

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-02-12T18:02:24.330  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3379635415046266624  
 2Mass ID (if available) : 06480002+2322180

ICRS Star Coord at Epoch: 06h 48m 00.03076s +23:22:17.93954s

RUWE (>1.4 is poor) : 1.05  
 K magnitude : 14.914  
 G magnitude : 16.337  
 RP magnitude : 15.850  
 BP magnitude : 16.652  
 DUPflag : 0  
 Distance (au) : 18.075  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -15.67  
 Sun-Target sep (deg) : 137.90  
 Sun-Moon sep (deg) : 53.61  
 B (ring opening deg) : 65.34  
 PA of pole (deg) : 75.06

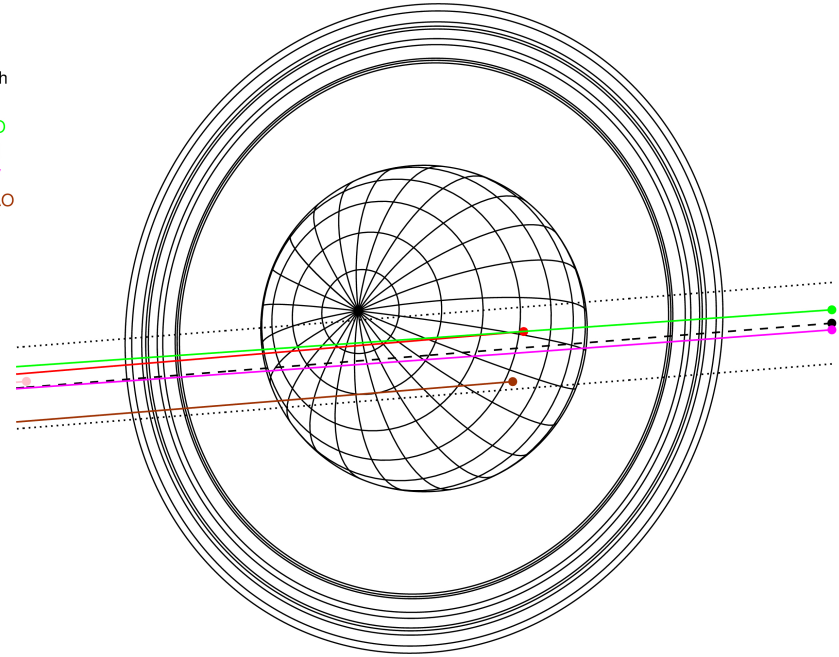
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2036-02-12T18:02:24.3300 a: 06 48 00.0308 & +23 22 17.940 C/A 0.317" PA 4.54 deg v\_sky -15.67 km/s D 18.08 AU  
 Credit: Styled after SORA/Lucky Star

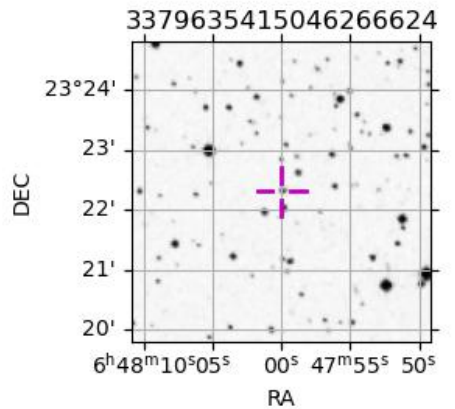
Uranus 2036-02-12T18:02:24 K14.91 G16.34 PgtRgt

Earth  
 PIC  
 PMO  
 TEN  
 KAV  
 SAAO

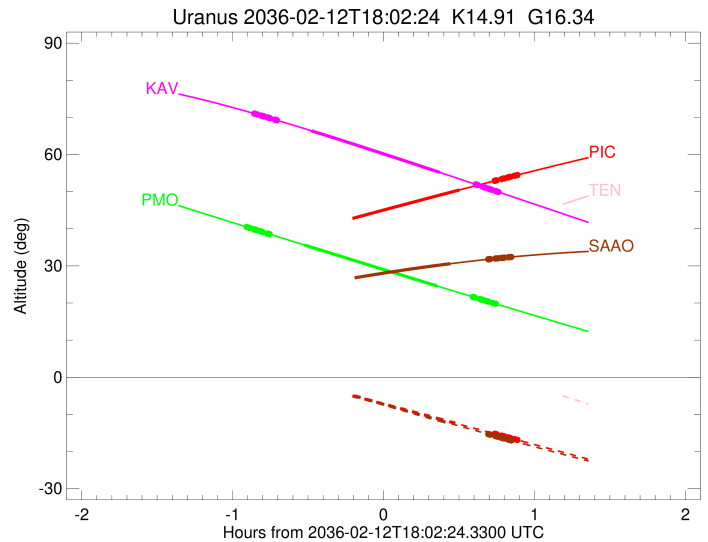
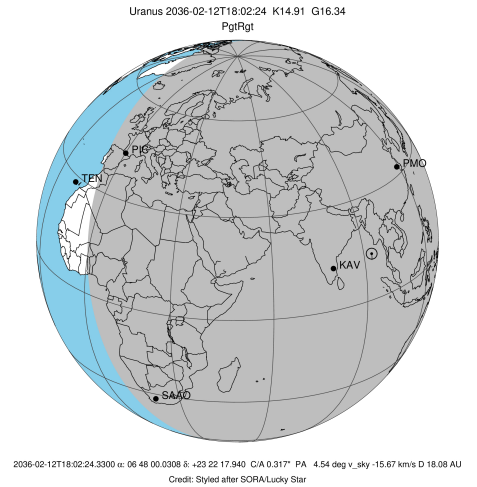


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1		+	+++++	FEB 12 18:32 - FEB 12 18:55	PneRne
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+	+++++	FEB 12 17:08 - FEB 12 18:47	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	+++++	+	+++++	FEB 12 17:11 - FEB 12 18:48	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					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8		+	+++++	FEB 12 18:29 - FEB 12 18:53	PneRne
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

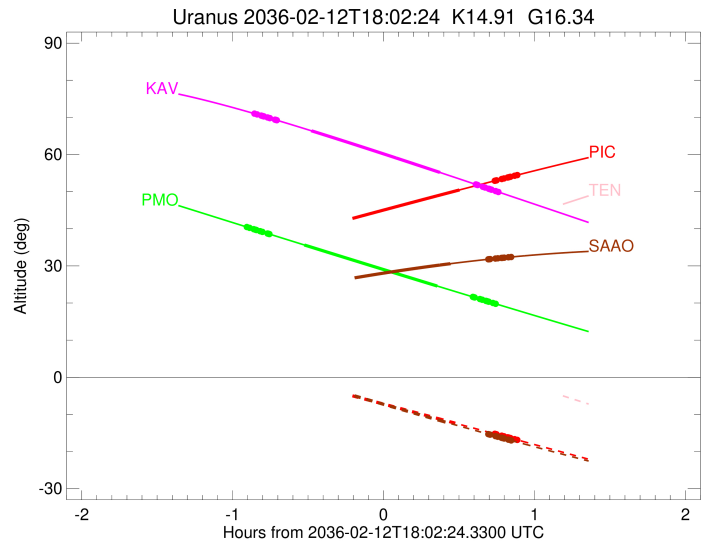
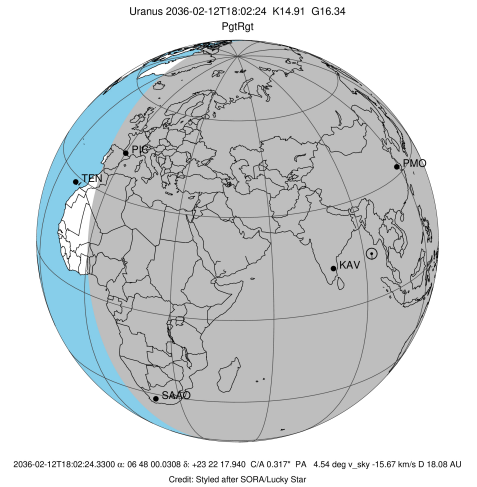


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-02-12T18:06:20.930  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 3379635415046266624  
 2Mass ID (if available) : 06480002+2322180  
 ICRS Star Coord at Epoch: 06h 48m 00.03076s +23:22:17.93954s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 14.914  
 G magnitude : 16.337  
 RP magnitude : 15.850  
 BP magnitude : 16.652  
 DUPflag : 0  
 Distance (au) : 18.075  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -15.67  
 Sun-Target sep (deg) : 137.90  
 Sun-Moon sep (deg) : 54.54  
 B (ring opening deg) : 65.34  
 PA of pole (deg) : 75.06  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.137  
 C/A sky separation (km) : 1799.6  
 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



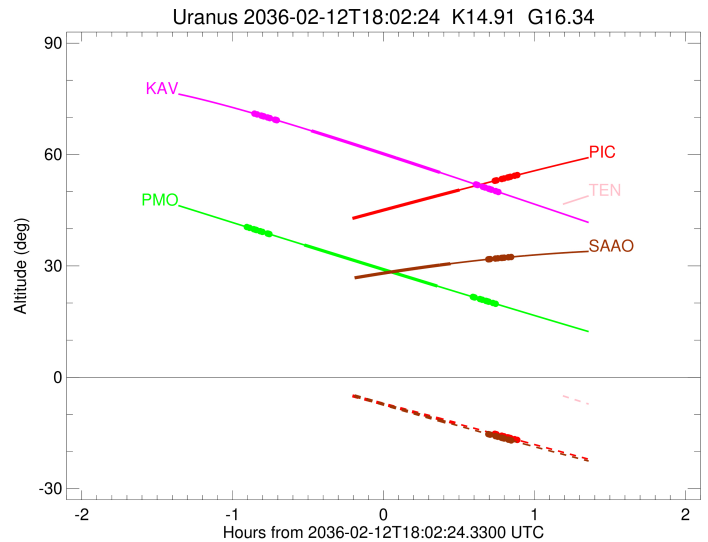
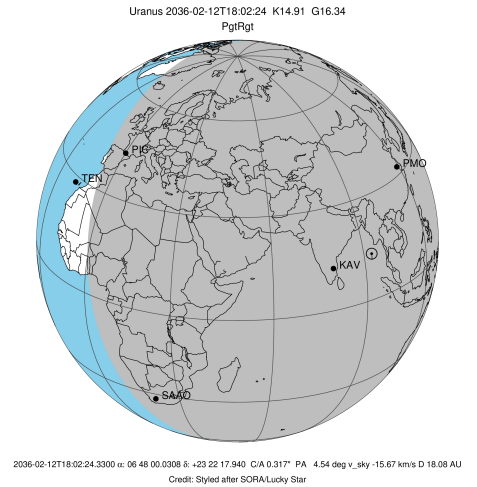
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-02-12T17:17:28.931		36.80	0.72x	50865.40	-17.25		
lambda	I	2036-02-12T17:18:17.547		36.95	0.58x	50026.71	-17.25		
delta	I	2036-02-12T17:19:57.617		37.26	0.29x	48300.35	-17.25		
gamma	I	2036-02-12T17:20:36.918		37.38	0.18x	47622.32	-17.25		
eta	I	2036-02-12T17:21:02.782		37.46	0.10x	47176.12	-17.25		
beta	I	2036-02-12T17:22:31.774		37.73	-0.16x	45642.36	-17.25		
alpha	I	2036-02-12T17:23:23.906		37.89	-0.31x	44746.63	-17.25		
4	I	2036-02-12T17:25:28.298		38.27	-0.67x	42584.92	-17.25		
5	I	2036-02-12T17:25:49.623		38.34	-0.73x	42217.16	-17.25		
6	I	2036-02-12T17:26:12.150		38.41	-0.80x	41818.95	-17.24		
Uranus	I	2036-02-12T17:40:04.407		40.96	-3.23x	25110.44		-23.68	-24.67
Uranus	E	2036-02-12T18:32:37.971		50.47	-12.68	25153.19		22.43	23.38
6	E	2036-02-12T18:46:39.171		52.93	-15.24	41852.22	17.32		
5	E	2036-02-12T18:47:02.185		52.99	-15.31	42259.02	17.33		
4	E	2036-02-12T18:47:19.138		53.04	-15.36	42554.01	17.32		
alpha	E	2036-02-12T18:49:21.455		53.40	-15.73	44689.01	17.33		
beta	E	2036-02-12T18:50:18.866		53.56	-15.91	45680.42	17.34		
eta	E	2036-02-12T18:51:45.229		53.81	-16.17	47176.12	17.34		
gamma	E	2036-02-12T18:52:11.436		53.89	-16.25	47630.46	17.34		
delta	E	2036-02-12T18:52:50.073		54.00	-16.37	48300.35	17.34		
lambda	E	2036-02-12T18:54:29.635		54.28	-16.67	50026.71	17.34		
epsilon	E	2036-02-12T18:55:51.679		54.52	-16.92	51449.49	17.35		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-02-12T17:57:18.350  
 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 : 3379635415046266624  
 2Mass ID (if available) : 06480002+2322180  
 ICRS Star Coord at Epoch: 06h 48m 00.03076s +23:22:17.93954s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 14.914  
 G magnitude : 16.337  
 RP magnitude : 15.850  
 BP magnitude : 16.652  
 DUPflag : 0  
 Distance (au) : 18.075  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -15.67  
 Sun-Target sep (deg) : 137.90  
 Sun-Moon sep (deg) : 53.55  
 B (ring opening deg) : 65.34  
 PA of pole (deg) : 75.06  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.118  
 C/A sky separation (km) : 1543.6  
 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\_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	2036-02-12T17:08:21.676		40.41	-68.53	50868.02	-17.31		
lambda	I	2036-02-12T17:09:10.283		40.24	-68.43	50026.71	-17.31		
delta	I	2036-02-12T17:10:50.041		39.89	-68.23	48300.35	-17.30		
gamma	I	2036-02-12T17:11:29.225		39.75	-68.15	47622.35	-17.30		
eta	I	2036-02-12T17:11:55.017		39.66	-68.09	47176.12	-17.30		
beta	I	2036-02-12T17:13:23.768		39.35	-67.90	45642.42	-17.30		
alpha	I	2036-02-12T17:14:15.782		39.16	-67.79	44746.48	-17.30		
4	I	2036-02-12T17:16:19.903		38.73	-67.51	42584.58	-17.28		
5	I	2036-02-12T17:16:41.137		38.65	-67.47	42217.77	-17.28		
6	I	2036-02-12T17:17:03.663		38.57	-67.42	41818.65	-17.28		
Uranus	I	2036-02-12T17:30:54.856		35.64	-65.41	25109.20		-23.72	-24.71
Uranus	E	2036-02-12T18:23:49.022		24.57	-56.10	25144.65		22.68	23.64
6	E	2036-02-12T18:37:57.105		21.65	-53.35	41852.99	17.12		
5	E	2036-02-12T18:38:20.240		21.57	-53.28	42257.53	17.12		
4	E	2036-02-12T18:38:37.547		21.51	-53.22	42554.82	17.12		
alpha	E	2036-02-12T18:40:41.316		21.08	-52.81	44689.33	17.12		
beta	E	2036-02-12T18:41:39.414		20.89	-52.62	45680.31	17.12		
eta	E	2036-02-12T18:43:06.877		20.59	-52.33	47176.12	17.12		
gamma	E	2036-02-12T18:43:33.416		20.49	-52.24	47630.40	17.12		
delta	E	2036-02-12T18:44:12.555		20.36	-52.11	48300.35	17.12		
lambda	E	2036-02-12T18:45:53.421		20.02	-51.78	50026.71	17.11		
epsilon	E	2036-02-12T18:47:16.265		19.73	-51.50	51444.42	17.11		

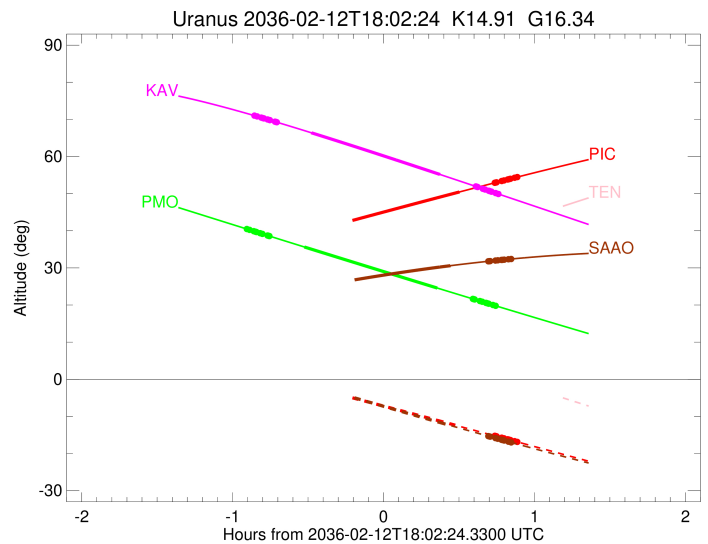
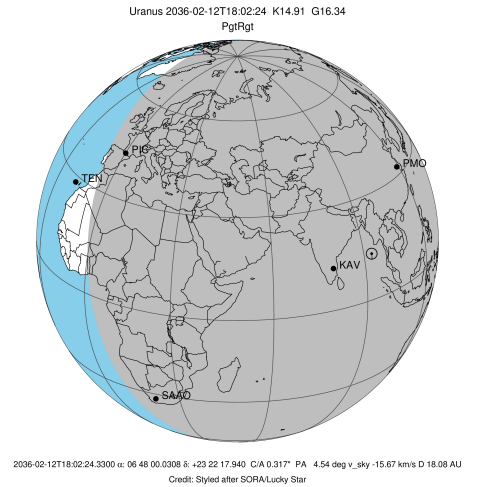
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-02-12T17:59:12.980  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : KAV  
 Location : Kavalur Observatory  
 Latitude (deg) : 12.57556  
 E. Longitude (deg) : 78.83167  
 Altitude (km) : 0.722  
 Gaia source ID : 3379635415046266624  
 2Mass ID (if available) : 06480002+2322180  
 ICRS Star Coord at Epoch: 06h 48m 00.03076s +23:22:17.93954s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 14.914  
 G magnitude : 16.337  
 RP magnitude : 15.850  
 BP magnitude : 16.652  
 DUPflag : 0  
 Distance (au) : 18.075  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -15.67  
 Sun-Target sep (deg) : 137.90  
 Sun-Moon sep (deg) : 54.03  
 B (ring opening deg) : 65.34  
 PA of pole (deg) : 75.06  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.373  
 C/A sky separation (km) : 4891.6  
 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\_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	2036-02-12T17:11:21.528		70.97	-63.82	50887.10	-17.48		
lambda	I	2036-02-12T17:12:10.792		70.81	-64.02	50026.71	-17.46		
delta	I	2036-02-12T17:13:49.673		70.48	-64.42	48300.35	-17.45		
gamma	I	2036-02-12T17:14:28.505		70.35	-64.58	47622.61	-17.45		
eta	I	2036-02-12T17:14:54.091		70.27	-64.69	47176.12	-17.45		
beta	I	2036-02-12T17:16:22.070		69.98	-65.04	45642.98	-17.44		
alpha	I	2036-02-12T17:17:13.772		69.80	-65.25	44745.00	-17.44		
4	I	2036-02-12T17:19:17.015		69.39	-65.75	42581.21	-17.42		
5	I	2036-02-12T17:19:37.615		69.32	-65.83	42223.89	-17.42		
6	I	2036-02-12T17:20:00.418		69.24	-65.93	41815.72	-17.41		
Uranus	I	2036-02-12T17:33:42.040		66.41	-69.25	25084.77		-24.41	-25.43
Uranus	E	2036-02-12T18:24:54.005		55.16	-81.67	25195.87		21.13	22.04
6	E	2036-02-12T18:39:07.855		51.94	-85.08	41849.67	17.30		
5	E	2036-02-12T18:39:31.373		51.85	-85.17	42263.76	17.32		
4	E	2036-02-12T18:39:47.864		51.79	-85.23	42551.44	17.31		
alpha	E	2036-02-12T18:41:50.371		51.33	-85.71	44688.08	17.33		
beta	E	2036-02-12T18:42:47.872		51.11	-85.94	45680.71	17.33		
eta	E	2036-02-12T18:44:14.236		50.78	-86.27	47176.12	17.33		
gamma	E	2036-02-12T18:44:40.457		50.68	-86.37	47630.63	17.33		
delta	E	2036-02-12T18:45:19.090		50.54	-86.52	48300.35	17.34		
lambda	E	2036-02-12T18:46:58.660		50.16	-86.90	50026.71	17.34		
epsilon	E	2036-02-12T18:48:21.463		49.85	-87.21	51462.64	17.35		

```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2036-02-12T18:04:38.180
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        : 3379635415046266624
2Mass ID (if available) : 06480002+2322180
ICRS Star Coord at Epoch: 06h 48m 00.03076s +23:22:17.93954s
RUWE (>1.4 is poor)  : 1.05
K magnitude           : 14.914
G magnitude           : 16.337
RP magnitude          : 15.850
BP magnitude          : 16.652
DUPflag              : 0
Distance (au)         : 18.075
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -15.67
Sun-Target sep (deg)  : 137.90
Sun-Moon sep (deg)    : 54.21
B (ring opening deg)  : 65.34
PA of pole (deg)      : 75.06
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.720
C/A sky separation (km) : 9436.8
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	2036-02-12T17:17:22.928		22.58	1.77x	50913.17	-17.12		
lambda	I	2036-02-12T17:18:14.793		22.69	1.60x	50026.71	-17.09		
delta	I	2036-02-12T17:19:55.896		22.92	1.25x	48300.35	-17.06		
gamma	I	2036-02-12T17:20:35.604		23.01	1.12x	47622.96	-17.05		
eta	I	2036-02-12T17:21:01.809		23.07	1.03x	47176.12	-17.05		
beta	I	2036-02-12T17:22:31.853		23.27	0.72x	45643.86	-17.03		
alpha	I	2036-02-12T17:23:25.003		23.38	0.54x	44742.88	-17.01		
4	I	2036-02-12T17:25:31.575		23.66	0.11x	42576.73	-16.96		
5	I	2036-02-12T17:25:52.086		23.71	0.04x	42231.98	-16.96		
6	I	2036-02-12T17:26:16.111		23.76	-0.04x	41812.08	-16.94		
Uranus	I	2036-02-12T17:40:26.664		25.55	-2.90x	25076.84		-24.64	-25.65
Uranus	E	2036-02-12T18:29:02.584		30.60	-12.46	25284.96		18.20	19.00
6	E	2036-02-12T18:44:05.254		31.78	-15.32	41844.68	16.99		
5	E	2036-02-12T18:44:30.140		31.81	-15.40	42272.49	17.01		
4	E	2036-02-12T18:44:46.049		31.83	-15.45	42546.75	17.01		
alpha	E	2036-02-12T18:46:50.870		31.98	-15.84	44686.59	17.06		
beta	E	2036-02-12T18:47:49.356		32.04	-16.02	45681.09	17.08		
eta	E	2036-02-12T18:49:16.920		32.14	-16.29	47176.12	17.10		
gamma	E	2036-02-12T18:49:43.512		32.17	-16.37	47630.93	17.11		
delta	E	2036-02-12T18:50:22.632		32.22	-16.50	48300.35	17.12		
lambda	E	2036-02-12T18:52:03.417		32.33	-16.81	50026.71	17.14		
epsilon	E	2036-02-12T18:53:28.552		32.42	-17.07	51486.83	17.17		