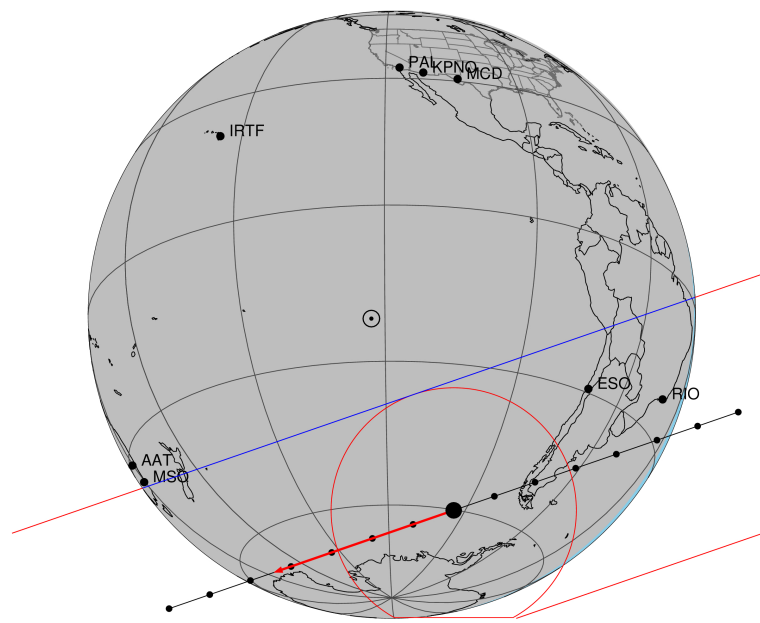


target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2049-07-12T08:16:43.660  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 6868046404486339328  
 2Mass ID (if available) : 19421036-2120140

ICRS Star Coord at Epoch: 19h 42m 10.39040s -21:20:14.04474s  
 RUWE (>1.4 is poor) : 1.13  
 K magnitude : 11.918  
 G magnitude : 14.167  
 RP magnitude : 13.471  
 BP magnitude : 14.708  
 DUPflag : 0  
 Distance (au) : 8.999  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -15.06  
 Sun-Target sep (deg) : 176.08  
 Sun-Moon sep (deg) : 42.64  
 B (ring opening deg) : 22.78  
 PA of pole (deg) : 6.92  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.663  
 C/A sky separation (km) : 4325.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk  
 URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

Titan 2049-07-12T08:16:43 K11.92 G14.17 dots 60.0 sec  
 Pt

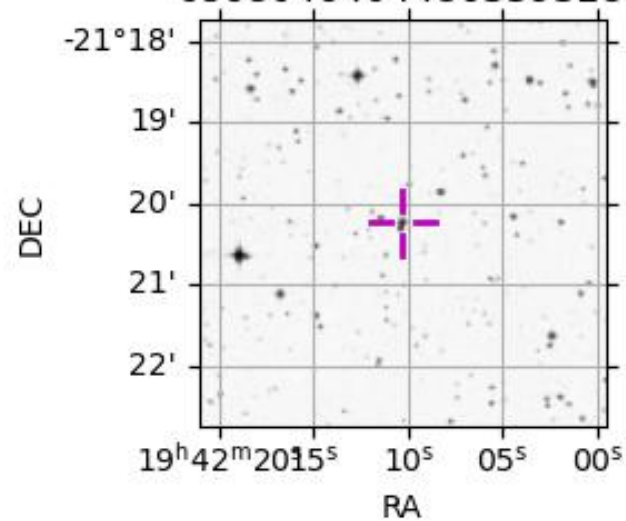


2049-07-12T08:16:43.6600 cc: 19 42 10.3904 & -21 20 14.0445 C/A 0.6600" PA 160.94 deg v\_sky -15.05 km/s D 09.00 AU  
 Credit: Styled after SORA/Lucky Star

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			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	+ +	JUL 12 08:08 - JUL 12 08:14	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 12 08:10 - JUL 12 08:15	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

6868046404486339328



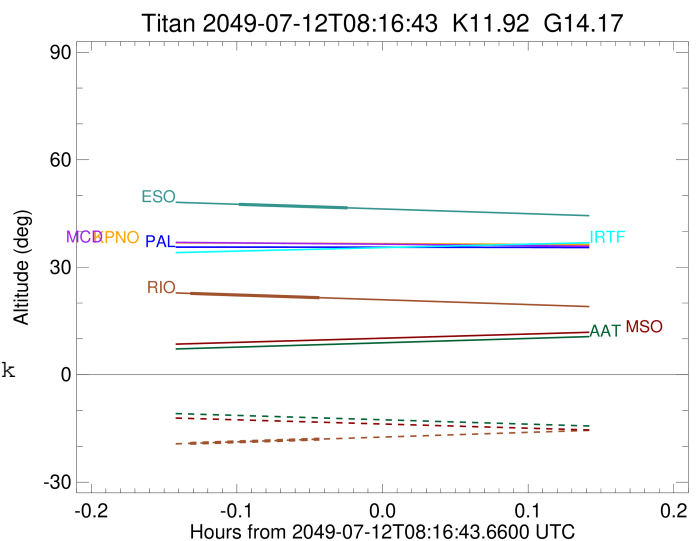
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2049-07-12T08:11:27.640
Event type            : Pt
: Titan occs: topocentric, not geocentric
: 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        : 6868046404486339328
2Mass ID (if available) : 19421036-2120140
ICRS Star Coord at Epoch: 19h 42m 10.39040s -21:20:14.04474s
RUWE (>1.4 is poor)  : 1.13
K magnitude           : 11.918
G magnitude           : 14.167
RP magnitude          : 13.471
BP magnitude          : 14.708
DUPflag              : 0
Distance (au)         : 8.999
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.06
Sun-Target sep (deg)  : 176.08
Sun-Moon sep (deg)    : 43.49
B (ring opening deg)  : 22.78
PA of pole (deg)      : 6.92
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.128
C/A sky separation (km) : 836.9
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	2049-07-12T08:08:46.510	22.69	-19.18	2575.2	-5.83	-5.83
Titan	E	2049-07-12T08:14:08.806	21.48	-17.99	2575.1	40.05	40.07



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2049-07-12T08:13:03.030  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : 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 : 6868046404486339328  
 2Mass ID (if available) : 19421036-2120140  
 ICRS Star Coord at Epoch: 19h 42m 10.39040s -21:20:14.04474s  
 RUWE (>1.4 is poor) : 1.13  
 K magnitude : 11.918  
 G magnitude : 14.167  
 RP magnitude : 13.471  
 BP magnitude : 14.708  
 DUPflag : 0  
 Distance (au) : 8.999  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -15.06  
 Sun-Target sep (deg) : 176.08  
 Sun-Moon sep (deg) : 43.57  
 B (ring opening deg) : 22.78  
 PA of pole (deg) : 6.92  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.237  
 C/A sky separation (km) : 1549.6  
 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	2049-07-12T08:10:48.423	47.54	-44.14	2575.1	10.82	10.82
Titan	E	2049-07-12T08:15:17.659	46.56	-43.16	2575.1	54.68	54.70

