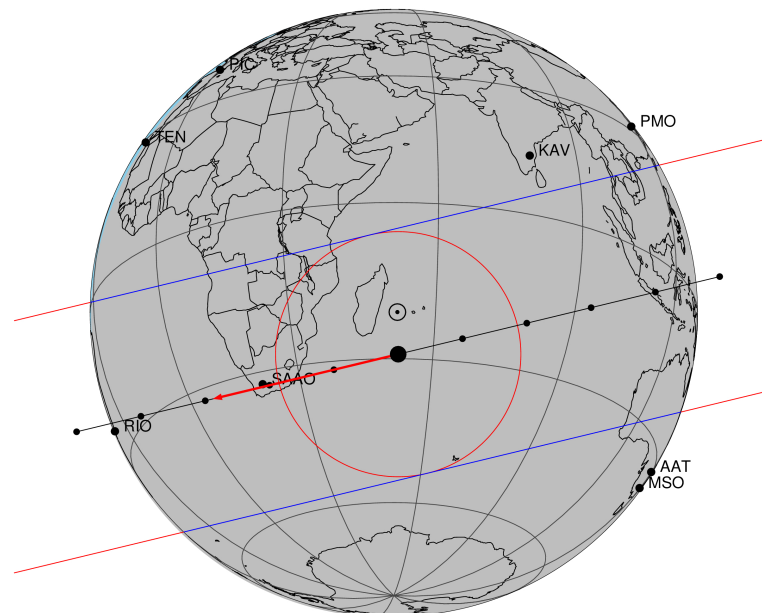


target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2049-07-16T20:37:04.090
 Event type : Pgt
 : Titan occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 6868070902979887616
 2Mass ID (if available) : 19405419-2125593

Titan 2049-07-16T20:37:04 K12.89 G14.73 dots 60.0 sec
 Pgt

ICRS Star Coord at Epoch: 19h 40m 54.21049s -21:25:59.14375s
 RUWE (>1.4 is poor) : 1.24
 K magnitude : 12.890
 G magnitude : 14.726
 RP magnitude : 14.099
 BP magnitude : 15.186
 DUPflag : 0
 Distance (au) : 8.986
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -23.15
 Sun-Target sep (deg) : 179.31
 Sun-Moon sep (deg) : 26.19
 B (ring opening deg) : 22.91
 PA of pole (deg) : 6.92
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.134
 C/A sky separation (km) : 874.8
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk

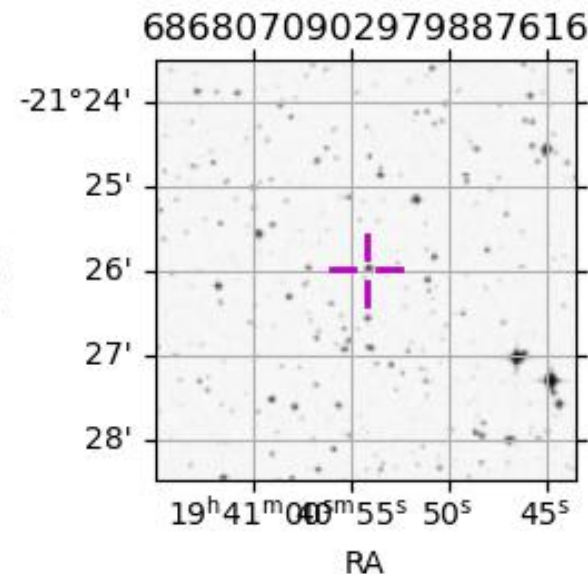


2049-07-16T20:37:04.0900 cc: 19 40 54.2105 d: -21 25 59.144 C/A 0.133" PA 166.46 deg v_sky -23.15 km/s D 08.99 AU
 Credit: Styled after SORA/Lucky Star

URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp

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

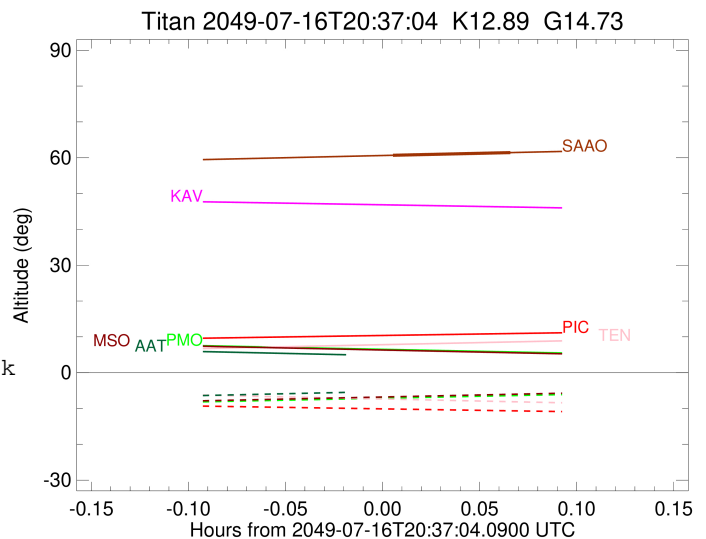
Obs	Location	lat	Elon	Target	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8			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	+ +	JUL 16 20:37 - JUL 16 20:41	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2049-07-16T20:39:13.030
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       : 6868070902979887616
2Mass ID (if available) : 19405419-2125593
ICRS Star Coord at Epoch: 19h 40m 54.21049s -21:25:59.14375s
RUWE (>1.4 is poor) : 1.24
K magnitude          : 12.890
G magnitude          : 14.726
RP magnitude         : 14.099
BP magnitude         : 15.186
DUPflag             : 0
Distance (au)        : 8.986
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -23.15
Sun-Target sep (deg) : 179.31
Sun-Moon sep (deg)   : 27.03
B (ring opening deg) : 22.91
PA of pole (deg)     : 6.92
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.015
C/A sky separation (km) : 95.9
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	2049-07-16T20:37:23.517	60.68	-60.02	2575.1	-16.84	-16.85
Titan	E	2049-07-16T20:41:02.521	61.43	-60.77	2575.1	20.72	20.73