

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-22T12:32:13.830
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 670674403289459584
 2Mass ID (if available) : 08071828+2049448

Uranus 2040-02-22T12:32:13 K14.77 G18.83 PgtRgt

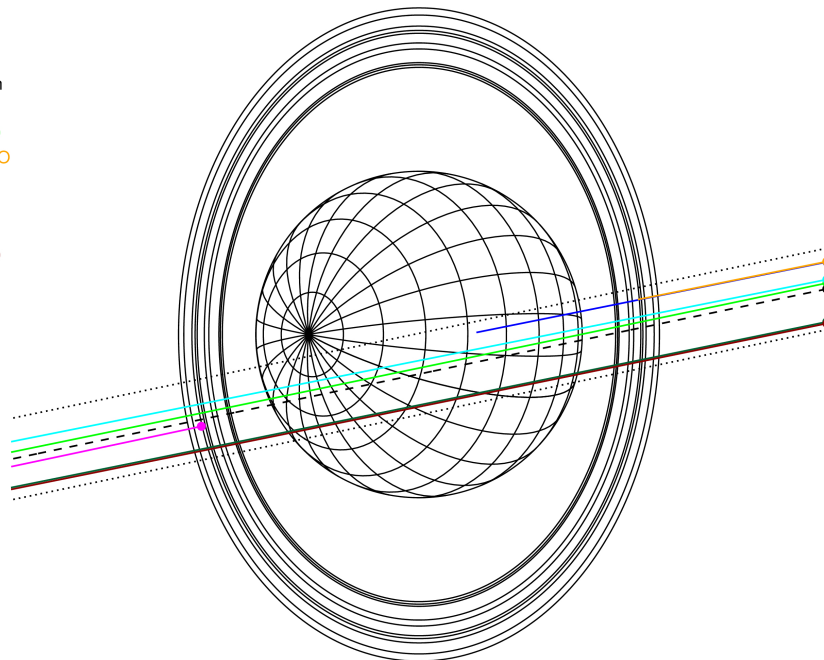
ICRS Star Coord at Epoch: 08h 07m 18.23195s +20:49:44.19094s

RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.771
 G magnitude : 18.830
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 17.750
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 146.59
 Sun-Moon sep (deg) : 28.18
 B (ring opening deg) : 47.42
 PA of pole (deg) : 90.00



2040-02-22T12:32:13.8300 α: 08 07 18.2320 δ: +20 49 44.191 C/A 0.465° PA 11.78 deg v_sky -18.32 km/s D 17.75 AU
 Credit: Styled after SORA/Lucky Star

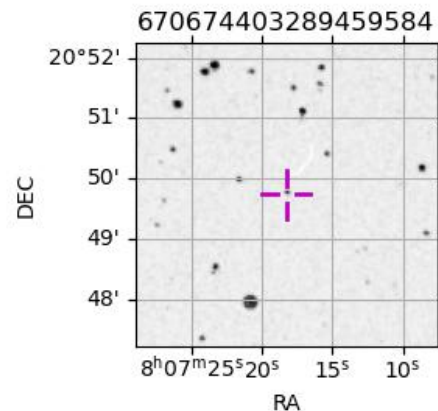
Earth
 PAL
 PMO
 KPNO
 IRTF
 KAV
 AAT
 MSO



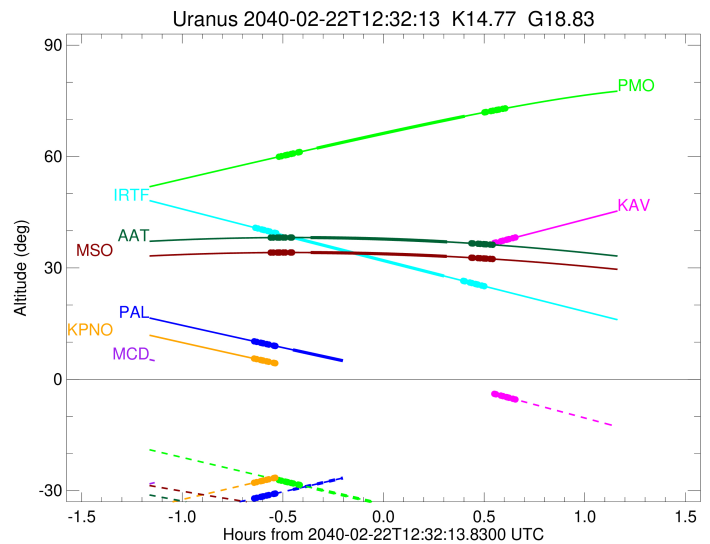
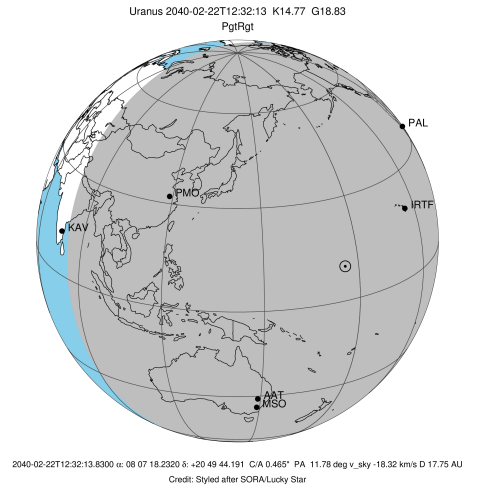
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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	+++++	+		FEB 22 11:53 - FEB 22 12:05	PinRin
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+	+++++	FEB 22 12:01 - FEB 22 13:08	PieRie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++			FEB 22 11:53 - FEB 22 11:56	PnnRin
MCD	McDonald Obs. 2.7m	30.7	256.0					PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+	+++++	FEB 22 11:53 - FEB 22 13:02	PieRie
KAV	Kavalur Observatory	12.6	78.8			++	FEB 22 13:10 - FEB 22 13:11	PnnRne
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	+++++	+	+++++	FEB 22 11:58 - FEB 22 13:04	PieRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+	+++++	FEB 22 11:58 - FEB 22 13:04	PieRie

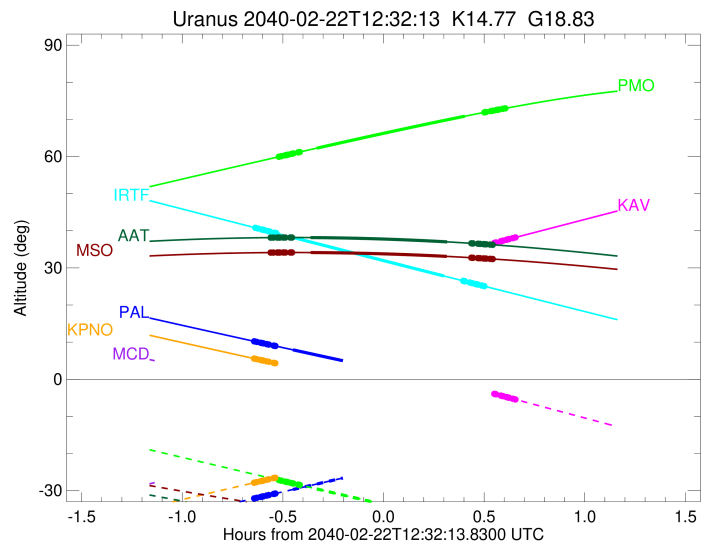
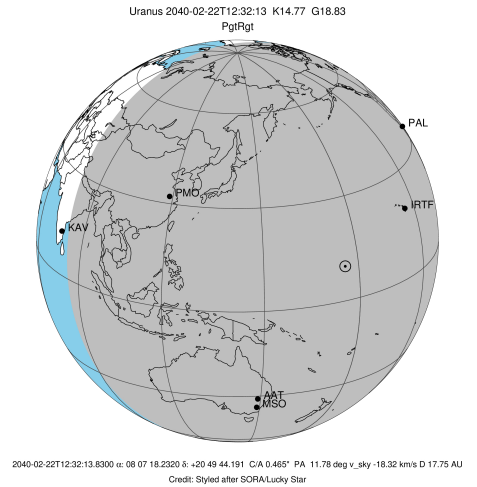


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-22T12:28:14.320
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 670674403289459584
 2Mass ID (if available) : 08071828+2049448
 ICRS Star Coord at Epoch: 08h 07m 18.23195s +20:49:44.19094s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.771
 G magnitude : 18.830
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 17.750
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 146.59
 Sun-Moon sep (deg) : 28.72
 B (ring opening deg) : 47.42
 PA of pole (deg) : 90.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.114
 C/A sky separation (km) : 1469.3
 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	2040-02-22T11:53:36.850		10.23	-32.11	51273.66	-24.59		
lambda	I	2040-02-22T11:54:27.554		10.07	-31.93	50026.71	-24.59		
delta	I	2040-02-22T11:55:37.762		9.83	-31.69	48300.35	-24.59		
gamma	I	2040-02-22T11:56:05.148		9.74	-31.60	47627.04	-24.58		
eta	I	2040-02-22T11:56:23.491		9.68	-31.53	47176.12	-24.58		
beta	I	2040-02-22T11:57:24.525		9.48	-31.32	45673.53	-24.58		
alpha	I	2040-02-22T11:58:02.440		9.35	-31.19	44752.06	-24.58		
4	I	2040-02-22T11:59:30.791		9.06	-30.89	42589.68	-24.58		
5	I	2040-02-22T11:59:46.891		9.01	-30.83	42180.23	-24.57		
6	I	2040-02-22T12:00:02.180		8.96	-30.78	41803.82	-24.57		
Uranus	I	2040-02-22T12:05:12.841		7.93	-29.70	25249.10		-42.06	-43.37
Uranus	E	2040-02-22T12:51:19.761		-1.00x	-20.08	25263.17		40.87	42.17
6	E	2040-02-22T12:56:48.679		-2.03x	-18.93	41872.39	24.43		
5	E	2040-02-22T12:57:06.122		-2.08x	-18.87	42293.61	24.43		
4	E	2040-02-22T12:57:16.218		-2.12x	-18.83	42555.61	24.44		
alpha	E	2040-02-22T12:58:43.676		-2.39x	-18.53	44684.73	24.43		
beta	E	2040-02-22T12:59:23.634		-2.51x	-18.39	45649.79	24.42		
eta	E	2040-02-22T13:00:26.027		-2.71x	-18.17	47176.12	24.42		
gamma	E	2040-02-22T13:00:44.439		-2.77x	-18.11	47625.81	24.42		
delta	E	2040-02-22T13:01:12.057		-2.85x	-18.01	48300.35	24.42		
lambda	E	2040-02-22T13:02:22.743		-3.07x	-17.76	50026.71	24.42		
epsilon	E	2040-02-22T13:03:02.495		-3.20x	-17.62	50997.52	24.42		

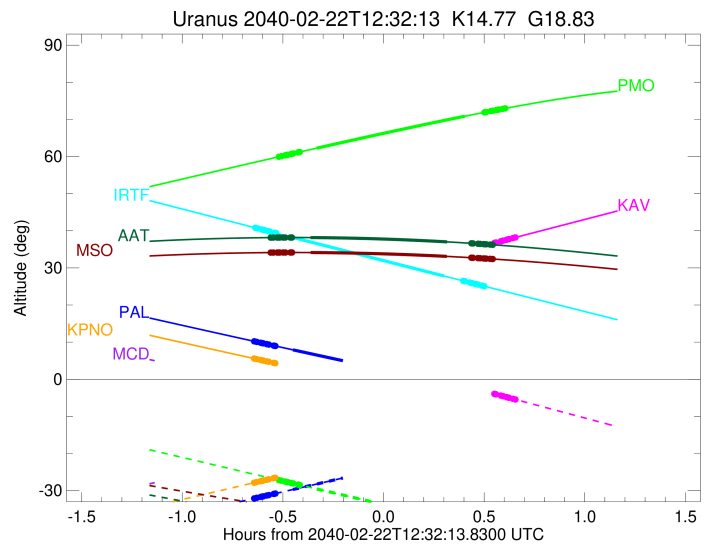
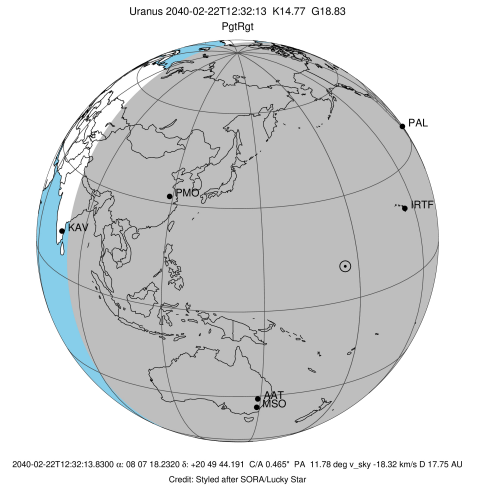
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-22T12:34:22.490
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 670674403289459584
 2Mass ID (if available) : 08071828+2049448
 ICRS Star Coord at Epoch: 08h 07m 18.23195s +20:49:44.19094s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.771
 G magnitude : 18.830
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 17.750
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 146.59
 Sun-Moon sep (deg) : 28.27
 B (ring opening deg) : 47.42
 PA of pole (deg) : 90.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.400
 C/A sky separation (km) : 5148.8
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2040-02-22T12:00:59.603		59.93	-27.15	51247.02	-24.95		
lambda	I	2040-02-22T12:01:48.486		60.10	-27.32	50026.71	-24.96		
delta	I	2040-02-22T12:02:57.663		60.34	-27.57	48300.35	-24.95		
gamma	I	2040-02-22T12:03:24.635		60.43	-27.66	47627.43	-24.95		
eta	I	2040-02-22T12:03:42.727		60.49	-27.73	47176.12	-24.94		
beta	I	2040-02-22T12:04:42.849		60.70	-27.94	45674.71	-24.93		
alpha	I	2040-02-22T12:05:20.264		60.83	-28.07	44751.55	-24.93		
4	I	2040-02-22T12:06:47.308		61.12	-28.38	42593.06	-24.92		
5	I	2040-02-22T12:07:03.200		61.18	-28.43	42185.33	-24.91		
6	I	2040-02-22T12:07:18.130		61.23	-28.48	41806.17	-24.91		
Uranus	I	2040-02-22T12:12:19.336		62.26	-29.54	25242.99		-42.58	-43.89
Uranus	E	2040-02-22T12:56:27.799		70.86	-38.76	25292.23		38.37	39.66
6	E	2040-02-22T13:02:19.453		71.90	-39.97	41874.44	24.94		
5	E	2040-02-22T13:02:36.923		71.95	-40.03	42298.37	24.94		
4	E	2040-02-22T13:02:46.710		71.98	-40.06	42559.53	24.95		
alpha	E	2040-02-22T13:04:12.088		72.23	-40.36	44684.61	24.96		
beta	E	2040-02-22T13:04:51.271		72.35	-40.49	45651.23	24.97		
eta	E	2040-02-22T13:05:52.229		72.52	-40.70	47176.12	24.98		
gamma	E	2040-02-22T13:06:10.248		72.57	-40.76	47626.25	24.98		
delta	E	2040-02-22T13:06:37.230		72.65	-40.85	48300.35	24.99		
lambda	E	2040-02-22T13:07:46.307		72.85	-41.09	50026.71	25.00		
epsilon	E	2040-02-22T13:08:24.014		72.95	-41.22	50969.39	24.98		

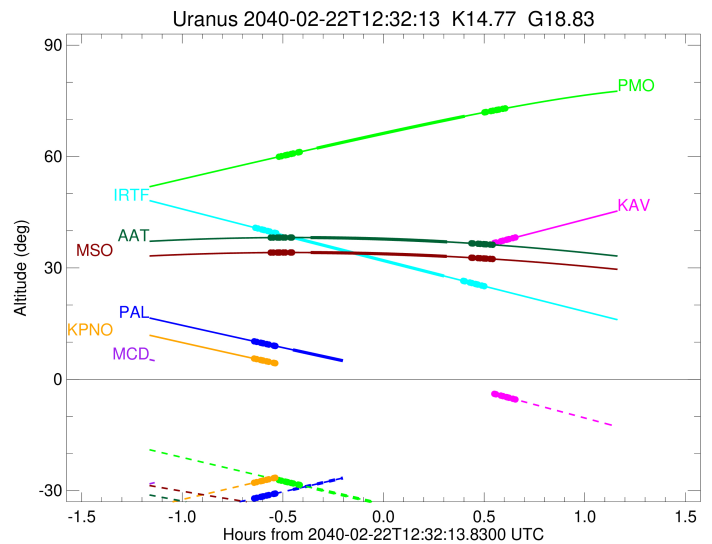
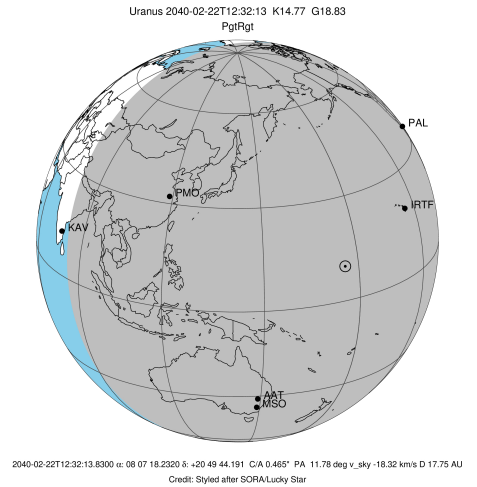
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2040-02-22T12:28:16.250
Event type          : PgtRgt
: Uranus occs: geocentric, topocentric
: 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      : 670674403289459584
2Mass ID (if available) : 08071828+2049448
ICRS Star Coord at Epoch: 08h 07m 18.23195s +20:49:44.19094s
RUWE (>1.4 is poor) : 0.99
K magnitude          : 14.771
G magnitude          : 18.830
RP magnitude         : 0.000
BP magnitude         : 0.000
DUPflag             : 0
Distance (au)       : 17.750
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -18.32
Sun-Target sep (deg) : 146.59
Sun-Moon sep (deg)  : 28.68
B (ring opening deg) : 47.42
PA of pole (deg)    : 90.00
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.110
C/A sky separation (km) : 1420.1
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall11.bsp
ural161.bsp
vgr2.ural161.bsp
peph.ural160.bsp
earthstns_itrfr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



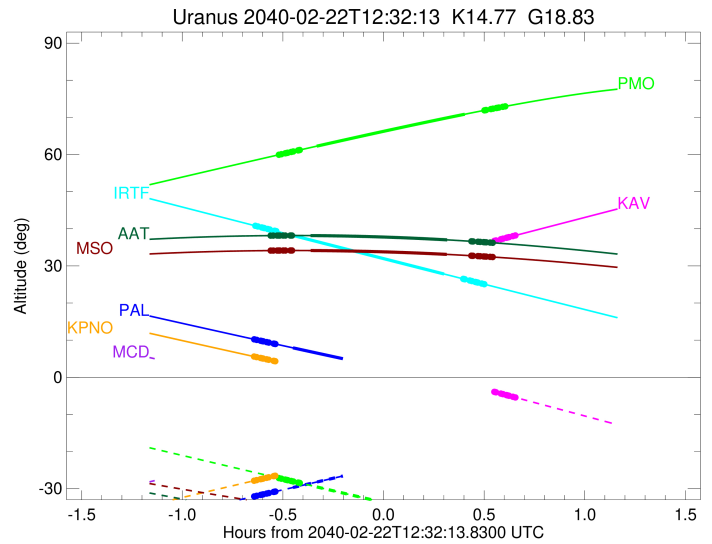
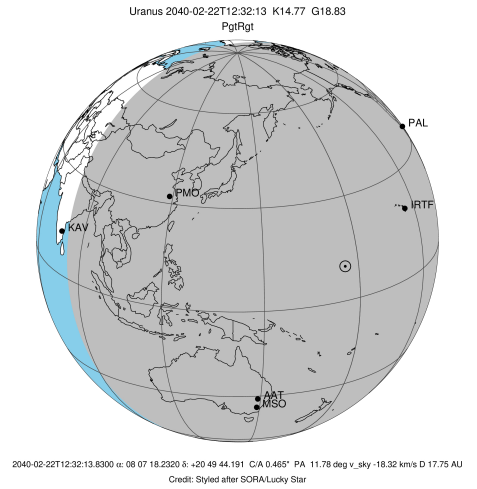
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2040-02-22T11:53:34.317		5.59	-27.88	51274.15	-24.54		
lambda	I	2040-02-22T11:54:25.140		5.42	-27.71	50026.71	-24.54		
delta	I	2040-02-22T11:55:35.486		5.19	-27.46	48300.35	-24.54		
gamma	I	2040-02-22T11:56:02.926		5.10	-27.36	47627.04	-24.54		
eta	I	2040-02-22T11:56:21.304		5.04	-27.30	47176.12	-24.54		
beta	I	2040-02-22T11:57:22.459		4.84x	-27.08	45673.51	-24.53		
alpha	I	2040-02-22T11:58:00.447		4.71x	-26.95	44752.06	-24.53		
4	I	2040-02-22T11:59:28.973		4.42x	-26.63	42589.62	-24.53		
5	I	2040-02-22T11:59:45.104		4.37x	-26.58	42180.14	-24.52		
6	I	2040-02-22T12:00:00.425		4.32x	-26.52	41803.78	-24.52		
Uranus	I	2040-02-22T12:05:11.888		3.29x	-25.42	25249.30		-42.05	-43.36
Uranus	E	2040-02-22T12:51:24.526		-5.60x	-15.60	25262.94		40.89	42.19
6	E	2040-02-22T12:56:53.853		-6.62x	-14.43	41872.36	24.38		
5	E	2040-02-22T12:57:11.326		-6.67x	-14.37	42293.56	24.38		
4	E	2040-02-22T12:57:21.442		-6.70x	-14.34	42555.58	24.39		
alpha	E	2040-02-22T12:58:49.072		-6.98x	-14.03	44684.73	24.38		
beta	E	2040-02-22T12:59:29.106		-7.10x	-13.88	45649.77	24.38		
eta	E	2040-02-22T13:00:31.620		-7.29x	-13.66	47176.12	24.38		
gamma	E	2040-02-22T13:00:50.068		-7.35x	-13.60	47625.81	24.38		
delta	E	2040-02-22T13:01:17.739		-7.43x	-13.50	48300.35	24.38		
lambda	E	2040-02-22T13:02:28.562		-7.65x	-13.25	50026.71	24.38		
epsilon	E	2040-02-22T13:03:08.400		-7.77x	-13.11	50997.75	24.37		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-22T12:27:46.240
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 670674403289459584
 2Mass ID (if available) : 08071828+2049448
 ICRS Star Coord at Epoch: 08h 07m 18.23195s +20:49:44.19094s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.771
 G magnitude : 18.830
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 17.750
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 146.59
 Sun-Moon sep (deg) : 29.01
 B (ring opening deg) : 47.42
 PA of pole (deg) : 90.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.312
 C/A sky separation (km) : 4011.1
 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
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 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



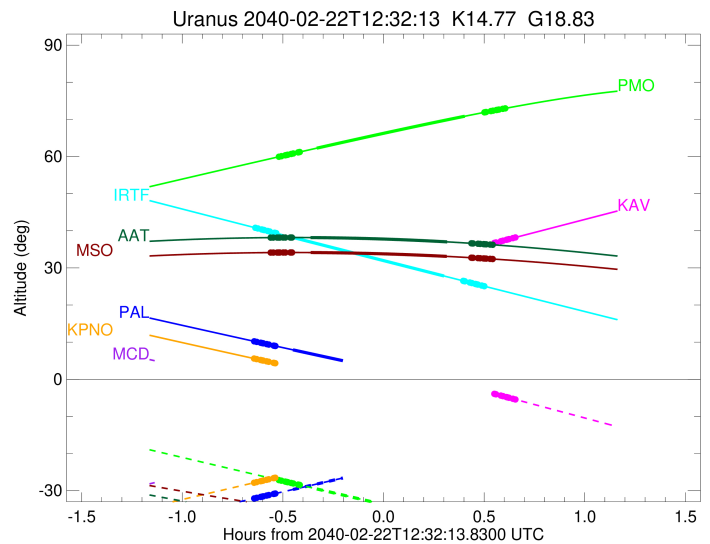
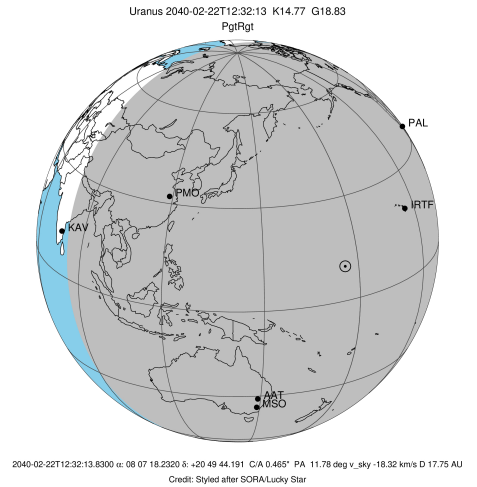
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2040-02-22T11:53:58.249		40.81	-68.80	51253.32	-24.88		
lambda	I	2040-02-22T11:54:47.525		40.62	-68.63	50026.71	-24.89		
delta	I	2040-02-22T11:55:56.899		40.35	-68.38	48300.35	-24.88		
gamma	I	2040-02-22T11:56:23.952		40.25	-68.28	47627.34	-24.88		
eta	I	2040-02-22T11:56:42.092		40.18	-68.21	47176.12	-24.87		
beta	I	2040-02-22T11:57:42.393		39.94	-67.99	45674.43	-24.86		
alpha	I	2040-02-22T11:58:19.903		39.80	-67.86	44751.70	-24.86		
4	I	2040-02-22T11:59:47.207		39.46	-67.54	42592.23	-24.85		
5	I	2040-02-22T12:00:03.141		39.40	-67.48	42184.02	-24.84		
6	I	2040-02-22T12:00:18.147		39.34	-67.43	41805.56	-24.84		
Uranus	I	2040-02-22T12:05:20.380		38.18	-66.32	25243.41		-42.55	-43.86
Uranus	E	2040-02-22T12:50:17.257		27.82	-56.13	25280.67		39.37	40.67
6	E	2040-02-22T12:56:00.266		26.51	-54.80	41873.73	24.70		
5	E	2040-02-22T12:56:17.767		26.44	-54.74	42296.70	24.70		
4	E	2040-02-22T12:56:27.682		26.40	-54.70	42558.10	24.71		
alpha	E	2040-02-22T12:57:54.004		26.07	-54.36	44684.63	24.71		
beta	E	2040-02-22T12:58:33.561		25.92	-54.21	45650.69	24.71		
eta	E	2040-02-22T12:59:35.188		25.69	-53.97	47176.12	24.71		
gamma	E	2040-02-22T12:59:53.395		25.62	-53.90	47626.09	24.72		
delta	E	2040-02-22T13:00:20.676		25.51	-53.80	48300.35	24.72		
lambda	E	2040-02-22T13:01:30.517		25.25	-53.53	50026.71	24.72		
epsilon	E	2040-02-22T13:02:09.069		25.10	-53.38	50979.75	24.71		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-22T12:37:09.120
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 670674403289459584
 2Mass ID (if available) : 08071828+2049448
 ICRS Star Coord at Epoch: 08h 07m 18.23195s +20:49:44.19094s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.771
 G magnitude : 18.830
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 17.750
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 146.59
 Sun-Moon sep (deg) : 27.70
 B (ring opening deg) : 47.42
 PA of pole (deg) : 90.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.540
 C/A sky separation (km) : 6953.4
 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



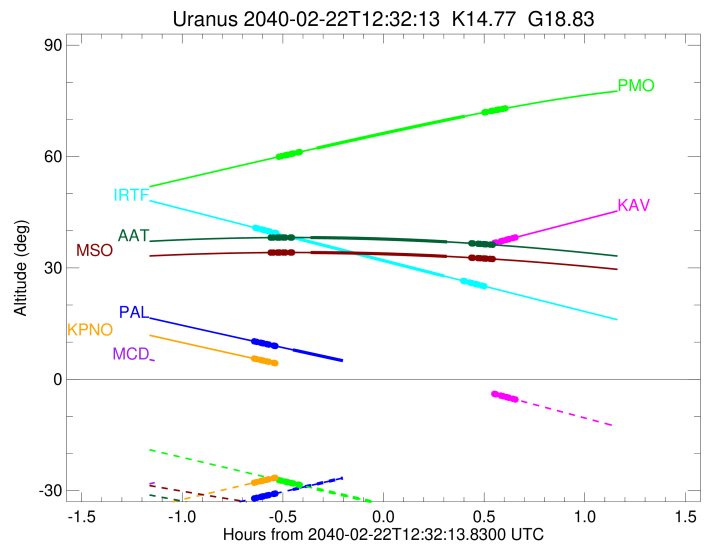
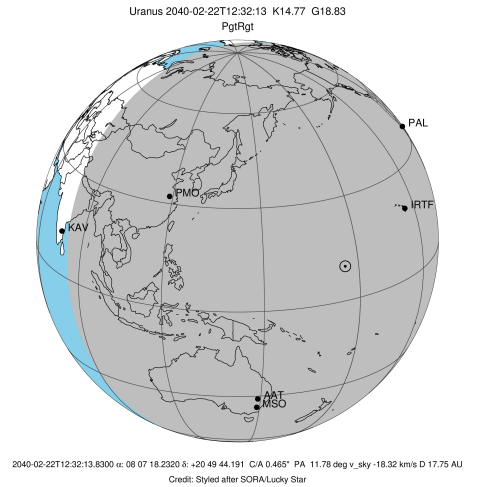
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2040-02-22T12:03:48.350		22.34	10.78x	51234.63	-24.60		
lambda	I	2040-02-22T12:04:37.416		22.53	10.59x	50026.71	-24.61		
delta	I	2040-02-22T12:05:47.579		22.80	10.31x	48300.35	-24.60		
gamma	I	2040-02-22T12:06:14.934		22.91	10.20x	47627.60	-24.59		
eta	I	2040-02-22T12:06:33.296		22.98	10.13x	47176.12	-24.58		
beta	I	2040-02-22T12:07:34.288		23.22	9.89x	45675.23	-24.57		
alpha	I	2040-02-22T12:08:12.280		23.36	9.73x	44751.25	-24.56		
4	I	2040-02-22T12:09:40.617		23.71	9.38x	42594.58	-24.54		
5	I	2040-02-22T12:09:56.759		23.77	9.32x	42187.83	-24.53		
6	I	2040-02-22T12:10:11.854		23.83	9.26x	41807.34	-24.52		
Uranus	I	2040-02-22T12:15:19.749		25.03	8.04x	25244.41		-42.46	-43.77
Uranus	E	2040-02-22T12:59:00.048		35.26	-2.42x	25311.65		36.69	37.96
6	E	2040-02-22T13:05:16.729		36.73	-3.93x	41875.40	24.63		
5	E	2040-02-22T13:05:34.607		36.80	-4.00x	42300.68	24.64		
4	E	2040-02-22T13:05:44.478		36.84	-4.04x	42561.64	24.65		
alpha	E	2040-02-22T13:07:10.740		37.17	-4.39x	44684.66	24.68		
beta	E	2040-02-22T13:07:50.407		37.33	-4.54x	45652.03	24.69		
eta	E	2040-02-22T13:08:52.002		37.57	-4.79x	47176.12	24.71		
gamma	E	2040-02-22T13:09:10.225		37.64	-4.86x	47626.48	24.72		
delta	E	2040-02-22T13:09:37.483		37.75	-4.97x	48300.35	24.73		
lambda	E	2040-02-22T13:10:47.272		38.02	-5.25	50026.71	24.75		
epsilon	E	2040-02-22T13:11:24.765		38.17	-5.40	50954.75	24.73		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-22T12:30:47.680
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 670674403289459584
 2Mass ID (if available) : 08071828+2049448
 ICRS Star Coord at Epoch: 08h 07m 18.23195s +20:49:44.19094s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.771
 G magnitude : 18.830
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 17.750
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 146.59
 Sun-Moon sep (deg) : 28.69
 B (ring opening deg) : 47.42
 PA of pole (deg) : 90.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.841
 C/A sky separation (km) : 10830.2
 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	2040-02-22T11:58:34.319		38.16	-36.97	51200.43	-24.54		
lambda	I	2040-02-22T11:59:22.084		38.16	-37.09	50026.71	-24.56		
delta	I	2040-02-22T12:00:32.446		38.17	-37.27	48300.35	-24.51		
gamma	I	2040-02-22T12:00:59.884		38.17	-37.33	47628.06	-24.49		
eta	I	2040-02-22T12:01:18.341		38.17	-37.38	47176.12	-24.48		
beta	I	2040-02-22T12:02:19.593		38.18	-37.53	45676.53	-24.43		
alpha	I	2040-02-22T12:02:57.858		38.18	-37.63	44750.24	-24.40		
4	I	2040-02-22T12:04:26.730		38.18	-37.84	42598.40	-24.33		
5	I	2040-02-22T12:04:43.001		38.18	-37.88	42194.71	-24.31		
6	I	2040-02-22T12:04:58.059		38.18	-37.92	41810.61	-24.29		
Uranus	I	2040-02-22T12:10:27.450		38.17	-38.71	25260.86		-41.06	-42.37
Uranus	E	2040-02-22T12:51:14.159		37.01	-43.83	25354.82		32.83	34.04
6	E	2040-02-22T12:58:25.879		36.62	-44.57	41876.90	24.26		
5	E	2040-02-22T12:58:44.350		36.60	-44.60	42304.44	24.28		
4	E	2040-02-22T12:58:54.327		36.59	-44.62	42565.51	24.30		
alpha	E	2040-02-22T13:00:21.534		36.51	-44.76	44684.90	24.37		
beta	E	2040-02-22T13:01:01.749		36.47	-44.83	45653.48	24.40		
eta	E	2040-02-22T13:02:03.984		36.41	-44.93	47176.12	24.44		
gamma	E	2040-02-22T13:02:22.420		36.39	-44.96	47626.88	24.46		
delta	E	2040-02-22T13:02:49.945		36.36	-45.00	48300.35	24.48		
lambda	E	2040-02-22T13:04:00.412		36.28	-45.11	50026.71	24.52		
epsilon	E	2040-02-22T13:04:37.244		36.24	-45.17	50930.24	24.51		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2040-02-22T12:30:46.400
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 670674403289459584
 2Mass ID (if available) : 08071828+2049448
 ICRS Star Coord at Epoch: 08h 07m 18.23195s +20:49:44.19094s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.771
 G magnitude : 18.830
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 17.750
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.32
 Sun-Target sep (deg) : 146.59
 Sun-Moon sep (deg) : 28.67
 B (ring opening deg) : 47.42
 PA of pole (deg) : 90.00
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.862
 C/A sky separation (km) : 11095.2
 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	2040-02-22T11:58:34.986		34.13	-34.01	51198.33	-24.49		
lambda	I	2040-02-22T11:59:22.770		34.13	-34.12	50026.71	-24.50		
delta	I	2040-02-22T12:00:33.290		34.14	-34.29	48300.35	-24.46		
gamma	I	2040-02-22T12:01:00.790		34.14	-34.35	47628.09	-24.44		
eta	I	2040-02-22T12:01:19.292		34.14	-34.39	47176.12	-24.42		
beta	I	2040-02-22T12:02:20.689		34.14	-34.53	45676.60	-24.37		
alpha	I	2040-02-22T12:02:59.053		34.15	-34.62	44750.17	-24.34		
4	I	2040-02-22T12:04:28.150		34.15	-34.82	42598.63	-24.27		
5	I	2040-02-22T12:04:44.463		34.15	-34.85	42195.15	-24.25		
6	I	2040-02-22T12:04:59.553		34.15	-34.89	41810.83	-24.22		
Uranus	I	2040-02-22T12:10:31.763		34.14	-35.62	25262.54		-40.92	-42.23
Uranus	E	2040-02-22T12:51:07.395		33.10	-40.27	25358.38		32.50	33.71
6	E	2040-02-22T12:58:24.571		32.74	-40.95	41877.00	24.20		
5	E	2040-02-22T12:58:43.115		32.73	-40.98	42304.71	24.22		
4	E	2040-02-22T12:58:53.118		32.72	-40.99	42565.81	24.24		
alpha	E	2040-02-22T13:00:20.534		32.64	-41.12	44684.93	24.31		
beta	E	2040-02-22T13:01:00.852		32.60	-41.18	45653.60	24.34		
eta	E	2040-02-22T13:02:03.229		32.55	-41.27	47176.12	24.39		
gamma	E	2040-02-22T13:02:21.708		32.53	-41.30	47626.91	24.40		
delta	E	2040-02-22T13:02:49.295		32.50	-41.34	48300.35	24.42		
lambda	E	2040-02-22T13:03:59.918		32.44	-41.44	50026.71	24.47		
epsilon	E	2040-02-22T13:04:36.750		32.40	-41.49	50928.34	24.45		