

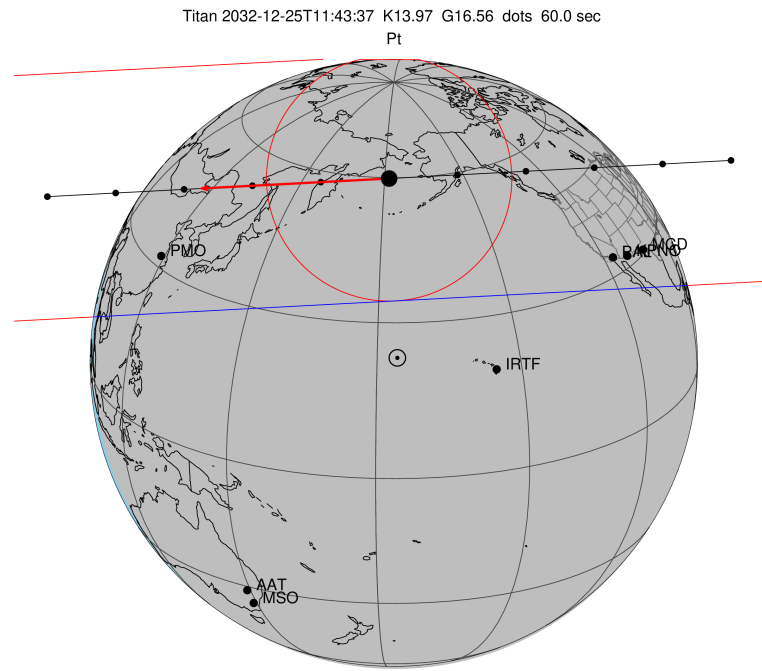
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2032-12-25T11:43:37.370  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 3376986034403962240  
 2Mass ID (if available) : 06133459+2226384

ICRS Star Coord at Epoch: 06h 13m 34.59498s +22:26:38.42853s  
 RUWE (>1.4 is poor) : 0.92  
 K magnitude : 13.966  
 G magnitude : 16.557  
 RP magnitude : 15.738  
 BP magnitude : 17.240  
 DUPflag : 0  
 Distance (au) : 8.027  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -23.95  
 Sun-Target sep (deg) : 178.85  
 Sun-Moon sep (deg) : 97.43  
 B (ring opening deg) : -26.20  
 PA of pole (deg) : -5.92  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.665  
 C/A sky separation (km) : 3873.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

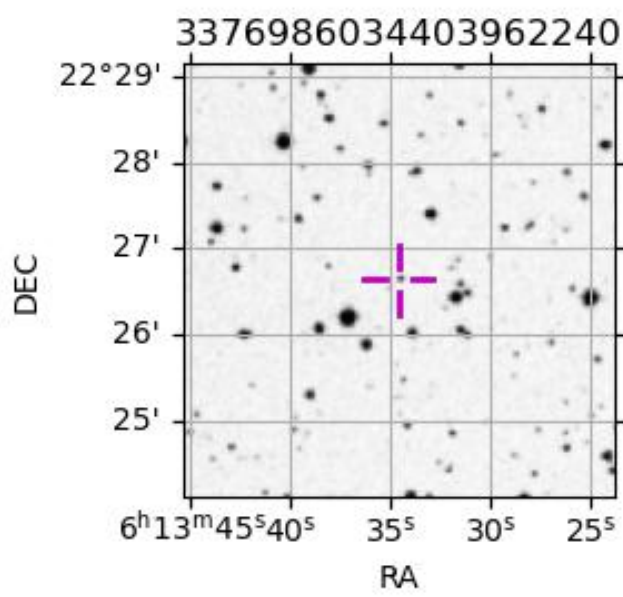
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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	+ +	DEC 25 11:39 - DEC 25 11:41	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	DEC 25 11:45 - DEC 25 11:48	Pie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	DEC 25 11:38 - DEC 25 11:41	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	DEC 25 11:38 - DEC 25 11:41	Pie
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			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



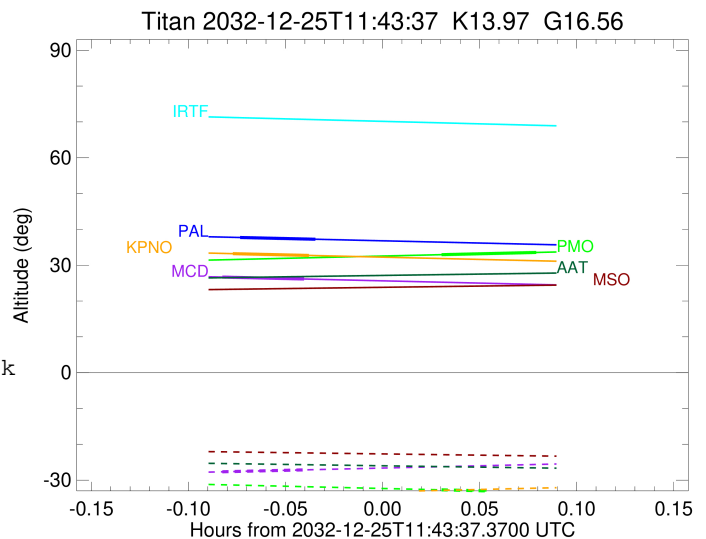
2032-12-25T11:43:37.3700 α: 06 13 34.5950 δ: +22 26 38.429 C/A 0.665" PA 356.96 deg v\_sky -23.96 km/s D 08.03 AU  
 Credit: Styled after SORA/Lucky Star



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2032-12-25T11:40:22.890  
 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 : 3376986034403962240  
 2Mass ID (if available) : 06133459+2226384  
 ICRS Star Coord at Epoch: 06h 13m 34.59498s +22:26:38.42853s  
 RUWE (>1.4 is poor) : 0.92  
 K magnitude : 13.966  
 G magnitude : 16.557  
 RP magnitude : 15.738  
 BP magnitude : 17.240  
 DUPflag : 0  
 Distance (au) : 8.027  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -23.95  
 Sun-Target sep (deg) : 178.85  
 Sun-Moon sep (deg) : 98.06  
 B (ring opening deg) : -26.20  
 PA of pole (deg) : -5.92  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.331  
 C/A sky separation (km) : 1929.8  
 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

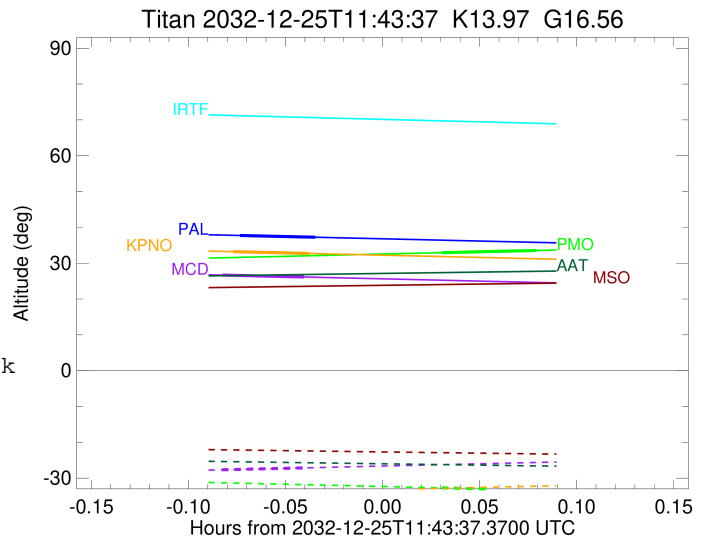
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2032-12-25T11:39:12.347	37.73	-38.73	2575.1	-40.14	-40.15
Titan	E	2032-12-25T11:41:33.449	37.24	-38.24	2575.1	-44.32	-44.34



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2032-12-25T11:46:54.860  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Observer code : PMO  
 Location : Purple Mtn Obs. Nanking  
 Latitude (deg) : 32.06667  
 E. Longitude (deg) : 118.82089  
 Altitude (km) : 0.364  
 Gaia source ID : 3376986034403962240  
 2Mass ID (if available) : 06133459+2226384  
 ICRS Star Coord at Epoch: 06h 13m 34.59498s +22:26:38.42853s  
 RUWE (>1.4 is poor) : 0.92  
 K magnitude : 13.966  
 G magnitude : 16.557  
 RP magnitude : 15.738  
 BP magnitude : 17.240  
 DUPflag : 0  
 Distance (au) : 8.027  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -23.95  
 Sun-Target sep (deg) : 178.85  
 Sun-Moon sep (deg) : 97.82  
 B (ring opening deg) : -26.20  
 PA of pole (deg) : -5.92  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.247  
 C/A sky separation (km) : 1435.7  
 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

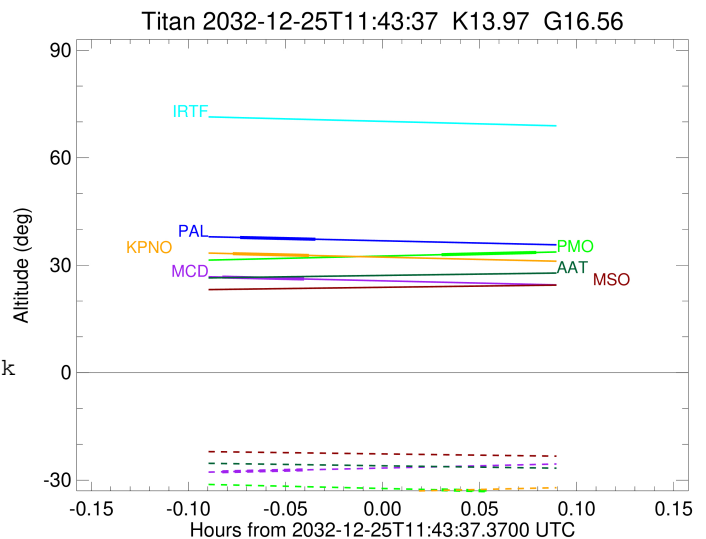
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2032-12-25T11:45:26.233	32.93	-32.71	2575.1	-27.23	-27.24
Titan	E	2032-12-25T11:48:23.488	33.56	-33.33	2575.1	-32.77	-32.78



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2032-12-25T11:40:10.080  
 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 : 3376986034403962240  
 2Mass ID (if available) : 06133459+2226384  
 ICRS Star Coord at Epoch: 06h 13m 34.59498s +22:26:38.42853s  
 RUWE (>1.4 is poor) : 0.92  
 K magnitude : 13.966  
 G magnitude : 16.557  
 RP magnitude : 15.738  
 BP magnitude : 17.240  
 DUPflag : 0  
 Distance (au) : 8.027  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -23.95  
 Sun-Target sep (deg) : 178.85  
 Sun-Moon sep (deg) : 98.01  
 B (ring opening deg) : -26.20  
 PA of pole (deg) : -5.92  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.329  
 C/A sky separation (km) : 1916.3  
 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	2032-12-25T11:38:58.827	33.22	-34.21	2575.1	-39.79	-39.80
Titan	E	2032-12-25T11:41:21.337	32.72	-33.71	2575.1	-43.95	-43.96



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2032-12-25T11:39:55.720  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Observer code : MCD  
 Location : McDonald Obs. 2.7m  
 Latitude (deg) : 30.67158  
 E. Longitude (deg) : 255.97844  
 Altitude (km) : 2.075  
 Gaia source ID : 3376986034403962240  
 2Mass ID (if available) : 06133459+2226384  
 ICRS Star Coord at Epoch: 06h 13m 34.59498s +22:26:38.42853s  
 RUWE (>1.4 is poor) : 0.92  
 K magnitude : 13.966  
 G magnitude : 16.557  
 RP magnitude : 15.738  
 BP magnitude : 17.240  
 DUPflag : 0  
 Distance (au) : 8.027  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -23.95  
 Sun-Target sep (deg) : 178.85  
 Sun-Moon sep (deg) : 97.92  
 B (ring opening deg) : -26.20  
 PA of pole (deg) : -5.92  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.310  
 C/A sky separation (km) : 1804.2  
 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	2032-12-25T11:38:39.468	26.68	-27.67	2575.1	-36.83	-36.84
Titan	E	2032-12-25T11:41:11.978	26.14	-27.14	2575.1	-41.04	-41.05

