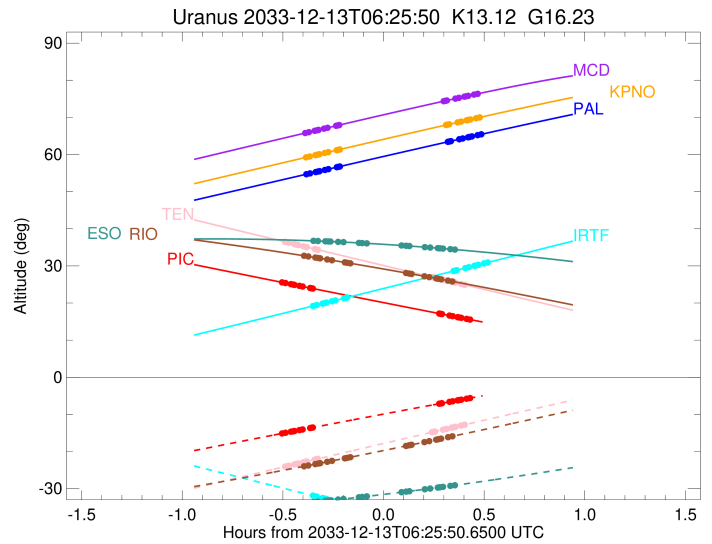
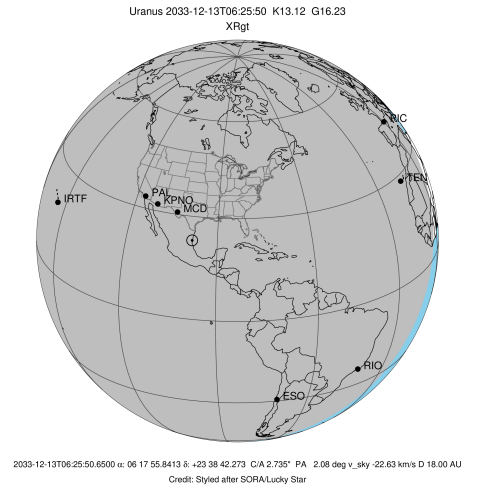


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-12-13T06:22:40.670
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3425563115250626048
 2Mass ID (if available) : 06175584+2338423
 ICRS Star Coord at Epoch: 06h 17m 55.84135s +23:38:42.27292s
 RUWE (>1.4 is poor) : 0.88
 K magnitude : 13.125
 G magnitude : 16.225
 RP magnitude : 15.276
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 17.995
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 166.97
 Sun-Moon sep (deg) : 72.96
 B (ring opening deg) : 71.75
 PA of pole (deg) : 65.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.443
 C/A sky separation (km) : 31882.2
 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

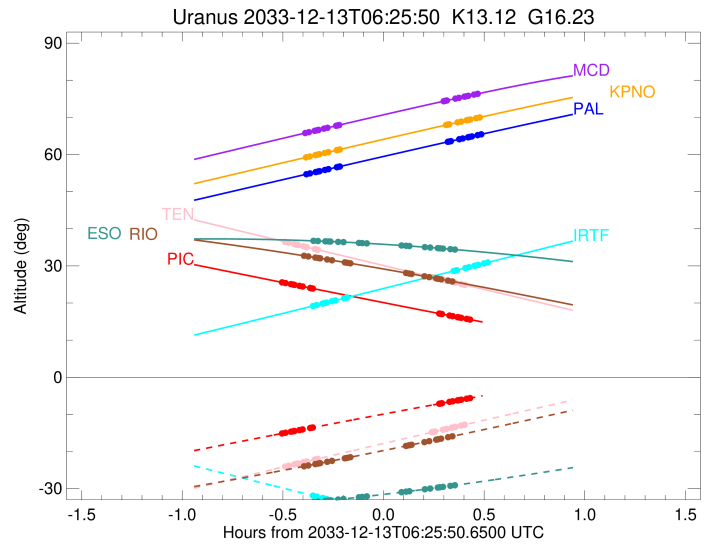
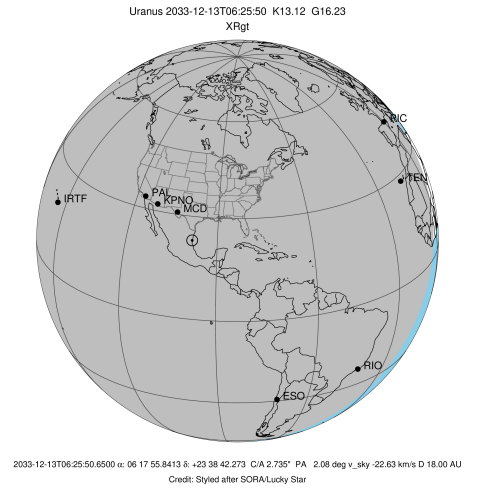


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-12-13T05:55:39.363		25.55	-15.12	51103.18	-18.49		
lambda	I	2033-12-13T05:56:38.367		25.37	-14.95	50026.71	-18.11		
delta	I	2033-12-13T05:58:14.940		25.08	-14.67	48300.35	-17.63		
gamma	I	2033-12-13T05:58:53.165		24.97	-14.56	47630.11	-17.43		
eta	I	2033-12-13T05:59:19.314		24.89	-14.48	47176.12	-17.29		
beta	I	2033-12-13T06:00:47.889		24.62	-14.22	45665.97	-16.76		
alpha	I	2033-12-13T06:01:47.032		24.44	-14.05	44689.68	-16.39		
4	I	2033-12-13T06:04:01.635		24.04	-13.66	42538.04	-15.47		
5	I	2033-12-13T06:04:15.895		23.99	-13.62	42314.01	-15.34		
6	I	2033-12-13T06:04:49.483		23.89	-13.52	41805.95	-15.06		

No planet occultations

6	E	2033-12-13T06:42:24.666		17.17	-7.14	41803.15	15.03		
5	E	2033-12-13T06:42:54.834		17.08	-7.05	42261.30	15.31		
4	E	2033-12-13T06:43:16.395		17.02	-7.00	42596.99	15.43		
alpha	E	2033-12-13T06:45:28.679		16.63	-6.63	44699.60	16.35		
beta	E	2033-12-13T06:46:25.599		16.46	-6.47	45641.62	16.72		
eta	E	2033-12-13T06:47:55.953		16.20	-6.22	47176.12	17.24		
gamma	E	2033-12-13T06:48:22.150		16.12	-6.15	47629.59	17.38		
delta	E	2033-12-13T06:49:00.519		16.01	-6.05	48300.35	17.58		
lambda	E	2033-12-13T06:50:37.396		15.73	-5.78	50026.71	18.05		
epsilon	E	2033-12-13T06:52:01.077		15.48	-5.55	51552.84	18.43		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-12-13T06:27:55.360
 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 : 3425563115250626048
 2Mass ID (if available) : 06175584+2338423
 ICRS Star Coord at Epoch: 06h 17m 55.84135s +23:38:42.27292s
 RUWE (>1.4 is poor) : 0.88
 K magnitude : 13.125
 G magnitude : 16.225
 RP magnitude : 15.276
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 17.995
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 166.97
 Sun-Moon sep (deg) : 73.72
 B (ring opening deg) : 71.75
 PA of pole (deg) : 65.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.645
 C/A sky separation (km) : 34521.2
 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

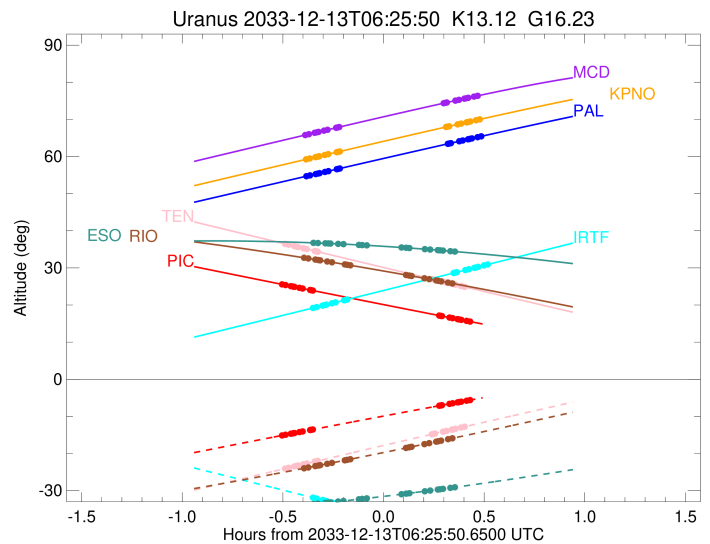
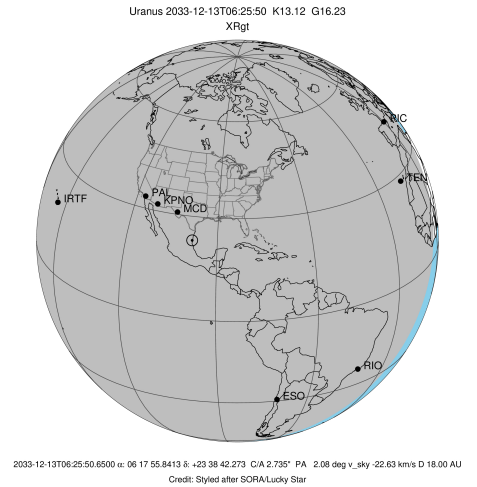


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-12-13T06:02:53.168		54.70	-66.13	51127.45	-17.60		
lambda	I	2033-12-13T06:03:56.798		54.92	-66.34	50026.71	-17.13		
delta	I	2033-12-13T06:05:39.361		55.28	-66.68	48300.35	-16.53		
gamma	I	2033-12-13T06:06:20.214		55.42	-66.82	47630.35	-16.27		
eta	I	2033-12-13T06:06:48.289		55.52	-66.91	47176.12	-16.09		
beta	I	2033-12-13T06:08:24.132		55.85	-67.22	45664.44	-15.41		
alpha	I	2033-12-13T06:09:28.740		56.08	-67.43	44688.32	-14.93		
4	I	2033-12-13T06:11:58.178		56.60	-67.92	42541.07	-13.70		
5	I	2033-12-13T06:12:14.591		56.65	-67.97	42314.99	-13.53		
6	I	2033-12-13T06:12:53.146		56.79	-68.10	41803.26	-13.15		

No planet occultations

6	E	2033-12-13T06:44:57.888		63.41	-74.02	41800.43	13.17		
5	E	2033-12-13T06:45:33.004		63.53	-74.12	42269.67	13.55		
4	E	2033-12-13T06:45:56.528		63.61	-74.19	42592.70	13.72		
alpha	E	2033-12-13T06:48:23.130		64.11	-74.60	44696.90	14.96		
beta	E	2033-12-13T06:49:25.267		64.32	-74.77	45642.15	15.44		
eta	E	2033-12-13T06:51:02.452		64.64	-75.04	47176.12	16.12		
gamma	E	2033-12-13T06:51:30.447		64.74	-75.12	47629.94	16.30		
delta	E	2033-12-13T06:52:11.244		64.88	-75.23	48300.35	16.56		
lambda	E	2033-12-13T06:53:53.590		65.22	-75.50	50026.71	17.16		
epsilon	E	2033-12-13T06:55:21.416		65.52	-75.73	51555.08	17.64		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-12-13T06:27:38.920
 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 : 3425563115250626048
 2Mass ID (if available) : 06175584+2338423
 ICRS Star Coord at Epoch: 06h 17m 55.84135s +23:38:42.27292s
 RUWE (>1.4 is poor) : 0.88
 K magnitude : 13.125
 G magnitude : 16.225
 RP magnitude : 15.276
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 17.995
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 166.97
 Sun-Moon sep (deg) : 73.74
 B (ring opening deg) : 71.75
 PA of pole (deg) : 65.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.663
 C/A sky separation (km) : 34751.5
 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
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

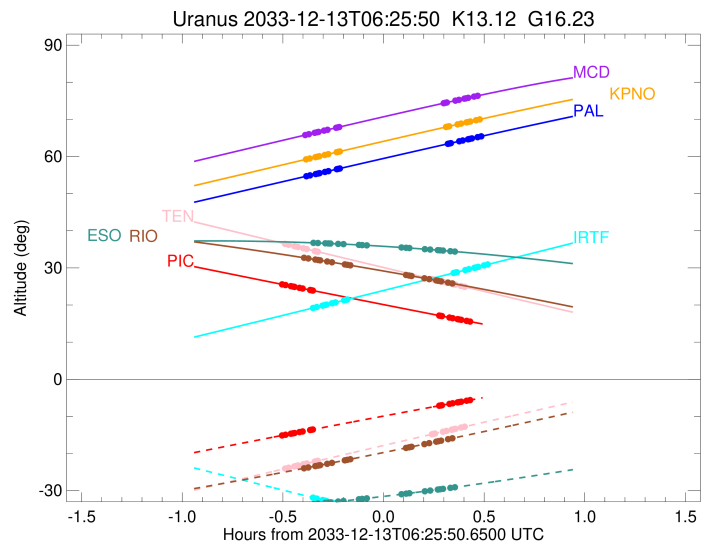
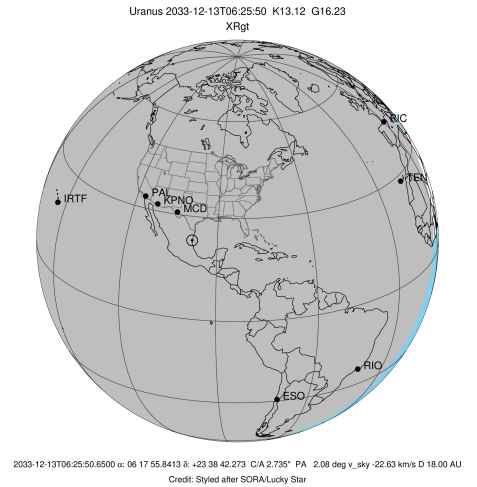


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-12-13T06:02:47.599		59.25	-70.76	51130.15	-17.52		
lambda	I	2033-12-13T06:03:51.702		59.47	-70.97	50026.71	-17.04		
delta	I	2033-12-13T06:05:34.852		59.84	-71.31	48300.35	-16.42		
gamma	I	2033-12-13T06:06:15.968		59.98	-71.44	47630.38	-16.16		
eta	I	2033-12-13T06:06:44.237		60.08	-71.53	47176.12	-15.97		
beta	I	2033-12-13T06:08:20.827		60.42	-71.85	45664.28	-15.28		
alpha	I	2033-12-13T06:09:26.008		60.65	-72.06	44688.18	-14.79		
4	I	2033-12-13T06:11:57.063		61.18	-72.54	42541.41	-13.52		
5	I	2033-12-13T06:12:13.725		61.24	-72.60	42315.05	-13.35		
6	I	2033-12-13T06:12:52.845		61.38	-72.72	41802.99	-12.96		

No planet occultations

6	E	2033-12-13T06:44:26.002		67.95	-78.24	41800.23	12.98		
5	E	2033-12-13T06:45:01.685		68.07	-78.33	42270.34	13.36		
4	E	2033-12-13T06:45:25.458		68.15	-78.39	42592.34	13.54		
alpha	E	2033-12-13T06:47:53.712		68.66	-78.74	44696.70	14.81		
beta	E	2033-12-13T06:48:56.436		68.87	-78.89	45642.20	15.31		
eta	E	2033-12-13T06:50:34.389		69.20	-79.12	47176.12	16.00		
gamma	E	2033-12-13T06:51:02.584		69.30	-79.18	47629.97	16.19		
delta	E	2033-12-13T06:51:43.654		69.43	-79.27	48300.35	16.45		
lambda	E	2033-12-13T06:53:26.614		69.78	-79.49	50026.71	17.07		
epsilon	E	2033-12-13T06:54:54.898		70.08	-79.67	51555.15	17.55		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-12-13T06:27:12.330
 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 : 3425563115250626048
 2Mass ID (if available) : 06175584+2338423
 ICRS Star Coord at Epoch: 06h 17m 55.84135s +23:38:42.27292s
 RUWE (>1.4 is poor) : 0.88
 K magnitude : 13.125
 G magnitude : 16.225
 RP magnitude : 15.276
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 17.995
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 166.97
 Sun-Moon sep (deg) : 73.75
 B (ring opening deg) : 71.75
 PA of pole (deg) : 65.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.680
 C/A sky separation (km) : 34980.2
 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

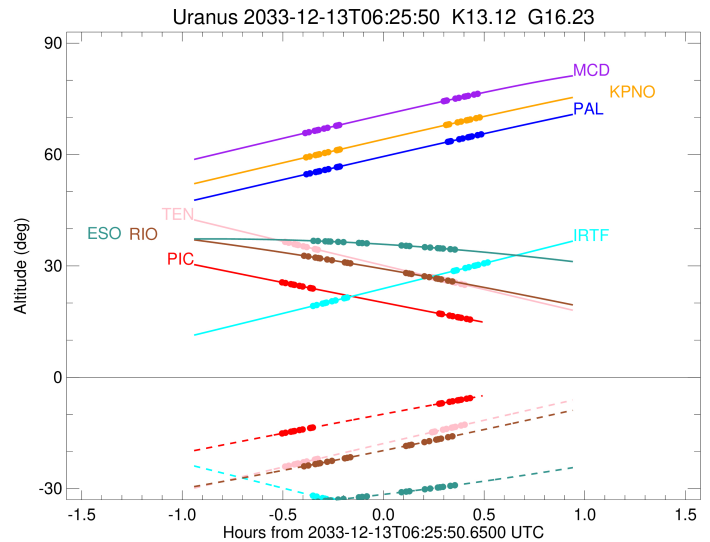
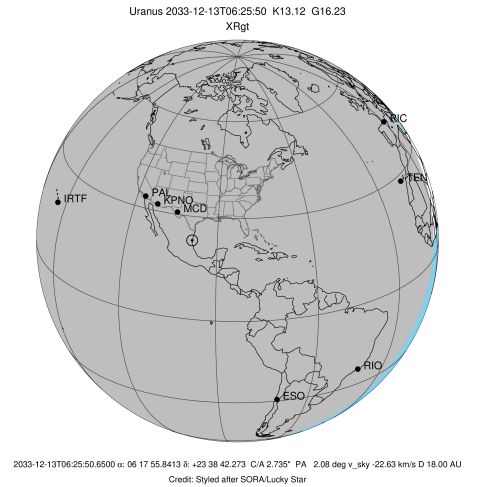


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-12-13T06:02:32.079		65.80	-77.09	51132.97	-17.44		
lambda	I	2033-12-13T06:03:36.656		66.02	-77.28	50026.71	-16.95		
delta	I	2033-12-13T06:05:20.385		66.39	-77.60	48300.35	-16.32		
gamma	I	2033-12-13T06:06:01.762		66.54	-77.72	47630.41	-16.06		
eta	I	2033-12-13T06:06:30.225		66.64	-77.80	47176.12	-15.86		
beta	I	2033-12-13T06:08:07.565		66.98	-78.09	45664.10	-15.16		
alpha	I	2033-12-13T06:09:13.324		67.21	-78.28	44688.05	-14.65		
4	I	2033-12-13T06:11:46.028		67.75	-78.72	42541.77	-13.35		
5	I	2033-12-13T06:12:02.948		67.81	-78.77	42315.11	-13.17		
6	I	2033-12-13T06:12:42.651		67.95	-78.88	41802.71	-12.77		

No planet occultations

6	E	2033-12-13T06:43:43.666		74.35	-82.52	41800.04	12.78		
5	E	2033-12-13T06:44:19.937		74.48	-82.54	42270.99	13.18		
4	E	2033-12-13T06:44:43.970		74.56	-82.56	42591.99	13.36		
alpha	E	2033-12-13T06:47:13.928		75.05	-82.63	44696.50	14.67		
beta	E	2033-12-13T06:48:17.250		75.26	-82.65	45642.25	15.18		
eta	E	2033-12-13T06:49:55.986		75.58	-82.66	47176.12	15.89		
gamma	E	2033-12-13T06:50:24.386		75.68	-82.66	47629.99	16.08		
delta	E	2033-12-13T06:51:05.733		75.81	-82.66	48300.35	16.35		
lambda	E	2033-12-13T06:52:49.315		76.15	-82.64	50026.71	16.98		
epsilon	E	2033-12-13T06:54:18.062		76.43	-82.61	51555.20	17.47		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-12-13T06:22:16.780
 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 : 3425563115250626048
 2Mass ID (if available) : 06175584+2338423
 ICRS Star Coord at Epoch: 06h 17m 55.84135s +23:38:42.27292s
 RUWE (>1.4 is poor) : 0.88
 K magnitude : 13.125
 G magnitude : 16.225
 RP magnitude : 15.276
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 17.995
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 166.97
 Sun-Moon sep (deg) : 73.07
 B (ring opening deg) : 71.75
 PA of pole (deg) : 65.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.586
 C/A sky separation (km) : 33746.7
 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

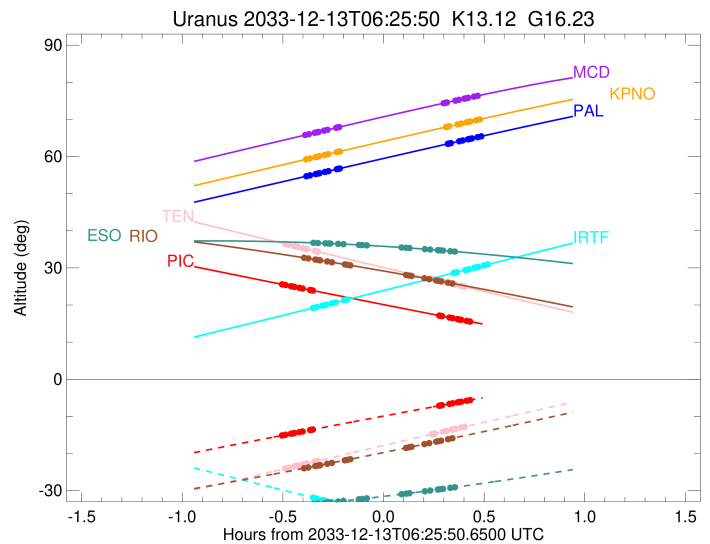
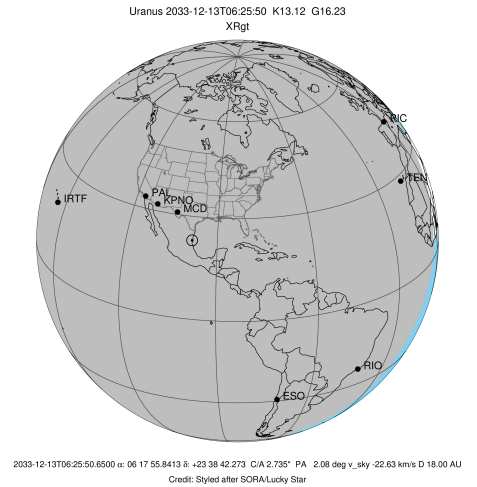


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-12-13T05:56:33.687		36.46	-24.05	51122.88	-17.86		
lambda	I	2033-12-13T05:57:36.054		36.23	-23.83	50026.71	-17.41		
delta	I	2033-12-13T05:59:16.776		35.87	-23.47	48300.35	-16.85		
gamma	I	2033-12-13T05:59:56.813		35.72	-23.32	47630.31	-16.62		
eta	I	2033-12-13T06:00:24.288		35.62	-23.23	47176.12	-16.44		
beta	I	2033-12-13T06:01:57.846		35.28	-22.90	45664.78	-15.82		
alpha	I	2033-12-13T06:03:00.703		35.06	-22.67	44688.61	-15.37		
4	I	2033-12-13T06:05:25.244		34.53	-22.16	42540.32	-14.24		
5	I	2033-12-13T06:05:40.946		34.48	-22.10	42314.82	-14.09		
6	I	2033-12-13T06:06:17.846		34.34	-21.97	41803.89	-13.74		

No planet occultations

6	E	2033-12-13T06:40:14.238		27.01	-14.82	41801.38	13.71		
5	E	2033-12-13T06:40:47.721		26.89	-14.71	42266.61	14.05		
4	E	2033-12-13T06:41:10.695		26.81	-14.63	42594.33	14.21		
alpha	E	2033-12-13T06:43:32.997		26.30	-14.13	44697.89	15.33		
beta	E	2033-12-13T06:44:33.639		26.08	-13.92	45641.93	15.77		
eta	E	2033-12-13T06:46:08.997		25.74	-13.59	47176.12	16.40		
gamma	E	2033-12-13T06:46:36.527		25.64	-13.49	47629.81	16.57		
delta	E	2033-12-13T06:47:16.719		25.50	-13.36	48300.35	16.80		
lambda	E	2033-12-13T06:48:57.775		25.14	-13.01	50026.71	17.36		
epsilon	E	2033-12-13T06:50:24.704		24.83	-12.70	51554.49	17.80		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-12-13T06:29:52.290
 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 : 3425563115250626048
 2Mass ID (if available) : 06175584+2338423
 ICRS Star Coord at Epoch: 06h 17m 55.84135s +23:38:42.27292s
 RUWE (>1.4 is poor) : 0.88
 K magnitude : 13.125
 G magnitude : 16.225
 RP magnitude : 15.276
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 17.995
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 166.97
 Sun-Moon sep (deg) : 73.43
 B (ring opening deg) : 71.75
 PA of pole (deg) : 65.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.670
 C/A sky separation (km) : 34851.7
 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

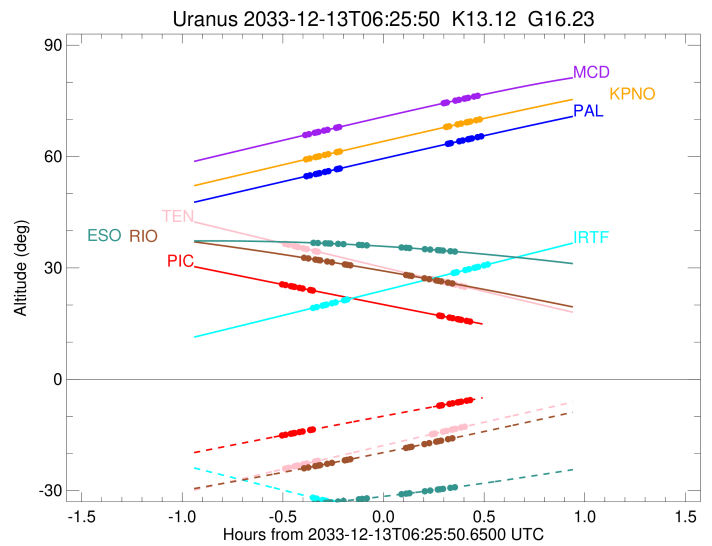
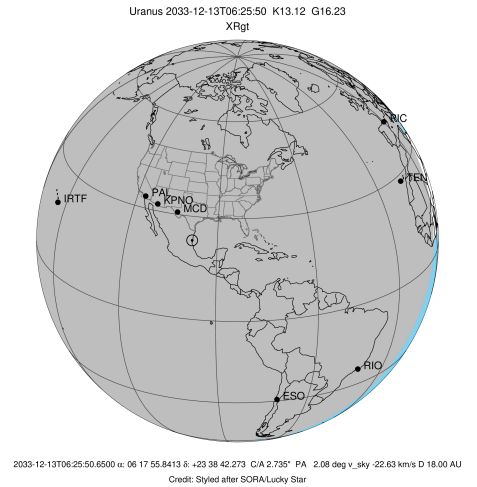


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-12-13T06:04:51.838		19.21	-31.90	51129.66	-17.30		
lambda	I	2033-12-13T06:05:56.734		19.46	-32.14	50026.71	-16.82		
delta	I	2033-12-13T06:07:41.237		19.84	-32.54	48300.35	-16.21		
gamma	I	2033-12-13T06:08:22.905		20.00	-32.70	47630.38	-15.95		
eta	I	2033-12-13T06:08:51.558		20.11	-32.80	47176.12	-15.76		
beta	I	2033-12-13T06:10:29.492		20.47	-33.17	45664.28	-15.07		
alpha	I	2033-12-13T06:11:35.616		20.72	-33.42	44688.19	-14.57		
4	I	2033-12-13T06:14:09.000		21.29	-34.00	42541.42	-13.31		
5	I	2033-12-13T06:14:25.936		21.35	-34.07	42315.06	-13.13		
6	I	2033-12-13T06:15:05.712		21.50	-34.22	41802.97	-12.74		

No planet occultations

6	E	2033-12-13T06:46:41.436		28.61	-41.41	41800.04	12.78		
5	E	2033-12-13T06:47:17.732		28.75	-41.55	42270.98	13.17		
4	E	2033-12-13T06:47:41.794		28.84	-41.64	42591.98	13.35		
alpha	E	2033-12-13T06:50:12.096		29.40	-42.22	44696.48	14.62		
beta	E	2033-12-13T06:51:15.634		29.64	-42.46	45642.26	15.12		
eta	E	2033-12-13T06:52:54.761		30.02	-42.84	47176.12	15.82		
gamma	E	2033-12-13T06:53:23.285		30.12	-42.94	47629.99	16.01		
delta	E	2033-12-13T06:54:04.819		30.28	-43.10	48300.35	16.27		
lambda	E	2033-12-13T06:55:48.907		30.67	-43.50	50026.71	16.89		
epsilon	E	2033-12-13T06:57:18.120		31.01	-43.84	51555.22	17.37		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-12-13T06:23:06.640
 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 : 3425563115250626048
 2Mass ID (if available) : 06175584+2338423
 ICRS Star Coord at Epoch: 06h 17m 55.84135s +23:38:42.27292s
 RUWE (>1.4 is poor) : 0.88
 K magnitude : 13.125
 G magnitude : 16.225
 RP magnitude : 15.276
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 17.995
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 166.97
 Sun-Moon sep (deg) : 73.10
 B (ring opening deg) : 71.75
 PA of pole (deg) : 65.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.043
 C/A sky separation (km) : 39715.8
 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

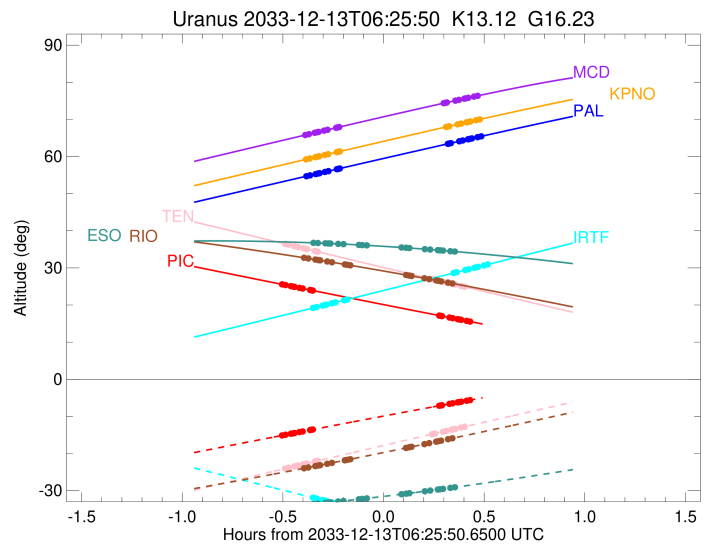
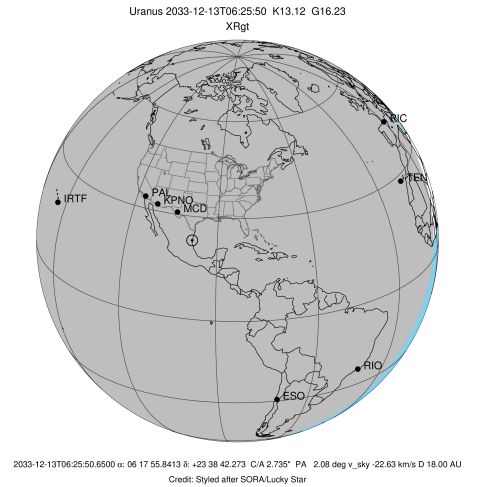


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-12-13T06:02:07.352		32.73	-23.99	51191.49	-15.02		
lambda	I	2033-12-13T06:03:27.171		32.54	-23.76	50026.71	-14.30		
delta	I	2033-12-13T06:05:32.026		32.24	-23.40	48300.35	-13.33		
gamma	I	2033-12-13T06:06:23.050		32.12	-23.25	47630.92	-12.91		
eta	I	2033-12-13T06:06:58.718		32.03	-23.14	47176.12	-12.60		
beta	I	2033-12-13T06:09:04.724		31.72	-22.77	45660.20	-11.42		
alpha	I	2033-12-13T06:10:33.789		31.50	-22.51	44685.62	-10.53		
4	I	2033-12-13T06:14:22.777		30.93	-21.82	42551.49	-8.00		
5	I	2033-12-13T06:14:53.495		30.86	-21.73	42313.55	-7.59		
6	I	2033-12-13T06:16:06.040		30.67	-21.51	41797.13	-6.69		

No planet occultations

6	E	2033-12-13T06:32:24.873		28.12	-18.53	41795.88	6.69		
5	E	2033-12-13T06:33:33.972		27.93	-18.31	42287.78	7.59		
4	E	2033-12-13T06:34:11.894		27.83	-18.19	42581.65	7.99		
alpha	E	2033-12-13T06:37:58.649		27.21	-17.49	44691.91	10.52		
beta	E	2033-12-13T06:39:25.407		26.98	-17.21	45643.79	11.40		
eta	E	2033-12-13T06:41:33.135		26.62	-16.81	47176.12	12.58		
gamma	E	2033-12-13T06:42:08.832		26.52	-16.70	47630.54	12.88		
delta	E	2033-12-13T06:42:59.972		26.38	-16.54	48300.35	13.31		
lambda	E	2033-12-13T06:45:05.059		26.03	-16.14	50026.71	14.28		
epsilon	E	2033-12-13T06:46:49.253		25.74	-15.81	51552.88	14.99		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-12-13T06:24:51.550
 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 : 3425563115250626048
 2Mass ID (if available) : 06175584+2338423
 ICRS Star Coord at Epoch: 06h 17m 55.84135s +23:38:42.27292s
 RUWE (>1.4 is poor) : 0.88
 K magnitude : 13.125
 G magnitude : 16.225
 RP magnitude : 15.276
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 17.995
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.63
 Sun-Target sep (deg) : 166.97
 Sun-Moon sep (deg) : 73.29
 B (ring opening deg) : 71.75
 PA of pole (deg) : 65.47
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.123
 C/A sky separation (km) : 40765.0
 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	2033-12-13T06:04:54.592		36.75	-33.63	51203.95	-14.41		
lambda	I	2033-12-13T06:06:19.014		36.70	-33.50	50026.71	-13.62		
delta	I	2033-12-13T06:08:30.905		36.62	-33.30	48300.35	-12.54		
gamma	I	2033-12-13T06:09:25.334		36.59	-33.21	47631.01	-12.06		
eta	I	2033-12-13T06:10:03.625		36.56	-33.15	47176.12	-11.70		
beta	I	2033-12-13T06:12:20.900		36.47	-32.93	45659.23	-10.35		
alpha	I	2033-12-13T06:14:00.295		36.40	-32.77	44685.22	-9.30		
4	I	2033-12-13T06:18:35.515		36.19	-32.32	42554.91	-6.07		
5	I	2033-12-13T06:19:18.028		36.15	-32.24	42311.77	-5.48		
6	I	2033-12-13T06:21:06.219		36.06	-32.06	41795.83	-4.07		

No planet occultations

6	E	2033-12-13T06:30:58.257		35.51	-30.99	41795.03	4.07		
5	E	2033-12-13T06:32:42.990		35.41	-30.80	42293.29	5.48		
4	E	2033-12-13T06:33:32.655		35.35	-30.70	42577.72	6.07		
alpha	E	2033-12-13T06:38:05.470		35.06	-30.18	44690.68	9.30		
beta	E	2033-12-13T06:39:42.472		34.94	-29.99	45644.36	10.35		
eta	E	2033-12-13T06:42:01.326		34.78	-29.71	47176.12	11.70		
gamma	E	2033-12-13T06:42:39.604		34.74	-29.64	47630.68	12.05		
delta	E	2033-12-13T06:43:34.083		34.67	-29.53	48300.35	12.53		
lambda	E	2033-12-13T06:45:46.035		34.51	-29.26	50026.71	13.62		
epsilon	E	2033-12-13T06:47:34.701		34.37	-29.04	51550.97	14.40		