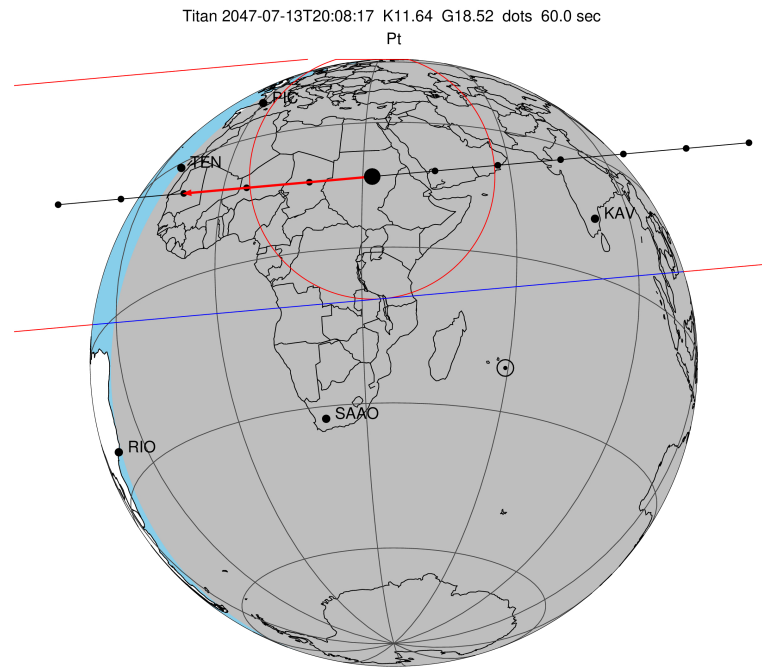


target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-07-13T20:08:17.320  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 4070288142183644032  
 2Mass ID (if available) : 17562731-2224544

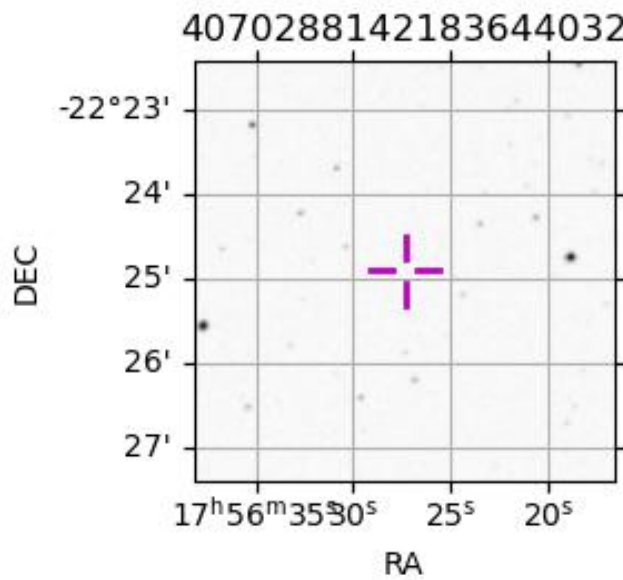
ICRS Star Coord at Epoch: 17h 56m 27.31554s -22:24:54.43897s  
 RUWE (>1.4 is poor) : 1.14  
 K magnitude : 11.641  
 G magnitude : 18.516  
 RP magnitude : 16.838  
 BP magnitude : 20.858  
 DUPflag : 0  
 Distance (au) : 9.089  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -22.06  
 Sun-Target sep (deg) : 158.44  
 Sun-Moon sep (deg) : 98.50  
 B (ring opening deg) : 26.57  
 PA of pole (deg) : 5.60  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.596  
 C/A sky separation (km) : 3928.5  
 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	+ +	JUL 13 20:08 - JUL 13 20:11	Pie
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	+ +	JUL 13 20:03 - JUL 13 20:06	Pie
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



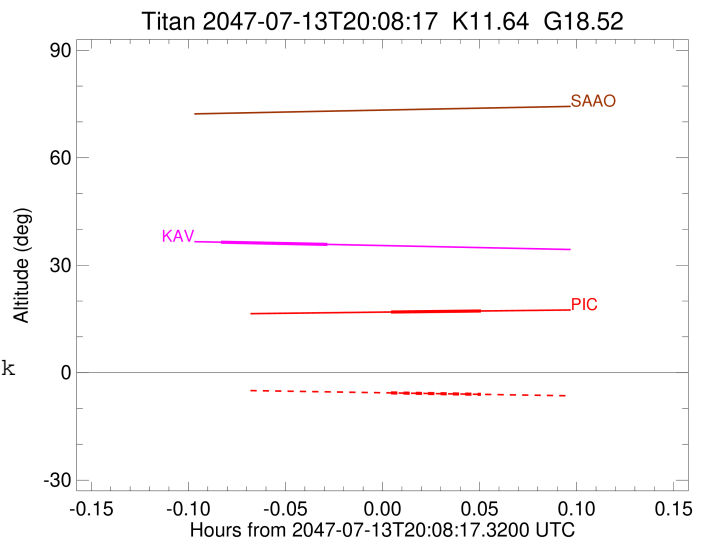
2047-07-13T20:08:17.3200 cc: 17 56 27.3155 s: -22 24 54.439 C/A 0.597" PA 354.87 deg v\_sky -22.06 km/s D 09.09 AU  
 Credit: Styled after SORA/Lucky Star



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-07-13T20:09:56.540
Event type            : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code         : PIC
Location              : Pic du Midi
Latitude (deg)        : 42.93656
E. Longitude (deg)    : 0.14231
Altitude (km)         : 2.890
Gaia source ID        : 4070288142183644032
2Mass ID (if available) : 17562731-2224544
ICRS Star Coord at Epoch: 17h 56m 27.31554s -22:24:54.43897s
RUWE (>1.4 is poor)  : 1.14
K magnitude           : 11.641
G magnitude           : 18.516
RP magnitude          : 16.838
BP magnitude          : 20.858
DUPflag              : 0
Distance (au)         : 9.089
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -22.06
Sun-Target sep (deg)  : 158.44
Sun-Moon sep (deg)    : 98.71
B (ring opening deg) : 26.57
PA of pole (deg)      : 5.60
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.266
C/A sky separation (km) : 1753.3
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

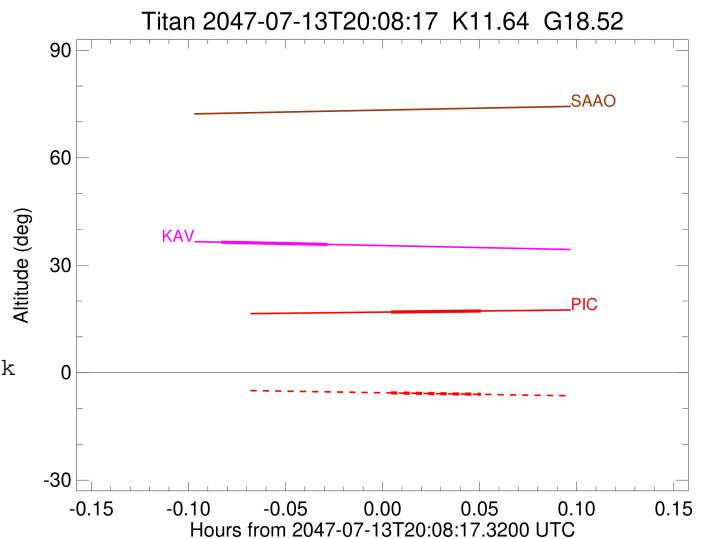
```



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	2047-07-13T20:08:32.147	16.93	-5.64	2575.1	28.34	28.36
Titan	E	2047-07-13T20:11:20.923	17.22	-6.06	2575.1	46.16	46.18

target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-07-13T20:04:56.310  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Observer code : KAV  
 Location : Kavalur Observatory  
 Latitude (deg) : 12.57556  
 E. Longitude (deg) : 78.83167  
 Altitude (km) : 0.722  
 Gaia source ID : 4070288142183644032  
 2Mass ID (if available) : 17562731-2224544  
 ICRS Star Coord at Epoch: 17h 56m 27.31554s -22:24:54.43897s  
 RUWE (>1.4 is poor) : 1.14  
 K magnitude : 11.641  
 G magnitude : 18.516  
 RP magnitude : 16.838  
 BP magnitude : 20.858  
 DUPflag : 0  
 Distance (au) : 9.089  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -22.06  
 Sun-Target sep (deg) : 158.44  
 Sun-Moon sep (deg) : 99.12  
 B (ring opening deg) : 26.57  
 PA of pole (deg) : 5.60  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.196  
 C/A sky separation (km) : 1291.8  
 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	2047-07-13T20:03:16.807	36.42	-51.39	2575.1	-35.48	-35.49
Titan	E	2047-07-13T20:06:35.813	35.80	-51.01	2575.2	-17.60	-17.60