

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2038-01-09T17:55:24.720  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 865599294997189376  
 2Mass ID (if available) : 07341411+2210382

ICRS Star Coord at Epoch: 07h 34m 14.06717s +22:10:37.99175s

RUWE (>1.4 is poor) : 0.93  
 K magnitude : 12.805  
 G magnitude : 14.298  
 RP magnitude : 13.795  
 BP magnitude : 14.638  
 DUPflag : 0  
 Distance (au) : 17.722  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.27  
 Sun-Target sep (deg) : 177.27  
 Sun-Moon sep (deg) : 133.87  
 B (ring opening deg) : 55.04  
 PA of pole (deg) : 84.85

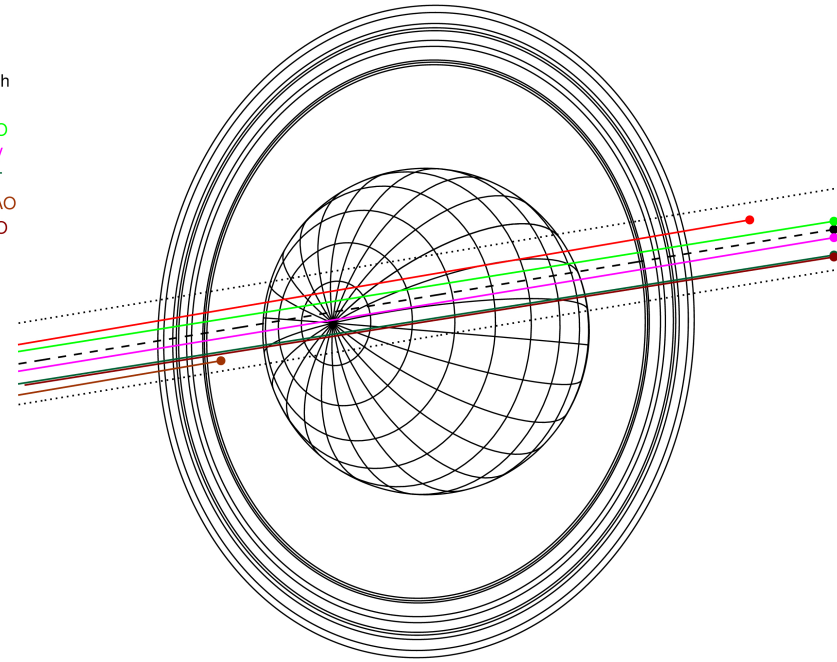
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2038-01-09T17:55:24.7200 α: 07 34 14.0672 δ: +22 10 37.992 C/A 0.427° PA 189.36 deg v\_sky -23.27 km/s D 17.72 AU  
 Credit: Styled after SORA/Lucky Star

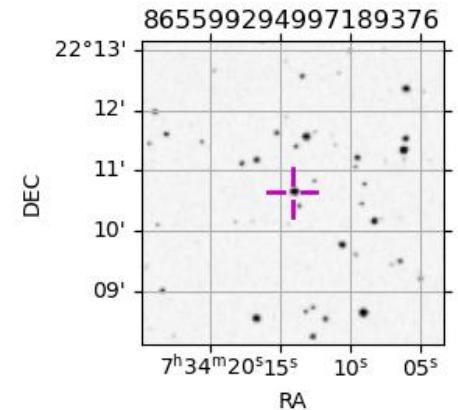
Uranus 2038-01-09T17:55:24 K12.80 G14.30 PgtRgt

Earth  
 PIC  
 PMO  
 KAV  
 AAT  
 SAAO  
 MSO

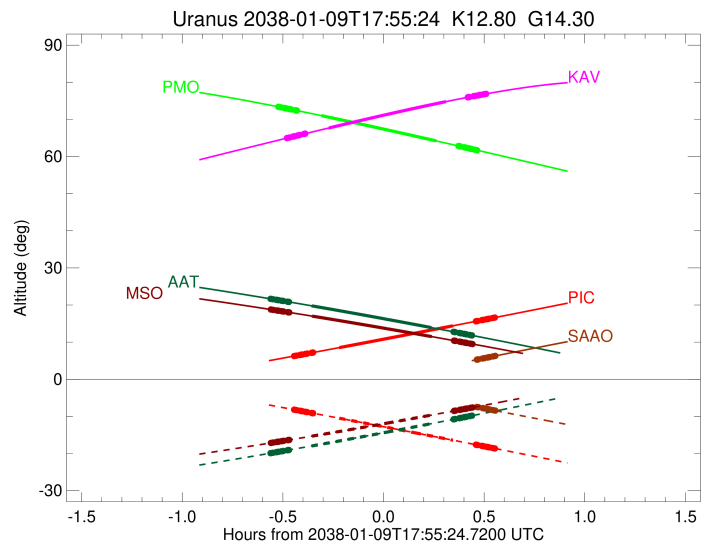
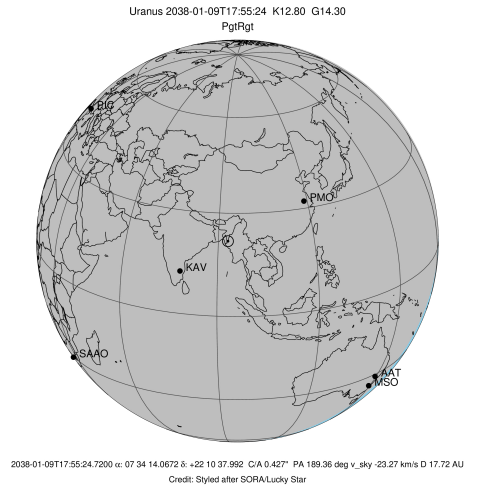


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	JAN 09 17:28 - JAN 09 18:28	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	JAN 09 17:24 - JAN 09 18:23	PieRie
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
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					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	JAN 09 17:26 - JAN 09 18:26	PieRie
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	+++++	+ +	+++++	JAN 09 17:21 - JAN 09 18:21	PieRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8				JAN 09 18:23 - JAN 09 18:28	PnnRne
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+ +	+++++	JAN 09 17:21 - JAN 09 18:21	PieRie

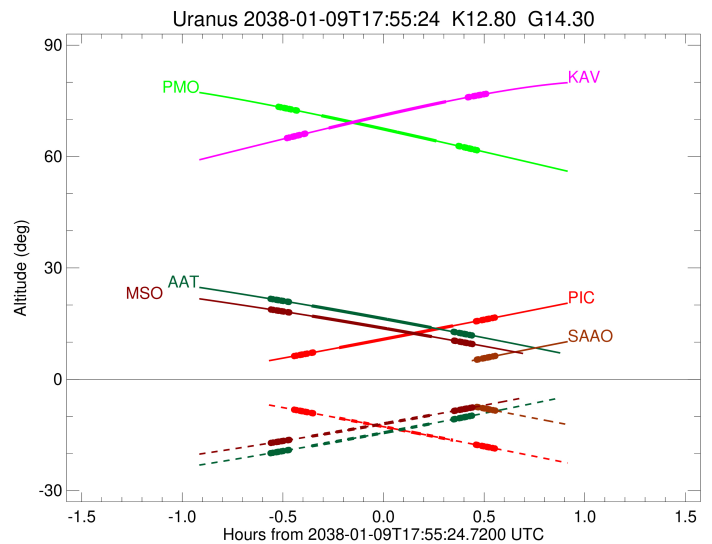
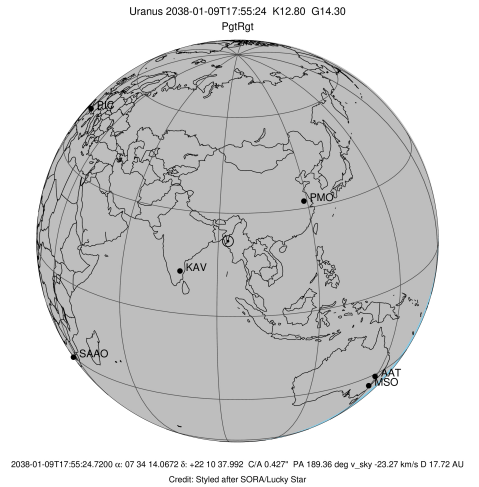


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2038-01-09T17:59:14.110  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 865599294997189376  
 2Mass ID (if available) : 07341411+2210382  
 ICRS Star Coord at Epoch: 07h 34m 14.06717s +22:10:37.99175s  
 RUWE (>1.4 is poor) : 0.93  
 K magnitude : 12.805  
 G magnitude : 14.298  
 RP magnitude : 13.795  
 BP magnitude : 14.638  
 DUPflag : 0  
 Distance (au) : 17.722  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.27  
 Sun-Target sep (deg) : 177.27  
 Sun-Moon sep (deg) : 134.48  
 B (ring opening deg) : 55.04  
 PA of pole (deg) : 84.85  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.676  
 C/A sky separation (km) : 8694.5  
 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\_itrfr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



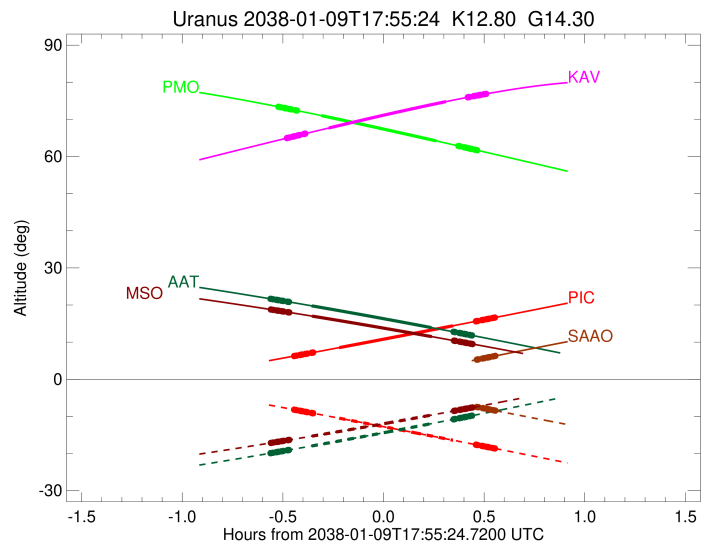
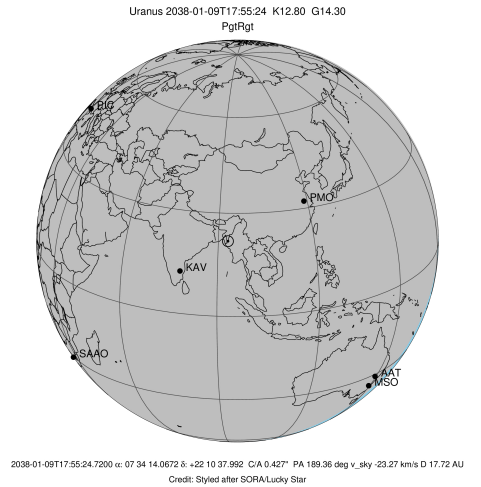
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-01-09T17:28:45.730		6.25	-8.19	51187.88	-27.63		
lambda	I	2038-01-09T17:29:27.826		6.37	-8.31	50026.71	-27.57		
delta	I	2038-01-09T17:30:30.468		6.54	-8.49	48300.35	-27.54		
gamma	I	2038-01-09T17:30:54.757		6.61	-8.56	47631.49	-27.53		
eta	I	2038-01-09T17:31:11.301		6.66	-8.60	47176.12	-27.52		
beta	I	2038-01-09T17:32:07.168		6.82	-8.76	45641.97	-27.49		
alpha	I	2038-01-09T17:32:41.001		6.91	-8.86	44710.72	-27.47		
4	I	2038-01-09T17:33:57.854		7.13	-9.08	42587.67	-27.41		
5	I	2038-01-09T17:34:08.638		7.16	-9.11	42280.55	-27.38		
6	I	2038-01-09T17:34:27.551		7.21	-9.16	41807.57	-27.40		
Uranus	I	2038-01-09T17:42:12.403		8.52	-10.49	25293.49		-28.02	-29.13
Uranus	E	2038-01-09T18:16:09.061		14.41	-16.42	25170.26		34.78	36.03
6	E	2038-01-09T18:22:58.187		15.61	-17.63	41851.65	27.48		
5	E	2038-01-09T18:23:11.083		15.65	-17.67	42166.38	27.46		
4	E	2038-01-09T18:23:25.448		15.69	-17.71	42573.29	27.49		
alpha	E	2038-01-09T18:24:43.356		15.92	-17.94	44738.45	27.56		
beta	E	2038-01-09T18:25:17.598		16.03	-18.04	45681.16	27.58		
eta	E	2038-01-09T18:26:11.863		16.19	-18.21	47176.12	27.62		
gamma	E	2038-01-09T18:26:27.970		16.23	-18.25	47621.06	27.63		
delta	E	2038-01-09T18:26:52.551		16.31	-18.33	48300.35	27.64		
lambda	E	2038-01-09T18:27:54.964		16.49	-18.51	50026.71	27.68		
epsilon	E	2038-01-09T18:28:38.935		16.62	-18.64	51244.21	27.74		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2038-01-09T17:54:03.980  
 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 : 865599294997189376  
 2Mass ID (if available) : 07341411+2210382  
 ICRS Star Coord at Epoch: 07h 34m 14.06717s +22:10:37.99175s  
 RUWE (>1.4 is poor) : 0.93  
 K magnitude : 12.805  
 G magnitude : 14.298  
 RP magnitude : 13.795  
 BP magnitude : 14.638  
 DUPflag : 0  
 Distance (au) : 17.722  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.27  
 Sun-Target sep (deg) : 177.27  
 Sun-Moon sep (deg) : 134.27  
 B (ring opening deg) : 55.04  
 PA of pole (deg) : 84.85  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.540  
 C/A sky separation (km) : 6943.0  
 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	2038-01-09T17:24:05.245		73.39	-71.16	51170.18	-28.30		
lambda	I	2038-01-09T17:24:45.701		73.27	-71.03	50026.71	-28.26		
delta	I	2038-01-09T17:25:46.818		73.09	-70.84	48300.35	-28.24		
gamma	I	2038-01-09T17:26:10.508		73.02	-70.76	47631.53	-28.23		
eta	I	2038-01-09T17:26:26.644		72.97	-70.71	47176.12	-28.22		
beta	I	2038-01-09T17:27:21.130		72.80	-70.54	45641.70	-28.20		
alpha	I	2038-01-09T17:27:54.167		72.70	-70.43	44709.11	-28.19		
4	I	2038-01-09T17:29:09.029		72.47	-70.20	42585.49	-28.14		
5	I	2038-01-09T17:29:19.326		72.44	-70.16	42283.89	-28.11		
6	I	2038-01-09T17:29:37.814		72.38	-70.10	41809.19	-28.14		
Uranus	I	2038-01-09T17:36:55.691		71.01	-68.68	25264.30		-29.69	-30.84
Uranus	E	2038-01-09T18:11:08.554		64.21	-61.76	25167.26		34.94	36.19
6	E	2038-01-09T18:17:46.048		62.85	-60.39	41853.02	28.09		
5	E	2038-01-09T18:17:58.704		62.80	-60.34	42167.84	28.07		
4	E	2038-01-09T18:18:12.649		62.75	-60.30	42571.76	28.10		
alpha	E	2038-01-09T18:19:28.950		62.49	-60.03	44737.58	28.14		
beta	E	2038-01-09T18:20:02.517		62.37	-59.92	45681.20	28.15		
eta	E	2038-01-09T18:20:55.695		62.19	-59.73	47176.12	28.17		
gamma	E	2038-01-09T18:21:11.485		62.14	-59.68	47621.03	28.18		
delta	E	2038-01-09T18:21:35.588		62.05	-59.59	48300.35	28.19		
lambda	E	2038-01-09T18:22:36.810		61.84	-59.38	50026.71	28.21		
epsilon	E	2038-01-09T18:23:19.592		61.69	-59.23	51233.81	28.25		

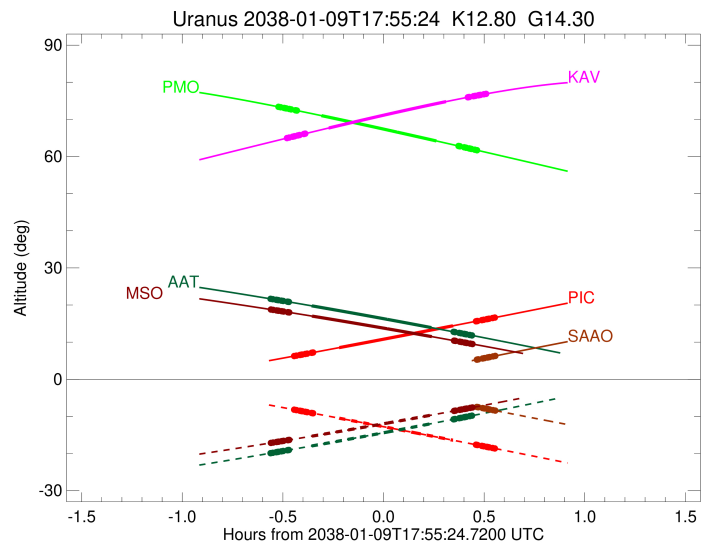
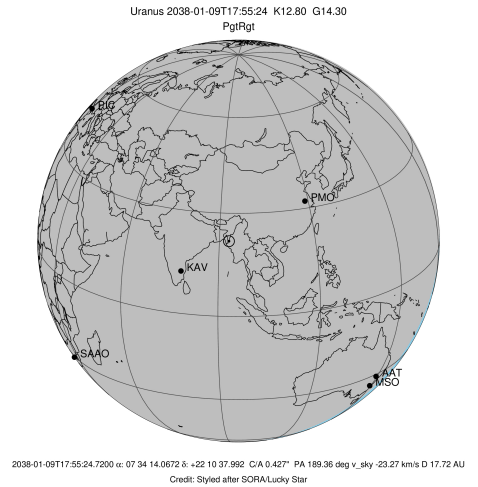
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2038-01-09T17:56:33.770  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : KAV  
 Location : Kavalur Observatory  
 Latitude (deg) : 12.57556  
 E. Longitude (deg) : 78.83167  
 Altitude (km) : 0.722  
 Gaia source ID : 865599294997189376  
 2Mass ID (if available) : 07341411+2210382  
 ICRS Star Coord at Epoch: 07h 34m 14.06717s +22:10:37.99175s  
 RUWE (>1.4 is poor) : 0.93  
 K magnitude : 12.805  
 G magnitude : 14.298  
 RP magnitude : 13.795  
 BP magnitude : 14.638  
 DUPflag : 0  
 Distance (au) : 17.722  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.27  
 Sun-Target sep (deg) : 177.27  
 Sun-Moon sep (deg) : 134.66  
 B (ring opening deg) : 55.04  
 PA of pole (deg) : 84.85  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.321  
 C/A sky separation (km) : 4124.6  
 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	2038-01-09T17:26:38.763		64.97	-67.58	51148.87	-28.51		
lambda	I	2038-01-09T17:27:18.145		65.12	-67.72	50026.71	-28.49		
delta	I	2038-01-09T17:28:18.743		65.34	-67.94	48300.35	-28.48		
gamma	I	2038-01-09T17:28:42.223		65.42	-68.02	47631.56	-28.48		
eta	I	2038-01-09T17:28:58.214		65.48	-68.08	47176.12	-28.48		
beta	I	2038-01-09T17:29:52.201		65.68	-68.27	45641.44	-28.47		
alpha	I	2038-01-09T17:30:24.988		65.80	-68.39	44707.15	-28.47		
4	I	2038-01-09T17:31:39.055		66.07	-68.65	42582.70	-28.45		
5	I	2038-01-09T17:31:48.989		66.11	-68.69	42287.90	-28.43		
6	I	2038-01-09T17:32:07.335		66.17	-68.75	41811.33	-28.46		
Uranus	I	2038-01-09T17:39:03.528		67.68	-70.22	25229.88		-31.60	-32.79
Uranus	E	2038-01-09T18:14:01.094		74.79	-76.89	25169.80		34.81	36.05
6	E	2038-01-09T18:20:32.931		75.96	-77.91	41855.81	28.49		
5	E	2038-01-09T18:20:45.498		76.00	-77.94	42171.12	28.46		
4	E	2038-01-09T18:20:59.021		76.04	-77.98	42568.57	28.48		
alpha	E	2038-01-09T18:22:14.398		76.25	-78.16	44735.65	28.50		
beta	E	2038-01-09T18:22:47.594		76.35	-78.23	45681.23	28.51		
eta	E	2038-01-09T18:23:40.126		76.50	-78.36	47176.12	28.51		
gamma	E	2038-01-09T18:23:55.728		76.54	-78.39	47620.98	28.52		
delta	E	2038-01-09T18:24:19.550		76.61	-78.45	48300.35	28.52		
lambda	E	2038-01-09T18:25:20.073		76.77	-78.58	50026.71	28.53		
epsilon	E	2038-01-09T18:26:01.556		76.89	-78.67	51210.24	28.55		

```

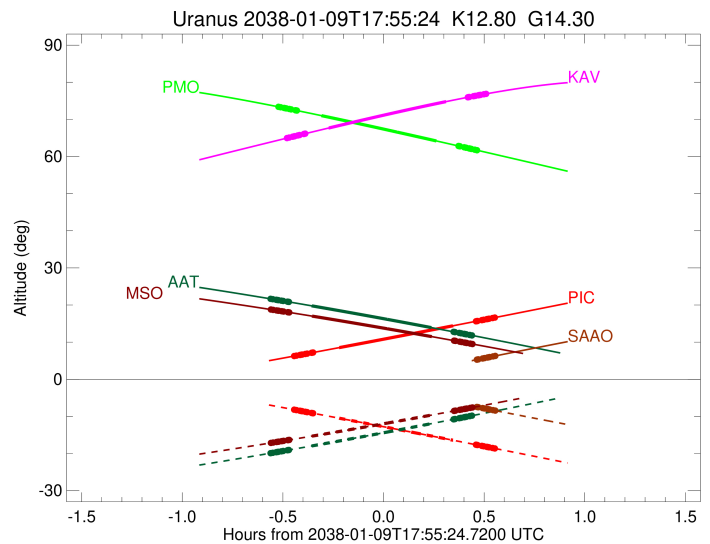
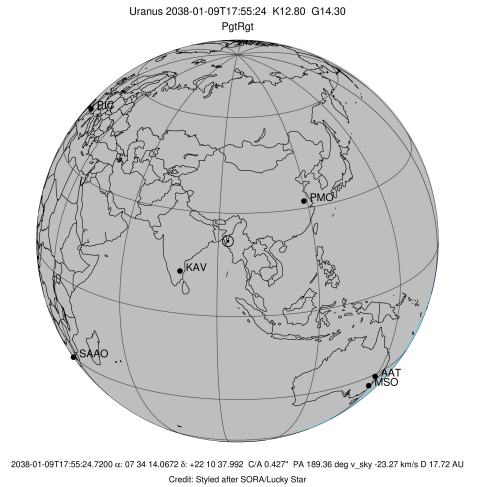
target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2038-01-09T17:51:50.460
Event type           : PgtRgt
: Ring occs: geocentric, topocentric
Observer code        : AAT
Location             : Siding Spring (AAT)
Latitude (deg)       : -31.27703
E. Longitude (deg)  : 149.06608
Altitude (km)        : 1.164
Gaia source ID       : 865599294997189376
2Mass ID (if available) : 07341411+2210382
ICRS Star Coord at Epoch: 07h 34m 14.06717s +22:10:37.99175s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 12.805
G magnitude           : 14.298
RP magnitude          : 13.795
BP magnitude          : 14.638
DUPflag              : 0
Distance (au)         : 17.722
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.27
Sun-Target sep (deg) : 177.27
Sun-Moon sep (deg)   : 133.59
B (ring opening deg) : 55.04
PA of pole (deg)     : 84.85
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.143
C/A sky separation (km) : 1844.4
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_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	2038-01-09T17:21:45.870		21.66	-19.91	51128.53	-28.40		
lambda	I	2038-01-09T17:22:24.675		21.57	-19.81	50026.71	-28.39		
delta	I	2038-01-09T17:23:25.483		21.41	-19.65	48300.35	-28.39		
gamma	I	2038-01-09T17:23:49.041		21.35	-19.59	47631.57	-28.39		
eta	I	2038-01-09T17:24:05.086		21.31	-19.54	47176.12	-28.39		
beta	I	2038-01-09T17:24:59.255		21.17	-19.40	45641.25	-28.38		
alpha	I	2038-01-09T17:25:32.215		21.09	-19.32	44705.36	-28.38		
4	I	2038-01-09T17:26:46.493		20.90	-19.12	42580.09	-28.37		
5	I	2038-01-09T17:26:56.233		20.88	-19.09	42291.40	-28.35		
6	I	2038-01-09T17:27:14.665		20.83	-19.05	41813.41	-28.38		
Uranus	I	2038-01-09T17:34:00.752		19.78	-17.96	25204.84		-32.95	-34.17
Uranus	E	2038-01-09T18:09:40.169		13.92	-11.95	25178.26		34.36	35.60
6	E	2038-01-09T18:16:17.561		12.78	-10.79	41857.73	28.30		
5	E	2038-01-09T18:16:30.271		12.74	-10.75	42173.64	28.27		
4	E	2038-01-09T18:16:43.716		12.70	-10.71	42566.31	28.28		
alpha	E	2038-01-09T18:17:59.682		12.48	-10.49	44734.25	28.29		
beta	E	2038-01-09T18:18:33.160		12.38	-10.39	45681.20	28.29		
eta	E	2038-01-09T18:19:26.095		12.23	-10.23	47176.12	28.29		
gamma	E	2038-01-09T18:19:41.818		12.18	-10.18	47620.97	28.29		
delta	E	2038-01-09T18:20:05.830		12.11	-10.11	48300.35	28.29		
lambda	E	2038-01-09T18:21:06.846		11.94	-9.93	50026.71	28.29		
epsilon	E	2038-01-09T18:21:48.096		11.82	-9.81	51193.83	28.30		

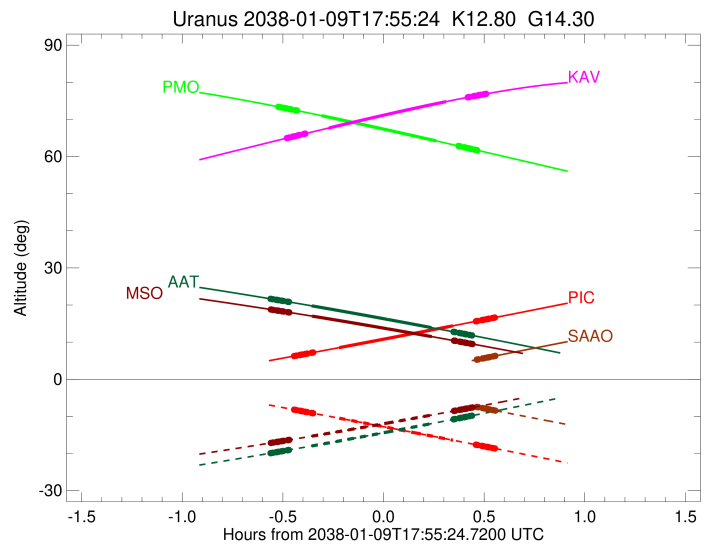
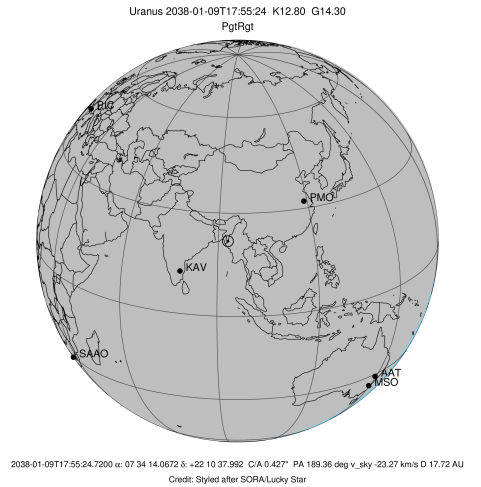
```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch              : 2038-01-09T17:58:38.510
Event type             : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code         : SAAO
Location              : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)        : -32.37953
E. Longitude (deg)    : 20.81070
Altitude (km)         : 1.768
Gaia source ID        : 865599294997189376
2Mass ID (if available) : 07341411+2210382
ICRS Star Coord at Epoch: 07h 34m 14.06717s +22:10:37.99175s
RUWE (>1.4 is poor)  : 0.93
K magnitude           : 12.805
G magnitude           : 14.298
RP magnitude          : 13.795
BP magnitude          : 14.638
DUPflag              : 0
Distance (au)         : 17.722
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.27
Sun-Target sep (deg) : 177.27
Sun-Moon sep (deg)   : 134.36
B (ring opening deg) : 55.04
PA of pole (deg)     : 84.85
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.067
C/A sky separation (km) : 864.5
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.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	2038-01-09T17:28:23.966	-5.12x	2.78x	51124.74	-28.17			
lambda	I	2038-01-09T17:29:02.956	-4.99x	2.65x	50026.71	-28.16			
delta	I	2038-01-09T17:30:04.254	-4.79x	2.45x	48300.35	-28.16			
gamma	I	2038-01-09T17:30:28.000	-4.71x	2.38x	47631.58	-28.16			
eta	I	2038-01-09T17:30:44.171	-4.66x	2.33x	47176.12	-28.16			
beta	I	2038-01-09T17:31:38.765	-4.48x	2.15x	45641.22	-28.17			
alpha	I	2038-01-09T17:32:11.994	-4.38x	2.04x	44704.98	-28.17			
4	I	2038-01-09T17:33:26.829	-4.13x	1.81x	42579.50	-28.16			
5	I	2038-01-09T17:33:36.592	-4.10x	1.77x	42292.17	-28.15			
6	I	2038-01-09T17:33:55.164	-4.04x	1.71x	41813.89	-28.18			
Uranus	I	2038-01-09T17:40:41.384	-2.73x	0.42x	25198.89	-33.27	-34.49		
Uranus	E	2038-01-09T18:16:33.749	4.05x	-6.25	25185.79	33.96	35.20		
6	E	2038-01-09T18:23:14.777	5.28	-7.45	41858.96	28.28			
5	E	2038-01-09T18:23:27.537	5.32	-7.49	42175.38	28.25			
4	E	2038-01-09T18:23:40.880	5.36	-7.53	42564.83	28.26			
alpha	E	2038-01-09T18:24:56.942	5.60	-7.76	44733.28	28.27			
beta	E	2038-01-09T18:25:30.468	5.70	-7.86	45681.15	28.27			
eta	E	2038-01-09T18:26:23.440	5.86	-8.02	47176.12	28.28			
gamma	E	2038-01-09T18:26:39.172	5.91	-8.06	47620.96	28.28			
delta	E	2038-01-09T18:27:03.199	5.98	-8.14	48300.35	28.28			
lambda	E	2038-01-09T18:28:04.247	6.16	-8.32	50026.71	28.28			
epsilon	E	2038-01-09T18:28:45.101	6.29	-8.44	51182.10	28.29			

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2038-01-09T17:51:56.830  
 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 : 865599294997189376  
 2Mass ID (if available) : 07341411+2210382  
 ICRS Star Coord at Epoch: 07h 34m 14.06717s +22:10:37.99175s  
 RUWE (>1.4 is poor) : 0.93  
 K magnitude : 12.805  
 G magnitude : 14.298  
 RP magnitude : 13.795  
 BP magnitude : 14.638  
 DUPflag : 0  
 Distance (au) : 17.722  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.27  
 Sun-Target sep (deg) : 177.27  
 Sun-Moon sep (deg) : 133.58  
 B (ring opening deg) : 55.04  
 PA of pole (deg) : 84.85  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.119  
 C/A sky separation (km) : 1524.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.spk  
 ura111.bsp  
 IAU\_URANUS\_for\_RINGFIT.tpc  
 vgr2.ura111.bsp  
 ura161.bsp  
 vgr2.ura161.bsp  
 peph.ura160.bsp  
 earthstns\_itr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



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

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-01-09T17:21:52.151		18.78	-17.14	51126.07	-28.39		
lambda	I	2038-01-09T17:22:30.881		18.69	-17.05	50026.71	-28.38		
delta	I	2038-01-09T17:23:31.706		18.55	-16.90	48300.35	-28.38		
gamma	I	2038-01-09T17:23:55.271		18.49	-16.84	47631.58	-28.38		
eta	I	2038-01-09T17:24:11.320		18.45	-16.80	47176.12	-28.38		
beta	I	2038-01-09T17:25:05.504		18.32	-16.67	45641.23	-28.38		
alpha	I	2038-01-09T17:25:38.481		18.25	-16.59	44705.14	-28.38		
4	I	2038-01-09T17:26:52.775		18.07	-16.40	42579.76	-28.36		
5	I	2038-01-09T17:27:02.491		18.05	-16.38	42291.82	-28.35		
6	I	2038-01-09T17:27:20.929		18.00	-16.33	41813.67	-28.38		
Uranus	I	2038-01-09T17:34:05.855		17.02	-15.32	25202.03		-33.10	-34.32
Uranus	E	2038-01-09T18:09:47.951		11.49	-9.63	25180.02		34.27	35.51
6	E	2038-01-09T18:16:26.075		10.40	-8.53	41858.03	28.30		
5	E	2038-01-09T18:16:38.796		10.37	-8.49	42174.05	28.27		
4	E	2038-01-09T18:16:52.215		10.33	-8.45	42565.96	28.28		
alpha	E	2038-01-09T18:18:08.195		10.12	-8.24	44734.02	28.29		
beta	E	2038-01-09T18:18:41.682		10.03	-8.15	45681.19	28.29		
eta	E	2038-01-09T18:19:34.623		9.89	-8.00	47176.12	28.29		
gamma	E	2038-01-09T18:19:50.348		9.84	-7.95	47620.97	28.29		
delta	E	2038-01-09T18:20:14.363		9.78	-7.88	48300.35	28.29		
lambda	E	2038-01-09T18:21:15.387		9.61	-7.71	50026.71	28.29		
epsilon	E	2038-01-09T18:21:56.550		9.49	-7.60	51191.18	28.30		