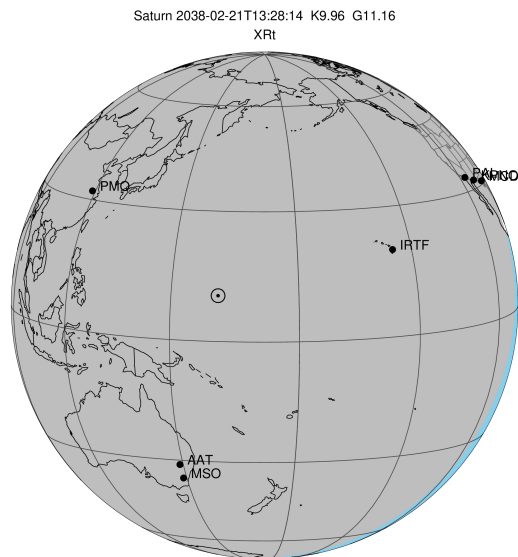


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2038-02-21T13:28:14.390
 Event type : XRT
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Gaia source ID : 3866733973980086272
 2Mass ID (if available) : 11005375+0833251

Saturn 2038-02-21T13:28:14 K9.96 G11.16 XRT

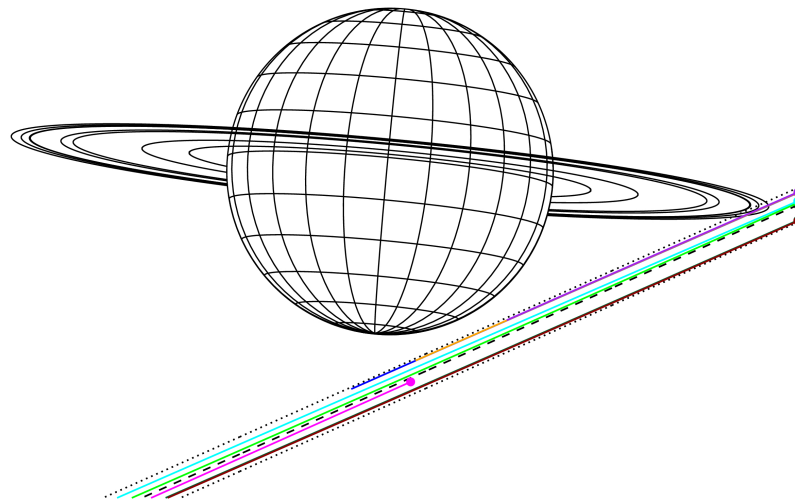
ICRS Star Coord at Epoch: 11h 00m 53.72962s +08:33:24.81050s

RUWE (>1.4 is poor) : 0.84
 K magnitude : 9.962
 G magnitude : 11.164
 RP magnitude : 10.734
 BP magnitude : 11.431
 DUPflag : 0
 Distance (au) : 8.364
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.68
 Sun-Target sep (deg) : 169.19
 Sun-Moon sep (deg) : 15.88
 B (ring opening deg) : -4.83
 PA of pole (deg) : -5.37



2038-02-21T13:28:14.3900 α: 11 00 53.7296 δ: +08 33 24.811 C/A ***** PA 24.06 deg v_sky -19.68 km/s D 08.36 AU
 Credit: Styled after SORA/Lucky Star

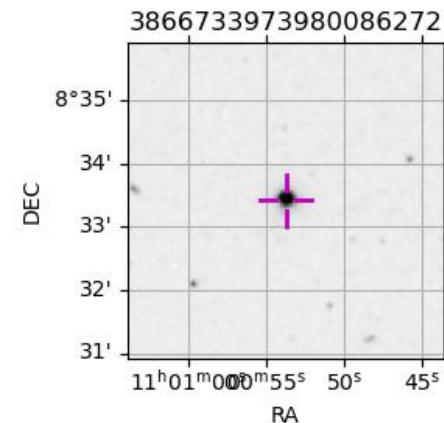
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 AAT
 MSO



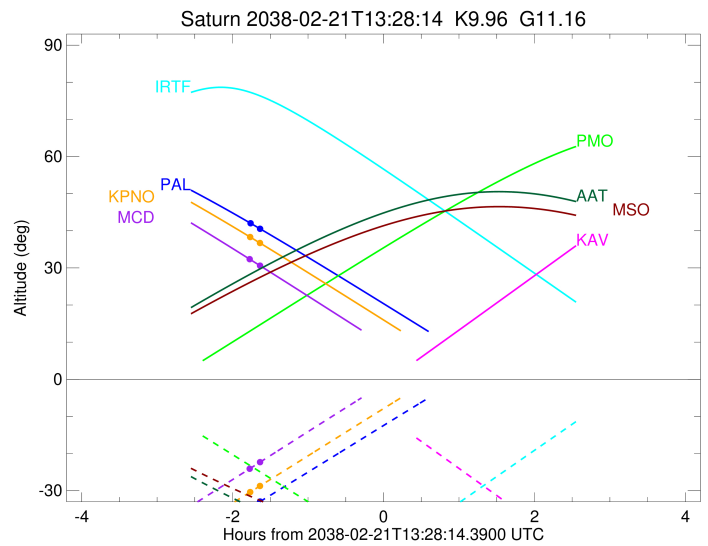
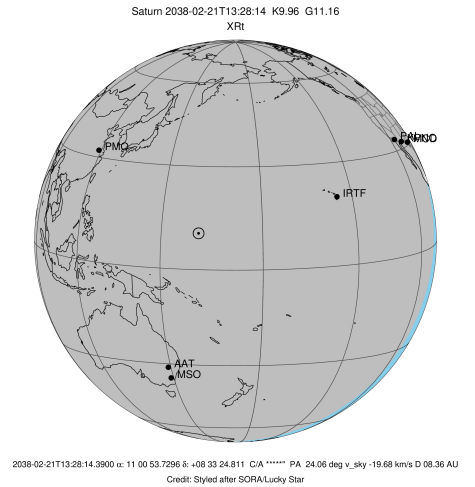
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (20	33.4	243.1	+		+	FEB 21 11:42 - FEB 21 11:50	PnnRie
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4	+		+	FEB 21 11:42 - FEB 21 11:50	PnnRie
MCD	McDonald Obs.	30.7	256.0	+		+	FEB 21 11:41 - FEB 21 11:50	PnnRie
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					PnnRnn
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



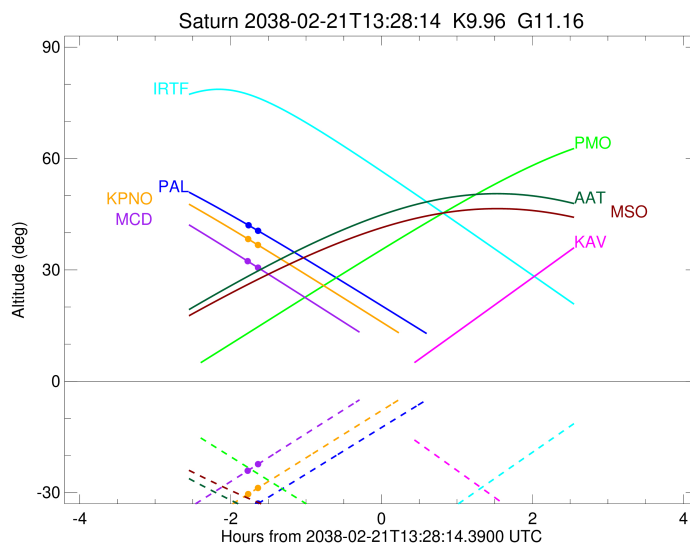
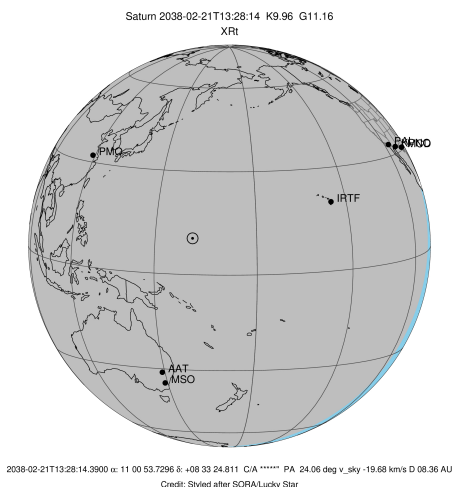
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2038-02-21T13:25:45.210
 Event type : XRt
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3866733973980086272
 2Mass ID (if available) : 11005375+0833251
 ICRS Star Coord at Epoch: 11h 00m 53.72962s +08:33:24.81050s
 RUWE (>1.4 is poor) : 0.84
 K magnitude : 9.962
 G magnitude : 11.164
 RP magnitude : 10.734
 BP magnitude : 11.431
 DUPflag : 0
 Distance (au) : 8.364
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.68
 Sun-Target sep (deg) : 169.19
 Sun-Moon sep (deg) : 15.33
 B (ring opening deg) : -4.83
 PA of pole (deg) : -5.37
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 11.167
 C/A sky separation (km) : 67739.5
 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	2038-02-21T11:42:36.402		42.02	-34.49	140461.00	-22.05		
No planet occultations									
F ring	E	2038-02-21T11:50:17.065		40.50	-32.91	140461.00	22.06		

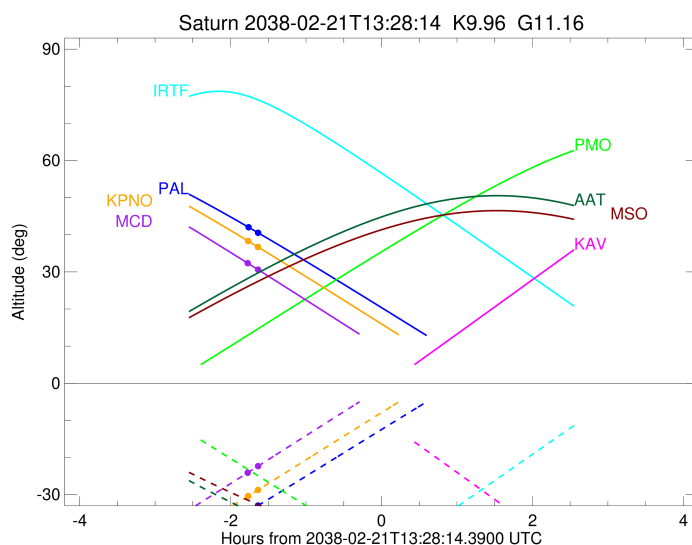
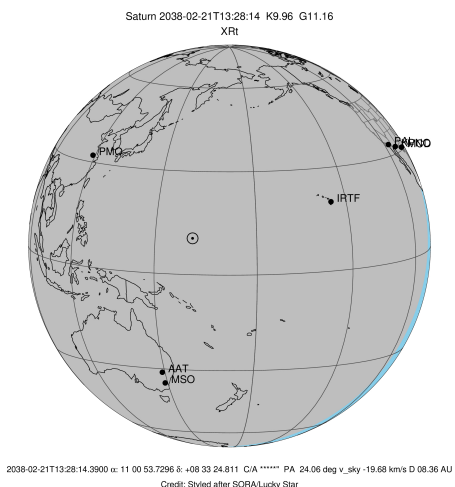
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2038-02-21T13:25:31.650
 Event type : XRt
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 3866733973980086272
 2Mass ID (if available) : 11005375+0833251
 ICRS Star Coord at Epoch: 11h 00m 53.72962s +08:33:24.81050s
 RUWE (>1.4 is poor) : 0.84
 K magnitude : 9.962
 G magnitude : 11.164
 RP magnitude : 10.734
 BP magnitude : 11.431
 DUPflag : 0
 Distance (au) : 8.364
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.68
 Sun-Target sep (deg) : 169.19
 Sun-Moon sep (deg) : 15.28
 B (ring opening deg) : -4.83
 PA of pole (deg) : -5.37
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 11.161
 C/A sky separation (km) : 67707.0
 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	2038-02-21T11:42:16.322		38.30	-30.38	140461.00	-22.73		
No planet occultations									
F ring	E	2038-02-21T11:50:11.805		36.67	-28.71	140461.00	22.74		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2038-02-21T13:25:18.510
 Event type : XRt
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3866733973980086272
 2Mass ID (if available) : 11005375+0833251
 ICRS Star Coord at Epoch: 11h 00m 53.72962s +08:33:24.81050s
 RUWE (>1.4 is poor) : 0.84
 K magnitude : 9.962
 G magnitude : 11.164
 RP magnitude : 10.734
 BP magnitude : 11.431
 DUPflag : 0
 Distance (au) : 8.364
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.68
 Sun-Target sep (deg) : 169.19
 Sun-Moon sep (deg) : 15.22
 B (ring opening deg) : -4.83
 PA of pole (deg) : -5.37
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 11.150
 C/A sky separation (km) : 67642.3
 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	2038-02-21T11:41:53.337		32.35	-24.09	140461.00	-23.97		
No planet occultations									
F ring	E	2038-02-21T11:50:15.604		30.56	-22.29	140461.00	23.97		