

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-08-23T09:47:28.640
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 144658763435090048
 2Mass ID (if available) : 04304238+2145063

ICRS Star Coord at Epoch: 04h 30m 42.41146s +21:45:05.60632s

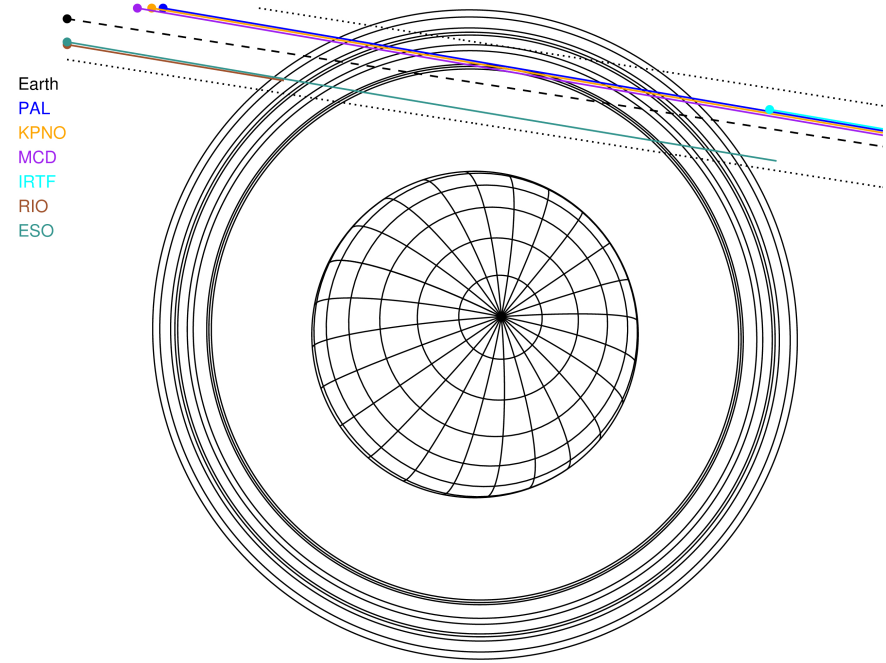
RUWE (>1.4 is poor) : 1.08
 K magnitude : 12.401
 G magnitude : 15.091
 RP magnitude : 14.246
 BP magnitude : 15.830
 DUPflag : 0
 Distance (au) : 19.526
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 11.34
 Sun-Target sep (deg) : 80.34
 Sun-Moon sep (deg) : 30.91
 B (ring opening deg) : 78.75
 PA of pole (deg) : -55.87

#	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



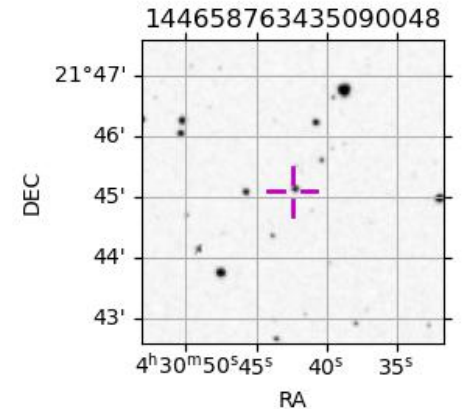
2027-08-23T09:47:28.6400 ex: 04 30 42.4115 s: +21 45 05.606 C/A 2.755° PA 171.10 deg v_sky +11.34 km/s D 19.53 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2027-08-23T09:47:28 K12.40 G15.09 XRgt

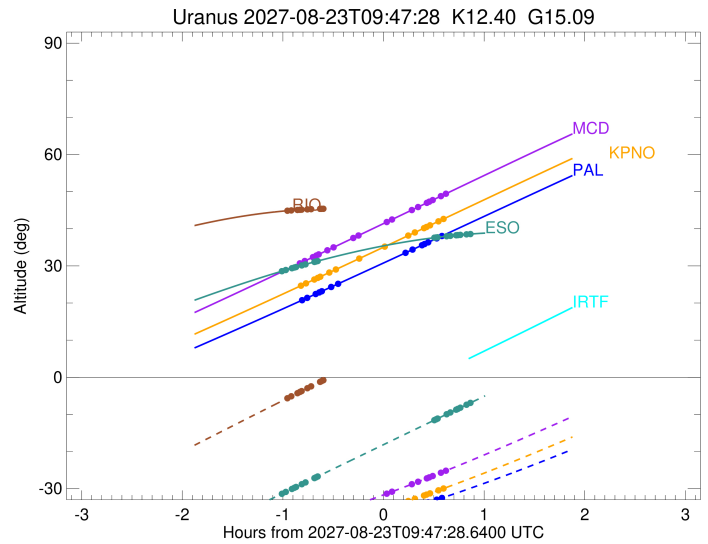
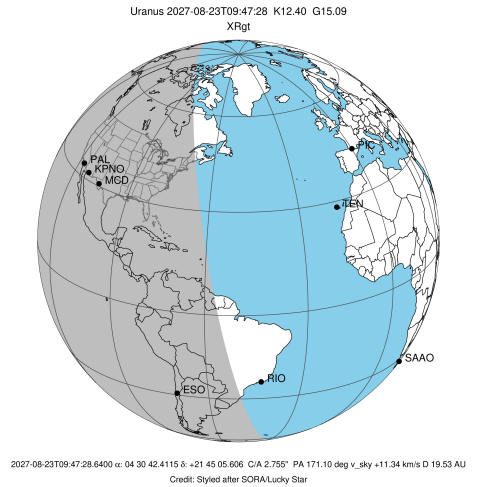


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+++++		+++++	AUG 23 09:00 - AUG 23 10:22	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	AUG 23 08:59 - AUG 23 10:23	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	AUG 23 08:58 - AUG 23 10:24	PnnRie
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					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	++			AUG 23 08:51 - AUG 23 08:52	PnnRin
ESO	European Southern Obs	-29.3	289.3	+++++		+++++	AUG 23 08:47 - AUG 23 10:39	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 : 2027-08-23T09:41:42.040
 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 : 144658763435090048
 2Mass ID (if available) : 04304238+2145063
 ICRS Star Coord at Epoch: 04h 30m 42.41146s +21:45:05.60632s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 12.401
 G magnitude : 15.091
 RP magnitude : 14.246
 BP magnitude : 15.830
 DUPflag : 0
 Distance (au) : 19.526
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 11.34
 Sun-Target sep (deg) : 80.34
 Sun-Moon sep (deg) : 30.52
 B (ring opening deg) : 78.75
 PA of pole (deg) : -55.87
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.979
 C/A sky separation (km) : 42187.9
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

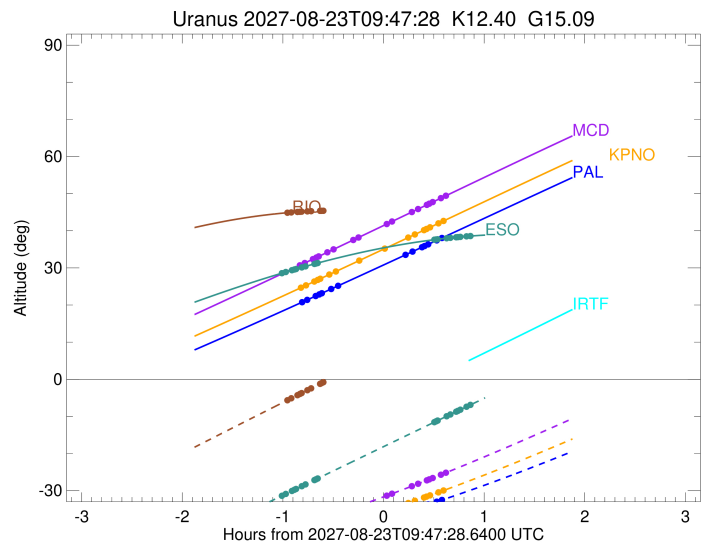
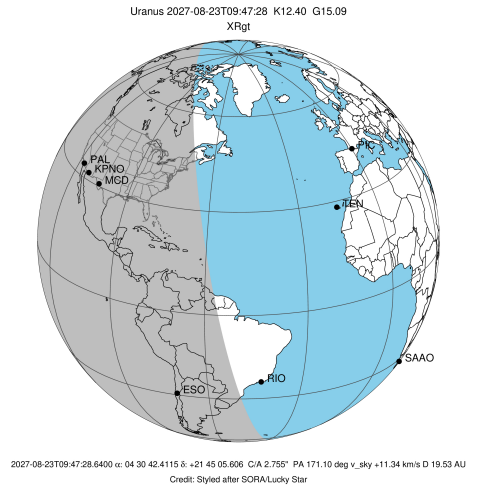


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-08-23T08:59:59.555		20.98	-42.36	50771.54	-6.24		
lambda	I	2027-08-23T09:02:01.728		21.39	-42.19	50026.71	-5.98		
delta	I	2027-08-23T09:07:05.525		22.43	-41.75	48300.35	-5.37		
gamma	I	2027-08-23T09:09:14.154		22.87	-41.55	47626.90	-5.10		
eta	I	2027-08-23T09:10:44.376		23.18	-41.41	47176.12	-4.90		
beta	I	2027-08-23T09:16:19.675		24.33	-40.87	45665.41	-4.11		
alpha	I	2027-08-23T09:20:20.478		25.16	-40.47	44752.43	-3.49		

No planet occultations

alpha	E	2027-08-23T10:00:39.719		33.53	-35.62	44745.84	3.46		
beta	E	2027-08-23T10:04:47.455		34.39	-35.05	45677.53	4.07		
eta	E	2027-08-23T10:10:22.804		35.56	-34.27	47176.12	4.85		
gamma	E	2027-08-23T10:11:53.067		35.87	-34.05	47622.43	5.04		
delta	E	2027-08-23T10:14:03.987		36.33	-33.74	48300.35	5.31		
lambda	E	2027-08-23T10:19:11.467		37.40	-32.99	50026.71	5.91		
epsilon	E	2027-08-23T10:22:13.914		38.04	-32.53	51133.78	6.15		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-08-23T09:41:49.780
 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 : 144658763435090048
 2Mass ID (if available) : 04304238+2145063
 ICRS Star Coord at Epoch: 04h 30m 42.41146s +21:45:05.60632s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 12.401
 G magnitude : 15.091
 RP magnitude : 14.246
 BP magnitude : 15.830
 DUPflag : 0
 Distance (au) : 19.526
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 11.34
 Sun-Target sep (deg) : 80.34
 Sun-Moon sep (deg) : 30.57
 B (ring opening deg) : 78.75
 PA of pole (deg) : -55.87
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.957
 C/A sky separation (km) : 41870.3
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

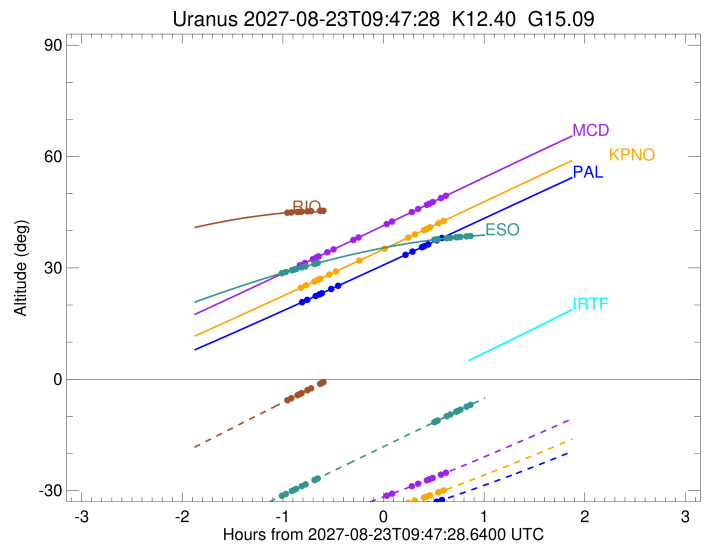
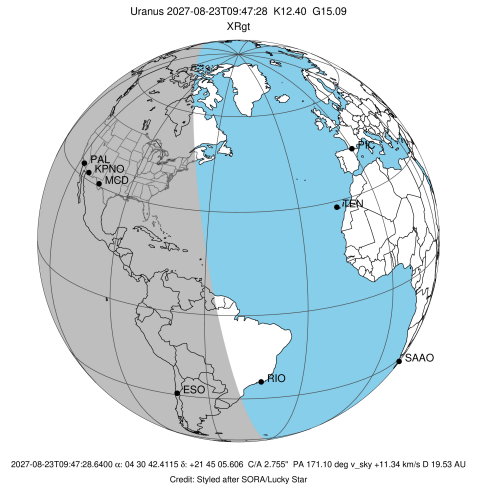


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-08-23T08:59:17.662		24.88	-41.67	50769.93	-6.33		
lambda	I	2027-08-23T09:01:17.700		25.30	-41.45	50026.71	-6.08		
delta	I	2027-08-23T09:06:15.679		26.34	-40.90	48300.35	-5.50		
gamma	I	2027-08-23T09:08:21.197		26.78	-40.66	47626.98	-5.23		
eta	I	2027-08-23T09:09:48.976		27.09	-40.49	47176.12	-5.04		
beta	I	2027-08-23T09:15:12.424		28.22	-39.85	45665.04	-4.29		
alpha	I	2027-08-23T09:19:00.478		29.02	-39.39	44752.43	-3.72		
4	I	2027-08-23T09:33:46.452		32.13	-37.47	42533.10	-1.24		

No planet occultations

4	E	2027-08-23T09:47:32.992		35.05	-35.53	42539.37	1.24		
alpha	E	2027-08-23T10:02:16.443		38.18	-33.33	44745.38	3.69		
beta	E	2027-08-23T10:06:11.427		39.01	-32.72	45677.75	4.26		
eta	E	2027-08-23T10:11:34.891		40.16	-31.87	47176.12	4.99		
gamma	E	2027-08-23T10:13:02.700		40.47	-31.63	47622.37	5.18		
delta	E	2027-08-23T10:15:10.499		40.92	-31.29	48300.35	5.43		
lambda	E	2027-08-23T10:20:12.127		41.99	-30.47	50026.71	6.00		
epsilon	E	2027-08-23T10:23:12.597		42.63	-29.98	51138.43	6.24		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-08-23T09:42:11.640
 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 : 144658763435090048
 2Mass ID (if available) : 04304238+2145063
 ICRS Star Coord at Epoch: 04h 30m 42.41146s +21:45:05.60632s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 12.401
 G magnitude : 15.091
 RP magnitude : 14.246
 BP magnitude : 15.830
 DUPflag : 0
 Distance (au) : 19.526
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 11.34
 Sun-Target sep (deg) : 80.34
 Sun-Moon sep (deg) : 30.66
 B (ring opening deg) : 78.75
 PA of pole (deg) : -55.87
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.928
 C/A sky separation (km) : 41466.7
 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

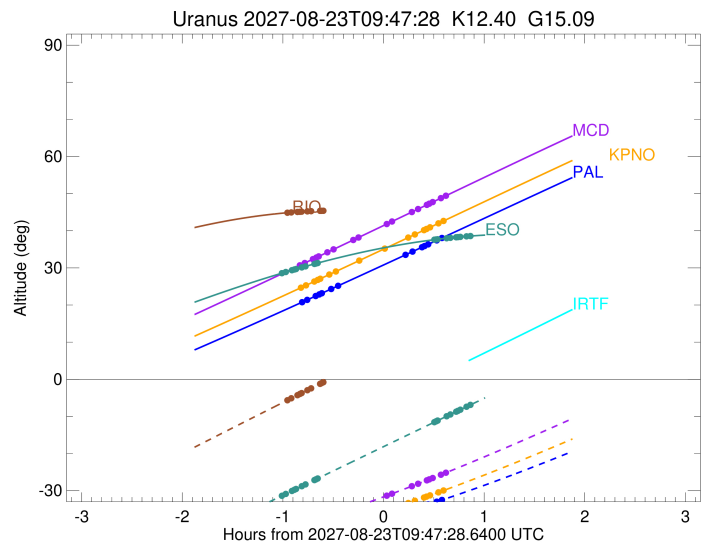
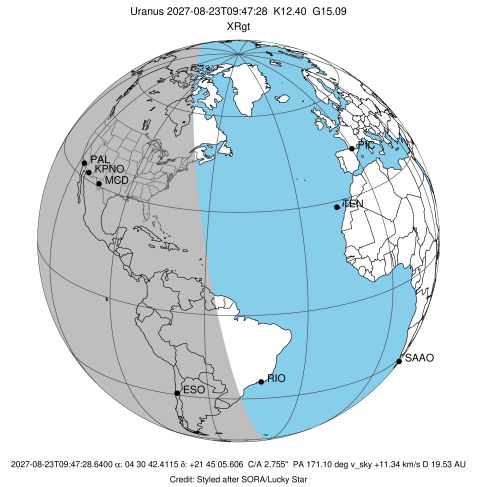


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-08-23T08:58:36.418		30.91	-39.12	50767.95	-6.43		
lambda	I	2027-08-23T09:00:33.995		31.33	-38.85	50026.71	-6.20		
delta	I	2027-08-23T09:05:25.339		32.36	-38.17	48300.35	-5.64		
gamma	I	2027-08-23T09:07:27.346		32.80	-37.89	47627.08	-5.39		
eta	I	2027-08-23T09:08:52.391		33.10	-37.68	47176.12	-5.21		
beta	I	2027-08-23T09:14:02.901		34.21	-36.93	45664.59	-4.52		
alpha	I	2027-08-23T09:17:37.705		34.98	-36.40	44752.40	-3.99		
4	I	2027-08-23T09:29:56.678		37.63	-34.52	42531.54	-1.98		
5	I	2027-08-23T09:33:44.411		38.44	-33.92	42156.16	-1.30		

No planet occultations

5	E	2027-08-23T09:48:12.744		41.56	-31.56	42154.97	1.30		
4	E	2027-08-23T09:52:08.009		42.41	-30.90	42541.59	1.98		
alpha	E	2027-08-23T10:04:24.284		45.05	-28.80	44744.81	3.96		
beta	E	2027-08-23T10:08:05.972		45.85	-28.15	45678.00	4.48		
eta	E	2027-08-23T10:13:16.382		46.97	-27.24	47176.12	5.16		
gamma	E	2027-08-23T10:14:41.421		47.28	-26.98	47622.31	5.33		
delta	E	2027-08-23T10:16:45.664		47.72	-26.61	48300.35	5.58		
lambda	E	2027-08-23T10:21:40.529		48.78	-25.73	50026.71	6.12		
epsilon	E	2027-08-23T10:24:38.695		49.43	-25.19	51144.10	6.35		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-08-23T09:47:44.750
 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 : 144658763435090048
 2Mass ID (if available) : 04304238+2145063
 ICRS Star Coord at Epoch: 04h 30m 42.41146s +21:45:05.60632s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 12.401
 G magnitude : 15.091
 RP magnitude : 14.246
 BP magnitude : 15.830
 DUPflag : 0
 Distance (au) : 19.526
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 11.34
 Sun-Target sep (deg) : 80.34
 Sun-Moon sep (deg) : 31.37
 B (ring opening deg) : 78.75
 PA of pole (deg) : -55.87
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.433
 C/A sky separation (km) : 34447.6
 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

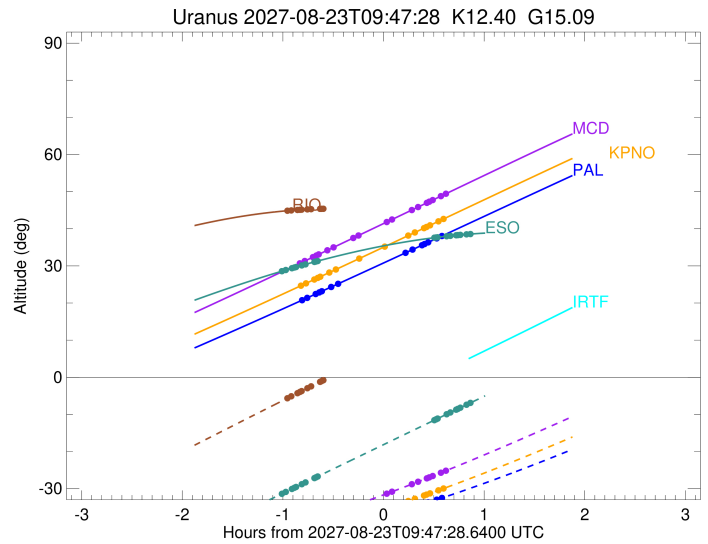
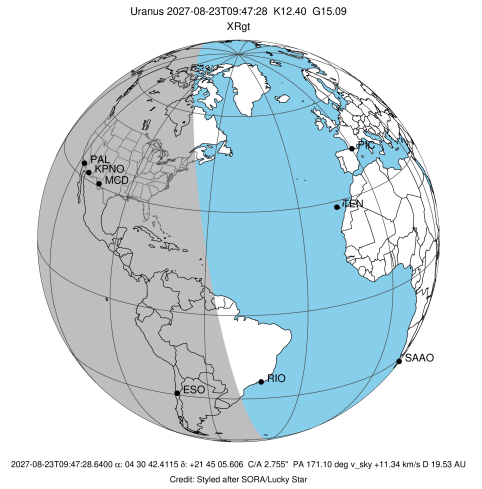


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-08-23T08:51:01.595		44.89	-5.46	50746.81	-8.07		
lambda	I	2027-08-23T08:52:31.510		44.95	-5.12	50026.71	-7.96		
delta	I	2027-08-23T08:56:12.280		45.07	-4.28x	48300.35	-7.68		
gamma	I	2027-08-23T08:57:40.465		45.12	-3.95x	47628.42	-7.56		
eta	I	2027-08-23T08:58:40.628		45.14	-3.72x	47176.12	-7.48		
beta	I	2027-08-23T09:02:07.836		45.23	-2.94x	45658.52	-7.17		
alpha	I	2027-08-23T09:04:16.439		45.28	-2.45x	44750.16	-6.96		
4	I	2027-08-23T09:09:50.002		45.37	-1.20x	42526.01	-6.36		
5	I	2027-08-23T09:10:45.947		45.38	-0.99x	42172.36	-6.24		
6	I	2027-08-23T09:11:38.731		45.39	-0.79x	41844.36	-6.14		

No planet occultations

6	E	2027-08-23T10:21:44.493		42.91	14.77x	41801.26	6.13		
5	E	2027-08-23T10:22:40.940		42.83	14.98x	42165.67	6.23		
4	E	2027-08-23T10:23:43.848		42.75	15.20x	42558.42	6.35		
alpha	E	2027-08-23T10:29:11.144		42.29	16.39x	44737.04	6.95		
beta	E	2027-08-23T10:31:25.116		42.09	16.87x	45680.39	7.16		
eta	E	2027-08-23T10:34:49.606		41.78	17.60x	47176.12	7.46		
gamma	E	2027-08-23T10:35:48.970		41.69	17.82x	47621.57	7.55		
delta	E	2027-08-23T10:37:18.225		41.55	18.14x	48300.35	7.66		
lambda	E	2027-08-23T10:40:59.425		41.19	18.93x	50026.71	7.94		
epsilon	E	2027-08-23T10:43:28.797		40.94	19.46x	51225.60	8.05		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-08-23T09:43:58.320
 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 : 144658763435090048
 2Mass ID (if available) : 04304238+2145063
 ICRS Star Coord at Epoch: 04h 30m 42.41146s +21:45:05.60632s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 12.401
 G magnitude : 15.091
 RP magnitude : 14.246
 BP magnitude : 15.830
 DUPflag : 0
 Distance (au) : 19.526
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 11.34
 Sun-Target sep (deg) : 80.34
 Sun-Moon sep (deg) : 30.97
 B (ring opening deg) : 78.75
 PA of pole (deg) : -55.87
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.438
 C/A sky separation (km) : 34523.0
 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	2027-08-23T08:47:44.973		28.69	-31.20	50747.20	-8.12		
lambda	I	2027-08-23T08:49:14.336		28.89	-30.88	50026.71	-8.01		
delta	I	2027-08-23T08:52:53.720		29.38	-30.08	48300.35	-7.72		
gamma	I	2027-08-23T08:54:21.393		29.57	-29.76	47628.38	-7.60		
eta	I	2027-08-23T08:55:21.211		29.70	-29.55	47176.12	-7.52		
beta	I	2027-08-23T08:58:47.311		30.14	-28.80	45658.69	-7.21		
alpha	I	2027-08-23T09:00:55.328		30.41	-28.33	44750.26	-6.99		
4	I	2027-08-23T09:06:27.678		31.09	-27.12	42526.03	-6.38		
5	I	2027-08-23T09:07:23.539		31.20	-26.92	42171.92	-6.26		
6	I	2027-08-23T09:08:16.176		31.31	-26.72	41843.98	-6.15		

No planet occultations

6	E	2027-08-23T10:17:39.870		37.59	-11.59	41801.20	6.11		
5	E	2027-08-23T10:18:36.509		37.65	-11.38	42165.79	6.22		
4	E	2027-08-23T10:19:39.595		37.70	-11.15	42558.55	6.34		
alpha	E	2027-08-23T10:25:07.596		37.99	-9.97	44736.94	6.94		
beta	E	2027-08-23T10:27:21.834		38.10	-9.48	45680.41	7.15		
eta	E	2027-08-23T10:30:46.669		38.25	-8.74	47176.12	7.45		
gamma	E	2027-08-23T10:31:46.127		38.30	-8.53	47621.56	7.53		
delta	E	2027-08-23T10:33:15.524		38.36	-8.21	48300.35	7.65		
lambda	E	2027-08-23T10:36:57.064		38.50	-7.41	50026.71	7.93		
epsilon	E	2027-08-23T10:39:26.880		38.59	-6.87	51227.34	8.04		