

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-12-30T17:27:51.890
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3380278113952382848
 2Mass ID (if available) : 06552404+2313078

Uranus 2035-12-30T17:27:51 K13.86 G16.14 PgtRgt

ICRS Star Coord at Epoch: 06h 55m 24.05415s +23:13:07.62994s

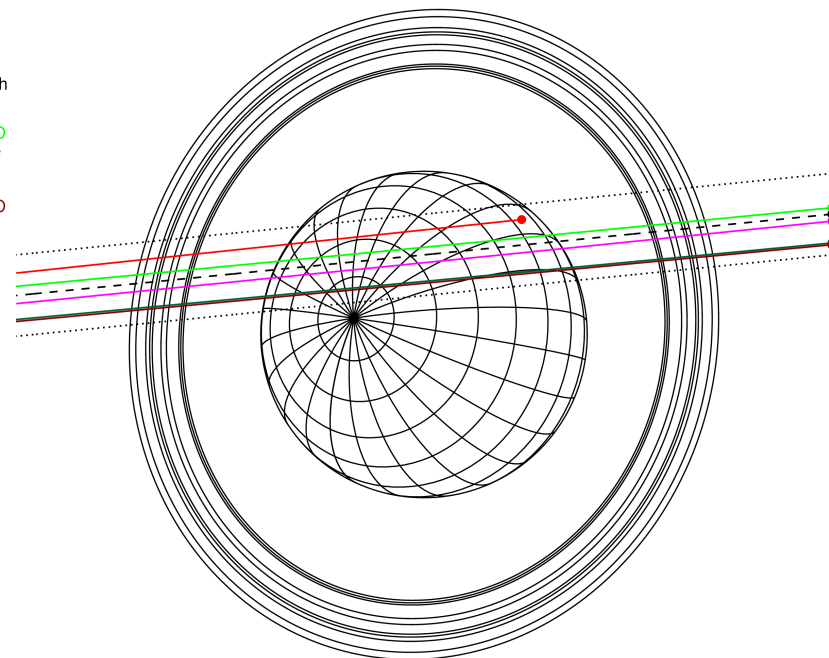
RUWE (>1.4 is poor) : 1.06
 K magnitude : 13.857
 G magnitude : 16.137
 RP magnitude : 15.438
 BP magnitude : 16.691
 DUPflag : 0
 Distance (au) : 17.846
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.27
 Sun-Target sep (deg) : 175.61
 Sun-Moon sep (deg) : 171.52
 B (ring opening deg) : 63.73
 PA of pole (deg) : 76.97

Uranus 2035-12-30T17:27:51 K13.86 G16.14
 PgtRgt



2035-12-30T17:27:51.8900 ra: 06 55 24.0541 s: +23 13 07.630 C/A 0.967 PA 185.70 deg v_sky -23.27 km/s D 17.85 AU
 Credit: Styled after SORA/Lucky Star

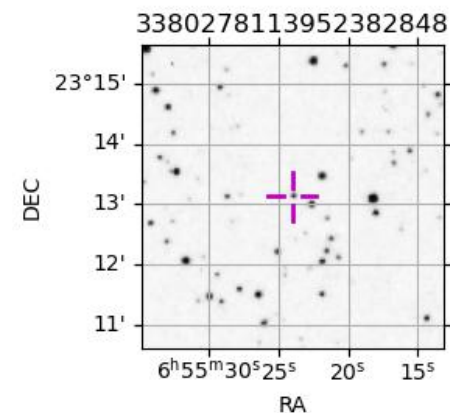
Earth
 PIC
 PMO
 KAV
 AAT
 MSO



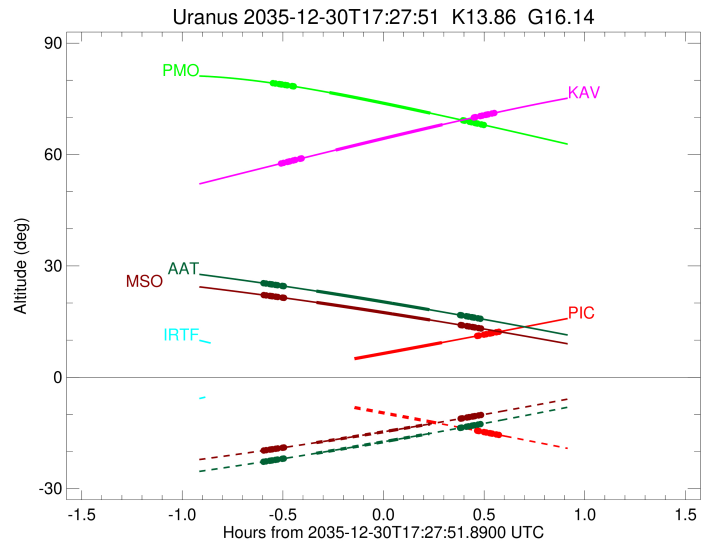
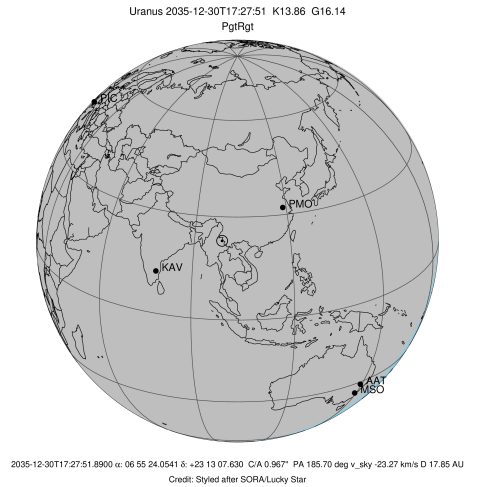
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1		+	+++++	DEC 30 17:45 - DEC 30 18:02	PneRne
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	DEC 30 16:55 - DEC 30 17:58	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	+++++	+ +	+++++	DEC 30 16:57 - DEC 30 18:01	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	+++++	+ +	+++++	DEC 30 16:52 - DEC 30 17:57	PieRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+ +	+++++	DEC 30 16:52 - DEC 30 17:57	PieRie

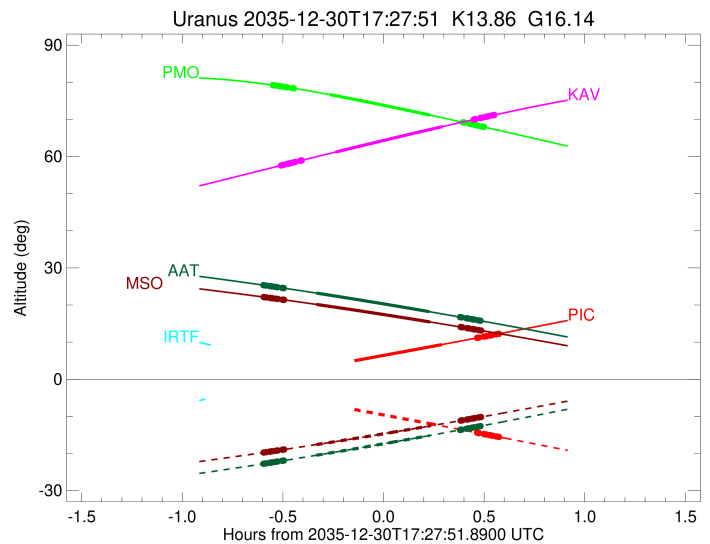
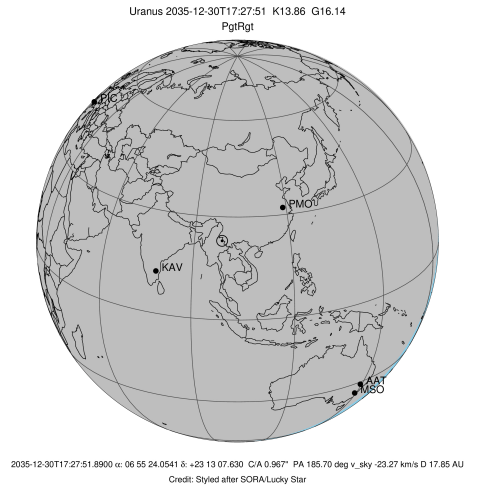


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-12-30T17:31:30.730
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3380278113952382848
 2Mass ID (if available) : 06552404+2313078
 ICRS Star Coord at Epoch: 06h 55m 24.05415s +23:13:07.62994s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 13.857
 G magnitude : 16.137
 RP magnitude : 15.438
 BP magnitude : 16.691
 DUPflag : 0
 Distance (au) : 17.846
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.27
 Sun-Target sep (deg) : 175.61
 Sun-Moon sep (deg) : 172.38
 B (ring opening deg) : 63.73
 PA of pole (deg) : 76.97
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.258
 C/A sky separation (km) : 16286.4
 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



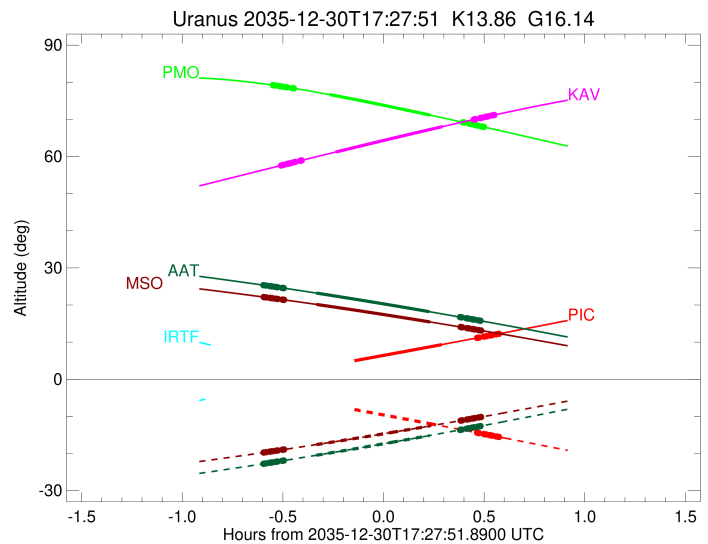
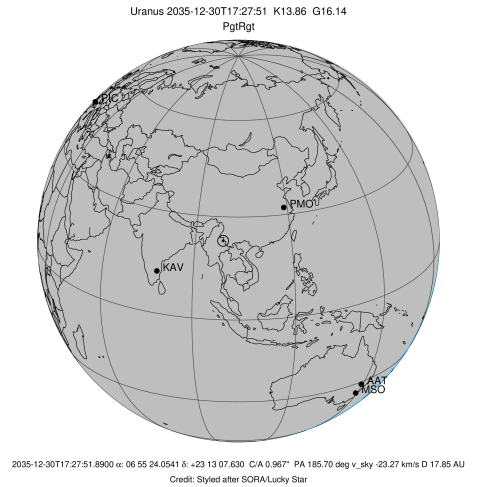
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-12-30T16:59:29.063		1.82x	-4.89x	50817.58	-24.21		
lambda	I	2035-12-30T17:00:01.805		1.90x	-4.97x	50026.71	-24.13		
delta	I	2035-12-30T17:01:13.497		2.09x	-5.17	48300.35	-24.03		
gamma	I	2035-12-30T17:01:41.696		2.17x	-5.25	47623.44	-23.98		
eta	I	2035-12-30T17:02:00.360		2.22x	-5.30	47176.12	-23.95		
beta	I	2035-12-30T17:03:03.773		2.39x	-5.47	45661.99	-23.84		
alpha	I	2035-12-30T17:03:43.300		2.49x	-5.58	44720.55	-23.76		
4	I	2035-12-30T17:05:13.300		2.73x	-5.83	42588.51	-23.57		
5	I	2035-12-30T17:05:30.281		2.78x	-5.87	42202.51	-23.56		
6	I	2035-12-30T17:05:43.806		2.81x	-5.91	41873.22	-23.50		
Uranus	I	2035-12-30T17:17:28.929		4.72x	-7.86	25430.98		-13.22	-13.82
Uranus	E	2035-12-30T17:45:15.926		9.34	-12.58	25149.36		24.36	25.37
6	E	2035-12-30T17:55:44.473		11.13	-14.39	41796.06	23.58		
5	E	2035-12-30T17:56:06.173		11.19	-14.46	42310.30	23.64		
4	E	2035-12-30T17:56:15.960		11.22	-14.49	42529.20	23.64		
alpha	E	2035-12-30T17:57:47.568		11.48	-14.75	44693.80	23.84		
beta	E	2035-12-30T17:58:28.449		11.60	-14.87	45674.03	23.93		
eta	E	2035-12-30T17:59:31.095		11.78	-15.05	47176.12	24.04		
gamma	E	2035-12-30T17:59:50.019		11.83	-15.11	47631.34	24.07		
delta	E	2035-12-30T18:00:17.786		11.91	-15.19	48300.35	24.12		
lambda	E	2035-12-30T18:01:29.204		12.12	-15.40	50026.71	24.23		
epsilon	E	2035-12-30T18:02:32.170		12.30	-15.58	51555.00	24.31		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-12-30T17:26:54.080
 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 : 3380278113952382848
 2Mass ID (if available) : 06552404+2313078
 ICRS Star Coord at Epoch: 06h 55m 24.05415s +23:13:07.62994s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 13.857
 G magnitude : 16.137
 RP magnitude : 15.438
 BP magnitude : 16.691
 DUPflag : 0
 Distance (au) : 17.846
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.27
 Sun-Target sep (deg) : 175.61
 Sun-Moon sep (deg) : 171.54
 B (ring opening deg) : 63.73
 PA of pole (deg) : 76.97
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.050
 C/A sky separation (km) : 13591.0
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ural11.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ural11.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	2035-12-30T16:55:07.218		79.20	-76.25	50803.33	-25.17		
lambda	I	2035-12-30T16:55:38.125		79.13	-76.16	50026.71	-25.11		
delta	I	2035-12-30T16:56:46.976		78.98	-75.96	48300.35	-25.04		
gamma	I	2035-12-30T16:57:14.043		78.92	-75.88	47623.14	-25.00		
eta	I	2035-12-30T16:57:31.929		78.88	-75.83	47176.12	-24.98		
beta	I	2035-12-30T16:58:32.737		78.74	-75.65	45660.56	-24.91		
alpha	I	2035-12-30T16:59:10.388		78.65	-75.54	44723.01	-24.84		
4	I	2035-12-30T17:00:36.358		78.44	-75.29	42591.67	-24.71		
5	I	2035-12-30T17:00:52.937		78.40	-75.24	42196.95	-24.71		
6	I	2035-12-30T17:01:05.537		78.37	-75.20	41874.87	-24.67		
Uranus	I	2035-12-30T17:11:48.394		76.68	-73.24	25369.25		-16.19	-16.92
Uranus	E	2035-12-30T17:41:47.363		71.16	-67.33	25116.56		25.41	26.45
6	E	2035-12-30T17:51:30.252		69.23	-65.35	41795.50	24.64		
5	E	2035-12-30T17:51:50.926		69.16	-65.28	42308.48	24.69		
4	E	2035-12-30T17:52:00.451		69.13	-65.24	42530.29	24.68		
alpha	E	2035-12-30T17:53:28.303		68.83	-64.94	44695.15	24.82		
beta	E	2035-12-30T17:54:07.515		68.70	-64.81	45673.16	24.88		
eta	E	2035-12-30T17:55:07.855		68.50	-64.60	47176.12	24.95		
gamma	E	2035-12-30T17:55:26.086		68.44	-64.54	47631.25	24.98		
delta	E	2035-12-30T17:55:52.860		68.35	-64.45	48300.35	25.01		
lambda	E	2035-12-30T17:57:01.792		68.11	-64.21	50026.71	25.08		
epsilon	E	2035-12-30T17:58:02.664		67.91	-64.00	51555.28	25.14		

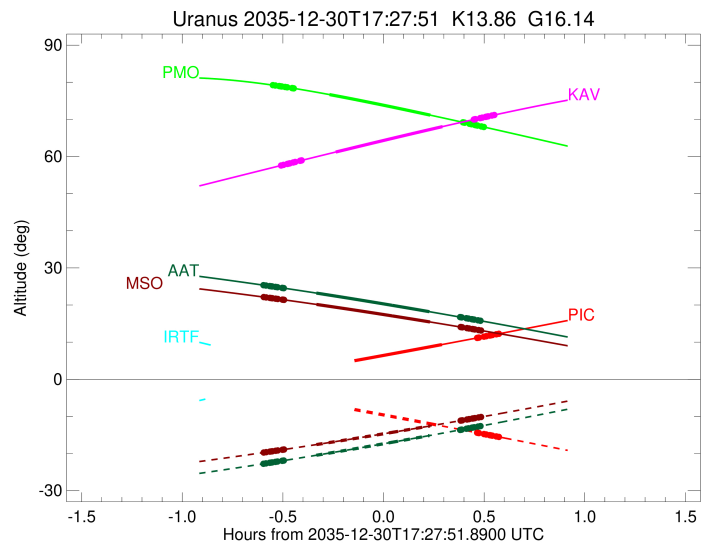
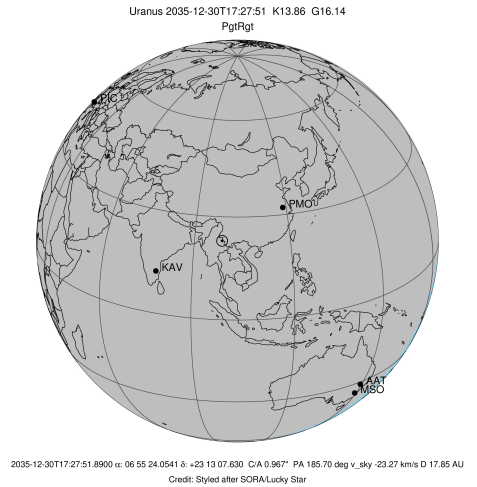
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-12-30T17:29:37.130
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 3380278113952382848
 2Mass ID (if available) : 06552404+2313078
 ICRS Star Coord at Epoch: 06h 55m 24.05415s +23:13:07.62994s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 13.857
 G magnitude : 16.137
 RP magnitude : 15.438
 BP magnitude : 16.691
 DUPflag : 0
 Distance (au) : 17.846
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.27
 Sun-Target sep (deg) : 175.61
 Sun-Moon sep (deg) : 171.88
 B (ring opening deg) : 63.73
 PA of pole (deg) : 76.97
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.864
 C/A sky separation (km) : 11186.0
 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_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	2035-12-30T16:57:34.258		57.64	-61.91	50794.21	-25.48		
lambda	I	2035-12-30T16:58:04.419		57.76	-62.02	50026.71	-25.44		
delta	I	2035-12-30T16:59:12.352		58.01	-62.26	48300.35	-25.39		
gamma	I	2035-12-30T16:59:39.045		58.11	-62.36	47622.94	-25.37		
eta	I	2035-12-30T16:59:56.665		58.18	-62.42	47176.12	-25.35		
beta	I	2035-12-30T17:00:56.591		58.40	-62.64	45659.53	-25.30		
alpha	I	2035-12-30T17:01:33.517		58.54	-62.78	44724.76	-25.26		
4	I	2035-12-30T17:02:58.004		58.85	-63.08	42593.88	-25.17		
5	I	2035-12-30T17:03:14.535		58.91	-63.14	42193.06	-25.18		
6	I	2035-12-30T17:03:26.707		58.96	-63.19	41875.93	-25.15		
Uranus	I	2035-12-30T17:13:38.142		61.22	-65.39	25321.00		-18.23	-19.03
Uranus	E	2035-12-30T17:45:25.086		68.05	-71.89	25097.05		26.02	27.08
6	E	2035-12-30T17:54:44.857		69.96	-73.63	41795.07	25.19		
5	E	2035-12-30T17:55:04.967		70.03	-73.69	42306.25	25.23		
4	E	2035-12-30T17:55:14.461		70.06	-73.72	42531.61	25.22		
alpha	E	2035-12-30T17:56:40.507		70.35	-73.97	44696.68	25.31		
beta	E	2035-12-30T17:57:18.883		70.48	-74.08	45672.19	25.35		
eta	E	2035-12-30T17:58:18.170		70.67	-74.26	47176.12	25.40		
gamma	E	2035-12-30T17:58:36.077		70.73	-74.31	47631.13	25.42		
delta	E	2035-12-30T17:59:02.394		70.82	-74.39	48300.35	25.44		
lambda	E	2035-12-30T18:00:10.188		71.04	-74.58	50026.71	25.49		
epsilon	E	2035-12-30T18:01:10.077		71.24	-74.75	51554.52	25.53		

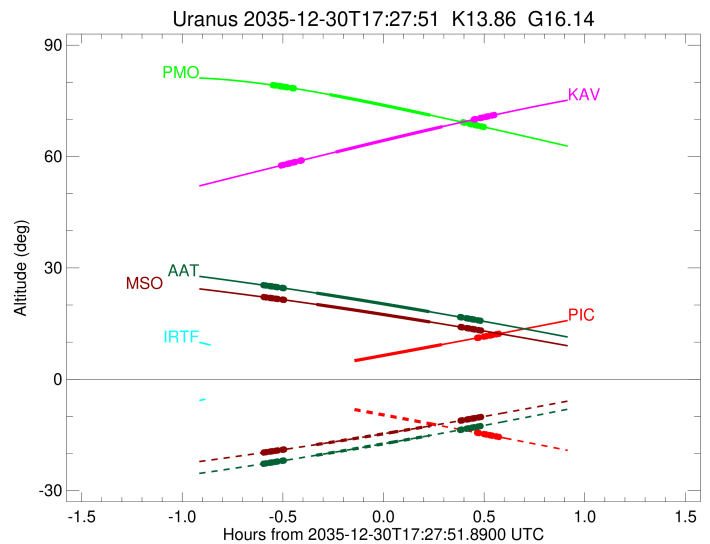
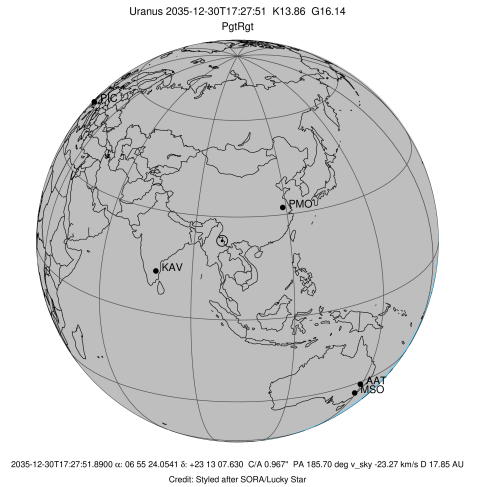
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2035-12-30T17:24:45.130
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       : 3380278113952382848
2Mass ID (if available) : 06552404+2313078
ICRS Star Coord at Epoch: 06h 55m 24.05415s +23:13:07.62994s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 13.857
G magnitude          : 16.137
RP magnitude         : 15.438
BP magnitude         : 16.691
DUPflag             : 0
Distance (au)        : 17.846
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.27
Sun-Target sep (deg) : 175.61
Sun-Moon sep (deg)   : 170.78
B (ring opening deg) : 63.73
PA of pole (deg)     : 76.97
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.640
C/A sky separation (km) : 8281.7
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	2035-12-30T16:52:19.514		25.32	-22.73	50782.17	-25.69		
lambda	I	2035-12-30T16:52:48.946		25.25	-22.66	50026.71	-25.66		
delta	I	2035-12-30T16:53:56.257		25.11	-22.50	48300.35	-25.63		
gamma	I	2035-12-30T16:54:22.702		25.05	-22.44	47622.66	-25.62		
eta	I	2035-12-30T16:54:40.133		25.01	-22.40	47176.12	-25.61		
beta	I	2035-12-30T16:55:39.481		24.88	-22.25	45658.09	-25.59		
alpha	I	2035-12-30T16:56:15.823		24.80	-22.17	44727.21	-25.56		
4	I	2035-12-30T16:57:39.294		24.61	-21.97	42596.86	-25.51		
5	I	2035-12-30T16:57:55.944		24.57	-21.93	42187.85	-25.52		
6	I	2035-12-30T16:58:07.714		24.55	-21.90	41877.20	-25.50		
Uranus	I	2035-12-30T17:07:51.876		23.21	-20.47	25260.41		-20.55	-21.43
Uranus	E	2035-12-30T17:41:31.569		18.21	-15.17	25089.00		26.27	27.33
6	E	2035-12-30T17:50:38.977		16.76	-13.65	41794.81	25.43		
5	E	2035-12-30T17:50:58.769		16.71	-13.60	42303.69	25.45		
4	E	2035-12-30T17:51:08.367		16.68	-13.57	42533.12	25.44		
alpha	E	2035-12-30T17:52:33.712		16.45	-13.33	44698.30	25.48		
beta	E	2035-12-30T17:53:11.742		16.35	-13.22	45671.17	25.51		
eta	E	2035-12-30T17:54:10.740		16.19	-13.06	47176.12	25.53		
gamma	E	2035-12-30T17:54:28.553		16.14	-13.01	47631.00	25.54		
delta	E	2035-12-30T17:54:54.755		16.07	-12.93	48300.35	25.55		
lambda	E	2035-12-30T17:56:02.284		15.88	-12.74	50026.71	25.58		
epsilon	E	2035-12-30T17:57:01.920		15.72	-12.57	51552.65	25.60		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2035-12-30T17:24:51.590
 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 : 3380278113952382848
 2Mass ID (if available) : 06552404+2313078
 ICRS Star Coord at Epoch: 06h 55m 24.05415s +23:13:07.62994s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 13.857
 G magnitude : 16.137
 RP magnitude : 15.438
 BP magnitude : 16.691
 DUPflag : 0
 Distance (au) : 17.846
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.27
 Sun-Target sep (deg) : 175.61
 Sun-Moon sep (deg) : 170.77
 B (ring opening deg) : 63.73
 PA of pole (deg) : 76.97
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.617
 C/A sky separation (km) : 7988.6
 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	2035-12-30T16:52:23.772		22.11	-19.70	50781.20	-25.70		
lambda	I	2035-12-30T16:52:53.155		22.05	-19.64	50026.71	-25.67		
delta	I	2035-12-30T16:54:00.437		21.92	-19.49	48300.35	-25.65		
gamma	I	2035-12-30T16:54:26.870		21.86	-19.43	47622.63	-25.63		
eta	I	2035-12-30T16:54:44.291		21.83	-19.39	47176.12	-25.63		
beta	I	2035-12-30T16:55:43.610		21.70	-19.26	45657.96	-25.60		
alpha	I	2035-12-30T16:56:19.914		21.63	-19.18	44727.42	-25.58		
4	I	2035-12-30T16:57:43.327		21.46	-18.99	42597.11	-25.53		
5	I	2035-12-30T16:57:59.992		21.42	-18.95	42187.41	-25.54		
6	I	2035-12-30T16:58:11.733		21.40	-18.92	41877.30	-25.52		
Uranus	I	2035-12-30T17:07:53.798		20.16	-17.59	25255.05		-20.74	-21.63
Uranus	E	2035-12-30T17:41:42.794		15.44	-12.58	25088.90		26.27	27.34
6	E	2035-12-30T17:50:49.235		14.08	-11.15	41794.80	25.45		
5	E	2035-12-30T17:51:08.991		14.03	-11.10	42303.38	25.47		
4	E	2035-12-30T17:51:18.602		14.00	-11.07	42533.30	25.46		
alpha	E	2035-12-30T17:52:43.869		13.79	-10.84	44698.49	25.50		
beta	E	2035-12-30T17:53:21.859		13.69	-10.74	45671.05	25.53		
eta	E	2035-12-30T17:54:20.821		13.54	-10.59	47176.12	25.55		
gamma	E	2035-12-30T17:54:38.622		13.49	-10.54	47630.99	25.56		
delta	E	2035-12-30T17:55:04.807		13.43	-10.47	48300.35	25.57		
lambda	E	2035-12-30T17:56:12.298		13.25	-10.29	50026.71	25.59		
epsilon	E	2035-12-30T17:57:11.892		13.10	-10.13	51552.36	25.61		