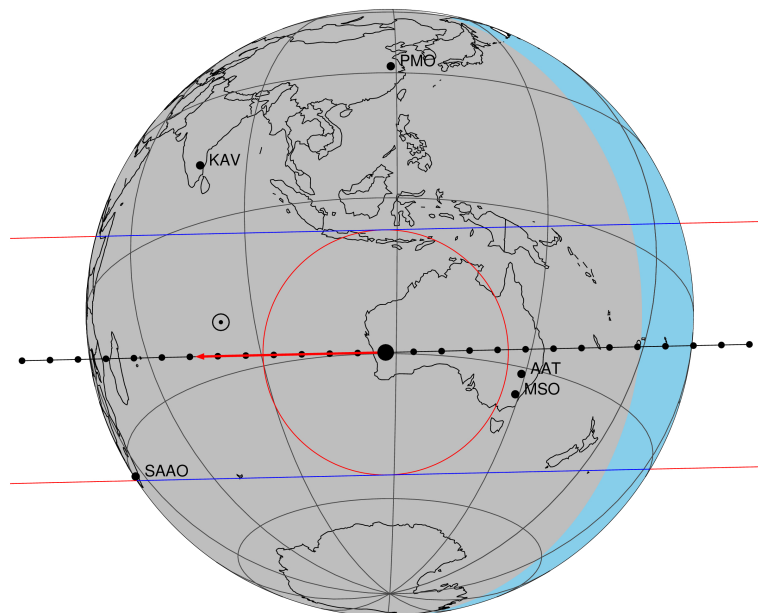


target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-05-20T18:27:17.860  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4066728370217341952  
 2Mass ID (if available) : 18121982-2217081

ICRS Star Coord at Epoch: 18h 12m 19.81823s -22:17:08.44969s  
 RUWE (>1.4 is poor) : 1.59  
 K magnitude : 12.051  
 G magnitude : 17.255  
 RP magnitude : 15.843  
 BP magnitude : 18.959  
 DUPflag : 0  
 Distance (au) : 9.197  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -9.80  
 Sun-Target sep (deg) : 146.15  
 Sun-Moon sep (deg) : 101.32  
 B (ring opening deg) : 26.08  
 PA of pole (deg) : 5.89  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.124  
 C/A sky separation (km) : 830.1  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

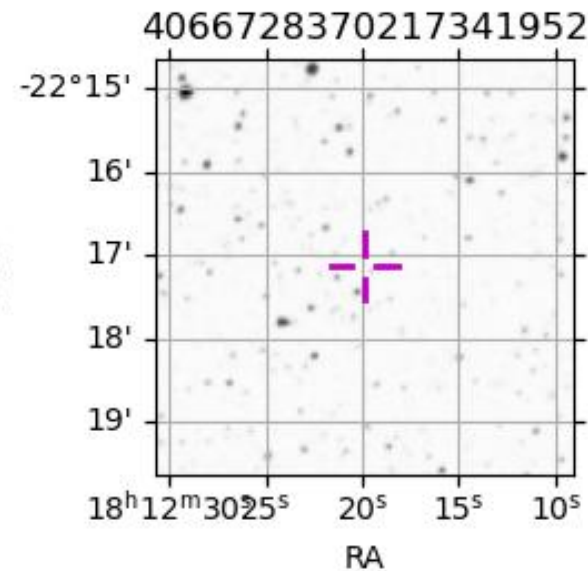
Titan 2047-05-20T18:27:17 K12.05 G17.25 dots 60.0 sec  
 Pgt



2047-05-20T18:27:17.8600 α: 18 12 19.8182 δ: -22 17 08.450 C/A 0.124" PA 178.71 deg v\_sky - 9.79 km/s D 09.20 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 |        |                             |          | Pnn    |
| AAT  | Siding Spring (AAT)               | -31.3 | 149.1 | + +    | MAY 20 18:18 - MAY 20 18:26 |          | Pie    |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8  | + +    | MAY 20 18:34 - MAY 20 18:38 |          | Pie    |
| MSO  | Mt. Stromlo Observatory           | -35.3 | 149.0 | + +    | MAY 20 18:19 - MAY 20 18:26 |          | Pie    |



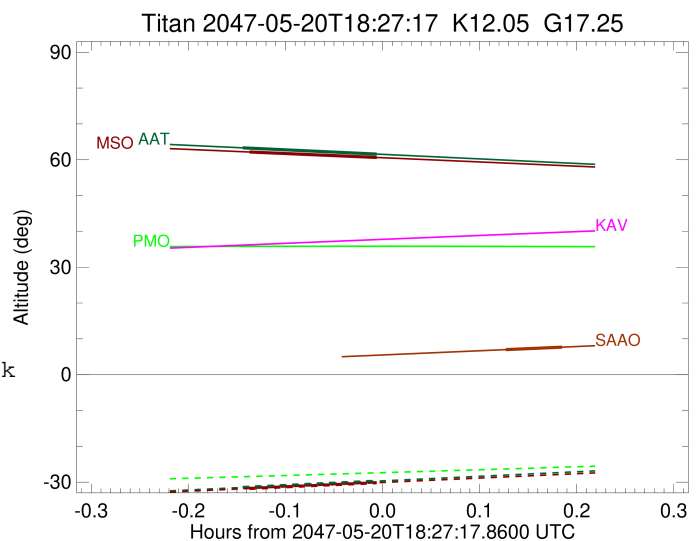
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-05-20T18:22:48.060
Event type           : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code        : AAT
Location             : Siding Spring (AAT)
Latitude (deg)       : -31.27703
E. Longitude (deg)  : 149.06608
Altitude (km)        : 1.164
Gaia source ID       : 4066728370217341952
2Mass ID (if available) : 18121982-2217081
ICRS Star Coord at Epoch: 18h 12m 19.81823s -22:17:08.44969s
RUWE (>1.4 is poor) : 1.59
K magnitude          : 12.051
G magnitude          : 17.255
RP magnitude         : 15.843
BP magnitude         : 18.959
DUPflag             : 0
Distance (au)        : 9.197
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -9.80
Sun-Target sep (deg) : 146.15
Sun-Moon sep (deg)  : 102.17
B (ring opening deg) : 26.08
PA of pole (deg)    : 5.89
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.073
C/A sky separation (km): 486.8
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

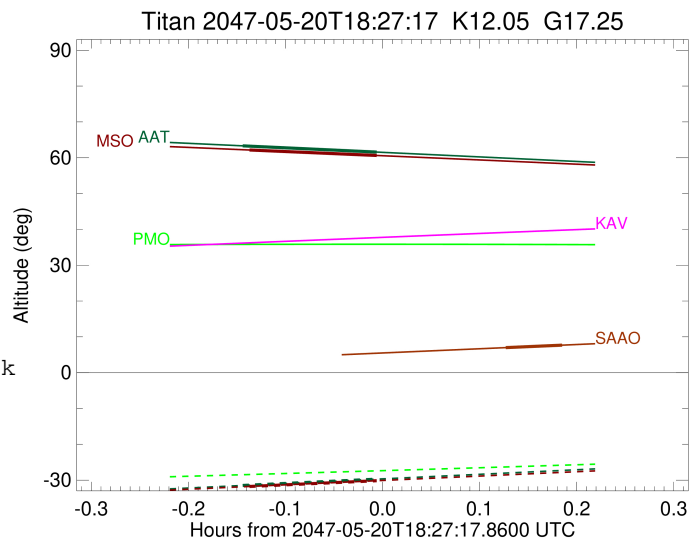
| Target | I/E | UTC                     | alt   | alt-sun | radius | lat-geo | lat-geodetic |
|--------|-----|-------------------------|-------|---------|--------|---------|--------------|
| Titan  | I   | 2047-05-20T18:18:38.689 | 63.31 | -31.49  | 2575.1 | -15.74  | -15.75       |
| Titan  | E   | 2047-05-20T18:26:57.533 | 61.56 | -29.72  | 2575.2 | -3.78   | -3.78        |



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-05-20T18:36:39.180
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      : 4066728370217341952
2Mass ID (if available) : 18121982-2217081
ICRS Star Coord at Epoch: 18h 12m 19.81823s -22:17:08.44969s
RUWE (>1.4 is poor) : 1.59
K magnitude          : 12.051
G magnitude          : 17.255
RP magnitude         : 15.843
BP magnitude         : 18.959
DUPflag             : 0
Distance (au)       : 9.197
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -9.80
Sun-Target sep (deg) : 146.15
Sun-Moon sep (deg)  : 101.25
B (ring opening deg) : 26.08
PA of pole (deg)    : 5.89
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.353
C/A sky separation (km) : 2357.4
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   | 2047-05-20T18:34:52.969 | 6.98 | -35.82  | 2575.1 | -59.88  | -59.89       |
| Titan  | E   | 2047-05-20T18:38:25.374 | 7.68 | -36.57  | 2575.1 | -49.75  | -49.76       |

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-05-20T18:23:01.270
Event type            : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code         : MSO
Location              : Mt. Stromlo Observatory
Latitude (deg)       : -35.32000
E. Longitude (deg)   : 149.00833
Altitude (km)        : 0.770
Gaia source ID       : 4066728370217341952
2Mass ID (if available) : 18121982-2217081
ICRS Star Coord at Epoch: 18h 12m 19.81823s -22:17:08.44969s
RUWE (>1.4 is poor) : 1.59
K magnitude           : 12.051
G magnitude           : 17.255
RP magnitude          : 15.843
BP magnitude          : 18.959
DUPflag              : 0
Distance (au)        : 9.197
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -9.80
Sun-Target sep (deg) : 146.15
Sun-Moon sep (deg)   : 102.16
B (ring opening deg) : 26.08
PA of pole (deg)     : 5.89
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.137
C/A sky separation (km) : 911.4
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   | 2047-05-20T18:19:03.387 | 62.15 | -31.77  | 2575.1 | -24.44  | -24.46       |
| Titan  | E   | 2047-05-20T18:26:59.248 | 60.61 | -30.15  | 2575.1 | -12.56  | -12.57       |

