

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2025-10-27T19:27:55.360  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 51128222702163968  
 2Mass ID (if available) : 03514472+1957255

ICRS Star Coord at Epoch: 03h 51m 44.72903s +19:57:25.76442s

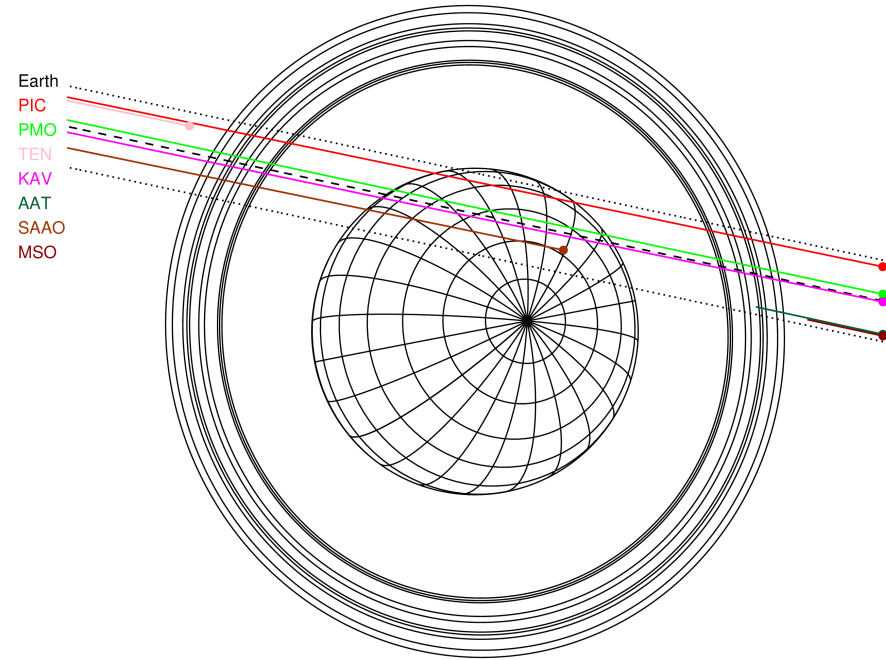
RUWE (>1.4 is poor) : 1.05  
 K magnitude : 14.662  
 G magnitude : 18.049  
 RP magnitude : 16.995  
 BP magnitude : 19.189  
 DUPflag : 0  
 Distance (au) : 18.602  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.49  
 Sun-Target sep (deg) : 154.21  
 Sun-Moon sep (deg) : 136.85  
 B (ring opening deg) : 70.93  
 PA of pole (deg) : -78.57

#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



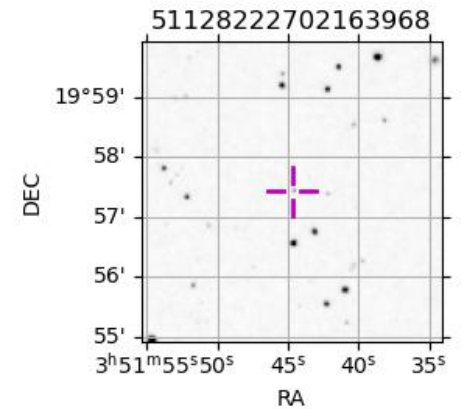
2025-10-27T19:27:55.3600 ex: 03 51 44.7290 s; +19 57 25.764 C/A 1.340" PA 167.93 deg v\_sky -20.49 km/s D 18.60 AU  
 Credit: Styled after SORA/Lucky Star

Uranus 2025-10-27T19:27:55 K14.66 G18.05 PgtRgt

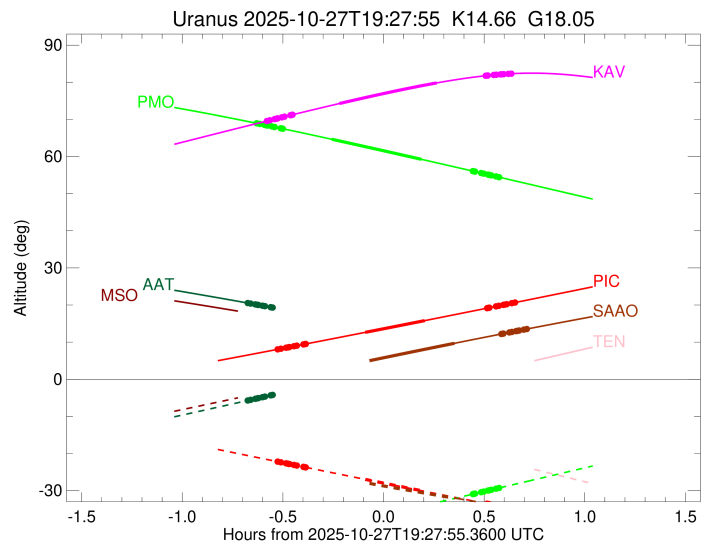
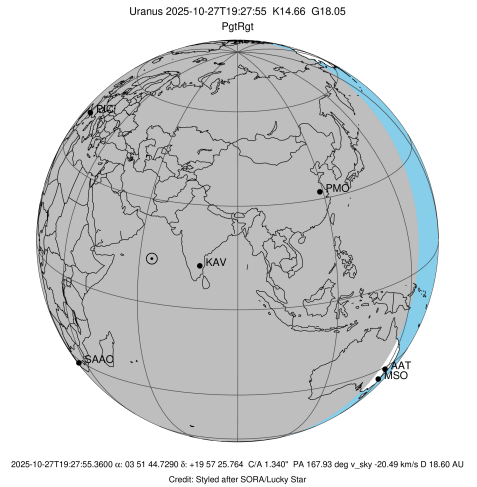


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	OCT 27 18:56 - OCT 27 20:07	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	OCT 27 18:50 - OCT 27 20:02	PieRie
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
MCD	McDonald Obs. 2.7m	30.7	256.0					PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	OCT 27 18:53 - OCT 27 20:06	PieRie
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European Southern Obs	-29.3	289.3					PnnRnn
AAT	Siding Spring (AAT)	-31.3	149.1	+++++			OCT 27 18:47 - OCT 27 18:50	PnnRin
SAAO	So. Afr. Astro. Obs.	-32.4	20.8		+	+++++	OCT 27 19:49 - OCT 27 20:10	PneRne
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

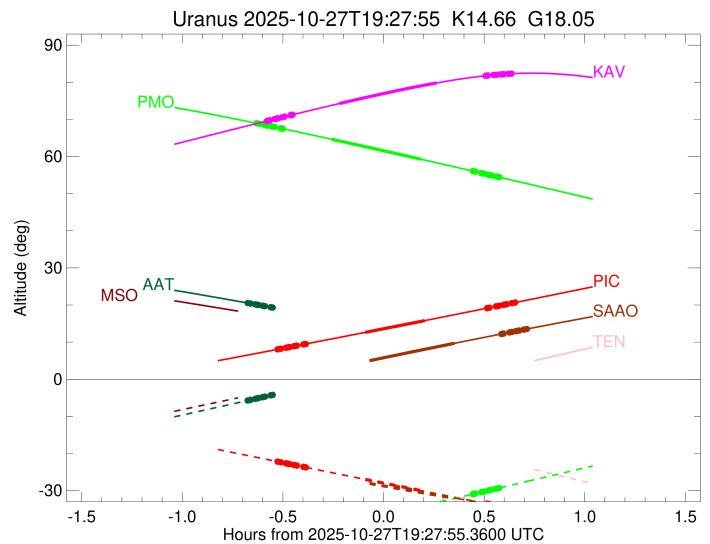
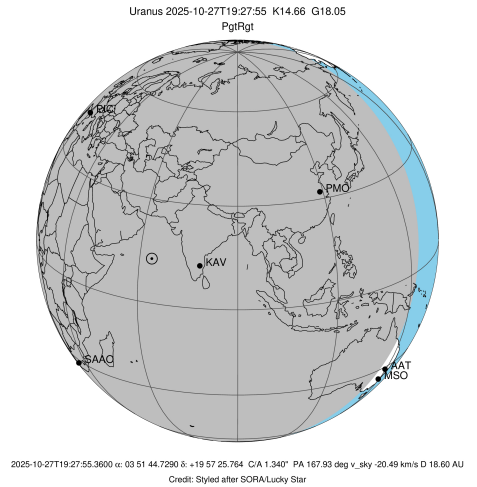


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2025-10-27T19:31:04.330  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 51128222702163968  
 2Mass ID (if available) : 03514472+1957255  
 ICRS Star Coord at Epoch: 03h 51m 44.72903s +19:57:25.76442s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 14.662  
 G magnitude : 18.049  
 RP magnitude : 16.995  
 BP magnitude : 19.189  
 DUPflag : 0  
 Distance (au) : 18.602  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.49  
 Sun-Target sep (deg) : 154.21  
 Sun-Moon sep (deg) : 137.31  
 B (ring opening deg) : 70.93  
 PA of pole (deg) : -78.57  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.702  
 C/A sky separation (km) : 22958.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.spk  
 ura111.bsp  
 IAU\_URANUS\_for\_RINGFIT.tpc  
 vgr2.ura111.bsp  
 ura161.bsp  
 vgr2.ura161.bsp  
 peph.ura160.bsp  
 earthstns\_itr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-10-27T18:56:30.021		8.08	-22.22	51007.05	-19.15		
lambda	I	2025-10-27T18:57:21.540		8.23	-22.37	50026.71	-18.98		
delta	I	2025-10-27T18:58:52.943		8.49	-22.65	48300.35	-18.79		
gamma	I	2025-10-27T18:59:28.865		8.60	-22.76	47626.70	-18.71		
eta	I	2025-10-27T18:59:52.980		8.67	-22.84	47176.12	-18.66		
beta	I	2025-10-27T19:01:14.572		8.91	-23.09	45660.46	-18.46		
alpha	I	2025-10-27T19:02:05.082		9.05	-23.24	44733.61	-18.33		
4	I	2025-10-27T19:04:02.128		9.39	-23.60	42615.57	-17.98		
5	I	2025-10-27T19:04:24.612		9.46	-23.67	42215.66	-17.89		
6	I	2025-10-27T19:04:46.496		9.52	-23.73	41807.69	-17.84		
Uranus	I	2025-10-27T19:22:28.622		12.63	-26.97	25267.54		14.02	14.65
Uranus	E	2025-10-27T19:40:12.739		15.80	-30.19	25557.63		-0.95	-0.99
6	E	2025-10-27T19:58:49.987		19.16	-33.53	41876.83	17.92		
5	E	2025-10-27T19:59:06.346		19.21	-33.58	42171.09	17.97		
4	E	2025-10-27T19:59:27.310		19.27	-33.65	42544.55	18.06		
alpha	E	2025-10-27T20:01:27.868		19.64	-34.00	44738.42	18.42		
beta	E	2025-10-27T20:02:18.671		19.79	-34.15	45679.03	18.55		
eta	E	2025-10-27T20:03:38.905		20.03	-34.39	47176.12	18.75		
gamma	E	2025-10-27T20:04:03.099		20.11	-34.46	47630.54	18.81		
delta	E	2025-10-27T20:04:38.629		20.21	-34.57	48300.35	18.89		
lambda	E	2025-10-27T20:06:09.536		20.49	-34.84	50026.71	19.09		
epsilon	E	2025-10-27T20:07:28.457		20.73	-35.07	51539.02	19.26		

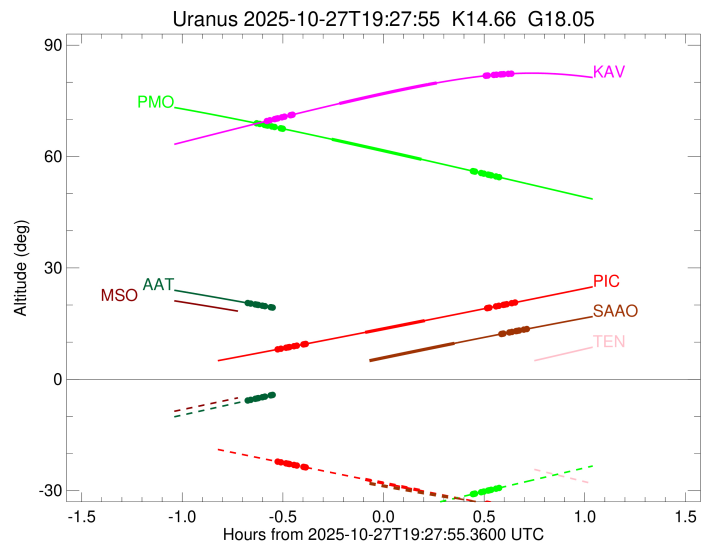
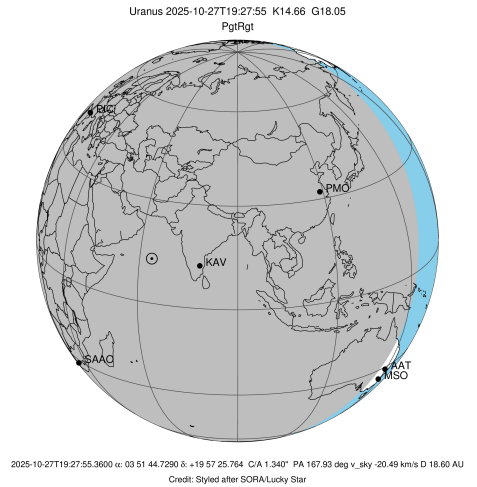
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2025-10-27T19:25:37.730  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PMO  
 Location : Purple Mtn Obs. Nanking  
 Latitude (deg) : 32.06667  
 E. Longitude (deg) : 118.82089  
 Altitude (km) : 0.364  
 Gaia source ID : 51128222702163968  
 2Mass ID (if available) : 03514472+1957255  
 ICRS Star Coord at Epoch: 03h 51m 44.72903s +19:57:25.76442s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 14.662  
 G magnitude : 18.049  
 RP magnitude : 16.995  
 BP magnitude : 19.189  
 DUPflag : 0  
 Distance (au) : 18.602  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.49  
 Sun-Target sep (deg) : 154.21  
 Sun-Moon sep (deg) : 137.08  
 B (ring opening deg) : 70.93  
 PA of pole (deg) : -78.57  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.409  
 C/A sky separation (km) : 19010.4  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.spk  
 ural11.bsp  
 IAU\_URANUS\_for\_RINGFIT.tpc  
 vgr2.ural11.bsp  
 ural61.bsp  
 vgr2.ural61.bsp  
 peph.ural60.bsp  
 earthstns\_itrf93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

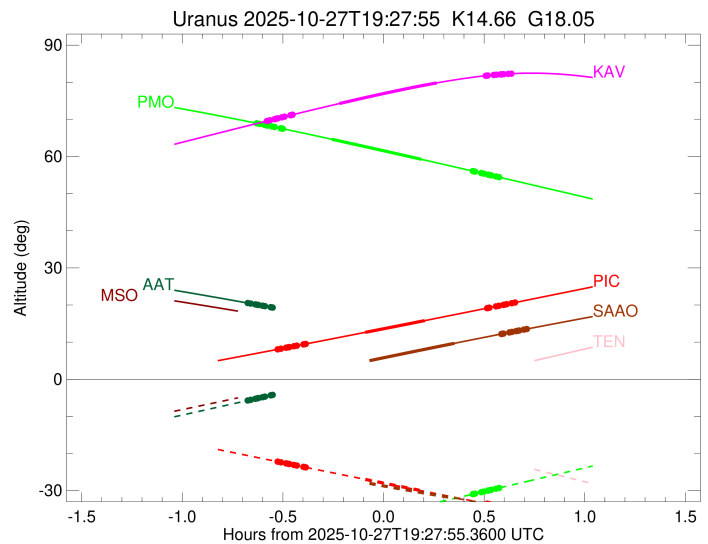
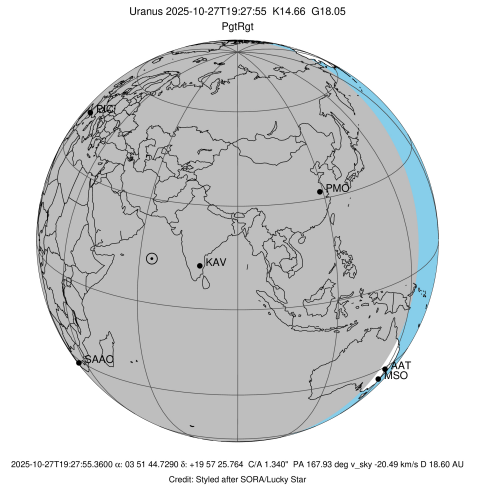
Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-10-27T18:50:15.747	68.92	-44.42	50973.70	-20.33		
lambda	I	2025-10-27T18:51:02.540	68.78	-44.26	50026.71	-20.21		
delta	I	2025-10-27T18:52:28.246	68.51	-43.96	48300.35	-20.08		
gamma	I	2025-10-27T18:53:01.870	68.41	-43.85	47626.18	-20.02		
eta	I	2025-10-27T18:53:24.367	68.34	-43.77	47176.12	-19.99		
beta	I	2025-10-27T18:54:40.491	68.10	-43.51	45658.41	-19.85		
alpha	I	2025-10-27T18:55:27.435	67.95	-43.35	44730.34	-19.77		
4	I	2025-10-27T18:57:15.419	67.61	-42.97	42616.35	-19.53		
5	I	2025-10-27T18:57:35.724	67.55	-42.90	42224.59	-19.47		
6	I	2025-10-27T18:57:56.480	67.48	-42.83	41804.39	-19.44		
Uranus	I	2025-10-27T19:12:29.299	64.66	-39.80	25131.99		17.12	17.88
Uranus	E	2025-10-27T19:39:13.584	59.25	-34.19	25505.84		-5.90	-6.17
6	E	2025-10-27T19:54:35.918	56.07	-30.94	41878.23	19.41		
5	E	2025-10-27T19:54:51.168	56.01	-30.88	42176.44	19.44		
4	E	2025-10-27T19:55:10.137	55.95	-30.81	42540.95	19.50		
alpha	E	2025-10-27T19:57:02.315	55.56	-30.42	44735.71	19.73		
beta	E	2025-10-27T19:57:49.894	55.39	-30.25	45678.11	19.82		
eta	E	2025-10-27T19:59:05.197	55.13	-29.98	47176.12	19.95		
gamma	E	2025-10-27T19:59:27.938	55.05	-29.90	47630.25	19.99		
delta	E	2025-10-27T20:00:01.418	54.93	-29.79	48300.35	20.04		
lambda	E	2025-10-27T20:01:27.282	54.63	-29.48	50026.71	20.17		
epsilon	E	2025-10-27T20:02:41.575	54.37	-29.22	51528.76	20.29		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2025-10-27T19:29:04.100  
 Event type : PgtRgt  
 : Uranus occs: geocentric, 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 : 51128222702163968  
 2Mass ID (if available) : 03514472+1957255  
 ICRS Star Coord at Epoch: 03h 51m 44.72903s +19:57:25.76442s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 14.662  
 G magnitude : 18.049  
 RP magnitude : 16.995  
 BP magnitude : 19.189  
 DUPflag : 0  
 Distance (au) : 18.602  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.49  
 Sun-Target sep (deg) : 154.21  
 Sun-Moon sep (deg) : 137.60  
 B (ring opening deg) : 70.93  
 PA of pole (deg) : -78.57  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.297  
 C/A sky separation (km) : 17503.2  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.spk  
 ura111.bsp  
 IAU\_URANUS\_for\_RINGFIT.tpc  
 vgr2.ura111.bsp  
 ura161.bsp  
 vgr2.ura161.bsp  
 peph.ura160.bsp  
 earthstns\_itr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-10-27T18:53:18.552		69.60	-83.93	50963.91	-20.61		
lambda	I	2025-10-27T18:54:04.193		69.77	-83.75	50026.71	-20.51		
delta	I	2025-10-27T18:55:28.589		70.08	-83.41	48300.35	-20.40		
gamma	I	2025-10-27T18:56:01.677		70.21	-83.27	47626.03	-20.36		
eta	I	2025-10-27T18:56:23.795		70.29	-83.18	47176.12	-20.33		
beta	I	2025-10-27T18:57:38.629		70.57	-82.88	45657.78	-20.22		
alpha	I	2025-10-27T18:58:24.721		70.74	-82.69	44729.30	-20.15		
4	I	2025-10-27T19:00:10.508		71.12	-82.26	42616.48	-19.95		
5	I	2025-10-27T19:00:30.258		71.20	-82.18	42227.39	-19.90		
6	I	2025-10-27T19:00:50.765		71.27	-82.10	41803.46	-19.88		
Uranus	I	2025-10-27T19:14:43.954		74.27	-78.72	25101.87		17.75	18.53
Uranus	E	2025-10-27T19:43:48.511		79.83	-71.64	25474.21		-7.46	-7.81
6	E	2025-10-27T19:58:24.917		81.77	-68.08	41878.70	19.91		
5	E	2025-10-27T19:58:39.858		81.79	-68.02	42178.98	19.94		
4	E	2025-10-27T19:58:58.172		81.82	-67.95	42539.47	19.99		
alpha	E	2025-10-27T20:00:47.764		81.98	-67.50	44734.46	20.18		
beta	E	2025-10-27T20:01:34.341		82.04	-67.32	45677.65	20.26		
eta	E	2025-10-27T20:02:48.083		82.13	-67.02	47176.12	20.37		
gamma	E	2025-10-27T20:03:10.354		82.16	-66.93	47630.10	20.40		
delta	E	2025-10-27T20:03:43.173		82.19	-66.79	48300.35	20.44		
lambda	E	2025-10-27T20:05:07.388		82.27	-66.45	50026.71	20.55		
epsilon	E	2025-10-27T20:06:20.048		82.33	-66.16	51523.15	20.66		

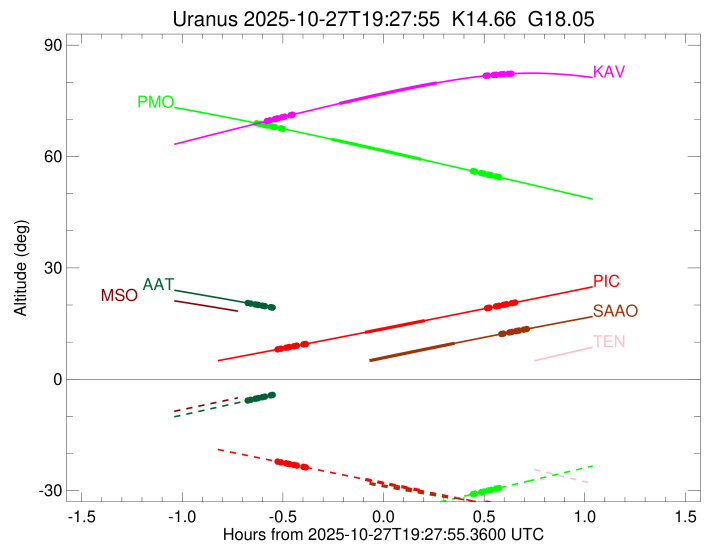
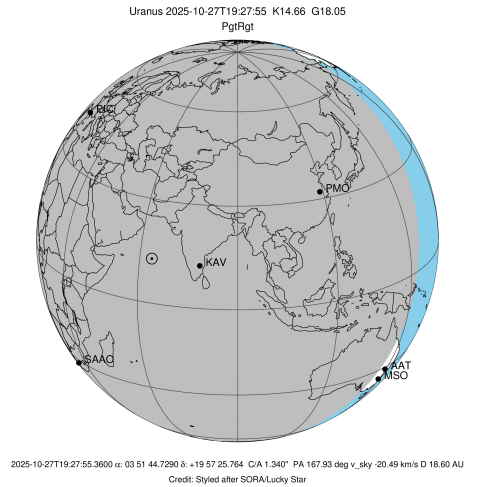
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2025-10-27T19:24:52.430  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : AAT  
 Location : Siding Spring (AAT)  
 Latitude (deg) : -31.27703  
 E. Longitude (deg) : 149.06608  
 Altitude (km) : 1.164  
 Gaia source ID : 51128222702163968  
 2Mass ID (if available) : 03514472+1957255  
 ICRS Star Coord at Epoch: 03h 51m 44.72903s +19:57:25.76442s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 14.662  
 G magnitude : 18.049  
 RP magnitude : 16.995  
 BP magnitude : 19.189  
 DUPflag : 0  
 Distance (au) : 18.602  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.49  
 Sun-Target sep (deg) : 154.21  
 Sun-Moon sep (deg) : 136.67  
 B (ring opening deg) : 70.93  
 PA of pole (deg) : -78.57  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.971  
 C/A sky separation (km) : 13096.3  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.spk  
 ural11.bsp  
 IAU\_URANUS\_for\_RINGFIT.tpc  
 vgr2.ural11.bsp  
 ural61.bsp  
 vgr2.ural61.bsp  
 peph.ural60.bsp  
 earthstns\_itr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-10-27T18:47:37.538		20.51	-5.68	50928.96	-21.06		
lambda	I	2025-10-27T18:48:20.480		20.39	-5.54	50026.71	-21.00		
delta	I	2025-10-27T18:49:42.816		20.17	-5.26	48300.35	-20.94		
gamma	I	2025-10-27T18:50:15.069		20.08	-5.15	47625.46	-20.91		
eta	I	2025-10-27T18:50:36.565		20.02	-5.08	47176.12	-20.89		
beta	I	2025-10-27T18:51:49.379		19.82	-4.83x	45655.59	-20.83		
alpha	I	2025-10-27T18:52:34.116		19.70	-4.68x	44725.56	-20.80		
4	I	2025-10-27T18:54:16.207		19.42	-4.34x	42616.49	-20.69		
5	I	2025-10-27T18:54:34.807		19.36	-4.27x	42237.14	-20.66		
6	I	2025-10-27T18:54:55.228		19.31	-4.20x	41800.55	-20.65		
Uranus	I	2025-10-27T19:07:42.567		17.15	-1.59x	25045.65		18.88	19.71
Uranus	E	2025-10-27T19:42:22.324		11.02	5.61x	25381.39		-10.86	-11.36
6	E	2025-10-27T19:55:46.997		8.54	8.43x	41879.46	20.57		
5	E	2025-10-27T19:56:01.653		8.50	8.48x	42185.26	20.58		
4	E	2025-10-27T19:56:18.967		8.44	8.55x	42536.31	20.61		
alpha	E	2025-10-27T19:58:05.543		8.11	8.92x	44731.48	20.71		
beta	E	2025-10-27T19:58:51.066		7.97	9.08x	45676.49	20.75		
eta	E	2025-10-27T20:00:03.202		7.74	9.33x	47176.12	20.81		
gamma	E	2025-10-27T20:00:24.995		7.67	9.41x	47629.76	20.82		
delta	E	2025-10-27T20:00:57.179		7.57	9.52x	48300.35	20.85		
lambda	E	2025-10-27T20:02:19.875		7.31	9.81x	50026.71	20.90		
epsilon	E	2025-10-27T20:03:30.708		7.09	10.06x	51508.91	20.97		



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2025-10-27T19:32:38.780  
 Event type : PgtRgt  
 : Uranus occs: geocentric, 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 : 51128222702163968  
 2Mass ID (if available) : 03514472+1957255  
 ICRS Star Coord at Epoch: 03h 51m 44.72903s +19:57:25.76442s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 14.662  
 G magnitude : 18.049  
 RP magnitude : 16.995  
 BP magnitude : 19.189  
 DUPflag : 0  
 Distance (au) : 18.602  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.49  
 Sun-Target sep (deg) : 154.21  
 Sun-Moon sep (deg) : 137.55  
 B (ring opening deg) : 70.93  
 PA of pole (deg) : -78.57  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.132  
 C/A sky separation (km) : 15276.2  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.spk  
 ura111.bsp  
 IAU\_URANUS\_for\_RINGFIT.tpc  
 vgr2.ura111.bsp  
 ura161.bsp  
 vgr2.ura161.bsp  
 peph.ura160.bsp  
 earthstns\_itrf93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-10-27T18:55:39.167	-0.37x	-23.31	50947.73	-20.58			
lambda	I	2025-10-27T18:56:24.051	-0.23x	-23.44	50026.71	-20.50			
delta	I	2025-10-27T18:57:48.414	0.05x	-23.68	48300.35	-20.42			
gamma	I	2025-10-27T18:58:21.468	0.15x	-23.78	47625.76	-20.39			
eta	I	2025-10-27T18:58:43.530	0.22x	-23.84	47176.12	-20.37			
beta	I	2025-10-27T18:59:58.197	0.46x	-24.06	45656.76	-20.29			
alpha	I	2025-10-27T19:00:44.119	0.61x	-24.19	44727.58	-20.24			
4	I	2025-10-27T19:02:29.191	0.95x	-24.49	42616.57	-20.10			
5	I	2025-10-27T19:02:48.585	1.01x	-24.55	42231.94	-20.06			
6	I	2025-10-27T19:03:09.246	1.08x	-24.61	41802.03	-20.05			
Uranus	I	2025-10-27T19:16:33.643	3.65x	-26.87	25067.90			18.44	19.25
Uranus	E	2025-10-27T19:49:04.333	9.69	-32.00	25425.22			-9.40	-9.84
6	E	2025-10-27T20:03:05.115	12.20	-34.03	41879.19	20.15			
5	E	2025-10-27T20:03:19.988	12.24	-34.07	42182.51	20.17			
4	E	2025-10-27T20:03:37.846	12.30	-34.11	42537.62	20.21			
alpha	E	2025-10-27T20:05:26.418	12.62	-34.36	44732.76	20.35			
beta	E	2025-10-27T20:06:12.684	12.75	-34.47	45676.99	20.41			
eta	E	2025-10-27T20:07:25.961	12.97	-34.64	47176.12	20.49			
gamma	E	2025-10-27T20:07:48.093	13.03	-34.69	47629.91	20.52			
delta	E	2025-10-27T20:08:20.746	13.13	-34.76	48300.35	20.55			
lambda	E	2025-10-27T20:09:44.587	13.37	-34.95	50026.71	20.63			
epsilon	E	2025-10-27T20:10:56.614	13.58	-35.11	51515.05	20.72			