

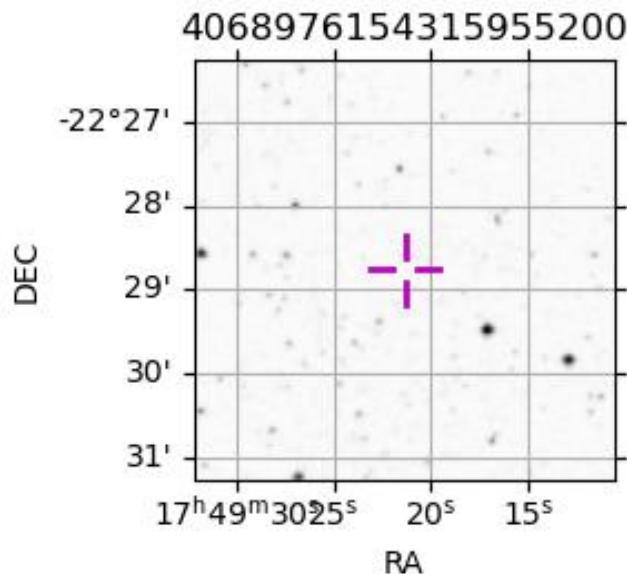
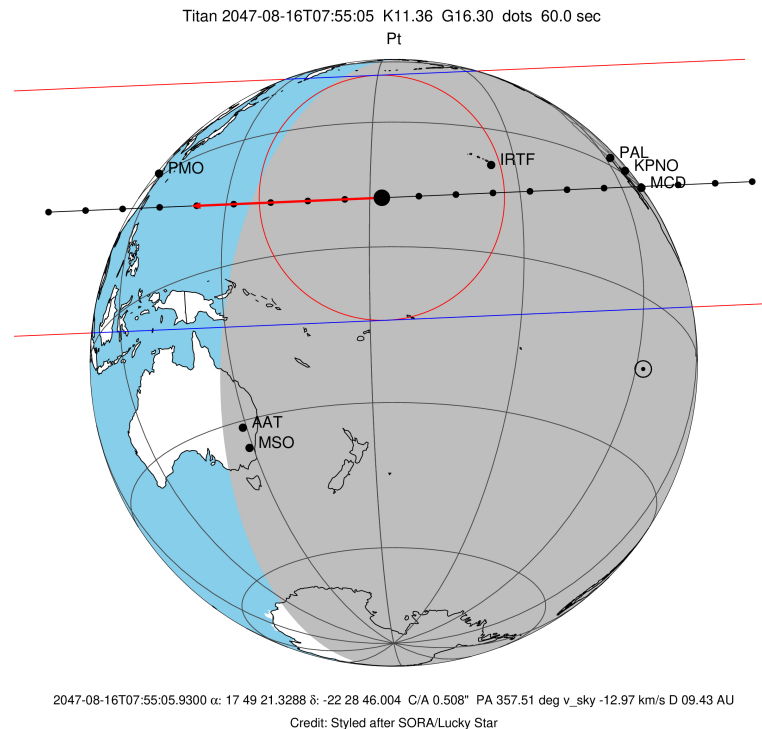
target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2047-08-16T07:55:05.930
 Event type : Pt
 : Titan occs: topocentric, not geocentric
 : Not a ringed target
 Gaia source ID : 4068976154315955200
 2Mass ID (if available) : 17492134-2228458

ICRS Star Coord at Epoch: 17h 49m 21.32882s -22:28:46.00421s
 RUWE (>1.4 is poor) : 1.38
 K magnitude : 11.364
 G magnitude : 16.301
 RP magnitude : 14.976
 BP magnitude : 17.850
 DUPflag : 0
 Distance (au) : 9.427
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.97
 Sun-Target sep (deg) : 124.79
 Sun-Moon sep (deg) : 173.24
 B (ring opening deg) : 26.80
 PA of pole (deg) : 5.46
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.507
 C/A sky separation (km) : 3469.1
 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	+ +	AUG 16 07:45 - AUG 16 07:52	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	AUG 16 07:45 - AUG 16 07:51	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+	AUG 16 07:44 - AUG 16 07:44	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	AUG 16 07:49 - AUG 16 07:55	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



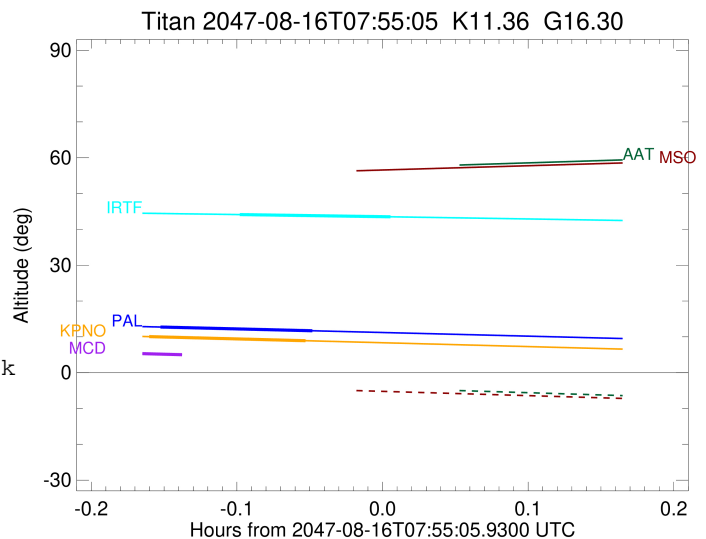
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-08-16T07:49:05.740
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)  : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 4068976154315955200
2Mass ID (if available) : 17492134-2228458
ICRS Star Coord at Epoch: 17h 49m 21.32882s -22:28:46.00420s
RUWE (>1.4 is poor) : 1.38
K magnitude          : 11.364
G magnitude          : 16.301
RP magnitude         : 14.976
BP magnitude         : 17.850
DUPflag             : 0
Distance (au)        : 9.427
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.97
Sun-Target sep (deg) : 124.79
Sun-Moon sep (deg)  : 174.10
B (ring opening deg) : 26.80
PA of pole (deg)    : 5.46
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.094
C/A sky separation (km): 642.4
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

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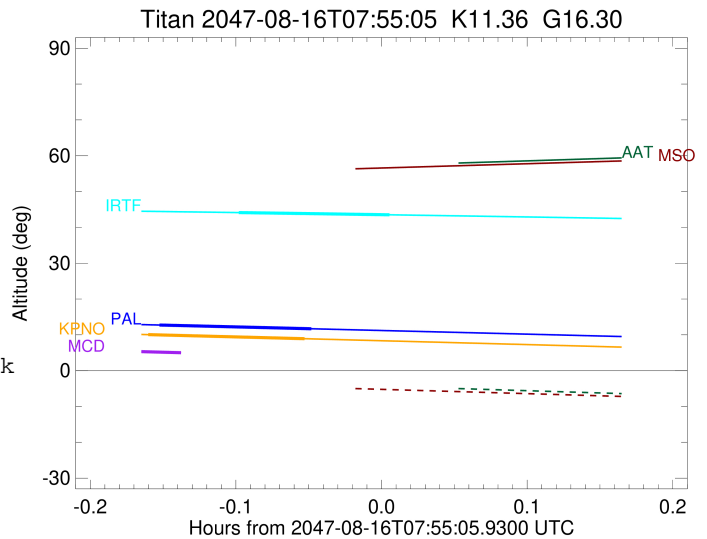
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2047-08-16T07:45:56.544	12.74	-43.09	2575.1	6.31	6.31
Titan	E	2047-08-16T07:52:15.005	11.69	-43.11	2575.1	19.36	19.37



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-08-16T07:48:42.090
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       : 4068976154315955200
2Mass ID (if available) : 17492134-2228458
ICRS Star Coord at Epoch: 17h 49m 21.32882s -22:28:46.00420s
RUWE (>1.4 is poor) : 1.38
K magnitude           : 11.364
G magnitude           : 16.301
RP magnitude          : 14.976
BP magnitude          : 17.850
DUPflag              : 0
Distance (au)        : 9.427
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.97
Sun-Target sep (deg) : 124.79
Sun-Moon sep (deg)   : 174.12
B (ring opening deg) : 26.80
PA of pole (deg)     : 5.46
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.053
C/A sky separation (km) : 363.5
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	2047-08-16T07:45:28.280	10.06	-44.36	2575.2	0.69	0.69
Titan	E	2047-08-16T07:51:55.987	8.92	-44.22	2575.1	13.75	13.76

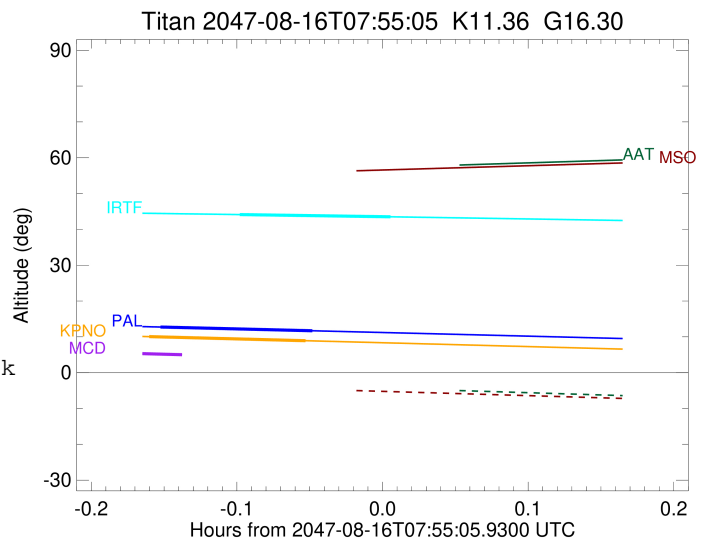
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-08-16T07:48:15.560
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : MCD
Location             : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 4068976154315955200
2Mass ID (if available) : 17492134-2228458
ICRS Star Coord at Epoch: 17h 49m 21.32882s -22:28:46.00420s
RUWE (>1.4 is poor) : 1.38
K magnitude          : 11.364
G magnitude          : 16.301
RP magnitude         : 14.976
BP magnitude         : 17.850
DUPflag             : 0
Distance (au)        : 9.427
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.97
Sun-Target sep (deg) : 124.79
Sun-Moon sep (deg)   : 174.14
B (ring opening deg) : 26.80
PA of pole (deg)     : 5.46
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.002
C/A sky separation (km) : 16.3
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	2047-08-16T07:44:59.113	5.35	-44.50	2575.1	-6.58	-6.59
Titan	E	2047-08-16T07:51:32.091	4.12x	-44.11	2575.1	6.44	6.45



target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2047-08-16T07:52:18.470
 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 : 4068976154315955200
 2Mass ID (if available) : 17492134-2228458
 ICRS Star Coord at Epoch: 17h 49m 21.32882s -22:28:46.00420s
 RUWE (>1.4 is poor) : 1.38
 K magnitude : 11.364
 G magnitude : 16.301
 RP magnitude : 14.976
 BP magnitude : 17.850
 DUPflag : 0
 Distance (au) : 9.427
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.97
 Sun-Target sep (deg) : 124.79
 Sun-Moon sep (deg) : 173.81
 B (ring opening deg) : 26.80
 PA of pole (deg) : 5.46
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.086
 C/A sky separation (km) : 587.4
 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	2047-08-16T07:49:11.131	44.13	-38.94	2575.2	4.95	4.96
Titan	E	2047-08-16T07:55:25.840	43.50	-40.09	2575.1	18.48	18.49

