

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-01-08T02:12:23.890  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3425257618521111040  
 2Mass ID (if available) : 06130810+2340462

Uranus 2034-01-08T02:12:23 K14.63 G17.29 PgtRgt

ICRS Star Coord at Epoch: 06h 13m 08.09354s +23:40:46.41061s

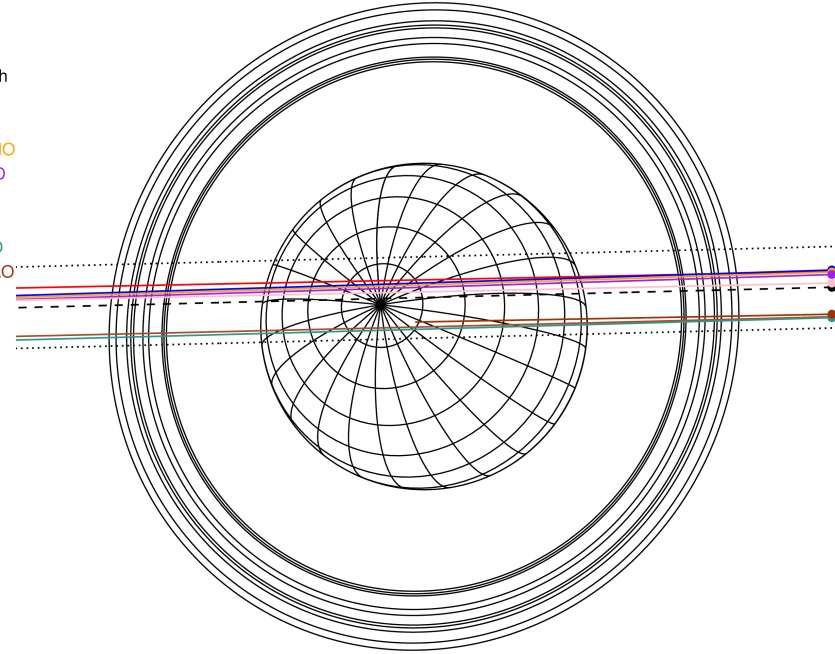
RUWE (>1.4 is poor) : 1.01  
 K magnitude : 14.632  
 G magnitude : 17.286  
 RP magnitude : 16.443  
 BP magnitude : 18.024  
 DUPflag : 0  
 Distance (au) : 17.997  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.46  
 Sun-Target sep (deg) : 165.62  
 Sun-Moon sep (deg) : 54.78  
 B (ring opening deg) : 72.72  
 PA of pole (deg) : 63.41

Uranus 2034-01-08T02:12:23 K14.63 G17.29  
 PgtRgt



2034-01-08T02:12:23.8900 ra: 06 13 08.0935 s: +23 40 46.4111 C/A 0.355 PA 181.44 deg v\_sky -22.46 km/s D 18.00 AU  
 Credit: Styled after SORA/Lucky Star

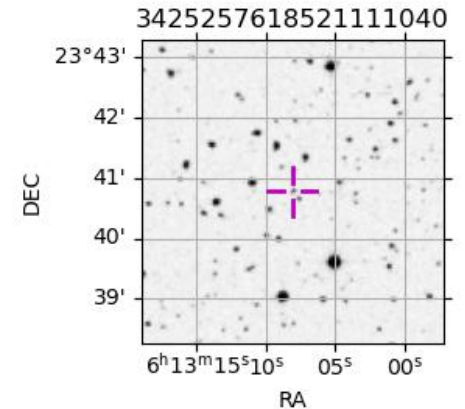
Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 RIO  
 ESO  
 SAAO



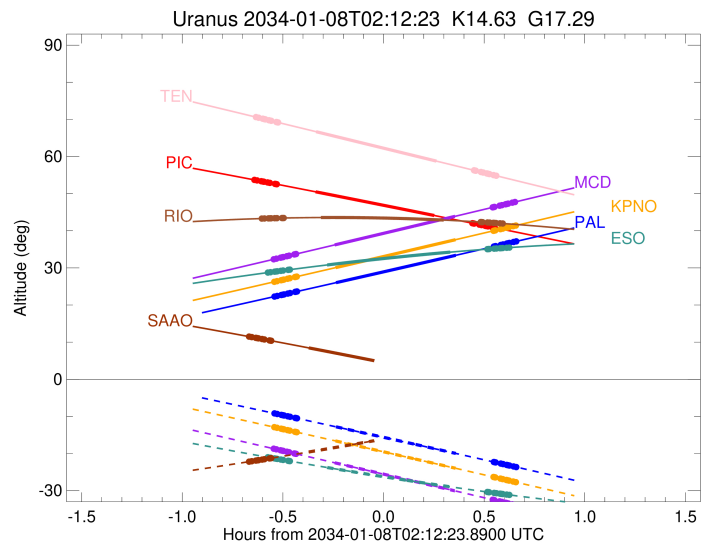
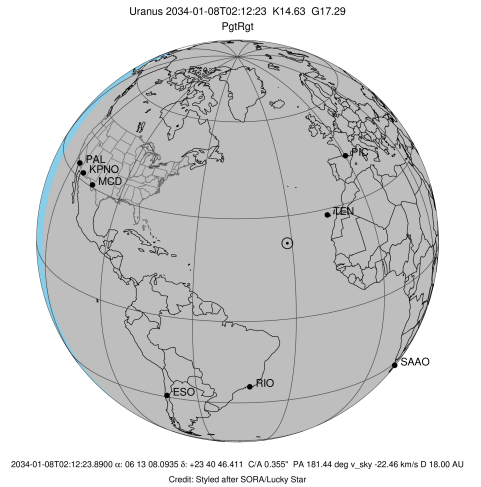
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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	+++++	+ +	+++++	JAN 08 01:34 - JAN 08 02:45	PieRie
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	JAN 08 01:40 - JAN 08 02:51	PieRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	JAN 08 01:39 - JAN 08 02:51	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	JAN 08 01:39 - JAN 08 02:51	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	JAN 08 01:34 - JAN 08 02:46	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++	+ +	+++++	JAN 08 01:36 - JAN 08 02:47	PieRie
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	JAN 08 01:37 - JAN 08 02:49	PieRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++	+		JAN 08 01:32 - JAN 08 01:50	PinRin
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



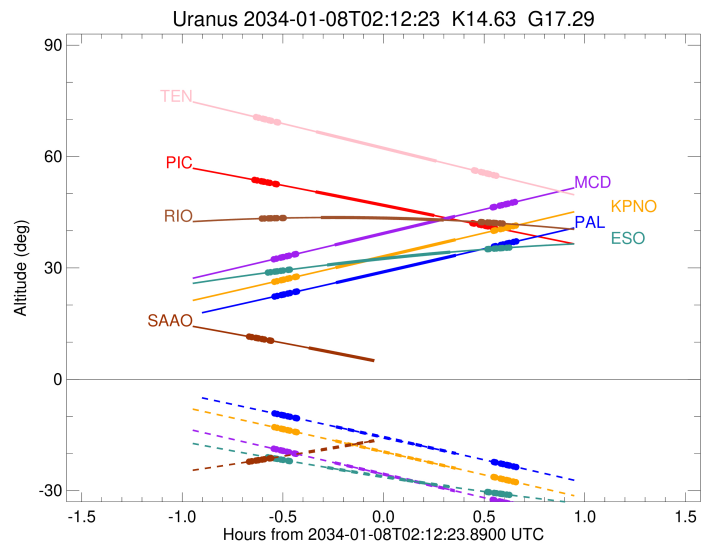
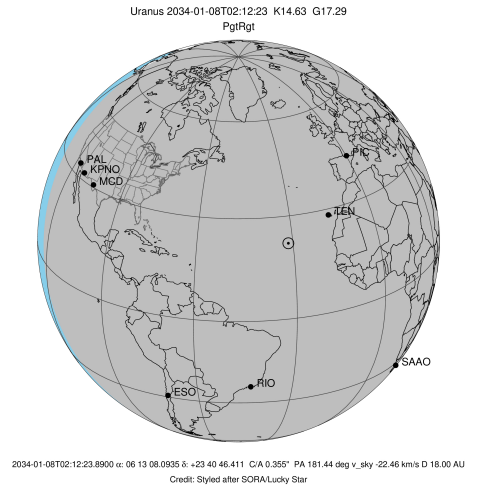
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-01-08T02:09:54.650  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 3425257618521111040  
 2Mass ID (if available) : 06130810+2340462  
 ICRS Star Coord at Epoch: 06h 13m 08.09354s +23:40:46.41061s  
 RUWE (>1.4 is poor) : 1.01  
 K magnitude : 14.632  
 G magnitude : 17.286  
 RP magnitude : 16.443  
 BP magnitude : 18.024  
 DUPflag : 0  
 Distance (au) : 17.997  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.46  
 Sun-Target sep (deg) : 165.62  
 Sun-Moon sep (deg) : 55.08  
 B (ring opening deg) : 72.72  
 PA of pole (deg) : 63.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.560  
 C/A sky separation (km) : 7305.9  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl1.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	2034-01-08T01:34:00.625		53.69	-62.51	51019.77	-23.30		
lambda	I	2034-01-08T01:34:43.209		53.56	-62.41	50026.71	-23.31		
delta	I	2034-01-08T01:35:57.287		53.35	-62.24	48300.35	-23.29		
gamma	I	2034-01-08T01:36:26.083		53.27	-62.17	47629.69	-23.29		
eta	I	2034-01-08T01:36:45.565		53.21	-62.13	47176.12	-23.28		
beta	I	2034-01-08T01:37:50.452		53.02	-61.97	45666.53	-23.26		
alpha	I	2034-01-08T01:38:32.380		52.90	-61.87	44689.41	-23.24		
4	I	2034-01-08T01:40:05.145		52.63	-61.65	42542.62	-23.21		
5	I	2034-01-08T01:40:14.583		52.60	-61.63	42315.25	-23.20		
6	I	2034-01-08T01:40:36.627		52.54	-61.58	41801.11	-23.19		
Uranus	I	2034-01-08T01:52:08.621		50.50	-59.88	25283.81		-12.22	-12.78
Uranus	E	2034-01-08T02:27:30.593		44.12	-54.20	25043.37		16.96	17.72
6	E	2034-01-08T02:38:54.987		42.04	-52.26	41878.91	23.12		
5	E	2034-01-08T02:39:06.983		42.00	-52.22	42159.46	23.13		
4	E	2034-01-08T02:39:24.820		41.95	-52.17	42585.98	23.14		
alpha	E	2034-01-08T02:40:58.716		41.66	-51.90	44751.72	23.17		
beta	E	2034-01-08T02:41:37.949		41.54	-51.79	45662.24	23.18		
eta	E	2034-01-08T02:42:43.225		41.34	-51.60	47176.12	23.20		
gamma	E	2034-01-08T02:43:02.432		41.28	-51.54	47621.76	23.21		
delta	E	2034-01-08T02:43:31.670		41.19	-51.46	48300.35	23.21		
lambda	E	2034-01-08T02:44:46.012		40.96	-51.25	50026.71	23.23		
epsilon	E	2034-01-08T02:45:34.642		40.81	-51.10	51156.69	23.21		

```

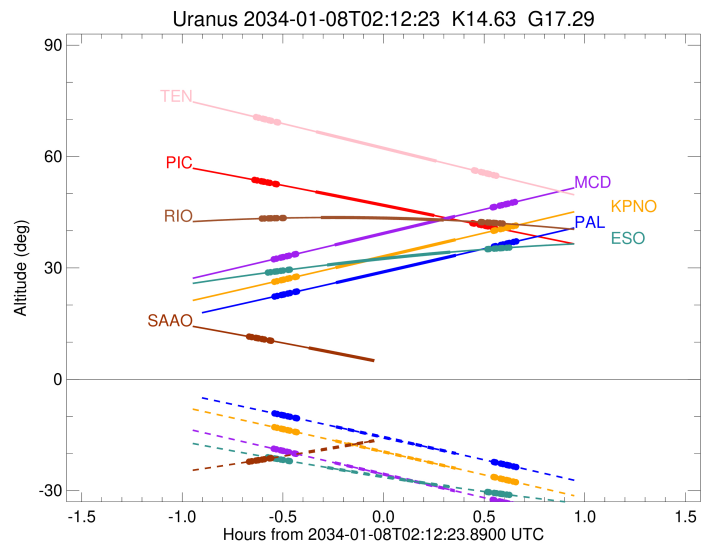
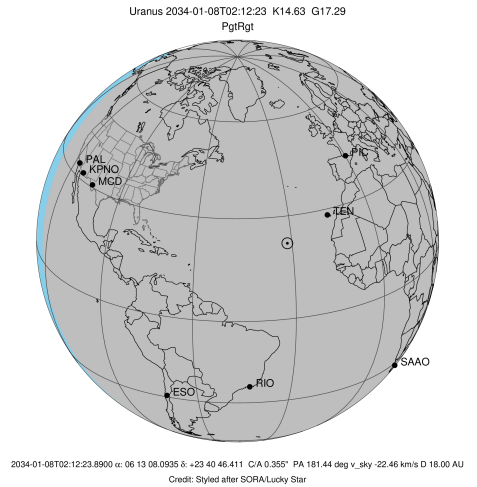
target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2034-01-08T02:16:10.350
Event type          : PgtRgt
: Ring occs: geocentric, topocentric
Observer code       : PAL
Location            : Palomar Mt (200")
Latitude (deg)      : 33.35622
E. Longitude (deg) : 243.13601
Altitude (km)       : 1.706
Gaia source ID      : 3425257618521111040
2Mass ID (if available) : 06130810+2340462
ICRS Star Coord at Epoch: 06h 13m 08.09354s +23:40:46.41061s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 14.632
G magnitude          : 17.286
RP magnitude         : 16.443
BP magnitude         : 18.024
DUPflag             : 0
Distance (au)       : 17.997
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -22.46
Sun-Target sep (deg) : 165.62
Sun-Moon sep (deg)  : 55.59
B (ring opening deg) : 72.72
PA of pole (deg)    : 63.41
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.523
C/A sky separation (km) : 6821.0
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_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	2034-01-08T01:40:00.165		22.30	-9.21	51019.46	-23.14		
lambda	I	2034-01-08T01:40:43.038		22.45	-9.35	50026.71	-23.15		
delta	I	2034-01-08T01:41:57.627		22.70	-9.60	48300.35	-23.14		
gamma	I	2034-01-08T01:42:26.617		22.80	-9.69	47629.69	-23.13		
eta	I	2034-01-08T01:42:46.228		22.86	-9.76	47176.12	-23.13		
beta	I	2034-01-08T01:43:51.537		23.09	-9.97	45666.52	-23.11		
alpha	I	2034-01-08T01:44:33.729		23.23	-10.11	44689.40	-23.10		
4	I	2034-01-08T01:46:07.050		23.55	-10.41	42542.66	-23.07		
5	I	2034-01-08T01:46:16.544		23.58	-10.45	42315.25	-23.07		
6	I	2034-01-08T01:46:38.717		23.65	-10.52	41801.08	-23.06		
Uranus	I	2034-01-08T01:58:13.004		26.02	-12.81	25279.00		-12.33	-12.89
Uranus	E	2034-01-08T02:33:55.897		33.39	-19.98	25049.79		16.85	17.60
6	E	2034-01-08T02:45:19.368		35.76	-22.29	41878.72	23.15		
5	E	2034-01-08T02:45:31.333		35.80	-22.33	42158.89	23.16		
4	E	2034-01-08T02:45:49.227		35.86	-22.39	42586.92	23.16		
alpha	E	2034-01-08T02:47:22.965		36.19	-22.71	44751.56	23.20		
beta	E	2034-01-08T02:48:02.136		36.32	-22.85	45661.81	23.21		
eta	E	2034-01-08T02:49:07.354		36.55	-23.07	47176.12	23.23		
gamma	E	2034-01-08T02:49:26.540		36.62	-23.13	47621.82	23.23		
delta	E	2034-01-08T02:49:55.739		36.72	-23.23	48300.35	23.24		
lambda	E	2034-01-08T02:51:09.988		36.98	-23.49	50026.71	23.26		
epsilon	E	2034-01-08T02:51:58.909		37.15	-23.65	51164.89	23.25		

```

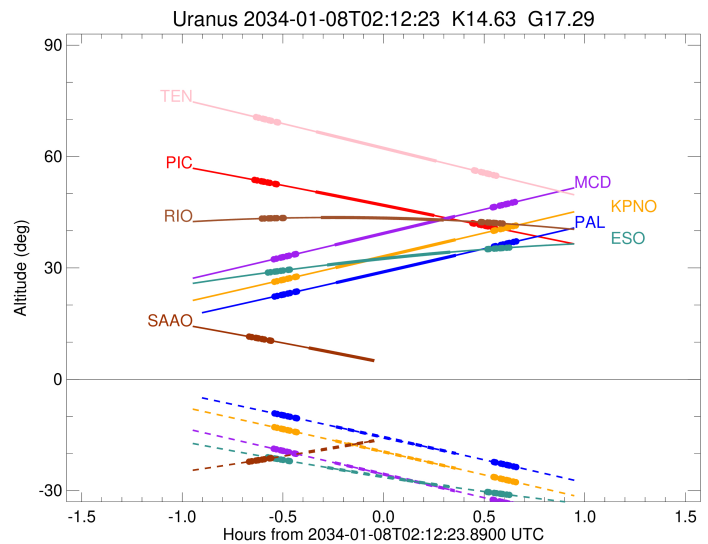
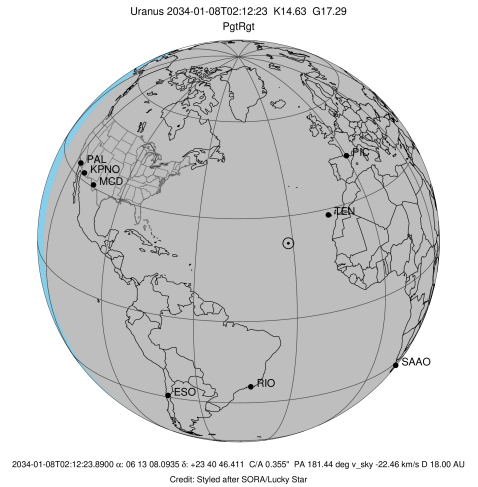
target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2034-01-08T02:16:04.410
Event type           : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 3425257618521111040
2Mass ID (if available) : 06130810+2340462
ICRS Star Coord at Epoch: 06h 13m 08.09354s +23:40:46.41061s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 14.632
G magnitude           : 17.286
RP magnitude          : 16.443
BP magnitude          : 18.024
DUPflag              : 0
Distance (au)        : 17.997
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -22.46
Sun-Target sep (deg) : 165.62
Sun-Moon sep (deg)   : 55.62
B (ring opening deg) : 72.72
PA of pole (deg)     : 63.41
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.499
C/A sky separation (km) : 6511.5
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	2034-01-08T01:39:56.320		26.28	-12.93	51021.90	-23.19		
lambda	I	2034-01-08T01:40:39.193		26.43	-13.07	50026.71	-23.21		
delta	I	2034-01-08T01:41:53.596		26.68	-13.32	48300.35	-23.20		
gamma	I	2034-01-08T01:42:22.511		26.78	-13.42	47629.72	-23.19		
eta	I	2034-01-08T01:42:42.072		26.85	-13.48	47176.12	-23.19		
beta	I	2034-01-08T01:43:47.217		27.08	-13.70	45666.38	-23.17		
alpha	I	2034-01-08T01:44:29.297		27.22	-13.84	44689.28	-23.16		
4	I	2034-01-08T01:46:02.347		27.55	-14.16	42542.93	-23.14		
5	I	2034-01-08T01:46:11.820		27.58	-14.19	42315.25	-23.13		
6	I	2034-01-08T01:46:33.937		27.66	-14.26	41800.90	-23.13		
Uranus	I	2034-01-08T01:58:05.333		30.06	-16.61	25272.18		-12.48	-13.05
Uranus	E	2034-01-08T02:33:52.223		37.60	-23.97	25052.64		16.80	17.55
6	E	2034-01-08T02:45:13.428		40.00	-26.33	41878.65	23.21		
5	E	2034-01-08T02:45:25.356		40.04	-26.37	42158.71	23.22		
4	E	2034-01-08T02:45:43.227		40.11	-26.44	42587.23	23.23		
alpha	E	2034-01-08T02:47:16.704		40.44	-26.76	44751.51	23.26		
beta	E	2034-01-08T02:47:55.771		40.58	-26.90	45661.68	23.27		
eta	E	2034-01-08T02:49:00.833		40.81	-27.12	47176.12	23.29		
gamma	E	2034-01-08T02:49:19.972		40.87	-27.19	47621.84	23.29		
delta	E	2034-01-08T02:49:49.100		40.98	-27.29	48300.35	23.30		
lambda	E	2034-01-08T02:51:03.173		41.24	-27.55	50026.71	23.31		
epsilon	E	2034-01-08T02:51:52.083		41.41	-27.72	51167.29	23.30		

```

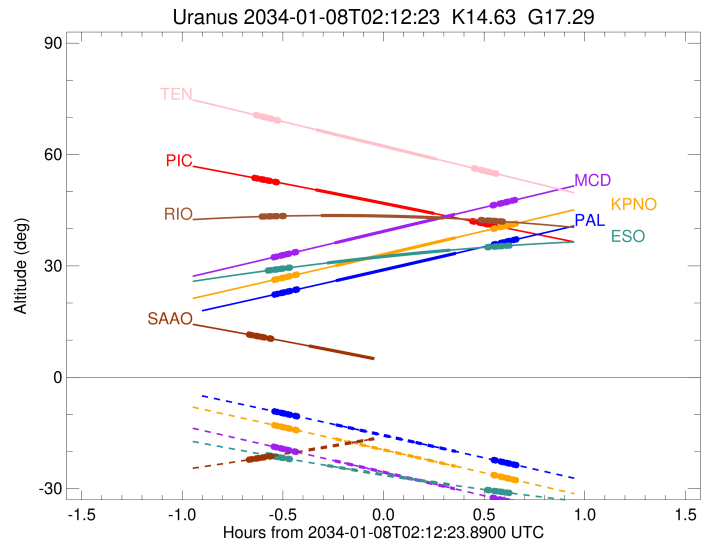
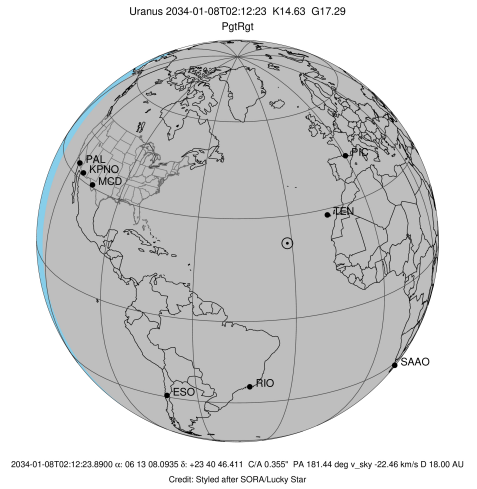
target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2034-01-08T02:15:50.600
Event type          : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : MCD
Location            : McDonald Obs. 2.7m
Latitude (deg)      : 30.67158
E. Longitude (deg)  : 255.97844
Altitude (km)       : 2.075
Gaia source ID      : 3425257618521111040
2Mass ID (if available) : 06130810+2340462
ICRS Star Coord at Epoch: 06h 13m 08.09354s +23:40:46.41061s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 14.632
G magnitude          : 17.286
RP magnitude         : 16.443
BP magnitude         : 18.024
DUPflag             : 0
Distance (au)       : 17.997
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -22.46
Sun-Target sep (deg) : 165.62
Sun-Moon sep (deg)  : 55.67
B (ring opening deg) : 72.72
PA of pole (deg)    : 63.41
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.471
C/A sky separation (km) : 6144.5
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	2034-01-08T01:39:45.749		32.34	-18.73	51024.87	-23.27		
lambda	I	2034-01-08T01:40:28.612		32.49	-18.87	50026.71	-23.28		
delta	I	2034-01-08T01:41:42.774		32.75	-19.13	48300.35	-23.27		
gamma	I	2034-01-08T01:42:11.592		32.86	-19.23	47629.75	-23.27		
eta	I	2034-01-08T01:42:31.090		32.93	-19.30	47176.12	-23.26		
beta	I	2034-01-08T01:43:36.023		33.16	-19.52	45666.22	-23.25		
alpha	I	2034-01-08T01:44:17.959		33.30	-19.67	44689.13	-23.24		
4	I	2034-01-08T01:45:50.664		33.63	-19.99	42543.26	-23.22		
5	I	2034-01-08T01:46:00.110		33.67	-20.02	42315.25	-23.21		
6	I	2034-01-08T01:46:22.156		33.74	-20.10	41800.70	-23.21		
Uranus	I	2034-01-08T01:57:50.013		36.19	-22.49	25264.04		-12.66	-13.24
Uranus	E	2034-01-08T02:33:40.589		43.88	-30.06	25056.16		16.74	17.48
6	E	2034-01-08T02:44:59.070		46.32	-32.46	41878.57	23.29		
5	E	2034-01-08T02:45:10.952		46.36	-32.50	42158.50	23.30		
4	E	2034-01-08T02:45:28.793		46.43	-32.57	42587.58	23.30		
alpha	E	2034-01-08T02:47:01.950		46.76	-32.90	44751.45	23.33		
beta	E	2034-01-08T02:47:40.888		46.90	-33.03	45661.52	23.34		
eta	E	2034-01-08T02:48:45.757		47.13	-33.27	47176.12	23.36		
gamma	E	2034-01-08T02:49:04.840		47.20	-33.33	47621.86	23.36		
delta	E	2034-01-08T02:49:33.879		47.31	-33.44	48300.35	23.37		
lambda	E	2034-01-08T02:50:47.734		47.57	-33.70	50026.71	23.38		
epsilon	E	2034-01-08T02:51:36.622		47.75	-33.87	51170.06	23.37		

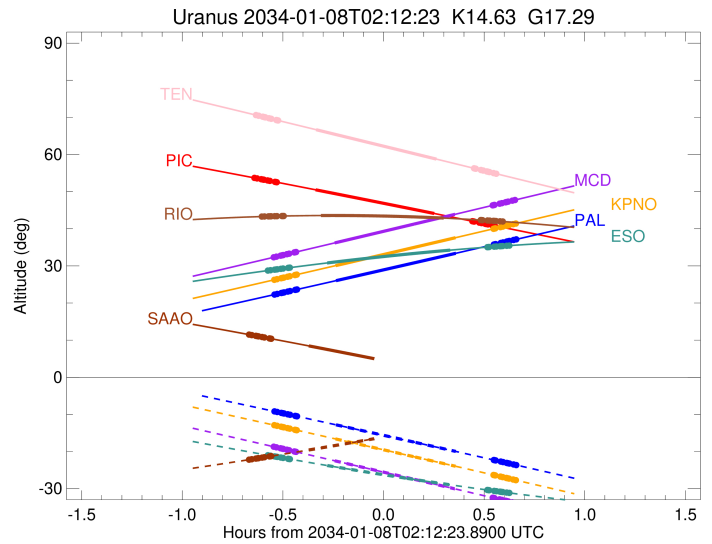
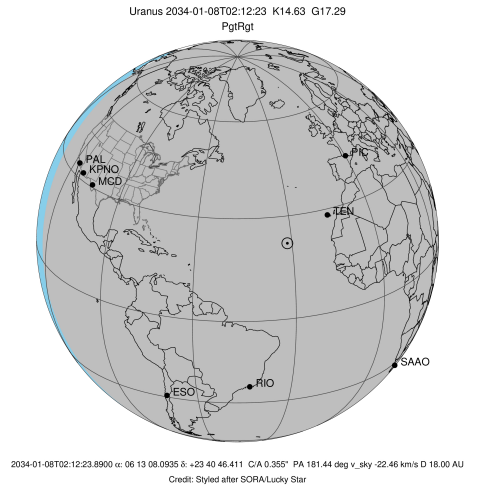


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-01-08T02:10:18.830  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : TEN  
 Location : Teide Obs./Tenerife  
 Latitude (deg) : 28.30050  
 E. Longitude (deg) : 343.48909  
 Altitude (km) : 2.395  
 Gaia source ID : 3425257618521111040  
 2Mass ID (if available) : 06130810+2340462  
 ICRS Star Coord at Epoch: 06h 13m 08.09354s +23:40:46.41061s  
 RUWE (>1.4 is poor) : 1.01  
 K magnitude : 14.632  
 G magnitude : 17.286  
 RP magnitude : 16.443  
 BP magnitude : 18.024  
 DUPflag : 0  
 Distance (au) : 17.997  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.46  
 Sun-Target sep (deg) : 165.62  
 Sun-Moon sep (deg) : 55.23  
 B (ring opening deg) : 72.72  
 PA of pole (deg) : 63.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.415  
 C/A sky separation (km) : 5419.9  
 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



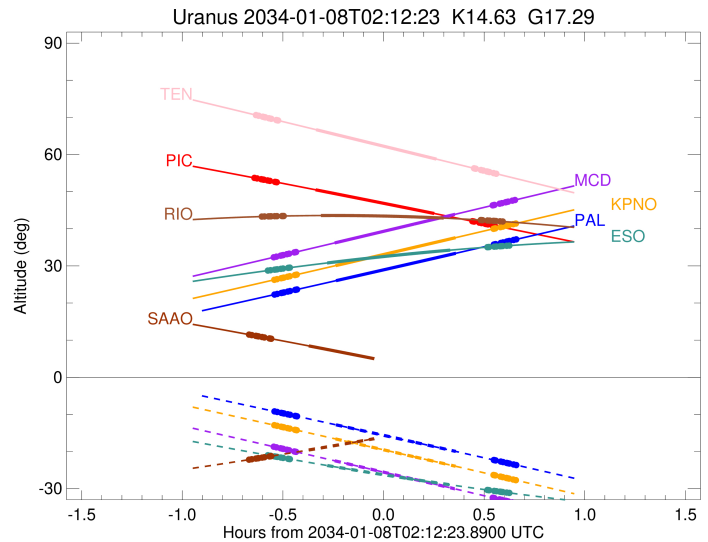
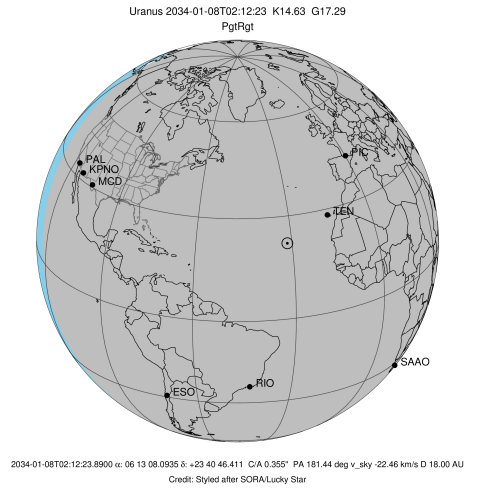
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-01-08T01:34:28.094		70.61	-82.29	51034.01	-23.53		
lambda	I	2034-01-08T01:35:10.868		70.45	-82.19	50026.71	-23.55		
delta	I	2034-01-08T01:36:24.203		70.18	-82.01	48300.35	-23.53		
gamma	I	2034-01-08T01:36:52.696		70.08	-81.93	47629.85	-23.53		
eta	I	2034-01-08T01:37:11.980		70.01	-81.88	47176.12	-23.53		
beta	I	2034-01-08T01:38:16.207		69.77	-81.71	45665.72	-23.52		
alpha	I	2034-01-08T01:38:57.672		69.62	-81.60	44688.70	-23.51		
4	I	2034-01-08T01:40:29.280		69.29	-81.35	42544.21	-23.49		
5	I	2034-01-08T01:40:38.643		69.25	-81.33	42315.21	-23.48		
6	I	2034-01-08T01:41:00.459		69.17	-81.27	41800.13	-23.47		
Uranus	I	2034-01-08T01:52:18.673		66.69	-79.24	25243.56		-13.11	-13.71
Uranus	E	2034-01-08T02:28:11.659		58.77	-71.91	25061.28		16.65	17.39
6	E	2034-01-08T02:39:25.382		56.28	-69.50	41878.48	23.42		
5	E	2034-01-08T02:39:37.196		56.24	-69.46	42158.31	23.42		
4	E	2034-01-08T02:39:54.971		56.17	-69.40	42587.93	23.43		
alpha	E	2034-01-08T02:41:27.645		55.83	-69.06	44751.39	23.44		
beta	E	2034-01-08T02:42:06.395		55.69	-68.92	45661.38	23.45		
eta	E	2034-01-08T02:43:10.977		55.45	-68.69	47176.12	23.46		
gamma	E	2034-01-08T02:43:29.977		55.38	-68.62	47621.88	23.46		
delta	E	2034-01-08T02:43:58.891		55.28	-68.52	48300.35	23.47		
lambda	E	2034-01-08T02:45:12.444		55.00	-68.25	50026.71	23.48		
epsilon	E	2034-01-08T02:46:01.228		54.82	-68.08	51172.10	23.46		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-01-08T02:12:01.120  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : RIO  
 Location : Rio de Janeiro  
 Latitude (deg) : -22.89506  
 E. Longitude (deg) : 316.77708  
 Altitude (km) : 0.033  
 Gaia source ID : 3425257618521111040  
 2Mass ID (if available) : 06130810+2340462  
 ICRS Star Coord at Epoch: 06h 13m 08.09354s +23:40:46.41061s  
 RUWE (>1.4 is poor) : 1.01  
 K magnitude : 14.632  
 G magnitude : 17.286  
 RP magnitude : 16.443  
 BP magnitude : 18.024  
 DUPflag : 0  
 Distance (au) : 17.997  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.46  
 Sun-Target sep (deg) : 165.62  
 Sun-Moon sep (deg) : 55.24  
 B (ring opening deg) : 72.72  
 PA of pole (deg) : 63.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.005  
 C/A sky separation (km) : 59.9  
 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	2034-01-08T01:36:10.353		43.29	-40.65	51075.62	-23.73		
lambda	I	2034-01-08T01:36:54.549		43.31	-40.73	50026.71	-23.73		
delta	I	2034-01-08T01:38:07.291		43.34	-40.85	48300.35	-23.73		
gamma	I	2034-01-08T01:38:35.526		43.36	-40.89	47630.27	-23.73		
eta	I	2034-01-08T01:38:54.662		43.36	-40.92	47176.12	-23.73		
beta	I	2034-01-08T01:39:58.411		43.39	-41.03	45663.38	-23.73		
alpha	I	2034-01-08T01:40:39.476		43.40	-41.09	44686.97	-23.73		
4	I	2034-01-08T01:42:09.914		43.43	-41.23	42549.05	-23.73		
5	I	2034-01-08T01:42:19.335		43.44	-41.25	42314.20	-23.73		
6	I	2034-01-08T01:42:40.970		43.44	-41.28	41797.77	-23.73		
Uranus	I	2034-01-08T01:53:42.940		43.57	-42.25	25138.85		-15.22	-15.91
Uranus	E	2034-01-08T02:30:19.577		42.88	-44.45	25140.65		15.19	15.87
6	E	2034-01-08T02:41:25.246		42.35	-44.79	41876.71	23.71		
5	E	2034-01-08T02:41:36.887		42.34	-44.80	42155.87	23.72		
4	E	2034-01-08T02:41:54.860		42.32	-44.81	42593.38	23.72		
alpha	E	2034-01-08T02:43:26.139		42.23	-44.84	44750.07	23.72		
beta	E	2034-01-08T02:44:04.377		42.20	-44.85	45658.89	23.72		
eta	E	2034-01-08T02:45:08.352		42.13	-44.87	47176.12	23.72		
gamma	E	2034-01-08T02:45:27.162		42.12	-44.88	47622.26	23.72		
delta	E	2034-01-08T02:45:55.752		42.09	-44.89	48300.35	23.72		
lambda	E	2034-01-08T02:47:08.538		42.01	-44.91	50026.71	23.72		
epsilon	E	2034-01-08T02:47:58.721		41.96	-44.92	51216.96	23.72		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-01-08T02:13:55.770  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : ESO  
 Location : European Southern Obs. (3.6m)  
 Latitude (deg) : -29.26097  
 E. Longitude (deg) : 289.26831  
 Altitude (km) : 2.400  
 Gaia source ID : 3425257618521111040  
 2Mass ID (if available) : 06130810+2340462  
 ICRS Star Coord at Epoch: 06h 13m 08.09354s +23:40:46.41061s  
 RUWE (>1.4 is poor) : 1.01  
 K magnitude : 14.632  
 G magnitude : 17.286  
 RP magnitude : 16.443  
 BP magnitude : 18.024  
 DUPflag : 0  
 Distance (au) : 17.997  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.46  
 Sun-Target sep (deg) : 165.62  
 Sun-Moon sep (deg) : 55.35  
 B (ring opening deg) : 72.72  
 PA of pole (deg) : 63.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.032  
 C/A sky separation (km) : 413.7  
 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

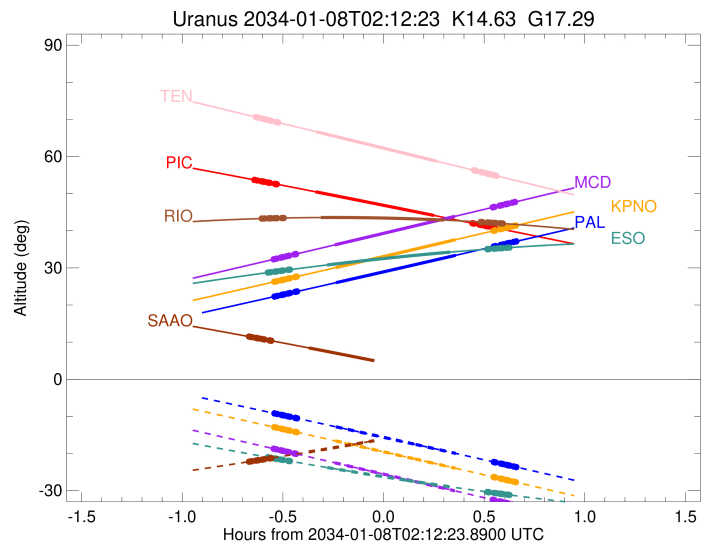
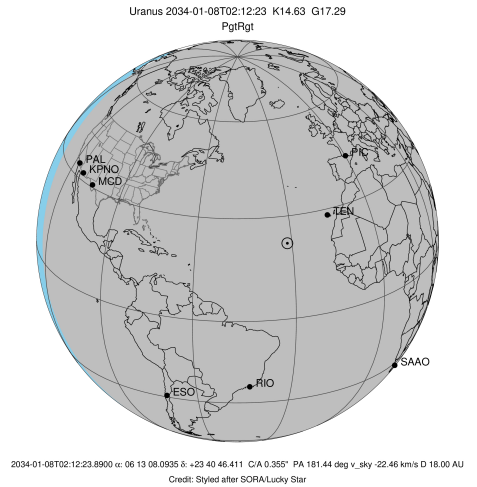


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-01-08T01:37:58.981		28.75	-21.02	51077.13	-23.65		
lambda	I	2034-01-08T01:38:43.406		28.84	-21.13	50026.71	-23.65		
delta	I	2034-01-08T01:39:56.416		28.99	-21.33	48300.35	-23.65		
gamma	I	2034-01-08T01:40:24.754		29.04	-21.40	47630.28	-23.65		
eta	I	2034-01-08T01:40:43.961		29.08	-21.46	47176.12	-23.65		
beta	I	2034-01-08T01:41:47.944		29.21	-21.62	45663.29	-23.65		
alpha	I	2034-01-08T01:42:29.157		29.29	-21.73	44686.91	-23.65		
4	I	2034-01-08T01:43:59.906		29.47	-21.97	42549.26	-23.65		
5	I	2034-01-08T01:44:09.369		29.49	-22.00	42314.13	-23.64		
6	I	2034-01-08T01:44:31.081		29.53	-22.05	41797.68	-23.64		
Uranus	I	2034-01-08T01:55:35.043		30.79	-23.77	25134.24		-15.31	-16.00
Uranus	E	2034-01-08T02:32:16.595		34.25	-28.96	25148.35		15.04	15.72
6	E	2034-01-08T02:43:23.734		35.05	-30.37	41876.53	23.68		
5	E	2034-01-08T02:43:35.394		35.07	-30.39	42155.72	23.68		
4	E	2034-01-08T02:43:53.426		35.09	-30.43	42593.83	23.69		
alpha	E	2034-01-08T02:45:24.802		35.19	-30.61	44749.92	23.69		
beta	E	2034-01-08T02:46:03.086		35.23	-30.69	45658.67	23.69		
eta	E	2034-01-08T02:47:07.152		35.30	-30.82	47176.12	23.69		
gamma	E	2034-01-08T02:47:25.988		35.32	-30.86	47622.30	23.69		
delta	E	2034-01-08T02:47:54.611		35.35	-30.91	48300.35	23.69		
lambda	E	2034-01-08T02:49:07.485		35.42	-31.06	50026.71	23.69		
epsilon	E	2034-01-08T02:49:57.900		35.47	-31.16	51221.07	23.69		



```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2034-01-08T02:08:37.890
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        : 3425257618521111040
2Mass ID (if available) : 06130810+2340462
ICRS Star Coord at Epoch: 06h 13m 08.09354s +23:40:46.41061s
RUWE (>1.4 is poor)  : 1.01
K magnitude           : 14.632
G magnitude           : 17.286
RP magnitude          : 16.443
BP magnitude          : 18.024
DUPflag              : 0
Distance (au)         : 17.997
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -22.46
Sun-Target sep (deg)  : 165.62
Sun-Moon sep (deg)    : 54.39
B (ring opening deg)  : 72.72
PA of pole (deg)      : 63.41
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.055
C/A sky separation (km) : 723.5
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_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	2034-01-08T01:32:23.065		11.48	-22.19	51071.74	-23.51		
lambda	I	2034-01-08T01:33:07.521		11.36	-22.08	50026.71	-23.51		
delta	I	2034-01-08T01:34:20.969		11.15	-21.91	48300.35	-23.50		
gamma	I	2034-01-08T01:34:49.481		11.07	-21.84	47630.23	-23.50		
eta	I	2034-01-08T01:35:08.803		11.02	-21.79	47176.12	-23.50		
beta	I	2034-01-08T01:36:13.171		10.84	-21.64	45663.61	-23.50		
alpha	I	2034-01-08T01:36:54.645		10.72	-21.54	44687.12	-23.50		
4	I	2034-01-08T01:38:26.016		10.46	-21.32	42548.54	-23.50		
5	I	2034-01-08T01:38:35.512		10.43	-21.30	42314.36	-23.49		
6	I	2034-01-08T01:38:57.365		10.37	-21.24	41797.98	-23.49		
Uranus	I	2034-01-08T01:50:06.930		8.45	-19.59	25150.02		-15.01	-15.69
Uranus	E	2034-01-08T02:27:09.268		1.81x	-13.68	25125.15		15.48	16.18
6	E	2034-01-08T02:38:23.342		-0.28x	-11.79	41877.08	23.39		
5	E	2034-01-08T02:38:35.144		-0.31x	-11.75	42156.20	23.39		
4	E	2034-01-08T02:38:53.298		-0.37x	-11.70	42592.43	23.39		
alpha	E	2034-01-08T02:40:25.916		-0.66x	-11.44	44750.34	23.39		
beta	E	2034-01-08T02:41:04.705		-0.78x	-11.32	45659.34	23.39		
eta	E	2034-01-08T02:42:09.567		-0.98x	-11.14	47176.12	23.39		
gamma	E	2034-01-08T02:42:28.642		-1.04x	-11.08	47622.19	23.39		
delta	E	2034-01-08T02:42:57.641		-1.13x	-11.00	48300.35	23.38		
lambda	E	2034-01-08T02:44:11.468		-1.36x	-10.79	50026.71	23.38		
epsilon	E	2034-01-08T02:45:02.019		-1.52x	-10.64	51208.76	23.38		