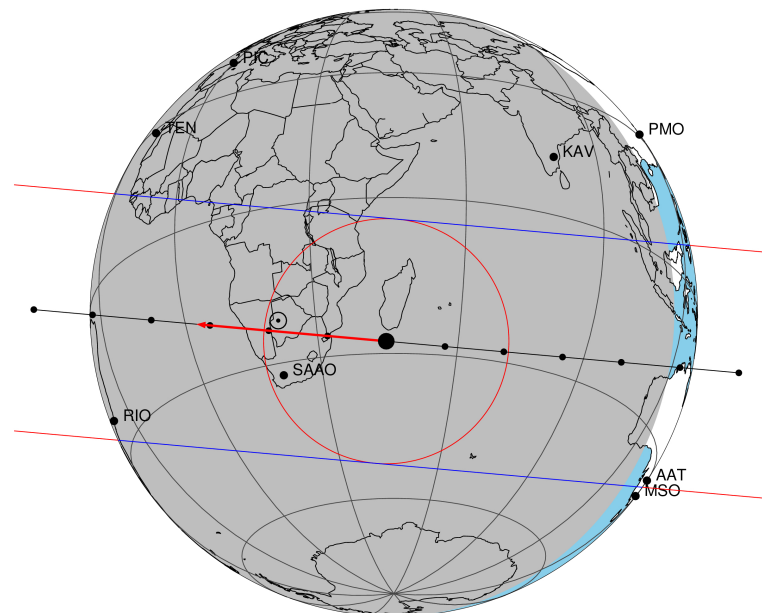


target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-05-31T22:29:51.260  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4069718526435806592  
 2Mass ID (if available) : 18091720-2219556

Titan 2047-05-31T22:29:51 K14.49 G17.35 dots 60.0 sec  
 Pgt

ICRS Star Coord at Epoch: 18h 09m 17.20659s -22:19:56.29543s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 14.490  
 G magnitude : 17.347  
 RP magnitude : 16.384  
 BP magnitude : 18.292  
 DUPflag : 0  
 Distance (au) : 9.098  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -20.64  
 Sun-Target sep (deg) : 157.58  
 Sun-Moon sep (deg) : 119.51  
 B (ring opening deg) : 26.20  
 PA of pole (deg) : 5.83  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.091  
 C/A sky separation (km) : 598.0  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

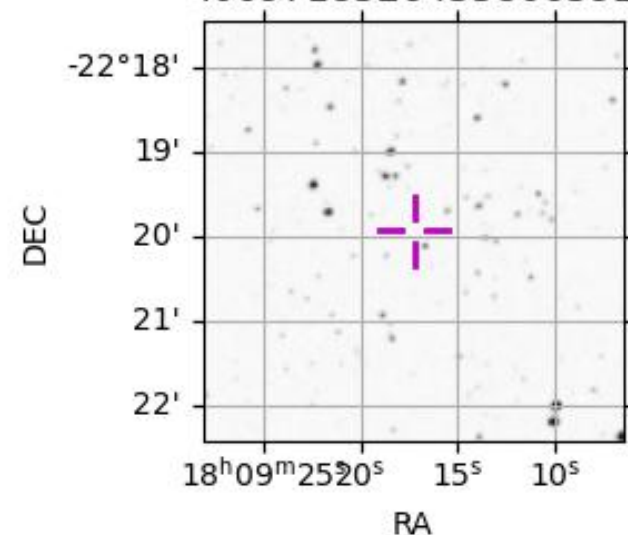


2047-05-31T22:29:51.2600 cc: 18 09 17.2066 s: -22 19 56.295 C/A 0.092" PA 185.18 deg v\_sky -20.64 km/s D 09.10 AU  
 Credit: Styled after SORA/Lucky Star

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	OEcode
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	+ +	MAY 31 22:33 - MAY 31 22:35	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	+ +	MAY 31 22:29 - MAY 31 22:33	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn

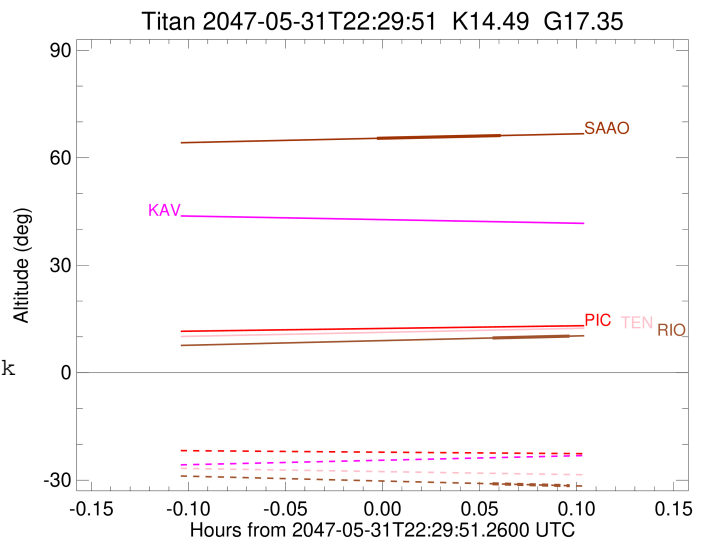
4069718526435806592



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-05-31T22:34:26.680
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        : 4069718526435806592
2Mass ID (if available) : 18091720-2219556
ICRS Star Coord at Epoch: 18h 09m 17.20659s -22:19:56.29543s
RUWE (>1.4 is poor)  : 1.03
K magnitude           : 14.490
G magnitude           : 17.347
RP magnitude          : 16.384
BP magnitude          : 18.292
DUPflag              : 0
Distance (au)         : 9.098
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -20.64
Sun-Target sep (deg)  : 157.58
Sun-Moon sep (deg)    : 120.10
B (ring opening deg)  : 26.20
PA of pole (deg)      : 5.83
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.319
C/A sky separation (km) : 2104.3
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	2047-05-31T22:33:14.766	9.68	-31.01	2575.1	-48.03	-48.05
Titan	E	2047-05-31T22:35:38.597	10.20	-31.55	2575.1	-46.28	-46.29

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-05-31T22:31:36.010
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        : 4069718526435806592
2Mass ID (if available) : 18091720-2219556
ICRS Star Coord at Epoch: 18h 09m 17.20659s -22:19:56.29543s
RUWE (>1.4 is poor)  : 1.03
K magnitude           : 14.490
G magnitude           : 17.347
RP magnitude          : 16.384
BP magnitude          : 18.292
DUPflag              : 0
Distance (au)         : 9.098
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -20.64
Sun-Target sep (deg)  : 157.58
Sun-Moon sep (deg)    : 120.45
B (ring opening deg)  : 26.20
PA of pole (deg)      : 5.83
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.133
C/A sky separation (km) : 875.1
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	2047-05-31T22:29:40.633	65.41	-79.74	2575.1	-18.60	-18.61
Titan	E	2047-05-31T22:33:31.393	66.19	-79.80	2575.1	-16.91	-16.91

