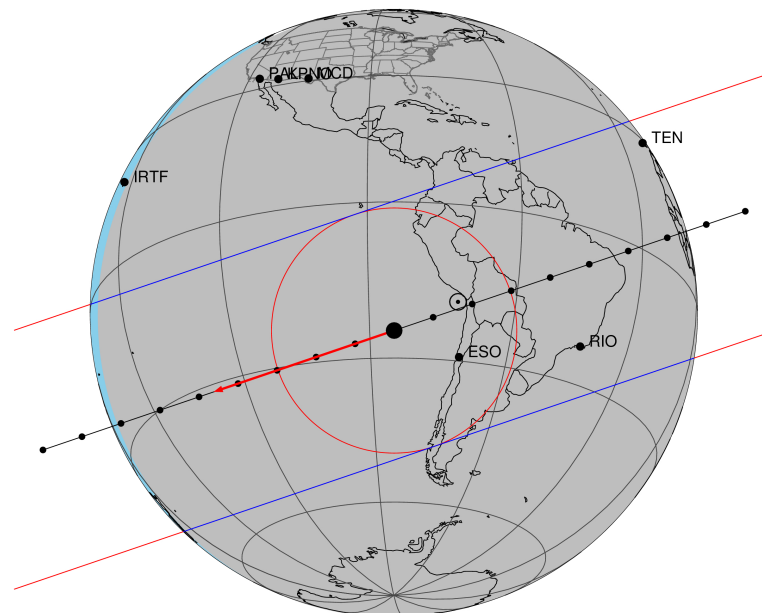


target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2049-07-28T04:54:46.400  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 6772185723737300352  
 2Mass ID (if available) : 19371518-2133176

ICRS Star Coord at Epoch: 19h 37m 15.18686s -21:33:17.78654s  
 RUWE (>1.4 is poor) : 1.04  
 K magnitude : 14.976  
 G magnitude : 16.523  
 RP magnitude : 15.974  
 BP magnitude : 16.889  
 DUPflag : 0  
 Distance (au) : 9.017  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -14.43  
 Sun-Target sep (deg) : 167.62  
 Sun-Moon sep (deg) : 173.70  
 B (ring opening deg) : 23.13  
 PA of pole (deg) : 6.90  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.057  
 C/A sky separation (km) : 373.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk  
 URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

Titan 2049-07-28T04:54:46 K14.98 G16.52 dots 60.0 sec  
 Pgt

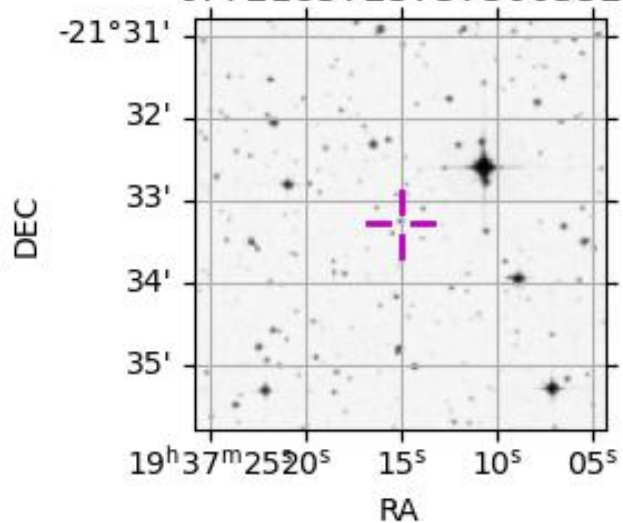


2049-07-28T04:54:46.4000 cc: 19 37 15.18686 s: -21 33 17.787 C/A 0.054" PA 161.28 deg v\_sky -14.42 km/s D 09.02 AU  
 Credit: Styled after SORA/Lucky Star

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	+ +	JUL 28 04:46 - JUL 28 04:49	Pie
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 28 04:48 - JUL 28 04:53	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 28 04:50 - JUL 28 04:56	Pie
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

6772185723737300352



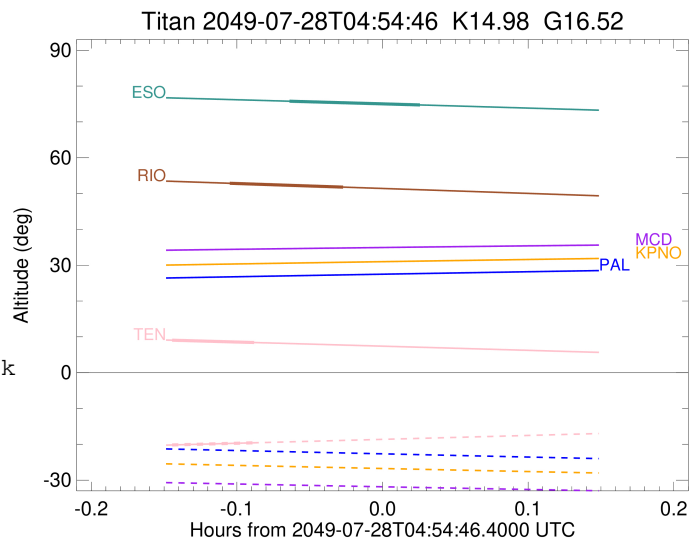
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2049-07-28T04:47:47.980
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        : 6772185723737300352
2Mass ID (if available) : 19371518-2133176
ICRS Star Coord at Epoch: 19h 37m 15.18686s -21:33:17.78654s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 14.976
G magnitude           : 16.523
RP magnitude          : 15.974
BP magnitude          : 16.889
DUPflag              : 0
Distance (au)         : 9.017
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.43
Sun-Target sep (deg)  : 167.62
Sun-Moon sep (deg)    : 174.16
B (ring opening deg) : 23.13
PA of pole (deg)      : 6.90
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.321
C/A sky separation (km) : 2100.3
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	2049-07-28T04:46:05.439	9.06	-20.18	2575.2	27.11	27.12
Titan	E	2049-07-28T04:49:30.533	8.41	-19.57	2575.1	64.76	64.77



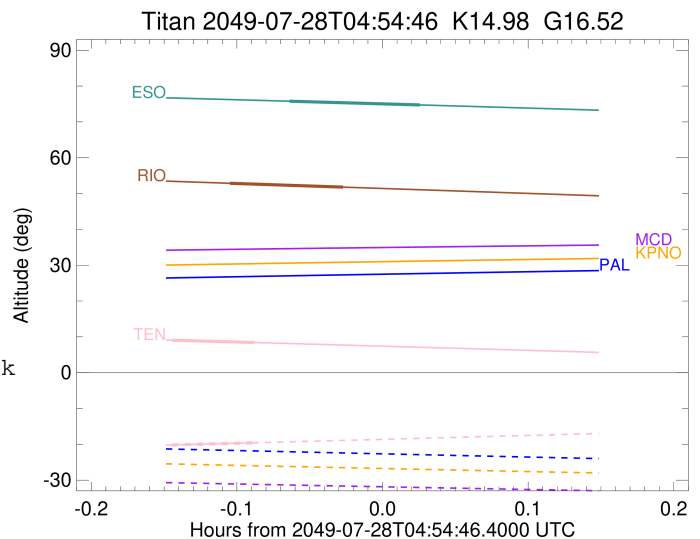
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2049-07-28T04:50:48.500
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       : 6772185723737300352
2Mass ID (if available) : 19371518-2133176
ICRS Star Coord at Epoch: 19h 37m 15.18686s -21:33:17.78654s
RUWE (>1.4 is poor) : 1.04
K magnitude          : 14.976
G magnitude          : 16.523
RP magnitude         : 15.974
BP magnitude         : 16.889
DUPflag             : 0
Distance (au)        : 9.017
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.43
Sun-Target sep (deg) : 167.62
Sun-Moon sep (deg)   : 174.32
B (ring opening deg) : 23.13
PA of pole (deg)     : 6.90
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.231
C/A sky separation (km) : 1510.7
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	2049-07-28T04:48:26.605	52.87	-64.25	2575.1	-53.40	-53.41
Titan	E	2049-07-28T04:53:10.430	51.78	-63.16	2575.2	-10.14	-10.14



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2049-07-28T04:53:38.200
Event type           : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code        : ESO
Location             : European Southern Obs. (3.6m)
Latitude (deg)       : -29.26097
E. Longitude (deg)  : 289.26831
Altitude (km)        : 2.400
Gaia source ID       : 6772185723737300352
2Mass ID (if available) : 19371518-2133176
ICRS Star Coord at Epoch: 19h 37m 15.18686s -21:33:17.78654s
RUWE (>1.4 is poor) : 1.04
K magnitude          : 14.976
G magnitude          : 16.523
RP magnitude         : 15.974
BP magnitude         : 16.889
DUPflag             : 0
Distance (au)        : 9.017
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.43
Sun-Target sep (deg) : 167.62
Sun-Moon sep (deg)  : 174.02
B (ring opening deg) : 23.13
PA of pole (deg)    : 6.90
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.141
C/A sky separation (km) : 925.2
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	2049-07-28T04:50:55.652	75.77	-79.76	2575.1	-41.51	-41.52
Titan	E	2049-07-28T04:56:20.768	74.72	-79.65	2575.2	3.67	3.68

