

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2049-10-26T23:56:13.780
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 6772102367012417792
 2Mass ID (if available) : 19303582-2156057

Saturn 2049-10-26T23:56:13 K9.96 G13.05 PgtRgt

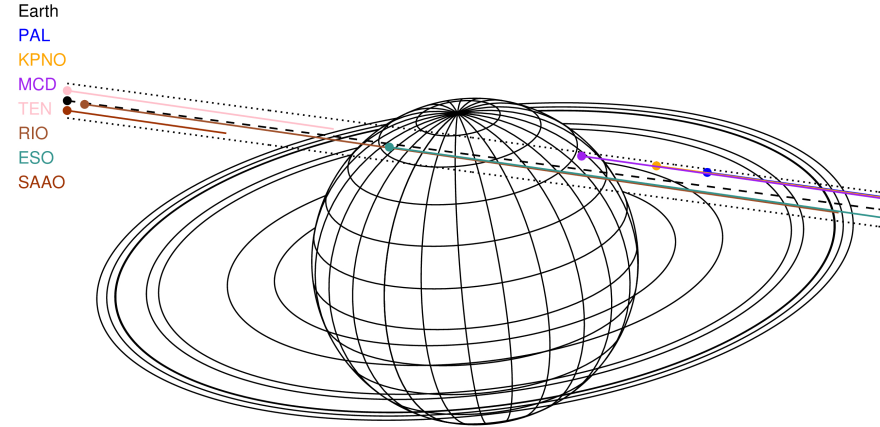
ICRS Star Coord at Epoch: 19h 30m 35.81343s -21:56:05.99181s

RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.955
 G magnitude : 13.051
 RP magnitude : 12.166
 BP magnitude : 13.874
 DUPflag : 0
 Distance (au) : 10.159
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.00
 Sun-Target sep (deg) : 77.62
 Sun-Moon sep (deg) : 73.69
 B (ring opening deg) : 23.80
 PA of pole (deg) : 6.76

#	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

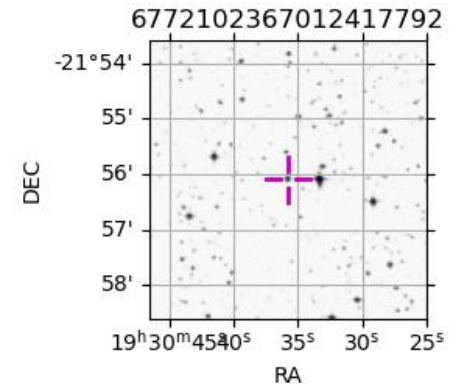


2049-10-26T23:56:13.7800 α: 19 30 35.8134 δ: -21 56 05.992 C/A 5.279° PA 172.38 deg v_sky +16.00 km/s D 10.16 AU
 Credit: Styled after SORA/Lucky Star

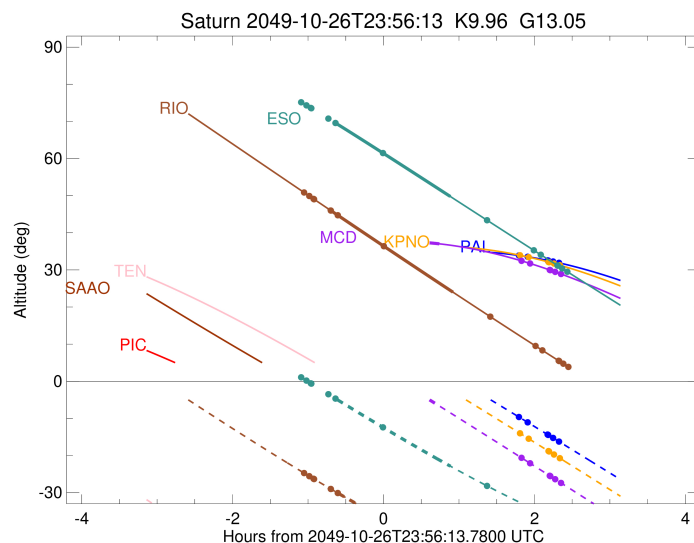
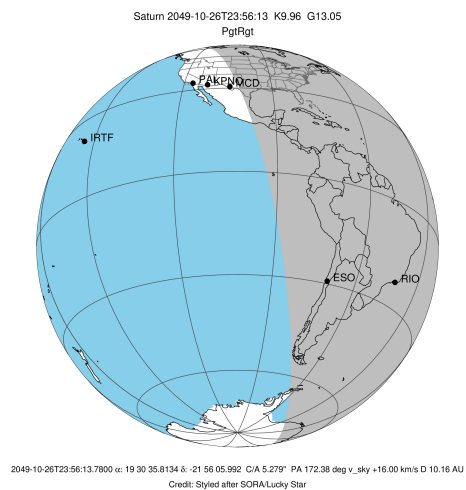


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (20	33.4	243.1			+	OCT 27 01:44 - OCT 27 02:15	PnnRne
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4			+	OCT 27 01:44 - OCT 27 02:16	PnnRne
MCD	McDonald Obs.	30.7	256.0		+	+	OCT 27 00:40 - OCT 27 02:17	PneRne
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	+	+	+	OCT 26 22:53 - OCT 27 02:15	PieRie
ESO	European South	-29.3	289.3		+	+	OCT 27 00:49 - OCT 27 02:22	PneRne
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



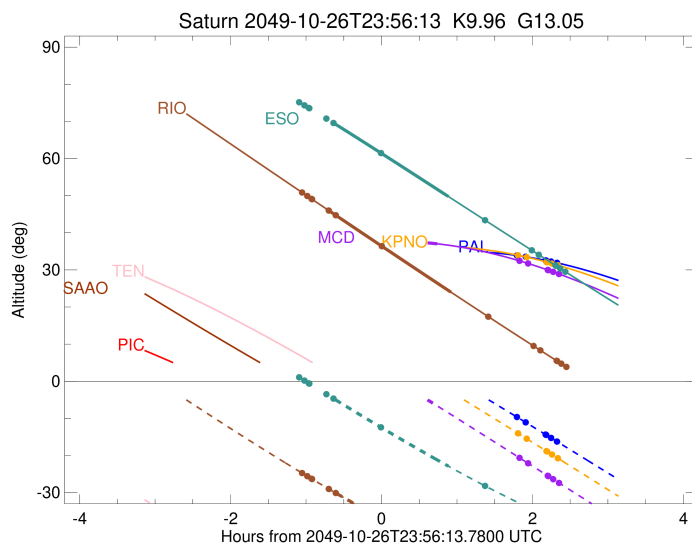
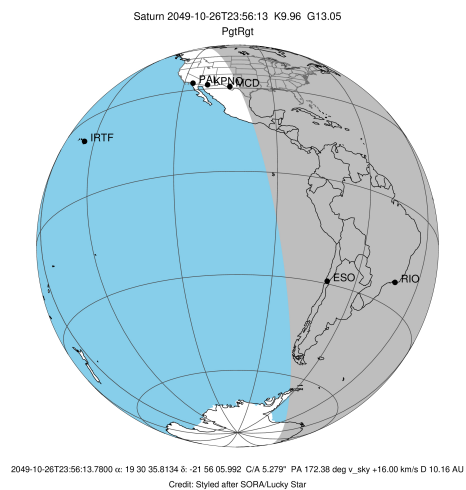
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2049-10-26T23:55:31.770
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 6772102367012417792
 2Mass ID (if available) : 19303582-2156057
 ICRS Star Coord at Epoch: 19h 30m 35.81343s -21:56:05.99181s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.955
 G magnitude : 13.051
 RP magnitude : 12.166
 BP magnitude : 13.874
 DUPflag : 0
 Distance (au) : 10.159
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.00
 Sun-Target sep (deg) : 77.62
 Sun-Moon sep (deg) : 74.18
 B (ring opening deg) : 23.80
 PA of pole (deg) : 6.76
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.998
 C/A sky separation (km) : 44193.5
 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	2049-10-26T23:04:01.851		28.66	21.54x	140461.00	-13.09		
A (OER)	I	2049-10-26T23:08:46.848		29.15	20.70x	136774.40	-12.78		
Encke (OEG)	I	2049-10-26T23:12:46.538		29.56	19.99x	133744.89	-12.50		
Encke (IEG)	I	2049-10-26T23:13:12.301	b	29.60	19.91x	133423.31	-12.47		
A (IER)	I	2049-10-26T23:29:14.147	b	31.08	17.00x	122050.38	-11.12		
B (OER)	I	2049-10-26T23:36:09.575	b	31.65	15.72x	117571.16	-10.43		
Saturn	I	2049-10-26T23:12:54.577		29.57	19.96x	59543.41		54.08	59.15
Saturn	E	2049-10-27T00:38:51.568		34.81	3.60x	59990.44		29.90	35.08
B (OER)	E	2049-10-27T01:44:03.712		33.88	-9.66	117571.17	10.54		
A (IER)	E	2049-10-27T01:50:54.410		33.53	-11.08	122050.38	11.26		
Encke (IEG)	E	2049-10-27T02:06:44.379		32.56	-14.36	133423.31	12.63		
Encke (OEG)	E	2049-10-27T02:07:09.810		32.53	-14.45	133744.89	12.66		
A (OER)	E	2049-10-27T02:11:06.370		32.25	-15.27	136774.40	12.95		
F ring	E	2049-10-27T02:15:47.564		31.90	-16.25	140461.00	13.27		

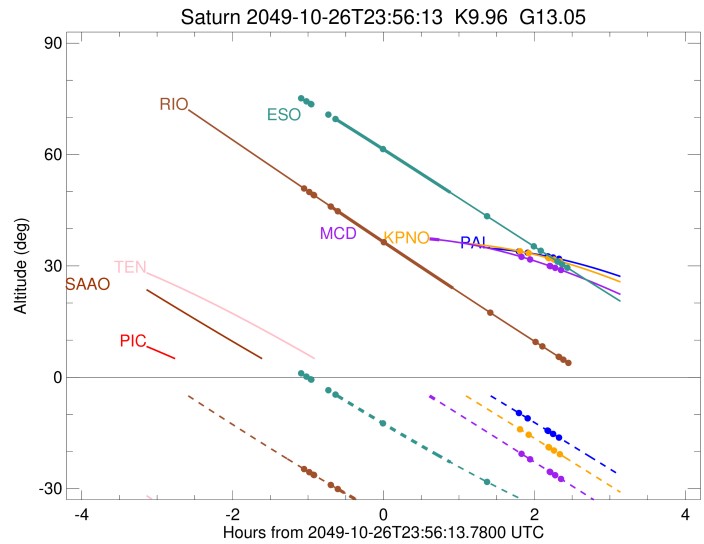
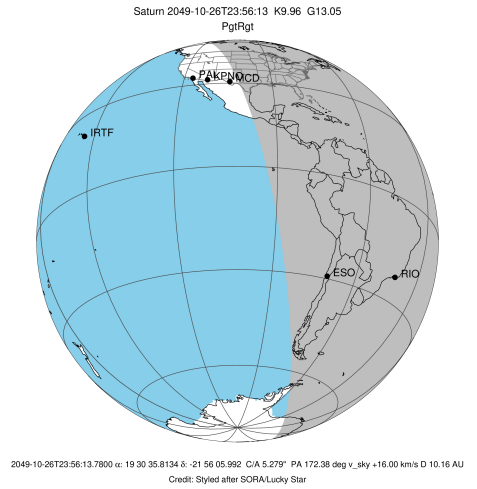
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2049-10-26T23:56:03.350
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 6772102367012417792
 2Mass ID (if available) : 19303582-2156057
 ICRS Star Coord at Epoch: 19h 30m 35.81343s -21:56:05.99181s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.955
 G magnitude : 13.051
 RP magnitude : 12.166
 BP magnitude : 13.874
 DUPflag : 0
 Distance (au) : 10.159
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.00
 Sun-Target sep (deg) : 77.62
 Sun-Moon sep (deg) : 74.23
 B (ring opening deg) : 23.80
 PA of pole (deg) : 6.76
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.982
 C/A sky separation (km) : 44080.4
 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



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	2049-10-26T23:04:15.869		31.99	18.39x	140461.00	-13.12		
A (OER)	I	2049-10-26T23:09:00.105		32.41	17.51x	136774.40	-12.81		
Encke (OEG)	I	2049-10-26T23:12:59.069		32.75	16.76x	133744.89	-12.54		
Encke (IEG)	I	2049-10-26T23:13:24.750	b	32.79	16.68x	133423.31	-12.51		
A (IER)	I	2049-10-26T23:29:22.632	b	34.01	13.63x	122050.38	-11.18		
B (OER)	I	2049-10-26T23:36:15.662	b	34.46	12.29x	117571.16	-10.50		
Saturn	I	2049-10-26T23:13:15.492		32.78	16.71x	59544.85		54.00	59.07
Saturn	E	2049-10-27T00:39:32.754		36.38	-0.40x	59993.66		29.70	34.88
B (OER)	E	2049-10-27T01:44:55.401		33.93	-14.05	117571.16	10.63		
A (IER)	E	2049-10-27T01:51:43.127		33.43	-15.48	122050.38	11.33		
Encke (IEG)	E	2049-10-27T02:07:27.590		32.11	-18.82	133423.31	12.69		
Encke (OEG)	E	2049-10-27T02:07:52.892		32.08	-18.91	133744.89	12.73		
A (OER)	E	2049-10-27T02:11:48.293		31.71	-19.74	136774.40	13.01		
F ring	E	2049-10-27T02:16:28.184		31.27	-20.73	140461.00	13.33		

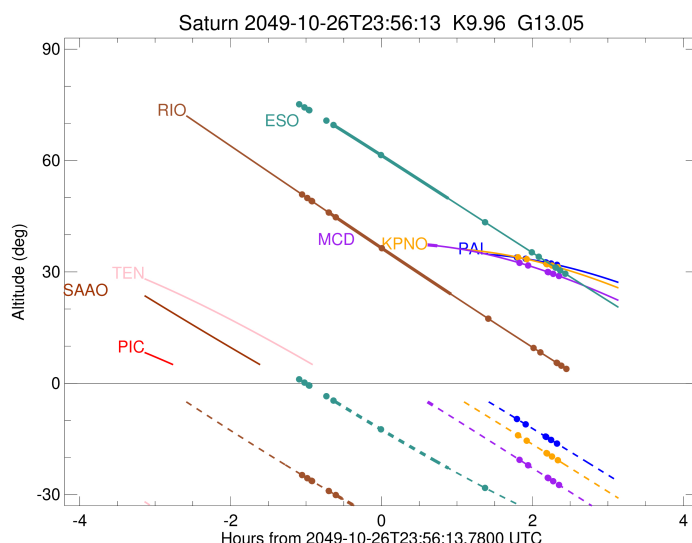
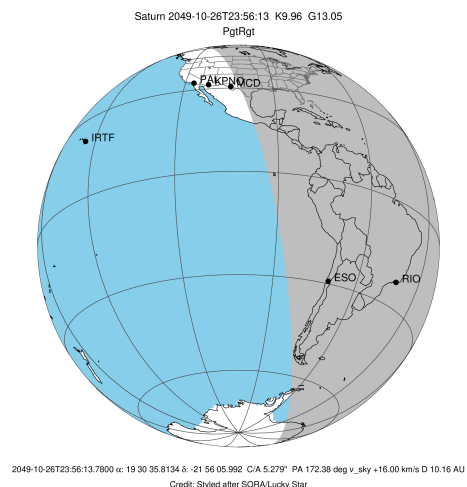
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2049-10-26T23:56:51.630
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 6772102367012417792
 2Mass ID (if available) : 19303582-2156057
 ICRS Star Coord at Epoch: 19h 30m 35.81343s -21:56:05.99181s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.955
 G magnitude : 13.051
 RP magnitude : 12.166
 BP magnitude : 13.874
 DUPflag : 0
 Distance (au) : 10.159
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.00
 Sun-Target sep (deg) : 77.62
 Sun-Moon sep (deg) : 74.28
 B (ring opening deg) : 23.80
 PA of pole (deg) : 6.76
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.961
 C/A sky separation (km) : 43924.9
 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



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	2049-10-26T23:04:42.218		35.61	13.06x	140461.00	-13.17		
A (OER)	I	2049-10-26T23:09:25.233		35.91	12.12x	136774.40	-12.87		
Encke (OEG)	I	2049-10-26T23:13:23.057		36.14	11.34x	133744.89	-12.60		
Encke (IEG)	I	2049-10-26T23:13:48.608		36.16	11.25x	133423.31	-12.57		
A (IER)	I	2049-10-26T23:29:40.496	b	36.93	8.06x	122050.38	-11.27		
B (OER)	I	2049-10-26T23:36:30.021	b	37.18	6.68x	117571.16	-10.59		
Saturn	I	2049-10-26T23:13:50.526		36.17	11.24x	59546.78		53.90	58.97
Saturn	E	2049-10-27T00:40:32.609		37.03	-6.64	59998.05		29.44	34.59
B (OER)	E	2049-10-27T01:46:06.570		32.42	-20.65	117571.16	10.75		
A (IER)	E	2049-10-27T01:52:50.028		31.73	-22.10	122050.38	11.44		
Encke (IEG)	E	2049-10-27T02:08:26.434		29.98	-25.46	133423.31	12.79		
Encke (OEG)	E	2049-10-27T02:08:51.547		29.93	-25.55	133744.89	12.82		
A (OER)	E	2049-10-27T02:12:45.226		29.46	-26.39	136774.40	13.10		
F ring	E	2049-10-27T02:17:23.173		28.90	-27.39	140461.00	13.42		

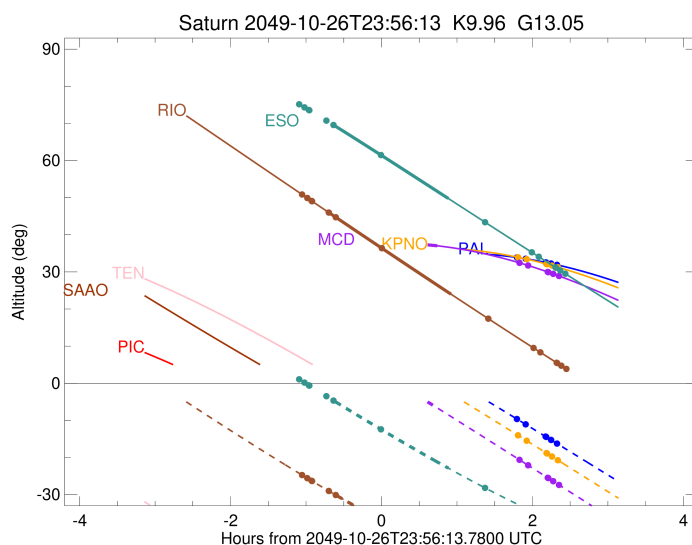
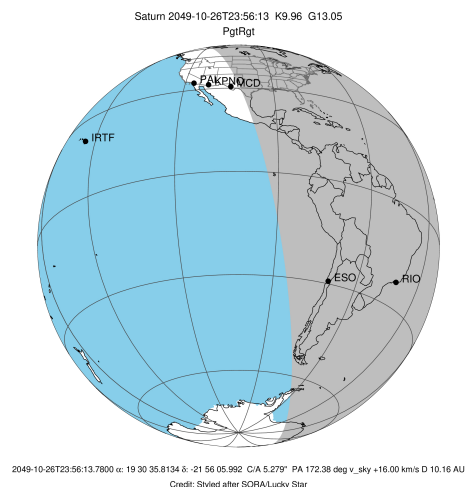
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2049-10-27T00:01:42.030
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 6772102367012417792
 2Mass ID (if available) : 19303582-2156057
 ICRS Star Coord at Epoch: 19h 30m 35.81343s -21:56:05.99181s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.955
 G magnitude : 13.051
 RP magnitude : 12.166
 BP magnitude : 13.874
 DUPflag : 0
 Distance (au) : 10.159
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.00
 Sun-Target sep (deg) : 77.62
 Sun-Moon sep (deg) : 74.42
 B (ring opening deg) : 23.80
 PA of pole (deg) : 6.76
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.025
 C/A sky separation (km) : 37029.1
 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	2049-10-26T22:53:11.045		50.83	-24.75	140461.00	-14.96		
A (OER)	I	2049-10-26T22:57:18.944		49.88	-25.59	136774.40	-14.78		
Encke (OEG)	I	2049-10-26T23:00:45.107		49.10	-26.29	133744.89	-14.61		
Encke (IEG)	I	2049-10-26T23:01:07.131		49.01	-26.36	133423.31	-14.59		
A (IER)	I	2049-10-26T23:14:26.942	b	45.96	-29.04	122050.38	-13.81		
B (OER)	I	2049-10-26T23:19:55.831	b	44.71	-30.12	117571.16	-13.42		
B (IER)	I	2049-10-26T23:56:41.575	b	36.34	-37.07	91984.69	-9.27		
Saturn	I	2049-10-26T23:12:11.227		46.48	-28.59	59671.64		47.18	52.67
Saturn	E	2049-10-27T00:51:30.136		23.99	-46.05	60123.94		21.01	25.19
B (IER)	E	2049-10-27T01:21:10.906		17.39	-49.87	91984.69	9.42		
B (OER)	E	2049-10-27T01:57:11.539		9.49	-53.08	117571.16	13.75		
A (IER)	E	2049-10-27T02:02:32.261		8.33	-53.40	122050.38	14.17		
Encke (IEG)	E	2049-10-27T02:15:30.736		5.53	-53.99	133423.31	15.01		
Encke (OEG)	E	2049-10-27T02:15:52.142		5.45	-54.00	133744.89	15.03		
A (OER)	E	2049-10-27T02:19:12.436		4.73x	-54.10	136774.40	15.22		
F ring	E	2049-10-27T02:23:13.078		3.87x	-54.21	140461.00	15.42		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2049-10-26T23:59:23.520
 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 : 6772102367012417792
 2Mass ID (if available) : 19303582-2156057
 ICRS Star Coord at Epoch: 19h 30m 35.81343s -21:56:05.99181s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.955
 G magnitude : 13.051
 RP magnitude : 12.166
 BP magnitude : 13.874
 DUPflag : 0
 Distance (au) : 10.159
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.00
 Sun-Target sep (deg) : 77.62
 Sun-Moon sep (deg) : 74.60
 B (ring opening deg) : 23.80
 PA of pole (deg) : 6.76
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.075
 C/A sky separation (km) : 37395.4
 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	2049-10-26T22:50:52.198		75.14	1.05x	140461.00	-14.72		
A (OER)	I	2049-10-26T22:55:04.184		74.31	0.16x	136774.40	-14.53		
Encke (OEG)	I	2049-10-26T22:58:33.870		73.60	-0.58x	133744.89	-14.36		
Encke (IEG)	I	2049-10-26T22:58:56.278		73.53	-0.66x	133423.31	-14.34		
A (IER)	I	2049-10-26T23:12:31.064	b	70.73	-3.51x	122050.38	-13.54		
B (OER)	I	2049-10-26T23:18:06.822	b	69.56	-4.68x	117571.16	-13.14		
B (IER)	I	2049-10-26T23:56:01.261	b	61.43	-12.45	91984.69	-8.84		
Saturn	I	2049-10-26T23:09:47.727		71.30	-2.94x	59667.29		47.41	52.89
Saturn	E	2049-10-27T00:49:22.938		49.77	-22.87	60117.27		21.51	25.77
B (IER)	E	2049-10-27T01:18:37.089		43.37	-28.20	91984.69	8.96		
B (OER)	E	2049-10-27T01:55:48.868		35.26	-34.44	117571.16	13.44		
A (IER)	E	2049-10-27T02:01:16.965		34.08	-35.29	122050.38	13.86		
Encke (IEG)	E	2049-10-27T02:14:31.831		31.21	-37.28	133423.31	14.72		
Encke (OEG)	E	2049-10-27T02:14:53.663		31.13	-37.33	133744.89	14.74		
A (OER)	E	2049-10-27T02:18:17.887		30.39	-37.82	136774.40	14.93		
F ring	E	2049-10-27T02:22:23.129		29.51	-38.40	140461.00	15.14		