

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-28T03:37:52.170
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3368277563011218304
 2Mass ID (if available) : 07102842+2253570

ICRS Star Coord at Epoch: 07h 10m 28.44243s +22:53:57.00430s

RUWE (>1.4 is poor) : 0.94
 K magnitude : 14.784
 G magnitude : 16.179
 RP magnitude : 15.672
 BP magnitude : 16.506
 DUPflag : 0
 Distance (au) : 17.843
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.17
 Sun-Target sep (deg) : 158.15
 Sun-Moon sep (deg) : 25.41
 B (ring opening deg) : 60.39
 PA of pole (deg) : 80.32

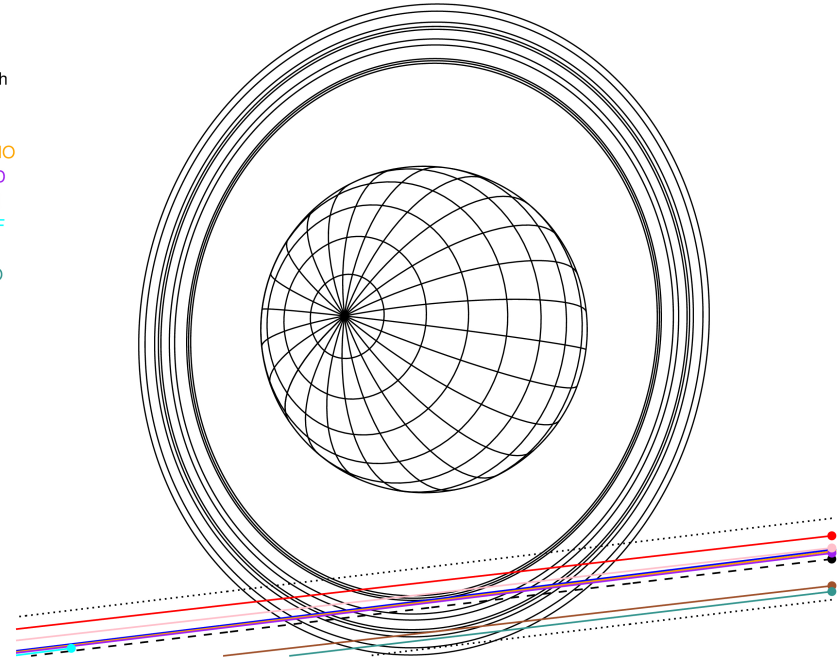
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2037-01-28T03:37:52.1700 a: 07 10 28.4424 s: +22 53 57.004 C/A 3.342" PA 6.90 deg v_sky -21.17 km/s D 17.84 AU
 Credit: Styled after SORA/Lucky Star

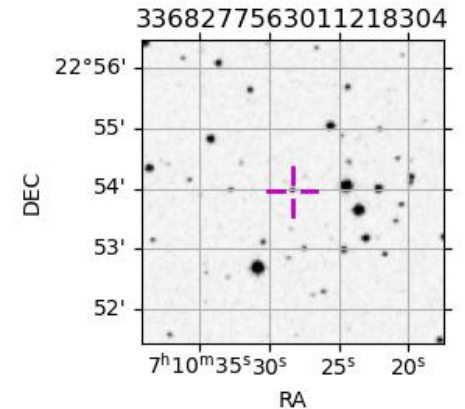
Uranus 2037-01-28T03:37:52 K14.78 G16.18 XRgt

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO

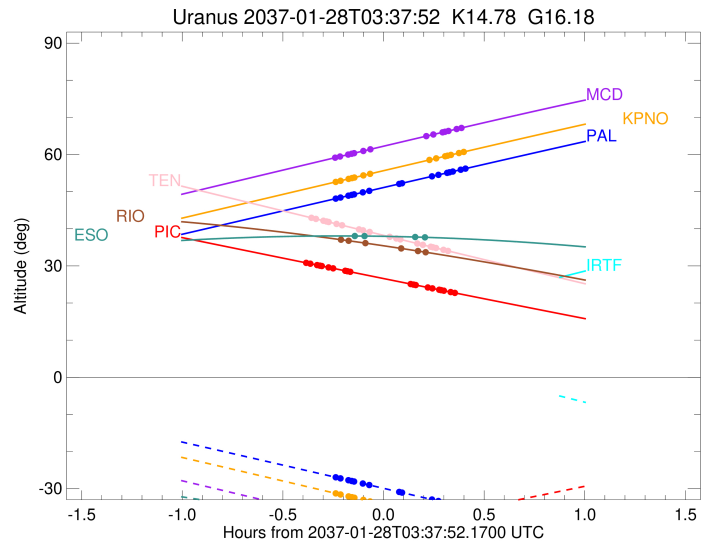
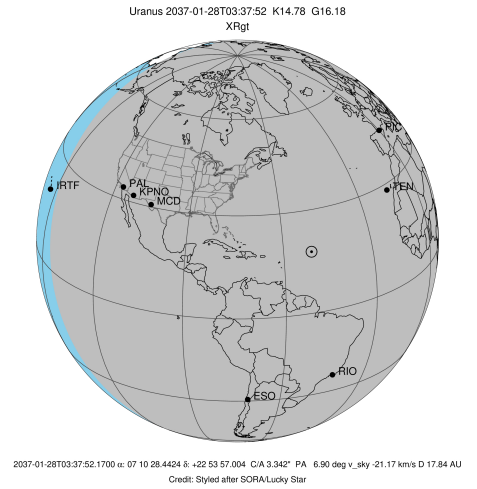


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	JAN 28 03:14 - JAN 28 03:58	PnnRie
PAL	Palomar Mt (200")	33.4	243.1	+++++		+++++	JAN 28 03:23 - JAN 28 04:02	PnnRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	JAN 28 03:23 - JAN 28 04:01	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	JAN 28 03:23 - JAN 28 04:00	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++		+++++	JAN 28 03:16 - JAN 28 03:56	PnnRie
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	+++		+++	JAN 28 03:24 - JAN 28 03:50	PnnRie
ESO	European Southern Obs	-29.3	289.3	++		++	JAN 28 03:28 - JAN 28 03:50	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 : 2037-01-28T03:34:54.300
 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 : 3368277563011218304
 2Mass ID (if available) : 07102842+2253570
 ICRS Star Coord at Epoch: 07h 10m 28.44243s +22:53:57.00430s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 14.784
 G magnitude : 16.179
 RP magnitude : 15.672
 BP magnitude : 16.506
 DUPflag : 0
 Distance (au) : 17.843
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.17
 Sun-Target sep (deg) : 158.15
 Sun-Moon sep (deg) : 26.25
 B (ring opening deg) : 60.39
 PA of pole (deg) : 80.32
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.041
 C/A sky separation (km) : 39359.7
 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

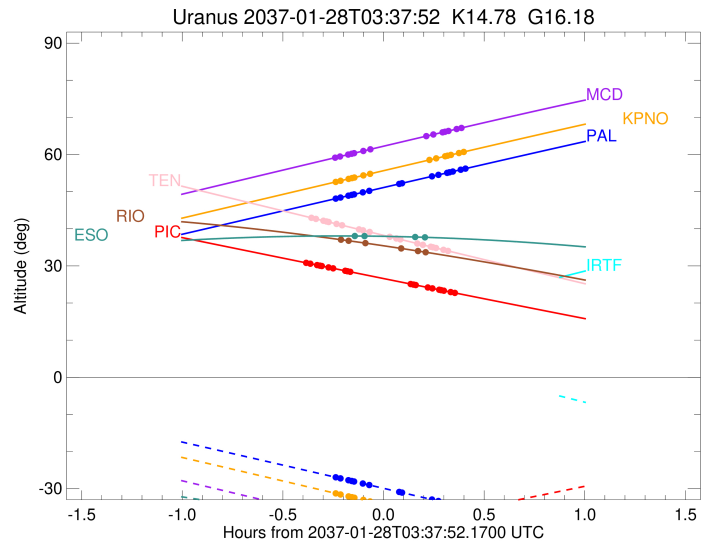
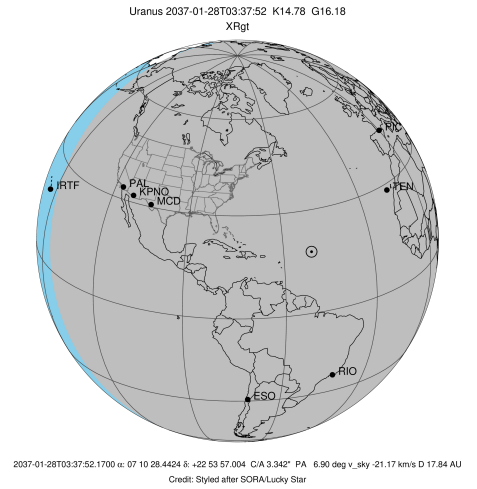


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-01-28T03:14:27.556		30.88	-44.42	51489.98	-15.33		
lambda	I	2037-01-28T03:16:04.664		30.59	-44.14	50026.71	-14.72		
delta	I	2037-01-28T03:18:05.806		30.22	-43.79	48300.35	-13.77		
gamma	I	2037-01-28T03:18:55.914		30.06	-43.64	47621.03	-13.34		
eta	I	2037-01-28T03:19:29.625		29.96	-43.54	47176.12	-13.05		
beta	I	2037-01-28T03:21:31.519		29.59	-43.19	45654.65	-11.92		
alpha	I	2037-01-28T03:22:55.488		29.33	-42.94	44692.25	-11.06		
4	I	2037-01-28T03:26:25.469		28.69	-42.32	42610.40	-8.73		
5	I	2037-01-28T03:27:19.245		28.52	-42.16	42154.87	-8.06		
6	I	2037-01-28T03:28:00.136		28.40	-42.04	41849.51	-7.53		

No planet occultations

6	E	2037-01-28T03:45:54.448		25.13	-38.84	41823.05	7.53		
5	E	2037-01-28T03:46:39.193		24.99	-38.71	42174.45	8.05		
4	E	2037-01-28T03:47:31.892		24.83	-38.55	42615.57	8.72		
alpha	E	2037-01-28T03:51:00.938		24.20	-37.92	44685.79	11.04		
beta	E	2037-01-28T03:52:27.009		23.94	-37.66	45674.09	11.90		
eta	E	2037-01-28T03:54:27.468		23.58	-37.30	47176.12	13.02		
gamma	E	2037-01-28T03:55:01.444		23.47	-37.20	47623.42	13.31		
delta	E	2037-01-28T03:55:51.506		23.32	-37.05	48300.35	13.73		
lambda	E	2037-01-28T03:57:52.996		22.96	-36.68	50026.71	14.67		
epsilon	E	2037-01-28T03:58:58.350		22.76	-36.48	51001.07	15.28		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-28T03:40:43.560
 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 : 3368277563011218304
 2Mass ID (if available) : 07102842+2253570
 ICRS Star Coord at Epoch: 07h 10m 28.44243s +22:53:57.00430s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 14.784
 G magnitude : 16.179
 RP magnitude : 15.672
 BP magnitude : 16.506
 DUPflag : 0
 Distance (au) : 17.843
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.17
 Sun-Target sep (deg) : 158.15
 Sun-Moon sep (deg) : 25.24
 B (ring opening deg) : 60.39
 PA of pole (deg) : 80.32
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.256
 C/A sky separation (km) : 42132.7
 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

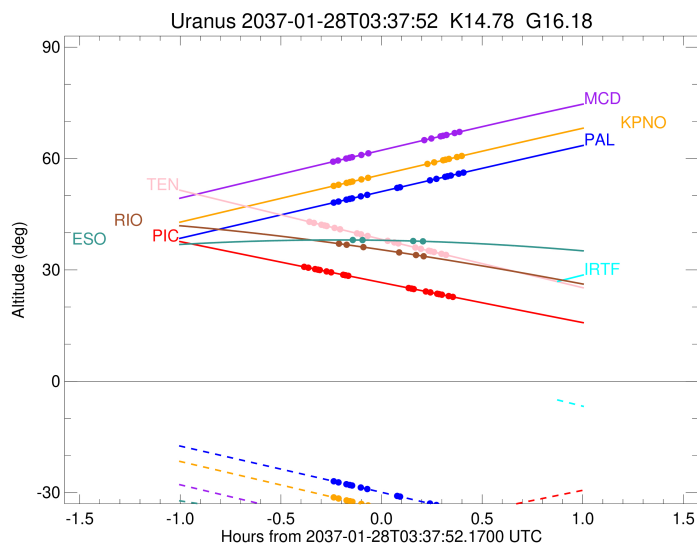
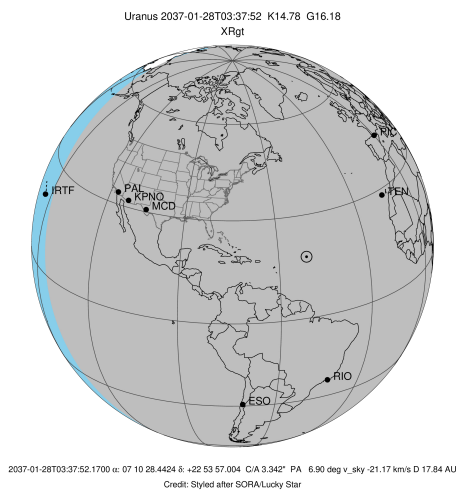


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-01-28T03:23:15.152		48.04	-26.86	51470.19	-13.62		
lambda	I	2037-01-28T03:25:03.914		48.42	-27.24	50026.71	-12.82		
delta	I	2037-01-28T03:27:25.627		48.92	-27.73	48300.35	-11.53		
gamma	I	2037-01-28T03:28:26.115		49.13	-27.94	47620.97	-10.93		
eta	I	2037-01-28T03:29:07.598		49.27	-28.09	47176.12	-10.51		
beta	I	2037-01-28T03:31:44.661		49.82	-28.63	45657.30	-8.82		
alpha	I	2037-01-28T03:33:44.192		50.24	-29.05	44689.21	-7.40		
4	I	2037-01-28T03:41:51.316		51.94	-30.75	42621.00	-1.03		

No planet occultations

4	E	2037-01-28T03:44:07.273		52.41	-31.22	42622.69	1.04		
alpha	E	2037-01-28T03:52:12.715		54.10	-32.91	44684.75	7.41		
beta	E	2037-01-28T03:54:14.037		54.52	-33.33	45671.60	8.83		
eta	E	2037-01-28T03:56:49.203		55.06	-33.87	47176.12	10.53		
gamma	E	2037-01-28T03:57:30.806		55.21	-34.02	47622.87	10.95		
delta	E	2037-01-28T03:58:31.037		55.42	-34.23	48300.35	11.54		
lambda	E	2037-01-28T04:00:52.533		55.91	-34.72	50026.71	12.84		
epsilon	E	2037-01-28T04:02:09.496		56.17	-34.99	51039.84	13.64		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-28T03:40:28.000
 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 : 3368277563011218304
 2Mass ID (if available) : 07102842+2253570
 ICRS Star Coord at Epoch: 07h 10m 28.44243s +22:53:57.00430s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 14.784
 G magnitude : 16.179
 RP magnitude : 15.672
 BP magnitude : 16.506
 DUPflag : 0
 Distance (au) : 17.843
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.17
 Sun-Target sep (deg) : 158.15
 Sun-Moon sep (deg) : 25.31
 B (ring opening deg) : 60.39
 PA of pole (deg) : 80.32
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.273
 C/A sky separation (km) : 42355.7
 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



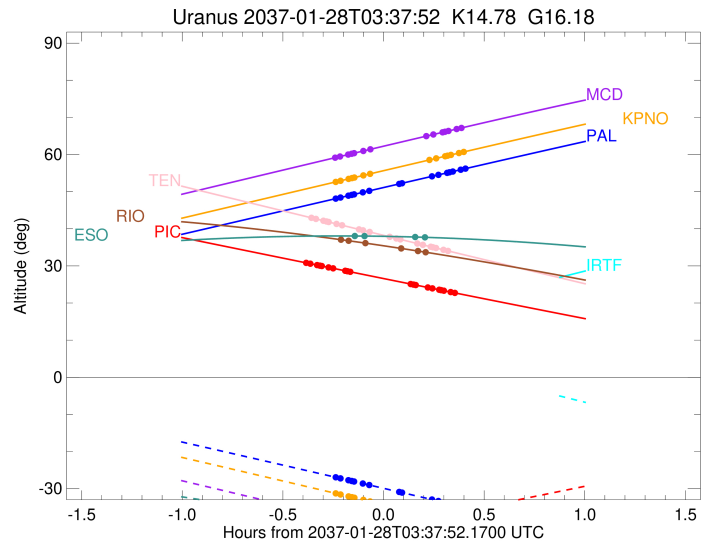
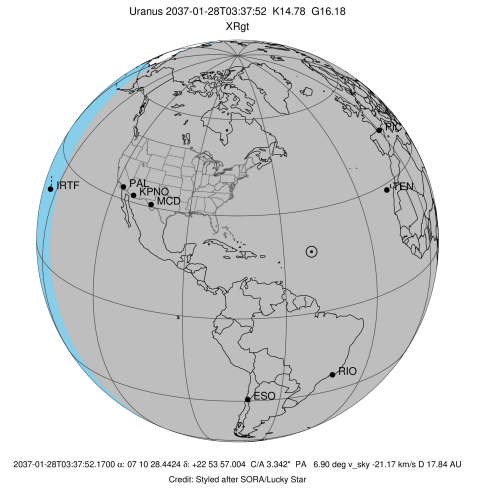
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-01-28T03:23:15.127		52.54	-31.20	51468.09	-13.47		
lambda	I	2037-01-28T03:25:04.982		52.93	-31.59	50026.71	-12.65		
delta	I	2037-01-28T03:27:28.821		53.44	-32.09	48300.35	-11.33		
gamma	I	2037-01-28T03:28:30.453		53.66	-32.31	47620.96	-10.71		
eta	I	2037-01-28T03:29:12.826		53.81	-32.46	47176.12	-10.28		
beta	I	2037-01-28T03:31:54.330		54.38	-33.03	45657.58	-8.52		
alpha	I	2037-01-28T03:33:59.231		54.82	-33.48	44688.91	-7.01		

No planet occultations

alpha	E	2037-01-28T03:51:27.220		58.52	-37.18	44684.71	7.02		
beta	E	2037-01-28T03:53:33.920		58.97	-37.63	45671.37	8.53		
eta	E	2037-01-28T03:56:13.547		59.53	-38.20	47176.12	10.29		
gamma	E	2037-01-28T03:56:56.047		59.68	-38.35	47622.83	10.73		
delta	E	2037-01-28T03:57:57.431		59.89	-38.57	48300.35	11.34		
lambda	E	2037-01-28T04:00:21.077		60.40	-39.07	50026.71	12.67		
epsilon	E	2037-01-28T04:01:39.182		60.67	-39.35	51042.73	13.50		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-28T03:40:02.150
 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 : 3368277563011218304
 2Mass ID (if available) : 07102842+2253570
 ICRS Star Coord at Epoch: 07h 10m 28.44243s +22:53:57.00430s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 14.784
 G magnitude : 16.179
 RP magnitude : 15.672
 BP magnitude : 16.506
 DUPflag : 0
 Distance (au) : 17.843
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.17
 Sun-Target sep (deg) : 158.15
 Sun-Moon sep (deg) : 25.41
 B (ring opening deg) : 60.39
 PA of pole (deg) : 80.32
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.290
 C/A sky separation (km) : 42572.6
 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

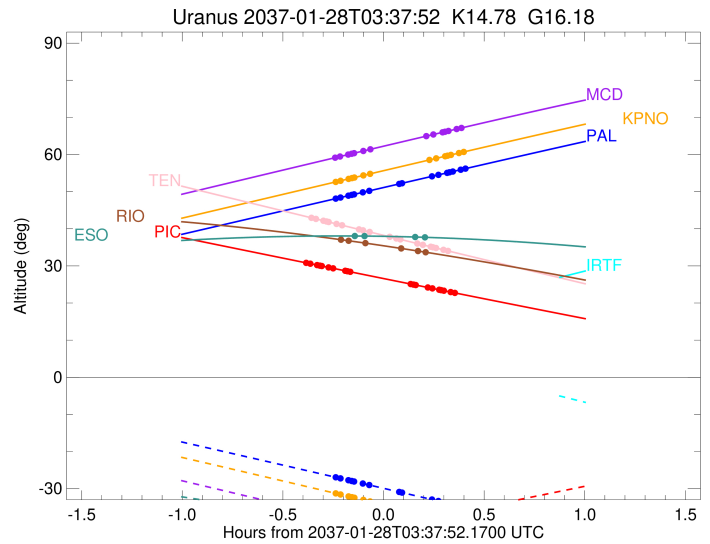
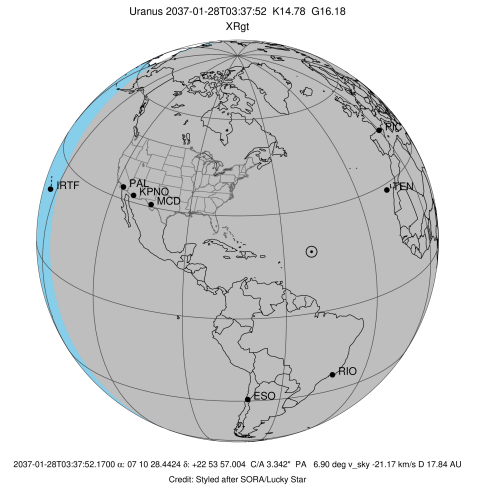


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-01-28T03:23:04.679		59.07	-37.61	51465.93	-13.34		
lambda	I	2037-01-28T03:24:55.601		59.47	-38.01	50026.71	-12.50		
delta	I	2037-01-28T03:27:21.569		59.99	-38.53	48300.35	-11.13		
gamma	I	2037-01-28T03:28:24.366		60.22	-38.76	47620.96	-10.50		
eta	I	2037-01-28T03:29:07.654		60.37	-38.91	47176.12	-10.05		
beta	I	2037-01-28T03:31:53.845		60.97	-39.51	45657.87	-8.21		
alpha	I	2037-01-28T03:34:04.732		61.43	-39.98	44688.62	-6.62		

No planet occultations

alpha	E	2037-01-28T03:50:30.300		64.93	-43.51	44684.67	6.62		
beta	E	2037-01-28T03:52:43.000		65.40	-43.98	45671.15	8.22		
eta	E	2037-01-28T03:55:27.350		65.98	-44.57	47176.12	10.06		
gamma	E	2037-01-28T03:56:10.775		66.13	-44.73	47622.79	10.51		
delta	E	2037-01-28T03:57:13.338		66.35	-44.95	48300.35	11.14		
lambda	E	2037-01-28T03:59:39.154		66.86	-45.47	50026.71	12.51		
epsilon	E	2037-01-28T04:00:58.391		67.14	-45.76	51045.44	13.35		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-28T03:34:35.570
 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 : 3368277563011218304
 2Mass ID (if available) : 07102842+2253570
 ICRS Star Coord at Epoch: 07h 10m 28.44243s +22:53:57.00430s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 14.784
 G magnitude : 16.179
 RP magnitude : 15.672
 BP magnitude : 16.506
 DUPflag : 0
 Distance (au) : 17.843
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.17
 Sun-Target sep (deg) : 158.15
 Sun-Moon sep (deg) : 26.34
 B (ring opening deg) : 60.39
 PA of pole (deg) : 80.32
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.185
 C/A sky separation (km) : 41213.2
 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

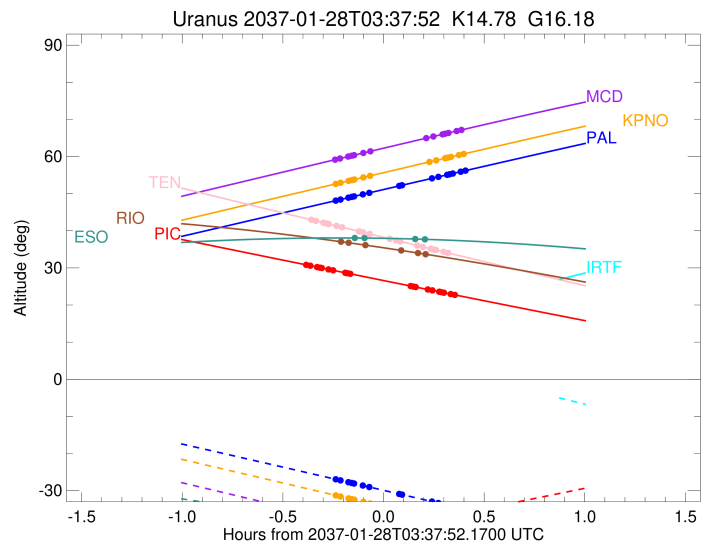
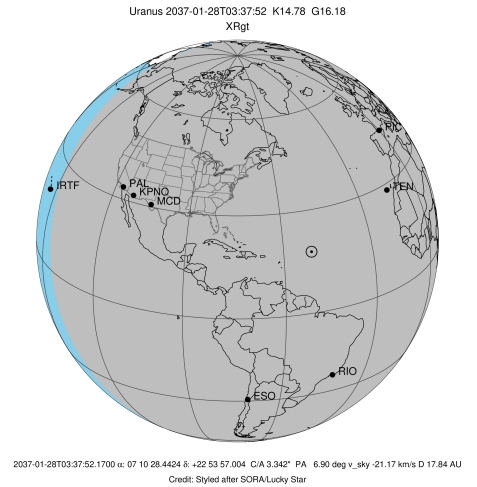


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-01-28T03:16:01.296		43.03	-61.36	51475.92	-14.26		
lambda	I	2037-01-28T03:17:45.223		42.65	-60.98	50026.71	-13.53		
delta	I	2037-01-28T03:19:58.445		42.16	-60.51	48300.35	-12.37		
gamma	I	2037-01-28T03:20:54.551		41.96	-60.31	47620.98	-11.84		
eta	I	2037-01-28T03:21:32.702		41.82	-60.17	47176.12	-11.47		
beta	I	2037-01-28T03:23:54.071		41.30	-59.66	45656.41	-10.03		
alpha	I	2037-01-28T03:25:36.594		40.93	-59.30	44690.19	-8.86		
4	I	2037-01-28T03:30:29.723		39.85	-58.24	42613.43	-5.23		
5	I	2037-01-28T03:32:09.306		39.49	-57.88	42156.69	-3.88		
6	I	2037-01-28T03:33:52.935		39.11	-57.51	41840.41	-2.41		

No planet occultations

6	E	2037-01-28T03:39:33.427		37.87	-56.27	41831.98	2.41		
5	E	2037-01-28T03:41:20.794		37.48	-55.89	42166.07	3.88		
4	E	2037-01-28T03:42:59.334		37.12	-55.53	42616.49	5.22		
alpha	E	2037-01-28T03:47:51.548		36.05	-54.47	44685.06	8.85		
beta	E	2037-01-28T03:49:36.153		35.67	-54.09	45672.67	10.01		
eta	E	2037-01-28T03:51:56.103		35.16	-53.58	47176.12	11.45		
gamma	E	2037-01-28T03:52:34.522		35.02	-53.44	47623.09	11.82		
delta	E	2037-01-28T03:53:30.587		34.82	-53.23	48300.35	12.34		
lambda	E	2037-01-28T03:55:44.169		34.33	-52.74	50026.71	13.49		
epsilon	E	2037-01-28T03:56:56.522		34.07	-52.48	51023.65	14.21		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-28T03:35:22.090
 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 : 3368277563011218304
 2Mass ID (if available) : 07102842+2253570
 ICRS Star Coord at Epoch: 07h 10m 28.44243s +22:53:57.00430s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 14.784
 G magnitude : 16.179
 RP magnitude : 15.672
 BP magnitude : 16.506
 DUPflag : 0
 Distance (au) : 17.843
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.17
 Sun-Target sep (deg) : 158.15
 Sun-Moon sep (deg) : 26.05
 B (ring opening deg) : 60.39
 PA of pole (deg) : 80.32
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.647
 C/A sky separation (km) : 47202.2
 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

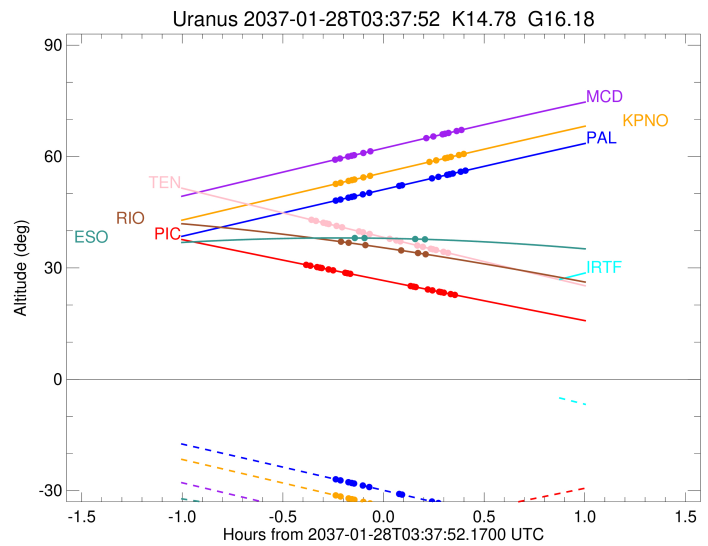
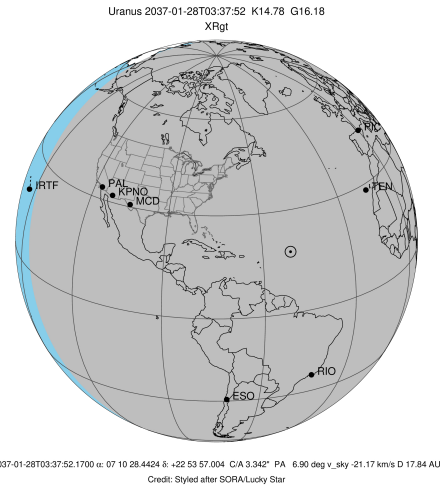


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-01-28T03:24:44.467		37.12	-48.86	51407.42	-9.04		
lambda	I	2037-01-28T03:27:30.441		36.77	-48.78	50026.71	-7.43		
delta	I	2037-01-28T03:32:32.412		36.13	-48.60	48300.35	-3.94		

No planet occultations

delta	E	2037-01-28T03:43:05.095		34.71	-48.12	48300.35	3.94		
lambda	E	2037-01-28T03:48:07.302		34.01	-47.84	50026.71	7.43		
epsilon	E	2037-01-28T03:50:21.825		33.69	-47.70	51122.36	9.03		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-01-28T03:37:14.640
 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 : 3368277563011218304
 2Mass ID (if available) : 07102842+2253570
 ICRS Star Coord at Epoch: 07h 10m 28.44243s +22:53:57.00430s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 14.784
 G magnitude : 16.179
 RP magnitude : 15.672
 BP magnitude : 16.506
 DUPflag : 0
 Distance (au) : 17.843
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.17
 Sun-Target sep (deg) : 158.15
 Sun-Moon sep (deg) : 25.69
 B (ring opening deg) : 60.39
 PA of pole (deg) : 80.32
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.732
 C/A sky separation (km) : 48295.1
 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



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2037-01-28T03:28:48.909		38.06	-38.33	51387.68	-7.56		
lambda	I	2037-01-28T03:32:15.439		38.03	-38.66	50026.71	-5.43		

No planet occultations

lambda	E	2037-01-28T03:47:16.553		37.78	-39.98	50026.71	5.43		
epsilon	E	2037-01-28T03:50:11.577		37.70	-40.20	51149.61	7.56		