

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-11-29T04:31:30.990
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 57448078099849984
 2Mass ID (if available) : 03282208+1836459

ICRS Star Coord at Epoch: 03h 28m 22.09865s +18:36:45.84792s

RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.406
 G magnitude : 17.367
 RP magnitude : 16.405
 BP magnitude : 18.361
 DUPflag : 0
 Distance (au) : 18.595
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.72
 Sun-Target sep (deg) : 167.29
 Sun-Moon sep (deg) : 168.79
 B (ring opening deg) : 65.65
 PA of pole (deg) : -85.74

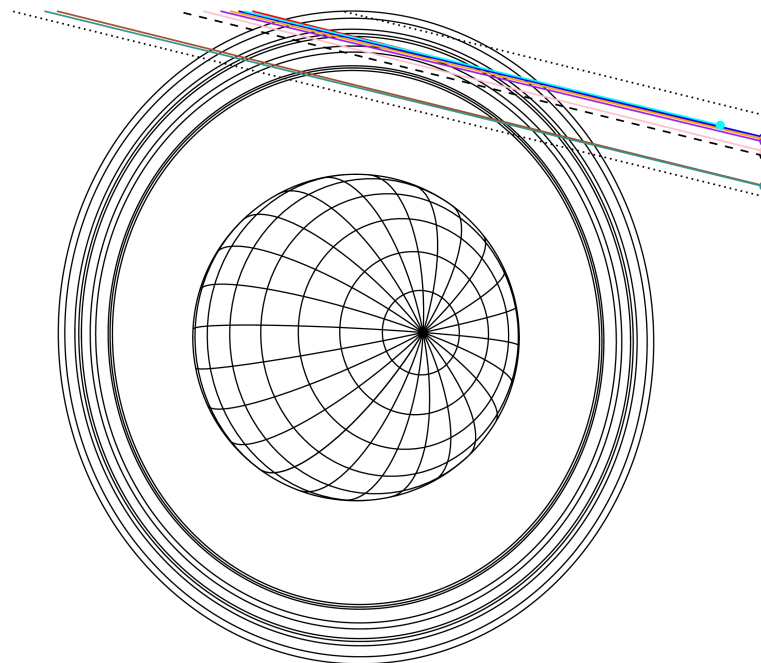
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2024-11-29T04:31:30.9900 ex: 03 28 22.0986 s: +18 36 45.848 C/A 3.185° PA 166.15 deg v_sky -22.72 km/s D 18.60 AU
 Credit: Styled after SORA/Lucky Star

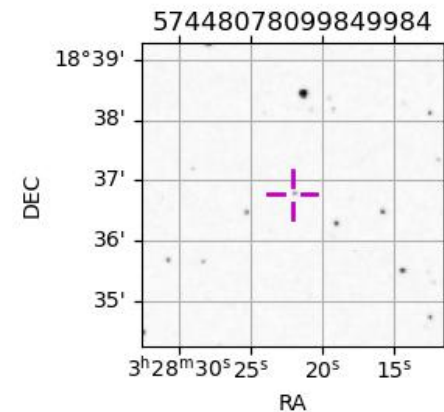
Uranus 2024-11-29T04:31:30 K14.41 G17.37 XRgt

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO

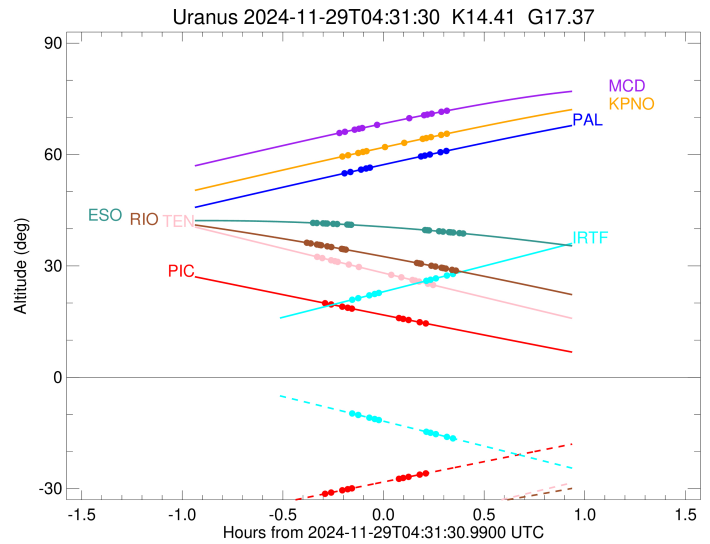
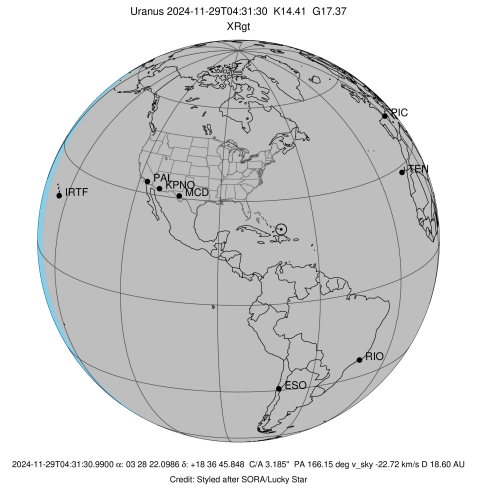


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	NOV 29 04:13 - NOV 29 04:44	PnnRie
PAL	Palomar Mt (200")	33.4	243.1	+++++		+++++	NOV 29 04:19 - NOV 29 04:50	PnnRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	NOV 29 04:18 - NOV 29 04:50	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	NOV 29 04:17 - NOV 29 04:50	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++		+++++	NOV 29 04:11 - NOV 29 04:46	PnnRie
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++		+++++	NOV 29 04:21 - NOV 29 04:52	PnnRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++		+++++	NOV 29 04:08 - NOV 29 04:53	PnnRie
ESO	European Southern Obs	-29.3	289.3	+++++		+++++	NOV 29 04:10 - NOV 29 04:55	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 : 2024-11-29T04:27:23.040
 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 : 57448078099849984
 2Mass ID (if available) : 03282208+1836459
 ICRS Star Coord at Epoch: 03h 28m 22.09865s +18:36:45.84792s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.406
 G magnitude : 17.367
 RP magnitude : 16.405
 BP magnitude : 18.361
 DUPflag : 0
 Distance (au) : 18.595
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.72
 Sun-Target sep (deg) : 167.29
 Sun-Moon sep (deg) : 169.43
 B (ring opening deg) : 65.65
 PA of pole (deg) : -85.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.382
 C/A sky separation (km) : 45617.7
 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



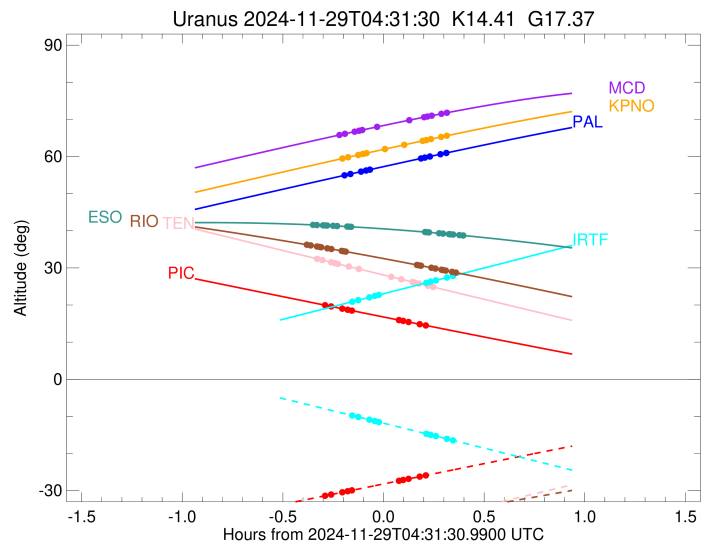
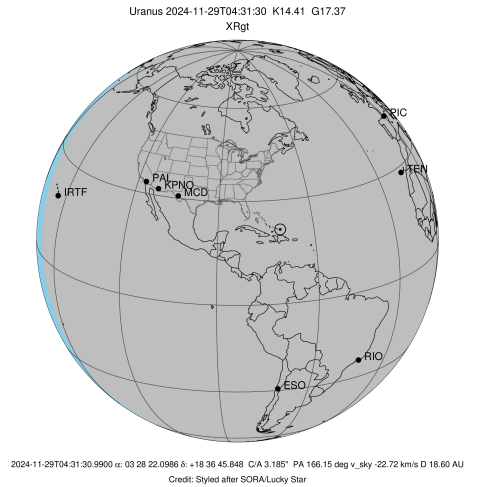
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2024-11-29T04:13:32.372		20.05	-31.49	51532.26	-11.11		
lambda	I	2024-11-29T04:15:56.279		19.61	-31.05	50026.71	-9.73		
delta	I	2024-11-29T04:19:15.832		19.01	-30.44	48300.35	-7.53		
gamma	I	2024-11-29T04:20:53.475		18.71	-30.14	47620.96	-6.38		
eta	I	2024-11-29T04:22:08.659		18.48	-29.91	47176.12	-5.45		

No planet occultations

eta	E	2024-11-29T04:36:04.552		15.95	-27.36	47176.12	5.45		
gamma	E	2024-11-29T04:37:19.942		15.73	-27.13	47621.79	6.37		
delta	E	2024-11-29T04:38:57.572		15.43	-26.84	48300.35	7.52		
lambda	E	2024-11-29T04:42:17.431		14.83	-26.23	50026.71	9.72		
epsilon	E	2024-11-29T04:44:17.957		14.47	-25.86	51271.21	11.09		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-11-29T04:33:26.140
 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 : 57448078099849984
 2Mass ID (if available) : 03282208+1836459
 ICRS Star Coord at Epoch: 03h 28m 22.09865s +18:36:45.84792s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.406
 G magnitude : 17.367
 RP magnitude : 16.405
 BP magnitude : 18.361
 DUPflag : 0
 Distance (au) : 18.595
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.72
 Sun-Target sep (deg) : 167.29
 Sun-Moon sep (deg) : 168.52
 B (ring opening deg) : 65.65
 PA of pole (deg) : -85.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.366
 C/A sky separation (km) : 45402.9
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

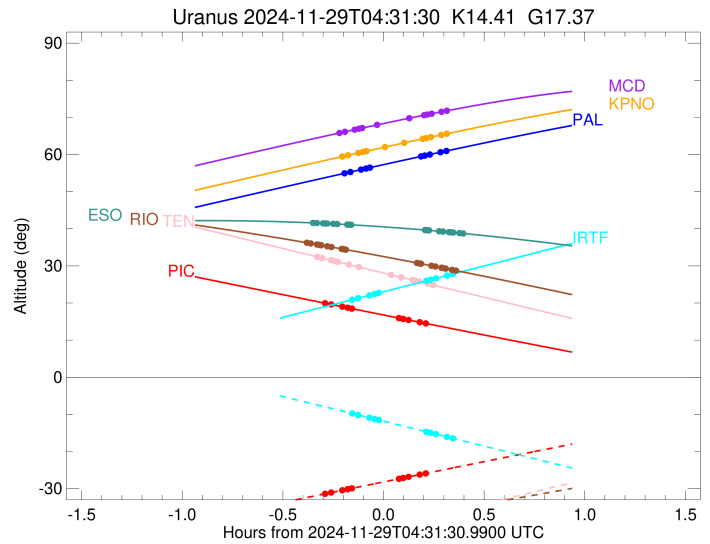
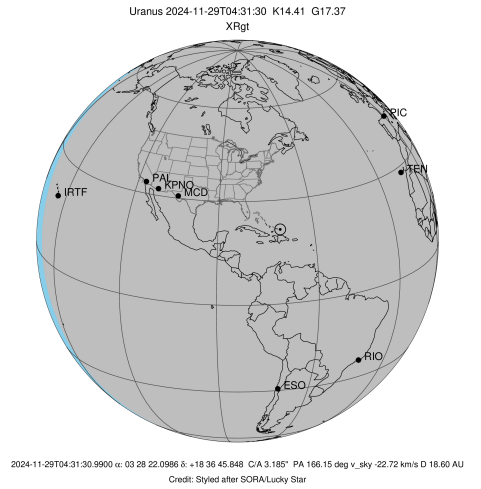


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2024-11-29T04:19:21.514		54.83	-45.28	51532.36	-11.45		
lambda	I	2024-11-29T04:21:40.742		55.30	-45.77	50026.71	-10.10		
delta	I	2024-11-29T04:24:51.190		55.94	-46.43	48300.35	-7.99		
gamma	I	2024-11-29T04:26:22.408		56.25	-46.75	47620.96	-6.90		
eta	I	2024-11-29T04:27:31.093		56.48	-46.99	47176.12	-6.05		

No planet occultations

eta	E	2024-11-29T04:42:38.957		59.48	-50.14	47176.12	6.05		
gamma	E	2024-11-29T04:43:47.728		59.70	-50.38	47621.88	6.91		
delta	E	2024-11-29T04:45:18.743		60.00	-50.70	48300.35	8.00		
lambda	E	2024-11-29T04:48:29.006		60.62	-51.36	50026.71	10.12		
epsilon	E	2024-11-29T04:50:24.492		60.99	-51.76	51263.48	11.46		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-11-29T04:33:11.770
 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 : 57448078099849984
 2Mass ID (if available) : 03282208+1836459
 ICRS Star Coord at Epoch: 03h 28m 22.09865s +18:36:45.84792s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.406
 G magnitude : 17.367
 RP magnitude : 16.405
 BP magnitude : 18.361
 DUPflag : 0
 Distance (au) : 18.595
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.72
 Sun-Target sep (deg) : 167.29
 Sun-Moon sep (deg) : 168.58
 B (ring opening deg) : 65.65
 PA of pole (deg) : -85.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.344
 C/A sky separation (km) : 45094.5
 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

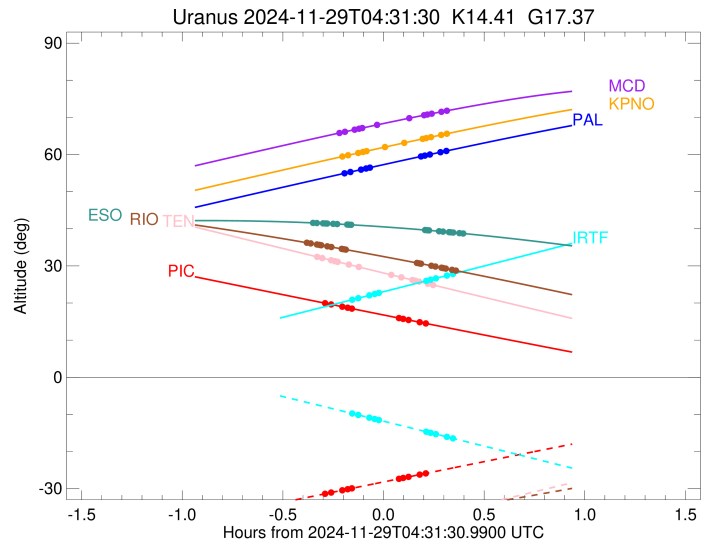
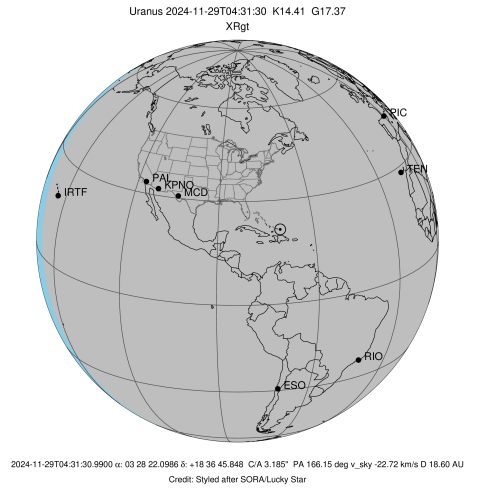


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2024-11-29T04:18:43.745		59.35	-49.65	51534.11	-11.75		
lambda	I	2024-11-29T04:20:59.011		59.81	-50.13	50026.71	-10.46		
delta	I	2024-11-29T04:24:01.130		60.42	-50.77	48300.35	-8.46		
gamma	I	2024-11-29T04:25:26.459		60.71	-51.08	47620.96	-7.45		
eta	I	2024-11-29T04:26:29.360		60.92	-51.30	47176.12	-6.68		
beta	I	2024-11-29T04:32:03.255		62.03	-52.48	45663.90	-2.31		

No planet occultations

beta	E	2024-11-29T04:37:38.253		63.13	-53.66	45667.50	2.31		
eta	E	2024-11-29T04:43:10.465		64.21	-54.82	47176.12	6.69		
gamma	E	2024-11-29T04:44:13.459		64.42	-55.04	47621.94	7.46		
delta	E	2024-11-29T04:45:38.593		64.69	-55.34	48300.35	8.47		
lambda	E	2024-11-29T04:48:40.551		65.27	-55.98	50026.71	10.47		
epsilon	E	2024-11-29T04:50:32.123		65.63	-56.37	51258.42	11.76		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-11-29T04:32:46.730
 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 : 57448078099849984
 2Mass ID (if available) : 03282208+1836459
 ICRS Star Coord at Epoch: 03h 28m 22.09865s +18:36:45.84792s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.406
 G magnitude : 17.367
 RP magnitude : 16.405
 BP magnitude : 18.361
 DUPflag : 0
 Distance (au) : 18.595
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.72
 Sun-Target sep (deg) : 167.29
 Sun-Moon sep (deg) : 168.68
 B (ring opening deg) : 65.65
 PA of pole (deg) : -85.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.316
 C/A sky separation (km) : 44724.5
 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

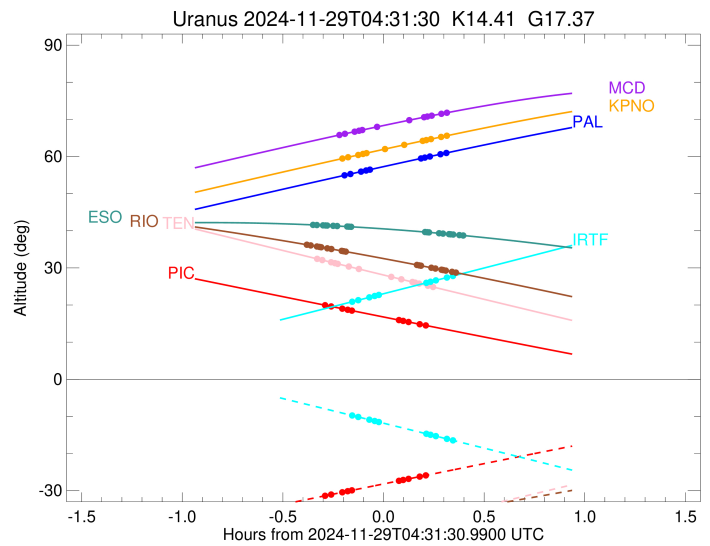
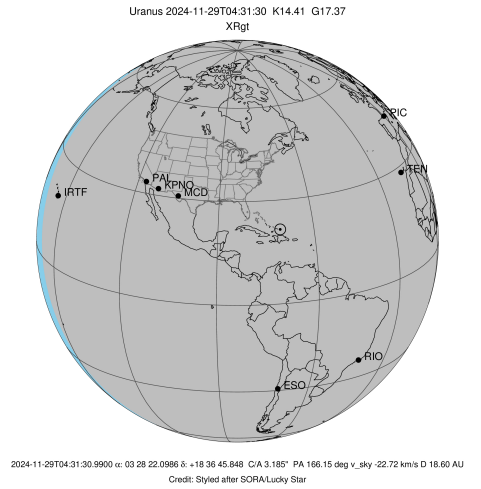


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2024-11-29T04:17:51.710		65.70	-56.04	51536.08	-12.10		
lambda	I	2024-11-29T04:20:02.671		66.13	-56.51	50026.71	-10.87		
delta	I	2024-11-29T04:22:56.160		66.70	-57.13	48300.35	-8.99		
gamma	I	2024-11-29T04:24:15.759		66.96	-57.41	47620.96	-8.07		
eta	I	2024-11-29T04:25:13.360		67.15	-57.61	47176.12	-7.37		
beta	I	2024-11-29T04:29:39.725		68.00	-58.56	45662.59	-3.94		

No planet occultations

beta	E	2024-11-29T04:39:10.018		69.79	-60.58	45668.73	3.95		
eta	E	2024-11-29T04:43:34.734		70.59	-61.52	47176.12	7.38		
gamma	E	2024-11-29T04:44:32.436		70.76	-61.72	47622.02	8.07		
delta	E	2024-11-29T04:45:51.856		71.00	-62.00	48300.35	9.00		
lambda	E	2024-11-29T04:48:45.220		71.51	-62.61	50026.71	10.88		
epsilon	E	2024-11-29T04:50:32.557		71.82	-62.98	51252.56	12.12		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-11-29T04:27:21.820
 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 : 57448078099849984
 2Mass ID (if available) : 03282208+1836459
 ICRS Star Coord at Epoch: 03h 28m 22.09865s +18:36:45.84792s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.406
 G magnitude : 17.367
 RP magnitude : 16.405
 BP magnitude : 18.361
 DUPflag : 0
 Distance (au) : 18.595
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.72
 Sun-Target sep (deg) : 167.29
 Sun-Moon sep (deg) : 169.56
 B (ring opening deg) : 65.65
 PA of pole (deg) : -85.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.245
 C/A sky separation (km) : 43759.3
 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



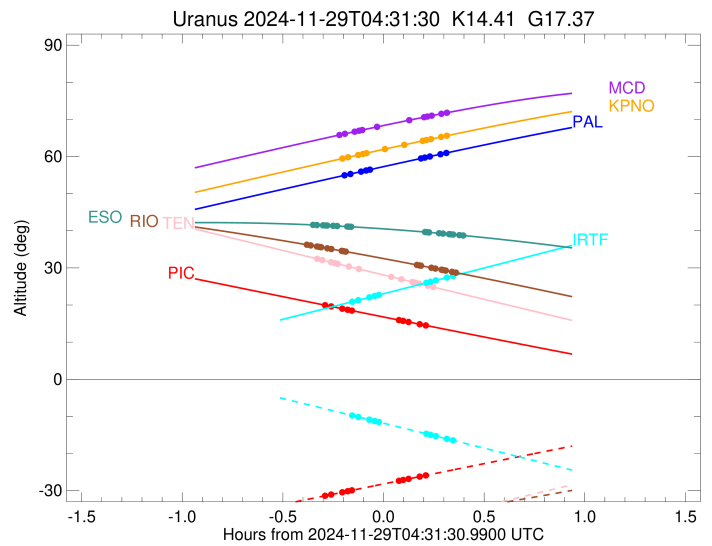
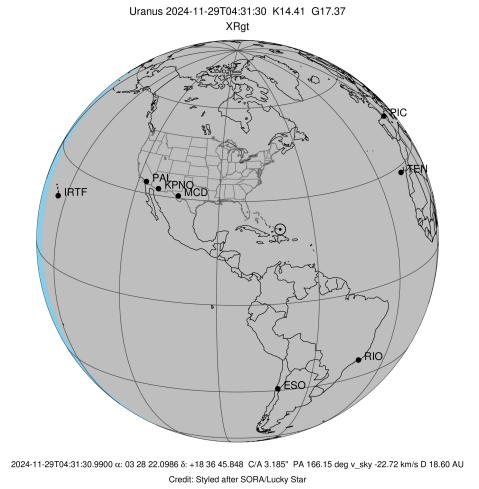
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2024-11-29T04:11:14.623		32.55	-45.14	51541.32	-12.84		
lambda	I	2024-11-29T04:13:17.525		32.10	-44.69	50026.71	-11.74		
delta	I	2024-11-29T04:15:55.195		31.52	-44.12	48300.35	-10.13		
gamma	I	2024-11-29T04:17:04.911		31.26	-43.86	47620.97	-9.36		
eta	I	2024-11-29T04:17:53.906		31.08	-43.68	47176.12	-8.80		
beta	I	2024-11-29T04:21:13.240		30.35	-42.95	45660.40	-6.38		
alpha	I	2024-11-29T04:24:07.106		29.72	-42.31	44752.13	-4.08		

No planet occultations

alpha	E	2024-11-29T04:33:53.935		27.57	-40.17	44751.79	4.08		
beta	E	2024-11-29T04:36:49.285		26.93	-39.52	45670.41	6.37		
eta	E	2024-11-29T04:40:07.329		26.21	-38.80	47176.12	8.79		
gamma	E	2024-11-29T04:40:56.534		26.03	-38.62	47622.18	9.34		
delta	E	2024-11-29T04:42:06.246		25.77	-38.37	48300.35	10.11		
lambda	E	2024-11-29T04:44:44.242		25.20	-37.79	50026.71	11.72		
epsilon	E	2024-11-29T04:46:23.895		24.84	-37.43	51241.15	12.81		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2024-11-29T04:35:32.810
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       : 57448078099849984
2Mass ID (if available) : 03282208+1836459
ICRS Star Coord at Epoch: 03h 28m 22.09865s +18:36:45.84792s
RUWE (>1.4 is poor) : 1.10
K magnitude          : 14.406
G magnitude          : 17.367
RP magnitude         : 16.405
BP magnitude         : 18.361
DUPflag             : 0
Distance (au)        : 18.595
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -22.72
Sun-Target sep (deg) : 167.29
Sun-Moon sep (deg)  : 168.05
B (ring opening deg) : 65.65
PA of pole (deg)    : -85.74
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.382
C/A sky separation (km) : 45616.2
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
    
```

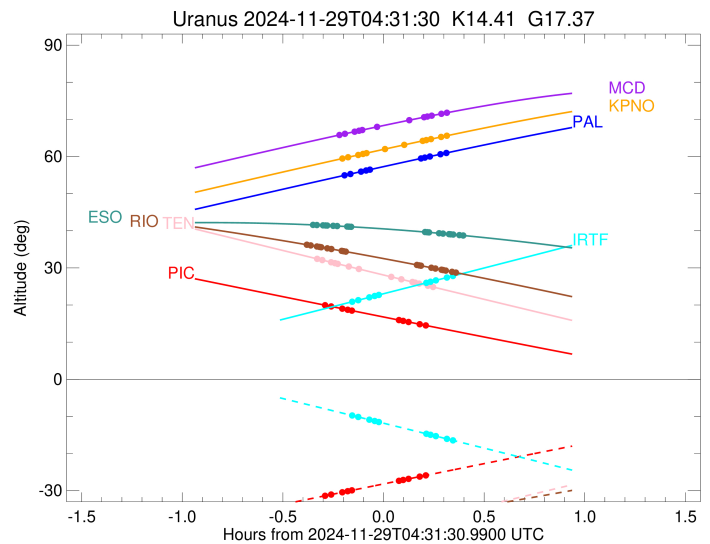
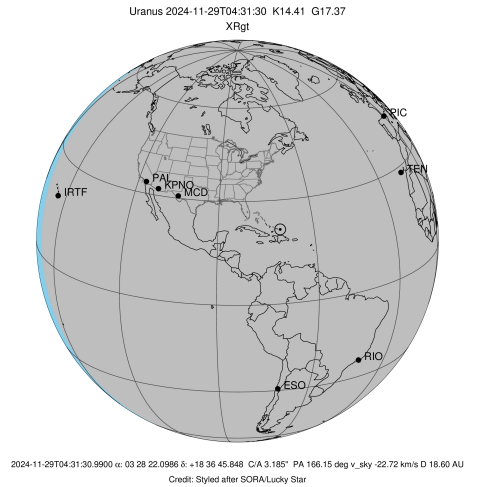


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2024-11-29T04:21:37.763		20.76	-9.63	51531.01	-11.14		
lambda	I	2024-11-29T04:24:01.107		21.31	-10.16	50026.71	-9.77		
delta	I	2024-11-29T04:27:19.624		22.07	-10.90	48300.35	-7.58		
gamma	I	2024-11-29T04:28:56.465		22.44	-11.26	47620.97	-6.44		
eta	I	2024-11-29T04:30:10.798		22.73	-11.53	47176.12	-5.53		

No planet occultations

eta	E	2024-11-29T04:44:14.665		25.97	-14.67	47176.12	5.53		
gamma	E	2024-11-29T04:45:29.043		26.26	-14.95	47621.83	6.45		
delta	E	2024-11-29T04:47:05.613		26.63	-15.31	48300.35	7.60		
lambda	E	2024-11-29T04:50:23.772		27.40	-16.05	50026.71	9.79		
epsilon	E	2024-11-29T04:52:23.002		27.86	-16.50	51266.67	11.17		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-11-29T04:29:27.430
 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 : 57448078099849984
 2Mass ID (if available) : 03282208+1836459
 ICRS Star Coord at Epoch: 03h 28m 22.09865s +18:36:45.84792s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.406
 G magnitude : 17.367
 RP magnitude : 16.405
 BP magnitude : 18.361
 DUPflag : 0
 Distance (au) : 18.595
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.72
 Sun-Target sep (deg) : 167.29
 Sun-Moon sep (deg) : 169.44
 B (ring opening deg) : 65.65
 PA of pole (deg) : -85.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.843
 C/A sky separation (km) : 38348.3
 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

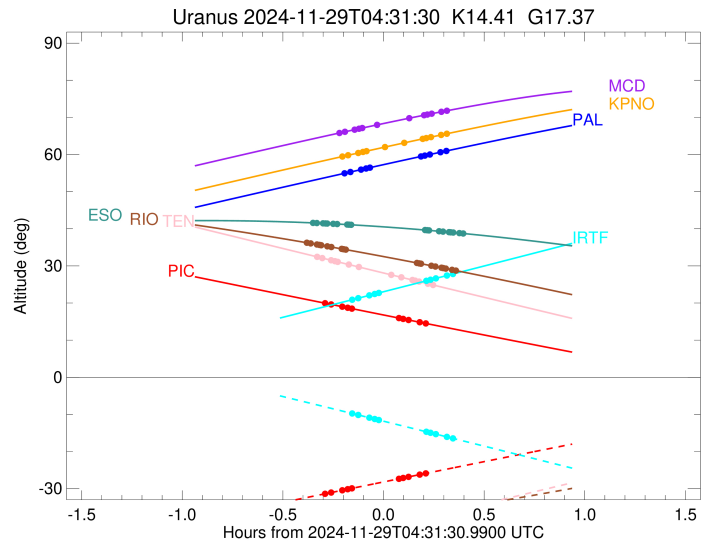
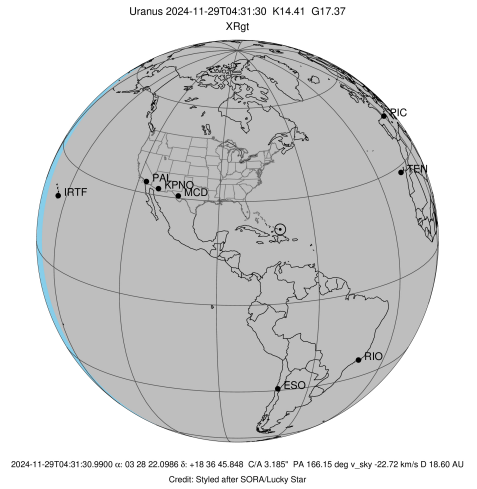


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2024-11-29T04:08:16.219		36.30	-40.88	51553.84	-16.60		
lambda	I	2024-11-29T04:09:50.019		36.06	-40.72	50026.71	-15.94		
delta	I	2024-11-29T04:11:41.399		35.76	-40.52	48300.35	-15.05		
gamma	I	2024-11-29T04:12:27.123		35.64	-40.44	47621.21	-14.65		
eta	I	2024-11-29T04:12:57.777		35.56	-40.38	47176.12	-14.38		
beta	I	2024-11-29T04:14:47.432		35.27	-40.18	45654.53	-13.35		
alpha	I	2024-11-29T04:15:57.398		35.09	-40.05	44748.39	-12.63		
4	I	2024-11-29T04:19:09.345		34.57	-39.68	42526.43	-10.43		
5	I	2024-11-29T04:19:33.109		34.50	-39.64	42281.17	-10.17		
6	I	2024-11-29T04:20:19.840		34.38	-39.55	41830.94	-9.52		

No planet occultations

6	E	2024-11-29T04:41:23.528		30.82	-36.90	41803.28	9.51		
5	E	2024-11-29T04:42:15.432		30.66	-36.78	42314.62	10.16		
4	E	2024-11-29T04:42:37.920		30.60	-36.73	42546.94	10.42		
alpha	E	2024-11-29T04:45:48.363		30.04	-36.30	44747.26	12.62		
beta	E	2024-11-29T04:46:59.803		29.83	-36.14	45675.32	13.33		
eta	E	2024-11-29T04:48:48.094		29.51	-35.88	47176.12	14.36		
gamma	E	2024-11-29T04:49:18.935		29.42	-35.81	47623.11	14.63		
delta	E	2024-11-29T04:50:04.615		29.28	-35.71	48300.35	15.02		
lambda	E	2024-11-29T04:51:56.222		28.95	-35.44	50026.71	15.90		
epsilon	E	2024-11-29T04:53:06.796		28.73	-35.28	51167.29	16.56		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-11-29T04:31:29.960
 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 : 57448078099849984
 2Mass ID (if available) : 03282208+1836459
 ICRS Star Coord at Epoch: 03h 28m 22.09865s +18:36:45.84792s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.406
 G magnitude : 17.367
 RP magnitude : 16.405
 BP magnitude : 18.361
 DUPflag : 0
 Distance (au) : 18.595
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.72
 Sun-Target sep (deg) : 167.29
 Sun-Moon sep (deg) : 169.11
 B (ring opening deg) : 65.65
 PA of pole (deg) : -85.74
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.823
 C/A sky separation (km) : 38072.2
 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	2024-11-29T04:10:07.200		41.60	-39.10	51554.02	-16.79		
lambda	I	2024-11-29T04:11:39.921		41.54	-39.13	50026.71	-16.14		
delta	I	2024-11-29T04:13:29.806		41.46	-39.17	48300.35	-15.27		
gamma	I	2024-11-29T04:14:14.838		41.43	-39.19	47621.22	-14.89		
eta	I	2024-11-29T04:14:45.001		41.41	-39.20	47176.12	-14.62		
beta	I	2024-11-29T04:16:32.679		41.33	-39.23	45654.36	-13.62		
alpha	I	2024-11-29T04:17:41.151		41.28	-39.25	44748.23	-12.93		
4	I	2024-11-29T04:20:47.634		41.13	-39.29	42526.35	-10.81		
5	I	2024-11-29T04:21:10.601		41.11	-39.29	42280.28	-10.56		
6	I	2024-11-29T04:21:55.329		41.07	-39.30	41831.56	-9.95		

No planet occultations

6	E	2024-11-29T04:43:49.787		39.67	-39.26	41802.77	9.95		
5	E	2024-11-29T04:44:39.627		39.60	-39.25	42314.80	10.56		
4	E	2024-11-29T04:45:01.322		39.58	-39.24	42547.66	10.81		
alpha	E	2024-11-29T04:48:06.103		39.33	-39.19	44746.97	12.92		
beta	E	2024-11-29T04:49:15.975		39.24	-39.17	45675.53	13.62		
eta	E	2024-11-29T04:51:02.163		39.09	-39.13	47176.12	14.62		
gamma	E	2024-11-29T04:51:32.473		39.05	-39.12	47623.17	14.88		
delta	E	2024-11-29T04:52:17.401		38.99	-39.10	48300.35	15.26		
lambda	E	2024-11-29T04:54:07.353		38.83	-39.05	50026.71	16.13		
epsilon	E	2024-11-29T04:55:16.712		38.73	-39.02	51162.70	16.78		