

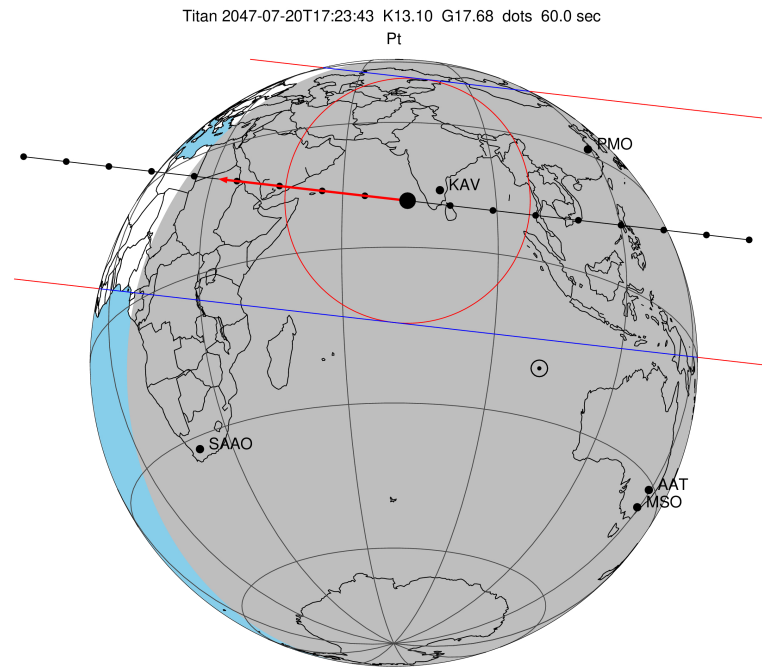
target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2047-07-20T17:23:43.840
 Event type : Pt
 : Titan occs: topocentric, not geocentric
 : Not a ringed target
 Gaia source ID : 4070241932705589376
 2Mass ID (if available) : 17541226-2223494

ICRS Star Coord at Epoch: 17h 54m 12.27365s -22:23:49.38387s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 13.098
 G magnitude : 17.682
 RP magnitude : 16.434
 BP magnitude : 19.151
 DUPflag : 0
 Distance (au) : 9.144
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.04
 Sun-Target sep (deg) : 151.36
 Sun-Moon sep (deg) : 176.81
 B (ring opening deg) : 26.61
 PA of pole (deg) : 5.55
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.517
 C/A sky separation (km) : 3427.8
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk

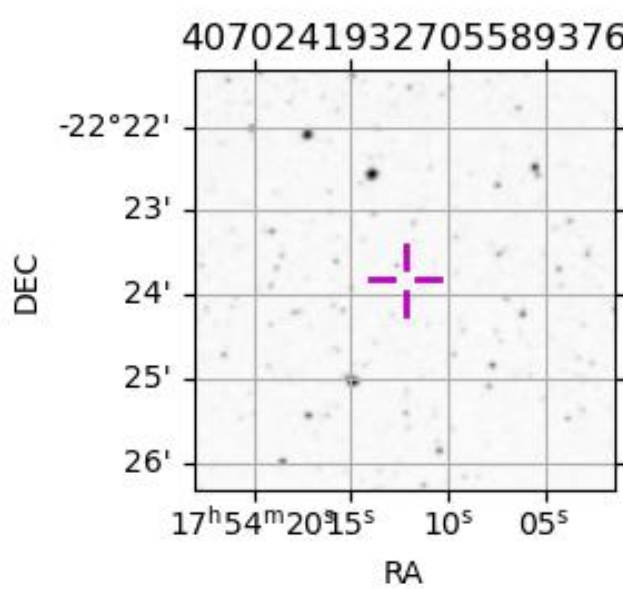
URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp

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

| Obs | Location | lat | Elon | Target | Observed Events Interval | 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 | + + | JUL 20 17:17 - JUL 20 17:22 | Pie |
| 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 | + + | JUL 20 17:20 - JUL 20 17:25 | Pie |
| 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 |



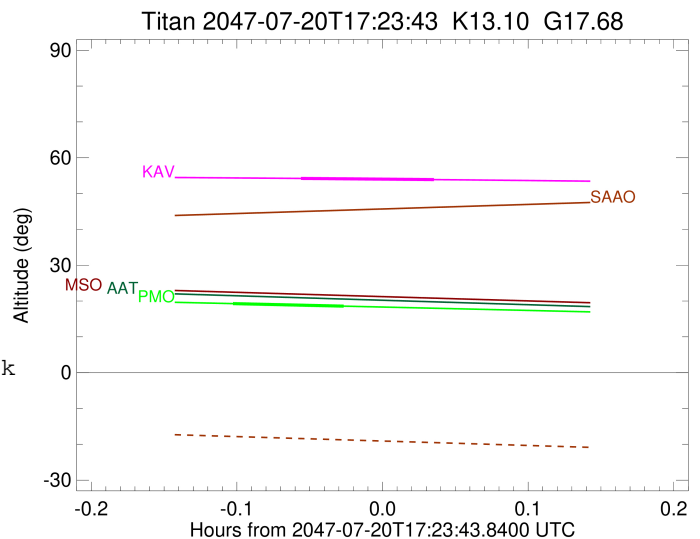
2047-07-20T17:23:43.8400 α: 17 54 12.2736 δ: -22 23 49.384 C/A 0.515" PA 6.55 deg v_sky -15.03 km/s D 09.14 AU
 Credit: Styled after SORA/Lucky Star



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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-07-20T17:19:51.310
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        : 4070241932705589376
2Mass ID (if available) : 17541226-2223494
ICRS Star Coord at Epoch: 17h 54m 12.27365s -22:23:49.38387s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 13.098
G magnitude           : 17.682
RP magnitude          : 16.434
BP magnitude          : 19.151
DUPflag              : 0
Distance (au)         : 9.144
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.04
Sun-Target sep (deg) : 151.36
Sun-Moon sep (deg)   : 176.79
B (ring opening deg) : 26.61
PA of pole (deg)     : 5.55
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.223
C/A sky separation (km) : 1477.0
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

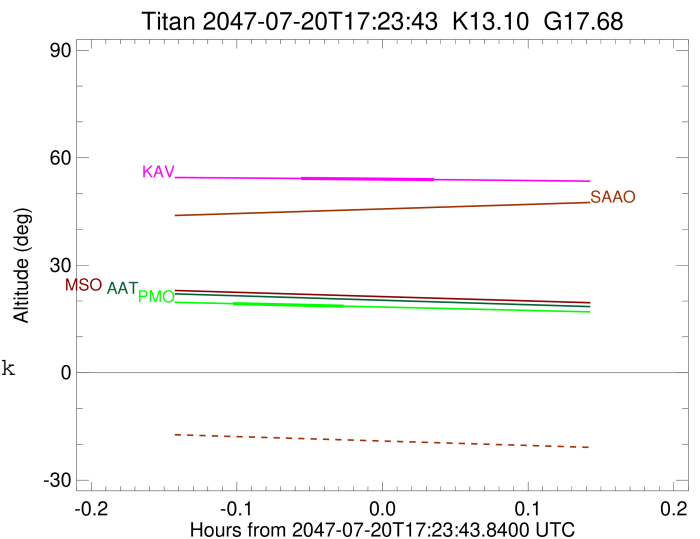
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x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|--------|-----|-------------------------|-------|---------|--------|---------|--------------|
| Titan | I | 2047-07-20T17:17:33.607 | 19.27 | -35.18 | 2575.1 | 31.96 | 31.98 |
| Titan | E | 2047-07-20T17:22:09.079 | 18.56 | -34.85 | 2575.1 | 29.73 | 29.75 |

target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2047-07-20T17:23:07.150
 Event type : Pt
 : Titan occs: topocentric, not geocentric
 : Not a ringed target
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 4070241932705589376
 2Mass ID (if available) : 17541226-2223494
 ICRS Star Coord at Epoch: 17h 54m 12.27365s -22:23:49.38387s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 13.098
 G magnitude : 17.682
 RP magnitude : 16.434
 BP magnitude : 19.151
 DUPflag : 0
 Distance (au) : 9.144
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.04
 Sun-Target sep (deg) : 151.36
 Sun-Moon sep (deg) : 177.11
 B (ring opening deg) : 26.61
 PA of pole (deg) : 5.55
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.042
 C/A sky separation (km) : 275.4
 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 | 2047-07-20T17:20:21.823 | 54.21 | -50.13 | 2575.1 | 6.29 | 6.30 |
| Titan | E | 2047-07-20T17:25:52.539 | 53.89 | -50.87 | 2575.1 | 4.66 | 4.67 |