

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-17T10:26:44.710  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3382411544468425856  
 2Mass ID (if available) : 06372751+2329225

Uranus 2034-12-17T10:26:44 K12.89 G14.51 PgtRgt

ICRS Star Coord at Epoch: 06h 37m 27.56852s +23:29:22.13192s

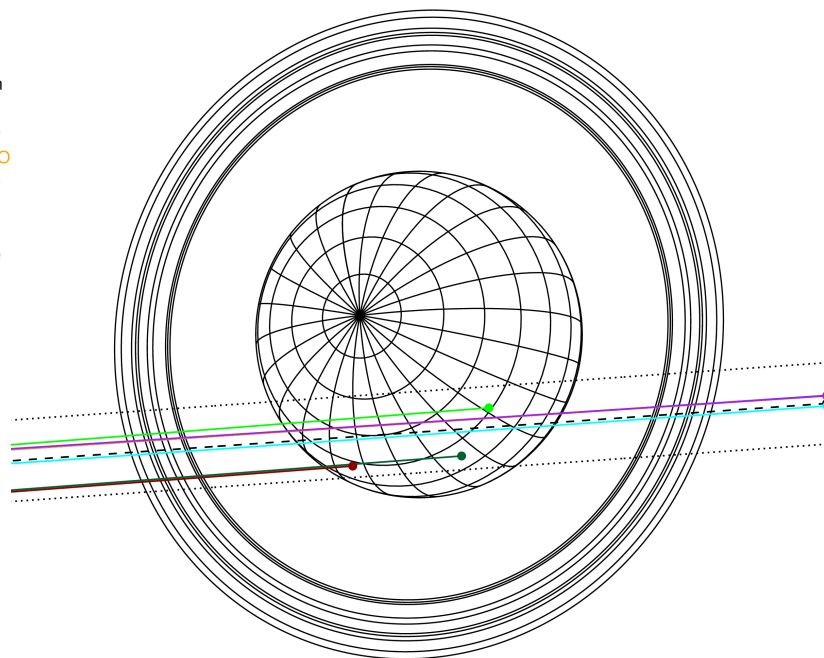
RUWE (>1.4 is poor) : 1.03  
 K magnitude : 12.892  
 G magnitude : 14.510  
 RP magnitude : 13.963  
 BP magnitude : 14.886  
 DUPflag : 0  
 Distance (au) : 17.933  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.55  
 Sun-Target sep (deg) : 166.47  
 Sun-Moon sep (deg) : 119.32  
 B (ring opening deg) : 67.63  
 PA of pole (deg) : 72.18

Uranus 2034-12-17T10:26:44 K12.89 G14.51  
 PgtRgt



2034-12-17T10:26:44.7100 α: 06 37 27.5685 δ: +23 29 22.132 C/A 1.165° PA 4.02 deg v\_sky -22.55 km/s D 17.93 AU  
 Credit: Styled after SORA/Lucky Star

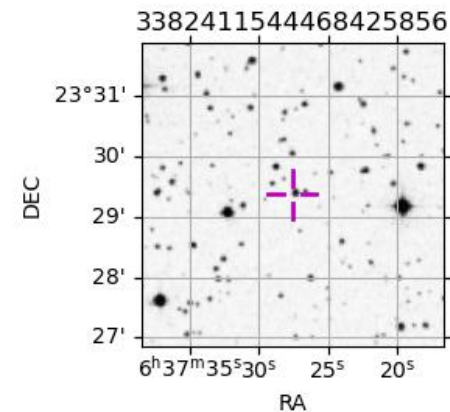
Earth  
 PAL  
 PMO  
 KPNO  
 MCD  
 IRTF  
 AAT  
 MSO



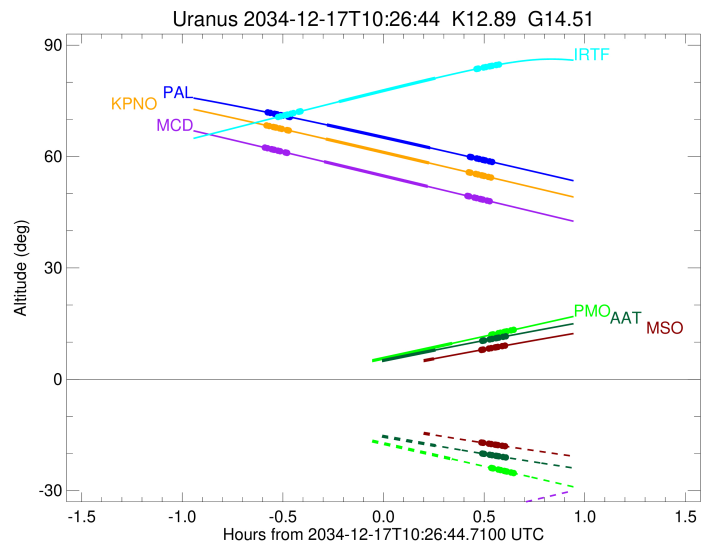
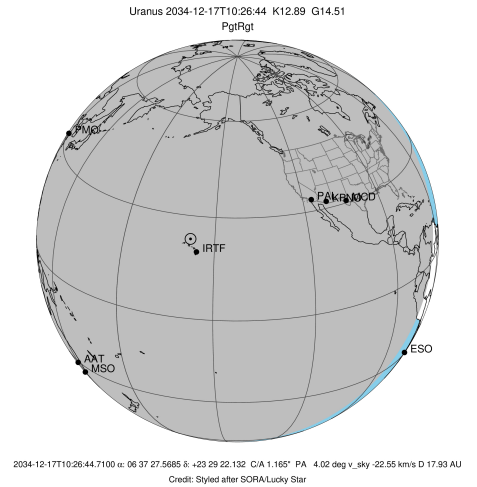
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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	+++++	+ +	+++++	DEC 17 09:51 - DEC 17 10:58	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8		+	+++++	DEC 17 10:47 - DEC 17 11:05	PneRne
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	DEC 17 09:51 - DEC 17 10:58	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	DEC 17 09:51 - DEC 17 10:58	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	DEC 17 09:55 - DEC 17 11:00	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 10:42 - DEC 17 11:02	PneRne
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0		+	+++++	DEC 17 10:41 - DEC 17 11:02	PneRne

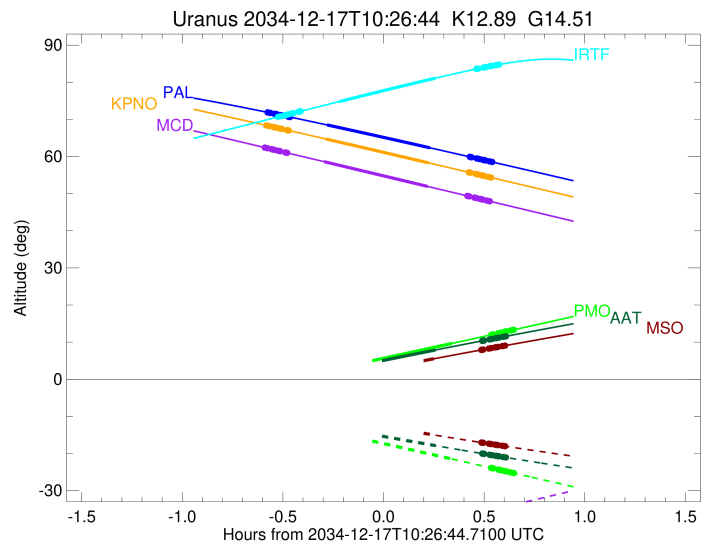
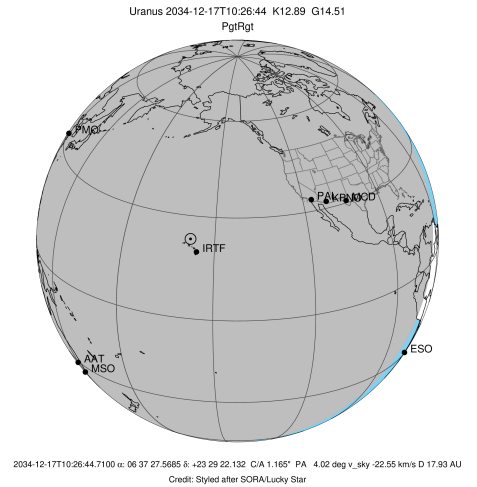


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-17T10:25:09.240  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PAL  
 Location : Palomar Mt (200")  
 Latitude (deg) : 33.35622  
 E. Longitude (deg) : 243.13601  
 Altitude (km) : 1.706  
 Gaia source ID : 3382411544468425856  
 2Mass ID (if available) : 06372751+2329225  
 ICRS Star Coord at Epoch: 06h 37m 27.56852s +23:29:22.13192s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 12.892  
 G magnitude : 14.510  
 RP magnitude : 13.963  
 BP magnitude : 14.886  
 DUPflag : 0  
 Distance (au) : 17.933  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.55  
 Sun-Target sep (deg) : 166.47  
 Sun-Moon sep (deg) : 119.89  
 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 (") : 1.061  
 C/A sky separation (km) : 13800.2  
 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\_itrff93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



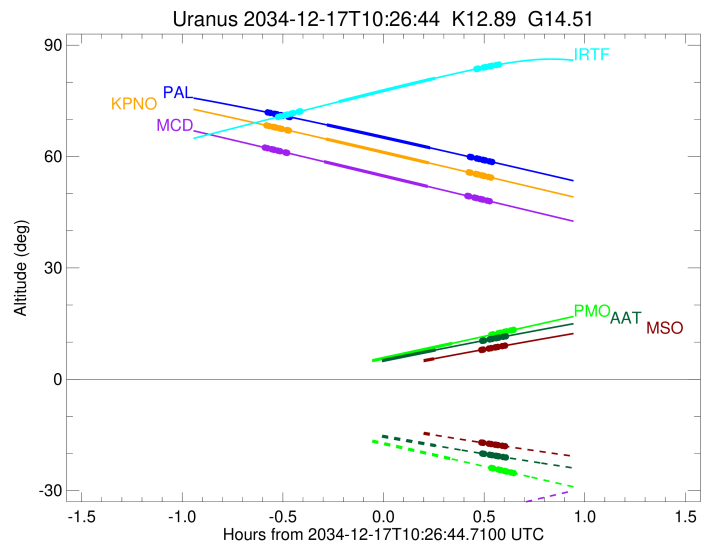
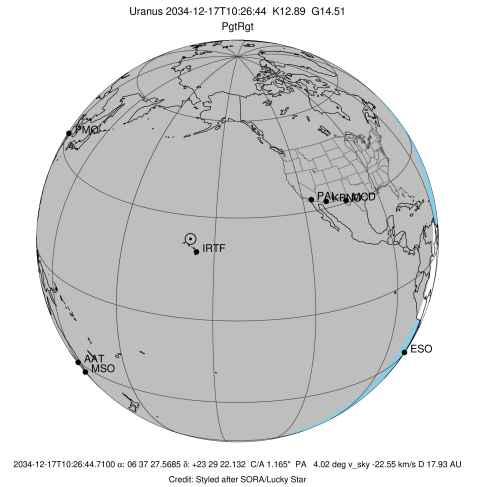
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-17T09:51:57.949		71.94	-60.20	51520.30	-23.59		
lambda	I	2034-12-17T09:53:01.284		71.74	-59.98	50026.71	-23.55		
delta	I	2034-12-17T09:54:14.692		71.51	-59.73	48300.35	-23.48		
gamma	I	2034-12-17T09:54:43.601		71.42	-59.63	47622.04	-23.45		
eta	I	2034-12-17T09:55:02.626		71.36	-59.57	47176.12	-23.43		
beta	I	2034-12-17T09:56:07.188		71.16	-59.34	45665.10	-23.35		
alpha	I	2034-12-17T09:56:48.965		71.03	-59.20	44688.29	-23.30		
4	I	2034-12-17T09:58:19.248		70.75	-58.89	42585.33	-23.15		
5	I	2034-12-17T09:58:37.515		70.69	-58.83	42179.06	-23.15		
6	I	2034-12-17T09:58:50.834		70.65	-58.78	41866.75	-23.11		
Uranus	I	2034-12-17T10:09:54.766		68.51	-56.49	25078.97		-21.88	-22.81
Uranus	E	2034-12-17T10:40:40.222		62.34	-50.08	25387.20		12.76	13.35
6	E	2034-12-17T10:52:27.299		59.92	-47.62	41795.08	23.08		
5	E	2034-12-17T10:52:49.610		59.84	-47.54	42314.58	23.12		
4	E	2034-12-17T10:52:59.298		59.81	-47.51	42533.54	23.12		
alpha	E	2034-12-17T10:54:34.779		59.48	-47.18	44751.99	23.26		
beta	E	2034-12-17T10:55:13.025		59.35	-47.04	45646.49	23.31		
eta	E	2034-12-17T10:56:18.536		59.12	-46.82	47176.12	23.39		
gamma	E	2034-12-17T10:56:38.002		59.05	-46.75	47631.57	23.41		
delta	E	2034-12-17T10:57:06.554		58.96	-46.65	48300.35	23.44		
lambda	E	2034-12-17T10:58:20.096		58.70	-46.39	50026.71	23.51		
epsilon	E	2034-12-17T10:58:50.723		58.60	-46.28	50747.17	23.54		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-17T10:30:49.210  
 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 : 3382411544468425856  
 2Mass ID (if available) : 06372751+2329225  
 ICRS Star Coord at Epoch: 06h 37m 27.56852s +23:29:22.13192s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 12.892  
 G magnitude : 14.510  
 RP magnitude : 13.963  
 BP magnitude : 14.886  
 DUPflag : 0  
 Distance (au) : 17.933  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.55  
 Sun-Target sep (deg) : 166.47  
 Sun-Moon sep (deg) : 119.81  
 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 (") : 0.946  
 C/A sky separation (km) : 12299.2  
 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	2034-12-17T09:56:39.993	-0.10x	-11.28	51526.70	-23.29			
lambda	I	2034-12-17T09:57:44.395	0.11x	-11.49	50026.71	-23.27			
delta	I	2034-12-17T09:58:58.670	0.34x	-11.74	48300.35	-23.22			
gamma	I	2034-12-17T09:59:27.908	0.43x	-11.84	47621.91	-23.19			
eta	I	2034-12-17T09:59:47.136	0.49x	-11.90	47176.12	-23.18			
beta	I	2034-12-17T10:00:52.335	0.70x	-12.12	45665.98	-23.12			
alpha	I	2034-12-17T10:01:34.575	0.83x	-12.26	44687.62	-23.08			
4	I	2034-12-17T10:03:05.529	1.12x	-12.56	42587.35	-22.97			
5	I	2034-12-17T10:03:24.121	1.18x	-12.62	42176.39	-22.97			
6	I	2034-12-17T10:03:37.356	1.22x	-12.67	41868.18	-22.94			
Uranus	I	2034-12-17T10:14:38.496	3.32x	-14.87	25066.25	-22.19		-23.13	
Uranus	E	2034-12-17T10:47:13.577	9.67	-21.50	25359.52	13.78		14.41	
6	E	2034-12-17T10:58:51.341	11.98	-23.89	41795.24	23.04			
5	E	2034-12-17T10:59:13.664	12.05	-23.96	42314.27	23.08			
4	E	2034-12-17T10:59:23.435	12.09	-24.00	42534.23	23.08			
alpha	E	2034-12-17T11:00:59.124	12.41	-24.33	44752.11	23.19			
beta	E	2034-12-17T11:01:37.501	12.53	-24.46	45646.82	23.23			
eta	E	2034-12-17T11:02:43.240	12.75	-24.68	47176.12	23.29			
gamma	E	2034-12-17T11:03:02.785	12.82	-24.75	47631.56	23.31			
delta	E	2034-12-17T11:03:31.459	12.91	-24.85	48300.35	23.34			
lambda	E	2034-12-17T11:04:45.345	13.16	-25.11	50026.71	23.39			
epsilon	E	2034-12-17T11:05:16.083	13.26	-25.21	50746.17	23.42			

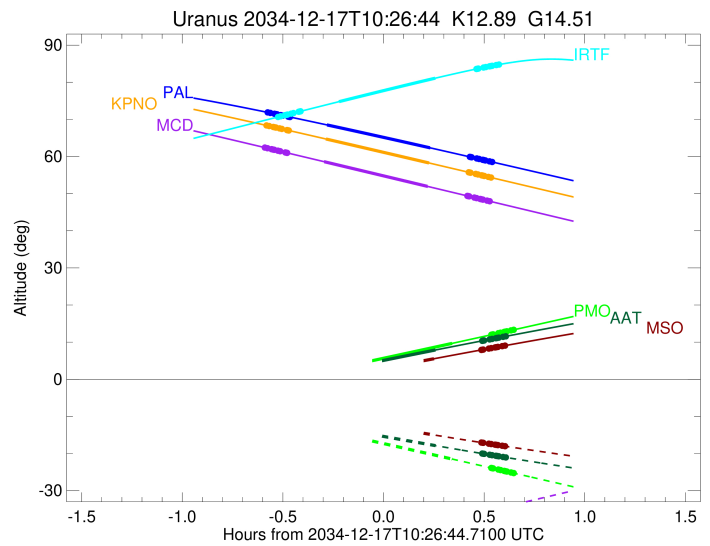
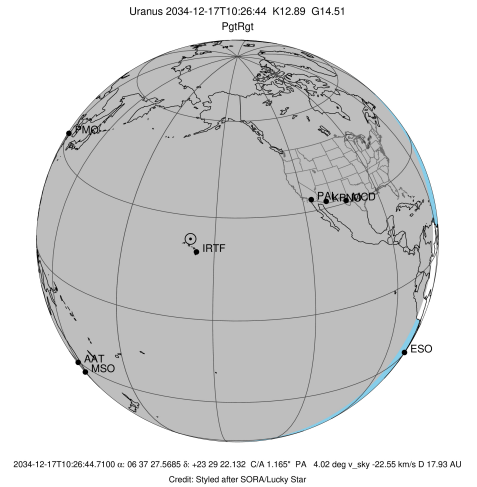
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-17T10:24:48.730  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : KPNO  
 Location : Kitt Peak Natl Obs  
 Latitude (deg) : 31.96333  
 E. Longitude (deg) : 248.40000  
 Altitude (km) : 2.120  
 Gaia source ID : 3382411544468425856  
 2Mass ID (if available) : 06372751+2329225  
 ICRS Star Coord at Epoch: 06h 37m 27.56852s +23:29:22.13192s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 12.892  
 G magnitude : 14.510  
 RP magnitude : 13.963  
 BP magnitude : 14.886  
 DUPflag : 0  
 Distance (au) : 17.933  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.55  
 Sun-Target sep (deg) : 166.47  
 Sun-Moon sep (deg) : 119.83  
 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 (") : 1.063  
 C/A sky separation (km) : 13822.5  
 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



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	2034-12-17T09:51:36.921		68.43	-56.06	51520.14	-23.58		
lambda	I	2034-12-17T09:52:40.275		68.21	-55.84	50026.71	-23.54		
delta	I	2034-12-17T09:53:53.716		67.96	-55.58	48300.35	-23.47		
gamma	I	2034-12-17T09:54:22.637		67.87	-55.48	47622.04	-23.44		
eta	I	2034-12-17T09:54:41.671		67.80	-55.41	47176.12	-23.42		
beta	I	2034-12-17T09:55:46.264		67.58	-55.18	45665.09	-23.34		
alpha	I	2034-12-17T09:56:28.060		67.44	-55.03	44688.31	-23.29		
4	I	2034-12-17T09:57:58.391		67.13	-54.72	42585.29	-23.14		
5	I	2034-12-17T09:58:16.663		67.07	-54.65	42179.13	-23.14		
6	I	2034-12-17T09:58:29.994		67.02	-54.60	41866.71	-23.10		
Uranus	I	2034-12-17T10:09:34.438		64.73	-52.26	25079.29		-21.87	-22.80
Uranus	E	2034-12-17T10:40:19.631		58.26	-45.72	25387.44		12.75	13.34
6	E	2034-12-17T10:52:07.450		55.76	-43.22	41795.08	23.06		
5	E	2034-12-17T10:52:29.781		55.68	-43.14	42314.58	23.10		
4	E	2034-12-17T10:52:39.477		55.65	-43.11	42533.54	23.10		
alpha	E	2034-12-17T10:54:15.041		55.31	-42.77	44751.99	23.24		
beta	E	2034-12-17T10:54:53.320		55.17	-42.63	45646.49	23.29		
eta	E	2034-12-17T10:55:58.887		54.94	-42.40	47176.12	23.37		
gamma	E	2034-12-17T10:56:18.369		54.87	-42.33	47631.57	23.39		
delta	E	2034-12-17T10:56:46.946		54.77	-42.23	48300.35	23.42		
lambda	E	2034-12-17T10:58:00.550		54.51	-41.97	50026.71	23.49		
epsilon	E	2034-12-17T10:58:31.203		54.40	-41.87	50747.17	23.52		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-17T10:24:21.510  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : 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 : 3382411544468425856  
 2Mass ID (if available) : 06372751+2329225  
 ICRS Star Coord at Epoch: 06h 37m 27.56852s +23:29:22.13192s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 12.892  
 G magnitude : 14.510  
 RP magnitude : 13.963  
 BP magnitude : 14.886  
 DUPflag : 0  
 Distance (au) : 17.933  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.55  
 Sun-Target sep (deg) : 166.47  
 Sun-Moon sep (deg) : 119.74  
 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 (") : 1.057  
 C/A sky separation (km) : 13752.5  
 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\_itrff93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk

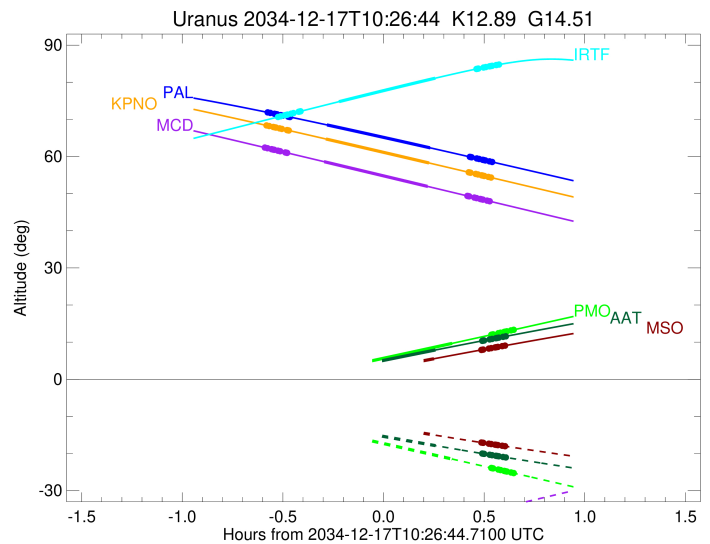
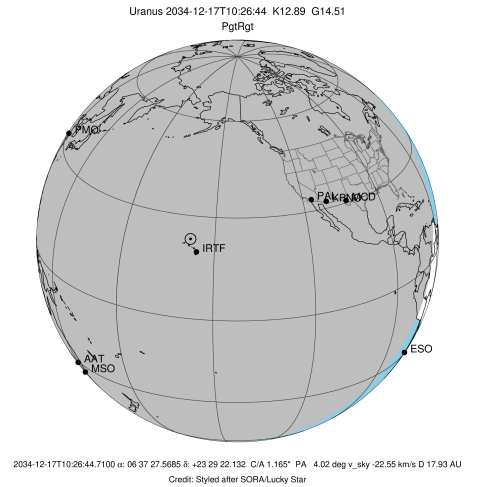


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-17T09:51:06.787		62.46	-49.73	51520.26	-23.57		
lambda	I	2034-12-17T09:52:10.171		62.24	-49.50	50026.71	-23.53		
delta	I	2034-12-17T09:53:23.639		61.98	-49.24	48300.35	-23.46		
gamma	I	2034-12-17T09:53:52.570		61.87	-49.14	47622.04	-23.43		
eta	I	2034-12-17T09:54:11.611		61.80	-49.07	47176.12	-23.41		
beta	I	2034-12-17T09:55:16.223		61.57	-48.84	45665.10	-23.33		
alpha	I	2034-12-17T09:55:58.033		61.42	-48.69	44688.29	-23.28		
4	I	2034-12-17T09:57:28.386		61.10	-48.36	42585.33	-23.14		
5	I	2034-12-17T09:57:46.667		61.04	-48.30	42179.06	-23.13		
6	I	2034-12-17T09:57:59.996		60.99	-48.25	41866.75	-23.09		
Uranus	I	2034-12-17T10:09:04.255		58.61	-45.87	25078.78		-21.88	-22.81
Uranus	E	2034-12-17T10:39:55.408		51.95	-39.25	25385.56		12.82	13.41
6	E	2034-12-17T10:51:43.043		49.40	-36.73	41795.09	23.04		
5	E	2034-12-17T10:52:05.387		49.32	-36.65	42314.55	23.08		
4	E	2034-12-17T10:52:15.096		49.29	-36.62	42533.60	23.08		
alpha	E	2034-12-17T10:53:50.730		48.94	-36.28	44752.00	23.22		
beta	E	2034-12-17T10:54:29.041		48.80	-36.14	45646.52	23.27		
eta	E	2034-12-17T10:55:34.662		48.57	-35.91	47176.12	23.35		
gamma	E	2034-12-17T10:55:54.162		48.50	-35.84	47631.57	23.37		
delta	E	2034-12-17T10:56:22.764		48.40	-35.74	48300.35	23.40		
lambda	E	2034-12-17T10:57:36.437		48.13	-35.47	50026.71	23.47		
epsilon	E	2034-12-17T10:58:07.114		48.02	-35.36	50747.06	23.50		



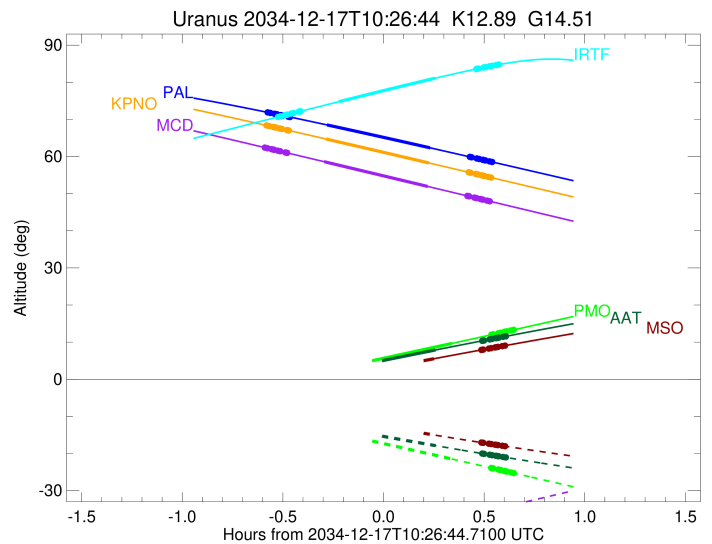
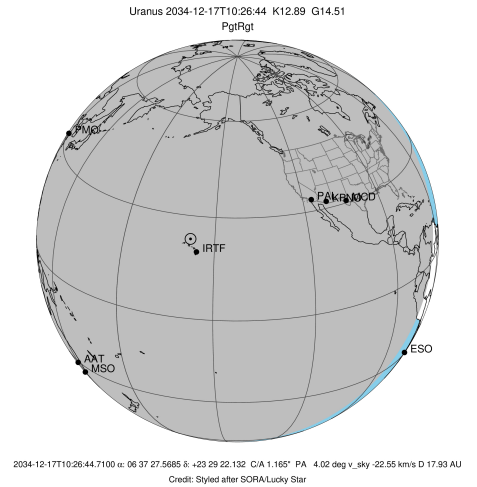
```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2034-12-17T10:27:40.000
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        : 3382411544468425856
2Mass ID (if available) : 06372751+2329225
ICRS Star Coord at Epoch: 06h 37m 27.56852s +23:29:22.13192s
RUWE (>1.4 is poor)  : 1.03
K magnitude           : 12.892
G magnitude           : 14.510
RP magnitude          : 13.963
BP magnitude          : 14.886
DUPflag              : 0
Distance (au)         : 17.933
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -22.55
Sun-Target sep (deg)  : 166.47
Sun-Moon sep (deg)    : 120.21
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 (") : 1.208
C/A sky separation (km) : 15709.1
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
    
```



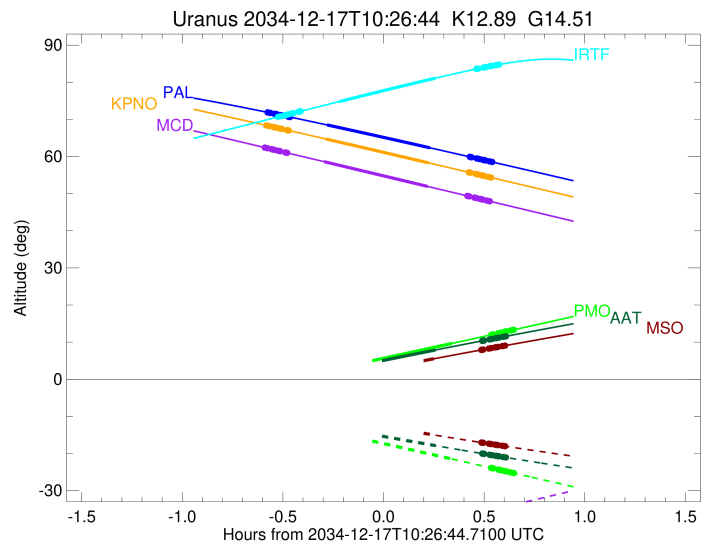
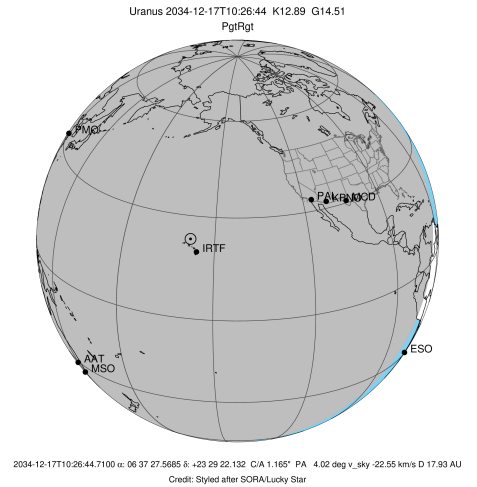
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-17T09:55:02.410		70.60	-83.55	51514.24	-23.35		
lambda	I	2034-12-17T09:56:06.151		70.84	-83.75	50026.71	-23.30		
delta	I	2034-12-17T09:57:20.393		71.12	-83.98	48300.35	-23.20		
gamma	I	2034-12-17T09:57:49.644		71.23	-84.07	47622.17	-23.17		
eta	I	2034-12-17T09:58:08.911		71.31	-84.13	47176.12	-23.14		
beta	I	2034-12-17T09:59:14.348		71.55	-84.32	45664.30	-23.03		
alpha	I	2034-12-17T09:59:56.653		71.71	-84.45	44688.96	-22.97		
4	I	2034-12-17T10:01:28.426		72.06	-84.71	42583.40	-22.78		
5	I	2034-12-17T10:01:46.811		72.13	-84.76	42181.70	-22.78		
6	I	2034-12-17T10:02:00.538		72.18	-84.80	41865.33	-22.73		
Uranus	I	2034-12-17T10:13:27.904		74.78	-86.20	25099.79		-21.36	-22.28
Uranus	E	2034-12-17T10:42:10.277		81.11	-83.29	25431.06		10.97	11.48
6	E	2034-12-17T10:54:25.950		83.58	-80.76	41794.86	22.75		
5	E	2034-12-17T10:54:48.611		83.65	-80.68	42315.01	22.80		
4	E	2034-12-17T10:54:58.315		83.68	-80.65	42532.28	22.81		
alpha	E	2034-12-17T10:56:35.035		83.98	-80.30	44751.67	23.00		
beta	E	2034-12-17T10:57:13.691		84.10	-80.16	45645.84	23.06		
eta	E	2034-12-17T10:58:19.893		84.29	-79.93	47176.12	23.17		
gamma	E	2034-12-17T10:58:39.541		84.35	-79.86	47631.58	23.20		
delta	E	2034-12-17T10:59:08.348		84.44	-79.75	48300.35	23.24		
lambda	E	2034-12-17T11:00:22.491		84.64	-79.48	50026.71	23.33		
epsilon	E	2034-12-17T11:00:53.463		84.73	-79.37	50749.90	23.38		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-17T10:30:09.340  
 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 : 3382411544468425856  
 2Mass ID (if available) : 06372751+2329225  
 ICRS Star Coord at Epoch: 06h 37m 27.56852s +23:29:22.13192s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 12.892  
 G magnitude : 14.510  
 RP magnitude : 13.963  
 BP magnitude : 14.886  
 DUPflag : 0  
 Distance (au) : 17.933  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.55  
 Sun-Target sep (deg) : 166.47  
 Sun-Moon sep (deg) : 119.73  
 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 (") : 1.498  
 C/A sky separation (km) : 19478.4  
 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	2034-12-17T09:58:14.432	-0.25x	-10.58	51499.99	-22.36			
lambda	I	2034-12-17T09:59:20.361	-0.04x	-10.78	50026.71	-22.29			
delta	I	2034-12-17T10:00:38.069	0.21x	-11.00	48300.35	-22.14			
gamma	I	2034-12-17T10:01:08.729	0.30x	-11.09	47622.45	-22.08			
eta	I	2034-12-17T10:01:28.965	0.37x	-11.15	47176.12	-22.04			
beta	I	2034-12-17T10:02:37.840	0.58x	-11.34	45662.59	-21.87			
alpha	I	2034-12-17T10:03:22.299	0.72x	-11.47	44690.53	-21.77			
4	I	2034-12-17T10:04:59.623	1.03x	-11.75	42579.26	-21.49			
5	I	2034-12-17T10:05:18.691	1.09x	-11.80	42187.60	-21.47			
6	I	2034-12-17T10:05:33.708	1.14x	-11.85	41862.15	-21.39			
Uranus	I	2034-12-17T10:18:27.235	3.55x	-14.02	25170.19	-19.54		-20.39	
Uranus	E	2034-12-17T10:42:14.203	7.89	-17.87	25509.69	6.77		7.09	
6	E	2034-12-17T10:56:08.423	10.34	-20.00	41794.77	21.47			
5	E	2034-12-17T10:56:32.452	10.41	-20.06	42315.22	21.55			
4	E	2034-12-17T10:56:42.525	10.44	-20.09	42530.08	21.57			
alpha	E	2034-12-17T10:58:24.612	10.74	-20.34	44750.82	21.86			
beta	E	2034-12-17T10:59:05.228	10.86	-20.44	45644.66	21.97			
eta	E	2034-12-17T11:00:14.684	11.06	-20.62	47176.12	22.13			
gamma	E	2034-12-17T11:00:35.241	11.11	-20.67	47631.56	22.18			
delta	E	2034-12-17T11:01:05.355	11.20	-20.74	48300.35	22.24			
lambda	E	2034-12-17T11:02:22.708	11.42	-20.93	50026.71	22.39			
epsilon	E	2034-12-17T11:02:55.296	11.52	-21.01	50757.45	22.47			

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-17T10:29:58.620  
 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 : 3382411544468425856  
 2Mass ID (if available) : 06372751+2329225  
 ICRS Star Coord at Epoch: 06h 37m 27.56852s +23:29:22.13192s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 12.892  
 G magnitude : 14.510  
 RP magnitude : 13.963  
 BP magnitude : 14.886  
 DUPflag : 0  
 Distance (au) : 17.933  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.55  
 Sun-Target sep (deg) : 166.47  
 Sun-Moon sep (deg) : 119.68  
 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 (") : 1.520  
 C/A sky separation (km) : 19763.1  
 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	2034-12-17T09:58:08.785	-2.17x	-8.16	51498.68	-22.30			
lambda	I	2034-12-17T09:59:14.844	-1.97x	-8.34	50026.71	-22.22			
delta	I	2034-12-17T10:00:32.790	-1.73x	-8.56	48300.35	-22.07			
gamma	I	2034-12-17T10:01:03.548	-1.64x	-8.64	47622.48	-22.01			
eta	I	2034-12-17T10:01:23.852	-1.58x	-8.70	47176.12	-21.96			
beta	I	2034-12-17T10:02:32.974	-1.37x	-8.88	45662.44	-21.80			
alpha	I	2034-12-17T10:03:17.586	-1.24x	-9.01	44690.67	-21.69			
4	I	2034-12-17T10:04:55.328	-0.94x	-9.27	42578.91	-21.40			
5	I	2034-12-17T10:05:14.440	-0.89x	-9.32	42188.11	-21.37			
6	I	2034-12-17T10:05:29.562	-0.84x	-9.36	41861.87	-21.30			
Uranus	I	2034-12-17T10:18:31.363	1.49x	-11.45	25177.69			-19.34	-20.18
Uranus	E	2034-12-17T10:41:49.017	5.53	-15.01	25514.69			6.42	6.72
6	E	2034-12-17T10:55:52.552	7.90	-17.04	41794.78	21.37			
5	E	2034-12-17T10:56:16.692	7.96	-17.09	42315.20	21.45			
4	E	2034-12-17T10:56:26.798	7.99	-17.12	42529.94	21.47			
alpha	E	2034-12-17T10:58:09.321	8.27	-17.36	44750.74	21.78			
beta	E	2034-12-17T10:58:50.095	8.38	-17.45	45644.58	21.88			
eta	E	2034-12-17T10:59:59.811	8.58	-17.62	47176.12	22.05			
gamma	E	2034-12-17T11:00:20.440	8.63	-17.66	47631.56	22.10			
delta	E	2034-12-17T11:00:50.657	8.71	-17.73	48300.35	22.17			
lambda	E	2034-12-17T11:02:08.263	8.93	-17.91	50026.71	22.32			
epsilon	E	2034-12-17T11:02:40.980	9.02	-17.99	50758.07	22.40			