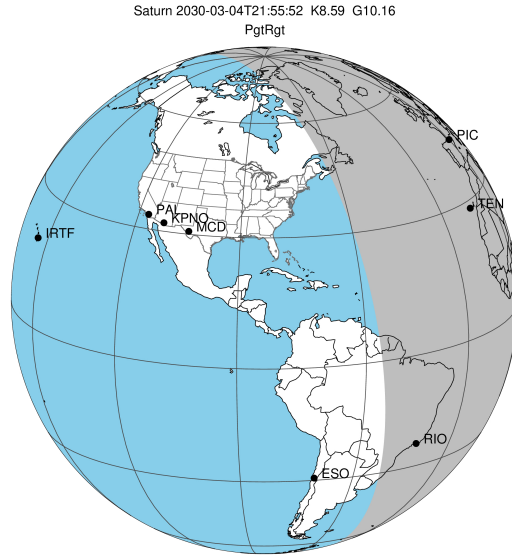


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2030-03-04T21:55:52.260
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 31288909766656128
 2Mass ID (if available) : 03102235+1538042

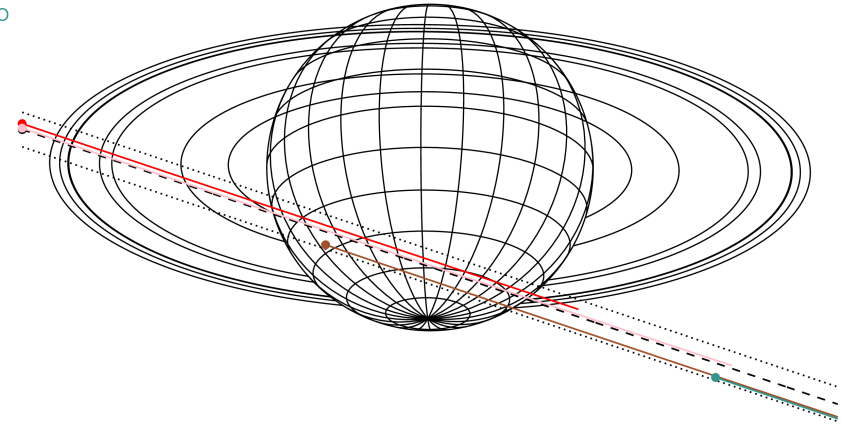
Saturn 2030-03-04T21:55:52 K8.59 G10.16 PgtRgt

ICRS Star Coord at Epoch: 03h 10m 22.54856s +15:38:01.43210s

RUWE (>1.4 is poor) : 0.95
 K magnitude : 8.589
 G magnitude : 10.165
 RP magnitude : 9.614
 BP magnitude : 10.549
 DUPflag : 0
 Distance (au) : 9.477
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 22.07
 Sun-Target sep (deg) : 65.54
 Sun-Moon sep (deg) : 58.35
 B (ring opening deg) : -22.09
 PA of pole (deg) : -0.85



Earth
 PIC
 TEN
 RIO
 ESO

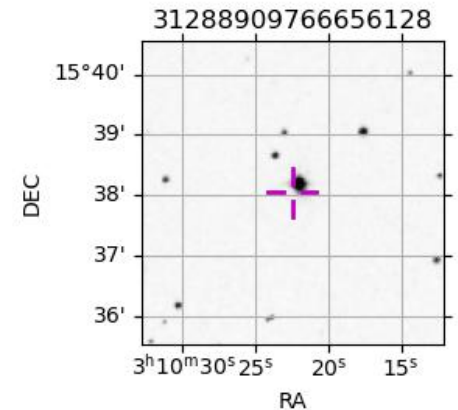


2030-03-04T21:55:52.2600 ex: 03 10 22.5486 s: +15 38 01.432 C/A 5.062° PA 341.39 deg v_sky +22.07 km/s D 09.48 AU
 Credit: Styled after SORA/Lucky Star

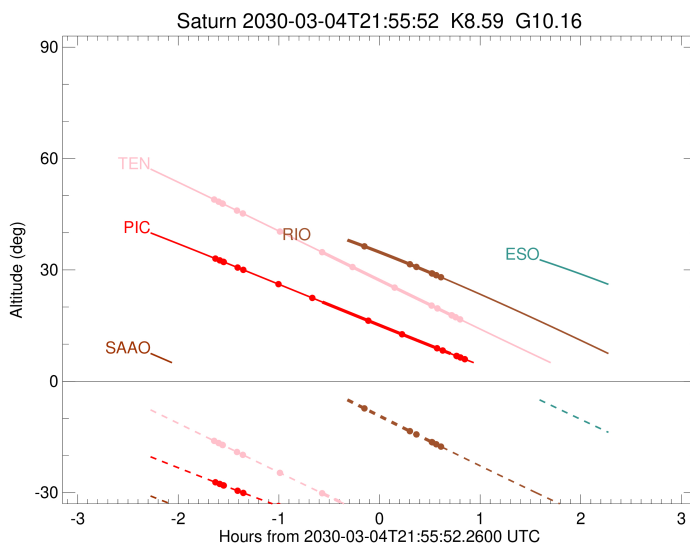
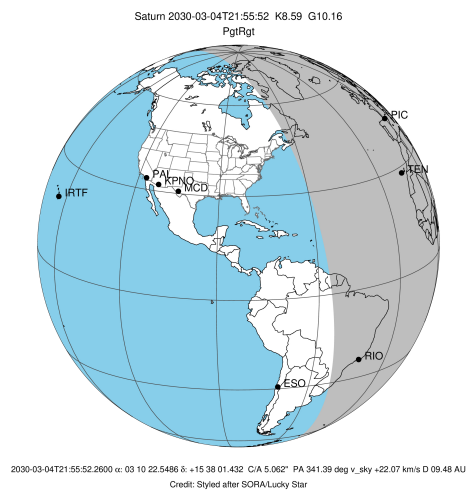
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	OEcode
PIC	Pic du Midi	42.9	0.1	+	+	+	MAR 04 20:18 - MAR 04 22:46	PieRie
PAL	Palomar Mt (20	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
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	+	+	+	MAR 04 20:17 - MAR 04 22:44	PieRie
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		+		MAR 04 22:32 - MAR 04 22:32	PneRne
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

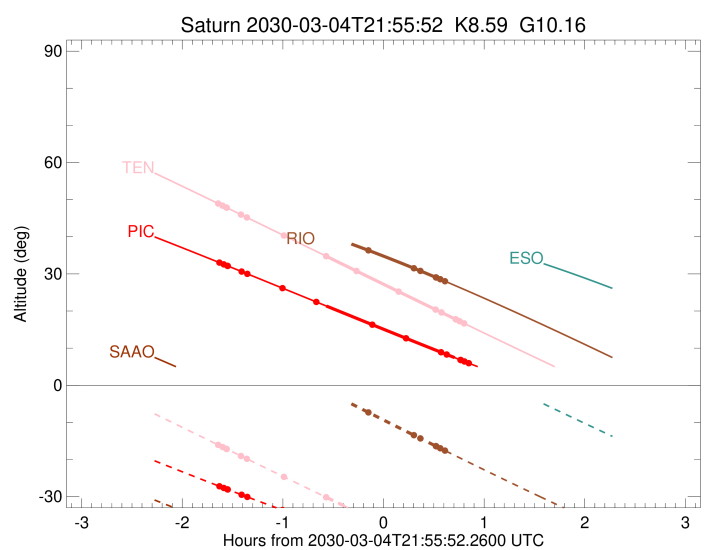
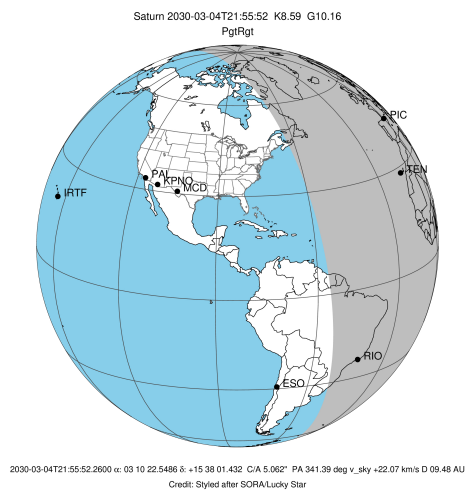


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2030-03-04T22:00:15.850
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 31288909766656128
 2Mass ID (if available) : 03102235+1538042
 ICRS Star Coord at Epoch: 03h 10m 22.54856s +15:38:01.43210s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 8.589
 G magnitude : 10.165
 RP magnitude : 9.614
 BP magnitude : 10.549
 DUPflag : 0
 Distance (au) : 9.477
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 22.07
 Sun-Target sep (deg) : 65.54
 Sun-Moon sep (deg) : 58.95
 B (ring opening deg) : -22.09
 PA of pole (deg) : -0.85
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.718
 C/A sky separation (km) : 32427.4
 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_itr93_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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2030-03-04T20:18:01.316		33.05	-27.21	140461.00	-23.74		
A (OER)	I	2030-03-04T20:20:37.292		32.57	-27.66	136774.40	-23.53		
Encke (OEG)	I	2030-03-04T20:22:46.538		32.18	-28.04	133744.89	-23.35		
Encke (IEG)	I	2030-03-04T20:23:00.318		32.14	-28.08	133423.31	-23.33		
A (IER)	I	2030-03-04T20:31:16.477		30.63	-29.50	122050.38	-22.48		
B (OER)	I	2030-03-04T20:34:37.554		30.02	-30.07	117571.16	-22.06		
B (IER)	I	2030-03-04T20:55:39.320		26.16	-33.60	91984.69	-17.99		
C (IER)	I	2030-03-04T21:15:49.613		22.45	-36.86	74490.58	-10.08		
Saturn	I	2030-03-04T21:21:47.155		21.35	-37.79	60213.65		-13.88	-16.87
Saturn	E	2030-03-04T22:38:14.832		7.45	-48.05	59791.60		-45.55	-51.10
C (IER)	E	2030-03-04T21:49:08.453	b	16.33	-41.87	74490.58	10.11		
B (IER)	E	2030-03-04T22:09:17.517	b	12.66	-44.61	91984.69	17.99		
B (OER)	E	2030-03-04T22:30:17.790	b	8.87	-47.17	117571.16	22.14		
A (IER)	E	2030-03-04T22:33:38.152	b	8.28	-47.55	122050.38	22.57		
Encke (IEG)	E	2030-03-04T22:41:52.013		6.81	-48.44	133423.31	23.45		
Encke (OEG)	E	2030-03-04T22:42:05.719		6.77	-48.46	133744.89	23.47		
A (OER)	E	2030-03-04T22:44:14.249		6.39	-48.68	136774.40	23.67		
F ring	E	2030-03-04T22:46:49.303		5.93	-48.94	140461.00	23.88		

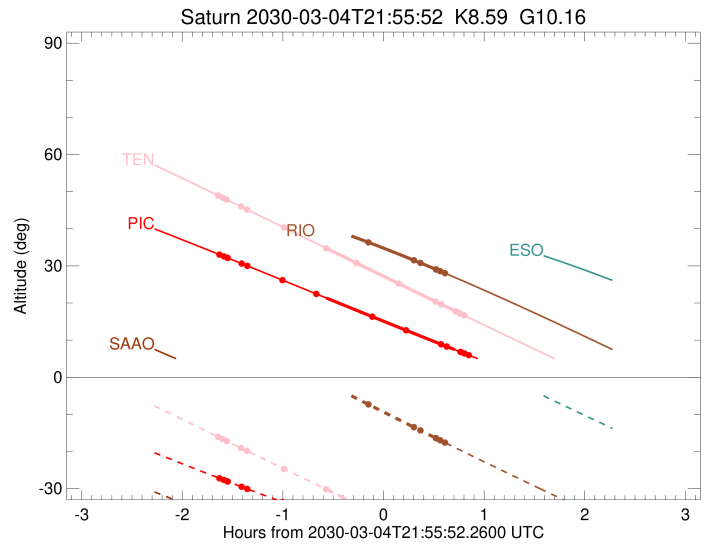
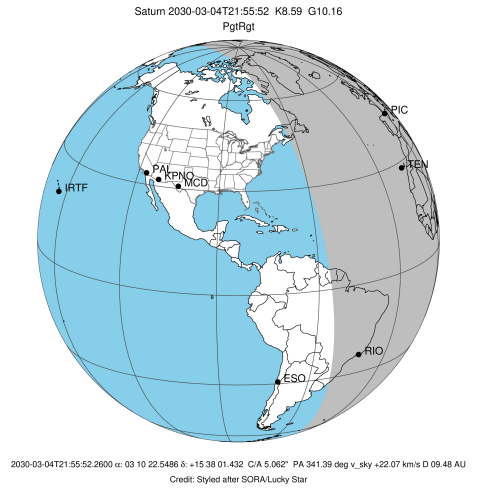
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2030-03-04T22:00:13.620
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 31288909766656128
 2Mass ID (if available) : 03102235+1538042
 ICRS Star Coord at Epoch: 03h 10m 22.54856s +15:38:01.43210s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 8.589
 G magnitude : 10.165
 RP magnitude : 9.614
 BP magnitude : 10.549
 DUPflag : 0
 Distance (au) : 9.477
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 22.07
 Sun-Target sep (deg) : 65.54
 Sun-Moon sep (deg) : 59.12
 B (ring opening deg) : -22.09
 PA of pole (deg) : -0.85
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.981
 C/A sky separation (km) : 34237.9
 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_itr93_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	2030-03-04T20:17:17.293		48.96	-16.06	140461.00	-23.23		
A (OER)	I	2030-03-04T20:19:56.792		48.37	-16.64	136774.40	-22.99		
Encke (OEG)	I	2030-03-04T20:22:09.135		47.89	-17.13	133744.89	-22.79		
Encke (IEG)	I	2030-03-04T20:22:23.255		47.84	-17.18	133423.31	-22.76		
A (IER)	I	2030-03-04T20:30:53.194		45.97	-19.05	122050.38	-21.80		
B (OER)	I	2030-03-04T20:34:20.884		45.21	-19.81	117571.16	-21.33		
B (IER)	I	2030-03-04T20:56:30.804		40.33	-24.68	91984.69	-16.57		
C (IER)	I	2030-03-04T21:21:40.211		34.77	-30.17	74490.58	-5.43		
Saturn	I	2030-03-04T21:22:27.846		34.60	-30.34	60198.70		-15.72	-19.05
Saturn	E	2030-03-04T22:37:27.950		18.08	-46.21	59762.31		-47.38	-52.85
C (IER)	E	2030-03-04T21:39:45.569	b	30.77	-34.08	74490.58	5.44		
B (IER)	E	2030-03-04T22:04:52.302	b	25.24	-39.44	91984.69	16.57		
B (OER)	E	2030-03-04T22:27:01.583	b	20.37	-44.07	117571.16	21.37		
A (IER)	E	2030-03-04T22:30:28.789	b	19.61	-44.78	122050.38	21.86		
Encke (IEG)	E	2030-03-04T22:38:57.016		17.76	-46.51	133423.31	22.86		
Encke (OEG)	E	2030-03-04T22:39:11.079		17.71	-46.56	133744.89	22.88		
A (OER)	E	2030-03-04T22:41:22.859		17.23	-47.00	136774.40	23.10		
F ring	E	2030-03-04T22:44:01.625		16.65	-47.54	140461.00	23.34		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2030-03-04T21:57:43.740
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 31288909766656128
 2Mass ID (if available) : 03102235+1538042
 ICRS Star Coord at Epoch: 03h 10m 22.54856s +15:38:01.43210s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 8.589
 G magnitude : 10.165
 RP magnitude : 9.614
 BP magnitude : 10.549
 DUPflag : 0
 Distance (au) : 9.477
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 22.07
 Sun-Target sep (deg) : 65.54
 Sun-Moon sep (deg) : 59.05
 B (ring opening deg) : -22.09
 PA of pole (deg) : -0.85
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.733
 C/A sky separation (km) : 39405.2
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2030-03-04T20:14:19.199		48.80	13.93x	140461.00	-21.84		
A (OER)	I	2030-03-04T20:17:09.280		48.54	13.27x	136774.40	-21.51		
Encke (OEG)	I	2030-03-04T20:19:31.100		48.33	12.73x	133744.89	-21.21		
Encke (IEG)	I	2030-03-04T20:19:46.272		48.30	12.67x	133423.31	-21.18		
A (IER)	I	2030-03-04T20:29:00.543		47.38	10.54x	122050.38	-19.80		
B (OER)	I	2030-03-04T20:32:50.749		46.97	9.66x	117571.16	-19.10		
B (IER)	I	2030-03-04T21:00:01.775		43.61	3.40x	91984.69	-11.32		
Saturn	I	2030-03-04T21:22:50.552		40.27	-1.83x	60143.76		-21.28	-25.51
Saturn	E	2030-03-04T22:32:03.975		28.12	-17.50	59678.12		-52.71	-57.87
B (IER)	E	2030-03-04T21:46:53.301	b	36.34	-7.31	91984.69	11.33		
B (OER)	E	2030-03-04T22:14:05.249	b	31.50	-13.47	117571.16	19.08		
A (IER)	E	2030-03-04T22:17:55.794	b	30.79	-14.33	122050.38	19.77		
Encke (IEG)	E	2030-03-04T22:27:10.625	b	29.05	-16.40	133423.31	21.17		
Encke (OEG)	E	2030-03-04T22:27:25.806	b	29.00	-16.46	133744.89	21.20		
A (OER)	E	2030-03-04T22:29:47.694	b	28.55	-16.99	136774.40	21.50		
F ring	E	2030-03-04T22:32:37.816		28.01	-17.62	140461.00	21.84		