

target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2047-05-25T09:54:10.940  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 4066741774875125632  
 2Mass ID (if available) : 18111479-2219003

Saturn 2047-05-25T09:54:10 K9.41 G12.96 PgtRgt

ICRS Star Coord at Epoch: 18h 11m 14.80742s -22:19:00.20021s

RUWE (>1.4 is poor) : 1.08  
 K magnitude : 9.406  
 G magnitude : 12.961  
 RP magnitude : 11.978  
 BP magnitude : 13.960  
 DUPflag : 0  
 Distance (au) : 9.149  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -16.43  
 Sun-Target sep (deg) : 150.87  
 Sun-Moon sep (deg) : 156.75  
 B (ring opening deg) : 26.20  
 PA of pole (deg) : 5.73

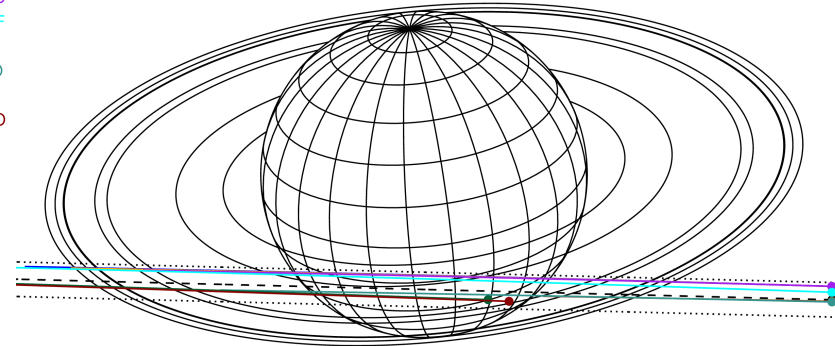
# a(km) ring

- 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



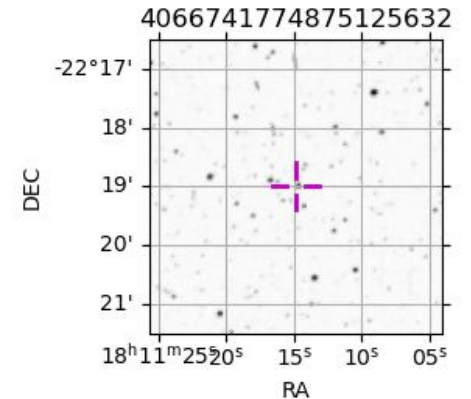
2047-05-25T09:54:10.9400 at: 18 11 14.8074 s: -22 19 00.200 C/A 6.398° PA 358.55 deg v\_sky -16.43 km/s D 09.15 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PAL  
 KPNO  
 MCD  
 IRTF  
 RIO  
 ESO  
 AAT  
 MSO



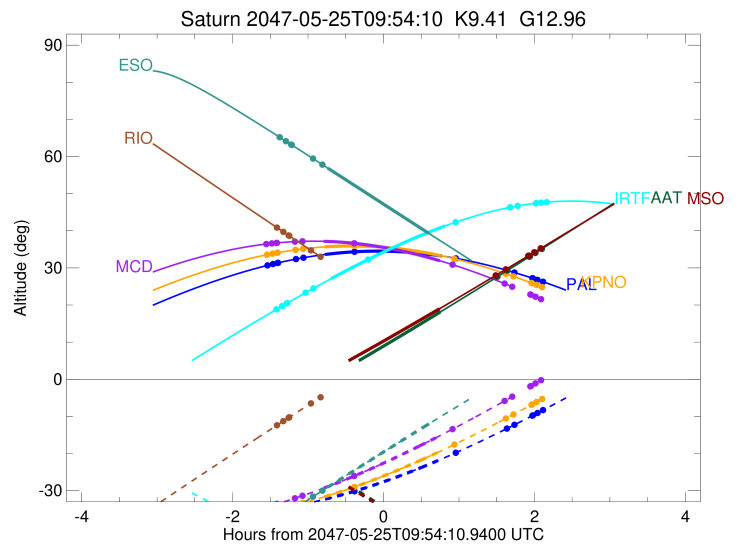
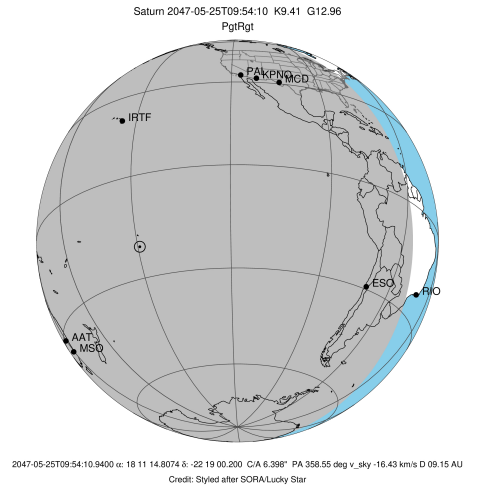
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+	+	+	MAY 25 08:22 - MAY 25 12:01	PieRie
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4	+	+	+	MAY 25 08:21 - MAY 25 12:00	PieRie
MCD	McDonald Obs.	30.7	256.0	+	+	+	MAY 25 08:21 - MAY 25 11:30	PieRie
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	+	+	MAY 25 08:29 - MAY 25 12:03	PieRie
KAV	Kavalur Observ	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+			MAY 25 08:29 - MAY 25 08:56	PnnRin
ESO	European South	-29.3	289.3	+	+		MAY 25 08:31 - MAY 25 10:30	PieRin
AAT	Siding Spring	-31.3	149.1		+	+	MAY 25 10:39 - MAY 25 12:00	PneRne
SAAO	So. Afr. Astro	-32.4	20.8			+		PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0		+	+	MAY 25 10:38 - MAY 25 11:59	PneRne





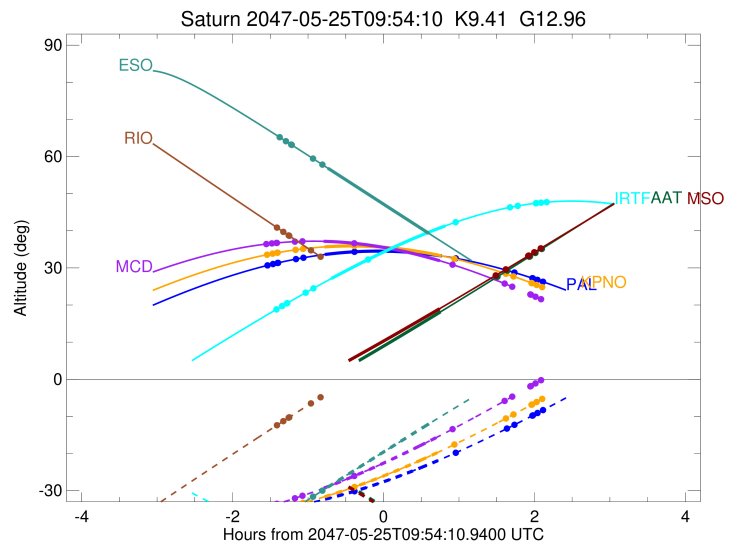
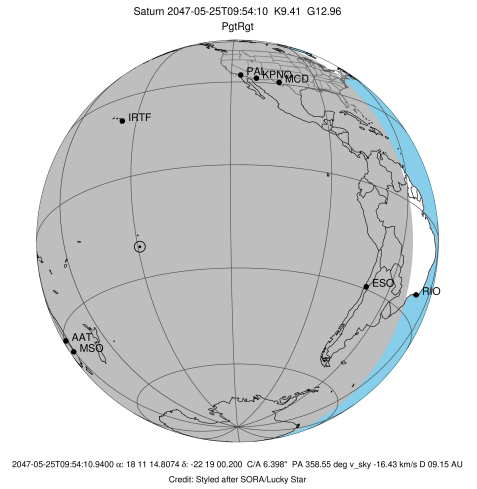
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2047-05-25T09:53:22.310  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : KPNO  
 Location : Kitt Peak Natl Obs  
 Latitude (deg) : 31.96333  
 E. Longitude (deg) : 248.40000  
 Altitude (km) : 2.120  
 Gaia source ID : 4066741774875125632  
 2Mass ID (if available) : 18111479-2219003  
 ICRS Star Coord at Epoch: 18h 11m 14.80742s -22:19:00.20021s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 9.406  
 G magnitude : 12.961  
 RP magnitude : 11.978  
 BP magnitude : 13.960  
 DUPflag : 0  
 Distance (au) : 9.149  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -16.43  
 Sun-Target sep (deg) : 150.87  
 Sun-Moon sep (deg) : 157.16  
 B (ring opening deg) : 26.20  
 PA of pole (deg) : 5.73  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 5.624  
 C/A sky separation (km) : 37320.2  
 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	2047-05-25T08:21:40.437		33.56	-35.43	140461.00	-14.11		
A (OER)	I	2047-05-25T08:26:03.561		33.85	-35.15	136774.40	-13.91		
Encke (OEG)	I	2047-05-25T08:29:42.776		34.08	-34.90	133744.89	-13.73		
Encke (IEG)	I	2047-05-25T08:30:06.217		34.10	-34.87	133423.31	-13.71		
A (IER)	I	2047-05-25T08:44:20.901		34.87	-33.79	122050.38	-12.87		
B (OER)	I	2047-05-25T08:50:14.718		35.12	-33.28	117571.16	-12.44		
B (IER)	I	2047-05-25T09:31:13.823	b	35.90	-28.99	91984.69	-7.80		
Saturn	I	2047-05-25T09:07:13.888		35.66	-31.67	59693.98		-40.04	-45.65
Saturn	E	2047-05-25T10:39:51.341		33.28	-19.31	59960.95		-27.96	-32.98
B (IER)	E	2047-05-25T10:50:39.941		32.45	-17.56	91984.69	7.82		
B (OER)	E	2047-05-25T11:31:41.479		28.39	-10.53	117571.16	12.40		
A (IER)	E	2047-05-25T11:37:36.706		27.70	-9.47	122050.38	12.81		
Encke (IEG)	E	2047-05-25T11:51:55.499		25.93	-6.86	133423.31	13.64		
Encke (OEG)	E	2047-05-25T11:52:19.066		25.88	-6.79	133744.89	13.66		
A (OER)	E	2047-05-25T11:55:59.483		25.40	-6.11	136774.40	13.83		
F ring	E	2047-05-25T12:00:24.121		24.81	-5.29	140461.00	14.03		

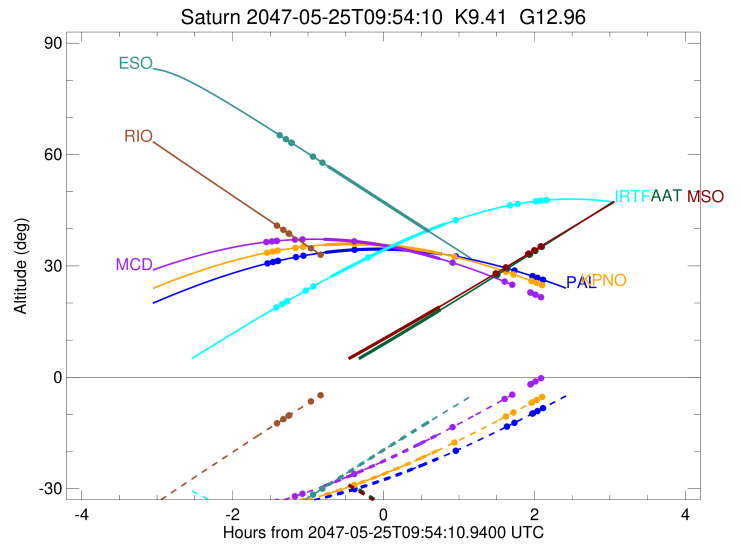
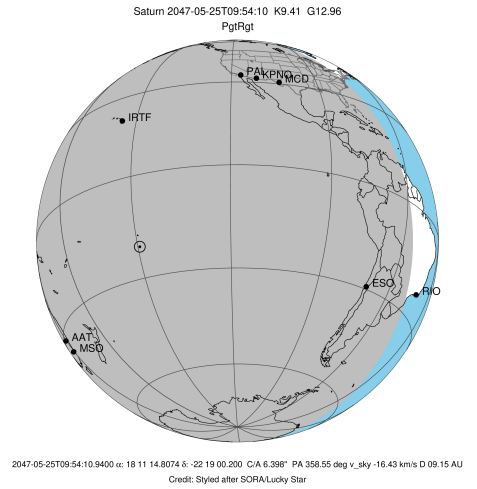
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2047-05-25T09:52:36.980  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : MCD  
 Location : McDonald Obs. 2.7m  
 Latitude (deg) : 30.67158  
 E. Longitude (deg) : 255.97844  
 Altitude (km) : 2.075  
 Gaia source ID : 4066741774875125632  
 2Mass ID (if available) : 18111479-2219003  
 ICRS Star Coord at Epoch: 18h 11m 14.80742s -22:19:00.20021s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 9.406  
 G magnitude : 12.961  
 RP magnitude : 11.978  
 BP magnitude : 13.960  
 DUPflag : 0  
 Distance (au) : 9.149  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -16.43  
 Sun-Target sep (deg) : 150.87  
 Sun-Moon sep (deg) : 157.25  
 B (ring opening deg) : 26.20  
 PA of pole (deg) : 5.73  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 5.647  
 C/A sky separation (km) : 37472.7  
 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	2047-05-25T08:21:05.120		36.43	-34.35	140461.00	-14.08		
A (OER)	I	2047-05-25T08:25:28.790		36.60	-33.94	136774.40	-13.88		
Encke (OEG)	I	2047-05-25T08:29:08.516		36.72	-33.59	133744.89	-13.69		
Encke (IEG)	I	2047-05-25T08:29:32.015		36.73	-33.55	133423.31	-13.67		
A (IER)	I	2047-05-25T08:43:49.317		37.08	-32.05	122050.38	-12.82		
B (OER)	I	2047-05-25T08:49:44.564		37.15	-31.38	117571.16	-12.39		
B (IER)	I	2047-05-25T09:31:06.798	b	36.62	-26.03	91984.69	-7.65		
Saturn	I	2047-05-25T09:06:36.186		37.16	-29.34	59691.61		-40.14	-45.76
Saturn	E	2047-05-25T10:39:00.016		31.92	-15.20	59956.53		-28.18	-33.23
B (IER)	E	2047-05-25T10:49:10.161		30.86	-13.42	91984.69	7.66		
B (OER)	E	2047-05-25T11:30:38.705		25.75	-5.80	117571.16	12.32		
A (IER)	E	2047-05-25T11:36:36.162		24.92	-4.67x	122050.38	12.74		
Encke (IEG)	E	2047-05-25T11:50:59.732		22.84	-1.90x	133423.31	13.57		
Encke (OEG)	E	2047-05-25T11:51:23.419		22.78	-1.82x	133744.89	13.59		
A (OER)	E	2047-05-25T11:55:04.956		22.23	-1.11x	136774.40	13.76		
F ring	E	2047-05-25T11:59:30.896		21.56	-0.24x	140461.00	13.96		

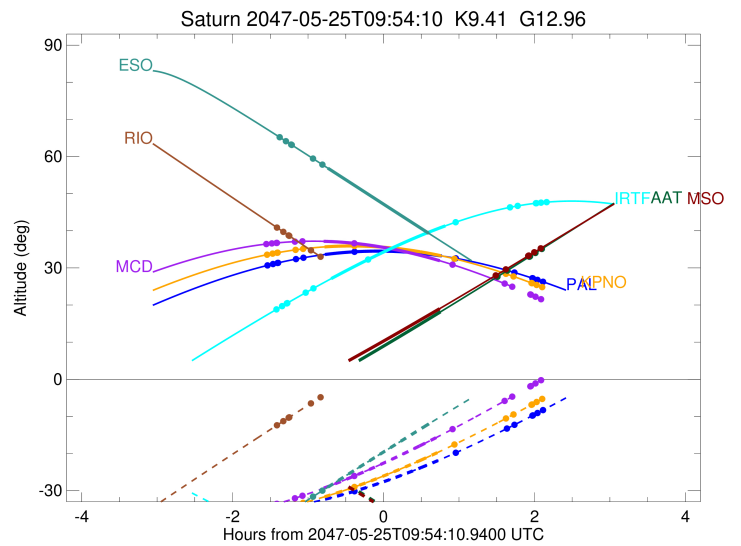
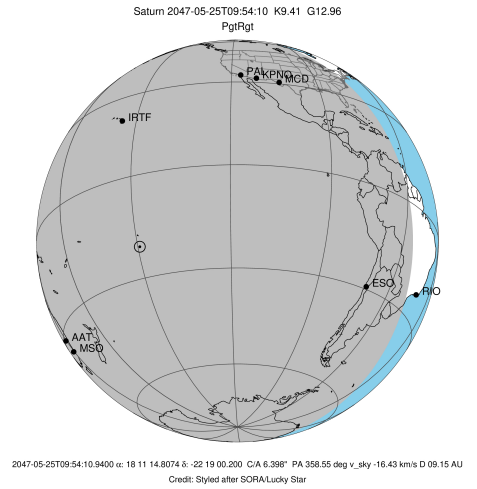


target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2047-05-25T09:48:05.510  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : RIO  
 Location : Rio de Janeiro  
 Latitude (deg) : -22.89506  
 E. Longitude (deg) : 316.77708  
 Altitude (km) : 0.033  
 Gaia source ID : 4066741774875125632  
 2Mass ID (if available) : 18111479-2219003  
 ICRS Star Coord at Epoch: 18h 11m 14.80742s -22:19:00.20021s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 9.406  
 G magnitude : 12.961  
 RP magnitude : 11.978  
 BP magnitude : 13.960  
 DUPflag : 0  
 Distance (au) : 9.149  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -16.43  
 Sun-Target sep (deg) : 150.87  
 Sun-Moon sep (deg) : 157.57  
 B (ring opening deg) : 26.20  
 PA of pole (deg) : 5.73  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 6.670  
 C/A sky separation (km) : 44260.1  
 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



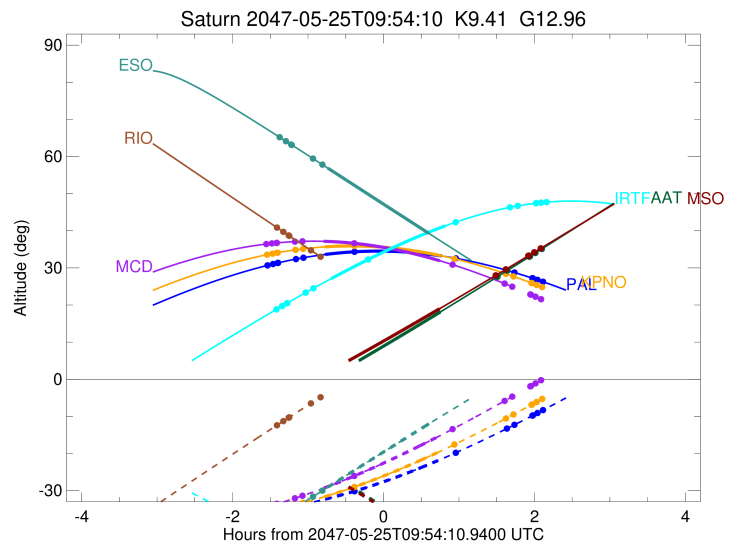
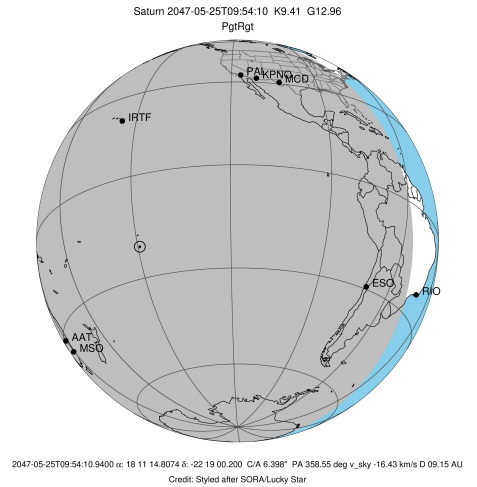
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-25T08:29:31.389		40.85	-12.38	140461.00	-12.32		
A (OER)	I	2047-05-25T08:34:34.596		39.70	-11.27	136774.40	-11.99		
Encke (OEG)	I	2047-05-25T08:38:50.328		38.73	-10.34	133744.89	-11.70		
Encke (IEG)	I	2047-05-25T08:39:17.860		38.63	-10.24	133423.31	-11.66		
A (IER)	I	2047-05-25T08:56:33.523		34.72	-6.49	122050.38	-10.24		
B (OER)	I	2047-05-25T09:04:07.349		33.01	-4.85x	117571.16	-9.49		
Saturn	I	2047-05-25T09:08:04.852		32.12	-4.00x	59528.20		-47.04	-52.53
Saturn	E	2047-05-25T10:28:38.923		14.19	12.80x	59782.50		-36.23	-41.77
B (OER)	E	2047-05-25T11:12:36.028		4.66x	21.34x	117571.16	9.37		
A (IER)	E	2047-05-25T11:20:16.133		3.03x	22.77x	122050.38	10.09		
Encke (IEG)	E	2047-05-25T11:37:49.717		-0.69x	25.96x	133423.31	11.44		
Encke (OEG)	E	2047-05-25T11:38:17.789		-0.79x	26.04x	133744.89	11.47		
A (OER)	E	2047-05-25T11:42:38.692		-1.70x	26.81x	136774.40	11.75		
F ring	E	2047-05-25T11:47:48.377		-2.78x	27.71x	140461.00	12.06		

target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2047-05-25T09:49:49.930  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : ESO  
 Location : European Southern Obs. (3.6m)  
 Latitude (deg) : -29.26097  
 E. Longitude (deg) : 289.26831  
 Altitude (km) : 2.400  
 Gaia source ID : 4066741774875125632  
 2Mass ID (if available) : 18111479-2219003  
 ICRS Star Coord at Epoch: 18h 11m 14.80742s -22:19:00.20021s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 9.406  
 G magnitude : 12.961  
 RP magnitude : 11.978  
 BP magnitude : 13.960  
 DUPflag : 0  
 Distance (au) : 9.149  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -16.43  
 Sun-Target sep (deg) : 150.87  
 Sun-Moon sep (deg) : 157.50  
 B (ring opening deg) : 26.20  
 PA of pole (deg) : 5.73  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 6.627  
 C/A sky separation (km) : 43976.9  
 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\_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	2047-05-25T08:31:40.830		65.19	-37.36	140461.00	-12.52		
A (OER)	I	2047-05-25T08:36:38.954		64.12	-36.28	136774.40	-12.20		
Encke (OEG)	I	2047-05-25T08:40:50.160		63.21	-35.37	133744.89	-11.91		
Encke (IEG)	I	2047-05-25T08:41:17.190		63.11	-35.27	133423.31	-11.88		
A (IER)	I	2047-05-25T08:58:11.499		59.43	-31.61	122050.38	-10.48		
B (OER)	I	2047-05-25T09:05:33.947		57.82	-30.01	117571.16	-9.75		
Saturn	I	2047-05-25T09:09:52.207		56.88	-29.08	59532.72		-46.85	-52.35
Saturn	E	2047-05-25T10:30:17.361		39.29	-12.01	59792.73		-35.78	-41.31
B (OER)	E	2047-05-25T11:14:30.337		29.71	-2.93x	117571.16	9.66		
A (IER)	E	2047-05-25T11:21:57.540		28.10	-1.43x	122050.38	10.36		
Encke (IEG)	E	2047-05-25T11:39:05.624		24.43	1.98x	133423.31	11.70		
Encke (OEG)	E	2047-05-25T11:39:33.072		24.34	2.07x	133744.89	11.73		
A (OER)	E	2047-05-25T11:43:48.282		23.43	2.90x	136774.40	12.01		
F ring	E	2047-05-25T11:48:51.432		22.35	3.89x	140461.00	12.31		

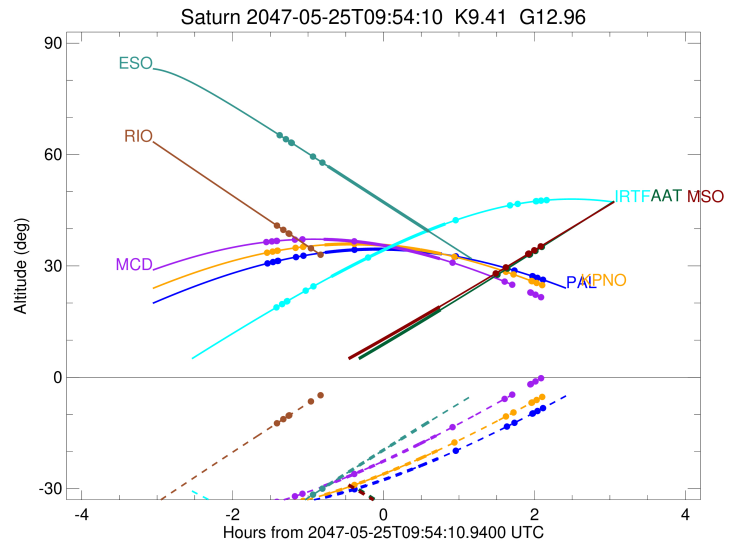
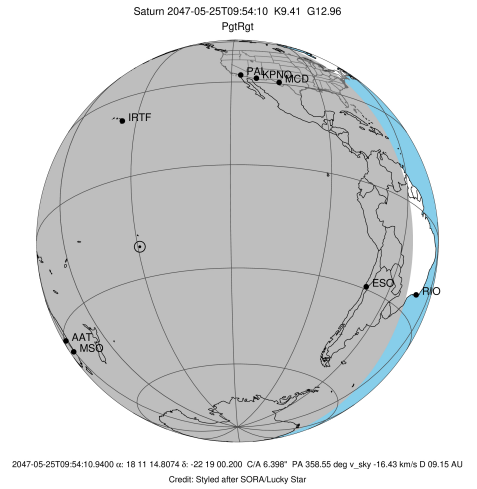
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2047-05-25T10:00:14.030  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : AAT  
 Location : Siding Spring (AAT)  
 Latitude (deg) : -31.27703  
 E. Longitude (deg) : 149.06608  
 Altitude (km) : 1.164  
 Gaia source ID : 4066741774875125632  
 2Mass ID (if available) : 18111479-2219003  
 ICRS Star Coord at Epoch: 18h 11m 14.80742s -22:19:00.20021s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 9.406  
 G magnitude : 12.961  
 RP magnitude : 11.978  
 BP magnitude : 13.960  
 DUPflag : 0  
 Distance (au) : 9.149  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -16.43  
 Sun-Target sep (deg) : 150.87  
 Sun-Moon sep (deg) : 156.03  
 B (ring opening deg) : 26.20  
 PA of pole (deg) : 5.73  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 6.840  
 C/A sky separation (km) : 45385.9  
 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\_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	2047-05-25T08:46:08.976		-4.32x	-20.04	140461.00	-11.92		
A (OER)	I	2047-05-25T08:51:22.330		-3.33x	-21.13	136774.40	-11.60		
Encke (OEG)	I	2047-05-25T08:55:46.798		-2.50x	-22.05	133744.89	-11.31		
Encke (IEG)	I	2047-05-25T08:56:15.282		-2.41x	-22.15	133423.31	-11.27		
A (IER)	I	2047-05-25T09:14:09.817		1.02x	-25.92	122050.38	-9.83		
B (OER)	I	2047-05-25T09:22:03.859	b	2.56x	-27.59	117571.16	-9.05		
Saturn	I	2047-05-25T09:21:07.904		2.37x	-27.39	59479.34		-49.12	-54.51
Saturn	E	2047-05-25T10:39:36.649		18.18	-44.12	59771.77		-36.69	-42.25
B (OER)	E	2047-05-25T11:24:59.109		27.67	-53.81	117571.16	9.22		
A (IER)	E	2047-05-25T11:32:44.576		29.31	-55.46	122050.38	10.02		
Encke (IEG)	E	2047-05-25T11:50:17.299		33.03	-59.16	133423.31	11.53		
Encke (OEG)	E	2047-05-25T11:50:45.158		33.13	-59.26	133744.89	11.56		
A (OER)	E	2047-05-25T11:55:03.690		34.05	-60.16	136774.40	11.87		
F ring	E	2047-05-25T12:00:09.720		35.13	-61.23	140461.00	12.22		



target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2047-05-25T09:59:58.710  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : MSO  
 Location : Mt. Stromlo Observatory  
 Latitude (deg) : -35.32000  
 E. Longitude (deg) : 149.00833  
 Altitude (km) : 0.770  
 Gaia source ID : 4066741774875125632  
 2Mass ID (if available) : 18111479-2219003  
 ICRS Star Coord at Epoch: 18h 11m 14.80742s -22:19:00.20021s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 9.406  
 G magnitude : 12.961  
 RP magnitude : 11.978  
 BP magnitude : 13.960  
 DUPflag : 0  
 Distance (au) : 9.149  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -16.43  
 Sun-Target sep (deg) : 150.87  
 Sun-Moon sep (deg) : 156.06  
 B (ring opening deg) : 26.20  
 PA of pole (deg) : 5.73  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 6.893  
 C/A sky separation (km) : 45741.4  
 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\_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	2047-05-25T08:46:48.093	-2.26x	-20.98	140461.00	-11.83			
A (OER)	I	2047-05-25T08:52:04.091	-1.31x	-22.04	136774.40	-11.50			
Encke (OEG)	I	2047-05-25T08:56:31.048	-0.51x	-22.93	133744.89	-11.19			
Encke (IEG)	I	2047-05-25T08:56:59.817	-0.42x	-23.03	133423.31	-11.16			
A (IER)	I	2047-05-25T09:15:08.027	2.90x	-26.69	122050.38	-9.67			
B (OER)	I	2047-05-25T09:23:10.732	b	4.39x	-28.32	117571.16	-8.87		
Saturn	I	2047-05-25T09:21:19.461		4.05x	-27.95	59470.42		-49.50	-54.88
Saturn	E	2047-05-25T10:38:55.260		19.04	-43.78	59760.97		-37.16	-42.73
B (OER)	E	2047-05-25T11:23:39.093		28.02	-52.84	117571.16	9.02		
A (IER)	E	2047-05-25T11:31:33.454		29.62	-54.42	122050.38	9.85		
Encke (IEG)	E	2047-05-25T11:49:20.552		33.25	-57.93	133423.31	11.40		
Encke (OEG)	E	2047-05-25T11:49:48.716		33.34	-58.02	133744.89	11.44		
A (OER)	E	2047-05-25T11:54:09.945		34.23	-58.86	136774.40	11.76		
F ring	E	2047-05-25T11:59:18.880		35.29	-59.86	140461.00	12.11		