OCode |
|------|-----------------------------------|-------|-------|--------|-----------------------------|-------|
| 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 | + +    | JUL 31 22:15 - JUL 31 22:21 | Pie   |
| 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  | + +    | JUL 31 22:07 - JUL 31 22:13 | Pie   |
| MSO  | Mt. Stromlo Observatory           | -35.3 | 149.0 |        |                             | Pnn   |

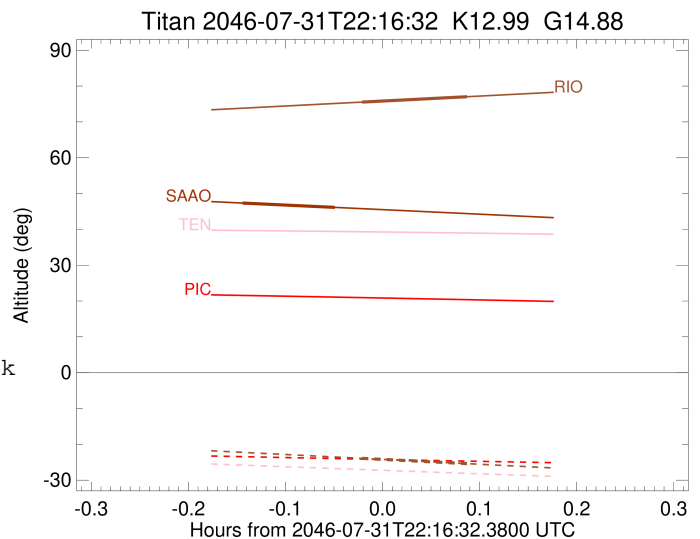
4127831740367080192



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2046-07-31T22:18:30.980
Event type           : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code        : RIO
Location             : Rio de Janeiro
Latitude (deg)       : -22.89506
E. Longitude (deg)   : 316.77708
Altitude (km)        : 0.033
Gaia source ID       : 4127831740367080192
2Mass ID (if available) : 17004511-2118356
ICRS Star Coord at Epoch: 17h 00m 45.09683s -21:18:35.66546s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 12.993
G magnitude           : 14.884
RP magnitude         : 14.251
BP magnitude         : 15.347
DUPflag              : 0
Distance (au)        : 9.375
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.15
Sun-Target sep (deg) : 127.97
Sun-Moon sep (deg)   : 148.73
B (ring opening deg) : 26.59
PA of pole (deg)     : 4.28
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.116
C/A sky separation (km): 785.9
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

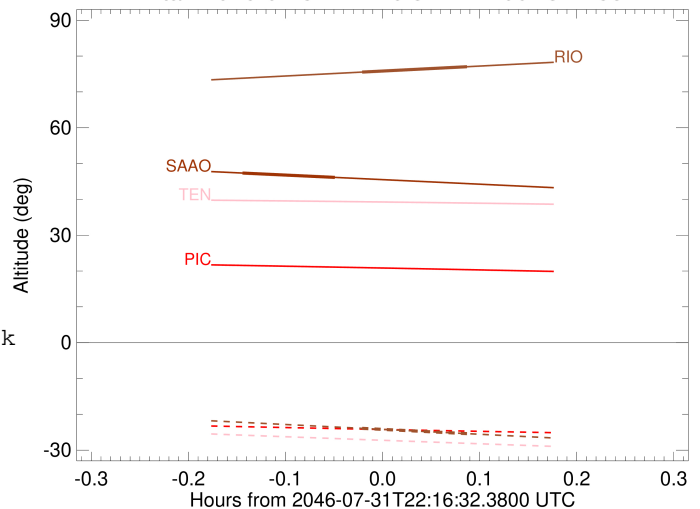
| Target | I/E | UTC                     | alt   | alt-sun | radius | lat-geo | lat-geodetic |
|--------|-----|-------------------------|-------|---------|--------|---------|--------------|
| Titan  | I   | 2046-07-31T22:15:15.637 | 75.52 | -23.91  | 2575.1 | -10.93  | -10.93       |
| Titan  | E   | 2046-07-31T22:21:46.368 | 77.02 | -25.39  | 2575.1 | -20.73  | -20.74       |

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2046-07-31T22:10:44.360
Event type            : Pgt
: Titan occs: geocentric, topocentric
: 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       : 4127831740367080192
2Mass ID (if available) : 17004511-2118356
ICRS Star Coord at Epoch: 17h 00m 45.09683s -21:18:35.66546s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 12.993
G magnitude           : 14.884
RP magnitude          : 14.251
BP magnitude          : 15.347
DUPflag              : 0
Distance (au)        : 9.375
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.15
Sun-Target sep (deg) : 127.97
Sun-Moon sep (deg)   : 147.84
B (ring opening deg) : 26.59
PA of pole (deg)     : 4.28
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.208
C/A sky separation (km) : 1415.1
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

```

Titan 2046-07-31T22:16:32 K12.99 G14.88



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   | 2046-07-31T22:07:51.511 | 47.35 | -73.76  | 2575.1 | -24.00  | -24.01       |
| Titan  | E   | 2046-07-31T22:13:37.319 | 46.13 | -74.35  | 2575.1 | -34.78  | -34.79       |