

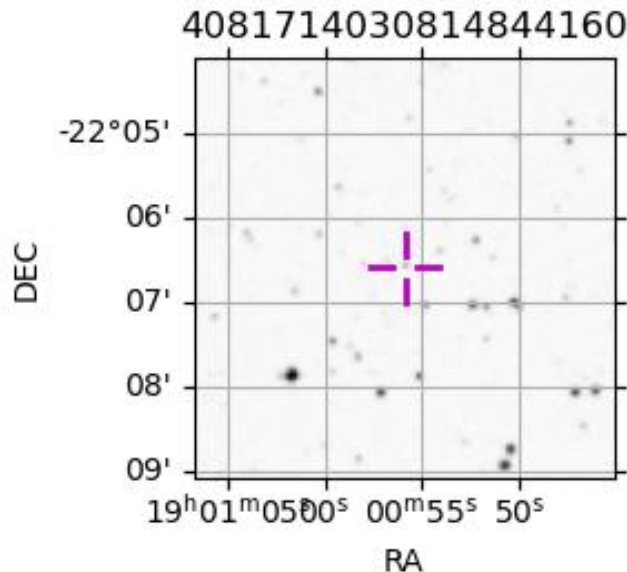
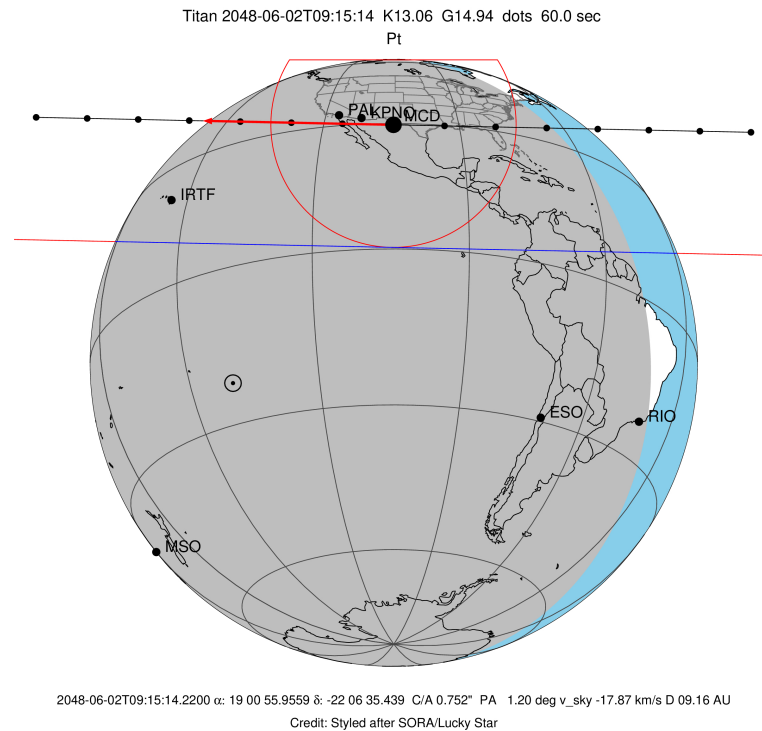
target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2048-06-02T09:15:14.220
 Event type : Pt
 : Titan occs: topocentric, not geocentric
 : Not a ringed target
 Gaia source ID : 4081714030814844160
 2Mass ID (if available) : 19005597-2206352

ICRS Star Coord at Epoch: 19h 00m 55.95588s -22:06:35.43941s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 13.058
 G magnitude : 14.939
 RP magnitude : 14.325
 BP magnitude : 15.381
 DUPflag : 0
 Distance (au) : 9.162
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -17.87
 Sun-Target sep (deg) : 147.75
 Sun-Moon sep (deg) : 44.09
 B (ring opening deg) : 24.67
 PA of pole (deg) : 6.59
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.754
 C/A sky separation (km) : 5012.9
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk

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

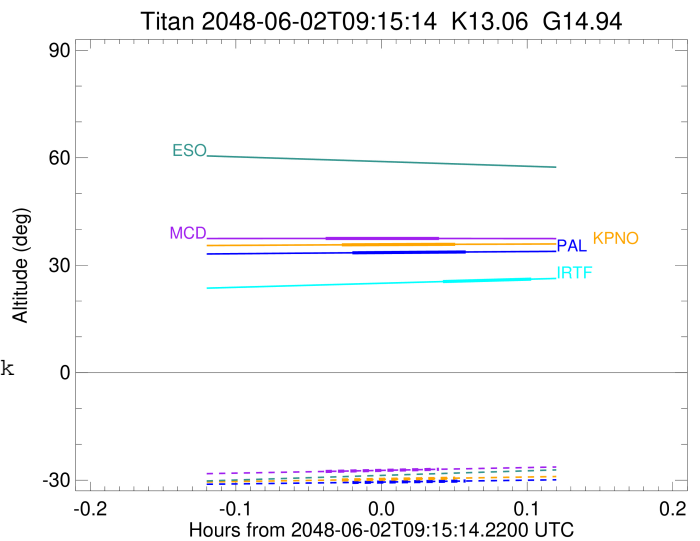
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	JUN 02 09:14 - JUN 02 09:18	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 02 09:13 - JUN 02 09:18	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 02 09:12 - JUN 02 09:17	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUN 02 09:17 - JUN 02 09:21	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            : 2048-06-02T09:16:21.820
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       : 4081714030814844160
2Mass ID (if available) : 19005597-2206352
ICRS Star Coord at Epoch: 19h 00m 55.95588s -22:06:35.43941s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 13.058
G magnitude          : 14.939
RP magnitude         : 14.325
BP magnitude         : 15.381
DUPflag             : 0
Distance (au)        : 9.162
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.87
Sun-Target sep (deg) : 147.75
Sun-Moon sep (deg)  : 44.47
B (ring opening deg) : 24.67
PA of pole (deg)    : 6.59
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.024
C/A sky separation (km) : 158.1
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
    
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x: target alt < 5.0 deg or sun > -5.0 deg

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Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2048-06-02T09:14:00.980	33.46	-30.65	2575.2	-1.82	-1.82
Titan	E	2048-06-02T09:18:42.666	33.69	-30.24	2575.1	8.19	8.20

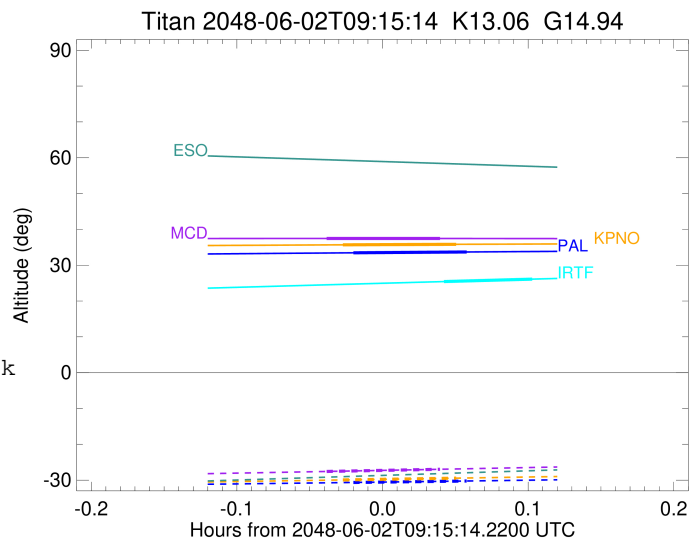
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-06-02T09:15:55.870
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       : 4081714030814844160
2Mass ID (if available) : 19005597-2206352
ICRS Star Coord at Epoch: 19h 00m 55.95588s -22:06:35.43941s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 13.058
G magnitude           : 14.939
RP magnitude          : 14.325
BP magnitude          : 15.381
DUPflag              : 0
Distance (au)        : 9.162
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.87
Sun-Target sep (deg) : 147.75
Sun-Moon sep (deg)   : 44.44
B (ring opening deg) : 24.67
PA of pole (deg)     : 6.59
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.016
C/A sky separation (km) : 106.3
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	2048-06-02T09:13:34.991	35.68	-29.94	2575.1	-2.83	-2.83
Titan	E	2048-06-02T09:18:16.774	35.82	-29.44	2575.1	7.11	7.12



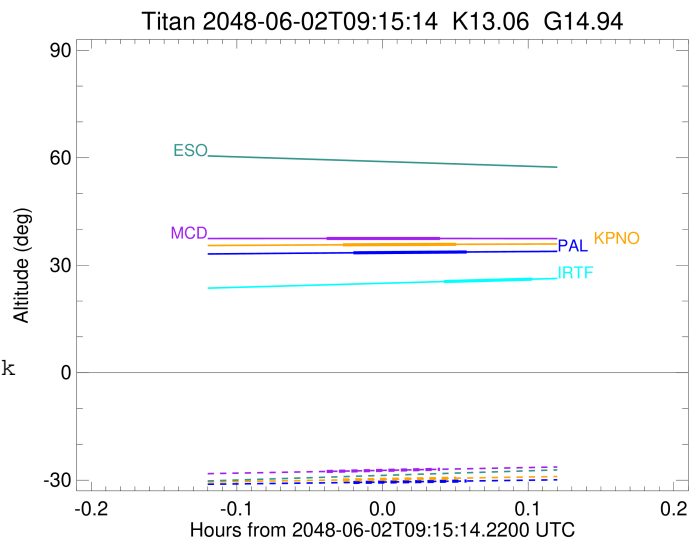
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-06-02T09:15:16.650
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : MCD
Location             : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 4081714030814844160
2Mass ID (if available) : 19005597-2206352
ICRS Star Coord at Epoch: 19h 00m 55.95588s -22:06:35.43941s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 13.058
G magnitude           : 14.939
RP magnitude          : 14.325
BP magnitude          : 15.381
DUPflag              : 0
Distance (au)        : 9.162
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.87
Sun-Target sep (deg) : 147.75
Sun-Moon sep (deg)   : 44.38
B (ring opening deg) : 24.67
PA of pole (deg)     : 6.59
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.007
C/A sky separation (km) : 47.7
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

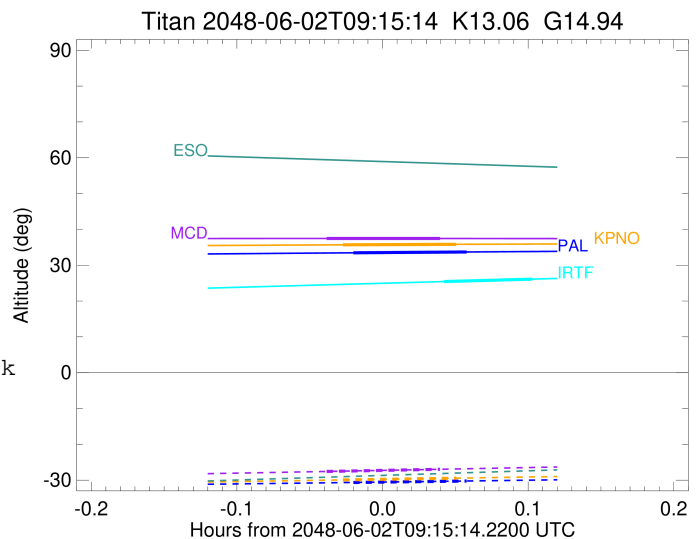
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2048-06-02T09:12:55.749	37.46	-27.57	2575.1	-3.97	-3.97
Titan	E	2048-06-02T09:17:37.580	37.45	-26.97	2575.1	5.86	5.87



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-06-02T09:19:35.350
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      : 4081714030814844160
2Mass ID (if available) : 19005597-2206352
ICRS Star Coord at Epoch: 19h 00m 55.95588s -22:06:35.43941s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 13.058
G magnitude          : 14.939
RP magnitude         : 14.325
BP magnitude         : 15.381
DUPflag             : 0
Distance (au)        : 9.162
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.87
Sun-Target sep (deg) : 147.75
Sun-Moon sep (deg)  : 44.79
B (ring opening deg) : 24.67
PA of pole (deg)    : 6.59
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.247
C/A sky separation (km) : 1644.1
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	2048-06-02T09:17:46.125	25.43	-45.35	2575.1	-40.39	-40.40
Titan	E	2048-06-02T09:21:24.567	26.10	-45.64	2575.1	-30.43	-30.44