

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-24T04:20:46.140
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3382455765451800704
 2Mass ID (if available) : 06361308+2330309

ICRS Star Coord at Epoch: 06h 36m 13.08132s +23:30:30.97993s

RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.516
 G magnitude : 16.137
 RP magnitude : 15.573
 BP magnitude : 16.499
 DUPflag : 0
 Distance (au) : 17.912
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.18
 Sun-Target sep (deg) : 173.62
 Sun-Moon sep (deg) : 23.88
 B (ring opening deg) : 67.89
 PA of pole (deg) : 71.80

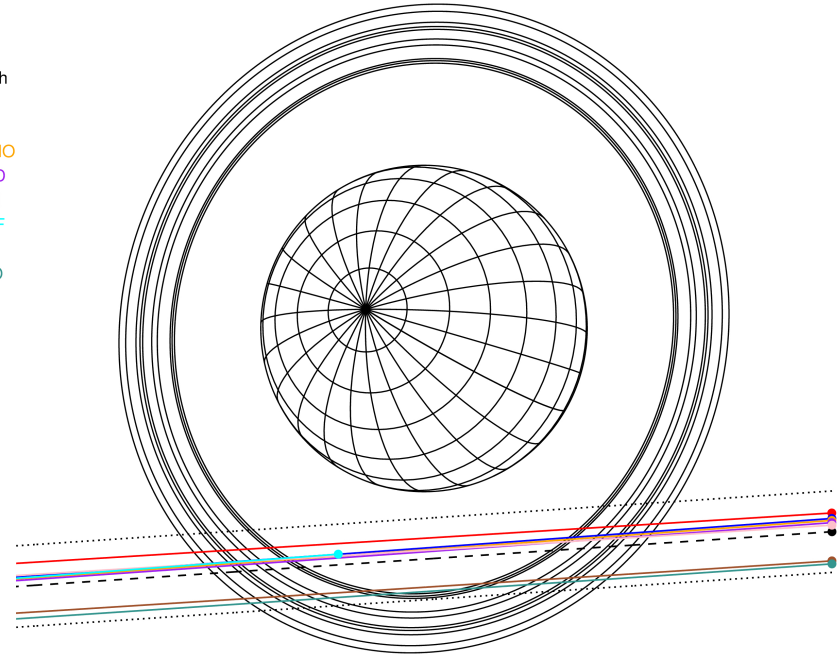
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2034-12-24T04:20:46.1400 α: 06 36 13.0813 δ: +23 30 30.980 C/A 2.766° PA 3.84 deg v_sky -23.18 km/s D 17.91 AU
 Credit: Styled after SORA/Lucky Star

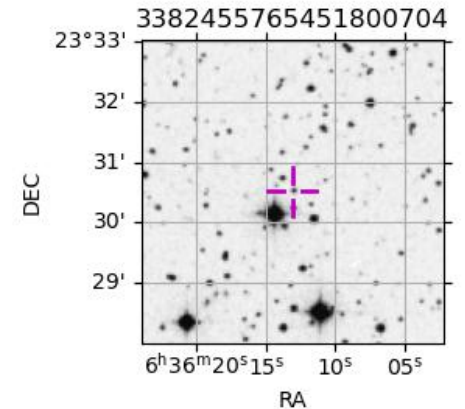
Uranus 2034-12-24T04:20:46 K14.52 G16.14 XRgt

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO

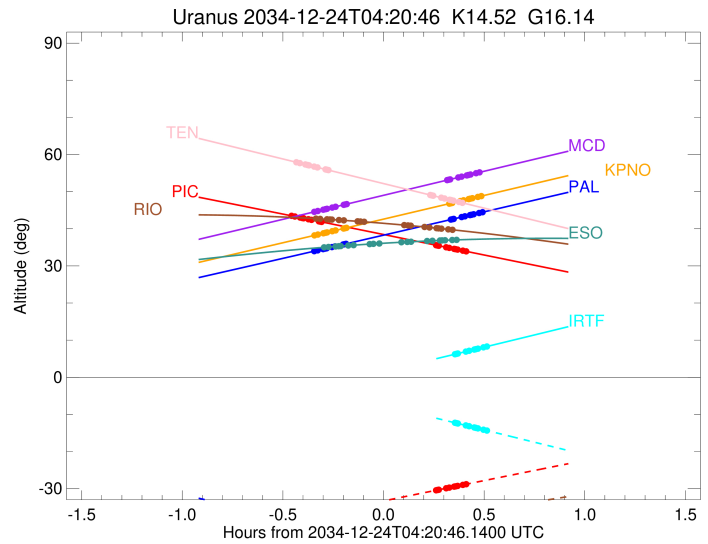
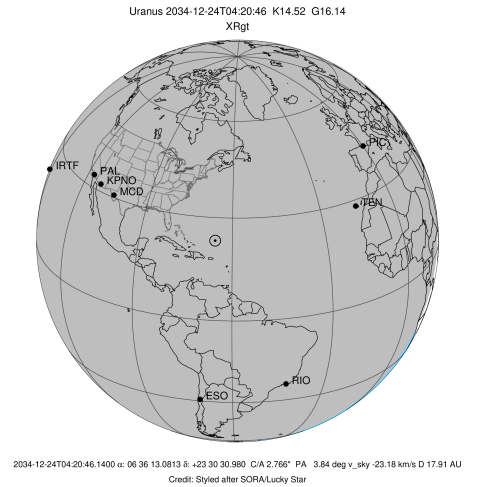


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	DEC 24 03:53 - DEC 24 04:45	PnnRie
PAL	Palomar Mt (200")	33.4	243.1	+++++		+++++	DEC 24 03:59 - DEC 24 04:49	PnnRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	DEC 24 04:00 - DEC 24 04:49	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	DEC 24 03:59 - DEC 24 04:49	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++		+++++	DEC 24 03:54 - DEC 24 04:43	PnnRie
IRTF	Mauna Kea/IRTF	19.8	204.5			+++++	DEC 24 04:42 - DEC 24 04:51	PnnRne
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++		+++++	DEC 24 04:00 - DEC 24 04:40	PnnRie
ESO	European Southern Obs	-29.3	289.3	+++++		+++++	DEC 24 04:02 - DEC 24 04:42	PnnRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-24T04:18:12.380
 Event type : XRgt
 : No Uranus occs
 : 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 : 3382455765451800704
 2Mass ID (if available) : 06361308+2330309
 ICRS Star Coord at Epoch: 06h 36m 13.08132s +23:30:30.97993s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.516
 G magnitude : 16.137
 RP magnitude : 15.573
 BP magnitude : 16.499
 DUPflag : 0
 Distance (au) : 17.912
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.18
 Sun-Target sep (deg) : 173.62
 Sun-Moon sep (deg) : 24.79
 B (ring opening deg) : 67.89
 PA of pole (deg) : 71.80
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.524
 C/A sky separation (km) : 32791.6
 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

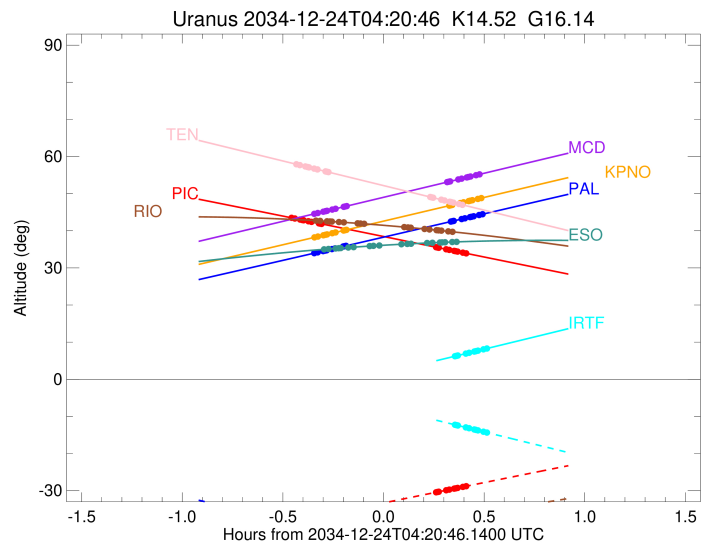
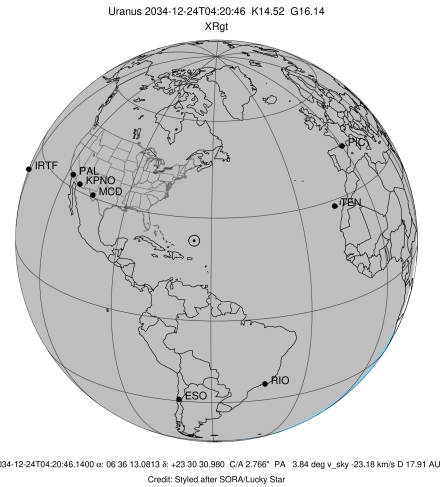


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-24T03:53:10.490		43.52	-38.38	51364.66	-18.98		
lambda	I	2034-12-24T03:54:21.255		43.31	-38.16	50026.71	-18.72		
delta	I	2034-12-24T03:55:54.816		43.02	-37.88	48300.35	-18.18		
gamma	I	2034-12-24T03:56:32.209		42.91	-37.76	47625.00	-17.94		
eta	I	2034-12-24T03:56:57.339		42.83	-37.69	47176.12	-17.78		
beta	I	2034-12-24T03:58:24.506		42.56	-37.42	45650.73	-17.17		
alpha	I	2034-12-24T03:59:19.998		42.39	-37.25	44707.73	-16.78		
4	I	2034-12-24T04:01:32.816		41.99	-36.84	42547.51	-15.65		
5	I	2034-12-24T04:01:53.330		41.93	-36.78	42243.77	-15.52		
6	I	2034-12-24T04:02:19.979		41.85	-36.70	41831.50	-15.22		

No planet occultations

6	E	2034-12-24T04:36:23.772		35.58	-30.46	41795.07	15.19		
5	E	2034-12-24T04:36:57.565		35.48	-30.35	42314.69	15.50		
4	E	2034-12-24T04:37:11.102		35.44	-30.31	42528.48	15.62		
alpha	E	2034-12-24T04:39:28.158		35.02	-29.89	44749.49	16.75		
beta	E	2034-12-24T04:40:20.781		34.86	-29.73	45643.44	17.14		
eta	E	2034-12-24T04:41:48.656		34.59	-29.47	47176.12	17.74		
gamma	E	2034-12-24T04:42:14.204		34.51	-29.39	47631.46	17.90		
delta	E	2034-12-24T04:42:51.325		34.39	-29.27	48300.35	18.13		
lambda	E	2034-12-24T04:44:25.117		34.11	-28.99	50026.71	18.67		
epsilon	E	2034-12-24T04:45:05.018		33.98	-28.87	50775.91	18.93		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-24T04:23:59.080
 Event type : XRgt
 : No Uranus occs
 : 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 : 3382455765451800704
 2Mass ID (if available) : 06361308+2330309
 ICRS Star Coord at Epoch: 06h 36m 13.08132s +23:30:30.97993s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.516
 G magnitude : 16.137
 RP magnitude : 15.573
 BP magnitude : 16.499
 DUPflag : 0
 Distance (au) : 17.912
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.18
 Sun-Target sep (deg) : 173.62
 Sun-Moon sep (deg) : 23.53
 B (ring opening deg) : 67.89
 PA of pole (deg) : 71.80
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.640
 C/A sky separation (km) : 34301.0
 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

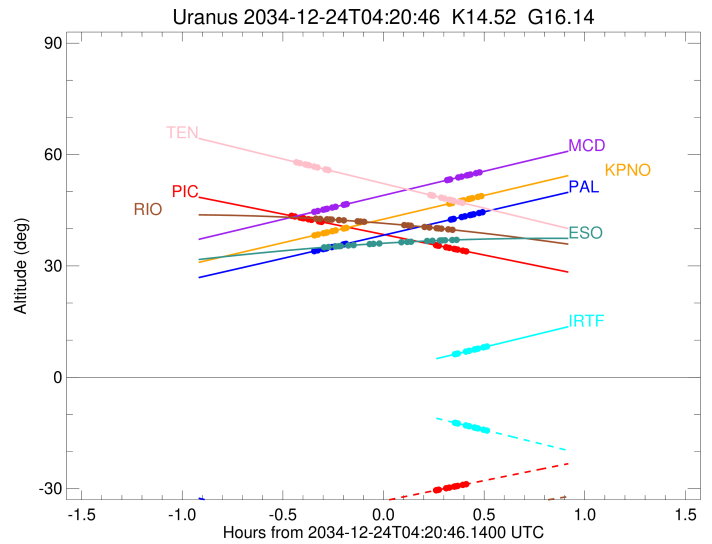
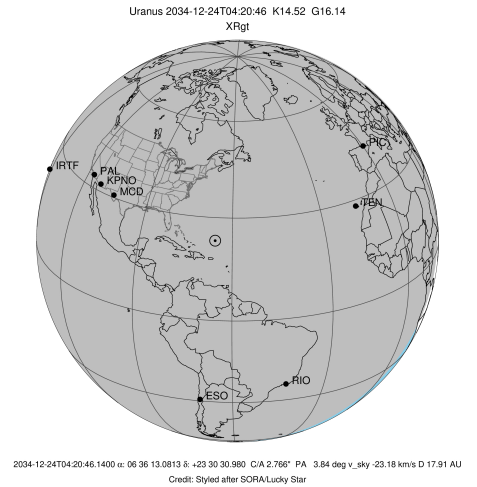


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-24T03:59:56.666		33.93	-39.71	51354.07	-18.28		
lambda	I	2034-12-24T04:01:09.621		34.19	-39.96	50026.71	-17.98		
delta	I	2034-12-24T04:02:47.261		34.53	-40.30	48300.35	-17.37		
gamma	I	2034-12-24T04:03:26.430		34.66	-40.44	47625.19	-17.11		
eta	I	2034-12-24T04:03:52.828		34.75	-40.53	47176.12	-16.92		
beta	I	2034-12-24T04:05:24.802		35.07	-40.85	45650.04	-16.22		
alpha	I	2034-12-24T04:06:23.587		35.28	-41.06	44709.13	-15.77		
4	I	2034-12-24T04:08:46.362		35.77	-41.55	42545.59	-14.44		
5	I	2034-12-24T04:09:08.180		35.85	-41.63	42247.87	-14.29		
6	I	2034-12-24T04:09:37.676		35.95	-41.73	41829.26	-13.93		

No planet occultations

6	E	2034-12-24T04:40:47.168		42.47	-48.25	41795.56	13.96		
5	E	2034-12-24T04:41:23.760		42.59	-48.37	42313.82	14.32		
4	E	2034-12-24T04:41:38.409		42.65	-48.43	42527.54	14.47		
alpha	E	2034-12-24T04:44:04.895		43.16	-48.94	44748.57	15.80		
beta	E	2034-12-24T04:45:00.540		43.35	-49.13	45642.90	16.26		
eta	E	2034-12-24T04:46:32.807		43.67	-49.45	47176.12	16.96		
gamma	E	2034-12-24T04:46:59.495		43.77	-49.54	47631.40	17.15		
delta	E	2034-12-24T04:47:38.193		43.90	-49.68	48300.35	17.42		
lambda	E	2034-12-24T04:49:15.546		44.24	-50.02	50026.71	18.04		
epsilon	E	2034-12-24T04:49:57.262		44.39	-50.16	50784.30	18.34		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-24T04:23:49.520
 Event type : XRgt
 : No Uranus occs
 : 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 : 3382455765451800704
 2Mass ID (if available) : 06361308+2330309
 ICRS Star Coord at Epoch: 06h 36m 13.08132s +23:30:30.97993s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.516
 G magnitude : 16.137
 RP magnitude : 15.573
 BP magnitude : 16.499
 DUPflag : 0
 Distance (au) : 17.912
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.18
 Sun-Target sep (deg) : 173.62
 Sun-Moon sep (deg) : 23.57
 B (ring opening deg) : 67.89
 PA of pole (deg) : 71.80
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.662
 C/A sky separation (km) : 34583.4
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

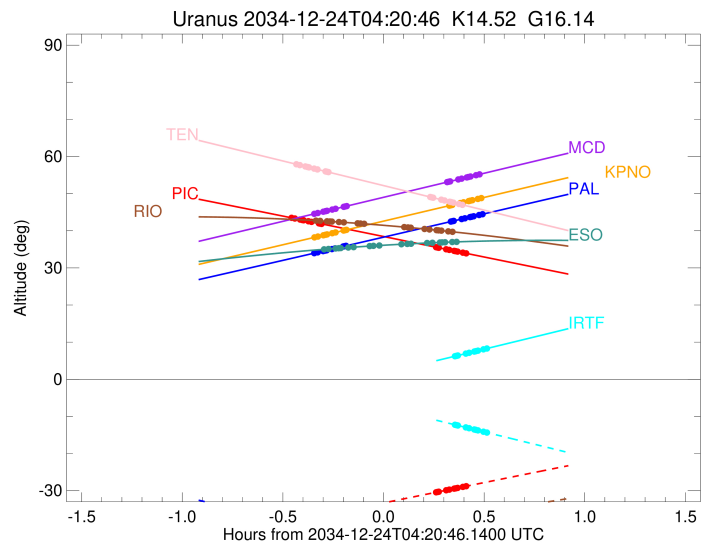
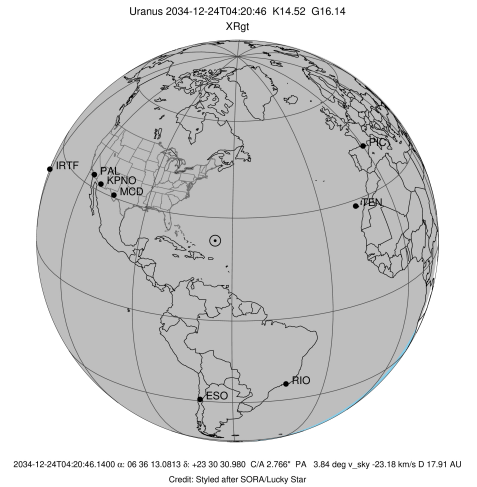


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-24T04:00:00.355		38.19	-44.07	51351.28	-18.18		
lambda	I	2034-12-24T04:01:13.587		38.45	-44.33	50026.71	-17.87		
delta	I	2034-12-24T04:02:51.892		38.79	-44.68	48300.35	-17.24		
gamma	I	2034-12-24T04:03:31.359		38.93	-44.82	47625.24	-16.97		
eta	I	2034-12-24T04:03:57.976		39.03	-44.91	47176.12	-16.78		
beta	I	2034-12-24T04:05:30.801		39.35	-45.24	45649.87	-16.06		
alpha	I	2034-12-24T04:06:30.180		39.56	-45.45	44709.47	-15.59		
4	I	2034-12-24T04:08:54.882		40.08	-45.96	42545.14	-14.22		
5	I	2034-12-24T04:09:16.935		40.15	-46.04	42248.83	-14.07		
6	I	2034-12-24T04:09:47.033		40.26	-46.14	41828.73	-13.70		

No planet occultations

6	E	2034-12-24T04:40:19.711		46.76	-52.63	41795.66	13.72		
5	E	2034-12-24T04:40:56.896		46.89	-52.76	42313.64	14.10		
4	E	2034-12-24T04:41:11.784		46.94	-52.81	42527.41	14.25		
alpha	E	2034-12-24T04:43:40.208		47.47	-53.34	44748.41	15.63		
beta	E	2034-12-24T04:44:36.459		47.67	-53.54	45642.83	16.10		
eta	E	2034-12-24T04:46:09.588		48.00	-53.87	47176.12	16.82		
gamma	E	2034-12-24T04:46:36.498		48.10	-53.96	47631.38	17.01		
delta	E	2034-12-24T04:47:15.500		48.23	-54.10	48300.35	17.29		
lambda	E	2034-12-24T04:48:53.534		48.58	-54.45	50026.71	17.92		
epsilon	E	2034-12-24T04:49:35.579		48.73	-54.60	50785.60	18.24		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-24T04:23:31.510
 Event type : XRgt
 : No Uranus occs
 : 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 : 3382455765451800704
 2Mass ID (if available) : 06361308+2330309
 ICRS Star Coord at Epoch: 06h 36m 13.08132s +23:30:30.97993s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.516
 G magnitude : 16.137
 RP magnitude : 15.573
 BP magnitude : 16.499
 DUPflag : 0
 Distance (au) : 17.912
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.18
 Sun-Target sep (deg) : 173.62
 Sun-Moon sep (deg) : 23.66
 B (ring opening deg) : 67.89
 PA of pole (deg) : 71.80
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.686
 C/A sky separation (km) : 34898.5
 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
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 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

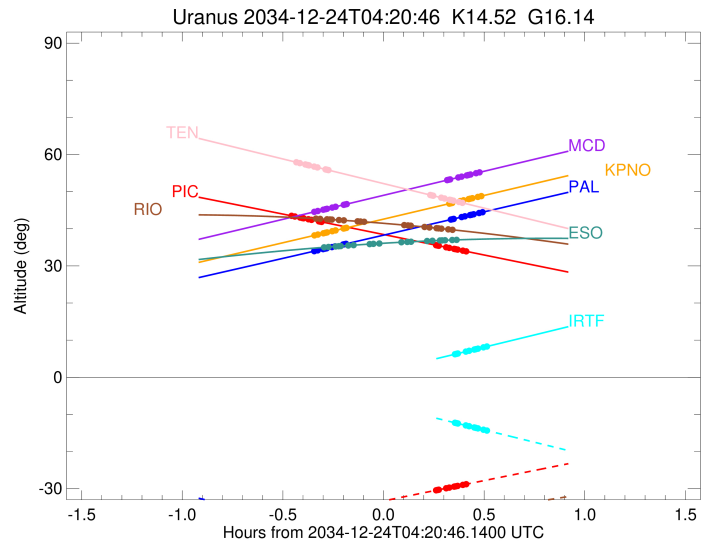
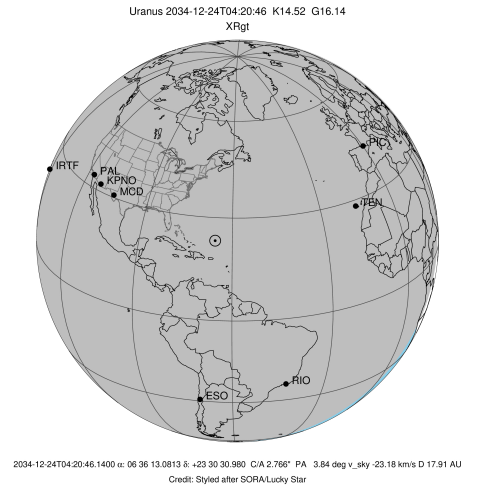


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-24T03:59:57.603		44.52	-50.50	51348.05	-18.07		
lambda	I	2034-12-24T04:01:11.128		44.79	-50.77	50026.71	-17.75		
delta	I	2034-12-24T04:02:50.175		45.14	-51.12	48300.35	-17.10		
gamma	I	2034-12-24T04:03:29.977		45.29	-51.26	47625.29	-16.82		
eta	I	2034-12-24T04:03:56.840		45.38	-51.36	47176.12	-16.62		
beta	I	2034-12-24T04:05:30.631		45.72	-51.70	45649.68	-15.88		
alpha	I	2034-12-24T04:06:30.687		45.94	-51.91	44709.86	-15.40		
4	I	2034-12-24T04:08:57.624		46.46	-52.44	42544.63	-13.98		
5	I	2034-12-24T04:09:19.950		46.54	-52.52	42249.94	-13.81		
6	I	2034-12-24T04:09:50.758		46.66	-52.63	41828.13	-13.43		

No planet occultations

6	E	2034-12-24T04:39:40.976		53.10	-59.05	41795.78	13.45		
5	E	2034-12-24T04:40:18.861		53.23	-59.18	42313.43	13.84		
4	E	2034-12-24T04:40:34.032		53.29	-59.24	42527.27	14.00		
alpha	E	2034-12-24T04:43:04.713		53.83	-59.77	44748.24	15.43		
beta	E	2034-12-24T04:44:01.660		54.04	-59.98	45642.74	15.92		
eta	E	2034-12-24T04:45:35.777		54.38	-60.31	47176.12	16.66		
gamma	E	2034-12-24T04:46:02.938		54.47	-60.41	47631.37	16.86		
delta	E	2034-12-24T04:46:42.287		54.61	-60.55	48300.35	17.14		
lambda	E	2034-12-24T04:48:21.089		54.97	-60.90	50026.71	17.79		
epsilon	E	2034-12-24T04:49:03.506		55.12	-61.06	50787.04	18.12		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-24T04:18:18.020
 Event type : XRgt
 : No Uranus occs
 : 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 : 3382455765451800704
 2Mass ID (if available) : 06361308+2330309
 ICRS Star Coord at Epoch: 06h 36m 13.08132s +23:30:30.97993s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.516
 G magnitude : 16.137
 RP magnitude : 15.573
 BP magnitude : 16.499
 DUPflag : 0
 Distance (au) : 17.912
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.18
 Sun-Target sep (deg) : 173.62
 Sun-Moon sep (deg) : 24.78
 B (ring opening deg) : 67.89
 PA of pole (deg) : 71.80
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.672
 C/A sky separation (km) : 34706.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl1.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

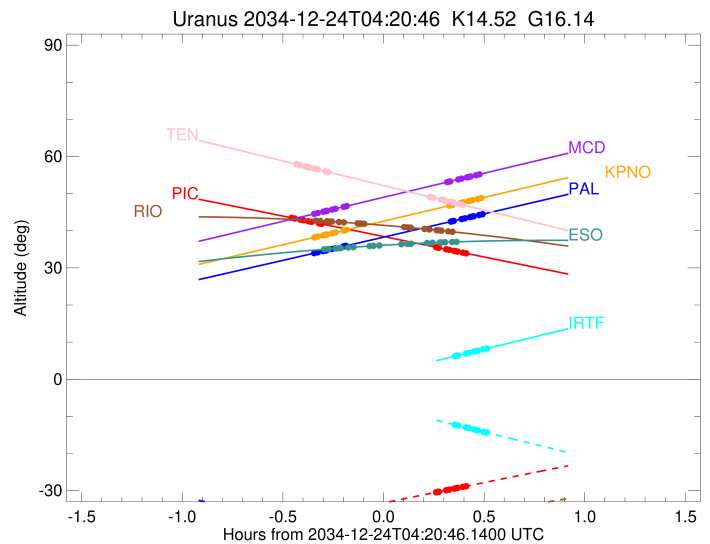
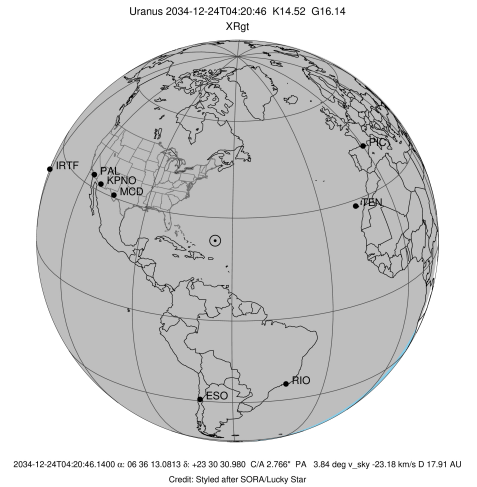


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-24T03:54:37.419		57.96	-51.79	51346.89	-18.23		
lambda	I	2034-12-24T03:55:50.235		57.69	-51.52	50026.71	-17.91		
delta	I	2034-12-24T03:57:28.354		57.33	-51.16	48300.35	-17.27		
gamma	I	2034-12-24T03:58:07.760		57.18	-51.02	47625.31	-16.99		
eta	I	2034-12-24T03:58:34.349		57.08	-50.92	47176.12	-16.80		
beta	I	2034-12-24T04:00:07.120		56.74	-50.58	45649.66	-16.07		
alpha	I	2034-12-24T04:01:06.459		56.52	-50.36	44709.90	-15.59		
4	I	2034-12-24T04:03:31.390		55.99	-49.83	42544.64	-14.19		
5	I	2034-12-24T04:03:53.372		55.91	-49.75	42249.92	-14.04		
6	I	2034-12-24T04:04:23.675		55.79	-49.64	41828.15	-13.66		

No planet occultations

6	E	2034-12-24T04:34:38.663		49.11	-43.00	41795.62	13.64		
5	E	2034-12-24T04:35:16.077		48.98	-42.87	42313.72	14.02		
4	E	2034-12-24T04:35:31.046		48.92	-42.81	42527.46	14.17		
alpha	E	2034-12-24T04:38:00.188		48.37	-42.27	44748.50	15.56		
beta	E	2034-12-24T04:38:56.661		48.17	-42.06	45642.87	16.04		
eta	E	2034-12-24T04:40:30.127		47.82	-41.72	47176.12	16.76		
gamma	E	2034-12-24T04:40:57.128		47.72	-41.62	47631.39	16.96		
delta	E	2034-12-24T04:41:36.257		47.58	-41.48	48300.35	17.23		
lambda	E	2034-12-24T04:43:14.589		47.22	-41.12	50026.71	17.87		
epsilon	E	2034-12-24T04:43:56.692		47.06	-40.97	50784.45	18.18		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-24T04:24:58.730
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 3382455765451800704
 2Mass ID (if available) : 06361308+2330309
 ICRS Star Coord at Epoch: 06h 36m 13.08132s +23:30:30.97993s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.516
 G magnitude : 16.137
 RP magnitude : 15.573
 BP magnitude : 16.499
 DUPflag : 0
 Distance (au) : 17.912
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.18
 Sun-Target sep (deg) : 173.62
 Sun-Moon sep (deg) : 23.09
 B (ring opening deg) : 67.89
 PA of pole (deg) : 71.80
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.636
 C/A sky separation (km) : 34244.3
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

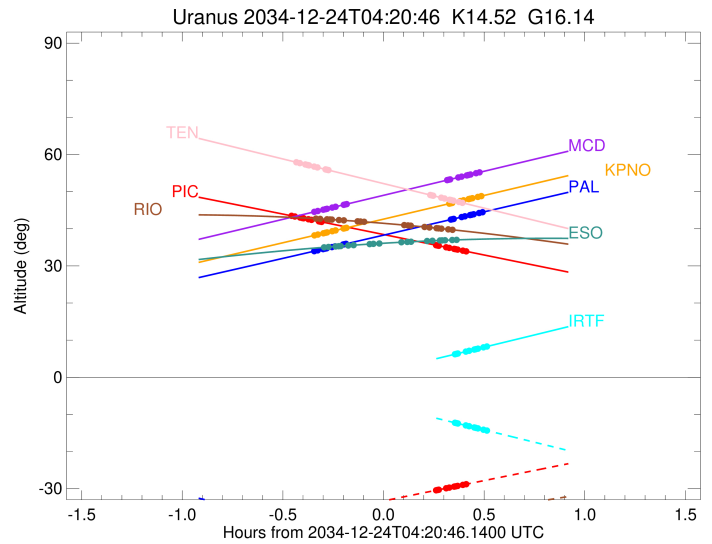
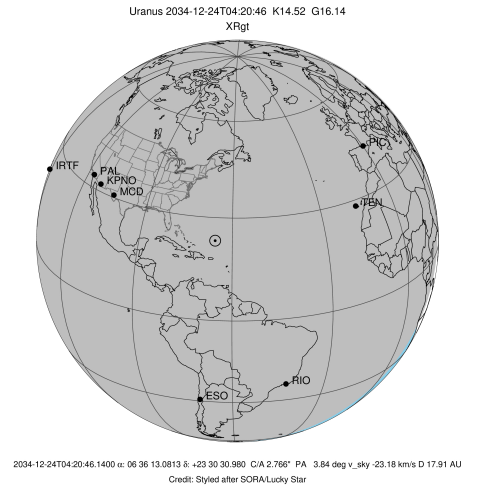


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-24T04:00:38.727	-2.70x	-3.23x	51355.38	-18.11			
lambda	I	2034-12-24T04:01:52.474	-2.44x	-3.50x	50026.71	-17.81			
delta	I	2034-12-24T04:03:31.058	-2.09x	-3.85x	48300.35	-17.20			
gamma	I	2034-12-24T04:04:10.600	-1.95x	-3.99x	47625.17	-16.95			
eta	I	2034-12-24T04:04:37.245	-1.85x	-4.09x	47176.12	-16.76			
beta	I	2034-12-24T04:06:10.061	-1.52x	-4.42x	45650.11	-16.08			
alpha	I	2034-12-24T04:07:09.383	-1.31x	-4.64x	44708.99	-15.63			
4	I	2034-12-24T04:09:33.343	-0.80x	-5.16	42545.76	-14.33			
5	I	2034-12-24T04:09:55.374	-0.72x	-5.24	42247.51	-14.18			
6	I	2034-12-24T04:10:25.060	-0.62x	-5.34	41829.45	-13.83			

No planet occultations

6	E	2034-12-24T04:42:00.888	6.19	-12.24	41795.56	13.86			
5	E	2034-12-24T04:42:37.739	6.33	-12.38	42313.82	14.22			
4	E	2034-12-24T04:42:52.494	6.38	-12.43	42527.53	14.37			
alpha	E	2034-12-24T04:45:20.102	6.92	-12.97	44748.56	15.68			
beta	E	2034-12-24T04:46:16.197	7.12	-13.18	45642.90	16.13			
eta	E	2034-12-24T04:47:49.228	7.46	-13.52	47176.12	16.82			
gamma	E	2034-12-24T04:48:16.141	7.56	-13.62	47631.39	17.01			
delta	E	2034-12-24T04:48:55.168	7.70	-13.77	48300.35	17.27			
lambda	E	2034-12-24T04:50:33.362	8.06	-14.13	50026.71	17.88			
epsilon	E	2034-12-24T04:51:15.455	8.21	-14.28	50784.53	18.18			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-24T04:19:32.830
 Event type : XRgt
 : No Uranus occs
 : 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 : 3382455765451800704
 2Mass ID (if available) : 06361308+2330309
 ICRS Star Coord at Epoch: 06h 36m 13.08132s +23:30:30.97993s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.516
 G magnitude : 16.137
 RP magnitude : 15.573
 BP magnitude : 16.499
 DUPflag : 0
 Distance (au) : 17.912
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.18
 Sun-Target sep (deg) : 173.62
 Sun-Moon sep (deg) : 24.28
 B (ring opening deg) : 67.89
 PA of pole (deg) : 71.80
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.113
 C/A sky separation (km) : 40447.2
 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

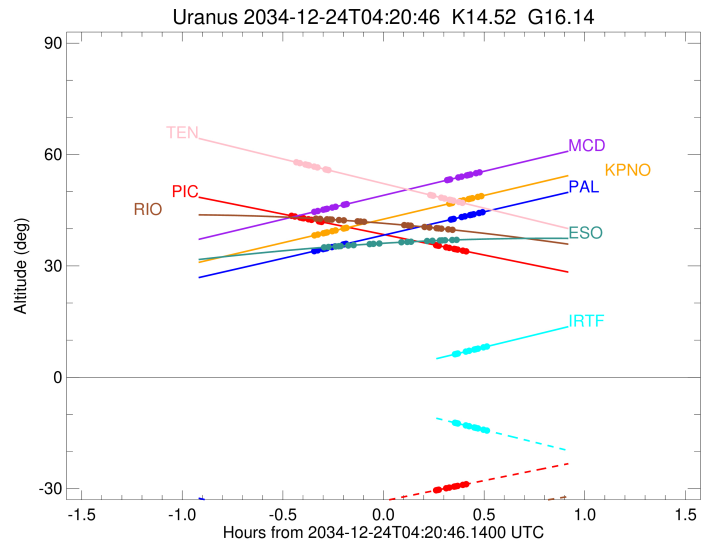
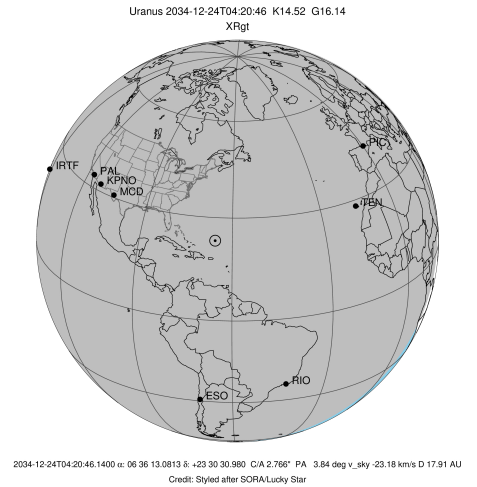


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-24T04:00:29.272		42.74	-40.95	51284.53	-15.08		
lambda	I	2034-12-24T04:01:53.764		42.67	-40.83	50026.71	-14.54		
delta	I	2034-12-24T04:03:57.115		42.56	-40.66	48300.35	-13.43		
gamma	I	2034-12-24T04:04:48.211		42.51	-40.58	47626.37	-12.94		
eta	I	2034-12-24T04:05:23.476		42.48	-40.53	47176.12	-12.59		
beta	I	2034-12-24T04:07:31.726		42.35	-40.34	45646.19	-11.22		
alpha	I	2034-12-24T04:08:58.217		42.27	-40.21	44718.26	-10.25		
4	I	2034-12-24T04:13:10.392		42.00	-39.82	42534.47	-6.97		
5	I	2034-12-24T04:13:50.772		41.96	-39.76	42274.78	-6.47		
6	I	2034-12-24T04:15:09.035		41.87	-39.63	41814.04	-5.29		

No planet occultations

6	E	2034-12-24T04:26:46.803		41.01	-38.44	41801.44	5.29		
5	E	2034-12-24T04:28:12.155		40.89	-38.28	42304.17	6.47		
4	E	2034-12-24T04:28:45.305		40.85	-38.22	42526.02	6.97		
alpha	E	2034-12-24T04:33:01.584		40.48	-37.74	44743.57	10.24		
beta	E	2034-12-24T04:34:25.140		40.36	-37.58	45641.43	11.22		
eta	E	2034-12-24T04:36:33.991		40.17	-37.33	47176.12	12.58		
gamma	E	2034-12-24T04:37:09.633		40.11	-37.27	47631.00	12.94		
delta	E	2034-12-24T04:38:00.402		40.03	-37.17	48300.35	13.43		
lambda	E	2034-12-24T04:40:03.833		39.84	-36.92	50026.71	14.53		
epsilon	E	2034-12-24T04:40:57.645		39.76	-36.81	50820.52	15.07		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-24T04:21:21.030
 Event type : XRgt
 : No Uranus occs
 : 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 : 3382455765451800704
 2Mass ID (if available) : 06361308+2330309
 ICRS Star Coord at Epoch: 06h 36m 13.08132s +23:30:30.97993s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.516
 G magnitude : 16.137
 RP magnitude : 15.573
 BP magnitude : 16.499
 DUPflag : 0
 Distance (au) : 17.912
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.18
 Sun-Target sep (deg) : 173.62
 Sun-Moon sep (deg) : 23.84
 B (ring opening deg) : 67.89
 PA of pole (deg) : 71.80
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.165
 C/A sky separation (km) : 41123.0
 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	2034-12-24T04:02:55.846		35.00	-36.65	51276.96	-14.59		
lambda	I	2034-12-24T04:04:22.760		35.10	-36.71	50026.71	-14.01		
delta	I	2034-12-24T04:06:31.281		35.24	-36.79	48300.35	-12.83		
gamma	I	2034-12-24T04:07:24.905		35.30	-36.83	47626.51	-12.30		
eta	I	2034-12-24T04:08:02.104		35.34	-36.85	47176.12	-11.92		
beta	I	2034-12-24T04:10:18.911		35.49	-36.93	45645.77	-10.41		
alpha	I	2034-12-24T04:11:52.883		35.59	-36.99	44719.50	-9.32		
4	I	2034-12-24T04:16:48.809		35.89	-37.14	42532.88	-5.35		
5	I	2034-12-24T04:17:41.581		35.94	-37.16	42279.62	-4.66		
6	I	2034-12-24T04:19:48.834		36.05	-37.22	41810.58	-2.72		

No planet occultations

6	E	2034-12-24T04:25:47.590		36.36	-37.34	41804.10	2.72		
5	E	2034-12-24T04:28:01.924		36.46	-37.38	42300.84	4.66		
4	E	2034-12-24T04:28:47.393		36.50	-37.39	42526.33	5.35		
alpha	E	2034-12-24T04:33:47.266		36.71	-37.46	44742.56	9.32		
beta	E	2034-12-24T04:35:18.218		36.77	-37.47	45641.30	10.41		
eta	E	2034-12-24T04:37:35.499		36.85	-37.48	47176.12	11.92		
gamma	E	2034-12-24T04:38:13.035		36.87	-37.49	47630.92	12.31		
delta	E	2034-12-24T04:39:06.271		36.90	-37.49	48300.35	12.84		
lambda	E	2034-12-24T04:41:14.712		36.97	-37.49	50026.71	14.02		
epsilon	E	2034-12-24T04:42:10.800		37.00	-37.50	50826.81	14.60		