

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-01-14T02:48:24.850
 Event type : XRT
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 Gaia source ID : 3415715786030349952
 2Mass ID (if available) : 05124486+2305231

ICRS Star Coord at Epoch: 05h 12m 44.88510s +23:05:22.68359s

RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.868
 G magnitude : 18.715
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 18.327
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 145.86
 Sun-Moon sep (deg) : 94.73
 B (ring opening deg) : 82.04
 PA of pole (deg) : 6.12

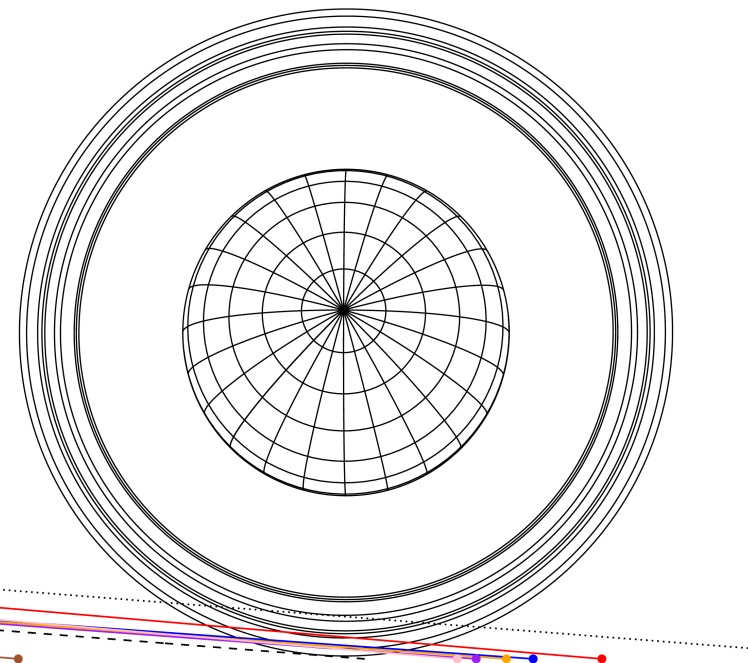
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2031-01-14T02:48:24.8500 α: 05 12 44.8851 δ: +23 05 22.684 C/A 3.811" PA 355.52 deg v_sky -18.32 km/s D 18.33 AU
 Credit: Styled after SORA/Lucky Star

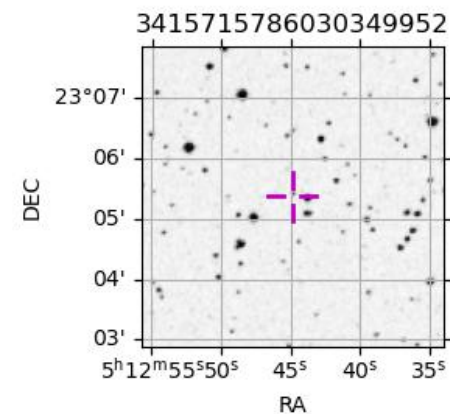
Uranus 2031-01-14T02:48:24 K14.87 G18.71 XRT

PIC
 PAL
 KPNO
 MCD
 TEN
 RIO
 ESO

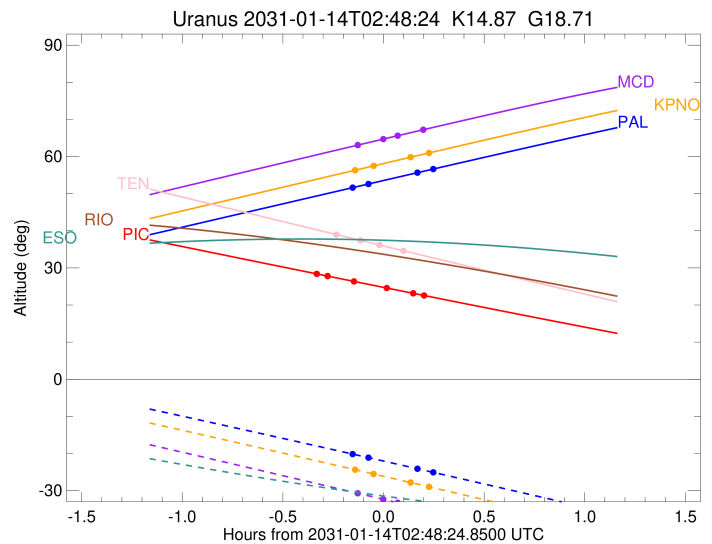
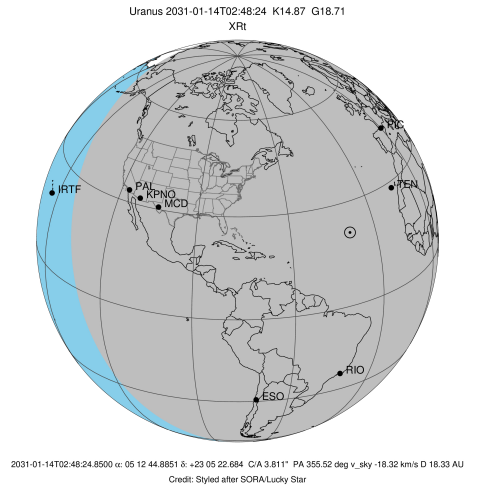


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++		+++	JAN 14 02:28 - JAN 14 03:01	PnnRie
PAL	Palomar Mt (200")	33.4	243.1	++		++	JAN 14 02:38 - JAN 14 03:04	PnnRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	++		++	JAN 14 02:39 - JAN 14 03:03	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	++		++	JAN 14 02:40 - JAN 14 03:01	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5	++		++	JAN 14 02:33 - JAN 14 02:55	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					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					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-01-14T02:44:20.830
 Event type : XRt
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3415715786030349952
 2Mass ID (if available) : 05124486+2305231
 ICRS Star Coord at Epoch: 05h 12m 44.88510s +23:05:22.68359s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.868
 G magnitude : 18.715
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 18.327
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 145.86
 Sun-Moon sep (deg) : 95.18
 B (ring opening deg) : 82.04
 PA of pole (deg) : 6.12
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.577
 C/A sky separation (km) : 47551.8
 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



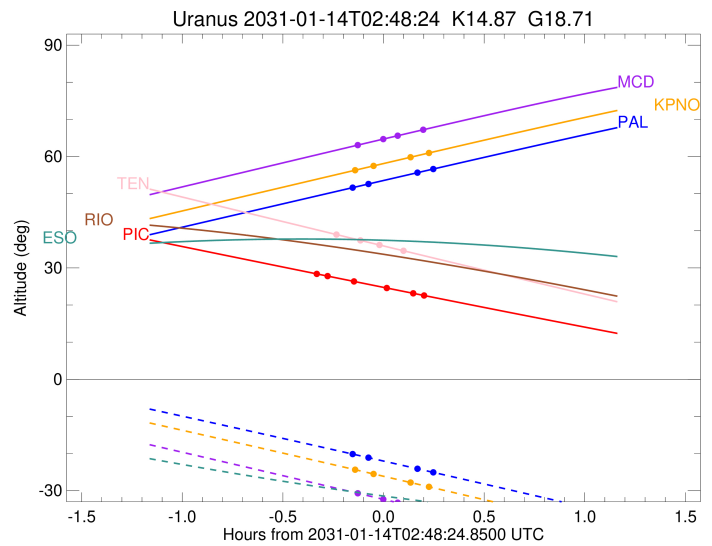
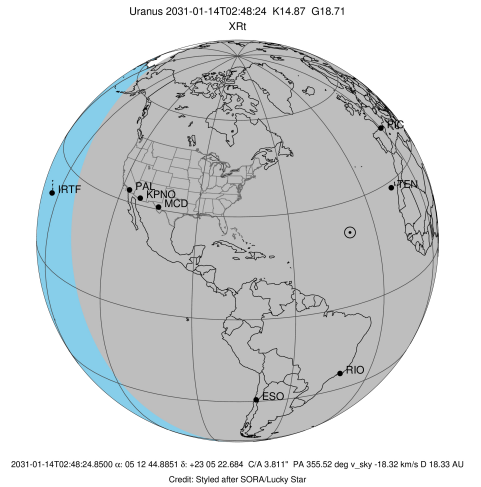
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-01-14T02:28:18.877		28.42	-53.83	51241.64	-6.58		
lambda	I	2031-01-14T02:31:47.648		27.79	-53.25	50026.71	-5.18		
delta	I	2031-01-14T02:39:44.266		26.34	-51.91	48300.35	-2.01		

No planet occultations

delta	E	2031-01-14T02:49:16.390		24.60	-50.27	48300.35	2.01		
lambda	E	2031-01-14T02:57:13.733		23.16	-48.89	50026.71	5.17		
epsilon	E	2031-01-14T03:01:19.796		22.42	-48.17	51481.82	6.56		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-01-14T02:51:05.410
 Event type : XRt
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3415715786030349952
 2Mass ID (if available) : 05124486+2305231
 ICRS Star Coord at Epoch: 05h 12m 44.88510s +23:05:22.68359s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.868
 G magnitude : 18.715
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 18.327
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 145.86
 Sun-Moon sep (deg) : 95.44
 B (ring opening deg) : 82.04
 PA of pole (deg) : 6.12
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.679
 C/A sky separation (km) : 48896.7
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



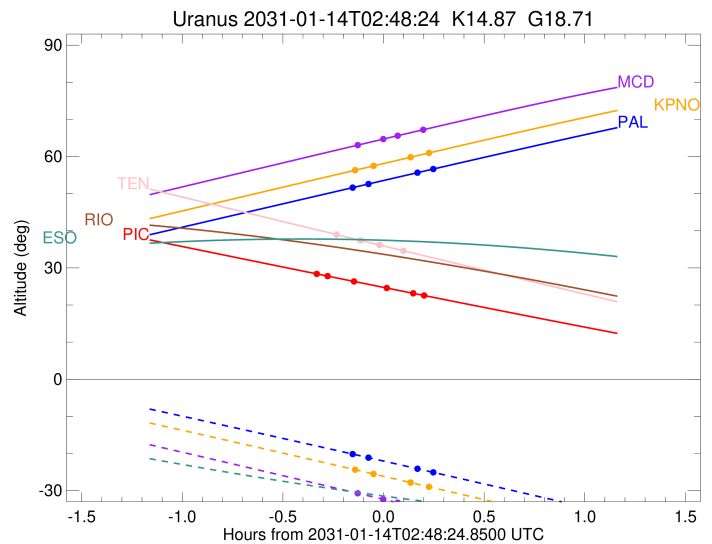
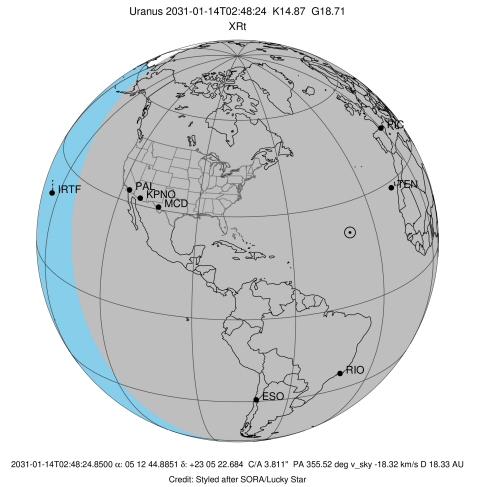
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-01-14T02:38:51.620	51.54	-20.08	51269.49	-5.15		
lambda	I	2031-01-14T02:44:00.740	52.62	-21.13	50026.71	-3.00		

No planet occultations

lambda	E	2031-01-14T02:58:27.898	55.64	-24.09	50026.71	3.00		
epsilon	E	2031-01-14T03:04:13.372	56.84	-25.28	51457.63	5.16		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-01-14T02:50:49.000
 Event type : XRt
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 3415715786030349952
 2Mass ID (if available) : 05124486+2305231
 ICRS Star Coord at Epoch: 05h 12m 44.88510s +23:05:22.68359s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.868
 G magnitude : 18.715
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 18.327
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 145.86
 Sun-Moon sep (deg) : 95.48
 B (ring opening deg) : 82.04
 PA of pole (deg) : 6.12
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.700
 C/A sky separation (km) : 49181.6
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



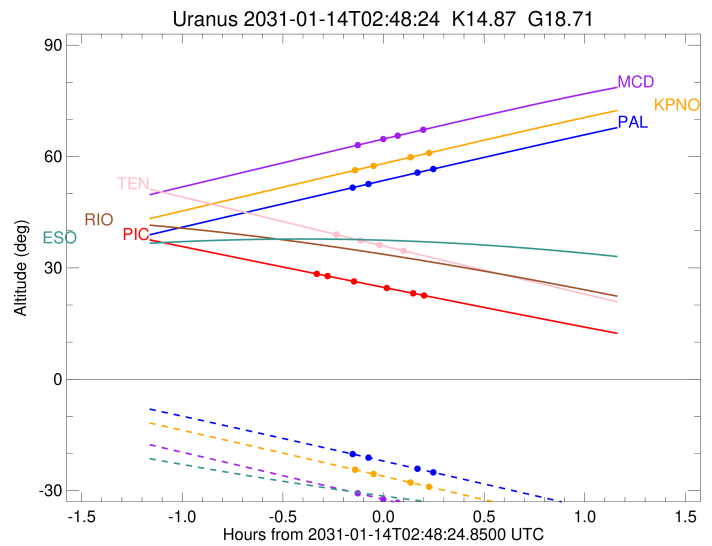
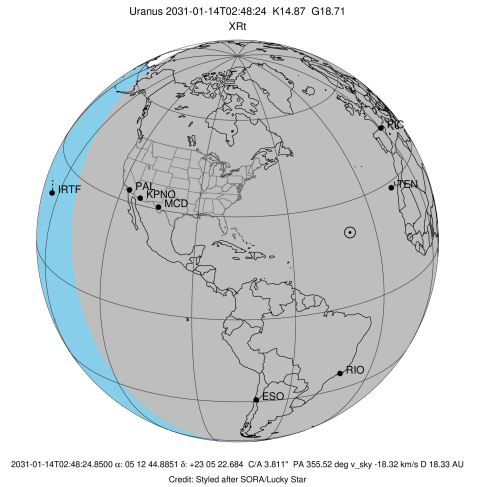
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-01-14T02:39:32.024	56.23	-24.28	51277.79	-4.78		
lambda	I	2031-01-14T02:45:33.133	57.50	-25.53	50026.71	-2.25		

No planet occultations

lambda	E	2031-01-14T02:56:22.869	59.79	-27.80	50026.71	2.26		
epsilon	E	2031-01-14T03:03:00.311	61.18	-29.19	51452.13	4.78		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-01-14T02:50:20.840
 Event type : XRt
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3415715786030349952
 2Mass ID (if available) : 05124486+2305231
 ICRS Star Coord at Epoch: 05h 12m 44.88510s +23:05:22.68359s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.868
 G magnitude : 18.715
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 18.327
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 145.86
 Sun-Moon sep (deg) : 95.54
 B (ring opening deg) : 82.04
 PA of pole (deg) : 6.12
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.724
 C/A sky separation (km) : 49502.5
 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

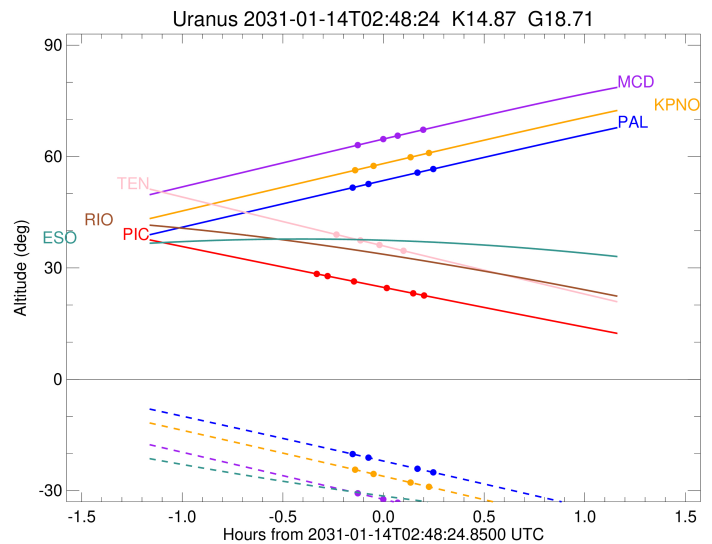
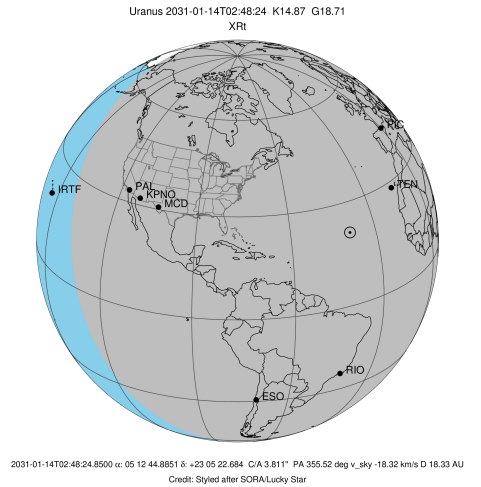


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-01-14T02:40:13.973		62.97	-30.60	51288.03	-4.32		
lambda	I	2031-01-14T02:48:37.504		64.76	-32.39	50026.72	-0.78		

No planet occultations

lambda	E	2031-01-14T02:52:22.408		65.55	-33.19	50026.72	0.78		
epsilon	E	2031-01-14T03:01:22.259		67.45	-35.12	51445.25	4.32		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-01-14T02:44:12.940
 Event type : XRt
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 3415715786030349952
 2Mass ID (if available) : 05124486+2305231
 ICRS Star Coord at Epoch: 05h 12m 44.88510s +23:05:22.68359s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.868
 G magnitude : 18.715
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 18.327
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 145.86
 Sun-Moon sep (deg) : 95.35
 B (ring opening deg) : 82.04
 PA of pole (deg) : 6.12
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.721
 C/A sky separation (km) : 49462.8
 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



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	2031-01-14T02:33:52.237	39.09	-70.84	51291.04	-4.37		
lambda	I	2031-01-14T02:41:43.895	37.37	-69.17	50026.71	-1.09		

No planet occultations

lambda	E	2031-01-14T02:47:01.639	36.22	-68.03	50026.71	1.09		
epsilon	E	2031-01-14T02:55:30.388	34.37	-66.20	51449.57	4.36		