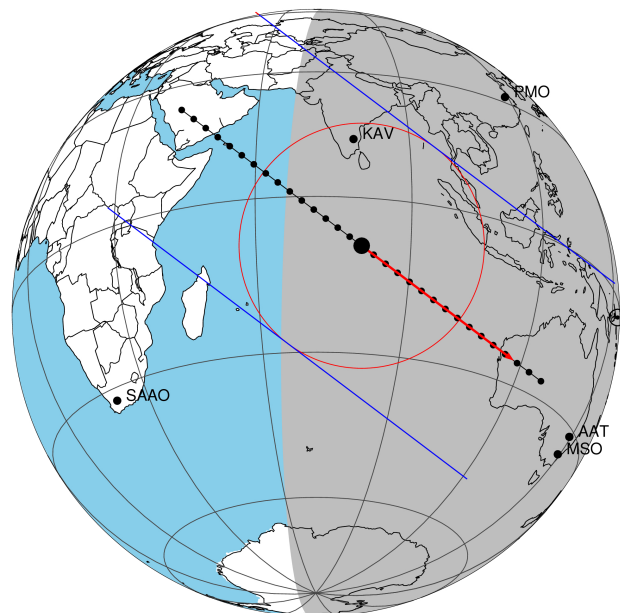


target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-09-14T13:31:57.750  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068969488524011776  
 2Mass ID (if available) : 17490907-2232444

ICRS Star Coord at Epoch: 17h 49m 09.06981s -22:32:44.83743s  
 RUWE (>1.4 is poor) : 1.35  
 K magnitude : 13.383  
 G magnitude : 17.867  
 RP magnitude : 16.540  
 BP magnitude : 19.143  
 DUPflag : 0  
 Distance (au) : 9.881  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 5.25  
 Sun-Target sep (deg) : 96.48  
 Sun-Moon sep (deg) : 162.79  
 B (ring opening deg) : 26.87  
 PA of pole (deg) : 5.45  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.246  
 C/A sky separation (km) : 1764.5  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

Titan 2047-09-14T13:31:57 K13.38 G17.87 dots 60.0 sec  
 Pgt

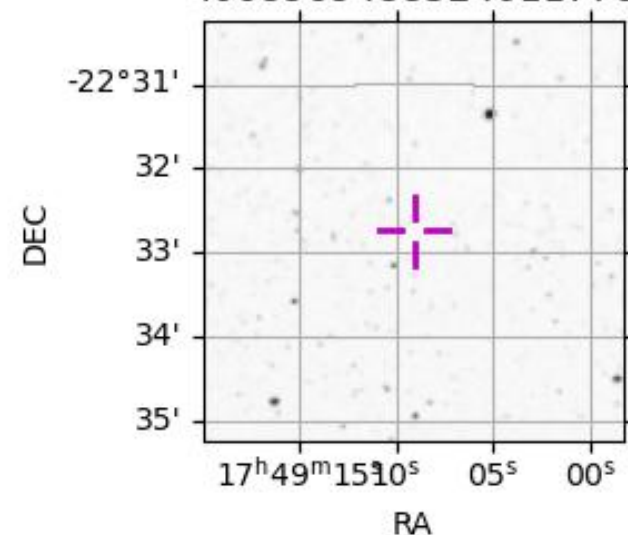


2047-09-14T13:31:57.7500 α: 17 49 09.0698 δ: -22 32 44.837 C/A 0.238" PA 37.06 deg v\_sky + 5.25 km/s D 09.88 AU  
 Credit: Styled after SORA/Lucky Star

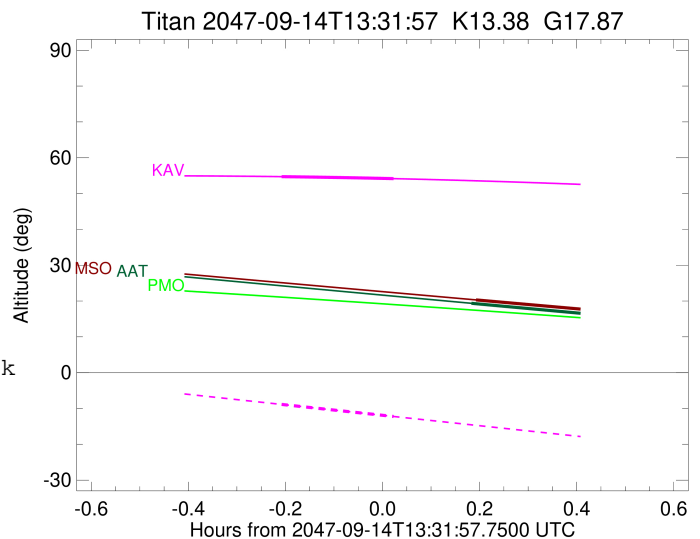
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp  
 Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	SEP 14 13:19 - SEP 14 13:33	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	+ +	SEP 14 13:42 - SEP 14 13:59	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	SEP 14 13:43 - SEP 14 13:58	Pie

4068969488524011776



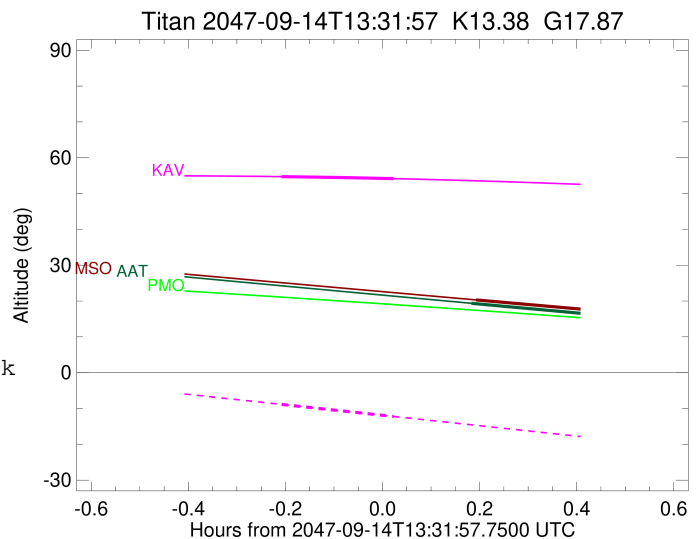
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-09-14T13:26:24.210  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Observer code : KAV  
 Location : Kavalur Observatory  
 Latitude (deg) : 12.57556  
 E. Longitude (deg) : 78.83167  
 Altitude (km) : 0.722  
 Gaia source ID : 4068969488524011776  
 2Mass ID (if available) : 17490907-2232444  
 ICRS Star Coord at Epoch: 17h 49m 09.06981s -22:32:44.83743s  
 RUWE (>1.4 is poor) : 1.35  
 K magnitude : 13.383  
 G magnitude : 17.867  
 RP magnitude : 16.540  
 BP magnitude : 19.143  
 DUPflag : 0  
 Distance (au) : 9.881  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 5.25  
 Sun-Target sep (deg) : 96.48  
 Sun-Moon sep (deg) : 162.92  
 B (ring opening deg) : 26.87  
 PA of pole (deg) : 5.45  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.216  
 C/A sky separation (km) : 1545.1  
 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	2047-09-14T13:19:23.521	54.71	-8.84	2575.2	2.02	2.02
Titan	E	2047-09-14T13:33:25.760	54.15	-12.25	2575.0	57.75	57.77

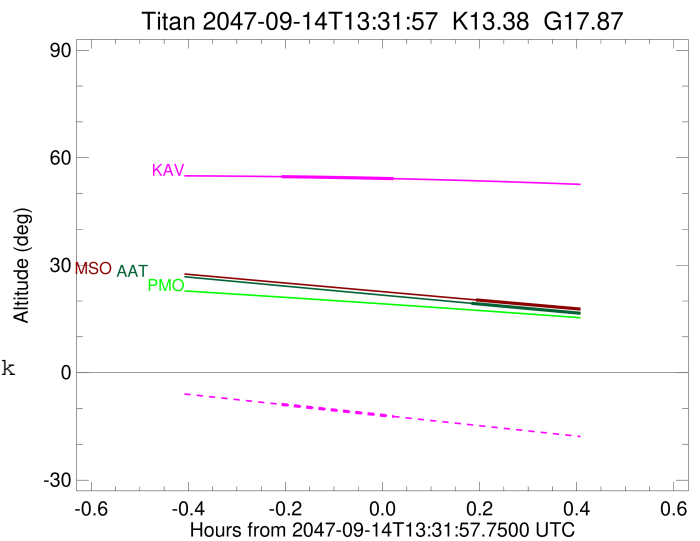
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-09-14T13:50:57.220  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Observer code : AAT  
 Location : Siding Spring (AAT)  
 Latitude (deg) : -31.27703  
 E. Longitude (deg) : 149.06608  
 Altitude (km) : 1.164  
 Gaia source ID : 4068969488524011776  
 2Mass ID (if available) : 17490907-2232444  
 ICRS Star Coord at Epoch: 17h 49m 09.06981s -22:32:44.83743s  
 RUWE (>1.4 is poor) : 1.35  
 K magnitude : 13.383  
 G magnitude : 17.867  
 RP magnitude : 16.540  
 BP magnitude : 19.143  
 DUPflag : 0  
 Distance (au) : 9.881  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 5.25  
 Sun-Target sep (deg) : 96.48  
 Sun-Moon sep (deg) : 162.13  
 B (ring opening deg) : 26.87  
 PA of pole (deg) : 5.45  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.102  
 C/A sky separation (km) : 732.9  
 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	2047-09-14T13:42:52.969	19.38	-61.92	2575.1	-40.94	-40.95
Titan	E	2047-09-14T13:59:01.338	16.05	-62.19	2575.1	12.59	12.59

target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-09-14T13:50:59.460  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Observer code : MSO  
 Location : Mt. Stromlo Observatory  
 Latitude (deg) : -35.32000  
 E. Longitude (deg) : 149.00833  
 Altitude (km) : 0.770  
 Gaia source ID : 4068969488524011776  
 2Mass ID (if available) : 17490907-2232444  
 ICRS Star Coord at Epoch: 17h 49m 09.06981s -22:32:44.83743s  
 RUWE (>1.4 is poor) : 1.35  
 K magnitude : 13.383  
 G magnitude : 17.867  
 RP magnitude : 16.540  
 BP magnitude : 19.143  
 DUPflag : 0  
 Distance (au) : 9.881  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 5.25  
 Sun-Target sep (deg) : 96.48  
 Sun-Moon sep (deg) : 162.16  
 B (ring opening deg) : 26.87  
 PA of pole (deg) : 5.45  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.163  
 C/A sky separation (km) : 1165.2  
 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	2047-09-14T13:43:29.559	20.31	-57.94	2575.1	-48.93	-48.94
Titan	E	2047-09-14T13:58:29.281	17.34	-58.15	2575.2	3.41	3.41