

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2031-02-06T21:16:04.460
 Event type : XRgt
 : No Saturn occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 49814924781710080
 2Mass ID (if available) : 03592589+1839457

Saturn 2031-02-06T21:16:04 K9.11 G10.74 XRgt

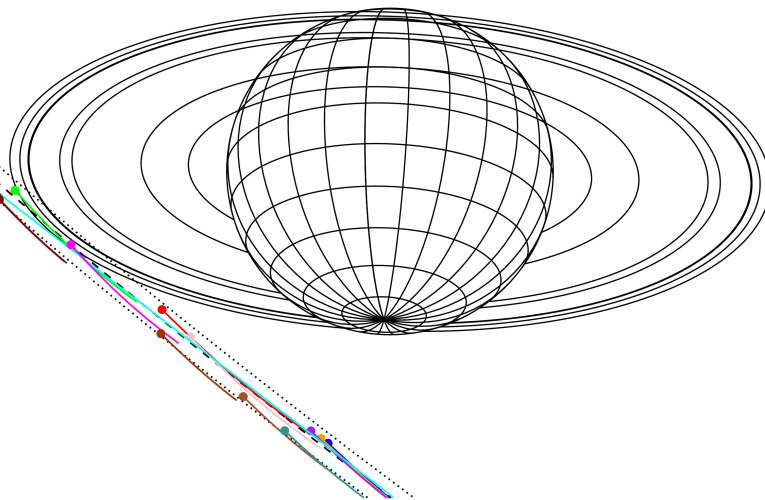
ICRS Star Coord at Epoch: 03h 59m 25.97206s +18:39:44.69133s

RUWE (>1.4 is poor) : 1.04
 K magnitude : 9.110
 G magnitude : 10.738
 RP magnitude : 10.178
 BP magnitude : 11.130
 DUPflag : 0
 Distance (au) : 8.767
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 2.70
 Sun-Target sep (deg) : 104.12
 Sun-Moon sep (deg) : 68.46
 B (ring opening deg) : -24.78
 PA of pole (deg) : -2.36

Saturn 2031-02-06T21:16:04 K9.11 G10.74 XRgt



Earth
 PIC
 PAL
 PMO
 KPNO
 MCD
 TEN
 IRTF
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO

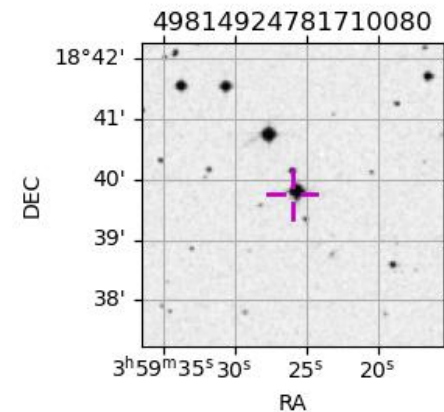


2031-02-06T21:16:04.4600 a: 03 59 25.9721 δ: +18 39 44.691 C/A ***** PA 321.73 deg v_sky + 2.70 km/s D 08.77 AU
 Credit: Styled after SORA/Lucky Star

#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

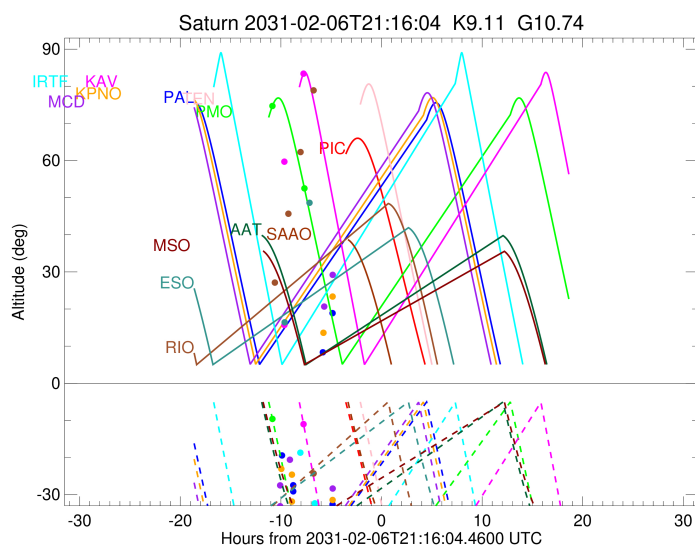
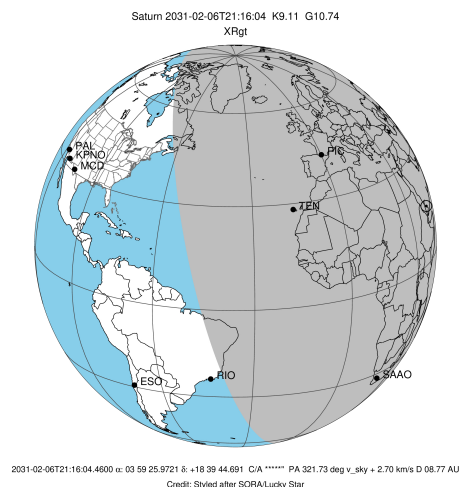
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (20	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs	32.1	118.8	+			FEB 06 10:26 - FEB 06 13:36	PnnRie
KPNO	Kitt Peak Natl	32.0	248.4					PnnRnn
MCD	McDonald Obs.	30.7	256.0					PnnRnn
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observ	12.6	78.8			+	FEB 06 13:31 - FEB 06 13:31	PnnRne
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European South	-29.3	289.3					PnnRnn
AAT	Siding Spring	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0					PnnRnn



```

target                : Saturn
target radius (km)   : 60268.00
C/A epoch            : 2031-02-06T22:28:04.070
Event type           : XRgt
: No Saturn occs
: Ring occs: geocentric, topocentric
Observer code        : PMO
Location             : Purple Mtn Obs. Nanking
Latitude (deg)       : 32.06667
E. Longitude (deg)   : 118.82089
Altitude (km)        : 0.364
Gaia source ID       : 49814924781710080
2Mass ID (if available) : 03592589+1839457
ICRS Star Coord at Epoch: 03h 59m 25.97206s +18:39:44.69133s
RUWE (>1.4 is poor) : 1.04
K magnitude          : 9.110
G magnitude          : 10.738
RP magnitude         : 10.178
BP magnitude         : 11.130
DUPflag             : 0
Distance (au)        : 8.768
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 2.70
Sun-Target sep (deg) : 104.12
Sun-Moon sep (deg)   : 67.83
B (ring opening deg) : -24.78
PA of pole (deg)     : -2.36
Pole direction: RA (deg): 40.60000
Dec (deg): 83.50000
C/A sky separation (") : 14.509
C/A sky separation (km) : 92263.3
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl.spk
Saturn_ring_plane.tf
sat378.bsp
sat286.bsp
vgr1.sat286.bsp
vgr2.sat286.bsp
HST1081HSPephemUTC.bsp
pfb10000r.bsp
cassini.bsp
earthstns_itrf93_040916.bsp
earth_200101_990628_predict.bpc
earth_720101_070426.bpc
cpck28Mar2008.tpc
pck.sat440.tpc
IAU_SATURN_for_RINGFIT.tpc
naif0012.tls
earth_flat_IAU.spk
  
```



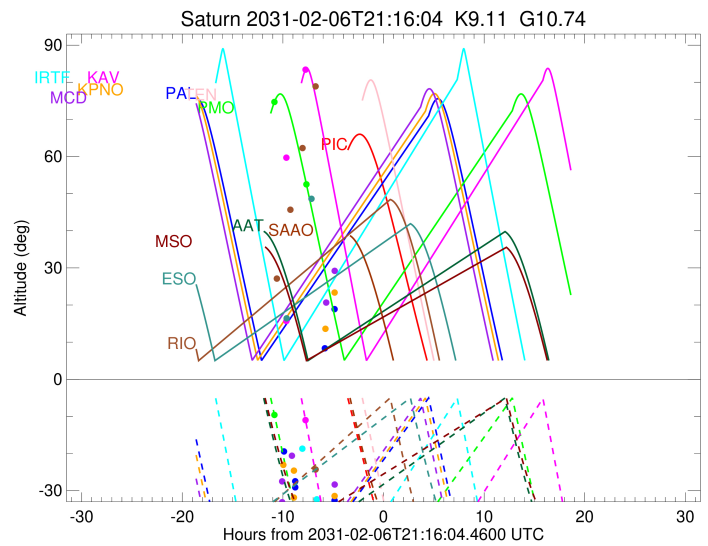
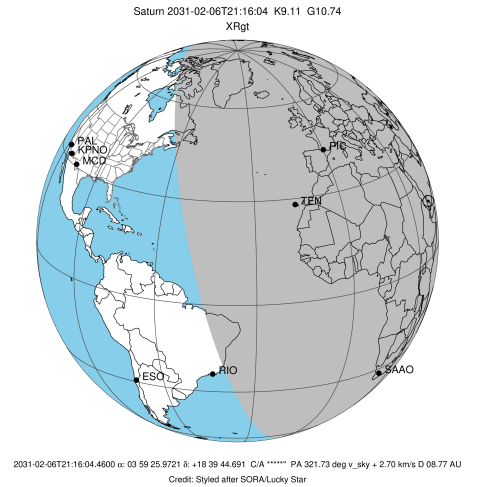
```

b: ring blocked by planet  x: target alt < 5.0 deg or sun > -5.0 deg
Ring      I/E            UTC          b? alt alt-sun radius r-dot lat-geo lat-geodetic
-----
F ring    I 2031-02-06T10:26:12.242  74.76 -9.72 140461.00 -0.57

No planet occultations

F ring    E 2031-02-06T13:36:37.284  52.48 -49.77 140461.00 0.51
  
```

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2031-02-06T22:47:00.860
 Event type : XRgt
 : No Saturn occs
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 49814924781710080
 2Mass ID (if available) : 03592589+1839457
 ICRS Star Coord at Epoch: 03h 59m 25.97206s +18:39:44.69133s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 9.110
 G magnitude : 10.738
 RP magnitude : 10.178
 BP magnitude : 11.130
 DUPflag : 0
 Distance (au) : 8.768
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 2.70
 Sun-Target sep (deg) : 104.12
 Sun-Moon sep (deg) : 67.87
 B (ring opening deg) : -24.78
 PA of pole (deg) : -2.36
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 15.134
 C/A sky separation (km) : 96240.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2031-02-06T09:22:41.921		27.90	44.62x	140461.00	-1.05		
A (OER)	I	2031-02-06T11:09:35.987		53.26	21.88x	136774.41	-0.11		
No planet occultations									
A (OER)	E	2031-02-06T11:35:10.347		59.30	16.08x	136774.40	0.10		
F ring	E	2031-02-06T13:31:20.835		83.41	-11.05	140461.00	0.91		