

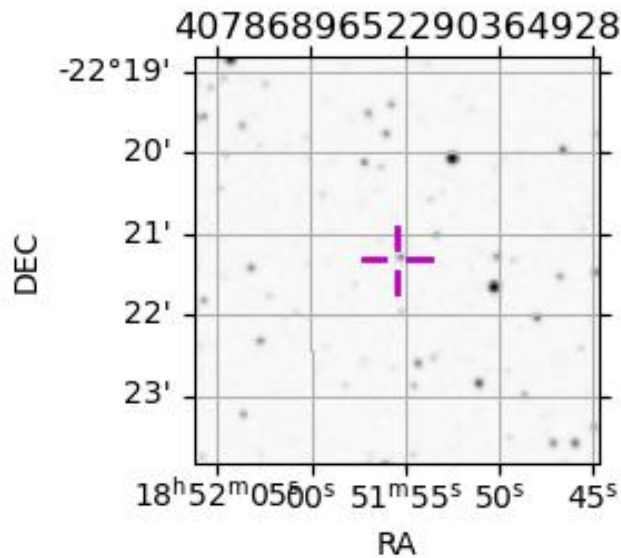
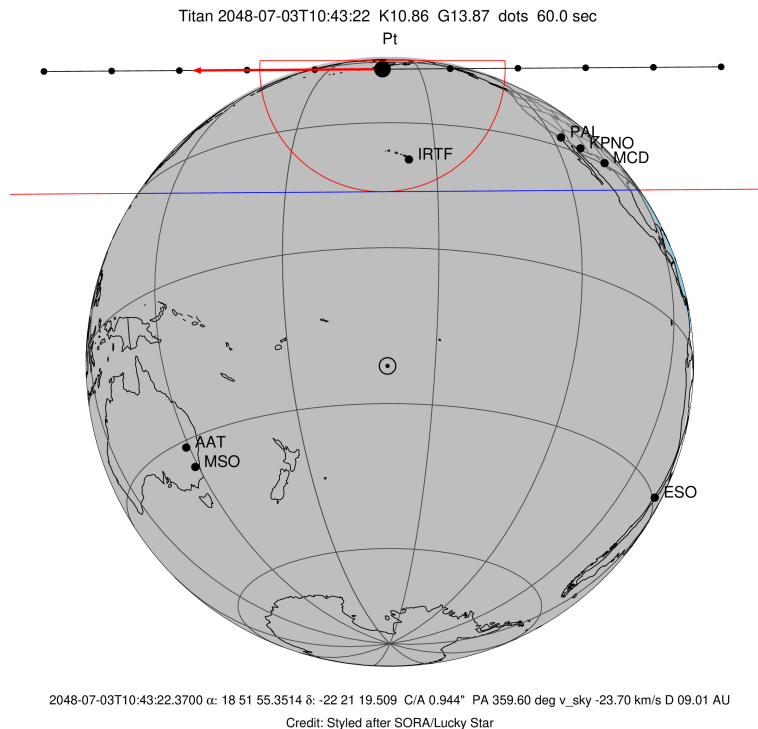
target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2048-07-03T10:43:22.370
 Event type : Pt
 : Titan occs: topocentric, not geocentric
 : Not a ringed target
 Gaia source ID : 4078689652290364928
 2Mass ID (if available) : 18515536-2221191

ICRS Star Coord at Epoch: 18h 51m 55.35145s -22:21:19.50908s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 10.858
 G magnitude : 13.872
 RP magnitude : 12.996
 BP magnitude : 14.670
 DUPflag : 0
 Distance (au) : 9.015
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -23.69
 Sun-Target sep (deg) : 179.28
 Sun-Moon sep (deg) : 94.63
 B (ring opening deg) : 25.16
 PA of pole (deg) : 6.50
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.945
 C/A sky separation (km) : 6179.4
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk

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

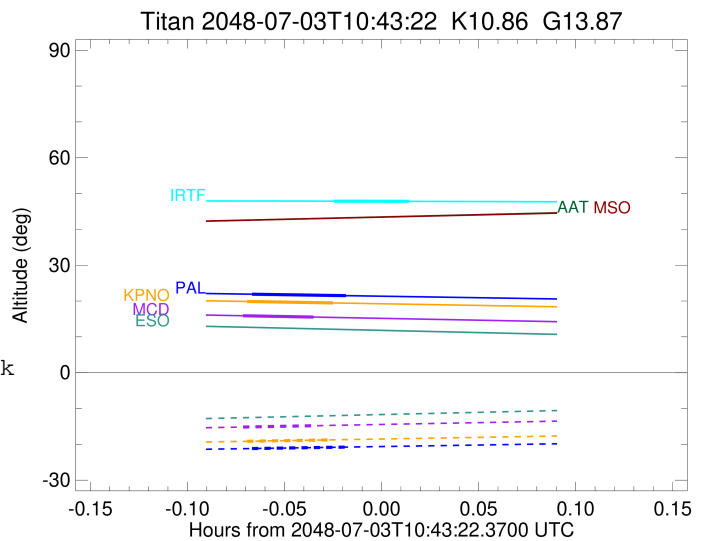
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	JUL 03 10:39 - JUL 03 10:42	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 03 10:39 - JUL 03 10:41	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 03 10:39 - JUL 03 10:41	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 03 10:41 - JUL 03 10:44	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            : 2048-07-03T10:40:49.730
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       : 4078689652290364928
2Mass ID (if available) : 18515536-2221191
ICRS Star Coord at Epoch: 18h 51m 55.35145s -22:21:19.50908s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 10.858
G magnitude           : 13.872
RP magnitude         : 12.996
BP magnitude         : 14.670
DUPflag              : 0
Distance (au)        : 9.015
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -23.69
Sun-Target sep (deg) : 179.28
Sun-Moon sep (deg)  : 95.02
B (ring opening deg) : 25.16
PA of pole (deg)    : 6.50
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.227
C/A sky separation (km): 1486.3
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
    
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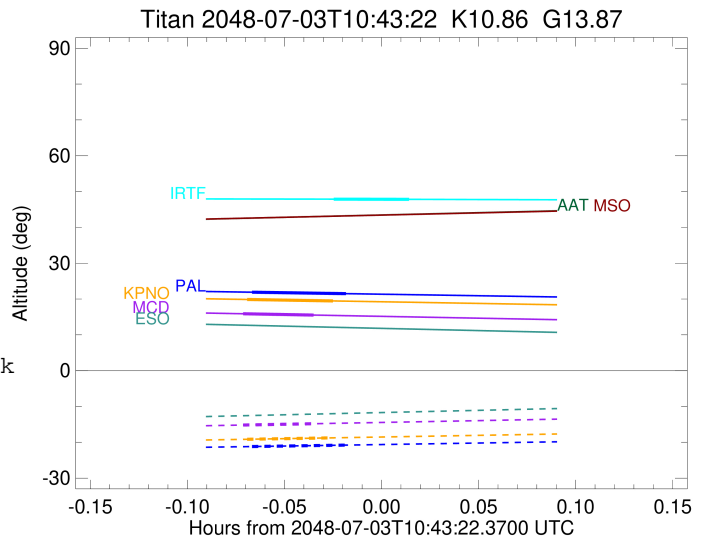


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2048-07-03T10:39:22.075	21.90	-21.18	2575.1	-37.19	-37.21
Titan	E	2048-07-03T10:42:17.389	21.49	-20.77	2575.1	-25.68	-25.69

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-07-03T10:40:32.610
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       : 4078689652290364928
2Mass ID (if available) : 18515536-2221191
ICRS Star Coord at Epoch: 18h 51m 55.35145s -22:21:19.50908s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 10.858
G magnitude          : 13.872
RP magnitude         : 12.996
BP magnitude         : 14.670
DUPflag             : 0
Distance (au)        : 9.015
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -23.69
Sun-Target sep (deg) : 179.28
Sun-Moon sep (deg)   : 95.00
B (ring opening deg) : 25.16
PA of pole (deg)     : 6.50
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.263
C/A sky separation (km) : 1717.8
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
    
```

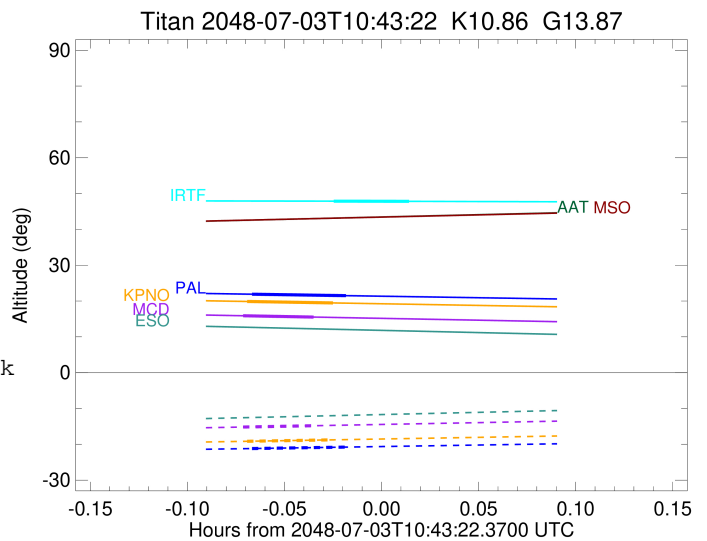


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2048-07-03T10:39:12.585	19.87	-19.16	2575.1	-42.66	-42.67
Titan	E	2048-07-03T10:41:52.652	19.46	-18.75	2575.1	-31.47	-31.48

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-07-03T10:40:11.200
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      : 4078689652290364928
2Mass ID (if available) : 18515536-2221191
ICRS Star Coord at Epoch: 18h 51m 55.35145s -22:21:19.50908s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 10.858
G magnitude          : 13.872
RP magnitude         : 12.996
BP magnitude         : 14.670
DUPflag             : 0
Distance (au)        : 9.015
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -23.69
Sun-Target sep (deg) : 179.28
Sun-Moon sep (deg)   : 94.94
B (ring opening deg) : 25.16
PA of pole (deg)     : 6.50
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.310
C/A sky separation (km) : 2028.6
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
    
```

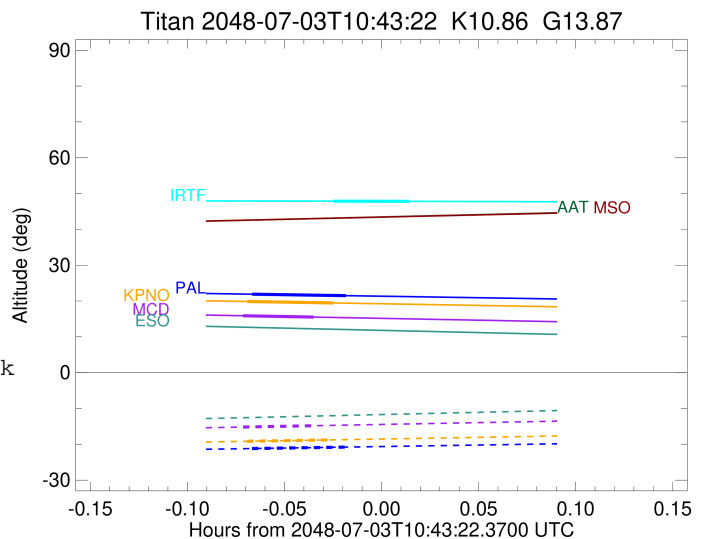


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2048-07-03T10:39:04.934	15.89	-15.18	2575.1	-50.56	-50.58
Titan	E	2048-07-03T10:41:17.484	15.51	-14.81	2575.1	-40.12	-40.13

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-07-03T10:43:03.610
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       : 4078689652290364928
2Mass ID (if available) : 18515536-2221191
ICRS Star Coord at Epoch: 18h 51m 55.35145s -22:21:19.50908s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 10.858
G magnitude          : 13.872
RP magnitude         : 12.996
BP magnitude         : 14.670
DUPflag             : 0
Distance (au)        : 9.015
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -23.69
Sun-Target sep (deg) : 179.28
Sun-Moon sep (deg)   : 95.33
B (ring opening deg) : 25.16
PA of pole (deg)     : 6.50
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.294
C/A sky separation (km) : 1920.7
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	2048-07-03T10:41:52.539	47.87	-47.25	2575.1	-47.92	-47.94
Titan	E	2048-07-03T10:44:14.678	47.82	-47.20	2575.1	-36.75	-36.77