

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-12-23T15:32:45.090
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 51404509358551808
 2Mass ID (if available) : 04003304+2027260

Uranus 2026-12-23T15:32:45 K13.05 G15.64 PgtRgt

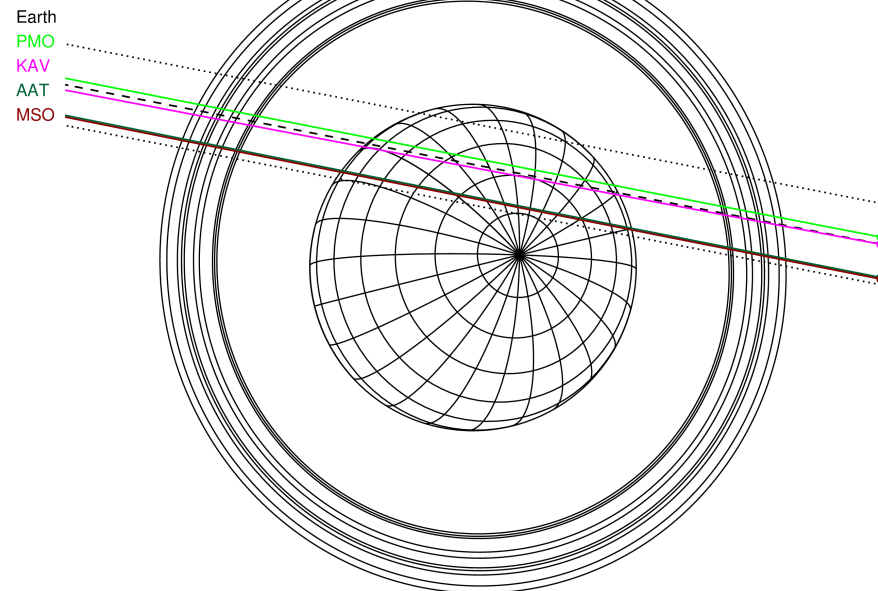
ICRS Star Coord at Epoch: 04h 00m 33.06176s +20:27:25.73583s

RUWE (>1.4 is poor) : 0.96
 K magnitude : 13.047
 G magnitude : 15.639
 RP magnitude : 14.824
 BP magnitude : 16.327
 DUPflag : 0
 Distance (au) : 18.562
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.65
 Sun-Target sep (deg) : 150.75
 Sun-Moon sep (deg) : 23.71
 B (ring opening deg) : 72.83
 PA of pole (deg) : -74.88

#	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

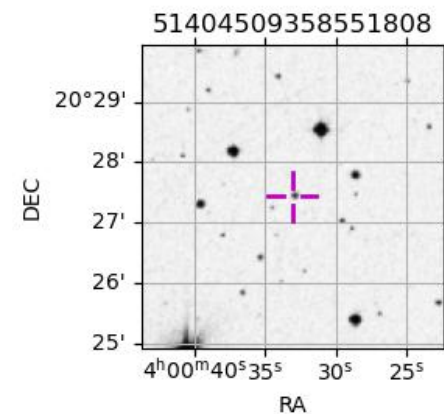


2026-12-23T15:32:45.0900 ra: 04 00 33.0618 s: +20 27 25.736 C/A 1.181" PA 168.94 deg v_sky -19.65 km/s D 18.56 AU
 Credit: Styled after SORA/Lucky Star

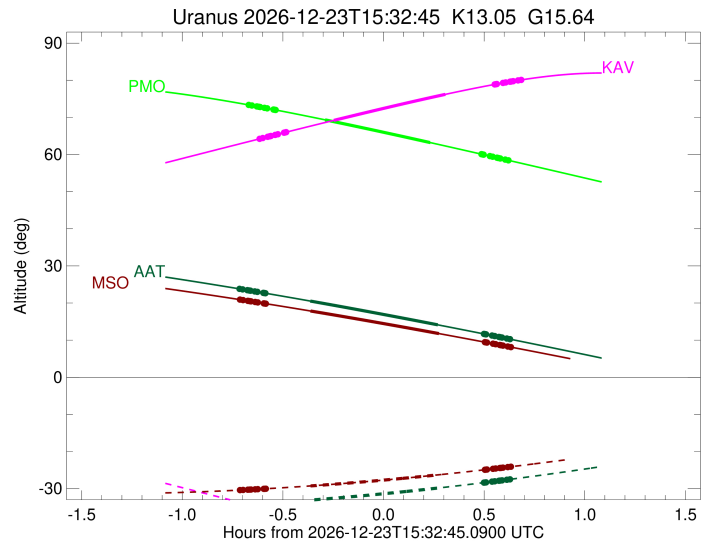
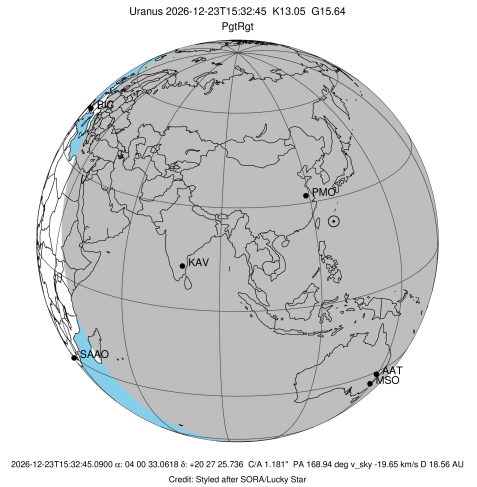


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	DEC 23 14:52 - DEC 23 16:09	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	+++++	+ +	+++++	DEC 23 14:55 - DEC 23 16:13	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	+++++	+ +	+++++	DEC 23 14:49 - DEC 23 16:10	PieRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+ +	+++++	DEC 23 14:49 - DEC 23 16:10	PieRie

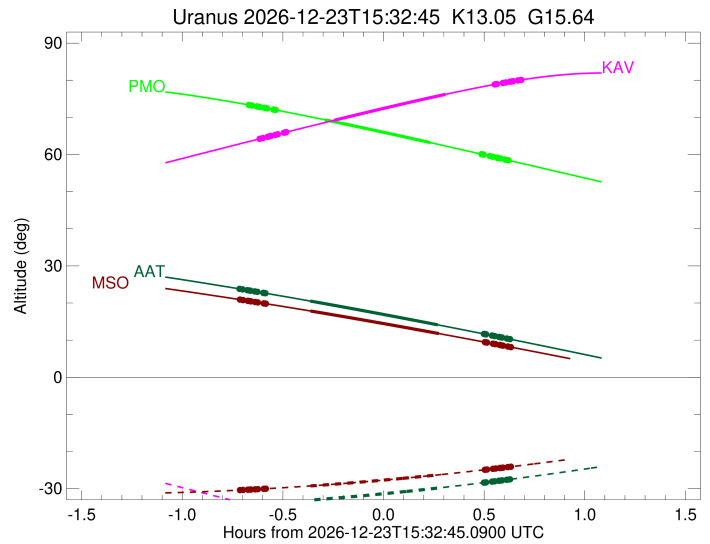
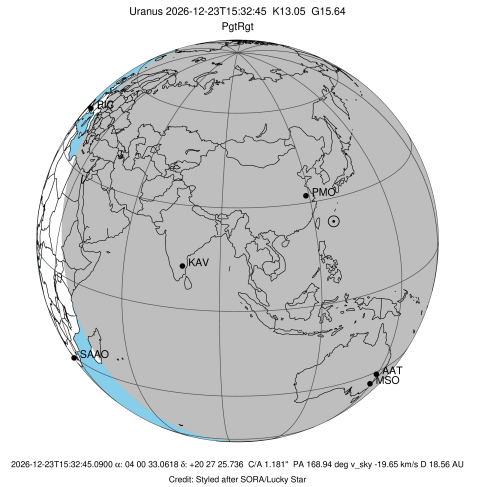


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-12-23T15:30:45.770
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 51404509358551808
 2Mass ID (if available) : 04003304+2027260
 ICRS Star Coord at Epoch: 04h 00m 33.06176s +20:27:25.73583s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 13.047
 G magnitude : 15.639
 RP magnitude : 14.824
 BP magnitude : 16.327
 DUPflag : 0
 Distance (au) : 18.562
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.65
 Sun-Target sep (deg) : 150.75
 Sun-Moon sep (deg) : 23.71
 B (ring opening deg) : 72.83
 PA of pole (deg) : -74.88
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.250
 C/A sky separation (km) : 16827.8
 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



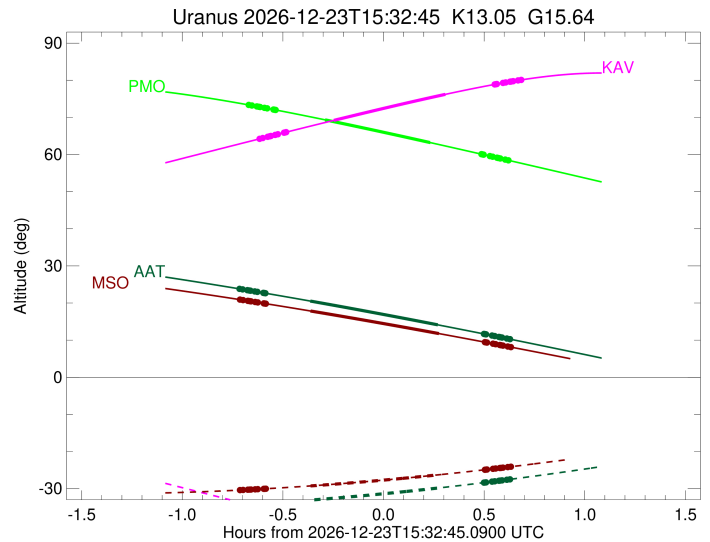
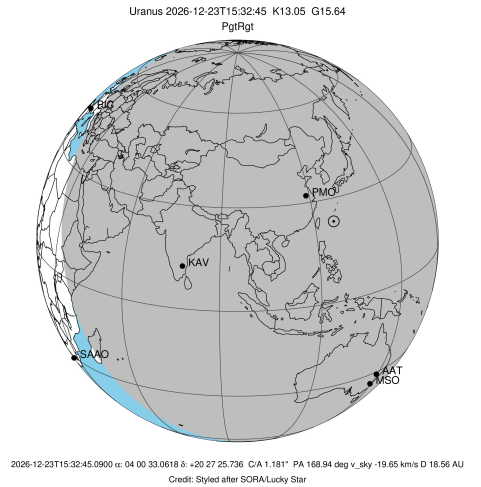
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-12-23T14:52:16.251		73.41	-72.07	51510.23	-19.60		
lambda	I	2026-12-23T14:53:31.965		73.20	-72.31	50026.71	-19.56		
delta	I	2026-12-23T14:55:00.449		72.96	-72.60	48300.35	-19.46		
gamma	I	2026-12-23T14:55:35.223		72.86	-72.71	47624.26	-19.42		
eta	I	2026-12-23T14:55:58.312		72.80	-72.78	47176.12	-19.40		
beta	I	2026-12-23T14:57:17.218		72.58	-73.03	45650.25	-19.29		
alpha	I	2026-12-23T14:58:05.350		72.44	-73.19	44720.98	-19.22		
4	I	2026-12-23T14:59:55.752		72.12	-73.53	42615.34	-19.07		
5	I	2026-12-23T15:00:12.726		72.07	-73.59	42289.30	-19.03		
6	I	2026-12-23T15:00:37.026		72.00	-73.66	41809.21	-18.98		
Uranus	I	2026-12-23T15:15:18.060		69.35	-76.33	25064.29		16.48	17.22
Uranus	E	2026-12-23T15:46:41.774		63.22	-80.72	25478.52		-6.49	-6.79
6	E	2026-12-23T16:01:56.483		60.11	-81.52	41832.14	18.94		
5	E	2026-12-23T16:02:12.747		60.05	-81.52	42154.82	18.98		
4	E	2026-12-23T16:02:33.681		59.98	-81.53	42548.90	19.02		
alpha	E	2026-12-23T16:04:26.106		59.59	-81.53	44692.92	19.18		
beta	E	2026-12-23T16:05:16.355		59.42	-81.53	45657.30	19.24		
eta	E	2026-12-23T16:06:35.058		59.15	-81.51	47176.12	19.34		
gamma	E	2026-12-23T16:06:58.560		59.07	-81.50	47631.05	19.37		
delta	E	2026-12-23T16:07:33.077		58.95	-81.49	48300.35	19.41		
lambda	E	2026-12-23T16:09:01.809		58.64	-81.46	50026.71	19.50		
epsilon	E	2026-12-23T16:09:38.972		58.51	-81.44	50752.08	19.55		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-12-23T15:34:23.110
 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 : 51404509358551808
 2Mass ID (if available) : 04003304+2027260
 ICRS Star Coord at Epoch: 04h 00m 33.06176s +20:27:25.73583s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 13.047
 G magnitude : 15.639
 RP magnitude : 14.824
 BP magnitude : 16.327
 DUPflag : 0
 Distance (au) : 18.562
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.65
 Sun-Target sep (deg) : 150.75
 Sun-Moon sep (deg) : 24.39
 B (ring opening deg) : 72.83
 PA of pole (deg) : -74.88
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.142
 C/A sky separation (km) : 15378.1
 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



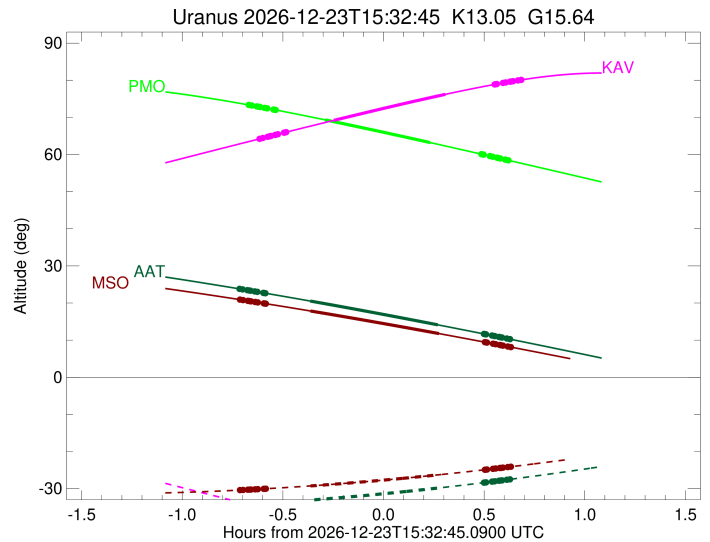
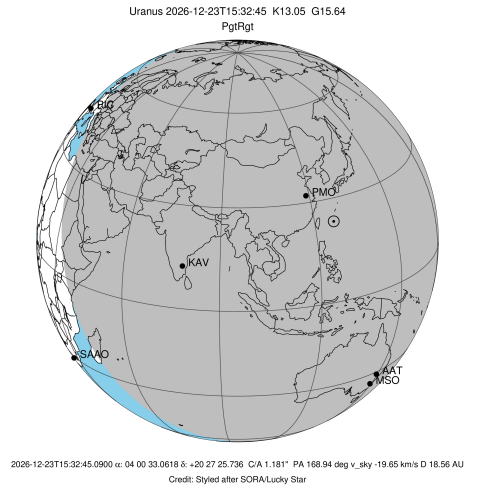
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-12-23T14:55:30.938		64.16	-34.96	51514.77	-19.81		
lambda	I	2026-12-23T14:56:46.072		64.45	-35.25	50026.71	-19.78		
delta	I	2026-12-23T14:58:13.536		64.78	-35.58	48300.35	-19.70		
gamma	I	2026-12-23T14:58:47.892		64.91	-35.71	47624.12	-19.67		
eta	I	2026-12-23T14:59:10.684		64.99	-35.80	47176.12	-19.64		
beta	I	2026-12-23T15:00:28.521		65.29	-36.10	45650.75	-19.56		
alpha	I	2026-12-23T15:01:15.958		65.47	-36.28	44721.99	-19.51		
4	I	2026-12-23T15:03:04.747		65.88	-36.69	42614.99	-19.38		
5	I	2026-12-23T15:03:21.346		65.94	-36.76	42291.19	-19.35		
6	I	2026-12-23T15:03:45.264		66.03	-36.85	41810.27	-19.31		
Uranus	I	2026-12-23T15:17:57.803		69.21	-40.10	25047.27		16.78	17.53
Uranus	E	2026-12-23T15:51:13.074		76.22	-47.70	25446.19		-7.70	-8.06
6	E	2026-12-23T16:05:53.768		78.89	-51.03	41833.97	19.34		
5	E	2026-12-23T16:06:09.567		78.93	-51.09	42154.88	19.38		
4	E	2026-12-23T16:06:29.987		78.99	-51.16	42547.24	19.41		
alpha	E	2026-12-23T16:08:20.408		79.28	-51.58	44693.84	19.54		
beta	E	2026-12-23T16:09:09.736		79.41	-51.77	45658.08	19.59		
eta	E	2026-12-23T16:10:27.032		79.61	-52.06	47176.12	19.68		
gamma	E	2026-12-23T16:10:50.132		79.67	-52.14	47630.96	19.70		
delta	E	2026-12-23T16:11:24.082		79.75	-52.27	48300.35	19.73		
lambda	E	2026-12-23T16:12:51.393		79.97	-52.60	50026.71	19.81		
epsilon	E	2026-12-23T16:13:27.844		80.05	-52.74	50749.38	19.85		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-12-23T15:29:45.790
 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 : 51404509358551808
 2Mass ID (if available) : 04003304+2027260
 ICRS Star Coord at Epoch: 04h 00m 33.06176s +20:27:25.73583s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 13.047
 G magnitude : 15.639
 RP magnitude : 14.824
 BP magnitude : 16.327
 DUPflag : 0
 Distance (au) : 18.562
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.65
 Sun-Target sep (deg) : 150.75
 Sun-Moon sep (deg) : 23.48
 B (ring opening deg) : 72.83
 PA of pole (deg) : -74.88
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.807
 C/A sky separation (km) : 10866.4
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-12-23T14:49:31.317		23.86	-34.34	51530.76	-20.22		
lambda	I	2026-12-23T14:50:45.717		23.67	-34.28	50026.71	-20.20		
delta	I	2026-12-23T14:52:11.264		23.46	-34.21	48300.35	-20.16		
gamma	I	2026-12-23T14:52:44.846		23.37	-34.18	47623.61	-20.14		
eta	I	2026-12-23T14:53:07.067		23.32	-34.16	47176.12	-20.13		
beta	I	2026-12-23T14:54:22.838		23.12	-34.09	45652.76	-20.09		
alpha	I	2026-12-23T14:55:08.934		23.01	-34.05	44725.85	-20.06		
4	I	2026-12-23T14:56:54.804		22.73	-33.95	42613.23	-20.00		
5	I	2026-12-23T14:57:10.529		22.69	-33.94	42297.77	-19.98		
6	I	2026-12-23T14:57:33.743		22.63	-33.92	41814.53	-19.96		
Uranus	I	2026-12-23T15:10:54.059		20.53	-33.09	25024.67		17.17	17.93
Uranus	E	2026-12-23T15:48:57.280		14.12	-29.84	25350.30		-10.53	-11.01
6	E	2026-12-23T16:02:42.146		11.67	-28.38	41838.45	19.86		
5	E	2026-12-23T16:02:57.258		11.63	-28.35	42155.64	19.88		
4	E	2026-12-23T16:03:16.914		11.57	-28.32	42543.41	19.90		
alpha	E	2026-12-23T16:05:05.168		11.24	-28.12	44696.22	19.96		
beta	E	2026-12-23T16:05:53.464		11.10	-28.02	45659.98	19.98		
eta	E	2026-12-23T16:07:09.259		10.87	-27.88	47176.12	20.02		
gamma	E	2026-12-23T16:07:31.959		10.80	-27.84	47630.71	20.03		
delta	E	2026-12-23T16:08:05.376		10.70	-27.77	48300.35	20.05		
lambda	E	2026-12-23T16:09:31.420		10.44	-27.61	50026.71	20.08		
epsilon	E	2026-12-23T16:10:07.181		10.33	-27.54	50745.06	20.10		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-12-23T15:29:58.670
 Event type : PgtRgt
 : Uranus 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 : 51404509358551808
 2Mass ID (if available) : 04003304+2027260
 ICRS Star Coord at Epoch: 04h 00m 33.06176s +20:27:25.73583s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 13.047
 G magnitude : 15.639
 RP magnitude : 14.824
 BP magnitude : 16.327
 DUPflag : 0
 Distance (au) : 18.562
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.65
 Sun-Target sep (deg) : 150.75
 Sun-Moon sep (deg) : 23.51
 B (ring opening deg) : 72.83
 PA of pole (deg) : -74.88
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.788
 C/A sky separation (km) : 10610.2
 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	2026-12-23T14:49:39.465		20.96	-30.41	51531.45	-20.23		
lambda	I	2026-12-23T14:50:53.867		20.79	-30.35	50026.71	-20.21		
delta	I	2026-12-23T14:52:19.368		20.58	-30.29	48300.35	-20.17		
gamma	I	2026-12-23T14:52:52.931		20.51	-30.26	47623.58	-20.16		
eta	I	2026-12-23T14:53:15.137		20.45	-30.24	47176.12	-20.15		
beta	I	2026-12-23T14:54:30.848		20.27	-30.18	45652.86	-20.10		
alpha	I	2026-12-23T14:55:16.906		20.16	-30.15	44726.05	-20.08		
4	I	2026-12-23T14:57:02.695		19.91	-30.06	42613.12	-20.02		
5	I	2026-12-23T14:57:18.387		19.87	-30.05	42298.08	-20.00		
6	I	2026-12-23T14:57:41.579		19.82	-30.03	41814.75	-19.98		
Uranus	I	2026-12-23T15:11:00.113		17.85	-29.27	25024.86		17.16	17.93
Uranus	E	2026-12-23T15:49:16.507		11.77	-26.27	25344.43		-10.68	-11.17
6	E	2026-12-23T16:02:59.002		9.46	-24.92	41838.73	19.88		
5	E	2026-12-23T16:03:14.080		9.41	-24.89	42155.72	19.91		
4	E	2026-12-23T16:03:33.696		9.36	-24.86	42543.18	19.92		
alpha	E	2026-12-23T16:05:21.855		9.05	-24.67	44696.38	19.98		
beta	E	2026-12-23T16:06:10.101		8.91	-24.58	45660.10	20.00		
eta	E	2026-12-23T16:07:25.821		8.69	-24.45	47176.12	20.04		
gamma	E	2026-12-23T16:07:48.502		8.63	-24.41	47630.70	20.05		
delta	E	2026-12-23T16:08:21.893		8.53	-24.35	48300.35	20.06		
lambda	E	2026-12-23T16:09:47.872		8.28	-24.20	50026.71	20.10		
epsilon	E	2026-12-23T16:10:23.599		8.18	-24.13	50744.87	20.11		