

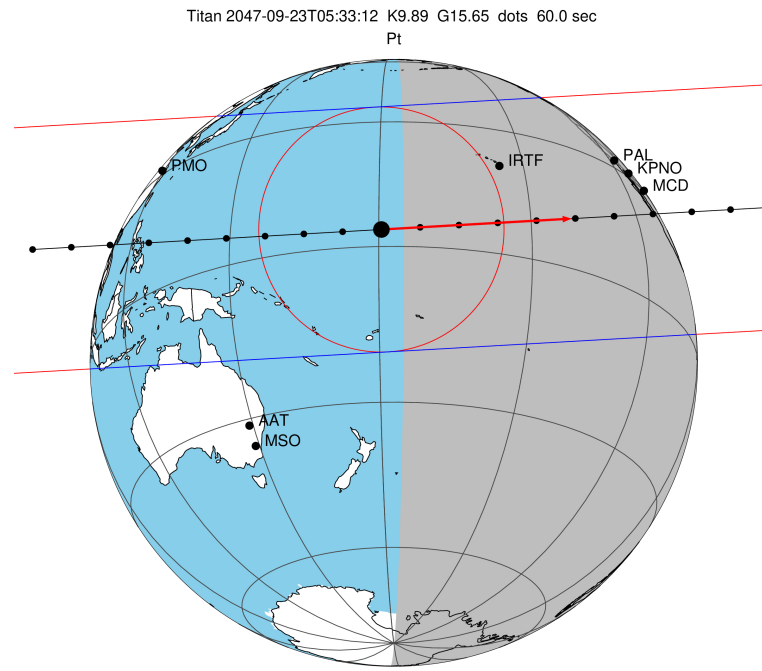
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-09-23T05:33:12.750  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 4068927702704102272  
 2Mass ID (if available) : 17495005-2232520

ICRS Star Coord at Epoch: 17h 49m 50.03662s -22:32:52.36899s  
 RUWE (>1.4 is poor) : 0.98  
 K magnitude : 9.894  
 G magnitude : 15.648  
 RP magnitude : 14.221  
 BP magnitude : 18.269  
 DUPflag : 0  
 Distance (au) : 10.031  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 13.59  
 Sun-Target sep (deg) : 88.18  
 Sun-Moon sep (deg) : 40.44  
 B (ring opening deg) : 26.85  
 PA of pole (deg) : 5.47  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.385  
 C/A sky separation (km) : 2803.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

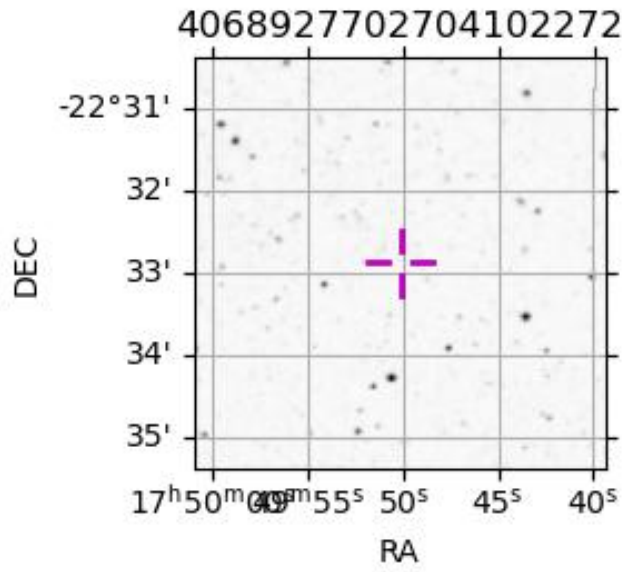
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	SEP 23 05:36 - SEP 23 05:42	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	SEP 23 05:36 - SEP 23 05:42	Pie
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	+ +	SEP 23 05:33 - SEP 23 05:39	Pie
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			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



2047-09-23T05:33:12.7500 α: 17 49 50.0366 δ: -22 32 52.369 C/A 0.386" PA 356.73 deg v\_sky +13.59 km/s D 10.03 AU  
 Credit: Styled after SORA/Lucky Star



4068927702704102272

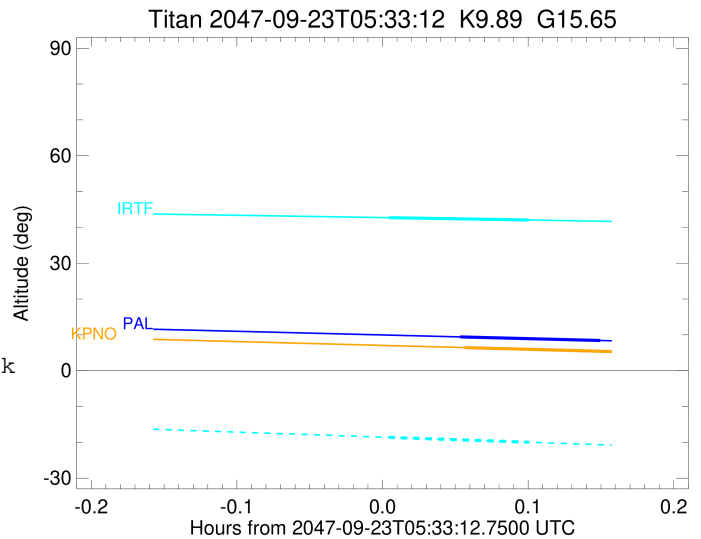
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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-09-23T05:39:17.870
Event type            : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code         : PAL
Location              : Palomar Mt (200")
Latitude (deg)        : 33.35622
E. Longitude (deg)    : 243.13601
Altitude (km)         : 1.706
Gaia source ID        : 4068927702704102272
2Mass ID (if available) : 17495005-2232520
ICRS Star Coord at Epoch: 17h 49m 50.03662s -22:32:52.36899s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 9.894
G magnitude           : 15.648
RP magnitude          : 14.221
BP magnitude          : 18.269
DUPflag              : 0
Distance (au)         : 10.031
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 13.59
Sun-Target sep (deg)  : 88.18
Sun-Moon sep (deg)   : 41.16
B (ring opening deg) : 26.85
PA of pole (deg)     : 5.47
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.149
C/A sky separation (km) : 1084.6
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	2047-09-23T05:36:23.851	9.42	-45.97	2575.1	30.13	30.15
Titan	E	2047-09-23T05:42:11.775	8.42	-46.86	2575.2	13.86	13.86



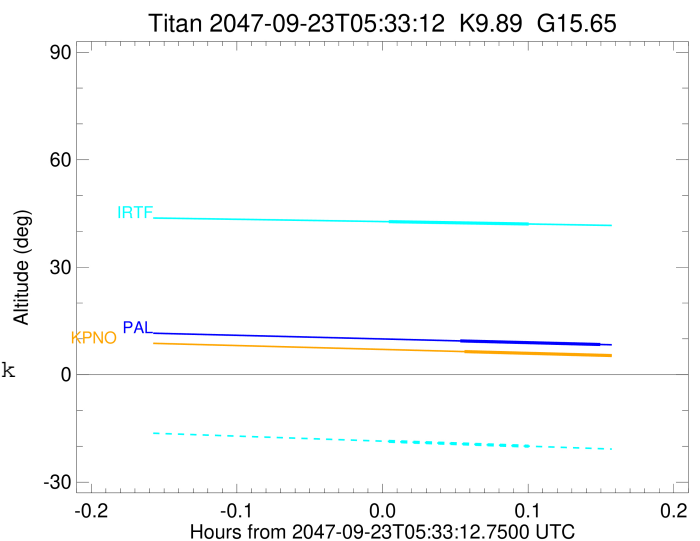
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-09-23T05:39:37.780
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)  : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 4068927702704102272
2Mass ID (if available) : 17495005-2232520
ICRS Star Coord at Epoch: 17h 49m 50.03662s -22:32:52.36899s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 9.894
G magnitude          : 15.648
RP magnitude         : 14.221
BP magnitude         : 18.269
DUPflag             : 0
Distance (au)        : 10.031
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 13.59
Sun-Target sep (deg) : 88.18
Sun-Moon sep (deg)  : 41.16
B (ring opening deg) : 26.85
PA of pole (deg)    : 5.47
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.108
C/A sky separation (km): 787.2
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	2047-09-23T05:36:35.525	6.44	-50.12	2575.1	24.03	24.05
Titan	E	2047-09-23T05:42:39.911	5.33	-50.98	2575.2	7.53	7.53



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-09-23T05:36:20.640  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Observer code : IRTF  
 Location : Mauna Kea/IRTF  
 Latitude (deg) : 19.82622  
 E. Longitude (deg) : 204.52800  
 Altitude (km) : 4.168  
 Gaia source ID : 4068927702704102272  
 2Mass ID (if available) : 17495005-2232520  
 ICRS Star Coord at Epoch: 17h 49m 50.03662s -22:32:52.36899s  
 RUWE (>1.4 is poor) : 0.98  
 K magnitude : 9.894  
 G magnitude : 15.648  
 RP magnitude : 14.221  
 BP magnitude : 18.269  
 DUPflag : 0  
 Distance (au) : 10.031  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 13.59  
 Sun-Target sep (deg) : 88.18  
 Sun-Moon sep (deg) : 41.21  
 B (ring opening deg) : 26.85  
 PA of pole (deg) : 5.47  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.160  
 C/A sky separation (km) : 1161.8  
 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	2047-09-23T05:33:26.441	42.71	-18.61	2575.1	31.57	31.59
Titan	E	2047-09-23T05:39:14.753	42.05	-19.97	2575.1	15.73	15.74

