

target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2042-04-17T03:29:37.090  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 3614804768789029760  
 2Mass ID (if available) : 14073243-1000347

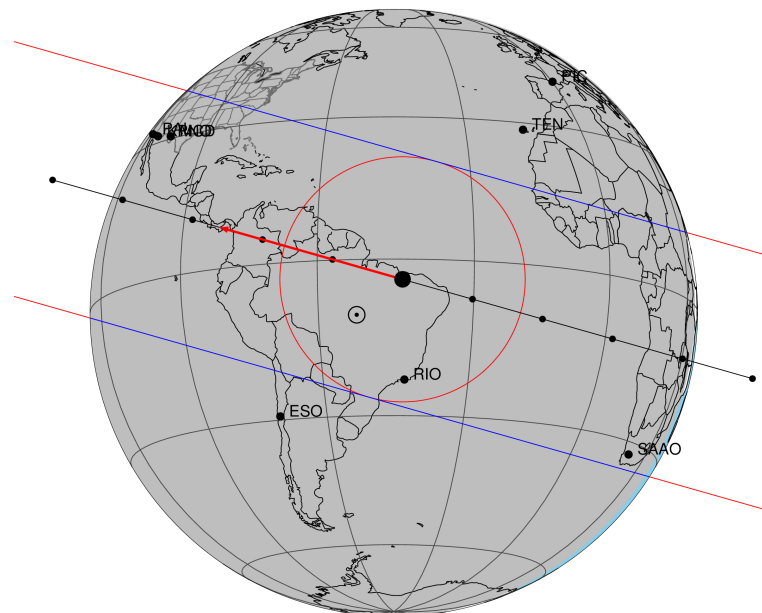
ICRS Star Coord at Epoch: 14h 07m 32.37162s -10:00:35.11227s  
 RUWE (>1.4 is poor) : 0.96  
 K magnitude : 13.447  
 G magnitude : 15.375  
 RP magnitude : 14.754  
 BP magnitude : 15.832  
 DUPflag : 0  
 Distance (au) : 8.778  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -25.45  
 Sun-Target sep (deg) : 172.97  
 Sun-Moon sep (deg) : 132.14  
 B (ring opening deg) : 16.52  
 PA of pole (deg) : -0.90  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.114  
 C/A sky separation (km) : 728.2  
 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	+ +	APR 17 03:32 - APR 17 03:34	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	APR 17 03:32 - APR 17 03:34	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	APR 17 03:31 - APR 17 03:34	Pie
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	+ +	APR 17 03:28 - APR 17 03:30	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	+ +	APR 17 03:25 - APR 17 03:26	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn

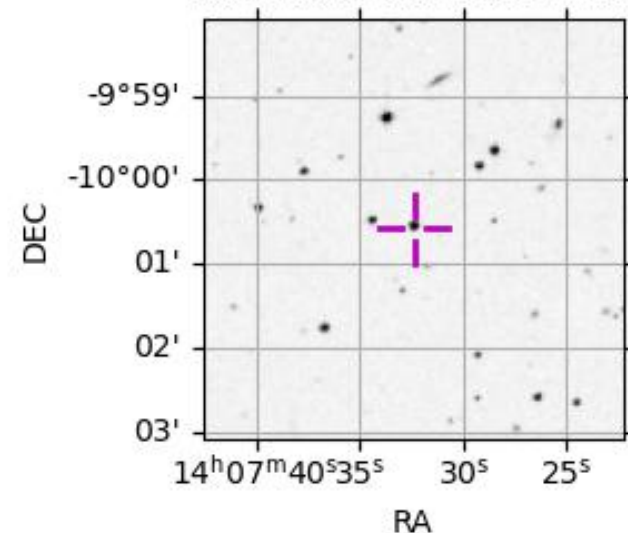
Titan 2042-04-17T03:29:37 K13.45 G15.37 dots 60.0 sec  
 Pgt



2042-04-17T03:29:37.0900 α: 14 07 32.3716 δ: -10 00 35.112 C/A 0.114" PA 15.91 deg v\_sky -25.46 km/s D 08.78 AU

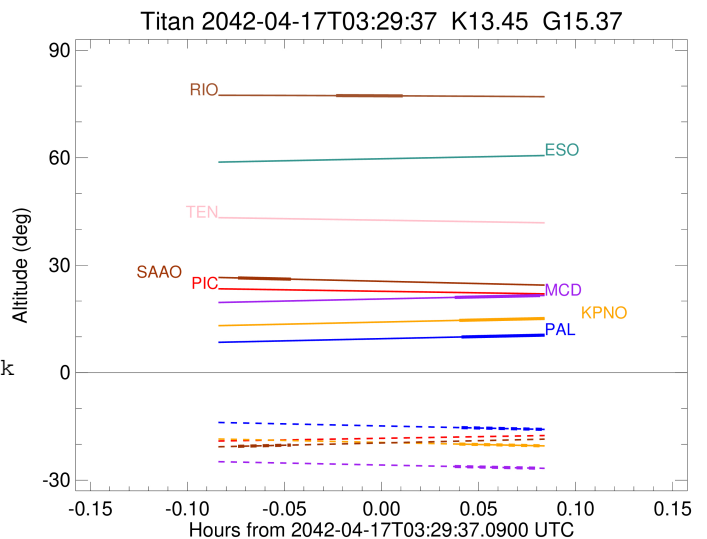
Credit: Styled after SORA/Lucky Star

3614804768789029760



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2042-04-17T03:33:26.900
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      : 3614804768789029760
2Mass ID (if available) : 14073243-1000347
ICRS Star Coord at Epoch: 14h 07m 32.37162s -10:00:35.11227s
RUWE (>1.4 is poor) : 0.96
K magnitude         : 13.447
G magnitude         : 15.375
RP magnitude        : 14.754
BP magnitude        : 15.832
DUPflag            : 0
Distance (au)       : 8.778
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -25.45
Sun-Target sep (deg) : 172.97
Sun-Moon sep (deg)  : 131.62
B (ring opening deg) : 16.52
PA of pole (deg)    : -0.90
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.238
C/A sky separation (km) : 1515.5
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	2042-04-17T03:32:05.468	9.97	-15.34	2575.1	49.61	49.62
Titan	E	2042-04-17T03:34:48.323	10.50	-15.86	2575.2	18.67	18.67

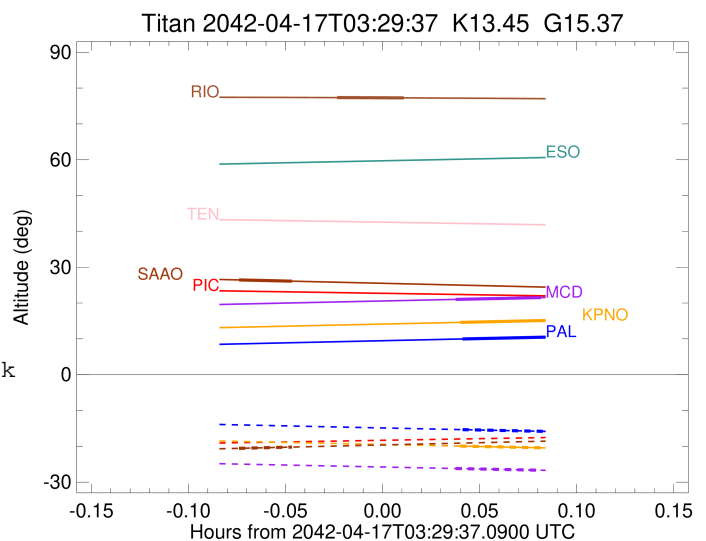
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2042-04-17T03:33:22.370
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      : 3614804768789029760
2Mass ID (if available) : 14073243-1000347
ICRS Star Coord at Epoch: 14h 07m 32.37162s -10:00:35.11227s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 13.447
G magnitude          : 15.375
RP magnitude         : 14.754
BP magnitude         : 15.832
DUPflag             : 0
Distance (au)        : 8.778
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -25.45
Sun-Target sep (deg) : 172.97
Sun-Moon sep (deg)  : 131.69
B (ring opening deg) : 16.52
PA of pole (deg)    : -0.90
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.236
C/A sky separation (km) : 1504.8
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

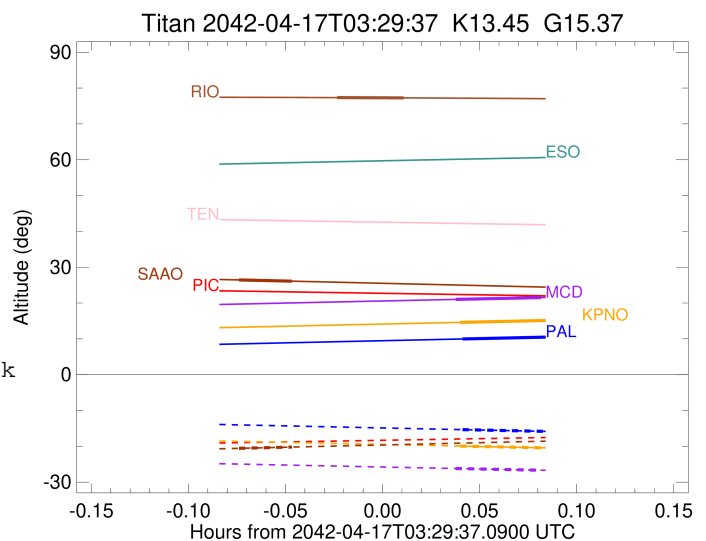
```

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	2042-04-17T03:32:00.748	14.59	-19.93	2575.1	49.32	49.34
Titan	E	2042-04-17T03:34:43.988	15.13	-20.45	2575.2	18.40	18.41



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2042-04-17T03:33:11.850  
 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 : 3614804768789029760  
 2Mass ID (if available) : 14073243-1000347  
 ICRS Star Coord at Epoch: 14h 07m 32.37162s -10:00:35.11227s  
 RUWE (>1.4 is poor) : 0.96  
 K magnitude : 13.447  
 G magnitude : 15.375  
 RP magnitude : 14.754  
 BP magnitude : 15.832  
 DUPflag : 0  
 Distance (au) : 8.778  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -25.45  
 Sun-Target sep (deg) : 172.97  
 Sun-Moon sep (deg) : 131.80  
 B (ring opening deg) : 16.52  
 PA of pole (deg) : -0.90  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.248  
 C/A sky separation (km) : 1577.5  
 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



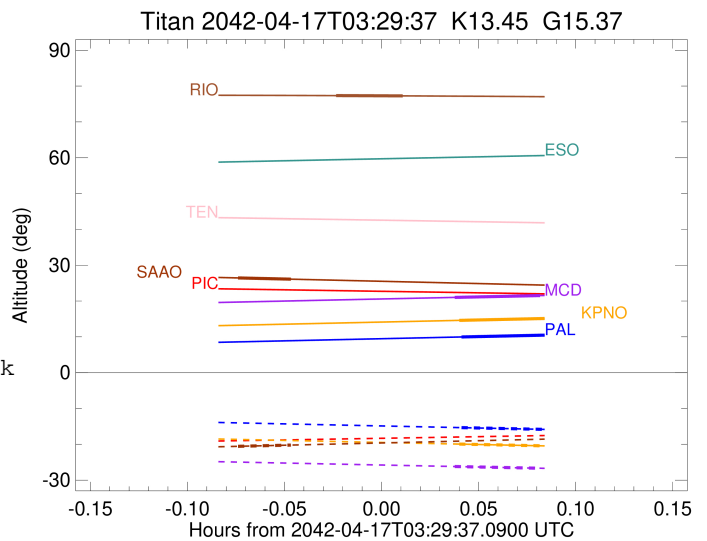
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2042-04-17T03:31:52.495	21.01	-26.19	2575.1	51.11	51.13
Titan	E	2042-04-17T03:34:31.200	21.52	-26.68	2575.2	20.35	20.36

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2042-04-17T03:29:14.660
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      : 3614804768789029760
2Mass ID (if available) : 14073243-1000347
ICRS Star Coord at Epoch: 14h 07m 32.37162s -10:00:35.11227s
RUWE (>1.4 is poor) : 0.96
K magnitude         : 13.447
G magnitude         : 15.375
RP magnitude        : 14.754
BP magnitude        : 15.832
DUPflag            : 0
Distance (au)       : 8.778
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -25.45
Sun-Target sep (deg) : 172.97
Sun-Moon sep (deg)  : 132.94
B (ring opening deg) : 16.52
PA of pole (deg)    : -0.90
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.315
C/A sky separation (km) : 2004.5
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

```



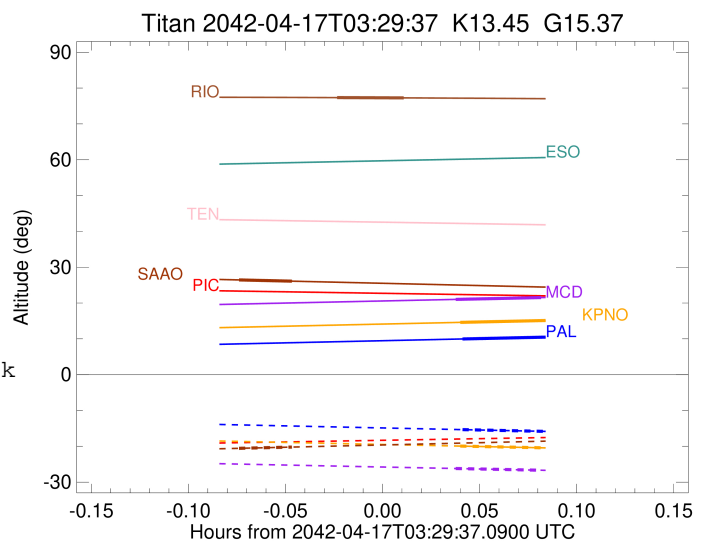
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2042-04-17T03:28:12.186	77.33	-75.06	2575.2	-32.99	-33.00
Titan	E	2042-04-17T03:30:17.140	77.26	-74.77	2575.1	-62.44	-62.45

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2042-04-17T03:26:00.480
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       : 3614804768789029760
2Mass ID (if available) : 14073243-1000347
ICRS Star Coord at Epoch: 14h 07m 32.37162s -10:00:35.11227s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 13.447
G magnitude           : 15.375
RP magnitude          : 14.754
BP magnitude          : 15.832
DUPflag              : 0
Distance (au)        : 8.778
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -25.45
Sun-Target sep (deg) : 172.97
Sun-Moon sep (deg)   : 133.07
B (ring opening deg) : 16.52
PA of pole (deg)     : -0.90
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.351
C/A sky separation (km) : 2233.2
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	2042-04-17T03:25:10.461	26.45	-20.56	2575.2	-41.15	-41.16
Titan	E	2042-04-17T03:26:50.496	26.09	-20.21	2575.1	-69.05	-69.06