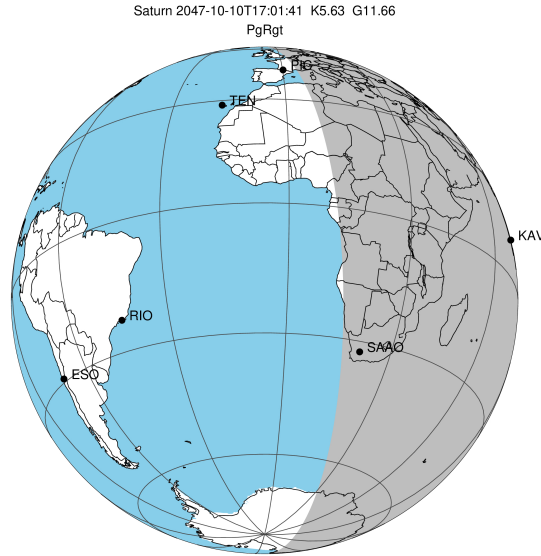


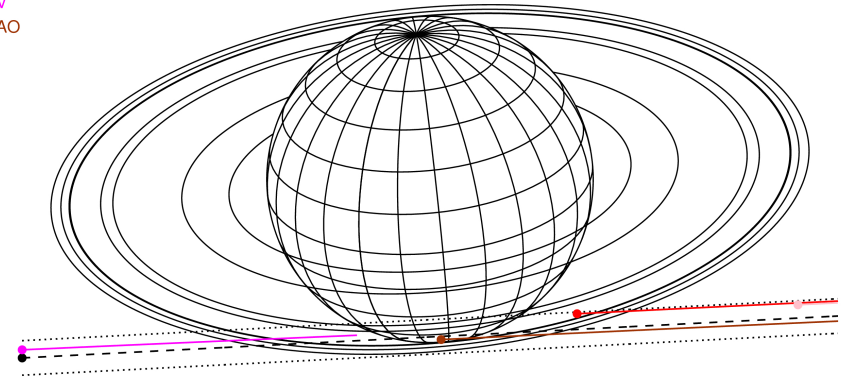
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-10-10T17:01:41.640
 Event type : PgRgt
 : Saturn occs: geocentric, not topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4070214238762508928
 2Mass ID (if available) : 17533732-2237157

Saturn 2047-10-10T17:01:41 K5.63 G11.66 PgRgt

ICRS Star Coord at Epoch: 17h 53m 37.33483s -22:37:15.84541s
 RUWE (>1.4 is poor) : 0.72
 K magnitude : 5.628
 G magnitude : 11.664
 RP magnitude : 10.203
 BP magnitude : 14.704
 DUPflag : 0
 Distance (au) : 10.311
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 18.84
 Sun-Target sep (deg) : 71.88
 Sun-Moon sep (deg) : 177.69
 B (ring opening deg) : 26.89
 PA of pole (deg) : 5.40
 # a(km) ring



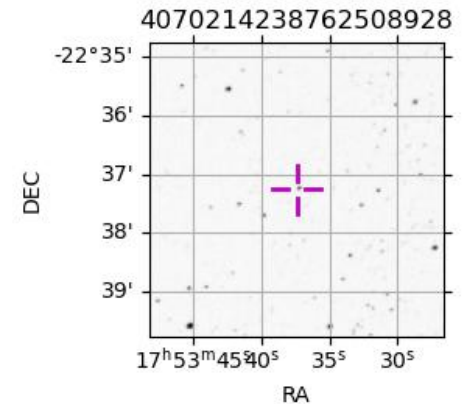
Earth
 PIC
 TEN
 KAV
 SAAO



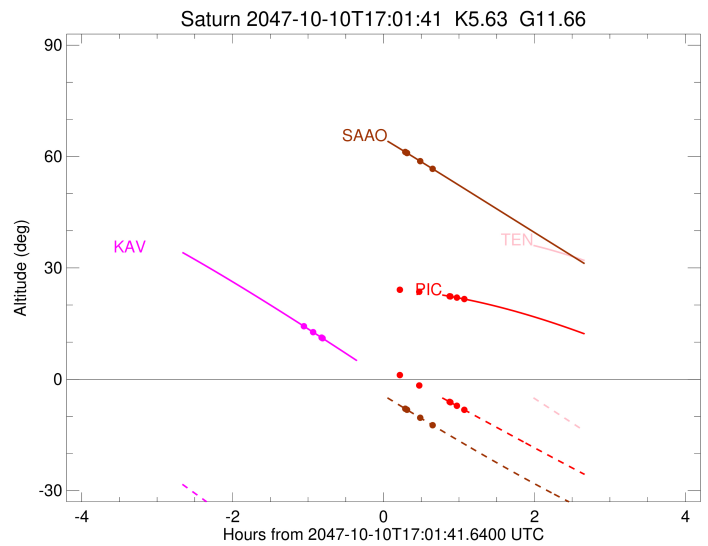
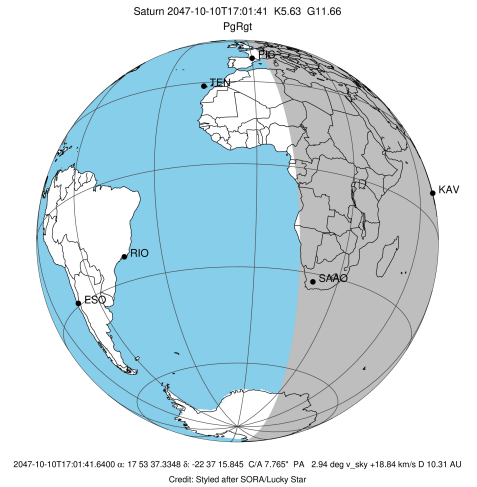
2047-10-10T17:01:41.6400 α: 17.53 37.3348 δ: -22.37 15.845 C/A 7.765° PA 2.94 deg v_sky +18.84 km/s D 10.31 AU
 Credit: Styled after SORA/Lucky Star

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			+	OCT 10 17:54 - OCT 10 18:05	PnnRne
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					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observ	12.6	78.8	+			OCT 10 15:58 - OCT 10 16:13	PnnRin
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			+	OCT 10 17:19 - OCT 10 17:40	PnnRne
MSO	Mt. Stromlo Ob	-35.3	149.0					PnnRnn



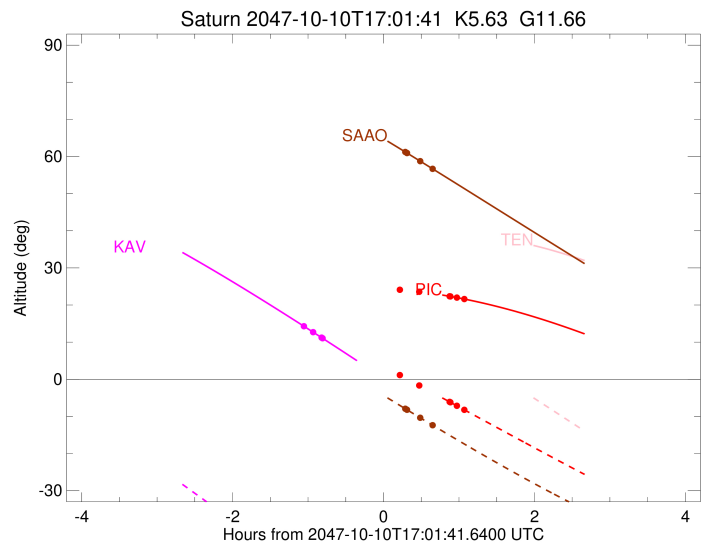
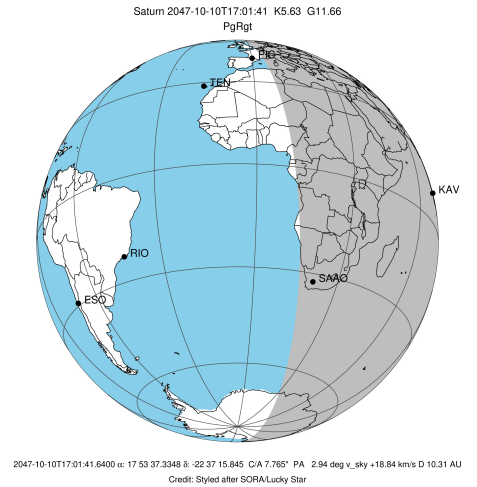
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-10-10T17:01:52.660
 Event type : PgRgt
 : Saturn occs: geocentric, not topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 4070214238762508928
 2Mass ID (if available) : 17533732-2237157
 ICRS Star Coord at Epoch: 17h 53m 37.33483s -22:37:15.84541s
 RUWE (>1.4 is poor) : 0.72
 K magnitude : 5.628
 G magnitude : 11.664
 RP magnitude : 10.203
 BP magnitude : 14.704
 DUPflag : 0
 Distance (au) : 10.311
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 18.84
 Sun-Target sep (deg) : 71.88
 Sun-Moon sep (deg) : 178.16
 B (ring opening deg) : 26.89
 PA of pole (deg) : 5.40
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.990
 C/A sky separation (km) : 52273.3
 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	2047-10-10T15:42:13.428		23.33	17.19x	140461.00	-10.64		
A (OER)	I	2047-10-10T15:48:10.153		23.58	16.21x	136774.40	-10.02		
Encke (OEG)	I	2047-10-10T15:53:21.334		23.78	15.35x	133744.89	-9.44		
Encke (IEG)	I	2047-10-10T15:53:55.509		23.81	15.26x	133423.31	-9.38		
A (IER)	I	2047-10-10T16:18:09.804		24.45	11.14x	122050.38	-6.12		
B (OER)	I	2047-10-10T16:33:21.650		24.62	8.50x	117571.16	-3.66		
Saturn	I	2047-10-10T16:36:27.799		24.63	7.95x	59406.61		-50.04	-55.39
Saturn	E	2047-10-10T17:27:07.136		23.69	-1.13x	59323.97		-53.45	-58.56
B (OER)	E	2047-10-10T17:14:50.853	b	24.11	1.10x	117571.16	3.66		
A (IER)	E	2047-10-10T17:30:03.225		23.57	-1.66x	122050.38	6.12		
Encke (IEG)	E	2047-10-10T17:54:15.662		22.35	-6.09	133423.31	9.40		
Encke (OEG)	E	2047-10-10T17:54:49.753		22.32	-6.19	133744.89	9.47		
A (OER)	E	2047-10-10T18:00:00.088		22.00	-7.14	136774.40	10.05		
F ring	E	2047-10-10T18:05:55.685		21.61	-8.23	140461.00	10.68		

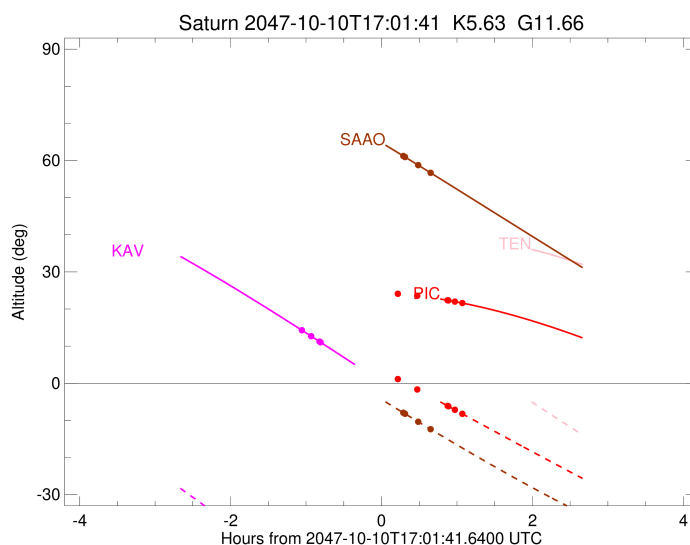
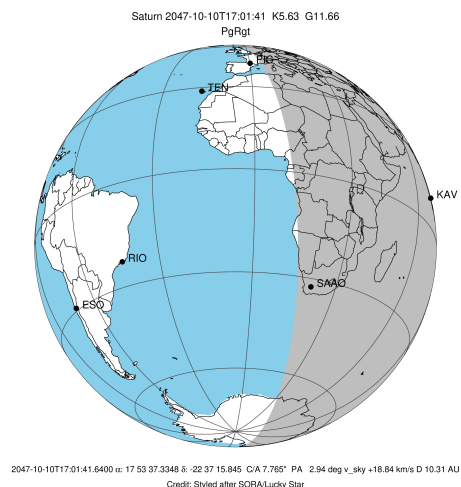
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-10-10T17:06:39.820
 Event type : PgRgt
 : Saturn occs: geocentric, not topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 4070214238762508928
 2Mass ID (if available) : 17533732-2237157
 ICRS Star Coord at Epoch: 17h 53m 37.33483s -22:37:15.84541s
 RUWE (>1.4 is poor) : 0.72
 K magnitude : 5.628
 G magnitude : 11.664
 RP magnitude : 10.203
 BP magnitude : 14.704
 DUPflag : 0
 Distance (au) : 10.311
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 18.84
 Sun-Target sep (deg) : 71.88
 Sun-Moon sep (deg) : 177.13
 B (ring opening deg) : 26.89
 PA of pole (deg) : 5.40
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.533
 C/A sky separation (km) : 56332.1
 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	2047-10-10T15:58:12.242		14.33	-51.82	140461.00	-8.83		
A (OER)	I	2047-10-10T16:05:31.769		12.73	-53.60	136774.40	-7.94		
Encke (OEG)	I	2047-10-10T16:12:15.738		11.26	-55.24	133744.89	-7.05		
Encke (IEG)	I	2047-10-10T16:13:01.676		11.10	-55.42	133423.31	-6.95		
Saturn	I	2047-10-10T16:50:21.312		2.83x	-64.44	59255.40		-56.38	-61.24
Saturn	E	2047-10-10T17:22:44.243		-4.47x	-72.13	59184.71		-59.55	-64.10
Encke (IEG)	E	2047-10-10T17:40:03.837		-8.40x	-76.11	133423.31	7.00		
Encke (OEG)	E	2047-10-10T17:40:49.414		-8.58x	-76.28	133744.89	7.11		
A (OER)	E	2047-10-10T17:47:29.814		-10.10x	-77.76	136774.40	8.01		
F ring	E	2047-10-10T17:54:44.663		-11.75x	-79.31	140461.00	8.93		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-10-10T17:03:45.200
 Event type : PgRgt
 : Saturn occs: geocentric, not topocentric
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 4070214238762508928
 2Mass ID (if available) : 17533732-2237157
 ICRS Star Coord at Epoch: 17h 53m 37.33483s -22:37:15.84541s
 RUWE (>1.4 is poor) : 0.72
 K magnitude : 5.628
 G magnitude : 11.664
 RP magnitude : 10.203
 BP magnitude : 14.704
 DUPflag : 0
 Distance (au) : 10.311
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 18.84
 Sun-Target sep (deg) : 71.88
 Sun-Moon sep (deg) : 177.36
 B (ring opening deg) : 26.89
 PA of pole (deg) : 5.40
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.922
 C/A sky separation (km) : 59242.2
 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



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	2047-10-10T16:07:55.011		75.10	6.92x	140461.00	-6.86		
A (OER)	I	2047-10-10T16:17:48.181		73.36	4.83x	136774.40	-5.55		
Encke (OEG)	I	2047-10-10T16:28:18.704		71.41	2.62x	133744.89	-4.04		
Encke (IEG)	I	2047-10-10T16:29:40.268		71.15	2.34x	133423.31	-3.84		

No planet occultations

Encke (IEG)	E	2047-10-10T17:19:02.615		61.22	-7.94	133423.31	3.85		
Encke (OEG)	E	2047-10-10T17:20:24.097		60.94	-8.22	133744.89	4.05		
A (OER)	E	2047-10-10T17:30:53.549		58.75	-10.37	136774.40	5.56		
F ring	E	2047-10-10T17:40:44.884		56.69	-12.38	140461.00	6.89		