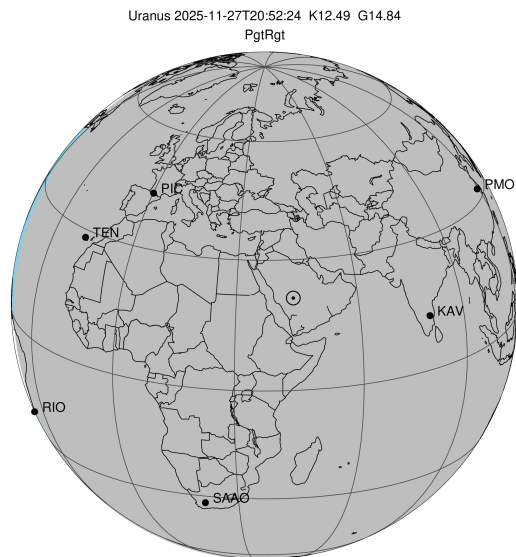


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2025-11-27T20:52:24.130  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 51050947649474304  
 2Mass ID (if available) : 03463178+1941253

ICRS Star Coord at Epoch: 03h 46m 31.78089s +19:41:25.47052s

RUWE (>1.4 is poor) : 5.48  
 K magnitude : 12.495  
 G magnitude : 14.843  
 RP magnitude : 14.070  
 BP magnitude : 15.409  
 DUPflag : 0  
 Distance (au) : 18.516  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.24  
 Sun-Target sep (deg) : 173.30  
 Sun-Moon sep (deg) : 88.37  
 B (ring opening deg) : 69.78  
 PA of pole (deg) : -80.38

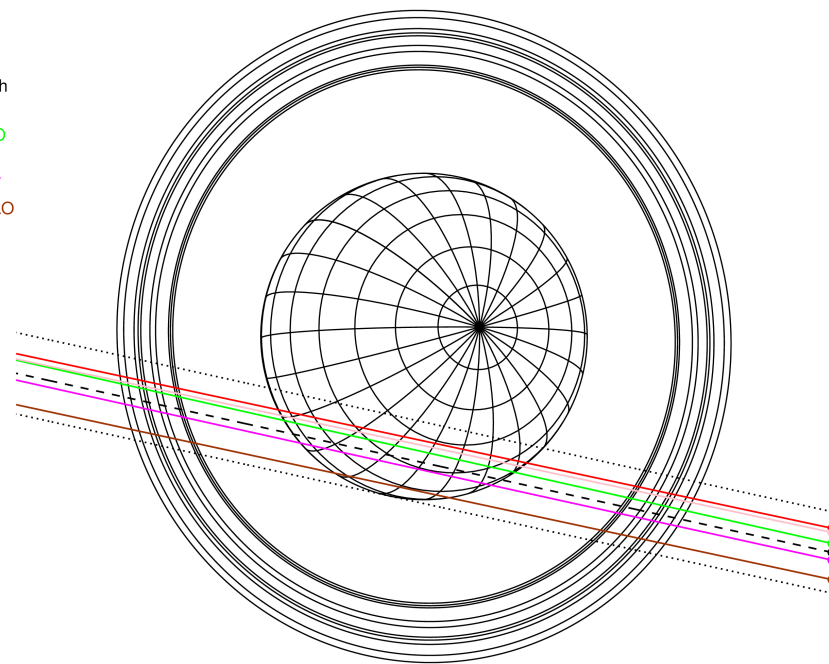
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



Uranus 2025-11-27T20:52:24 K12.49 G14.84 PgtRgt  
 2025-11-27T20:52:24.1300 ex: 03 46 31.78089 s: +19 41 25.471 C/A 1.436° PA 347.62 deg v\_sky -23.24 km/s D 18.52 AU  
 Credit: Styled after SORA/Lucky Star

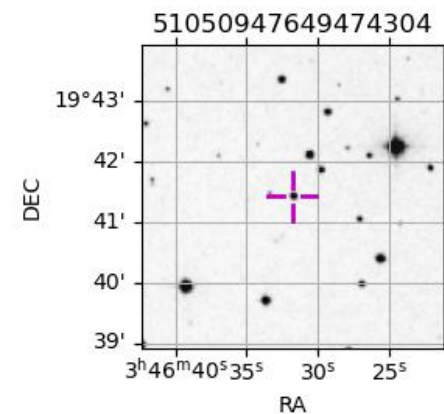
Uranus 2025-11-27T20:52:24 K12.49 G14.84 PgtRgt

Earth  
 PIC  
 PMO  
 TEN  
 KAV  
 SAAO

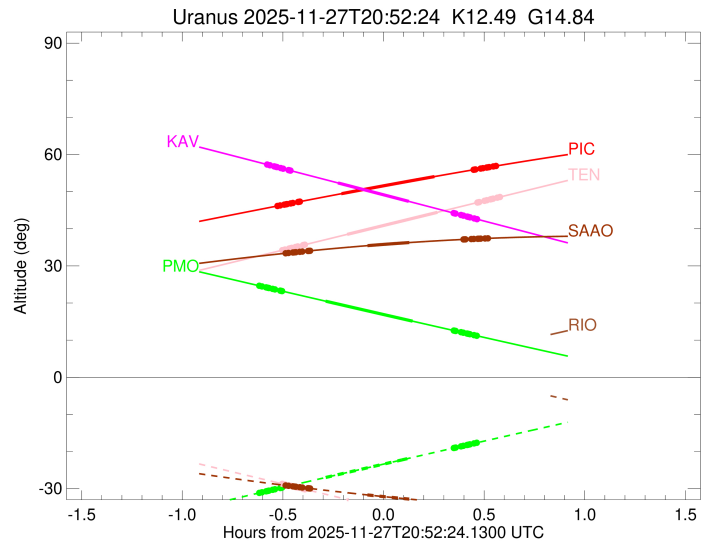
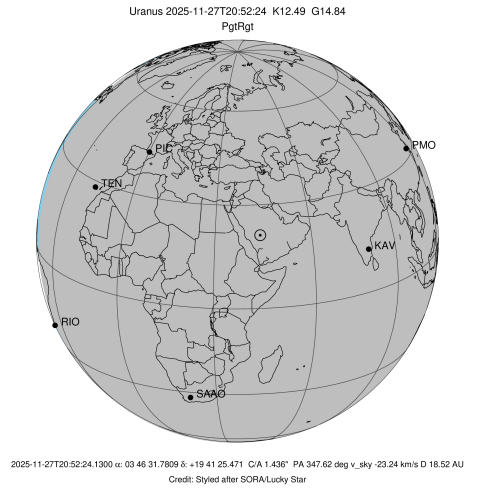


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	NOV 27 20:21 - NOV 27 21:26	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	NOV 27 20:15 - NOV 27 21:20	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	+++++	+ +	+++++	NOV 27 20:22 - NOV 27 21:27	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	NOV 27 20:18 - NOV 27 21:20	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					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++	+ +	+++++	NOV 27 20:23 - NOV 27 21:23	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

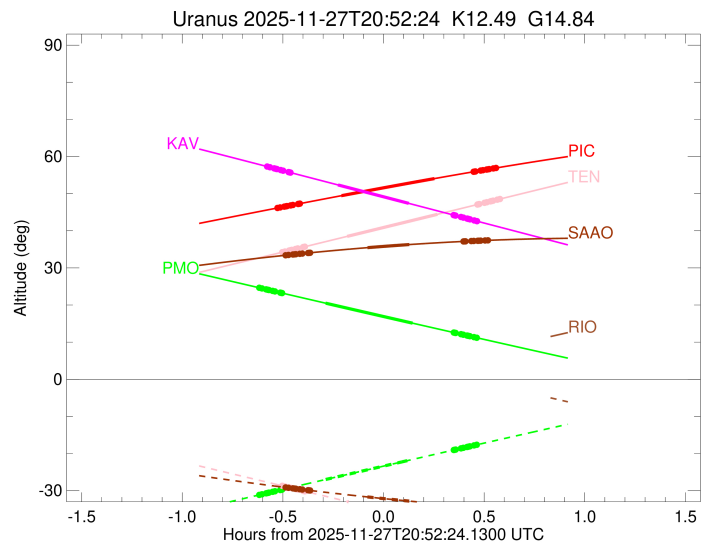
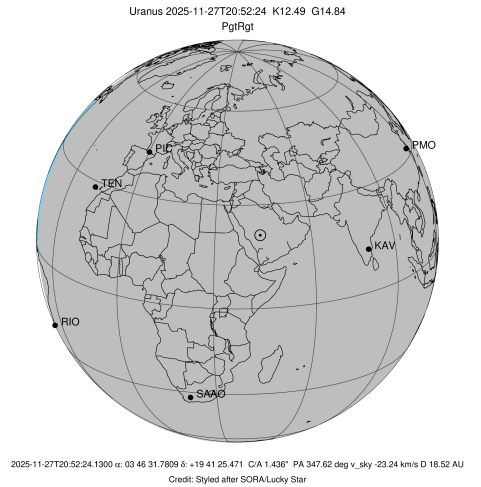


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2025-11-27T20:53:51.610  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 51050947649474304  
 2Mass ID (if available) : 03463178+1941253  
 ICRS Star Coord at Epoch: 03h 46m 31.78089s +19:41:25.47052s  
 RUWE (>1.4 is poor) : 5.48  
 K magnitude : 12.495  
 G magnitude : 14.843  
 RP magnitude : 14.070  
 BP magnitude : 15.409  
 DUPflag : 0  
 Distance (au) : 18.516  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.24  
 Sun-Target sep (deg) : 173.30  
 Sun-Moon sep (deg) : 89.11  
 B (ring opening deg) : 69.78  
 PA of pole (deg) : -80.38  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.192  
 C/A sky separation (km) : 16008.0  
 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



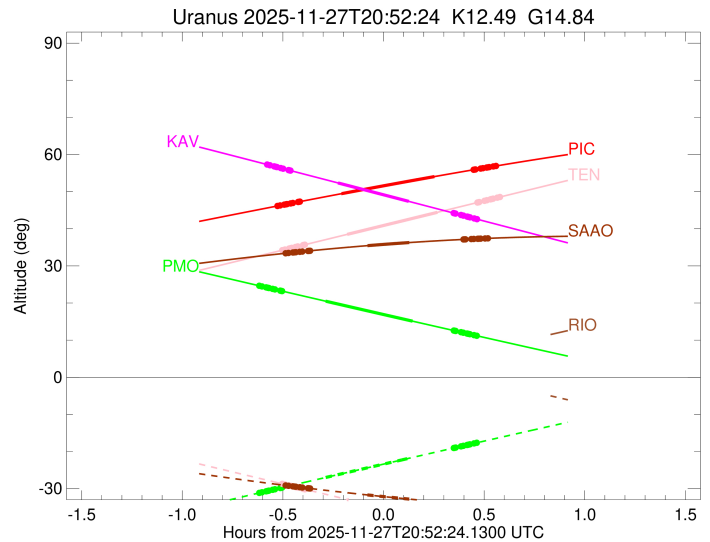
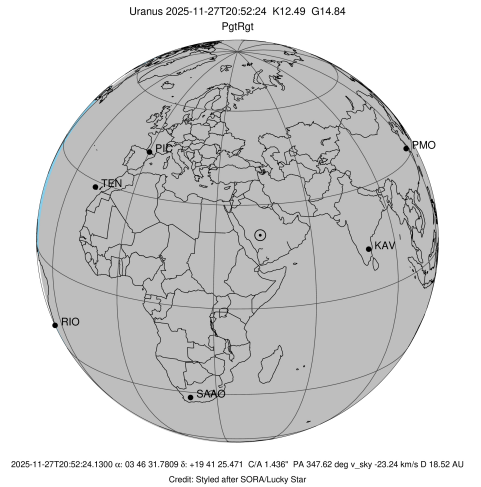
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-11-27T20:21:04.392		46.19	-42.22	50762.81	-23.52		
lambda	I	2025-11-27T20:21:35.735		46.29	-42.31	50026.71	-23.47		
delta	I	2025-11-27T20:22:49.458		46.50	-42.53	48300.35	-23.37		
gamma	I	2025-11-27T20:23:18.557		46.59	-42.62	47621.02	-23.32		
eta	I	2025-11-27T20:23:37.643		46.64	-42.68	47176.12	-23.30		
beta	I	2025-11-27T20:24:43.548		46.83	-42.88	45643.10	-23.19		
alpha	I	2025-11-27T20:25:25.049		46.96	-43.00	44684.68	-23.12		
4	I	2025-11-27T20:26:58.065		47.23	-43.28	42546.03	-22.93		
5	I	2025-11-27T20:27:08.756		47.26	-43.31	42300.93	-22.91		
6	I	2025-11-27T20:27:28.184		47.31	-43.37	41841.67	-22.88		
Uranus	I	2025-11-27T20:39:50.206		49.45	-45.59	25432.75		9.74	10.19
Uranus	E	2025-11-27T21:07:33.793		54.05	-50.46	25091.28		-19.20	-20.04
6	E	2025-11-27T21:19:17.886		55.90	-52.46	41864.11	22.92		
5	E	2025-11-27T21:19:30.097		55.94	-52.50	42156.07	22.95		
4	E	2025-11-27T21:19:47.551		55.98	-52.55	42562.77	22.98		
alpha	E	2025-11-27T21:21:21.977		56.22	-52.81	44745.02	23.17		
beta	E	2025-11-27T21:22:02.506		56.33	-52.93	45680.52	23.24		
eta	E	2025-11-27T21:23:06.665		56.49	-53.11	47176.12	23.35		
gamma	E	2025-11-27T21:23:26.128		56.54	-53.16	47630.82	23.38		
delta	E	2025-11-27T21:23:54.742		56.61	-53.24	48300.35	23.42		
lambda	E	2025-11-27T21:25:08.293		56.80	-53.44	50026.71	23.52		
epsilon	E	2025-11-27T21:26:12.231		56.96	-53.62	51533.19	23.58		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2025-11-27T20:48:16.970  
 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 : 51050947649474304  
 2Mass ID (if available) : 03463178+1941253  
 ICRS Star Coord at Epoch: 03h 46m 31.78089s +19:41:25.47052s  
 RUWE (>1.4 is poor) : 5.48  
 K magnitude : 12.495  
 G magnitude : 14.843  
 RP magnitude : 14.070  
 BP magnitude : 15.409  
 DUPflag : 0  
 Distance (au) : 18.516  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.24  
 Sun-Target sep (deg) : 173.30  
 Sun-Moon sep (deg) : 88.67  
 B (ring opening deg) : 69.78  
 PA of pole (deg) : -80.38  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.314  
 C/A sky separation (km) : 17649.3  
 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\_itrfr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



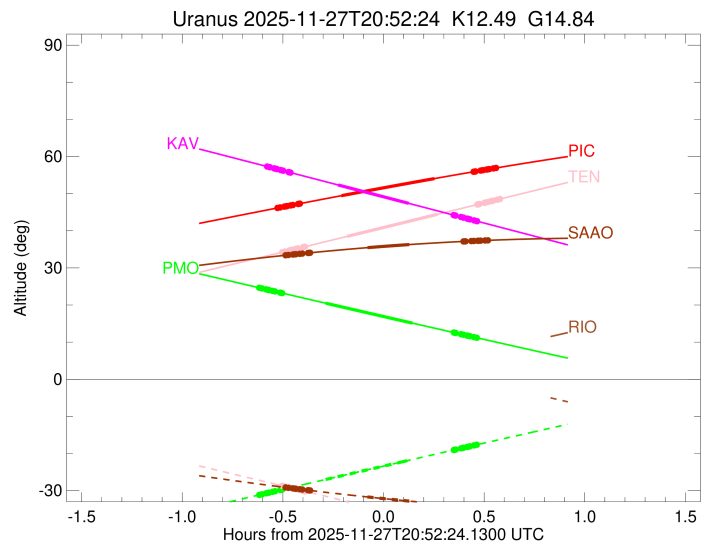
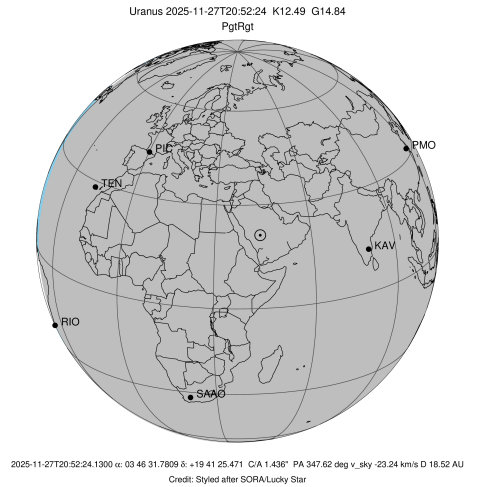
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-11-27T20:15:38.522		24.59	-31.09	50768.60	-23.15		
lambda	I	2025-11-27T20:16:10.635		24.47	-30.98	50026.71	-23.08		
delta	I	2025-11-27T20:17:25.641		24.21	-30.72	48300.35	-22.95		
gamma	I	2025-11-27T20:17:55.270		24.11	-30.61	47621.06	-22.90		
eta	I	2025-11-27T20:18:14.715		24.04	-30.55	47176.12	-22.86		
beta	I	2025-11-27T20:19:21.890		23.80	-30.31	45643.55	-22.73		
alpha	I	2025-11-27T20:20:04.250		23.66	-30.16	44684.83	-22.64		
4	I	2025-11-27T20:21:39.431		23.32	-29.83	42544.10	-22.41		
5	I	2025-11-27T20:21:50.412		23.28	-29.79	42298.44	-22.38		
6	I	2025-11-27T20:22:10.122		23.22	-29.72	41843.90	-22.34		
Uranus	I	2025-11-27T20:35:09.989		20.49	-26.99	25472.53		8.04	8.41
Uranus	E	2025-11-27T21:01:03.355		15.12	-21.60	25116.31		-18.65	-19.46
6	E	2025-11-27T21:13:23.364		12.58	-19.05	41865.20	22.25		
5	E	2025-11-27T21:13:35.938		12.54	-19.01	42156.59	22.29		
4	E	2025-11-27T21:13:53.811		12.48	-18.95	42561.31	22.32		
alpha	E	2025-11-27T21:15:30.930		12.14	-18.61	44744.36	22.55		
beta	E	2025-11-27T21:16:12.576		12.00	-18.47	45680.36	22.64		
eta	E	2025-11-27T21:17:18.418		11.78	-18.25	47176.12	22.77		
gamma	E	2025-11-27T21:17:38.373		11.71	-18.18	47630.74	22.80		
delta	E	2025-11-27T21:18:07.708		11.61	-18.08	48300.35	22.85		
lambda	E	2025-11-27T21:19:23.055		11.35	-17.82	50026.71	22.97		
epsilon	E	2025-11-27T21:20:28.354		11.13	-17.59	51529.83	23.04		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2025-11-27T20:55:11.910  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : TEN  
 Location : Teide Obs./Tenerife  
 Latitude (deg) : 28.30050  
 E. Longitude (deg) : 343.48909  
 Altitude (km) : 2.395  
 Gaia source ID : 51050947649474304  
 2Mass ID (if available) : 03463178+1941253  
 ICRS Star Coord at Epoch: 03h 46m 31.78089s +19:41:25.47052s  
 RUWE (>1.4 is poor) : 5.48  
 K magnitude : 12.495  
 G magnitude : 14.843  
 RP magnitude : 14.070  
 BP magnitude : 15.409  
 DUPflag : 0  
 Distance (au) : 18.516  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.24  
 Sun-Target sep (deg) : 173.30  
 Sun-Moon sep (deg) : 88.98  
 B (ring opening deg) : 69.78  
 PA of pole (deg) : -80.38  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.247  
 C/A sky separation (km) : 16741.7  
 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	2025-11-27T20:22:30.248		34.29	-28.77	50764.56	-23.35		
lambda	I	2025-11-27T20:23:01.901		34.41	-28.88	50026.71	-23.29		
delta	I	2025-11-27T20:24:16.197		34.68	-29.15	48300.35	-23.18		
gamma	I	2025-11-27T20:24:45.530		34.79	-29.26	47621.03	-23.14		
eta	I	2025-11-27T20:25:04.773		34.86	-29.33	47176.12	-23.10		
beta	I	2025-11-27T20:26:11.235		35.10	-29.57	45643.24	-22.99		
alpha	I	2025-11-27T20:26:53.107		35.25	-29.72	44684.72	-22.91		
4	I	2025-11-27T20:28:27.040		35.60	-30.06	42545.37	-22.71		
5	I	2025-11-27T20:28:37.849		35.64	-30.10	42300.12	-22.68		
6	I	2025-11-27T20:28:57.414		35.71	-30.17	41842.42	-22.65		
Uranus	I	2025-11-27T20:41:34.631		38.49	-32.92	25448.36		9.11	9.53
Uranus	E	2025-11-27T21:08:28.913		44.44	-38.80	25103.62		-18.93	-19.76
6	E	2025-11-27T21:20:25.920		47.08	-41.43	41864.78	22.71		
5	E	2025-11-27T21:20:38.239		47.12	-41.47	42156.38	22.75		
4	E	2025-11-27T21:20:55.790		47.19	-41.54	42561.87	22.78		
alpha	E	2025-11-27T21:22:31.010		47.54	-41.89	44744.61	22.99		
beta	E	2025-11-27T21:23:11.863		47.69	-42.04	45680.42	23.07		
eta	E	2025-11-27T21:24:16.491		47.93	-42.27	47176.12	23.19		
gamma	E	2025-11-27T21:24:36.086		48.00	-42.35	47630.77	23.22		
delta	E	2025-11-27T21:25:04.894		48.10	-42.45	48300.35	23.27		
lambda	E	2025-11-27T21:26:18.916		48.38	-42.72	50026.71	23.38		
epsilon	E	2025-11-27T21:27:23.137		48.61	-42.96	51530.91	23.44		

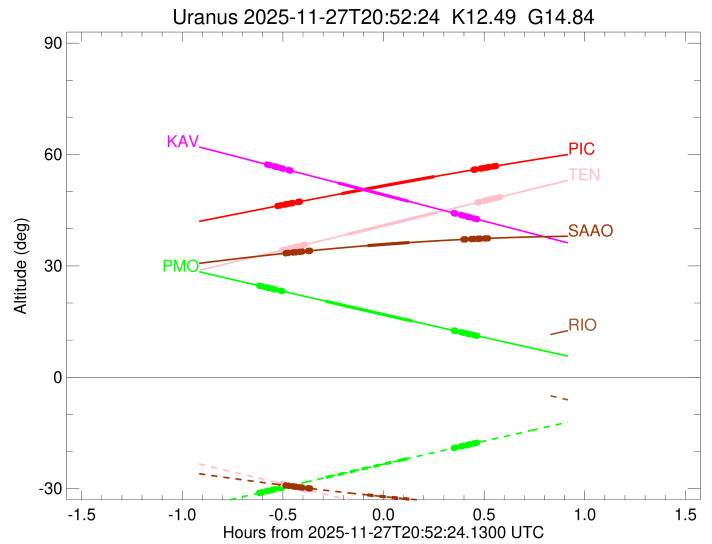
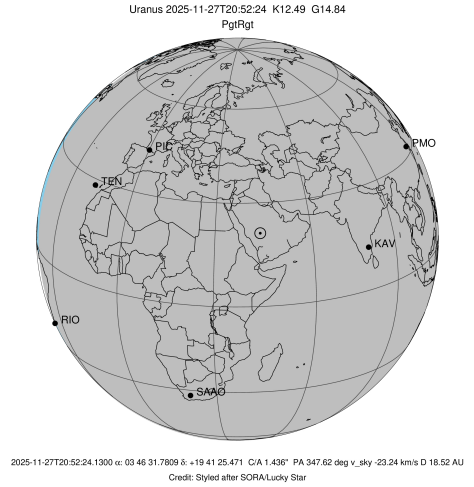
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2025-11-27T20:49:35.140  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : KAV  
 Location : Kavalur Observatory  
 Latitude (deg) : 12.57556  
 E. Longitude (deg) : 78.83167  
 Altitude (km) : 0.722  
 Gaia source ID : 51050947649474304  
 2Mass ID (if available) : 03463178+1941253  
 ICRS Star Coord at Epoch: 03h 46m 31.78089s +19:41:25.47052s  
 RUWE (>1.4 is poor) : 5.48  
 K magnitude : 12.495  
 G magnitude : 14.843  
 RP magnitude : 14.070  
 BP magnitude : 15.409  
 DUPflag : 0  
 Distance (au) : 18.516  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.24  
 Sun-Target sep (deg) : 173.30  
 Sun-Moon sep (deg) : 89.10  
 B (ring opening deg) : 69.78  
 PA of pole (deg) : -80.38  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.525  
 C/A sky separation (km) : 20478.7  
 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	2025-11-27T20:17:59.727		57.24	-63.33	50777.13	-22.83		
lambda	I	2025-11-27T20:18:32.690		57.11	-63.20	50026.71	-22.73		
delta	I	2025-11-27T20:19:48.923		56.81	-62.92	48300.35	-22.56		
gamma	I	2025-11-27T20:20:19.081		56.69	-62.80	47621.13	-22.49		
eta	I	2025-11-27T20:20:38.894		56.62	-62.73	47176.12	-22.43		
beta	I	2025-11-27T20:21:47.409		56.35	-62.47	45644.22	-22.25		
alpha	I	2025-11-27T20:22:30.721		56.18	-62.31	44685.16	-22.13		
4	I	2025-11-27T20:24:08.465		55.80	-61.94	42541.58	-21.80		
5	I	2025-11-27T20:24:19.825		55.75	-61.90	42294.74	-21.76		
6	I	2025-11-27T20:24:39.842		55.68	-61.82	41846.94	-21.70		
Uranus	I	2025-11-27T20:38:49.433		52.35	-58.60	25525.36		5.00	5.23
Uranus	E	2025-11-27T20:59:56.924		47.38	-53.75	25187.79		-16.99	-17.74
6	E	2025-11-27T21:13:20.117		44.23	-50.66	41867.68	21.64		
5	E	2025-11-27T21:13:33.065		44.18	-50.61	42158.16	21.70		
4	E	2025-11-27T21:13:51.172		44.10	-50.54	42557.87	21.74		
alpha	E	2025-11-27T21:15:30.689		43.71	-50.15	44742.66	22.07		
beta	E	2025-11-27T21:16:13.268		43.55	-49.99	45679.89	22.19		
eta	E	2025-11-27T21:17:20.387		43.28	-49.73	47176.12	22.37		
gamma	E	2025-11-27T21:17:40.680		43.20	-49.65	47630.53	22.42		
delta	E	2025-11-27T21:18:10.512		43.08	-49.53	48300.35	22.49		
lambda	E	2025-11-27T21:19:26.987		42.78	-49.24	50026.71	22.66		
epsilon	E	2025-11-27T21:20:32.704		42.53	-48.98	51520.05	22.76		



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2025-11-27T20:54:05.540  
 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 : 51050947649474304  
 2Mass ID (if available) : 03463178+1941253  
 ICRS Star Coord at Epoch: 03h 46m 31.78089s +19:41:25.47052s  
 RUWE (>1.4 is poor) : 5.48  
 K magnitude : 12.495  
 G magnitude : 14.843  
 RP magnitude : 14.070  
 BP magnitude : 15.409  
 DUPflag : 0  
 Distance (au) : 18.516  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.24  
 Sun-Target sep (deg) : 173.30  
 Sun-Moon sep (deg) : 88.92  
 B (ring opening deg) : 69.78  
 PA of pole (deg) : -80.38  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.777  
 C/A sky separation (km) : 23860.2  
 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\_itrfr93\_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	2025-11-27T20:23:30.097		33.43	-29.18	50789.11	-21.99		
lambda	I	2025-11-27T20:24:04.918		33.48	-29.24	50026.71	-21.85		
delta	I	2025-11-27T20:25:24.373		33.61	-29.39	48300.35	-21.61		
gamma	I	2025-11-27T20:25:55.880		33.66	-29.45	47621.25	-21.50		
eta	I	2025-11-27T20:26:16.615		33.69	-29.49	47176.12	-21.43		
beta	I	2025-11-27T20:27:28.431		33.80	-29.62	45645.14	-21.18		
alpha	I	2025-11-27T20:28:14.003		33.87	-29.71	44685.78	-21.00		
4	I	2025-11-27T20:29:57.530		34.02	-29.90	42538.66	-20.54		
5	I	2025-11-27T20:30:09.713		34.04	-29.92	42289.69	-20.47		
6	I	2025-11-27T20:30:30.640		34.07	-29.96	41850.66	-20.39		
Uranus	I	2025-11-27T20:47:37.275		35.45	-31.70	25558.92		-0.25	-0.26
Uranus	E	2025-11-27T21:00:05.837		36.29	-32.82	25330.27		-13.20	-13.80
6	E	2025-11-27T21:16:16.652		37.13	-34.07	41870.55	20.41		
5	E	2025-11-27T21:16:30.461		37.14	-34.08	42160.86	20.49		
4	E	2025-11-27T21:16:49.268		37.16	-34.10	42553.61	20.56		
alpha	E	2025-11-27T21:18:34.148		37.23	-34.22	44740.33	21.02		
beta	E	2025-11-27T21:19:18.845		37.26	-34.27	45679.15	21.20		
eta	E	2025-11-27T21:20:28.990		37.31	-34.35	47176.12	21.46		
gamma	E	2025-11-27T21:20:50.120		37.32	-34.37	47630.24	21.53		
delta	E	2025-11-27T21:21:21.173		37.34	-34.41	48300.35	21.63		
lambda	E	2025-11-27T21:22:40.536		37.39	-34.49	50026.71	21.87		
epsilon	E	2025-11-27T21:23:47.864		37.43	-34.56	51505.65	22.01		