

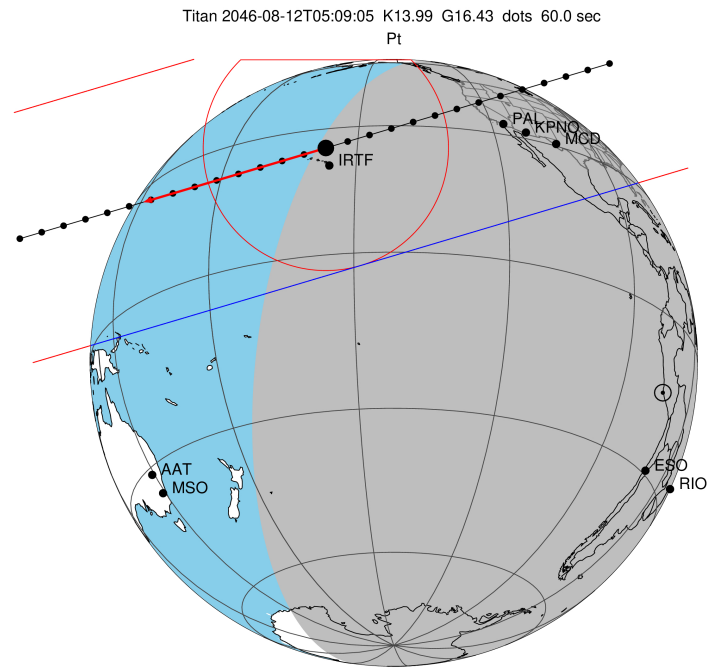
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2046-08-12T05:09:05.140  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 4126334171171523072  
 2Mass ID (if available) : 16595951-2119360

ICRS Star Coord at Epoch: 16h 59m 59.52530s -21:19:35.98359s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 13.988  
 G magnitude : 16.430  
 RP magnitude : 15.667  
 BP magnitude : 17.040  
 DUPflag : 0  
 Distance (au) : 9.533  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -7.97  
 Sun-Target sep (deg) : 116.99  
 Sun-Moon sep (deg) : 13.08  
 B (ring opening deg) : 26.62  
 PA of pole (deg) : 4.27  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.680  
 C/A sky separation (km) : 4699.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

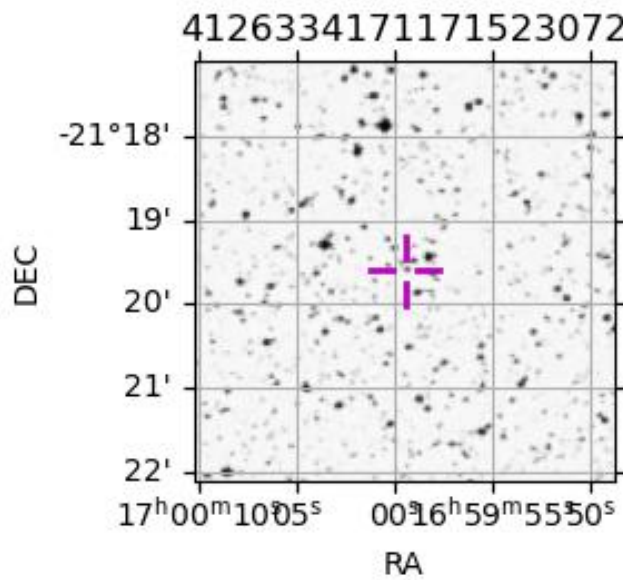
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	AUG 12 04:56 - AUG 12 05:06	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	AUG 12 04:55 - AUG 12 05:05	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	AUG 12 04:55 - AUG 12 05:04	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	AUG 12 05:14 - AUG 12 05:14	Pne
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



2046-08-12T05:09:05.1400 α: 16 59 59.5253 δ: -21 19 35.984 C/A 0.685" PA 343.44 deg v\_sky - 7.97 km/s D 09.53 AU  
 Credit: Styled after SORA/Lucky Star



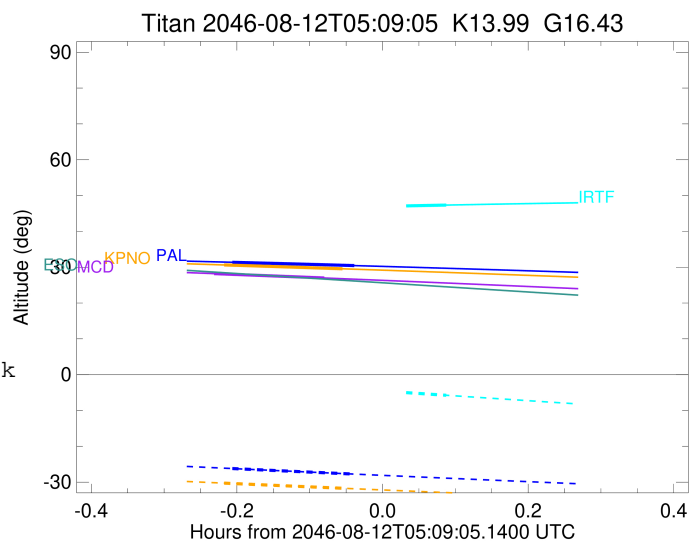
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2046-08-12T05:01:43.570
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       : 41263341711171523072
2Mass ID (if available) : 16595951-2119360
ICRS Star Coord at Epoch: 16h 59m 59.52530s -21:19:35.98359s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 13.988
G magnitude          : 16.430
RP magnitude         : 15.667
BP magnitude         : 17.040
DUPflag             : 0
Distance (au)        : 9.533
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.97
Sun-Target sep (deg) : 116.99
Sun-Moon sep (deg)  : 13.22
B (ring opening deg) : 26.62
PA of pole (deg)    : 4.27
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.074
C/A sky separation (km) : 508.6
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

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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	2046-08-12T04:56:39.206	31.37	-26.20	2575.1	-27.57	-27.58
Titan	E	2046-08-12T05:06:47.958	30.44	-27.76	2575.2	7.47	7.47



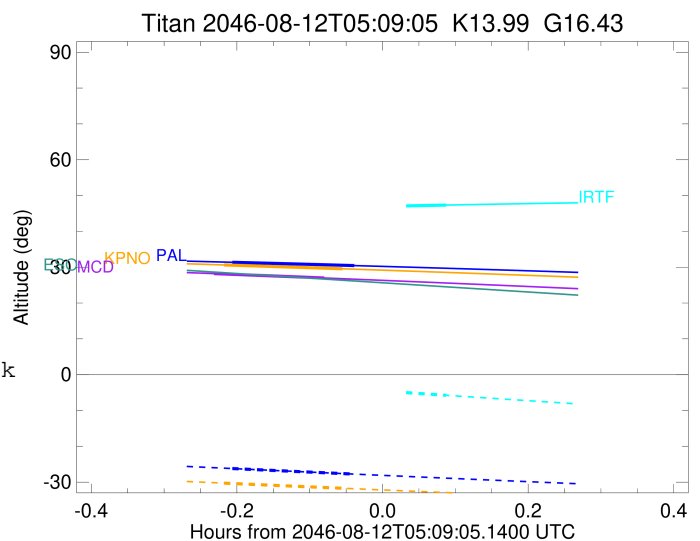
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2046-08-12T05:00:53.430
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       : 41263341711171523072
2Mass ID (if available) : 16595951-2119360
ICRS Star Coord at Epoch: 16h 59m 59.52530s -21:19:35.98359s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 13.988
G magnitude           : 16.430
RP magnitude          : 15.667
BP magnitude          : 17.040
DUPflag              : 0
Distance (au)        : 9.533
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.97
Sun-Target sep (deg) : 116.99
Sun-Moon sep (deg)   : 13.15
B (ring opening deg) : 26.62
PA of pole (deg)     : 4.27
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.117
C/A sky separation (km) : 805.6
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

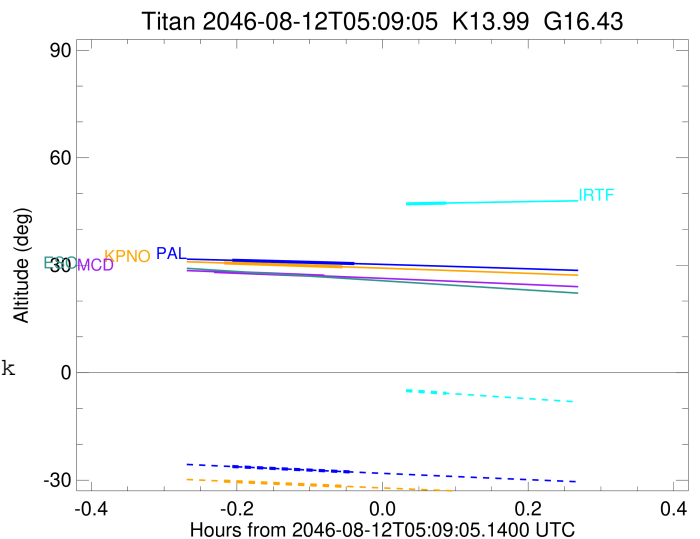
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2046-08-12T04:55:58.076	30.63	-30.27	2575.1	-33.36	-33.37
Titan	E	2046-08-12T05:05:48.831	29.55	-31.71	2575.2	1.31	1.31



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2046-08-12T04:59:45.370
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       : 41263341711171523072
2Mass ID (if available) : 16595951-2119360
ICRS Star Coord at Epoch: 16h 59m 59.52530s -21:19:35.98359s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 13.988
G magnitude           : 16.430
RP magnitude          : 15.667
BP magnitude          : 17.040
DUPflag              : 0
Distance (au)         : 9.533
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.97
Sun-Target sep (deg) : 116.99
Sun-Moon sep (deg)   : 13.04
B (ring opening deg) : 26.62
PA of pole (deg)     : 4.27
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.174
C/A sky separation (km) : 1204.4
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	2046-08-12T04:55:09.632	28.21	-35.41	2575.1	-41.27	-41.29
Titan	E	2046-08-12T05:04:21.170	26.98	-36.61	2575.2	-7.37	-7.37

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2046-08-12T05:09:16.560
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       : 41263341711171523072
2Mass ID (if available) : 16595951-2119360
ICRS Star Coord at Epoch: 16h 59m 59.52530s -21:19:35.98359s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 13.988
G magnitude           : 16.430
RP magnitude         : 15.667
BP magnitude         : 17.040
DUPflag              : 0
Distance (au)        : 9.533
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.97
Sun-Target sep (deg) : 116.99
Sun-Moon sep (deg)  : 13.68
B (ring opening deg) : 26.62
PA of pole (deg)    : 4.27
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.050
C/A sky separation (km) : 348.7
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	2046-08-12T05:04:12.466	46.60	-3.48x	2575.1	-24.83	-24.84
Titan	E	2046-08-12T05:14:20.472	47.33	-5.75	2575.1	11.08	11.09

