

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-17T12:18:12.300
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3382411544468426752
 2Mass ID (if available) : 06372672+2329244

Uranus 2034-12-17T12:18:12 K14.63 G16.79 PgtRgt

ICRS Star Coord at Epoch: 06h 37m 26.73423s +23:29:24.26218s

RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.633
 G magnitude : 16.786
 RP magnitude : 16.156
 BP magnitude : 17.231
 DUPflag : 0
 Distance (au) : 17.933
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.56
 Sun-Target sep (deg) : 166.56
 Sun-Moon sep (deg) : 118.31
 B (ring opening deg) : 67.63
 PA of pole (deg) : 72.18

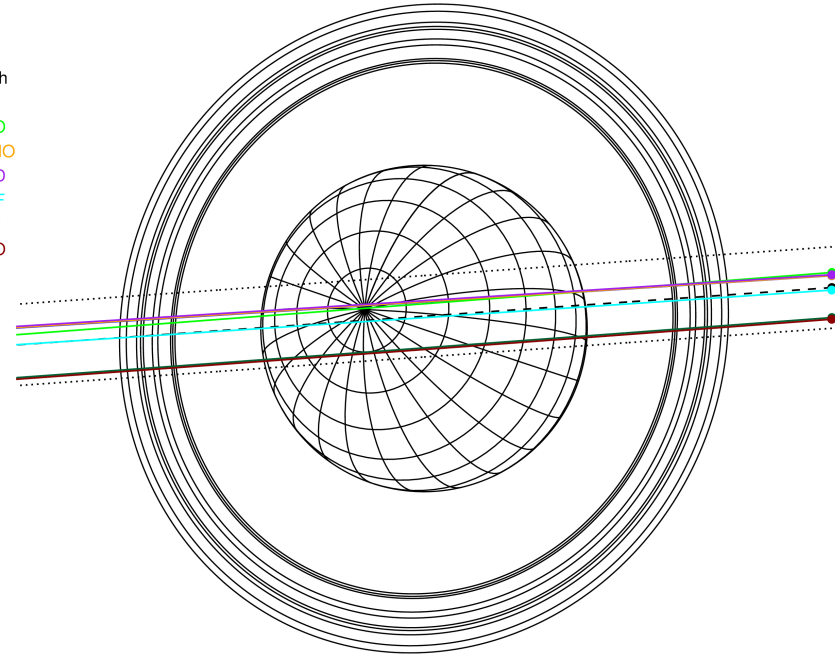
a(km) ring

- 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



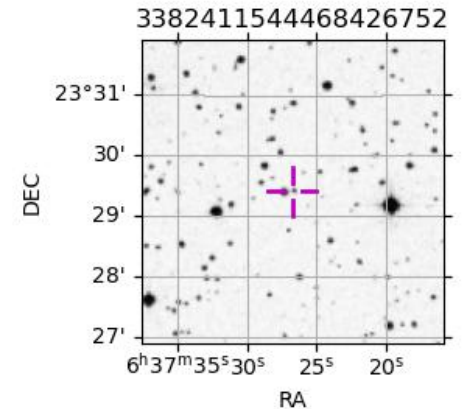
2034-12-17T12:18:12.3000 ra: 06 37 26.7342 s: +23 29 24.262 C/A 0.155° PA 184.04 deg v_sky -22.56 km/s D 17.93 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 AAT
 MSO

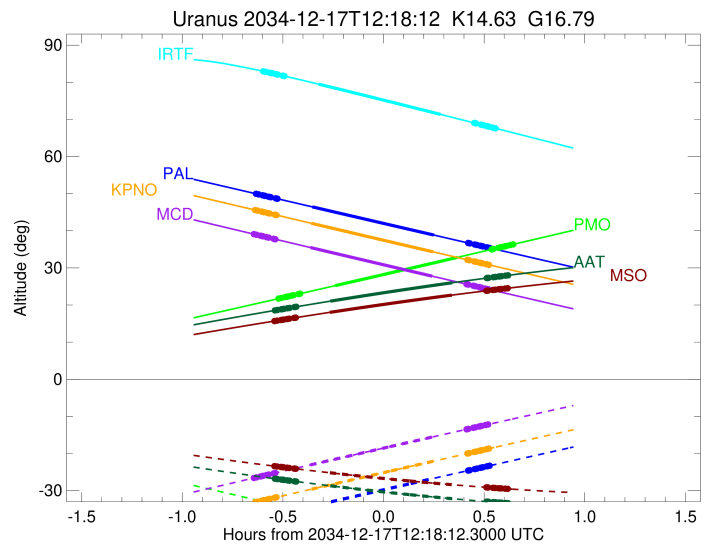
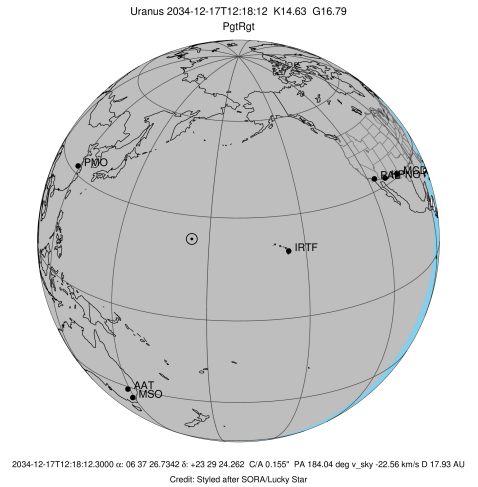


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	DEC 17 11:39 - DEC 17 12:49	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	DEC 17 11:46 - DEC 17 12:56	PieRie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	DEC 17 11:39 - DEC 17 12:49	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	DEC 17 11:39 - DEC 17 12:49	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	DEC 17 11:42 - DEC 17 12:51	PieRie
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	+++++	+ +	+++++	DEC 17 11:45 - DEC 17 12:55	PieRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+ +	+++++	DEC 17 11:45 - DEC 17 12:54	PieRie



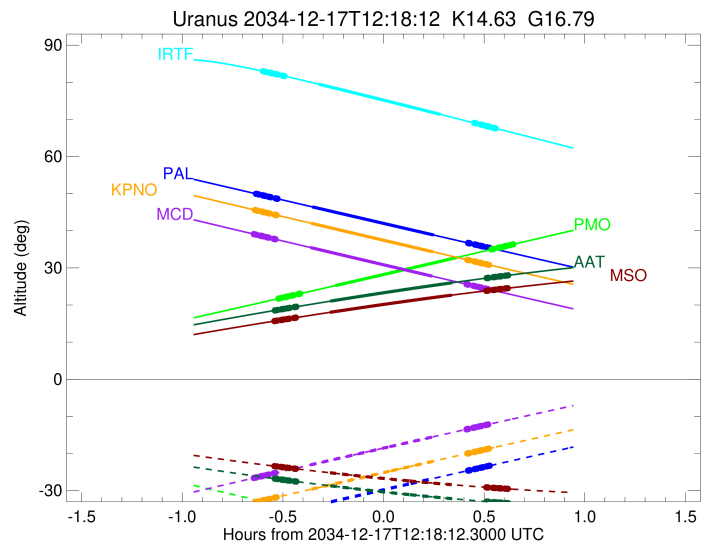
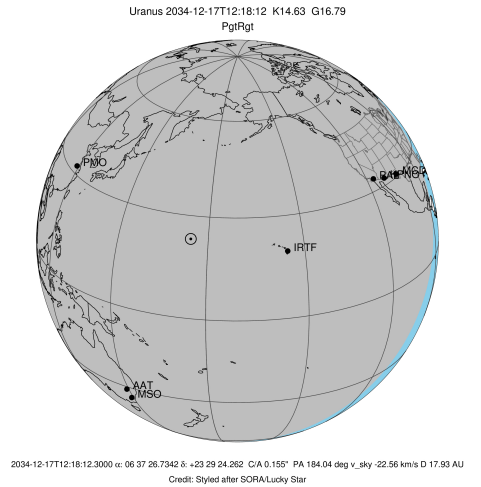
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-17T12:15:08.570
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3382411544468426752
 2Mass ID (if available) : 06372672+2329244
 ICRS Star Coord at Epoch: 06h 37m 26.73423s +23:29:24.26218s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.633
 G magnitude : 16.786
 RP magnitude : 16.156
 BP magnitude : 17.231
 DUPflag : 0
 Distance (au) : 17.933
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.56
 Sun-Target sep (deg) : 166.56
 Sun-Moon sep (deg) : 118.58
 B (ring opening deg) : 67.63
 PA of pole (deg) : 72.18
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.319
 C/A sky separation (km) : 4149.3
 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



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

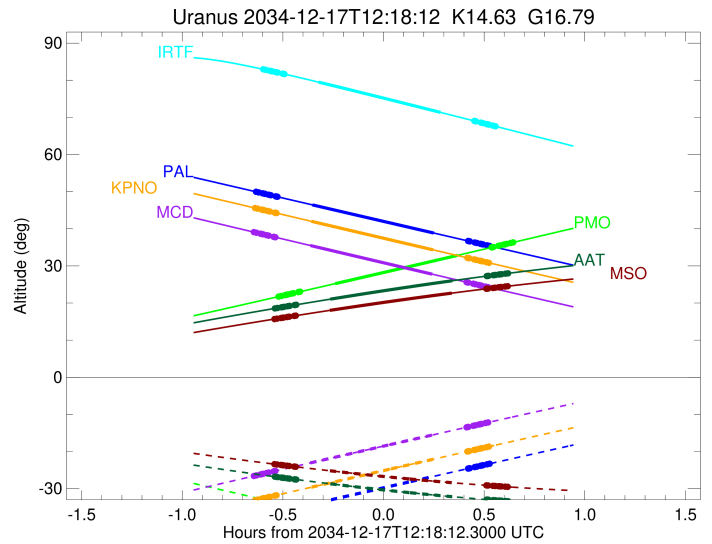
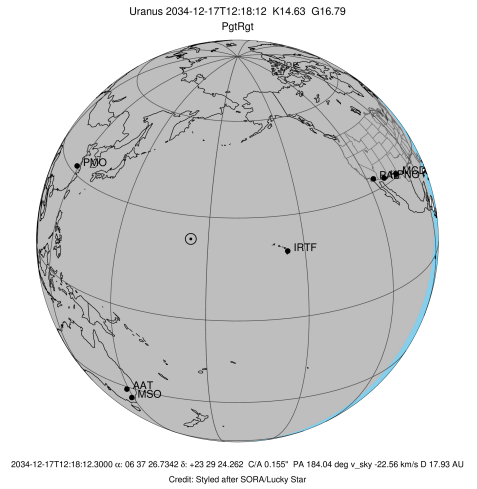
Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-17T11:39:56.104	50.02	-37.70	51554.46	-24.36		
lambda	I	2034-12-17T11:40:58.836	49.80	-37.49	50026.71	-24.35		
delta	I	2034-12-17T11:42:09.745	49.55	-37.24	48300.35	-24.34		
gamma	I	2034-12-17T11:42:37.649	49.45	-37.14	47621.15	-24.34		
eta	I	2034-12-17T11:42:55.935	49.39	-37.08	47176.12	-24.34		
beta	I	2034-12-17T11:43:57.722	49.17	-36.87	45672.42	-24.33		
alpha	I	2034-12-17T11:44:38.172	49.03	-36.73	44684.68	-24.32		
4	I	2034-12-17T11:46:03.639	48.73	-36.43	42601.90	-24.31		
5	I	2034-12-17T11:46:22.206	48.67	-36.36	42160.20	-24.31		
6	I	2034-12-17T11:46:33.668	48.63	-36.32	41876.89	-24.30		
Uranus	I	2034-12-17T11:56:58.780	46.44	-34.16	25188.40		-19.04	-19.88
Uranus	E	2034-12-17T12:33:14.657	38.84	-26.68	25079.61		21.86	22.79
6	E	2034-12-17T12:43:24.625	36.72	-24.60	41801.49	24.22		
5	E	2034-12-17T12:43:45.109	36.65	-24.53	42302.53	24.23		
4	E	2034-12-17T12:43:55.779	36.61	-24.50	42547.75	24.23		
alpha	E	2034-12-17T12:45:26.496	36.30	-24.19	44751.34	24.24		
beta	E	2034-12-17T12:46:03.559	36.17	-24.06	45653.12	24.24		
eta	E	2034-12-17T12:47:06.351	35.95	-23.85	47176.12	24.25		
gamma	E	2034-12-17T12:47:25.113	35.88	-23.79	47631.06	24.25		
delta	E	2034-12-17T12:47:52.712	35.79	-23.69	48300.35	24.25		
lambda	E	2034-12-17T12:49:03.890	35.54	-23.45	50026.71	24.26		
epsilon	E	2034-12-17T12:49:33.870	35.44	-23.35	50753.97	24.26		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-17T12:22:04.710
 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 : 3382411544468426752
 2Mass ID (if available) : 06372672+2329244
 ICRS Star Coord at Epoch: 06h 37m 26.73423s +23:29:24.26218s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.633
 G magnitude : 16.786
 RP magnitude : 16.156
 BP magnitude : 17.231
 DUPflag : 0
 Distance (au) : 17.933
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.56
 Sun-Target sep (deg) : 166.56
 Sun-Moon sep (deg) : 119.09
 B (ring opening deg) : 67.63
 PA of pole (deg) : 72.18
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.297
 C/A sky separation (km) : 3858.9
 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	2034-12-17T11:46:38.740		21.67	-33.84	51554.60	-24.16		
lambda	I	2034-12-17T11:47:41.974		21.89	-34.06	50026.71	-24.16		
delta	I	2034-12-17T11:48:53.431		22.14	-34.31	48300.35	-24.16		
gamma	I	2034-12-17T11:49:21.547		22.23	-34.41	47621.14	-24.16		
eta	I	2034-12-17T11:49:39.971		22.30	-34.47	47176.12	-24.15		
beta	I	2034-12-17T11:50:42.213		22.51	-34.69	45672.50	-24.15		
alpha	I	2034-12-17T11:51:22.961		22.65	-34.83	44684.67	-24.15		
4	I	2034-12-17T11:52:49.029		22.95	-35.14	42602.05	-24.14		
5	I	2034-12-17T11:53:07.733		23.01	-35.20	42160.08	-24.14		
6	I	2034-12-17T11:53:19.266		23.05	-35.24	41876.95	-24.14		
Uranus	I	2034-12-17T12:03:48.051		25.22	-37.45	25188.63		-19.04	-19.87
Uranus	E	2034-12-17T12:40:15.257		32.83	-45.16	25084.59		21.74	22.66
6	E	2034-12-17T12:50:25.649		34.98	-47.32	41801.08	24.24		
5	E	2034-12-17T12:50:46.169		35.05	-47.39	42303.30	24.24		
4	E	2034-12-17T12:50:56.758		35.09	-47.43	42547.05	24.24		
alpha	E	2034-12-17T12:52:27.448		35.40	-47.75	44751.49	24.26		
beta	E	2034-12-17T12:53:04.459		35.53	-47.88	45652.80	24.26		
eta	E	2034-12-17T12:54:07.210		35.75	-48.10	47176.12	24.27		
gamma	E	2034-12-17T12:54:25.955		35.82	-48.17	47631.09	24.27		
delta	E	2034-12-17T12:54:53.525		35.92	-48.27	48300.35	24.28		
lambda	E	2034-12-17T12:56:04.626		36.17	-48.52	50026.71	24.28		
epsilon	E	2034-12-17T12:56:34.510		36.27	-48.62	50752.48	24.29		

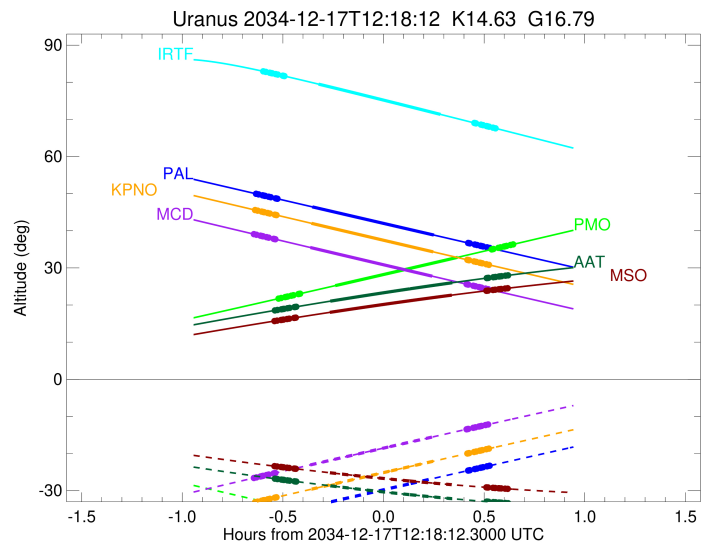
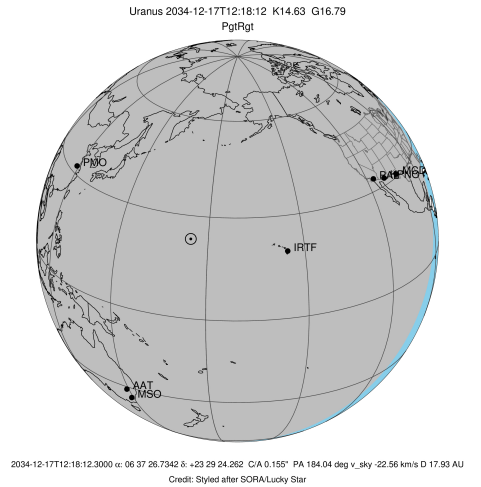
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-17T12:14:53.400
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 3382411544468426752
 2Mass ID (if available) : 06372672+2329244
 ICRS Star Coord at Epoch: 06h 37m 26.73423s +23:29:24.26218s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.633
 G magnitude : 16.786
 RP magnitude : 16.156
 BP magnitude : 17.231
 DUPflag : 0
 Distance (au) : 17.933
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.56
 Sun-Target sep (deg) : 166.56
 Sun-Moon sep (deg) : 118.50
 B (ring opening deg) : 67.63
 PA of pole (deg) : 72.18
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.323
 C/A sky separation (km) : 4197.4
 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_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	2034-12-17T11:39:38.746		45.64	-33.19	51554.48	-24.33		
lambda	I	2034-12-17T11:40:41.545		45.42	-32.97	50026.71	-24.32		
delta	I	2034-12-17T11:41:52.529		45.17	-32.72	48300.35	-24.32		
gamma	I	2034-12-17T11:42:20.464		45.07	-32.62	47621.15	-24.31		
eta	I	2034-12-17T11:42:38.769		45.00	-32.56	47176.12	-24.31		
beta	I	2034-12-17T11:43:40.623		44.78	-32.34	45672.43	-24.30		
alpha	I	2034-12-17T11:44:21.117		44.64	-32.20	44684.68	-24.29		
4	I	2034-12-17T11:45:46.678		44.34	-31.90	42601.93	-24.28		
5	I	2034-12-17T11:46:05.268		44.27	-31.84	42160.18	-24.28		
6	I	2034-12-17T11:46:16.741		44.23	-31.80	41876.90	-24.28		
Uranus	I	2034-12-17T11:56:42.702		42.01	-29.61	25189.08		-19.03	-19.86
Uranus	E	2034-12-17T12:33:00.429		34.32	-22.09	25079.16		21.87	22.80
6	E	2034-12-17T12:43:11.225		32.18	-20.00	41801.53	24.19		
5	E	2034-12-17T12:43:31.734		32.11	-19.94	42302.46	24.19		
4	E	2034-12-17T12:43:42.424		32.07	-19.90	42547.81	24.19		
alpha	E	2034-12-17T12:45:13.266		31.75	-19.59	44751.33	24.20		
beta	E	2034-12-17T12:45:50.383		31.62	-19.46	45653.14	24.21		
eta	E	2034-12-17T12:46:53.261		31.40	-19.25	47176.12	24.21		
gamma	E	2034-12-17T12:47:12.048		31.34	-19.19	47631.05	24.22		
delta	E	2034-12-17T12:47:39.686		31.24	-19.09	48300.35	24.22		
lambda	E	2034-12-17T12:48:50.963		30.99	-18.85	50026.71	24.22		
epsilon	E	2034-12-17T12:49:20.990		30.89	-18.75	50754.08	24.23		

```

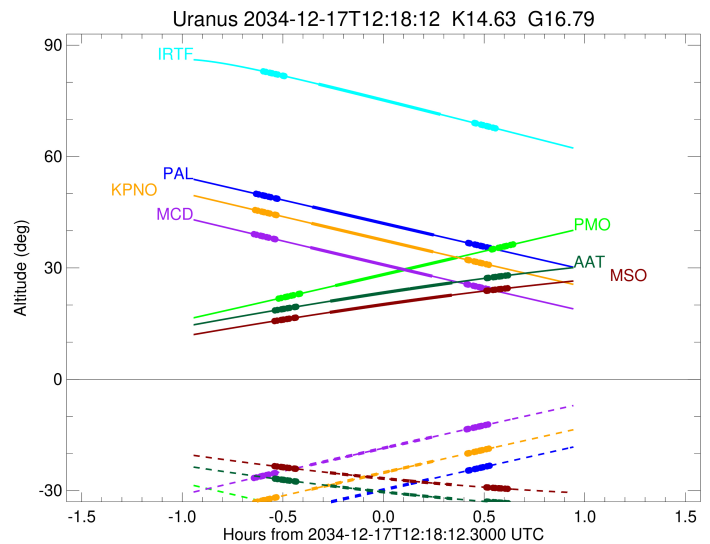
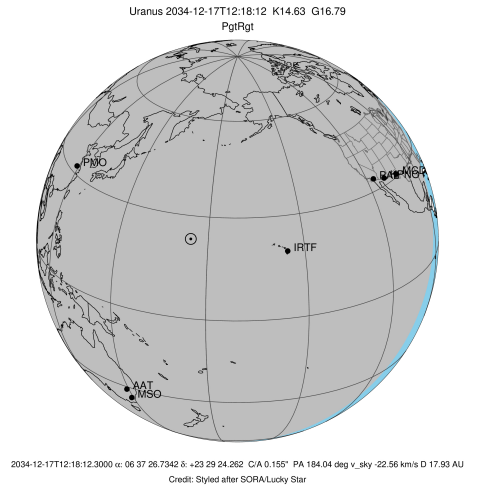
target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2034-12-17T12:14:36.060
Event type           : PgtRgt
: Ring occs: geocentric, topocentric
Observer code        : MCD
Location             : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 3382411544468426752
2Mass ID (if available) : 06372672+2329244
ICRS Star Coord at Epoch: 06h 37m 26.73423s +23:29:24.26218s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 14.633
G magnitude           : 16.786
RP magnitude          : 16.156
BP magnitude          : 17.231
DUPflag              : 0
Distance (au)         : 17.933
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -22.56
Sun-Target sep (deg) : 166.56
Sun-Moon sep (deg)   : 118.40
B (ring opening deg) : 67.63
PA of pole (deg)     : 72.18
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.335
C/A sky separation (km) : 4351.8
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.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	2034-12-17T11:39:17.754		39.15	-26.65	51554.54	-24.28		
lambda	I	2034-12-17T11:40:20.679		38.93	-26.43	50026.71	-24.28		
delta	I	2034-12-17T11:41:31.806		38.67	-26.18	48300.35	-24.27		
gamma	I	2034-12-17T11:41:59.797		38.57	-26.08	47621.14	-24.26		
eta	I	2034-12-17T11:42:18.139		38.51	-26.02	47176.12	-24.26		
beta	I	2034-12-17T11:43:20.118		38.29	-25.80	45672.48	-24.25		
alpha	I	2034-12-17T11:44:00.698		38.14	-25.66	44684.67	-24.24		
4	I	2034-12-17T11:45:26.434		37.84	-25.36	42602.04	-24.23		
5	I	2034-12-17T11:45:45.070		37.77	-25.30	42160.08	-24.23		
6	I	2034-12-17T11:45:56.561		37.73	-25.26	41876.95	-24.22		
Uranus	I	2034-12-17T11:56:24.349		35.49	-23.07	25191.61		-18.96	-19.79
Uranus	E	2034-12-17T12:32:44.034		27.77	-15.56	25077.89		21.90	22.83
6	E	2034-12-17T12:42:56.300		25.62	-13.48	41801.62	24.13		
5	E	2034-12-17T12:43:16.849		25.55	-13.42	42302.29	24.13		
4	E	2034-12-17T12:43:27.583		25.51	-13.38	42547.96	24.13		
alpha	E	2034-12-17T12:44:58.638		25.19	-13.07	44751.30	24.14		
beta	E	2034-12-17T12:45:35.850		25.06	-12.95	45653.21	24.15		
eta	E	2034-12-17T12:46:38.877		24.84	-12.73	47176.12	24.16		
gamma	E	2034-12-17T12:46:57.709		24.78	-12.67	47631.04	24.16		
delta	E	2034-12-17T12:47:25.413		24.68	-12.58	48300.35	24.16		
lambda	E	2034-12-17T12:48:36.861		24.43	-12.33	50026.71	24.17		
epsilon	E	2034-12-17T12:49:06.972		24.32	-12.23	50754.39	24.17		

```

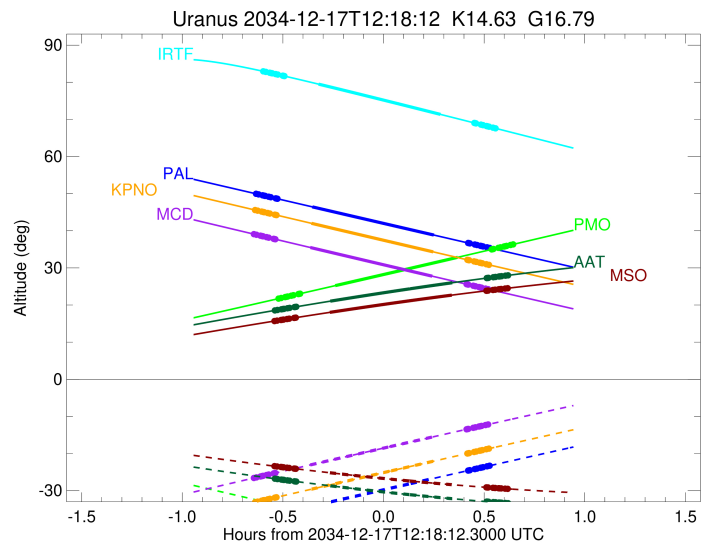
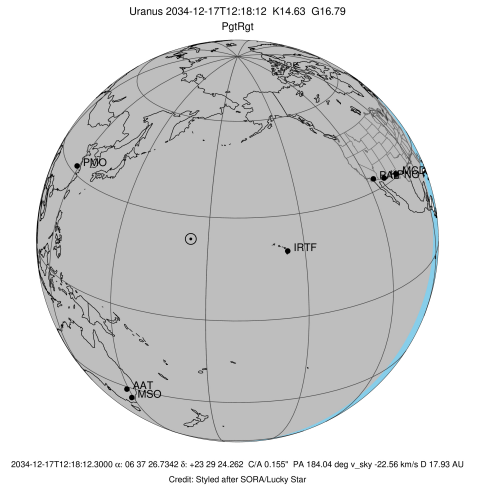
target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2034-12-17T12:17:01.770
Event type            : PgtRgt
: Ring occs: geocentric, topocentric
Observer code         : IRTF
Location              : Mauna Kea/IRTF
Latitude (deg)        : 19.82622
E. Longitude (deg)    : 204.52800
Altitude (km)         : 4.168
Gaia source ID        : 3382411544468426752
2Mass ID (if available) : 06372672+2329244
ICRS Star Coord at Epoch: 06h 37m 26.73423s +23:29:24.26218s
RUWE (>1.4 is poor)  : 1.05
K magnitude           : 14.633
G magnitude           : 16.786
RP magnitude          : 16.156
BP magnitude          : 17.231
DUPflag              : 0
Distance (au)         : 17.933
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -22.56
Sun-Target sep (deg)  : 166.56
Sun-Moon sep (deg)    : 119.00
B (ring opening deg)  : 67.63
PA of pole (deg)      : 72.18
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.130
C/A sky separation (km) : 1691.6
NAIF SPICE kernels    : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.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	2034-12-17T11:42:05.123		83.01	-70.12	51552.85	-24.60		
lambda	I	2034-12-17T11:43:07.176		82.80	-69.88	50026.71	-24.59		
delta	I	2034-12-17T11:44:17.375		82.57	-69.62	48300.35	-24.59		
gamma	I	2034-12-17T11:44:44.992		82.48	-69.51	47621.22	-24.59		
eta	I	2034-12-17T11:45:03.092		82.42	-69.44	47176.12	-24.59		
beta	I	2034-12-17T11:46:04.265		82.21	-69.21	45671.55	-24.59		
alpha	I	2034-12-17T11:46:44.244		82.07	-69.06	44684.85	-24.58		
4	I	2034-12-17T11:48:08.847		81.78	-68.74	42600.00	-24.58		
5	I	2034-12-17T11:48:27.102		81.72	-68.67	42161.94	-24.58		
6	I	2034-12-17T11:48:38.540		81.68	-68.62	41875.95	-24.58		
Uranus	I	2034-12-17T11:58:50.063		79.51	-66.29	25149.41		-20.09	-20.96
Uranus	E	2034-12-17T12:35:11.907		71.35	-57.96	25104.11		21.25	22.16
6	E	2034-12-17T12:45:15.297		69.06	-55.65	41800.14	24.56		
5	E	2034-12-17T12:45:35.661		68.98	-55.57	42305.06	24.56		
4	E	2034-12-17T12:45:45.947		68.94	-55.53	42545.44	24.55		
alpha	E	2034-12-17T12:47:15.583		68.60	-55.19	44751.78	24.56		
beta	E	2034-12-17T12:47:52.097		68.46	-55.05	45652.09	24.56		
eta	E	2034-12-17T12:48:54.129		68.22	-54.81	47176.12	24.56		
gamma	E	2034-12-17T12:49:12.657		68.15	-54.74	47631.18	24.56		
delta	E	2034-12-17T12:49:39.902		68.05	-54.64	48300.35	24.56		
lambda	E	2034-12-17T12:50:50.188		67.78	-54.37	50026.71	24.56		
epsilon	E	2034-12-17T12:51:19.628		67.67	-54.26	50749.82	24.56		

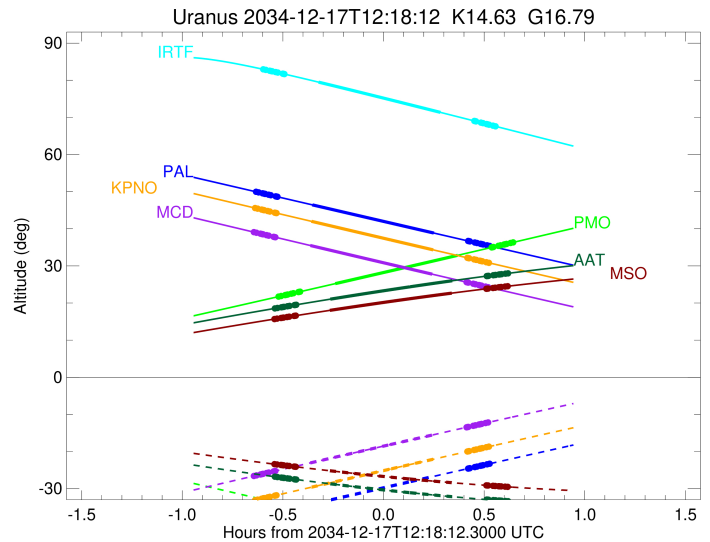
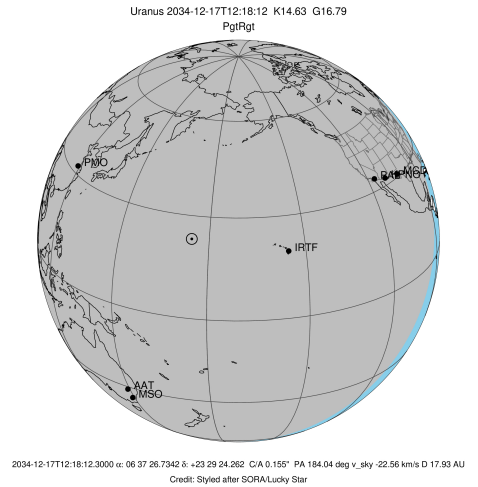
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2034-12-17T12:20:29.870
Event type          : PgtRgt
: 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      : 3382411544468426752
2Mass ID (if available) : 06372672+2329244
ICRS Star Coord at Epoch: 06h 37m 26.73423s +23:29:24.26218s
RUWE (>1.4 is poor) : 1.05
K magnitude         : 14.633
G magnitude         : 16.786
RP magnitude        : 16.156
BP magnitude        : 17.231
DUPflag            : 0
Distance (au)       : 17.933
f0 (km)            : 0.000
g0 (km)            : 0.000
skyplane vel. (km/s) : -22.56
Sun-Target sep (deg) : 166.56
Sun-Moon sep (deg)  : 118.86
B (ring opening deg) : 67.63
PA of pole (deg)    : 72.18
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.233
C/A sky separation (km) : 3030.4
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.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	2034-12-17T11:45:33.663		18.51	-26.76	51547.46	-24.38		
lambda	I	2034-12-17T11:46:36.028		18.67	-26.88	50026.71	-24.38		
delta	I	2034-12-17T11:47:46.830		18.85	-27.02	48300.35	-24.38		
gamma	I	2034-12-17T11:48:14.677		18.92	-27.08	47621.40	-24.38		
eta	I	2034-12-17T11:48:32.941		18.97	-27.12	47176.12	-24.38		
beta	I	2034-12-17T11:49:34.707		19.13	-27.24	45669.81	-24.38		
alpha	I	2034-12-17T11:50:14.949		19.23	-27.32	44685.41	-24.37		
4	I	2034-12-17T11:51:40.460		19.45	-27.49	42596.13	-24.36		
5	I	2034-12-17T11:51:58.635		19.49	-27.52	42165.88	-24.37		
6	I	2034-12-17T11:52:10.421		19.52	-27.54	41873.84	-24.37		
Uranus	I	2034-12-17T12:02:20.492		21.04	-28.70	25091.83		-21.56	-22.48
Uranus	E	2034-12-17T12:38:41.840		26.00	-32.17	25173.22		19.46	20.30
6	E	2034-12-17T12:48:57.459		27.25	-32.95	41797.92	24.44		
5	E	2034-12-17T12:49:18.183		27.29	-32.98	42309.22	24.44		
4	E	2034-12-17T12:49:28.081		27.31	-32.99	42541.22	24.44		
alpha	E	2034-12-17T12:50:58.332		27.49	-33.09	44752.31	24.45		
beta	E	2034-12-17T12:51:34.894		27.56	-33.13	45650.16	24.45		
eta	E	2034-12-17T12:52:37.272		27.68	-33.21	47176.12	24.46		
gamma	E	2034-12-17T12:52:55.883		27.72	-33.23	47631.36	24.46		
delta	E	2034-12-17T12:53:23.229		27.77	-33.26	48300.35	24.46		
lambda	E	2034-12-17T12:54:33.789		27.91	-33.34	50026.71	24.47		
epsilon	E	2034-12-17T12:55:03.131		27.96	-33.37	50744.71	24.47		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-12-17T12:20:22.330
 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 : 3382411544468426752
 2Mass ID (if available) : 06372672+2329244
 ICRS Star Coord at Epoch: 06h 37m 26.73423s +23:29:24.26218s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 14.633
 G magnitude : 16.786
 RP magnitude : 16.156
 BP magnitude : 17.231
 DUPflag : 0
 Distance (au) : 17.933
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.56
 Sun-Target sep (deg) : 166.56
 Sun-Moon sep (deg) : 118.81
 B (ring opening deg) : 67.63
 PA of pole (deg) : 72.18
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.253
 C/A sky separation (km) : 3284.4
 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	2034-12-17T11:45:26.121		15.64	-23.38	51547.04	-24.36		
lambda	I	2034-12-17T11:46:28.523		15.79	-23.49	50026.71	-24.36		
delta	I	2034-12-17T11:47:39.389		15.97	-23.63	48300.35	-24.36		
gamma	I	2034-12-17T11:48:07.261		16.03	-23.68	47621.41	-24.36		
eta	I	2034-12-17T11:48:25.543		16.08	-23.71	47176.12	-24.36		
beta	I	2034-12-17T11:49:27.371		16.23	-23.83	45669.70	-24.35		
alpha	I	2034-12-17T11:50:07.646		16.32	-23.90	44685.46	-24.35		
4	I	2034-12-17T11:51:33.253		16.53	-24.06	42595.90	-24.34		
5	I	2034-12-17T11:51:51.431		16.57	-24.09	42166.13	-24.35		
6	I	2034-12-17T11:52:03.246		16.60	-24.11	41873.70	-24.34		
Uranus	I	2034-12-17T12:02:13.800		18.02	-25.18	25089.32		-21.62	-22.54
Uranus	E	2034-12-17T12:38:33.798		22.66	-28.40	25177.42		19.34	20.19
6	E	2034-12-17T12:48:50.809		23.83	-29.12	41797.82	24.41		
5	E	2034-12-17T12:49:11.568		23.87	-29.14	42309.40	24.42		
4	E	2034-12-17T12:49:21.458		23.89	-29.15	42541.02	24.41		
alpha	E	2034-12-17T12:50:51.819		24.05	-29.25	44752.33	24.42		
beta	E	2034-12-17T12:51:28.416		24.12	-29.29	45650.06	24.43		
eta	E	2034-12-17T12:52:30.865		24.23	-29.35	47176.12	24.43		
gamma	E	2034-12-17T12:52:49.496		24.27	-29.37	47631.37	24.44		
delta	E	2034-12-17T12:53:16.871		24.32	-29.40	48300.35	24.44		
lambda	E	2034-12-17T12:54:27.504		24.44	-29.47	50026.71	24.44		
epsilon	E	2034-12-17T12:54:56.869		24.49	-29.50	50744.56	24.45		