

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2047-12-10T22:47:09.650
 Event type : PgtX
 : Uranus occs: geocentric, topocentric
 : No ring occs
 Gaia source ID : 3866139791024848000
 2Mass ID (if available) : 10490808+0821046

ICRS Star Coord at Epoch: 10h 49m 07.99017s +08:21:04.70987s

RUWE (>1.4 is poor) : 1.18
 K magnitude : 14.376
 G magnitude : 17.726
 RP magnitude : 16.580
 BP magnitude : 18.885
 DUPflag : 0
 Distance (au) : 18.144
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 2.93
 Sun-Target sep (deg) : 97.64
 Sun-Moon sep (deg) : 16.27
 B (ring opening deg) : 6.99
 PA of pole (deg) : 104.39

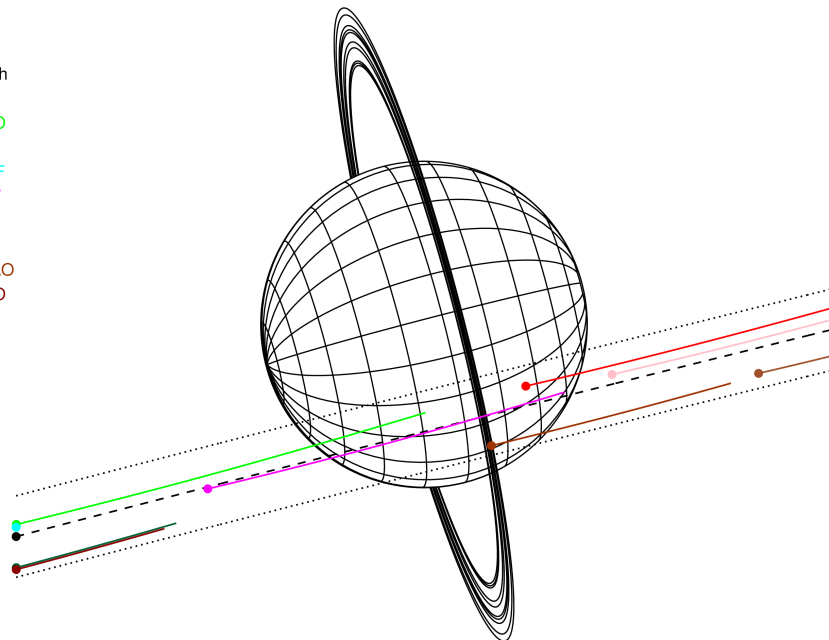
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2047-12-10T22:47:09.6500 a: 10 49 07.9902 δ: +08 21 04.710 C/A 1.316° PA 2.31 deg v_sky + 2.92 km/s D 18.14 AU
 Credit: Styled after SORA/Lucky Star

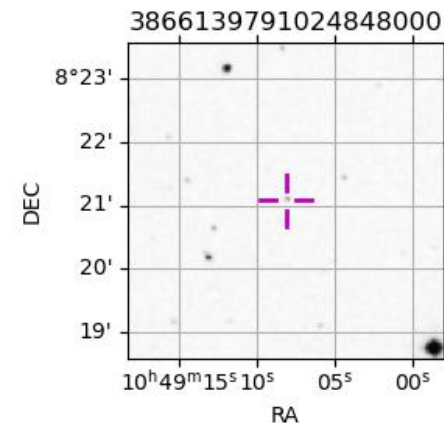
Uranus 2047-12-10T22:47:09 K14.38 G17.73 PgtX

- Earth
- PIC
- PMO
- TEN
- IRTF
- KAV
- RIO
- AAT
- SAAO
- MSO

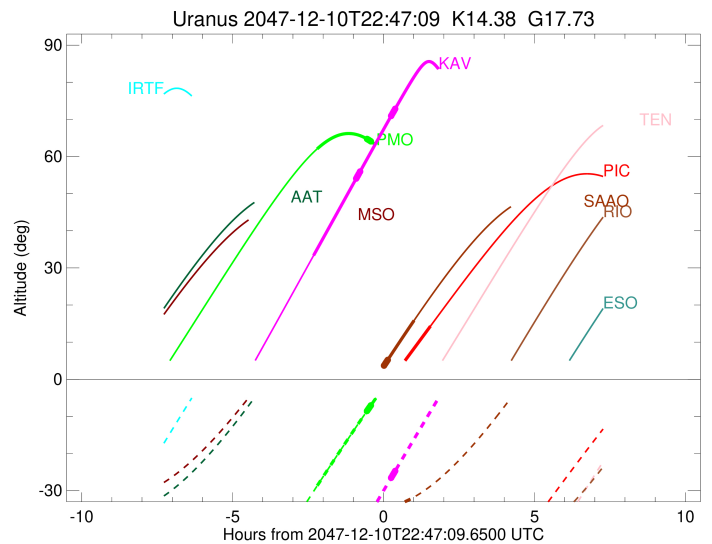
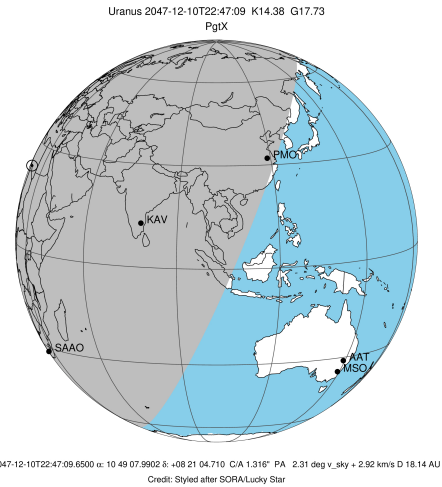


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1		+		DEC 11 00:20 - DEC 11 00:20	PneRnn
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8		+		DEC 10 20:35 - DEC 10 20:35	PinRnn
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 10 20:28 - DEC 10 20:28	PinRnn
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		+		DEC 10 23:47 - DEC 10 23:47	PneRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

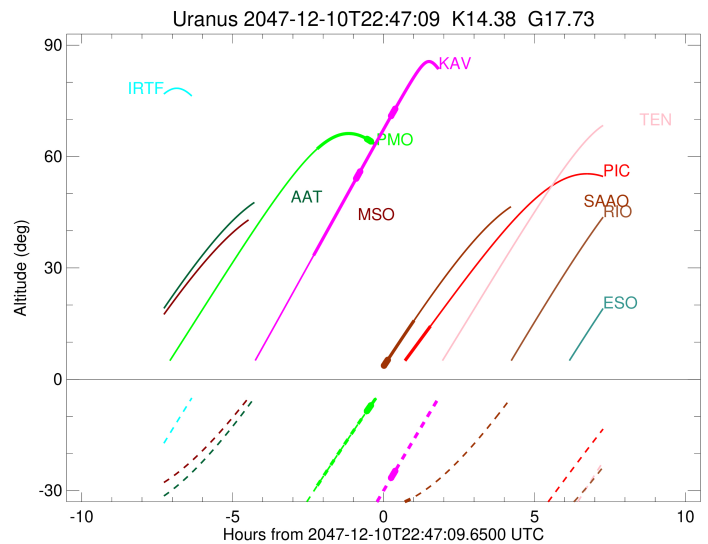
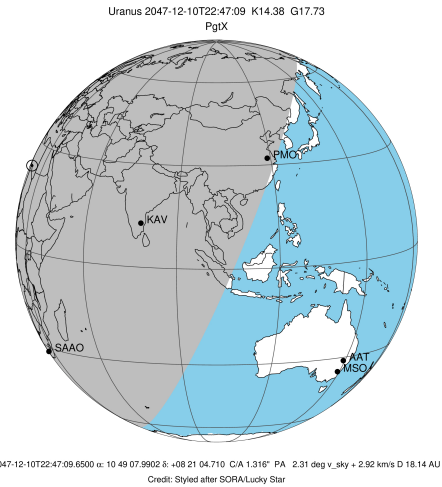


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2047-12-10T22:14:50.970
 Event type : PgtX
 : Uranus occs: geocentric, topocentric
 : No ring occs
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3866139791024848000
 2Mass ID (if available) : 10490808+0821046
 ICRS Star Coord at Epoch: 10h 49m 07.99017s +08:21:04.70987s
 RUWE (>1.4 is poor) : 1.18
 K magnitude : 14.376
 G magnitude : 17.726
 RP magnitude : 16.580
 BP magnitude : 18.885
 DUPflag : 0
 Distance (au) : 18.145
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 2.93
 Sun-Target sep (deg) : 97.64
 Sun-Moon sep (deg) : 17.18
 B (ring opening deg) : 6.99
 PA of pole (deg) : 104.39
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.988
 C/A sky separation (km) : 13004.9
 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



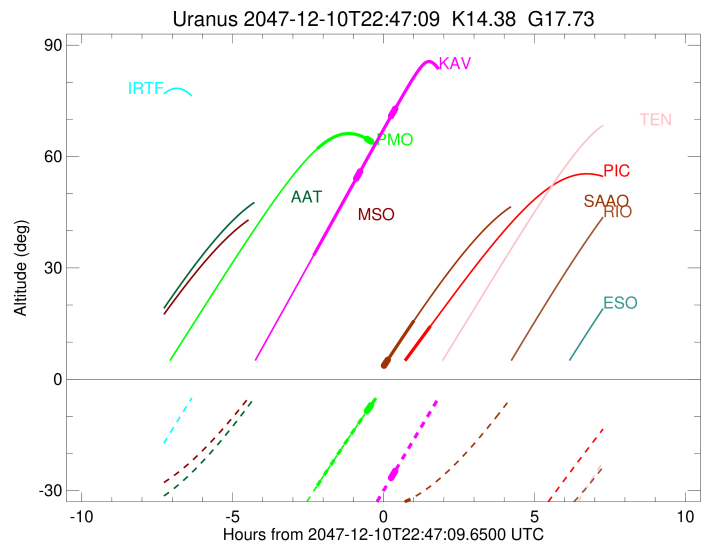
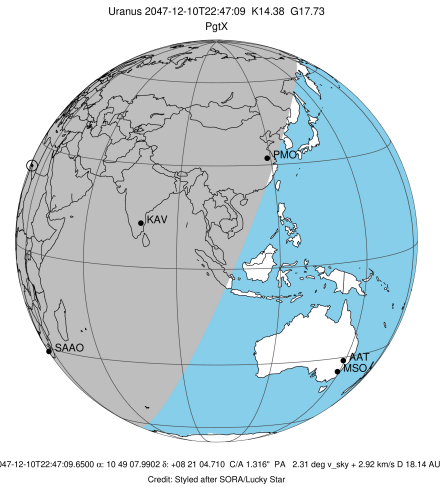
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2047-12-10T21:44:19.112	b	-13.64x	-56.97	50768.18	-24.61		
lambda	I	2047-12-10T21:44:49.276	b	-13.55x	-57.06	50026.71	-24.57		
delta	I	2047-12-10T21:45:59.663	b	-13.36x	-57.25	48300.35	-24.49		
gamma	I	2047-12-10T21:46:27.022	b	-13.28x	-57.32	47630.85	-24.45		
eta	I	2047-12-10T21:46:45.626	b	-13.23x	-57.37	47176.12	-24.43		
beta	I	2047-12-10T21:47:47.108	b	-13.06x	-57.54	45646.90	-24.34		
alpha	I	2047-12-10T21:48:27.762	b	-12.94x	-57.65	44721.59	-24.33		
4	I	2047-12-10T21:49:50.930	b	-12.71x	-57.87	42590.80	-24.08		
5	I	2047-12-10T21:49:58.291	b	-12.69x	-57.89	42251.98	-24.06		
6	I	2047-12-10T21:50:13.666	b	-12.64x	-57.94	41872.57	-23.93		
Uranus	I	2047-12-10T20:17:45.688		-26.84x	-41.76	25552.43		60.29	61.40
Uranus	E	2047-12-11T00:20:28.959		14.31	-69.37	25552.80		-57.52	-58.69
6	E	2047-12-10T22:43:34.344	b	-3.37x	-65.63	41794.79	23.20		
5	E	2047-12-10T22:43:43.084	b	-3.34x	-65.65	42267.25	23.32		
4	E	2047-12-10T22:43:58.020	b	-3.30x	-65.68	42531.44	23.34		
alpha	E	2047-12-10T22:45:20.157	b	-3.05x	-65.84	44697.05	23.54		
beta	E	2047-12-10T22:46:06.064	b	-2.92x	-65.93	45680.82	23.53		
eta	E	2047-12-10T22:47:08.689	b	-2.73x	-66.05	47176.12	23.60		
gamma	E	2047-12-10T22:47:27.657	b	-2.67x	-66.09	47623.79	23.61		
delta	E	2047-12-10T22:47:56.303	b	-2.59x	-66.14	48300.35	23.63		
lambda	E	2047-12-10T22:49:09.300	b	-2.37x	-66.28	50026.71	23.67		
epsilon	E	2047-12-10T22:50:13.598	b	-2.18x	-66.41	51549.78	23.70		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2047-12-10T22:56:47.120
 Event type : PgtX
 : Uranus occs: geocentric, topocentric
 : No ring occs
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3866139791024848000
 2Mass ID (if available) : 10490808+0821046
 ICRS Star Coord at Epoch: 10h 49m 07.99017s +08:21:04.70987s
 RUWE (>1.4 is poor) : 1.18
 K magnitude : 14.376
 G magnitude : 17.726
 RP magnitude : 16.580
 BP magnitude : 18.885
 DUPflag : 0
 Distance (au) : 18.144
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 2.93
 Sun-Target sep (deg) : 97.64
 Sun-Moon sep (deg) : 16.61
 B (ring opening deg) : 6.99
 PA of pole (deg) : 104.39
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.010
 C/A sky separation (km) : 13297.0
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



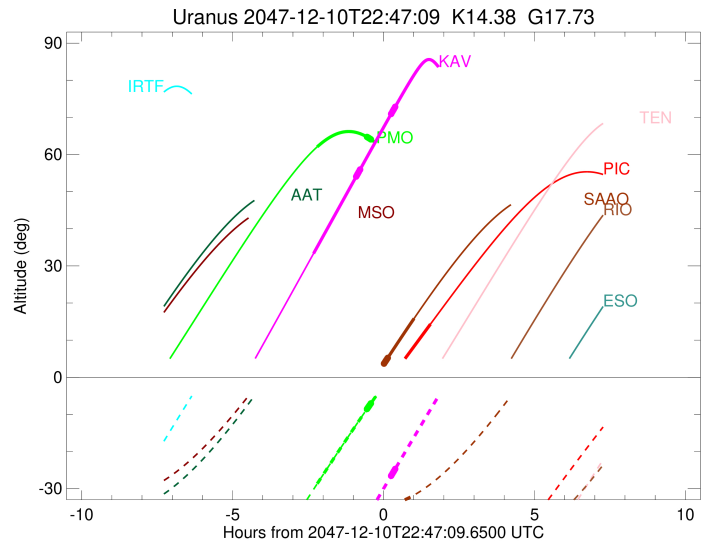
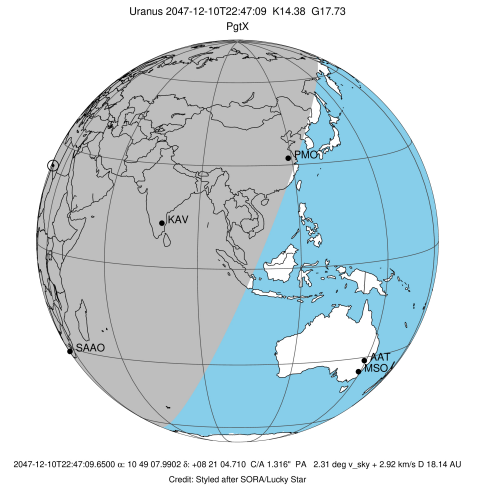
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2047-12-10T22:14:50.049	b	64.70	-8.45	50770.09	-20.39		
lambda	I	2047-12-10T22:15:26.554	b	64.66	-8.33	50026.71	-20.35		
delta	I	2047-12-10T22:16:51.489	b	64.54	-8.06	48300.35	-20.30		
gamma	I	2047-12-10T22:17:24.490	b	64.49	-7.95	47630.89	-20.27		
eta	I	2047-12-10T22:17:46.930	b	64.46	-7.87	47176.12	-20.26		
beta	I	2047-12-10T22:19:01.053	b	64.36	-7.63	45647.10	-20.19		
alpha	I	2047-12-10T22:19:50.014	b	64.29	-7.47	44721.11	-20.18		
4	I	2047-12-10T22:21:30.459	b	64.14	-7.14	42590.21	-19.99		
5	I	2047-12-10T22:21:38.980	b	64.12	-7.12	42253.11	-19.97		
6	I	2047-12-10T22:21:57.943	b	64.09	-7.05	41872.23	-19.87		
Uranus	I	2047-12-10T20:35:19.852		62.07	-28.70	25553.02		55.93	57.14
Uranus	E	2047-12-11T01:15:55.600		34.14	22.90x	25552.47		-60.01	-61.13
6	E	2047-12-10T23:24:48.256	b	55.58	4.84x	41794.80	19.99		
5	E	2047-12-10T23:24:58.435	b	55.56	4.88x	42267.32	20.09		
4	E	2047-12-10T23:25:15.730	b	55.51	4.93x	42531.42	20.12		
alpha	E	2047-12-10T23:26:50.987	b	55.24	5.22x	44697.04	20.31		
beta	E	2047-12-10T23:27:44.165	b	55.09	5.38x	45680.82	20.32		
eta	E	2047-12-10T23:28:56.646	b	54.88	5.60x	47176.12	20.40		
gamma	E	2047-12-10T23:29:18.585	b	54.82	5.66x	47623.79	20.41		
delta	E	2047-12-10T23:29:51.707	b	54.73	5.76x	48300.35	20.44		
lambda	E	2047-12-10T23:31:16.044	b	54.48	6.02x	50026.71	20.50		
epsilon	E	2047-12-10T23:32:30.255	b	54.27	6.24x	51549.86	20.54		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2047-12-10T22:34:04.330
 Event type : PgtX
 : Uranus occs: geocentric, topocentric
 : No ring occs
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 3866139791024848000
 2Mass ID (if available) : 10490808+0821046
 ICRS Star Coord at Epoch: 10h 49m 07.99017s +08:21:04.70987s
 RUWE (>1.4 is poor) : 1.18
 K magnitude : 14.376
 G magnitude : 17.726
 RP magnitude : 16.580
 BP magnitude : 18.885
 DUPflag : 0
 Distance (au) : 18.145
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 2.93
 Sun-Target sep (deg) : 97.64
 Sun-Moon sep (deg) : 16.84
 B (ring opening deg) : 6.99
 PA of pole (deg) : 104.39
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.246
 C/A sky separation (km) : 16391.9
 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	2047-12-10T21:53:14.906	b	54.16	-42.43	50779.67	-20.14		
lambda	I	2047-12-10T21:53:52.377	b	54.31	-42.29	50026.71	-20.07		
delta	I	2047-12-10T21:55:18.598	b	54.66	-41.96	48300.35	-19.97		
gamma	I	2047-12-10T21:55:52.148	b	54.80	-41.83	47631.05	-19.93		
eta	I	2047-12-10T21:56:14.995	b	54.89	-41.75	47176.12	-19.90		
beta	I	2047-12-10T21:57:30.508	b	55.20	-41.46	45648.14	-19.78		
alpha	I	2047-12-10T21:58:20.338	b	55.40	-41.27	44718.68	-19.74		
4	I	2047-12-10T22:00:04.351	b	55.83	-40.87	42587.03	-19.48		
5	I	2047-12-10T22:00:11.534	b	55.85	-40.84	42259.05	-19.45		
6	I	2047-12-10T22:00:33.107	b	55.94	-40.76	41870.25	-19.32		
Uranus	I	2047-12-10T20:28:10.161		33.34	-61.69	25554.07		48.78	50.08
Uranus	E	2047-12-11T00:46:52.622		81.54	-2.73x	25553.65		-51.62	-52.88
6	E	2047-12-10T23:02:27.274	b	70.96	-26.52	41795.09	18.79		
5	E	2047-12-10T23:02:37.388	b	71.00	-26.48	42272.98	18.91		
4	E	2047-12-10T23:02:56.856	b	71.08	-26.41	42529.86	18.93		
alpha	E	2047-12-10T23:04:37.780	b	71.48	-26.02	44695.16	19.16		
beta	E	2047-12-10T23:05:34.234	b	71.71	-25.80	45681.06	19.18		
eta	E	2047-12-10T23:06:51.095	b	72.02	-25.51	47176.12	19.27		
gamma	E	2047-12-10T23:07:14.330	b	72.11	-25.42	47624.12	19.29		
delta	E	2047-12-10T23:07:49.353	b	72.25	-25.29	48300.35	19.32		
lambda	E	2047-12-10T23:09:18.515	b	72.60	-24.94	50026.71	19.40		
epsilon	E	2047-12-10T23:10:36.652	b	72.91	-24.64	51544.81	19.45		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2047-12-10T22:20:18.300
 Event type : PgtX
 : Uranus occs: geocentric, topocentric
 : No ring occs
 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 : 3866139791024848000
 2Mass ID (if available) : 10490808+0821046
 ICRS Star Coord at Epoch: 10h 49m 07.99017s +08:21:04.70987s
 RUWE (>1.4 is poor) : 1.18
 K magnitude : 14.376
 G magnitude : 17.726
 RP magnitude : 16.580
 BP magnitude : 18.885
 DUPflag : 0
 Distance (au) : 18.145
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 2.93
 Sun-Target sep (deg) : 97.64
 Sun-Moon sep (deg) : 16.52
 B (ring opening deg) : 6.99
 PA of pole (deg) : 104.39
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.588
 C/A sky separation (km) : 20898.1
 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_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	2047-12-10T21:50:39.892	b	-8.39x	-34.06	50796.07	-22.28		
lambda	I	2047-12-10T21:51:14.547	b	-8.27x	-34.09	50026.71	-22.16		
delta	I	2047-12-10T21:52:32.780	b	-7.99x	-34.14	48300.35	-21.97		
gamma	I	2047-12-10T21:53:03.290	b	-7.88x	-34.15	47631.25	-21.89		
eta	I	2047-12-10T21:53:24.108	b	-7.81x	-34.17	47176.12	-21.83		
beta	I	2047-12-10T21:54:33.005	b	-7.57x	-34.21	45649.78	-21.63		
alpha	I	2047-12-10T21:55:18.379	b	-7.41x	-34.24	44715.10	-21.52		
4	I	2047-12-10T21:56:55.617	b	-7.06x	-34.29	42582.16	-21.09		
5	I	2047-12-10T21:57:00.430	b	-7.05x	-34.29	42267.56	-21.05		
6	I	2047-12-10T21:57:23.057	b	-6.97x	-34.31	41866.96	-20.87		
Uranus	I	2047-12-10T20:57:49.020		-19.59x	-30.65	25555.97		36.20	37.46
Uranus	E	2047-12-10T23:47:58.220		15.85	-31.74	25556.27		-34.07	-35.30
6	E	2047-12-10T22:48:20.189	b	3.71x	-34.65	41796.10	20.14		
5	E	2047-12-10T22:48:29.082	b	3.74x	-34.65	42281.42	20.31		
4	E	2047-12-10T22:48:48.477	b	3.81x	-34.64	42527.91	20.34		
alpha	E	2047-12-10T22:50:22.133	b	4.13x	-34.61	44692.48	20.71		
beta	E	2047-12-10T22:51:14.268	b	4.31x	-34.59	45681.23	20.79		
eta	E	2047-12-10T22:52:25.227	b	4.56x	-34.56	47176.12	20.96		
gamma	E	2047-12-10T22:52:46.609	b	4.63x	-34.56	47624.65	21.00		
delta	E	2047-12-10T22:53:18.740	b	4.74x	-34.54	48300.35	21.06		
lambda	E	2047-12-10T22:54:40.428	b	5.03	-34.51	50026.71	21.20		
epsilon	E	2047-12-10T22:55:51.309	b	5.27	-34.48	51533.69	21.29		