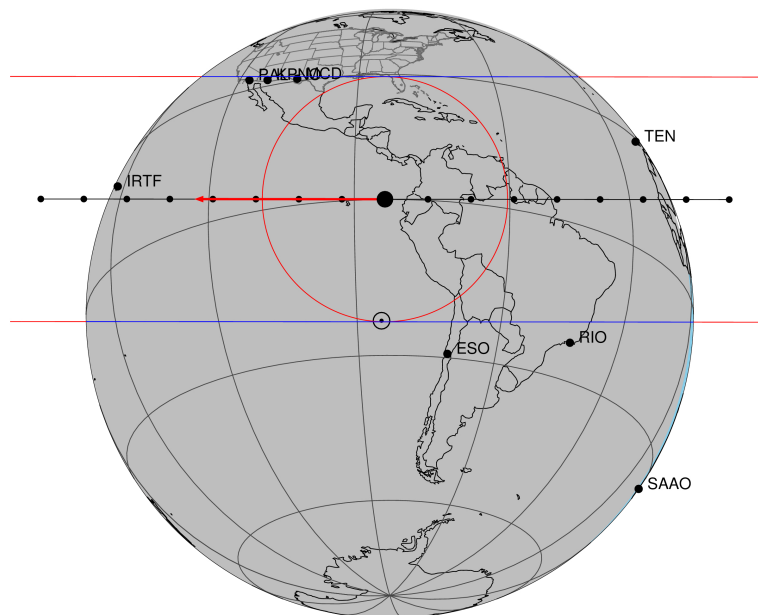


target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2047-06-21T05:41:38.080
 Event type : Pgt
 : Titan occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4069861531668436736
 2Mass ID (if available) : 18031142-2220124

ICRS Star Coord at Epoch: 18h 03m 11.42659s -22:20:12.76999s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 10.698
 G magnitude : 14.861
 RP magnitude : 13.764
 BP magnitude : 16.073
 DUPflag : 0
 Distance (au) : 9.037
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.06
 Sun-Target sep (deg) : 178.08
 Sun-Moon sep (deg) : 153.08
 B (ring opening deg) : 26.34
 PA of pole (deg) : 5.72
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.371
 C/A sky separation (km) : 2428.8
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk
 URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp

Titan 2047-06-21T05:41:38 K10.70 G14.86 dots 60.0 sec
 Pgt

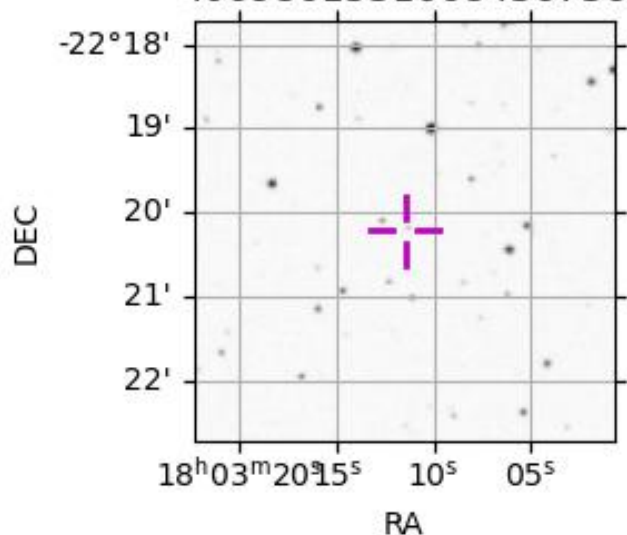


2047-06-21T05:41:38.0800 α: 18 03 11.4266 δ: -22 20 12.770 C/A 0.371" PA 0.05 deg v_sky -15.06 km/s D 09.04 AU
 Credit: Styled after SORA/Lucky Star

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

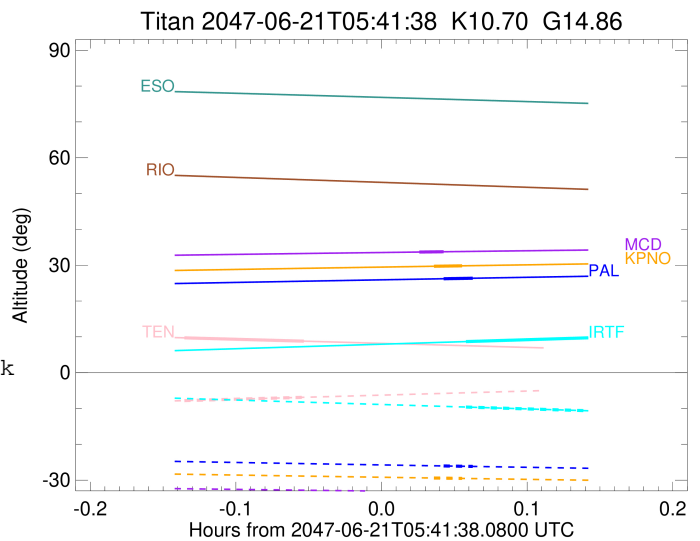
| Obs | Location | lat | Elon | Target | Observed Events Interval | OEcode |
|------|-----------------------------------|-------|-------|--------|-----------------------------|--------|
| PIC | Pic du Midi | 42.9 | 0.1 | | | Pnn |
| PAL | Palomar Mt (200") | 33.4 | 243.1 | + + | JUN 21 05:44 - JUN 21 05:45 | Pie |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | | | Pnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | + + | JUN 21 05:43 - JUN 21 05:45 | Pie |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | + + | JUN 21 05:43 - JUN 21 05:44 | Pie |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | + + | JUN 21 05:33 - JUN 21 05:38 | Pie |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | + + | JUN 21 05:45 - JUN 21 05:50 | Pie |
| 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 |

4069861531668436736



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-06-21T05:44:47.750
Event type           : Pgt
: Titan occs: geocentric, topocentric
: 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       : 4069861531668436736
2Mass ID (if available) : 18031142-2220124
ICRS Star Coord at Epoch: 18h 03m 11.42659s -22:20:12.76999s
RUWE (>1.4 is poor) : 1.07
K magnitude          : 10.698
G magnitude           : 14.861
RP magnitude         : 13.764
BP magnitude         : 16.073
DUPflag             : 0
Distance (au)        : 9.037
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.06
Sun-Target sep (deg) : 178.08
Sun-Moon sep (deg)   : 152.99
B (ring opening deg) : 26.34
PA of pole (deg)     : 5.72
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.384
C/A sky separation (km): 2513.7
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 | 2047-06-21T05:44:11.422 | 26.22 | -26.04 | 2575.0 | 58.19 | 58.21 |
| Titan | E | 2047-06-21T05:45:24.078 | 26.36 | -26.17 | 2575.1 | 62.91 | 62.92 |

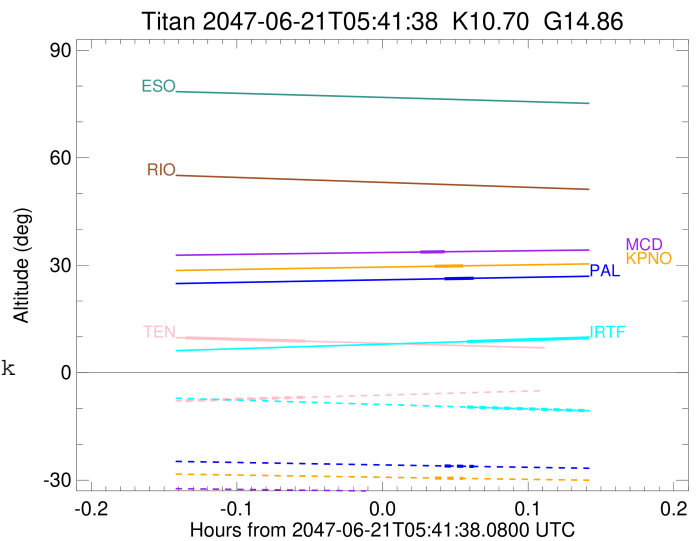
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-06-21T05:44:22.880
Event type           : Pgt
: Titan occs: geocentric, topocentric
: 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       : 4069861531668436736
2Mass ID (if available) : 18031142-2220124
ICRS Star Coord at Epoch: 18h 03m 11.42659s -22:20:12.76999s
RUWE (>1.4 is poor) : 1.07
K magnitude          : 10.698
G magnitude          : 14.861
RP magnitude         : 13.764
BP magnitude         : 16.073
DUPflag             : 0
Distance (au)        : 9.037
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.06
Sun-Target sep (deg) : 178.08
Sun-Moon sep (deg)  : 153.06
B (ring opening deg) : 26.34
PA of pole (deg)    : 5.72
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.383
C/A sky separation (km) : 2512.0
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 | 2047-06-21T05:43:46.097 | 29.70 | -29.40 | 2575.1 | 58.12 | 58.13 |
| Titan | E | 2047-06-21T05:44:59.653 | 29.82 | -29.52 | 2575.0 | 62.86 | 62.87 |



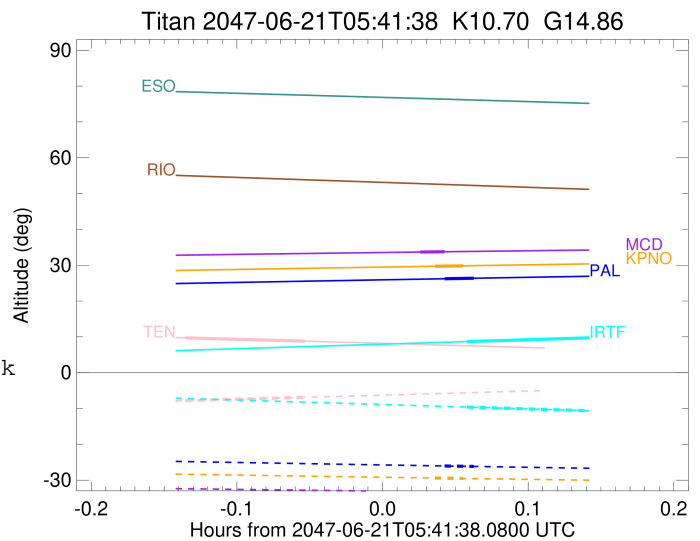
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-06-21T05:43:42.260
Event type            : Pgt
: Titan occs: geocentric, topocentric
: 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       : 4069861531668436736
2Mass ID (if available) : 18031142-2220124
ICRS Star Coord at Epoch: 18h 03m 11.42659s -22:20:12.76999s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 10.698
G magnitude           : 14.861
RP magnitude          : 13.764
BP magnitude          : 16.073
DUPflag              : 0
Distance (au)         : 9.037
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.06
Sun-Target sep (deg) : 178.08
Sun-Moon sep (deg)   : 153.16
B (ring opening deg) : 26.34
PA of pole (deg)     : 5.72
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.386
C/A sky separation (km) : 2530.5
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 | 2047-06-21T05:43:11.371 | 33.67 | -33.17 | 2575.0 | 59.22 | 59.23 |
| Titan | E | 2047-06-21T05:44:13.163 | 33.75 | -33.25 | 2575.1 | 63.25 | 63.27 |



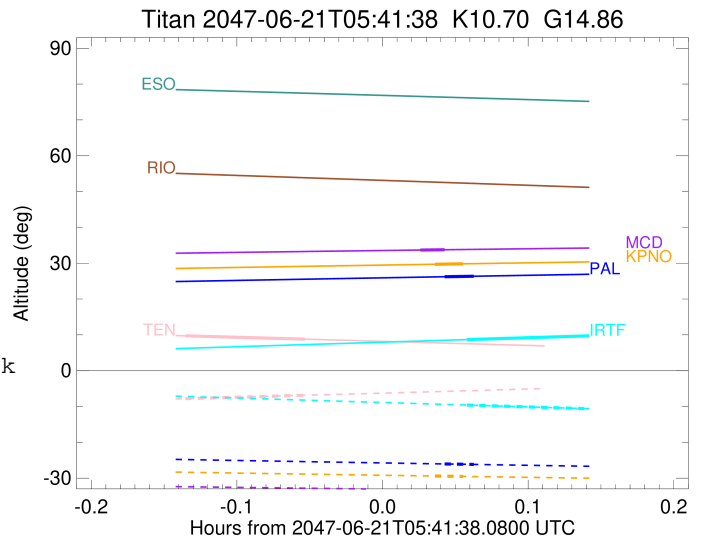
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-06-21T05:35:58.440
Event type            : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code        : TEN
Location              : Teide Obs./Tenerife
Latitude (deg)       : 28.30050
E. Longitude (deg)   : 343.48909
Altitude (km)        : 2.395
Gaia source ID       : 4069861531668436736
2Mass ID (if available) : 18031142-2220124
ICRS Star Coord at Epoch: 18h 03m 11.42659s -22:20:12.76999s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 10.698
G magnitude           : 14.861
RP magnitude          : 13.764
BP magnitude          : 16.073
DUPflag              : 0
Distance (au)        : 9.037
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.06
Sun-Target sep (deg) : 178.08
Sun-Moon sep (deg)   : 153.87
B (ring opening deg) : 26.34
PA of pole (deg)     : 5.72
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.186
C/A sky separation (km): 1222.1
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

```

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 | 2047-06-21T05:33:29.643 | 9.72 | -7.81 | 2575.1 | 20.68 | 20.69 |
| Titan | E | 2047-06-21T05:38:27.298 | 8.79 | -6.87 | 2575.1 | 29.60 | 29.62 |



target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2047-06-21T05:47:53.460
 Event type : Pgt
 : Titan occs: geocentric, topocentric
 : Not a ringed target
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 4069861531668436736
 2Mass ID (if available) : 18031142-2220124
 ICRS Star Coord at Epoch: 18h 03m 11.42659s -22:20:12.76999s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 10.698
 G magnitude : 14.861
 RP magnitude : 13.764
 BP magnitude : 16.073
 DUPflag : 0
 Distance (au) : 9.037
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.06
 Sun-Target sep (deg) : 178.08
 Sun-Moon sep (deg) : 152.48
 B (ring opening deg) : 26.34
 PA of pole (deg) : 5.72
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.052
 C/A sky separation (km) : 342.7
 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 | 2047-06-21T05:45:05.524 | 8.67 | -9.60 | 2575.2 | 1.22 | 1.22 |
| Titan | E | 2047-06-21T05:50:41.363 | 9.84 | -10.74 | 2575.1 | 12.45 | 12.46 |

