

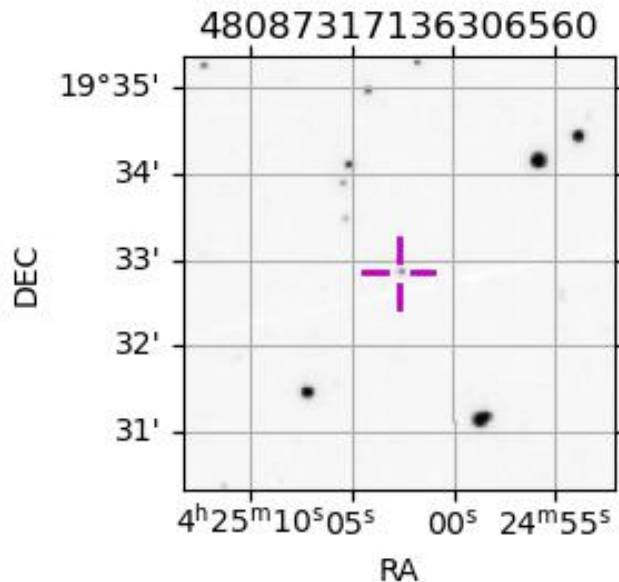
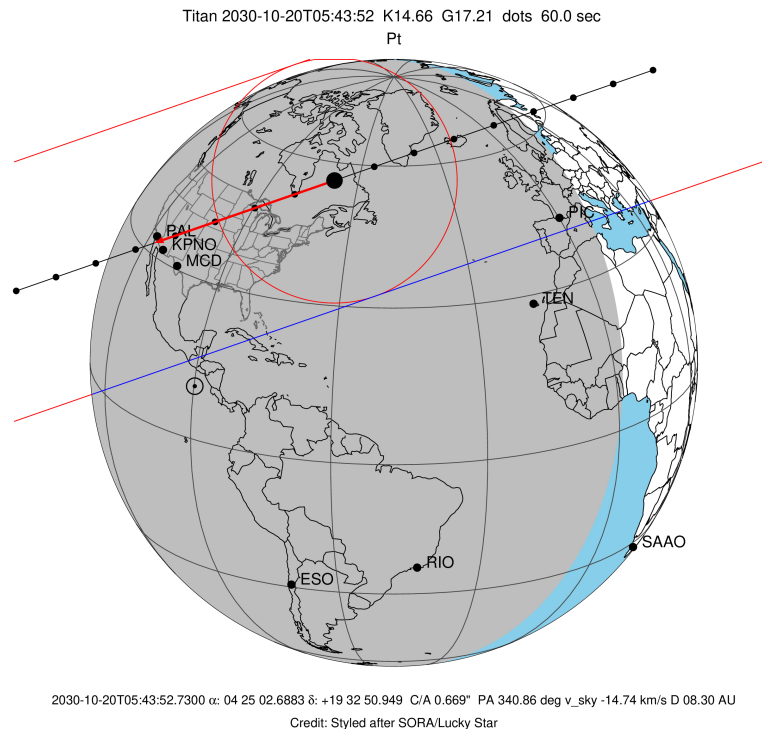
target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2030-10-20T05:43:52.730
 Event type : Pt
 : Titan occs: topocentric, not geocentric
 : Not a ringed target
 Gaia source ID : 48087317136306560
 2Mass ID (if available) : 04250268+1932511

ICRS Star Coord at Epoch: 04h 25m 02.68832s +19:32:50.94866s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.663
 G magnitude : 17.206
 RP magnitude : 16.395
 BP magnitude : 17.886
 DUPflag : 0
 Distance (au) : 8.299
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.74
 Sun-Target sep (deg) : 138.72
 Sun-Moon sep (deg) : 55.66
 B (ring opening deg) : -25.38
 PA of pole (deg) : -3.27
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.670
 C/A sky separation (km) : 4035.3
 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	+ +	OCT 20 05:37 - OCT 20 05:40	Pie
PAL	Palomar Mt (200")	33.4	243.1	+ +	OCT 20 05:45 - OCT 20 05:51	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	OCT 20 05:45 - OCT 20 05:51	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	OCT 20 05:45 - OCT 20 05:50	Pie
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			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



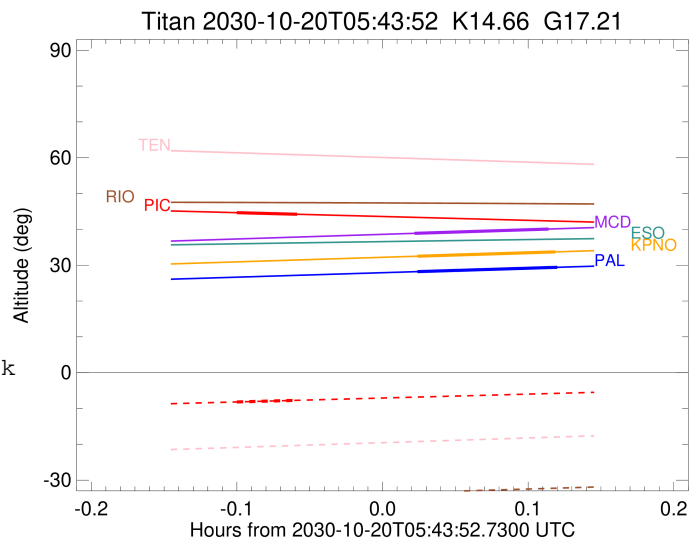
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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2030-10-20T05:39:07.310
Event type            : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code         : PIC
Location              : Pic du Midi
Latitude (deg)        : 42.93656
E. Longitude (deg)    : 0.14231
Altitude (km)         : 2.890
Gaia source ID        : 48087317136306560
2Mass ID (if available) : 04250268+1932511
ICRS Star Coord at Epoch: 04h 25m 02.68832s +19:32:50.94866s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 14.663
G magnitude           : 17.206
RP magnitude          : 16.395
BP magnitude          : 17.886
DUPflag              : 0
Distance (au)         : 8.300
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.74
Sun-Target sep (deg) : 138.72
Sun-Moon sep (deg)   : 55.88
B (ring opening deg) : -25.38
PA of pole (deg)     : -3.27
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.383
C/A sky separation (km): 2308.0
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	2030-10-20T05:37:51.151	44.66	-8.18	2575.1	-62.68	-62.69
Titan	E	2030-10-20T05:40:23.485	44.21	-7.71	2575.1	-42.01	-42.03



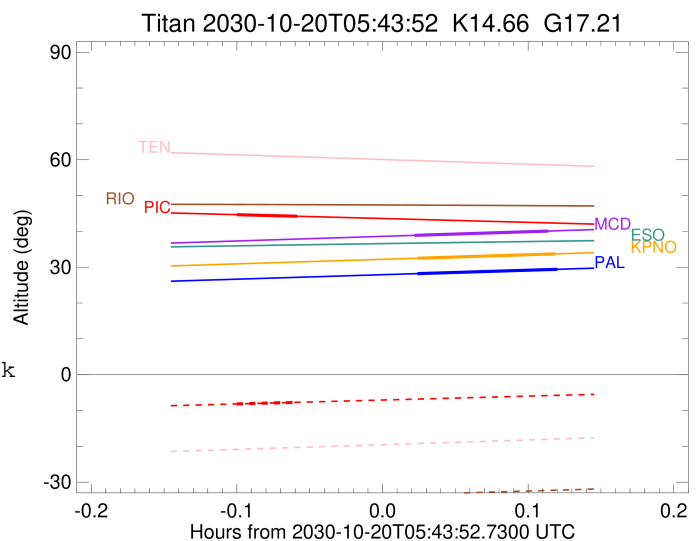
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2030-10-20T05:48:12.090
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)  : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 48087317136306560
2Mass ID (if available) : 04250268+1932511
ICRS Star Coord at Epoch: 04h 25m 02.68832s +19:32:50.94866s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 14.663
G magnitude          : 17.206
RP magnitude         : 16.395
BP magnitude         : 17.886
DUPflag             : 0
Distance (au)        : 8.299
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.74
Sun-Target sep (deg) : 138.72
Sun-Moon sep (deg)  : 56.39
B (ring opening deg) : -25.38
PA of pole (deg)    : -3.27
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.006
C/A sky separation (km) : 36.9
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	2030-10-20T05:45:18.549	28.20	-56.48	2575.1	-13.01	-13.01
Titan	E	2030-10-20T05:51:05.626	29.41	-57.44	2575.1	14.48	14.49



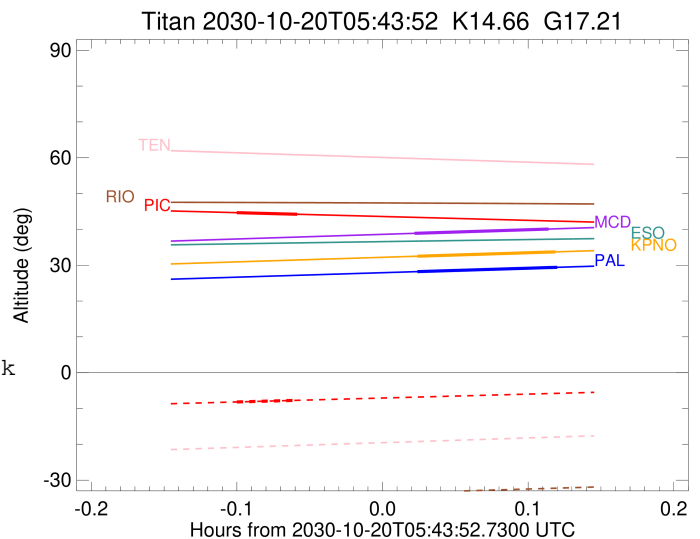
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2030-10-20T05:48:09.710
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)  : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 48087317136306560
2Mass ID (if available) : 04250268+1932511
ICRS Star Coord at Epoch: 04h 25m 02.68832s +19:32:50.94866s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 14.663
G magnitude          : 17.206
RP magnitude         : 16.395
BP magnitude         : 17.886
DUPflag             : 0
Distance (au)        : 8.299
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.74
Sun-Target sep (deg) : 138.72
Sun-Moon sep (deg)  : 56.44
B (ring opening deg) : -25.38
PA of pole (deg)    : -3.27
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.046
C/A sky separation (km) : 274.6
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	2030-10-20T05:45:17.536	32.50	-60.79	2575.1	-19.19	-19.20
Titan	E	2030-10-20T05:51:01.871	33.72	-61.67	2575.1	8.21	8.22



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2030-10-20T05:47:56.980
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       : 48087317136306560
2Mass ID (if available) : 04250268+1932511
ICRS Star Coord at Epoch: 04h 25m 02.68832s +19:32:50.94866s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 14.663
G magnitude           : 17.206
RP magnitude          : 16.395
BP magnitude          : 17.886
DUPflag              : 0
Distance (au)         : 8.299
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.74
Sun-Target sep (deg) : 138.72
Sun-Moon sep (deg)   : 56.48
B (ring opening deg) : -25.38
PA of pole (deg)     : -3.27
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.115
C/A sky separation (km) : 690.4
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	2030-10-20T05:45:10.689	38.89	-66.05	2575.1	-27.50	-27.51
Titan	E	2030-10-20T05:50:43.259	40.08	-66.73	2575.2	-0.33	-0.33

