

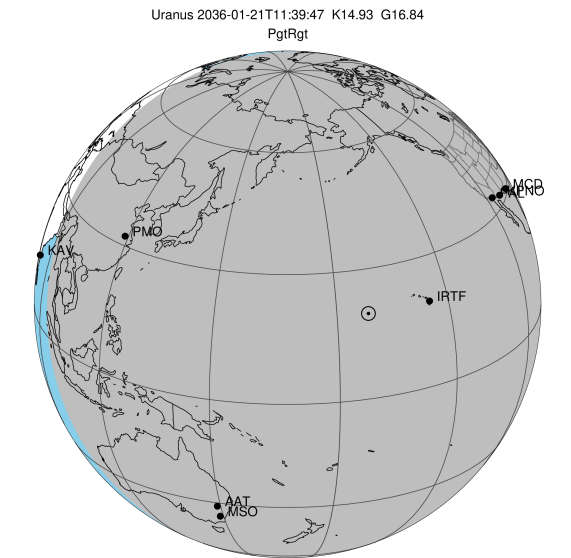
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-01-21T11:39:47.750
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3380324533958605696
 2Mass ID (if available) : 06512374+2318202

Uranus 2036-01-21T11:39:47 K14.93 G16.84 PgtRgt

ICRS Star Coord at Epoch: 06h 51m 23.74295s +23:18:20.20526s

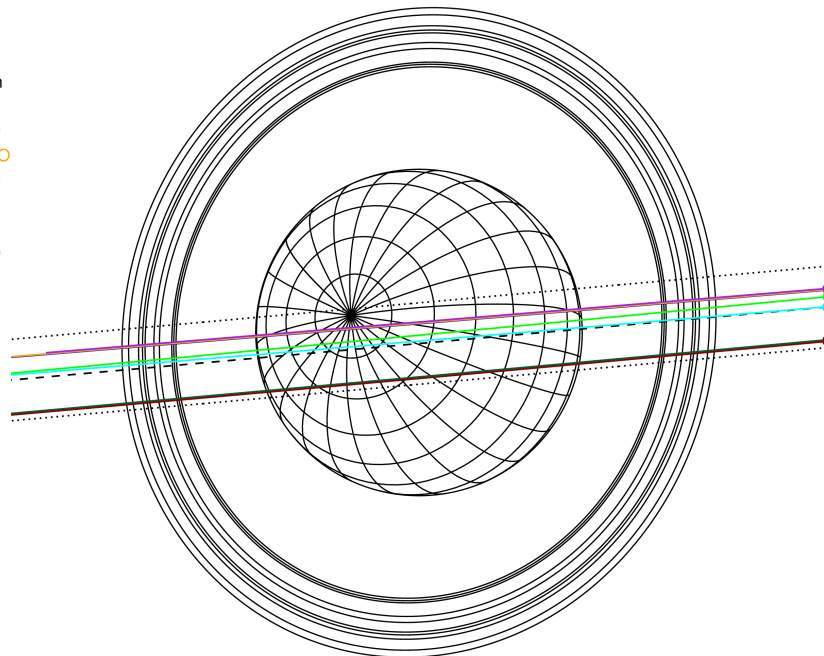
RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.931
 G magnitude : 16.837
 RP magnitude : 16.212
 BP magnitude : 17.299
 DUPflag : 0
 Distance (au) : 17.888
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.78
 Sun-Target sep (deg) : 161.28
 Sun-Moon sep (deg) : 122.51
 B (ring opening deg) : 64.60
 PA of pole (deg) : 75.95

#	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



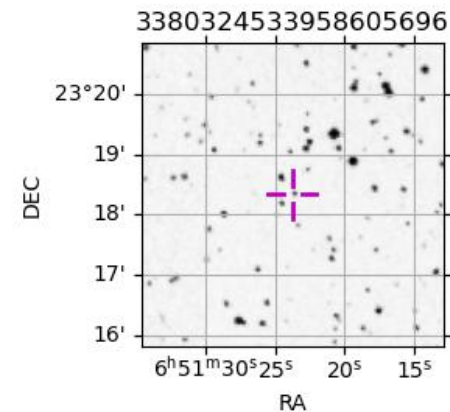
2036-01-21T11:39:47.7500 α: 06 51 23.7430 δ: +23 18 20.205 C/A 0.125° PA 5.12 deg v_sky -21.78 km/s D 17.89 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 AAT
 MSO



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

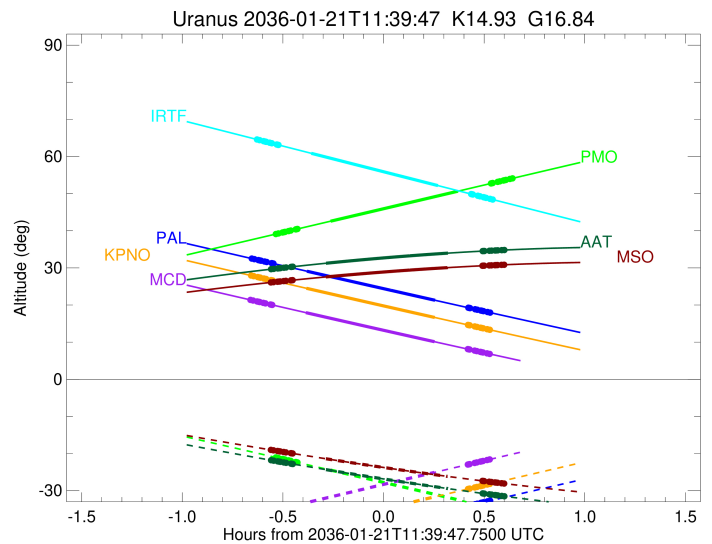
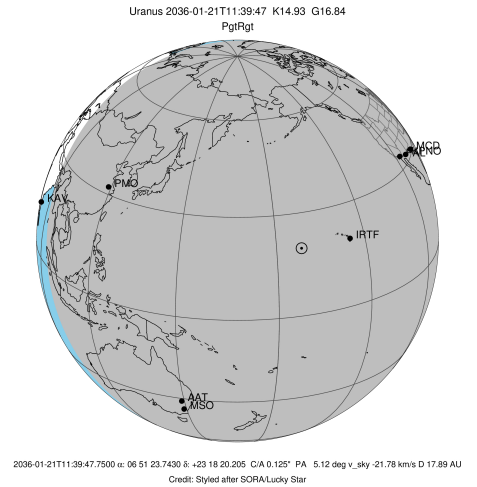
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	JAN 21 11:00 - JAN 21 12:11	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	JAN 21 11:07 - JAN 21 12:18	PieRie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	JAN 21 11:00 - JAN 21 12:11	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	JAN 21 11:00 - JAN 21 12:11	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	JAN 21 11:02 - JAN 21 12:12	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	+++++	+ +	+++++	JAN 21 11:06 - JAN 21 12:16	PieRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+ +	+++++	JAN 21 11:06 - JAN 21 12:16	PieRie



3380324533958605696

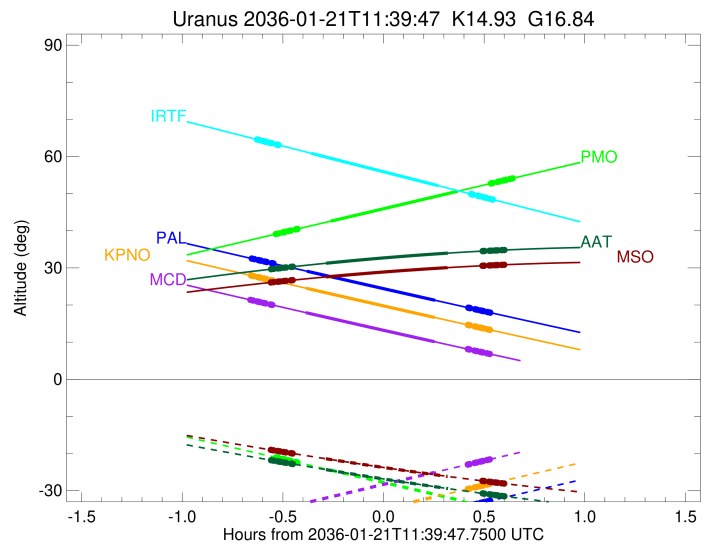
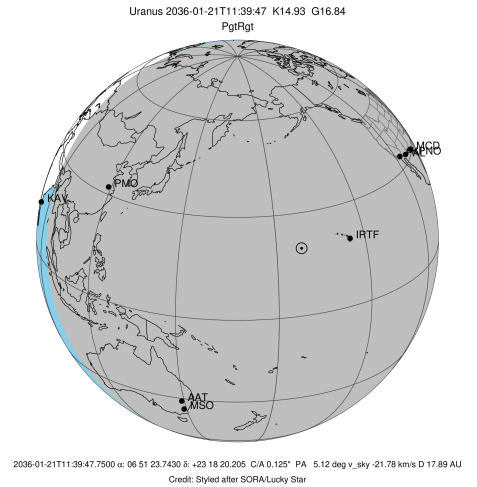
23°20'
 19'
 18'
 17'
 16'
 6^h51^m30^s25^s 20^s 15^s
 RA

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-01-21T11:36:03.890
 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 : 3380324533958605696
 2Mass ID (if available) : 06512374+2318202
 ICRS Star Coord at Epoch: 06h 51m 23.74295s +23:18:20.20526s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.931
 G magnitude : 16.837
 RP magnitude : 16.212
 BP magnitude : 17.299
 DUPflag : 0
 Distance (au) : 17.888
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.78
 Sun-Target sep (deg) : 161.28
 Sun-Moon sep (deg) : 123.24
 B (ring opening deg) : 64.60
 PA of pole (deg) : 75.95
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.106
 C/A sky separation (km) : 1373.9
 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



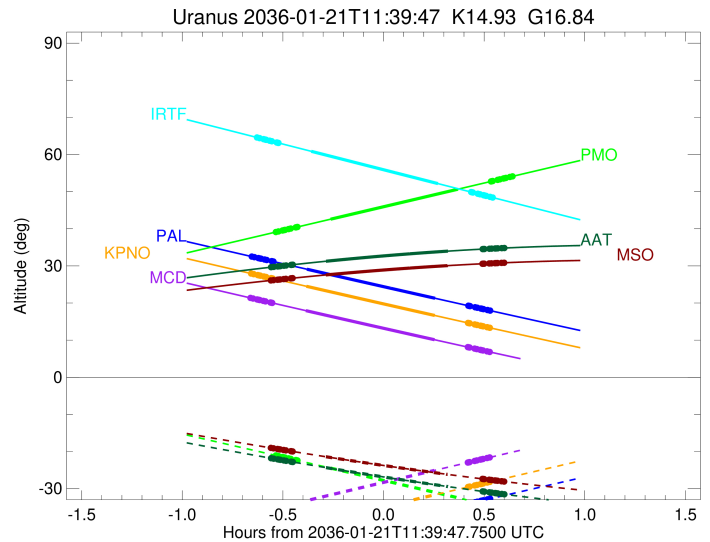
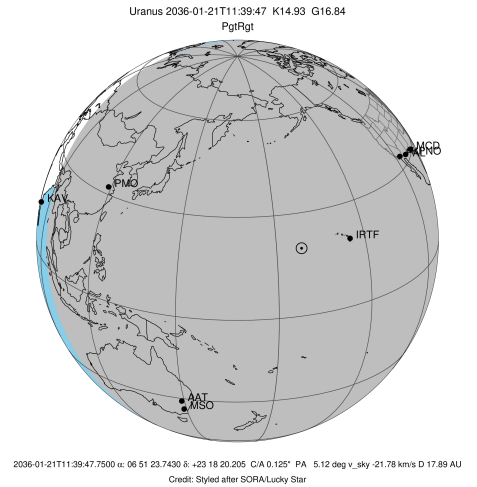
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-01-21T11:00:48.610		32.45	-47.51	50752.87	-24.03		
lambda	I	2036-01-21T11:01:18.825		32.35	-47.41	50026.71	-24.03		
delta	I	2036-01-21T11:02:30.665		32.10	-47.16	48300.35	-24.03		
gamma	I	2036-01-21T11:02:58.940		32.00	-47.06	47620.96	-24.03		
eta	I	2036-01-21T11:03:17.454		31.94	-47.00	47176.12	-24.03		
beta	I	2036-01-21T11:04:21.323		31.72	-46.78	45643.41	-24.02		
alpha	I	2036-01-21T11:04:58.539		31.59	-46.65	44750.71	-24.02		
4	I	2036-01-21T11:06:27.009		31.28	-46.34	42615.78	-24.01		
5	I	2036-01-21T11:06:46.671		31.22	-46.27	42157.15	-24.02		
6	I	2036-01-21T11:06:58.140		31.18	-46.23	41864.52	-24.01		
Uranus	I	2036-01-21T11:16:56.911		29.11	-44.15	25146.57		-23.45	-24.43
Uranus	E	2036-01-21T11:55:11.222		21.28	-36.15	25115.53		24.40	25.41
6	E	2036-01-21T12:05:04.315		19.27	-34.09	41812.21	23.90		
5	E	2036-01-21T12:05:24.468		19.21	-34.02	42311.42	23.91		
4	E	2036-01-21T12:05:34.107		19.17	-33.98	42527.38	23.90		
alpha	E	2036-01-21T12:07:04.014		18.87	-33.67	44685.72	23.90		
beta	E	2036-01-21T12:07:45.636		18.73	-33.52	45679.43	23.90		
eta	E	2036-01-21T12:08:48.329		18.52	-33.31	47176.12	23.90		
gamma	E	2036-01-21T12:09:07.386		18.46	-33.24	47631.57	23.90		
delta	E	2036-01-21T12:09:35.368		18.36	-33.14	48300.35	23.90		
lambda	E	2036-01-21T12:10:47.604		18.12	-32.89	50026.71	23.90		
epsilon	E	2036-01-21T12:11:50.930		17.91	-32.67	51540.09	23.90		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-01-21T11:42:59.680
 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 : 3380324533958605696
 2Mass ID (if available) : 06512374+2318202
 ICRS Star Coord at Epoch: 06h 51m 23.74295s +23:18:20.20526s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.931
 G magnitude : 16.837
 RP magnitude : 16.212
 BP magnitude : 17.299
 DUPflag : 0
 Distance (au) : 17.888
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.78
 Sun-Target sep (deg) : 161.28
 Sun-Moon sep (deg) : 122.75
 B (ring opening deg) : 64.60
 PA of pole (deg) : 75.95
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.033
 C/A sky separation (km) : 431.6
 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



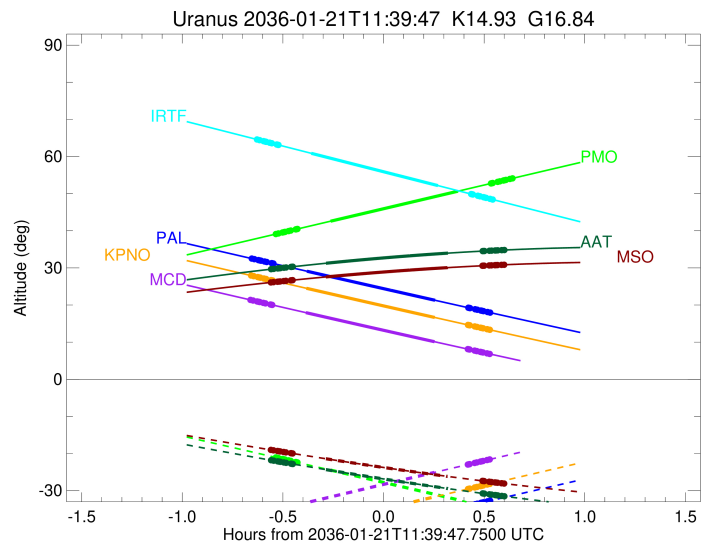
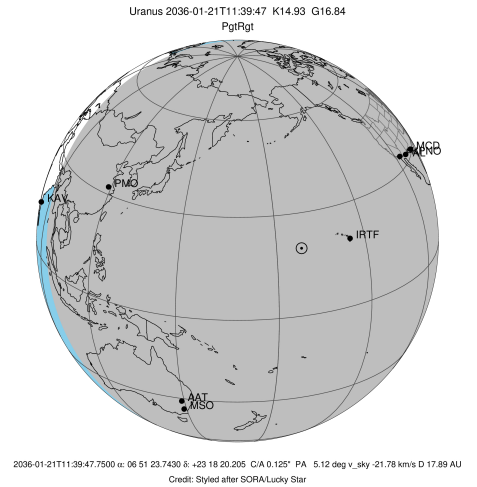
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-01-21T11:07:59.114		39.18	-21.12	50755.17	-24.11		
lambda	I	2036-01-21T11:08:29.331		39.29	-21.22	50026.71	-24.11		
delta	I	2036-01-21T11:09:40.938		39.54	-21.47	48300.35	-24.11		
gamma	I	2036-01-21T11:10:09.118		39.64	-21.57	47620.96	-24.11		
eta	I	2036-01-21T11:10:27.569		39.70	-21.64	47176.12	-24.11		
beta	I	2036-01-21T11:11:31.223		39.93	-21.86	45643.14	-24.11		
alpha	I	2036-01-21T11:12:08.274		40.06	-21.99	44751.02	-24.11		
4	I	2036-01-21T11:13:36.440		40.37	-22.29	42615.49	-24.11		
5	I	2036-01-21T11:13:56.001		40.44	-22.36	42157.82	-24.12		
6	I	2036-01-21T11:14:07.490		40.48	-22.40	41863.42	-24.11		
Uranus	I	2036-01-21T11:23:59.847		42.58	-24.46	25128.36		-24.01	-25.01
Uranus	E	2036-01-21T12:01:58.859		50.66	-32.46	25138.26		23.71	24.70
6	E	2036-01-21T12:11:49.373		52.75	-34.55	41810.41	24.18		
5	E	2036-01-21T12:12:09.424		52.82	-34.62	42312.61	24.19		
4	E	2036-01-21T12:12:18.849		52.86	-34.65	42526.84	24.18		
alpha	E	2036-01-21T12:13:47.714		53.17	-34.96	44686.19	24.19		
beta	E	2036-01-21T12:14:28.809		53.32	-35.11	45678.99	24.19		
eta	E	2036-01-21T12:15:30.768		53.54	-35.33	47176.12	24.19		
gamma	E	2036-01-21T12:15:49.595		53.60	-35.39	47631.58	24.19		
delta	E	2036-01-21T12:16:17.238		53.70	-35.49	48300.35	24.19		
lambda	E	2036-01-21T12:17:28.592		53.95	-35.74	50026.71	24.20		
epsilon	E	2036-01-21T12:18:31.329		54.18	-35.97	51544.71	24.20		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-01-21T11:35:55.290
 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 : 3380324533958605696
 2Mass ID (if available) : 06512374+2318202
 ICRS Star Coord at Epoch: 06h 51m 23.74295s +23:18:20.20526s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.931
 G magnitude : 16.837
 RP magnitude : 16.212
 BP magnitude : 17.299
 DUPflag : 0
 Distance (au) : 17.888
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.78
 Sun-Target sep (deg) : 161.28
 Sun-Moon sep (deg) : 123.20
 B (ring opening deg) : 64.60
 PA of pole (deg) : 75.95
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.112
 C/A sky separation (km) : 1453.4
 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_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	2036-01-21T11:00:36.763		27.88	-43.23	50752.75	-24.00		
lambda	I	2036-01-21T11:01:07.018		27.78	-43.12	50026.71	-24.00		
delta	I	2036-01-21T11:02:18.963		27.53	-42.86	48300.35	-23.99		
gamma	I	2036-01-21T11:02:47.280		27.43	-42.76	47620.96	-23.99		
eta	I	2036-01-21T11:03:05.821		27.36	-42.70	47176.12	-23.99		
beta	I	2036-01-21T11:04:09.784		27.14	-42.47	45643.42	-23.99		
alpha	I	2036-01-21T11:04:47.058		27.01	-42.34	44750.69	-23.99		
4	I	2036-01-21T11:06:15.657		26.70	-42.03	42615.79	-23.98		
5	I	2036-01-21T11:06:35.350		26.64	-41.96	42157.12	-23.98		
6	I	2036-01-21T11:06:46.833		26.60	-41.92	41864.57	-23.97		
Uranus	I	2036-01-21T11:16:46.723		24.52	-39.79	25147.55		-23.42	-24.40
Uranus	E	2036-01-21T11:55:04.179		16.65	-31.67	25114.75		24.42	25.43
6	E	2036-01-21T12:04:58.139		14.64	-29.57	41812.28	23.86		
5	E	2036-01-21T12:05:18.320		14.57	-29.50	42311.37	23.87		
4	E	2036-01-21T12:05:27.979		14.54	-29.47	42527.40	23.86		
alpha	E	2036-01-21T12:06:58.037		14.24	-29.15	44685.70	23.86		
beta	E	2036-01-21T12:07:39.729		14.10	-29.00	45679.44	23.86		
eta	E	2036-01-21T12:08:42.527		13.89	-28.78	47176.12	23.86		
gamma	E	2036-01-21T12:09:01.615		13.82	-28.71	47631.57	23.86		
delta	E	2036-01-21T12:09:29.644		13.73	-28.62	48300.35	23.86		
lambda	E	2036-01-21T12:10:42.001		13.49	-28.36	50026.71	23.86		
epsilon	E	2036-01-21T12:11:45.426		13.27	-28.14	51539.91	23.86		

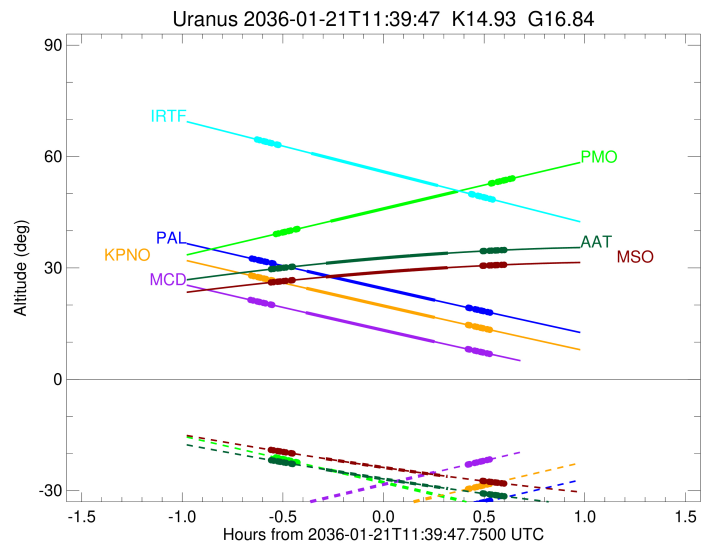
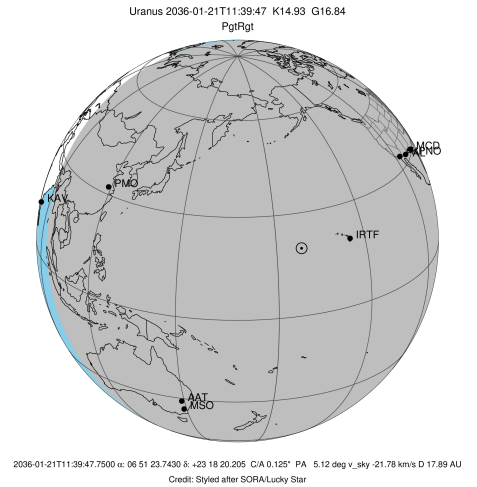
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-01-21T11:35:48.680
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3380324533958605696
 2Mass ID (if available) : 06512374+2318202
 ICRS Star Coord at Epoch: 06h 51m 23.74295s +23:18:20.20526s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.931
 G magnitude : 16.837
 RP magnitude : 16.212
 BP magnitude : 17.299
 DUPflag : 0
 Distance (au) : 17.888
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.78
 Sun-Target sep (deg) : 161.28
 Sun-Moon sep (deg) : 123.12
 B (ring opening deg) : 64.60
 PA of pole (deg) : 75.95
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.126
 C/A sky separation (km) : 1633.2
 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	2036-01-21T11:00:25.029		21.32	-36.77	50752.45	-23.94		
lambda	I	2036-01-21T11:00:55.342		21.21	-36.66	50026.71	-23.94		
delta	I	2036-01-21T11:02:07.458		20.96	-36.40	48300.35	-23.94		
gamma	I	2036-01-21T11:02:35.842		20.86	-36.30	47620.96	-23.94		
eta	I	2036-01-21T11:02:54.428		20.80	-36.23	47176.12	-23.93		
beta	I	2036-01-21T11:03:58.542		20.58	-36.00	45643.46	-23.93		
alpha	I	2036-01-21T11:04:35.909		20.45	-35.87	44750.65	-23.93		
4	I	2036-01-21T11:06:04.718		20.14	-35.55	42615.83	-23.92		
5	I	2036-01-21T11:06:24.461		20.07	-35.48	42157.04	-23.92		
6	I	2036-01-21T11:06:35.964		20.03	-35.44	41864.71	-23.92		
Uranus	I	2036-01-21T11:16:37.821		17.95	-33.28	25149.88		-23.35	-24.33
Uranus	E	2036-01-21T11:54:59.728		10.12	-25.09	25113.06		24.47	25.48
6	E	2036-01-21T12:04:54.960		8.13	-22.98	41812.43	23.80		
5	E	2036-01-21T12:05:15.182		8.06	-22.91	42311.27	23.80		
4	E	2036-01-21T12:05:24.875		8.03	-22.87	42527.45	23.80		
alpha	E	2036-01-21T12:06:55.163		7.73	-22.56	44685.67	23.80		
beta	E	2036-01-21T12:07:36.964		7.59	-22.41	45679.48	23.80		
eta	E	2036-01-21T12:08:39.921		7.38	-22.19	47176.12	23.80		
gamma	E	2036-01-21T12:08:59.058		7.31	-22.12	47631.57	23.80		
delta	E	2036-01-21T12:09:27.159		7.22	-22.02	48300.35	23.80		
lambda	E	2036-01-21T12:10:39.700		6.98	-21.76	50026.71	23.80		
epsilon	E	2036-01-21T12:11:43.270		6.77	-21.54	51539.53	23.80		

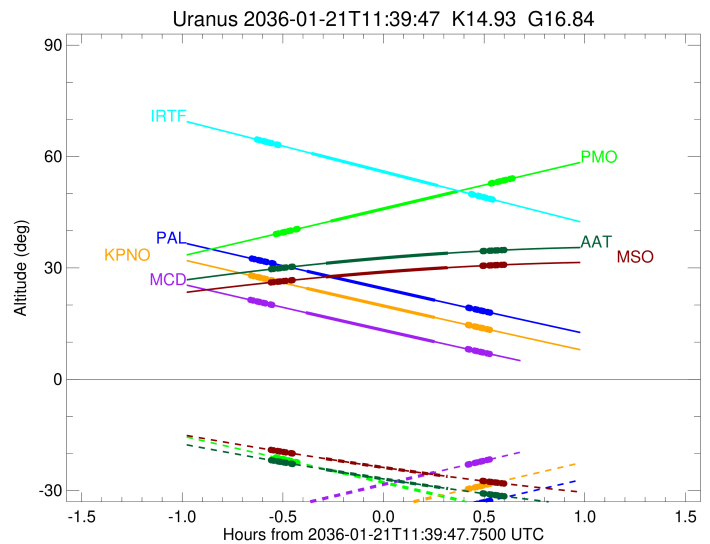
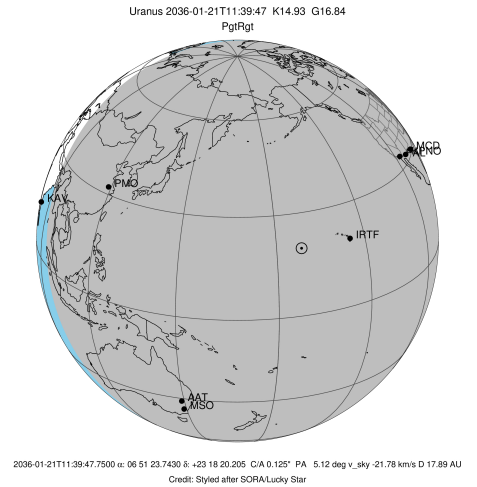

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2036-01-21T11:37:07.510
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       : 3380324533958605696
2Mass ID (if available) : 06512374+2318202
ICRS Star Coord at Epoch: 06h 51m 23.74295s +23:18:20.20526s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 14.931
G magnitude           : 16.837
RP magnitude          : 16.212
BP magnitude          : 17.299
DUPflag              : 0
Distance (au)        : 17.888
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -21.78
Sun-Target sep (deg) : 161.28
Sun-Moon sep (deg)   : 123.43
B (ring opening deg) : 64.60
PA of pole (deg)     : 75.95
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.103
C/A sky separation (km) : 1342.0
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
    
```



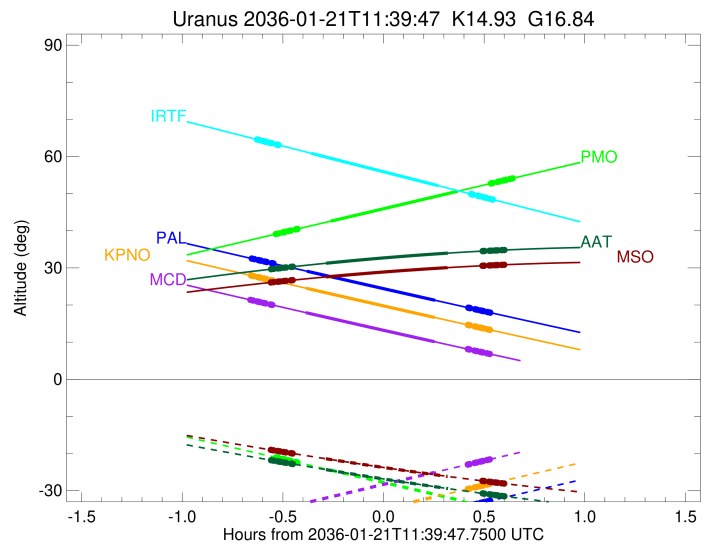
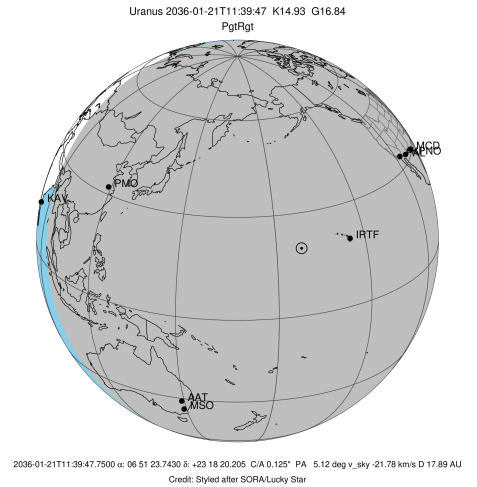
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-01-21T11:02:21.949		64.53	-83.09	50757.95	-24.29		
lambda	I	2036-01-21T11:02:52.060		64.41	-82.97	50026.71	-24.28		
delta	I	2036-01-21T11:04:03.154		64.14	-82.69	48300.35	-24.28		
gamma	I	2036-01-21T11:04:31.134		64.03	-82.58	47620.96	-24.28		
eta	I	2036-01-21T11:04:49.456		63.96	-82.51	47176.12	-24.28		
beta	I	2036-01-21T11:05:52.679		63.72	-82.26	45642.88	-24.28		
alpha	I	2036-01-21T11:06:29.451		63.58	-82.12	44751.29	-24.28		
4	I	2036-01-21T11:07:57.066		63.24	-81.77	42615.16	-24.27		
5	I	2036-01-21T11:08:16.473		63.17	-81.70	42158.53	-24.28		
6	I	2036-01-21T11:08:27.955		63.12	-81.65	41862.37	-24.26		
Uranus	I	2036-01-21T11:18:14.612		60.87	-79.35	25116.18		-24.38	-25.39
Uranus	E	2036-01-21T11:56:03.030		52.17	-70.48	25146.44		23.46	24.44
6	E	2036-01-21T12:05:54.714		49.90	-68.16	41809.99	24.19		
5	E	2036-01-21T12:06:14.790		49.82	-68.08	42312.87	24.20		
4	E	2036-01-21T12:06:24.192		49.79	-68.05	42526.73	24.19		
alpha	E	2036-01-21T12:07:53.048		49.44	-67.70	44686.31	24.19		
beta	E	2036-01-21T12:08:34.133		49.29	-67.54	45678.89	24.19		
eta	E	2036-01-21T12:09:36.097		49.05	-67.30	47176.12	24.19		
gamma	E	2036-01-21T12:09:54.924		48.98	-67.22	47631.58	24.19		
delta	E	2036-01-21T12:10:22.570		48.87	-67.12	48300.35	24.19		
lambda	E	2036-01-21T12:11:33.936		48.60	-66.84	50026.71	24.19		
epsilon	E	2036-01-21T12:12:36.723		48.36	-66.59	51545.49	24.19		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-01-21T11:40:45.850
 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 : 3380324533958605696
 2Mass ID (if available) : 06512374+2318202
 ICRS Star Coord at Epoch: 06h 51m 23.74295s +23:18:20.20526s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.931
 G magnitude : 16.837
 RP magnitude : 16.212
 BP magnitude : 17.299
 DUPflag : 0
 Distance (au) : 17.888
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.78
 Sun-Target sep (deg) : 161.28
 Sun-Moon sep (deg) : 122.78
 B (ring opening deg) : 64.60
 PA of pole (deg) : 75.95
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.534
 C/A sky separation (km) : 6929.7
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-01-21T11:06:33.392		29.69	-21.85	50771.29	-24.04		
lambda	I	2036-01-21T11:07:04.387		29.74	-21.93	50026.71	-24.02		
delta	I	2036-01-21T11:08:16.287		29.86	-22.12	48300.35	-24.00		
gamma	I	2036-01-21T11:08:44.594		29.91	-22.19	47621.03	-23.99		
eta	I	2036-01-21T11:09:03.138		29.94	-22.24	47176.12	-23.99		
beta	I	2036-01-21T11:10:07.181		30.05	-22.41	45642.03	-23.97		
alpha	I	2036-01-21T11:10:44.340		30.11	-22.51	44752.10	-23.96		
4	I	2036-01-21T11:12:13.331		30.26	-22.74	42613.38	-23.92		
5	I	2036-01-21T11:12:32.848		30.29	-22.79	42162.25	-23.93		
6	I	2036-01-21T11:12:44.842		30.31	-22.82	41857.72	-23.91		
Uranus	I	2036-01-21T11:22:37.799		31.25	-24.34	25083.26		-25.36	-26.40
Uranus	E	2036-01-21T11:59:00.775		33.98	-29.45	25236.85		20.54	21.42
6	E	2036-01-21T12:09:20.489		34.52	-30.75	41805.66	23.93		
5	E	2036-01-21T12:09:41.082		34.54	-30.79	42314.82	23.96		
4	E	2036-01-21T12:09:50.375		34.55	-30.81	42525.98	23.95		
alpha	E	2036-01-21T12:11:20.112		34.62	-30.99	44688.00	23.99		
beta	E	2036-01-21T12:12:01.426		34.65	-31.07	45677.52	24.00		
eta	E	2036-01-21T12:13:03.913		34.70	-31.20	47176.12	24.02		
gamma	E	2036-01-21T12:13:22.871		34.71	-31.23	47631.53	24.02		
delta	E	2036-01-21T12:13:50.706		34.73	-31.29	48300.35	24.03		
lambda	E	2036-01-21T12:15:02.514		34.78	-31.43	50026.71	24.05		
epsilon	E	2036-01-21T12:16:05.962		34.83	-31.55	51553.13	24.07		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-01-21T11:40:41.470
 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 : 3380324533958605696
 2Mass ID (if available) : 06512374+2318202
 ICRS Star Coord at Epoch: 06h 51m 23.74295s +23:18:20.20526s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.931
 G magnitude : 16.837
 RP magnitude : 16.212
 BP magnitude : 17.299
 DUPflag : 0
 Distance (au) : 17.888
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.78
 Sun-Target sep (deg) : 161.28
 Sun-Moon sep (deg) : 122.74
 B (ring opening deg) : 64.60
 PA of pole (deg) : 75.95
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.553
 C/A sky separation (km) : 7172.9
 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	2036-01-21T11:06:29.495		26.11	-19.07	50772.02	-24.00		
lambda	I	2036-01-21T11:07:00.565		26.16	-19.15	50026.71	-23.98		
delta	I	2036-01-21T11:08:12.572		26.28	-19.32	48300.35	-23.97		
gamma	I	2036-01-21T11:08:40.921		26.32	-19.40	47621.03	-23.96		
eta	I	2036-01-21T11:08:59.494		26.35	-19.44	47176.12	-23.95		
beta	I	2036-01-21T11:10:03.640		26.45	-19.60	45641.99	-23.93		
alpha	I	2036-01-21T11:10:40.855		26.51	-19.69	44752.13	-23.92		
4	I	2036-01-21T11:12:10.006		26.65	-19.91	42613.28	-23.88		
5	I	2036-01-21T11:12:29.546		26.68	-19.96	42162.45	-23.89		
6	I	2036-01-21T11:12:41.579		26.69	-19.99	41857.50	-23.86		
Uranus	I	2036-01-21T11:22:35.818		27.57	-21.41	25082.79		-25.37	-26.41
Uranus	E	2036-01-21T11:58:54.269		30.07	-26.16	25241.31		20.38	21.26
6	E	2036-01-21T12:09:16.348		30.58	-27.37	41805.49	23.89		
5	E	2036-01-21T12:09:36.990		30.59	-27.41	42314.87	23.91		
4	E	2036-01-21T12:09:46.294		30.60	-27.43	42525.97	23.91		
alpha	E	2036-01-21T12:11:16.190		30.66	-27.60	44688.08	23.95		
beta	E	2036-01-21T12:11:57.569		30.69	-27.67	45677.45	23.96		
eta	E	2036-01-21T12:13:00.160		30.73	-27.79	47176.12	23.98		
gamma	E	2036-01-21T12:13:19.149		30.75	-27.82	47631.53	23.99		
delta	E	2036-01-21T12:13:47.027		30.77	-27.88	48300.35	23.99		
lambda	E	2036-01-21T12:14:58.947		30.81	-28.01	50026.71	24.01		
epsilon	E	2036-01-21T12:16:02.498		30.85	-28.12	51553.33	24.03		