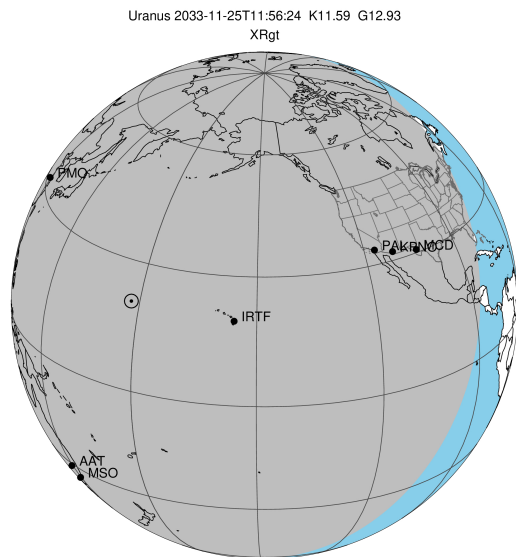


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T11:56:24.730
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3377535343540063616
 2Mass ID (if available) : 06205519+2337029

ICRS Star Coord at Epoch: 06h 20m 55.18909s +23:37:03.10108s

RUWE (>1.4 is poor) : 0.96
 K magnitude : 11.591
 G magnitude : 12.930
 RP magnitude : 12.448
 BP magnitude : 13.247
 DUPflag : 0
 Distance (au) : 18.112
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.96
 Sun-Target sep (deg) : 148.26
 Sun-Moon sep (deg) : 170.72
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.67

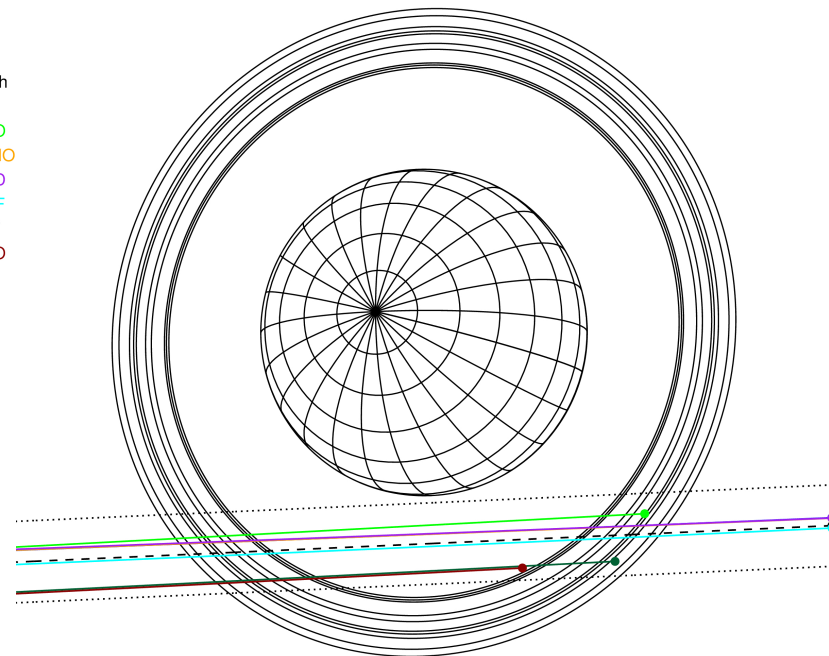
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2033-11-25T11:56:24.7300 α: 06 20 55.1891 δ: +23 37 03.101 C/A 2.509° PA 2.96 deg v_sky -18.96 km/s D 18.11 AU
 Credit: Styled after SORA/Lucky Star

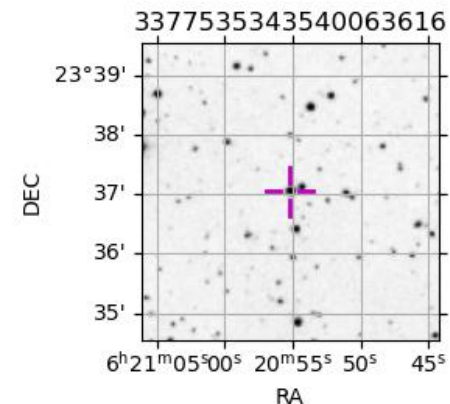
Uranus 2033-11-25T11:56:24 K11.59 G12.93 XRgt

Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 AAT
 MSO

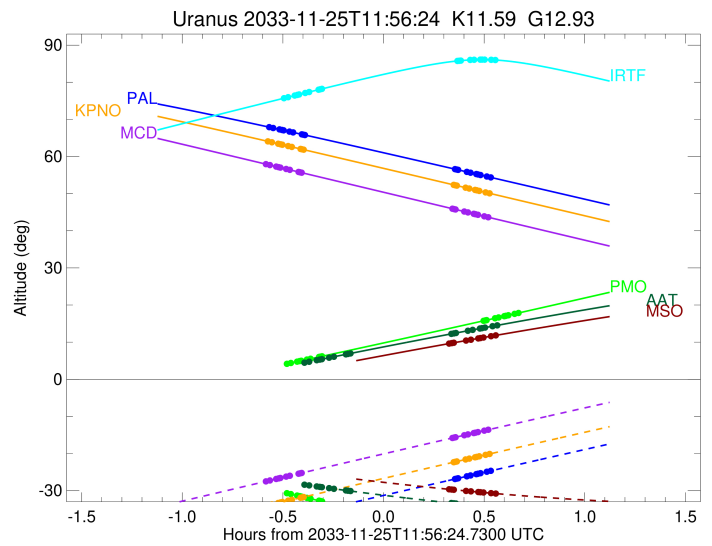
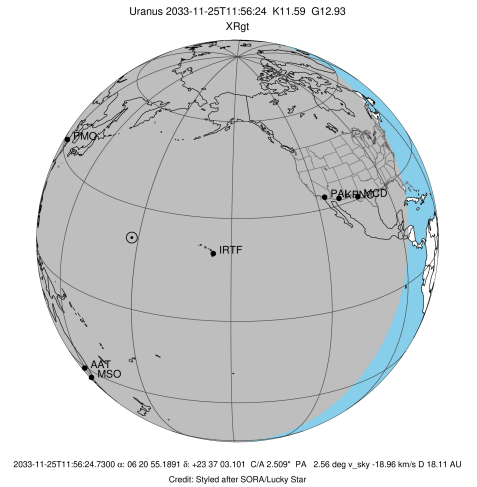


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++		+++++	NOV 25 11:22 - NOV 25 12:28	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8	++++		+++++	NOV 25 11:33 - NOV 25 12:37	PnnRie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	NOV 25 11:22 - NOV 25 12:28	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	NOV 25 11:21 - NOV 25 12:28	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++		+++++	NOV 25 11:26 - NOV 25 12:30	PnnRie
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	+++++		+++++	NOV 25 11:36 - NOV 25 12:30	PnnRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0			+++++	NOV 25 12:15 - NOV 25 12:30	PnnRne



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T11:54:12.980
 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 : 3377535343540063616
 2Mass ID (if available) : 06205519+2337029
 ICRS Star Coord at Epoch: 06h 20m 55.18909s +23:37:03.10108s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 11.591
 G magnitude : 12.930
 RP magnitude : 12.448
 BP magnitude : 13.247
 DUPflag : 0
 Distance (au) : 18.112
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.96
 Sun-Target sep (deg) : 148.26
 Sun-Moon sep (deg) : 170.65
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.67
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.404
 C/A sky separation (km) : 31580.0
 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

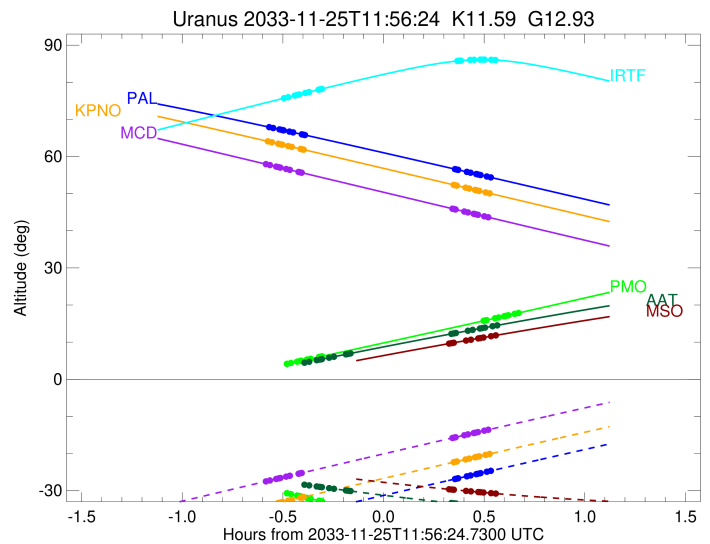
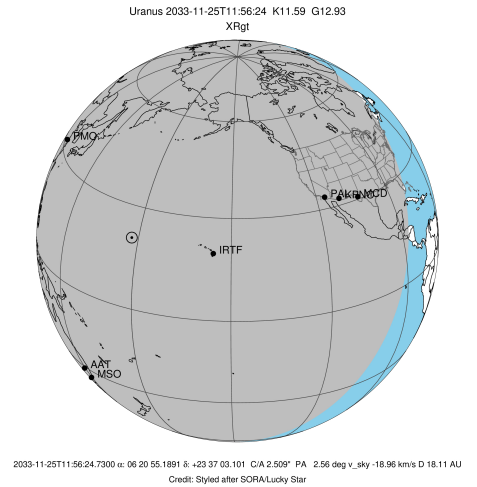


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-25T11:22:34.167		67.87	-38.36	50938.76	-15.83		
lambda	I	2033-11-25T11:23:32.455		67.68	-38.15	50026.71	-15.55		
delta	I	2033-11-25T11:25:24.857		67.31	-37.76	48300.35	-15.16		
gamma	I	2033-11-25T11:26:09.484		67.16	-37.61	47627.59	-14.99		
eta	I	2033-11-25T11:26:39.720		67.06	-37.50	47176.12	-14.87		
beta	I	2033-11-25T11:28:21.903		66.72	-37.15	45676.71	-14.44		
alpha	I	2033-11-25T11:29:30.012		66.49	-36.91	44707.70	-14.13		
4	I	2033-11-25T11:32:07.858		65.96	-36.36	42526.05	-13.35		
5	I	2033-11-25T11:32:27.268		65.90	-36.29	42276.98	-13.26		
6	I	2033-11-25T11:33:00.899		65.79	-36.17	41839.16	-13.04		

No planet occultations

6	E	2033-11-25T12:17:40.610		56.62	-26.88	41795.67	13.02		
5	E	2033-11-25T12:18:19.663		56.48	-26.75	42308.40	13.24		
4	E	2033-11-25T12:18:38.395		56.42	-26.68	42562.45	13.33		
alpha	E	2033-11-25T12:21:13.070		55.88	-26.15	44686.20	14.11		
beta	E	2033-11-25T12:22:20.557		55.64	-25.92	45648.05	14.42		
eta	E	2033-11-25T12:24:04.973		55.28	-25.56	47176.12	14.84		
gamma	E	2033-11-25T12:24:35.512		55.17	-25.45	47631.24	14.96		
delta	E	2033-11-25T12:25:19.984		55.02	-25.30	48300.35	15.13		
lambda	E	2033-11-25T12:27:12.622		54.63	-24.91	50026.71	15.52		
epsilon	E	2033-11-25T12:28:48.904		54.29	-24.58	51535.66	15.79		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T12:01:04.400
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3377535343540063616
 2Mass ID (if available) : 06205519+2337029
 ICRS Star Coord at Epoch: 06h 20m 55.18909s +23:37:03.10108s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 11.591
 G magnitude : 12.930
 RP magnitude : 12.448
 BP magnitude : 13.247
 DUPflag : 0
 Distance (au) : 18.112
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.96
 Sun-Target sep (deg) : 148.26
 Sun-Moon sep (deg) : 171.65
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.67
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.297
 C/A sky separation (km) : 30178.0
 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

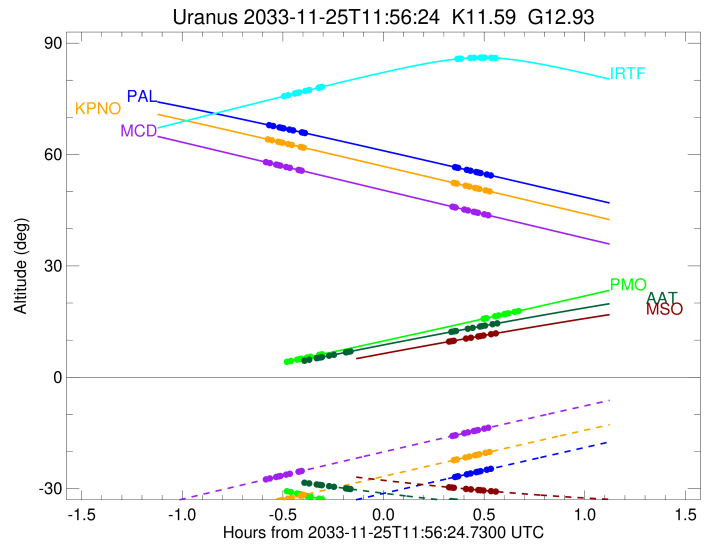
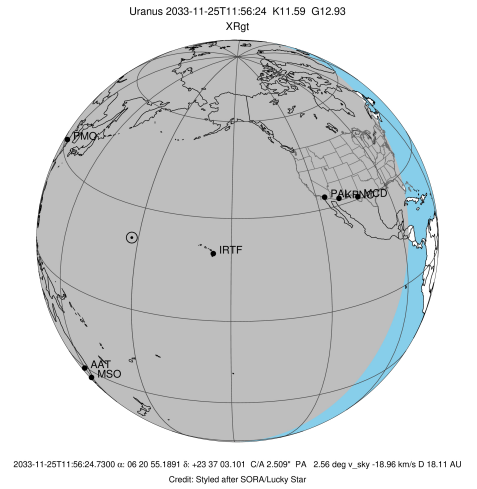


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-25T11:27:52.069		4.21x	-30.74	50922.80	-15.89		
lambda	I	2033-11-25T11:28:49.008		4.39x	-30.94	50026.71	-15.66		
delta	I	2033-11-25T11:30:40.452		4.75x	-31.33	48300.35	-15.32		
gamma	I	2033-11-25T11:31:24.593		4.89x	-31.49	47627.32	-15.18		
eta	I	2033-11-25T11:31:54.426		4.99x	-31.59	47176.12	-15.07		
beta	I	2033-11-25T11:33:34.973		5.31	-31.95	45677.38	-14.71		
alpha	I	2033-11-25T11:34:41.686		5.53	-32.18	44709.52	-14.44		
4	I	2033-11-25T11:37:15.533		6.02	-32.72	42526.33	-13.77		
5	I	2033-11-25T11:37:34.606		6.09	-32.79	42272.70	-13.71		
6	I	2033-11-25T11:38:06.603		6.19	-32.90	41841.82	-13.51		

No planet occultations

6	E	2033-11-25T12:26:12.227		15.73	-43.10	41795.37	13.58		
5	E	2033-11-25T12:26:49.656		15.86	-43.23	42307.18	13.78		
4	E	2033-11-25T12:27:07.845		15.92	-43.29	42564.03	13.84		
alpha	E	2033-11-25T12:29:37.378		16.43	-43.82	44686.53	14.52		
beta	E	2033-11-25T12:30:43.008		16.65	-44.05	45647.61	14.79		
eta	E	2033-11-25T12:32:25.026		16.99	-44.42	47176.12	15.17		
gamma	E	2033-11-25T12:32:54.931		17.09	-44.52	47631.19	15.27		
delta	E	2033-11-25T12:33:38.543		17.24	-44.68	48300.35	15.42		
lambda	E	2033-11-25T12:35:29.264		17.62	-45.07	50026.71	15.76		
epsilon	E	2033-11-25T12:37:04.333		17.94	-45.40	51538.22	16.01		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T11:53:50.180
 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 : 3377535343540063616
 2Mass ID (if available) : 06205519+2337029
 ICRS Star Coord at Epoch: 06h 20m 55.18909s +23:37:03.10108s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 11.591
 G magnitude : 12.930
 RP magnitude : 12.448
 BP magnitude : 13.247
 DUPflag : 0
 Distance (au) : 18.112
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.96
 Sun-Target sep (deg) : 148.26
 Sun-Moon sep (deg) : 170.59
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.67
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.405
 C/A sky separation (km) : 31598.8
 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

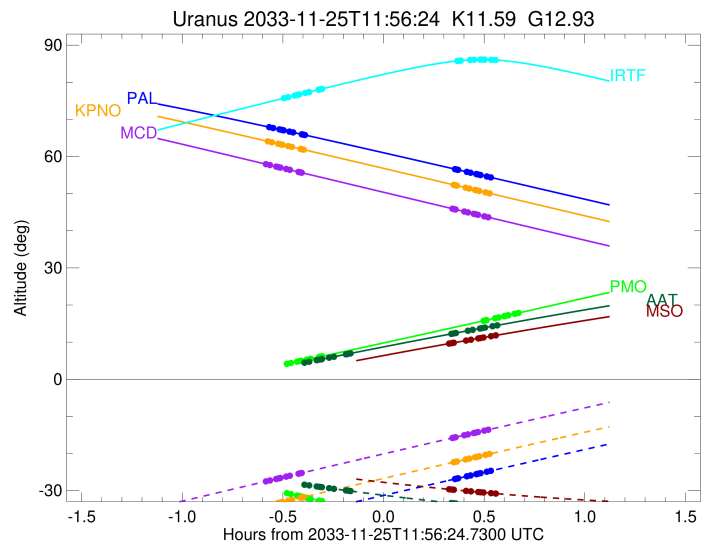
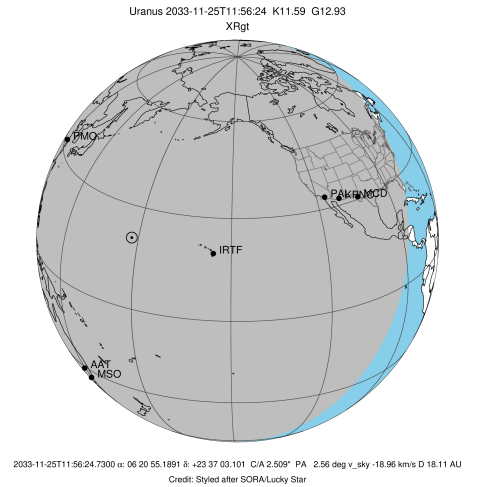


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-25T11:22:10.884		64.04	-33.93	50939.13	-15.81		
lambda	I	2033-11-25T11:23:09.247		63.83	-33.72	50026.71	-15.54		
delta	I	2033-11-25T11:25:01.752		63.44	-33.32	48300.35	-15.14		
gamma	I	2033-11-25T11:25:46.422		63.29	-33.17	47627.59	-14.98		
eta	I	2033-11-25T11:26:16.688		63.18	-33.06	47176.12	-14.86		
beta	I	2033-11-25T11:27:58.977		62.82	-32.70	45676.70	-14.43		
alpha	I	2033-11-25T11:29:07.164		62.58	-32.46	44707.66	-14.12		
4	I	2033-11-25T11:31:45.198		62.03	-31.90	42526.04	-13.33		
5	I	2033-11-25T11:32:04.627		61.96	-31.84	42277.07	-13.25		
6	I	2033-11-25T11:32:38.314		61.85	-31.72	41839.11	-13.02		

No planet occultations

6	E	2033-11-25T12:17:17.868		52.38	-22.35	41795.67	13.00		
5	E	2033-11-25T12:17:56.986		52.24	-22.21	42308.40	13.22		
4	E	2033-11-25T12:18:15.750		52.17	-22.15	42562.45	13.30		
alpha	E	2033-11-25T12:20:50.667		51.62	-21.61	44686.20	14.09		
beta	E	2033-11-25T12:21:58.255		51.38	-21.38	45648.05	14.40		
eta	E	2033-11-25T12:23:42.822		51.01	-21.01	47176.12	14.82		
gamma	E	2033-11-25T12:24:13.404		50.90	-20.91	47631.24	14.94		
delta	E	2033-11-25T12:24:57.939		50.74	-20.75	48300.35	15.11		
lambda	E	2033-11-25T12:26:50.731		50.34	-20.36	50026.71	15.50		
epsilon	E	2033-11-25T12:28:27.143		50.00	-20.03	51535.68	15.77		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T11:53:20.380
 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 : 3377535343540063616
 2Mass ID (if available) : 06205519+2337029
 ICRS Star Coord at Epoch: 06h 20m 55.18909s +23:37:03.10108s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 11.591
 G magnitude : 12.930
 RP magnitude : 12.448
 BP magnitude : 13.247
 DUPflag : 0
 Distance (au) : 18.112
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.96
 Sun-Target sep (deg) : 148.26
 Sun-Moon sep (deg) : 170.51
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.67
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.400
 C/A sky separation (km) : 31524.6
 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



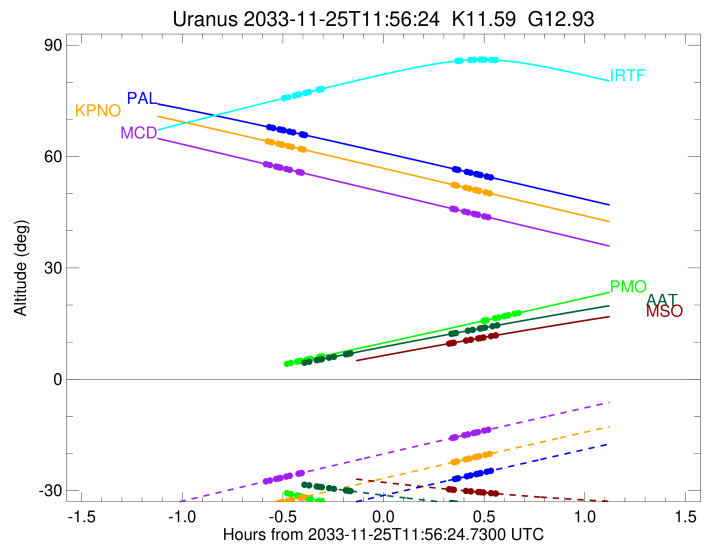
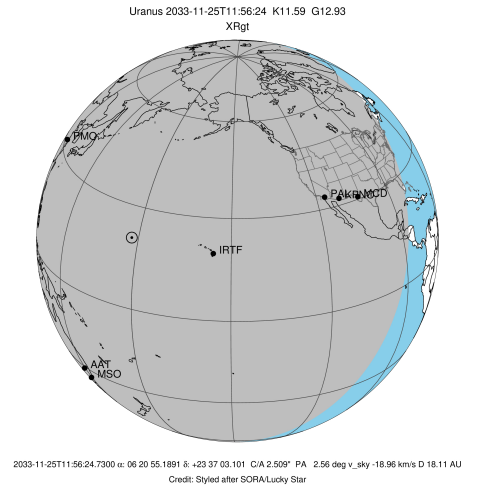
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-25T11:21:35.337		57.90	-27.46	50938.76	-15.82		
lambda	I	2033-11-25T11:22:33.650		57.69	-27.25	50026.71	-15.55		
delta	I	2033-11-25T11:24:26.090		57.29	-26.85	48300.35	-15.15		
gamma	I	2033-11-25T11:25:10.729		57.13	-26.70	47627.59	-14.99		
eta	I	2033-11-25T11:25:40.970		57.02	-26.59	47176.12	-14.87		
beta	I	2033-11-25T11:27:23.162		56.65	-26.23	45676.72	-14.44		
alpha	I	2033-11-25T11:28:31.267		56.40	-25.99	44707.72	-14.13		
4	I	2033-11-25T11:31:09.063		55.84	-25.43	42526.05	-13.35		
5	I	2033-11-25T11:31:28.465		55.77	-25.36	42276.93	-13.27		
6	I	2033-11-25T11:32:02.069		55.65	-25.24	41839.19	-13.05		

No planet occultations

6	E	2033-11-25T12:16:54.489		45.96	-15.82	41795.64	13.02		
5	E	2033-11-25T12:17:33.541		45.82	-15.69	42308.29	13.24		
4	E	2033-11-25T12:17:52.294		45.75	-15.62	42562.60	13.32		
alpha	E	2033-11-25T12:20:27.041		45.19	-15.09	44686.24	14.10		
beta	E	2033-11-25T12:21:34.581		44.95	-14.85	45648.00	14.40		
eta	E	2033-11-25T12:23:19.110		44.58	-14.49	47176.12	14.83		
gamma	E	2033-11-25T12:23:49.685		44.47	-14.39	47631.24	14.94		
delta	E	2033-11-25T12:24:34.214		44.31	-14.23	48300.35	15.11		
lambda	E	2033-11-25T12:26:27.011		43.90	-13.85	50026.71	15.50		
epsilon	E	2033-11-25T12:28:03.466		43.56	-13.51	51536.01	15.77		

```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2033-11-25T11:57:03.270
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       : 3377535343540063616
2Mass ID (if available) : 06205519+2337029
ICRS Star Coord at Epoch: 06h 20m 55.18909s +23:37:03.10108s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 11.591
G magnitude          : 12.930
RP magnitude         : 12.448
BP magnitude         : 13.247
DUPflag             : 0
Distance (au)        : 18.112
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -18.96
Sun-Target sep (deg) : 148.26
Sun-Moon sep (deg)   : 170.92
B (ring opening deg) : 71.13
PA of pole (deg)     : 66.67
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.552
C/A sky separation (km) : 33519.6
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
    
```

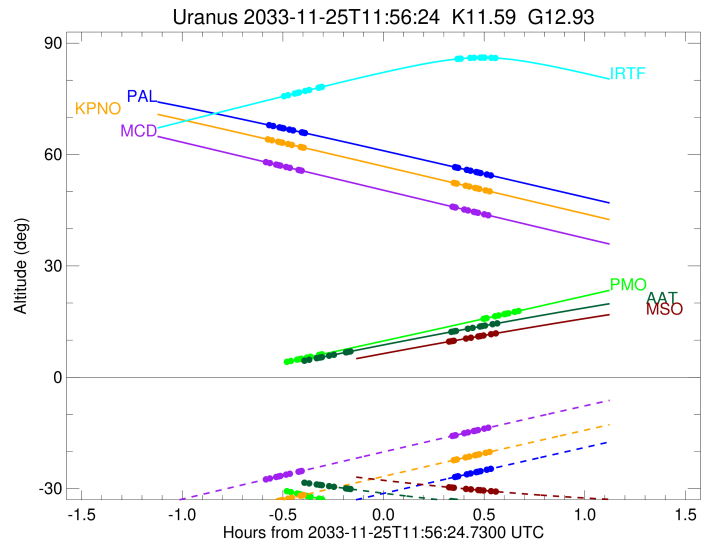
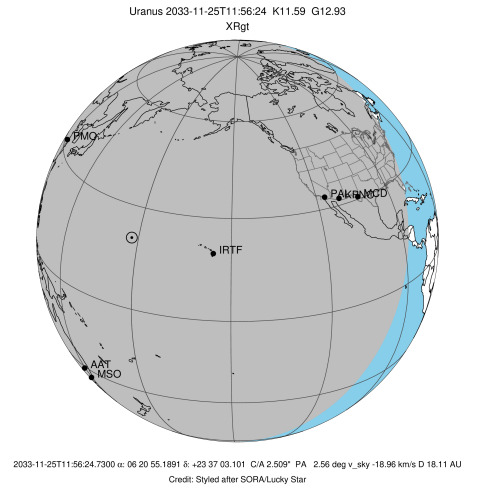


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-25T11:26:58.080		75.76	-71.67	50954.66	-15.23		
lambda	I	2033-11-25T11:27:59.846		75.99	-71.43	50026.71	-14.91		
delta	I	2033-11-25T11:29:57.438		76.43	-70.98	48300.35	-14.44		
gamma	I	2033-11-25T11:30:44.317		76.60	-70.79	47627.86	-14.25		
eta	I	2033-11-25T11:31:16.187		76.72	-70.67	47176.12	-14.10		
beta	I	2033-11-25T11:33:04.404		77.12	-70.25	45675.96	-13.59		
alpha	I	2033-11-25T11:34:17.074		77.39	-69.96	44705.79	-13.22		
4	I	2033-11-25T11:37:07.201		78.02	-69.30	42525.93	-12.25		
5	I	2033-11-25T11:37:28.033		78.09	-69.22	42281.61	-12.15		
6	I	2033-11-25T11:38:05.478		78.23	-69.08	41836.13	-11.87		

No planet occultations

6	E	2033-11-25T12:18:23.950		85.74	-59.67	41796.51	11.89		
5	E	2033-11-25T12:19:06.723		85.81	-59.50	42310.72	12.16		
4	E	2033-11-25T12:19:26.725		85.84	-59.43	42559.03	12.27		
alpha	E	2033-11-25T12:22:13.321		86.02	-58.78	44685.57	13.23		
beta	E	2033-11-25T12:23:25.167		86.07	-58.50	45649.09	13.61		
eta	E	2033-11-25T12:25:15.287		86.10	-58.07	47176.12	14.12		
gamma	E	2033-11-25T12:25:47.363		86.11	-57.95	47631.35	14.26		
delta	E	2033-11-25T12:26:33.939		86.10	-57.77	48300.35	14.46		
lambda	E	2033-11-25T12:28:31.377		86.05	-57.31	50026.71	14.93		
epsilon	E	2033-11-25T12:30:10.740		85.97	-56.92	51528.27	15.25		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T12:00:14.500
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 3377535343540063616
 2Mass ID (if available) : 06205519+2337029
 ICRS Star Coord at Epoch: 06h 20m 55.18909s +23:37:03.10108s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 11.591
 G magnitude : 12.930
 RP magnitude : 12.448
 BP magnitude : 13.247
 DUPflag : 0
 Distance (au) : 18.112
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.96
 Sun-Target sep (deg) : 148.26
 Sun-Moon sep (deg) : 170.90
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.67
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.843
 C/A sky separation (km) : 37345.5
 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

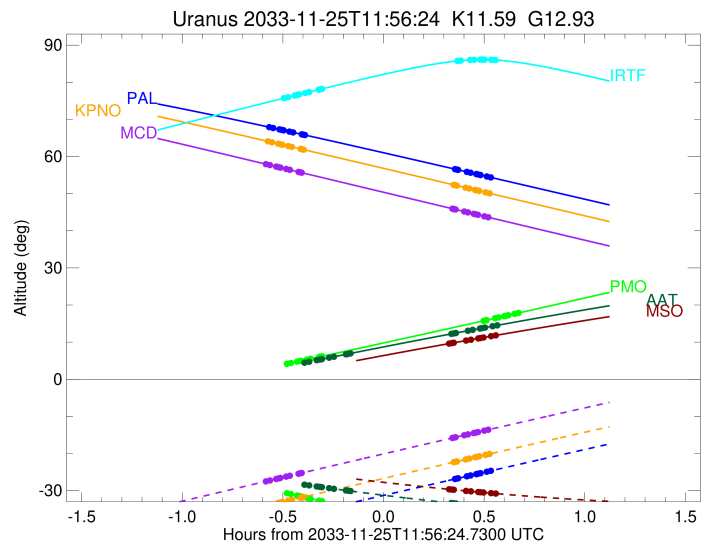
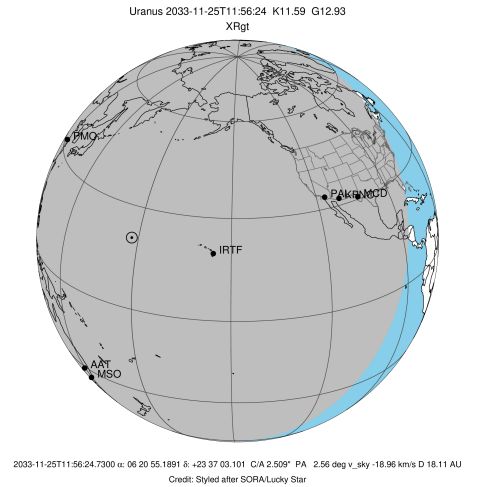


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-25T11:33:03.423		4.50x	-28.43	50991.11	-13.54		
lambda	I	2033-11-25T11:34:16.086		4.72x	-28.59	50026.71	-13.11		
delta	I	2033-11-25T11:36:31.011		5.13	-28.87	48300.35	-12.47		
gamma	I	2033-11-25T11:37:25.511		5.30	-28.99	47628.44	-12.19		
eta	I	2033-11-25T11:38:02.929		5.41	-29.07	47176.12	-11.99		
beta	I	2033-11-25T11:40:12.034		5.81	-29.33	45674.06	-11.25		
alpha	I	2033-11-25T11:41:40.910		6.07	-29.52	44701.54	-10.70		
4	I	2033-11-25T11:45:17.867		6.73	-29.95	42526.51	-9.22		
5	I	2033-11-25T11:45:44.770		6.81	-30.01	42291.88	-9.04		
6	I	2033-11-25T11:46:37.717		6.97	-30.11	41828.71	-8.60		

No planet occultations

6	E	2033-11-25T12:16:33.900		12.22	-33.34	41799.52	8.62		
5	E	2033-11-25T12:17:32.147		12.38	-33.43	42314.27	9.07		
4	E	2033-11-25T12:17:57.966		12.45	-33.47	42551.53	9.25		
alpha	E	2033-11-25T12:21:30.932		13.06	-33.80	44684.74	10.74		
beta	E	2033-11-25T12:22:58.710		13.30	-33.93	45651.53	11.29		
eta	E	2033-11-25T12:25:09.356		13.67	-34.12	47176.12	12.04		
gamma	E	2033-11-25T12:25:46.865		13.77	-34.18	47631.51	12.24		
delta	E	2033-11-25T12:26:40.876		13.92	-34.26	48300.35	12.52		
lambda	E	2033-11-25T12:28:55.171		14.29	-34.45	50026.71	13.18		
epsilon	E	2033-11-25T12:30:45.641		14.60	-34.60	51509.46	13.61		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-11-25T12:00:03.020
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : MSO
 Location : Mt. Stromlo Observatory
 Latitude (deg) : -35.32000
 E. Longitude (deg) : 149.00833
 Altitude (km) : 0.770
 Gaia source ID : 3377535343540063616
 2Mass ID (if available) : 06205519+2337029
 ICRS Star Coord at Epoch: 06h 20m 55.18909s +23:37:03.10108s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 11.591
 G magnitude : 12.930
 RP magnitude : 12.448
 BP magnitude : 13.247
 DUPflag : 0
 Distance (au) : 18.112
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.96
 Sun-Target sep (deg) : 148.26
 Sun-Moon sep (deg) : 170.84
 B (ring opening deg) : 71.13
 PA of pole (deg) : 66.67
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.864
 C/A sky separation (km) : 37628.1
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-11-25T11:33:07.454	2.38x	-25.16	50994.31	-13.41			
lambda	I	2033-11-25T11:34:21.090	2.60x	-25.31	50026.71	-12.97			
delta	I	2033-11-25T11:36:37.560	2.99x	-25.58	48300.35	-12.31			
gamma	I	2033-11-25T11:37:32.761	3.15x	-25.69	47628.49	-12.03			
eta	I	2033-11-25T11:38:10.697	3.26x	-25.76	47176.12	-11.82			
beta	I	2033-11-25T11:40:21.826	3.64x	-26.01	45673.88	-11.06			
alpha	I	2033-11-25T11:41:52.348	3.90x	-26.18	44701.18	-10.49			
4	I	2033-11-25T11:45:34.522	4.54x	-26.60	42526.63	-8.95			
5	I	2033-11-25T11:46:02.165	4.62x	-26.65	42292.74	-8.77			
6	I	2033-11-25T11:46:57.053	4.78x	-26.75	41828.03	-8.30			

No planet occultations

6	E	2033-11-25T12:15:52.999	9.60	-29.63	41799.83	8.32			
5	E	2033-11-25T12:16:53.190	9.76	-29.72	42314.45	8.79			
4	E	2033-11-25T12:17:19.745	9.83	-29.76	42550.94	8.98			
alpha	E	2033-11-25T12:20:57.959	10.41	-30.07	44684.71	10.53			
beta	E	2033-11-25T12:22:27.392	10.65	-30.20	45651.72	11.10			
eta	E	2033-11-25T12:24:40.082	11.00	-30.38	47176.12	11.87			
gamma	E	2033-11-25T12:25:18.116	11.10	-30.43	47631.51	12.08			
delta	E	2033-11-25T12:26:12.836	11.25	-30.50	48300.35	12.37			
lambda	E	2033-11-25T12:28:28.700	11.60	-30.68	50026.71	13.04			
epsilon	E	2033-11-25T12:30:20.174	11.89	-30.82	51507.95	13.48			