

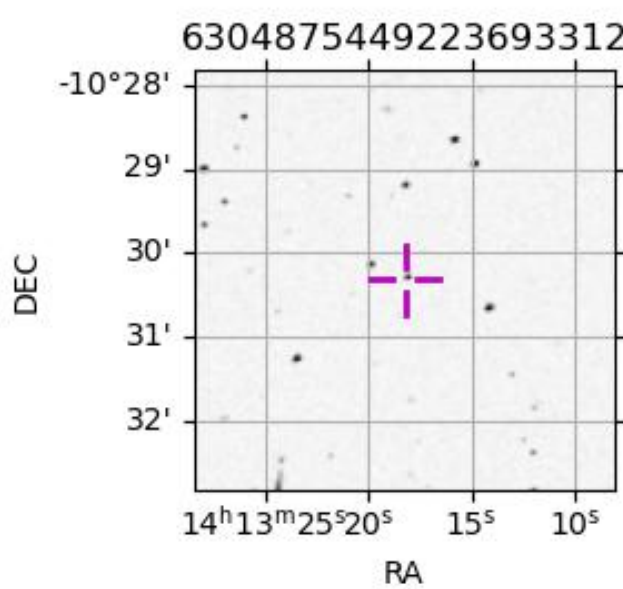
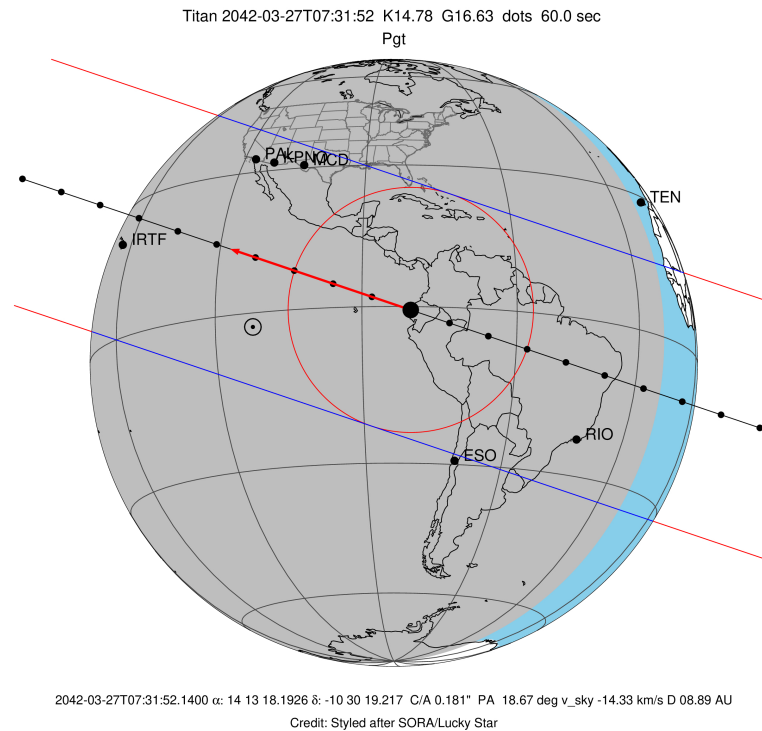
target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2042-03-27T07:31:52.140
 Event type : Pgt
 : Titan occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 6304875449223693312
 2Mass ID (if available) : 14131819-1030189

ICRS Star Coord at Epoch: 14h 13m 18.19262s -10:30:19.21658s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 14.782
 G magnitude : 16.633
 RP magnitude : 15.995
 BP magnitude : 17.138
 DUPflag : 0
 Distance (au) : 8.892
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.34
 Sun-Target sep (deg) : 151.40
 Sun-Moon sep (deg) : 132.43
 B (ring opening deg) : 17.04
 PA of pole (deg) : -0.74
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.181
 C/A sky separation (km) : 1168.2
 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	+ +	MAR 27 07:34 - MAR 27 07:38	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAR 27 07:34 - MAR 27 07:37	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAR 27 07:33 - MAR 27 07:36	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	MAR 27 07:36 - MAR 27 07:41	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAR 27 07:24 - MAR 27 07:29	Pie
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



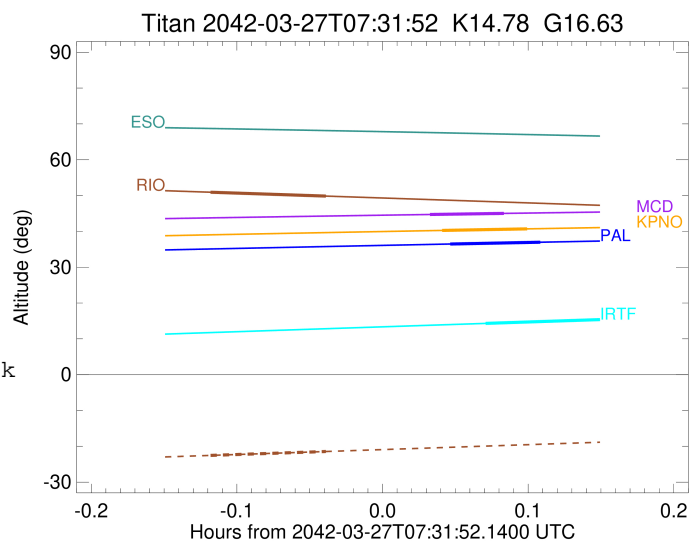
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2042-03-27T07:36:30.990
Event type           : Pgt
: Titan occs: geocentric, topocentric
: 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       : 6304875449223693312
2Mass ID (if available) : 14131819-1030189
ICRS Star Coord at Epoch: 14h 13m 18.19262s -10:30:19.21658s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 14.782
G magnitude           : 16.633
RP magnitude         : 15.995
BP magnitude         : 17.138
DUPflag              : 0
Distance (au)        : 8.892
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.34
Sun-Target sep (deg) : 151.40
Sun-Moon sep (deg)   : 133.31
B (ring opening deg) : 17.04
PA of pole (deg)     : -0.74
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.308
C/A sky separation (km): 1988.4
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	2042-03-27T07:34:39.229	36.46	-53.88	2575.1	63.50	63.51
Titan	E	2042-03-27T07:38:22.716	36.97	-53.97	2575.2	30.16	30.17



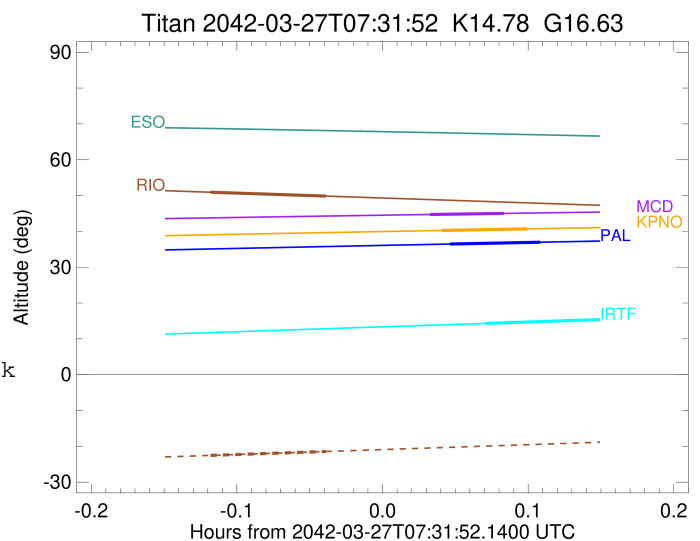
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2042-03-27T07:36:04.170
Event type           : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)  : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 6304875449223693312
2Mass ID (if available) : 14131819-1030189
ICRS Star Coord at Epoch: 14h 13m 18.19262s -10:30:19.21658s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 14.782
G magnitude          : 16.633
RP magnitude         : 15.995
BP magnitude         : 17.138
DUPflag             : 0
Distance (au)        : 8.892
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.34
Sun-Target sep (deg) : 151.40
Sun-Moon sep (deg)  : 133.31
B (ring opening deg) : 17.04
PA of pole (deg)    : -0.74
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.317
C/A sky separation (km) : 2042.9
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	2042-03-27T07:34:17.255	40.25	-55.52	2575.1	64.94	64.95
Titan	E	2042-03-27T07:37:51.050	40.69	-55.49	2575.2	32.00	32.01



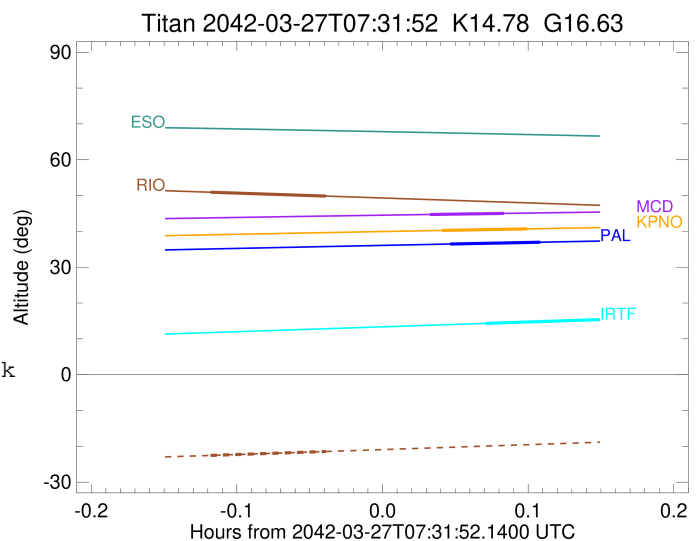
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2042-03-27T07:35:21.830
Event type            : Pgt
: Titan occs: geocentric, topocentric
: 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        : 6304875449223693312
2Mass ID (if available) : 14131819-1030189
ICRS Star Coord at Epoch: 14h 13m 18.19262s -10:30:19.21658s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 14.782
G magnitude           : 16.633
RP magnitude          : 15.995
BP magnitude          : 17.138
DUPflag              : 0
Distance (au)         : 8.892
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.34
Sun-Target sep (deg)  : 151.40
Sun-Moon sep (deg)   : 133.29
B (ring opening deg) : 17.04
PA of pole (deg)     : -0.74
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.339
C/A sky separation (km) : 2186.1
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	2042-03-27T07:33:49.190	44.71	-55.92	2575.1	68.65	68.66
Titan	E	2042-03-27T07:36:54.450	45.01	-55.74	2575.1	37.23	37.25



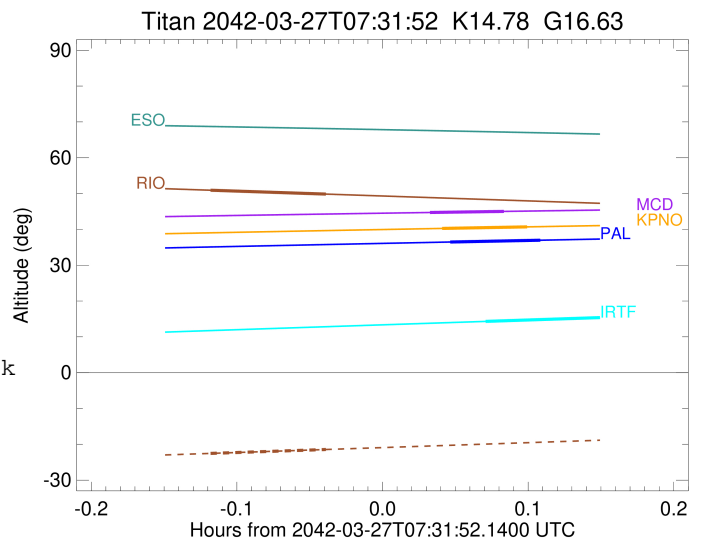
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2042-03-27T07:39:00.430
Event type           : Pgt
: Titan occs: geocentric, topocentric
: 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       : 6304875449223693312
2Mass ID (if available) : 14131819-1030189
ICRS Star Coord at Epoch: 14h 13m 18.19262s -10:30:19.21658s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 14.782
G magnitude          : 16.633
RP magnitude         : 15.995
BP magnitude         : 17.138
DUPflag             : 0
Distance (au)        : 8.892
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.34
Sun-Target sep (deg) : 151.40
Sun-Moon sep (deg)  : 133.23
B (ring opening deg) : 17.04
PA of pole (deg)    : -0.74
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.091
C/A sky separation (km) : 588.5
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	2042-03-27T07:36:07.053	14.31	-42.42	2575.1	5.46	5.46
Titan	E	2042-03-27T07:41:53.695	15.61	-43.67	2575.1	-30.55	-30.56



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2042-03-27T07:27:09.690
Event type            : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code         : RIO
Location              : Rio de Janeiro
Latitude (deg)       : -22.89506
E. Longitude (deg)   : 316.77708
Altitude (km)        : 0.033
Gaia source ID       : 6304875449223693312
2Mass ID (if available) : 14131819-1030189
ICRS Star Coord at Epoch: 14h 13m 18.19262s -10:30:19.21658s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 14.782
G magnitude           : 16.633
RP magnitude          : 15.995
BP magnitude          : 17.138
DUPflag              : 0
Distance (au)        : 8.892
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.34
Sun-Target sep (deg) : 151.40
Sun-Moon sep (deg)   : 132.55
B (ring opening deg) : 17.04
PA of pole (deg)     : -0.74
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.229
C/A sky separation (km) : 1476.3
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	2042-03-27T07:24:45.726	50.93	-22.54	2575.2	-15.07	-15.08
Titan	E	2042-03-27T07:29:33.637	49.84	-21.44	2575.1	-50.83	-50.84

