

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-08-08T11:12:25.890
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3416342129702544512
 2Mass ID (if available) : 05223038+2313244

Uranus 2030-08-08T11:12:25 K14.26 G17.36 PgtRgt

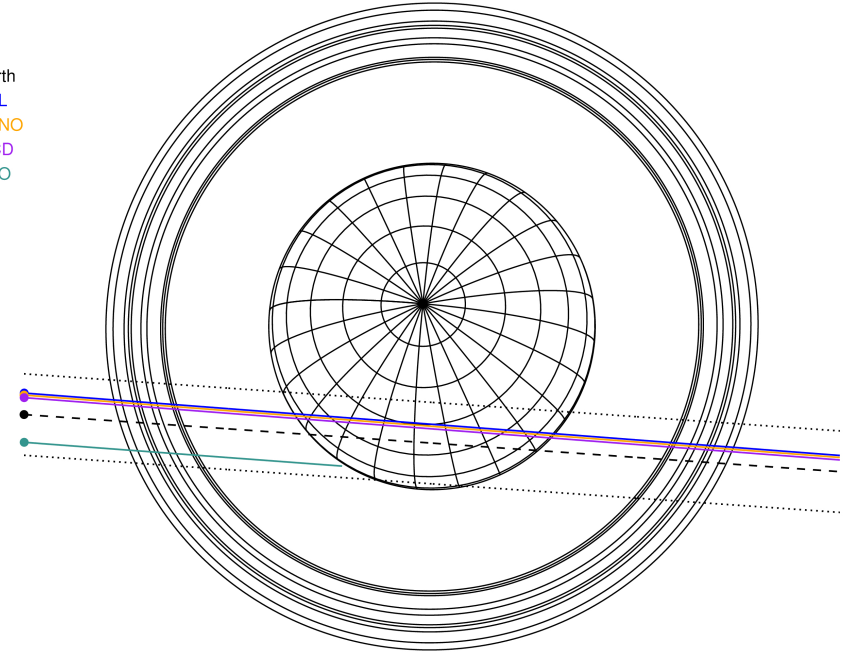
ICRS Star Coord at Epoch: 05h 22m 30.37004s +23:13:24.37696s

RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.255
 G magnitude : 17.363
 RP magnitude : 16.395
 BP magnitude : 18.318
 DUPflag : 0
 Distance (au) : 19.755
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 23.77
 Sun-Target sep (deg) : 54.16
 Sun-Moon sep (deg) : 167.55
 B (ring opening deg) : 81.37
 PA of pole (deg) : 21.83



2030-08-08T11:12:25.8900 ex: 05 22 30.3700 s: +23 13 24.377 C/A 1.267 PA 356.00 deg v_sky +23.77 km/s D 19.75 AU
 Credit: Styled after SORA/Lucky Star

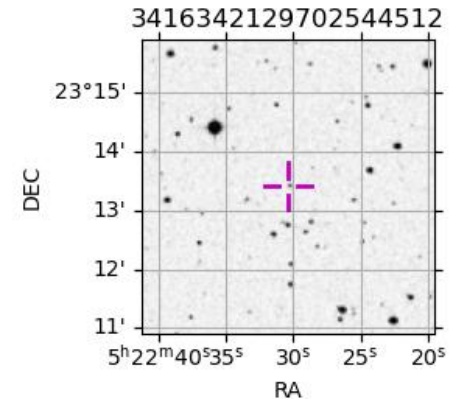
Earth
 PAL
 KPNO
 MCD
 ESO



#	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

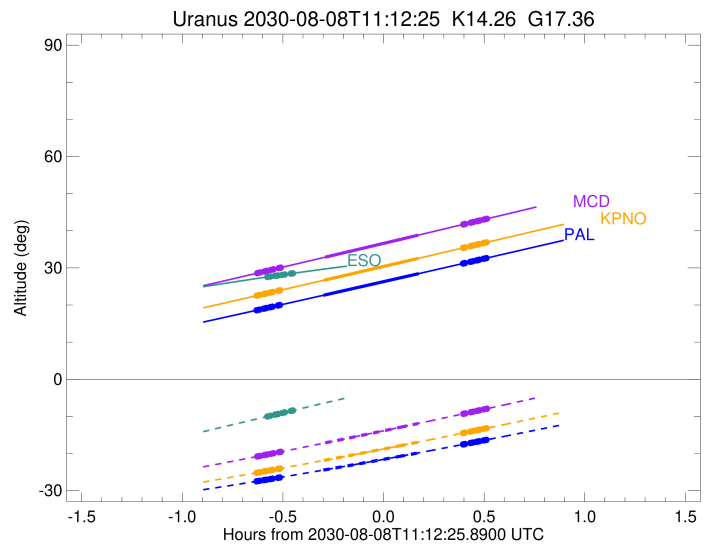
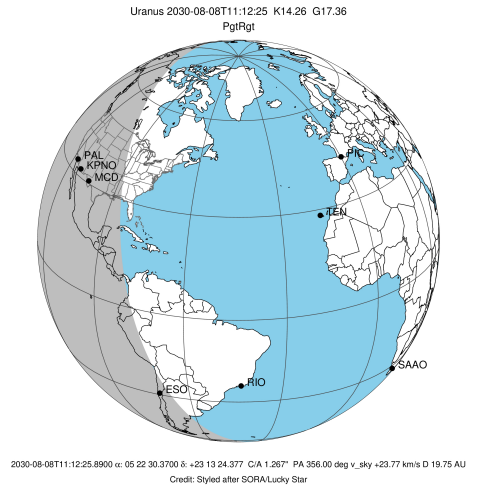
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	AUG 08 10:34 - AUG 08 11:43	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	AUG 08 10:34 - AUG 08 11:43	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	AUG 08 10:35 - AUG 08 11:43	PieRie
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					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European Southern Obs	-29.3	289.3	+++++			AUG 08 10:38 - AUG 08 10:45	PnnRin
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



```

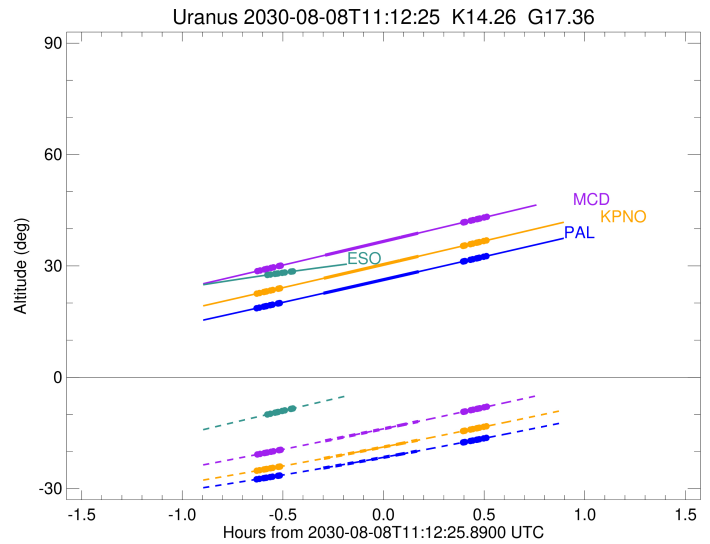
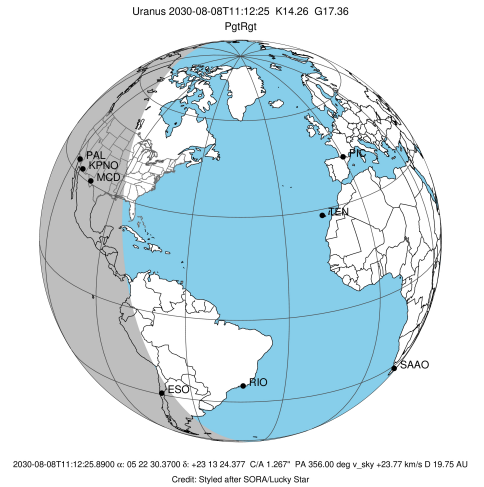
target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2030-08-08T11:08:54.070
Event type           : PgtRgt
: Ring occs: geocentric, topocentric
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)  : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 3416342129702544512
2Mass ID (if available) : 05223038+2313244
ICRS Star Coord at Epoch: 05h 22m 30.37004s +23:13:24.37696s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 14.255
G magnitude          : 17.363
RP magnitude         : 16.395
BP magnitude         : 18.318
DUPflag             : 0
Distance (au)        : 19.755
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 23.77
Sun-Target sep (deg) : 54.16
Sun-Moon sep (deg)  : 166.88
B (ring opening deg) : 81.37
PA of pole (deg)    : 21.83
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.066
C/A sky separation (km) : 15270.4
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	2030-08-08T10:34:52.748		18.65	-27.45	50766.42	-22.68		
lambda	I	2030-08-08T10:35:25.417		18.76	-27.37	50026.71	-22.62		
delta	I	2030-08-08T10:36:41.872		19.02	-27.18	48300.35	-22.53		
gamma	I	2030-08-08T10:37:11.825		19.12	-27.11	47625.91	-22.50		
eta	I	2030-08-08T10:37:31.830		19.18	-27.06	47176.12	-22.47		
beta	I	2030-08-08T10:38:39.980		19.41	-26.89	45647.89	-22.37		
alpha	I	2030-08-08T10:39:22.102		19.56	-26.78	44706.73	-22.32		
4	I	2030-08-08T10:40:56.496		19.87	-26.55	42607.87	-22.16		
5	I	2030-08-08T10:41:12.222		19.93	-26.51	42258.81	-22.14		
6	I	2030-08-08T10:41:31.942		19.99	-26.46	41823.71	-22.10		
Uranus	I	2030-08-08T10:54:29.719		22.62	-24.47	25539.28		-1.57	-1.64
Uranus	E	2030-08-08T11:22:55.936		28.46	-19.82	25095.89		-7.73	-8.10
6	E	2030-08-08T11:36:10.219		31.19	-17.54	41874.71	22.00		
5	E	2030-08-08T11:36:28.527		31.26	-17.49	42269.50	22.04		
4	E	2030-08-08T11:36:41.549		31.30	-17.45	42562.25	22.06		
alpha	E	2030-08-08T11:38:20.437		31.64	-17.17	44748.09	22.21		
beta	E	2030-08-08T11:39:01.515		31.79	-17.05	45661.73	22.26		
eta	E	2030-08-08T11:40:09.377		32.02	-16.85	47176.12	22.36		
gamma	E	2030-08-08T11:40:29.659		32.09	-16.79	47629.80	22.38		
delta	E	2030-08-08T11:40:59.595		32.19	-16.70	48300.35	22.42		
lambda	E	2030-08-08T11:42:16.460		32.46	-16.47	50026.71	22.50		
epsilon	E	2030-08-08T11:43:23.614		32.69	-16.28	51540.01	22.55		

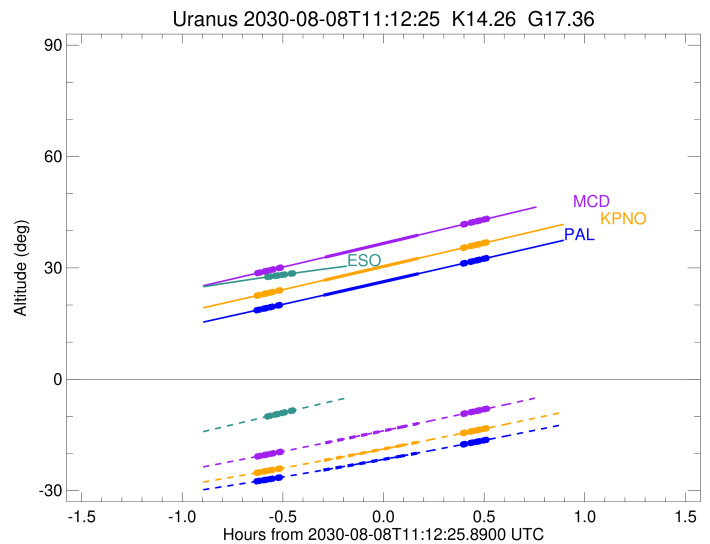
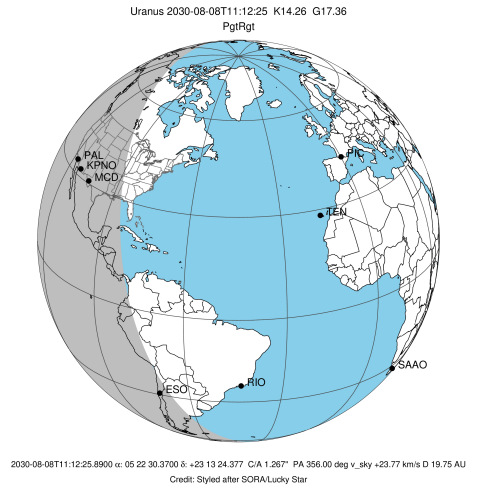
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2030-08-08T11:08:56.510
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       : 3416342129702544512
2Mass ID (if available) : 05223038+2313244
ICRS Star Coord at Epoch: 05h 22m 30.37004s +23:13:24.37696s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 14.255
G magnitude          : 17.363
RP magnitude         : 16.395
BP magnitude         : 18.318
DUPflag              : 0
Distance (au)        : 19.755
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 23.77
Sun-Target sep (deg) : 54.16
Sun-Moon sep (deg)   : 166.91
B (ring opening deg) : 81.37
PA of pole (deg)     : 21.83
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.088
C/A sky separation (km) : 15589.9
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	2030-08-08T10:34:56.228		22.59	-25.13	50767.31	-22.60		
lambda	I	2030-08-08T10:35:29.059		22.70	-25.05	50026.71	-22.54		
delta	I	2030-08-08T10:36:45.810		22.96	-24.84	48300.35	-22.45		
gamma	I	2030-08-08T10:37:15.881		23.07	-24.76	47625.95	-22.41		
eta	I	2030-08-08T10:37:35.970		23.14	-24.70	47176.12	-22.38		
beta	I	2030-08-08T10:38:44.410		23.37	-24.52	45647.78	-22.28		
alpha	I	2030-08-08T10:39:26.700		23.52	-24.40	44706.97	-22.22		
4	I	2030-08-08T10:41:01.528		23.84	-24.14	42608.08	-22.06		
5	I	2030-08-08T10:41:17.314		23.90	-24.10	42259.44	-22.04		
6	I	2030-08-08T10:41:37.138		23.97	-24.05	41824.04	-21.99		
Uranus	I	2030-08-08T10:54:41.236		26.68	-21.86	25535.80		-1.70	-1.78
Uranus	E	2030-08-08T11:22:48.726		32.57	-16.93	25088.69		-7.80	-8.16
6	E	2030-08-08T11:36:09.577		35.39	-14.49	41874.88	21.90		
5	E	2030-08-08T11:36:27.994		35.45	-14.44	42270.10	21.94		
4	E	2030-08-08T11:36:41.067		35.50	-14.40	42562.61	21.96		
alpha	E	2030-08-08T11:38:20.394		35.85	-14.09	44748.22	22.12		
beta	E	2030-08-08T11:39:01.636		36.00	-13.96	45661.58	22.17		
eta	E	2030-08-08T11:40:09.786		36.24	-13.75	47176.12	22.27		
gamma	E	2030-08-08T11:40:30.151		36.31	-13.69	47629.83	22.29		
delta	E	2030-08-08T11:41:00.204		36.41	-13.60	48300.35	22.33		
lambda	E	2030-08-08T11:42:17.363		36.69	-13.36	50026.71	22.42		
epsilon	E	2030-08-08T11:43:24.729		36.92	-13.15	51539.28	22.47		

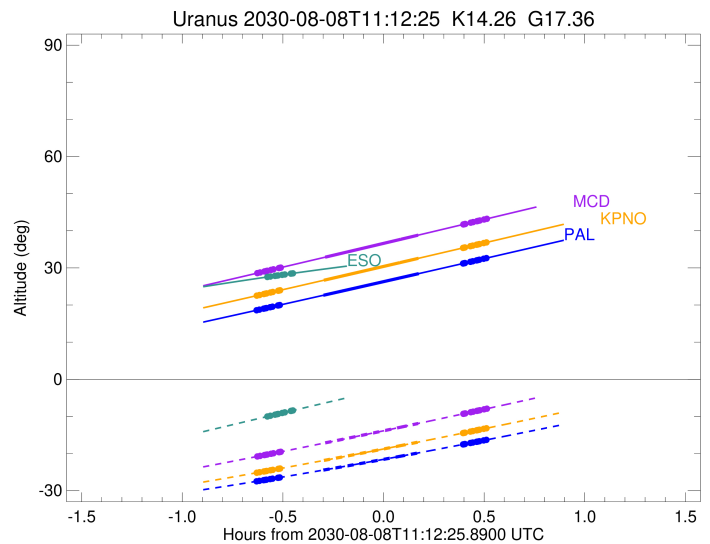
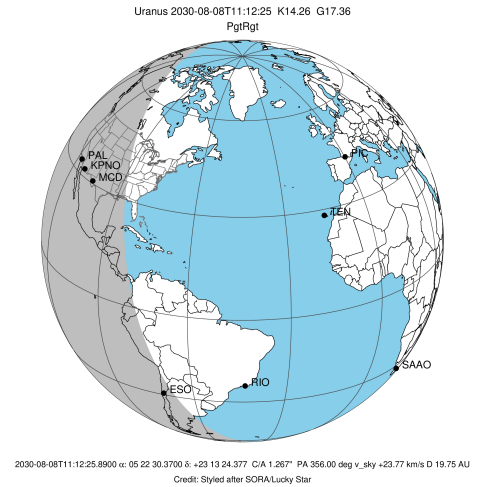
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-08-08T11:09:05.630
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3416342129702544512
 2Mass ID (if available) : 05223038+2313244
 ICRS Star Coord at Epoch: 05h 22m 30.37004s +23:13:24.37696s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.255
 G magnitude : 17.363
 RP magnitude : 16.395
 BP magnitude : 18.318
 DUPflag : 0
 Distance (au) : 19.755
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 23.77
 Sun-Target sep (deg) : 54.16
 Sun-Moon sep (deg) : 166.97
 B (ring opening deg) : 81.37
 PA of pole (deg) : 21.83
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.116
 C/A sky separation (km) : 15988.8
 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	2030-08-08T10:35:06.271		28.66	-20.74	50768.46	-22.48		
lambda	I	2030-08-08T10:35:39.320		28.77	-20.64	50026.71	-22.42		
delta	I	2030-08-08T10:36:56.471		29.05	-20.42	48300.35	-22.33		
gamma	I	2030-08-08T10:37:26.703		29.15	-20.33	47626.00	-22.29		
eta	I	2030-08-08T10:37:46.903		29.22	-20.27	47176.12	-22.26		
beta	I	2030-08-08T10:38:55.735		29.47	-20.06	45647.64	-22.15		
alpha	I	2030-08-08T10:39:38.251		29.62	-19.93	44707.28	-22.09		
4	I	2030-08-08T10:41:13.661		29.95	-19.65	42608.35	-21.92		
5	I	2030-08-08T10:41:29.530		30.01	-19.60	42260.23	-21.90		
6	I	2030-08-08T10:41:49.494		30.08	-19.54	41824.47	-21.85		
Uranus	I	2030-08-08T10:55:02.049		32.89	-17.14	25530.96		-1.87	-1.96
Uranus	E	2030-08-08T11:22:45.437		38.82	-11.92	25079.91		-7.87	-8.24
6	E	2030-08-08T11:36:14.995		41.72	-9.30	41875.08	21.76		
5	E	2030-08-08T11:36:33.555		41.78	-9.24	42270.82	21.80		
4	E	2030-08-08T11:36:46.697		41.83	-9.20	42563.06	21.82		
alpha	E	2030-08-08T11:38:26.605		42.19	-8.87	44748.37	21.99		
beta	E	2030-08-08T11:39:08.064		42.34	-8.74	45661.40	22.05		
eta	E	2030-08-08T11:40:16.594		42.58	-8.52	47176.12	22.15		
gamma	E	2030-08-08T11:40:37.068		42.66	-8.45	47629.86	22.18		
delta	E	2030-08-08T11:41:07.276		42.76	-8.35	48300.35	22.21		
lambda	E	2030-08-08T11:42:24.823		43.04	-8.10	50026.71	22.31		
epsilon	E	2030-08-08T11:43:32.472		43.29	-7.87	51538.35	22.36		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2030-08-08T11:10:21.450
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       : 3416342129702544512
2Mass ID (if available) : 05223038+2313244
ICRS Star Coord at Epoch: 05h 22m 30.37004s +23:13:24.37696s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 14.255
G magnitude           : 17.363
RP magnitude          : 16.395
BP magnitude          : 18.318
DUPflag              : 0
Distance (au)        : 19.755
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 23.77
Sun-Target sep (deg) : 54.16
Sun-Moon sep (deg)   : 167.24
B (ring opening deg) : 81.37
PA of pole (deg)     : 21.83
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.594
C/A sky separation (km) : 22843.6
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	2030-08-08T10:38:05.737		27.59	-9.96	50793.41	-20.97		
lambda	I	2030-08-08T10:38:42.437		27.67	-9.83	50026.71	-20.85		
delta	I	2030-08-08T10:40:05.652		27.85	-9.54	48300.35	-20.64		
gamma	I	2030-08-08T10:40:38.352		27.92	-9.42	47626.86	-20.55		
eta	I	2030-08-08T10:41:00.316		27.97	-9.34	47176.12	-20.49		
beta	I	2030-08-08T10:42:15.423		28.13	-9.08	45645.32	-20.27		
alpha	I	2030-08-08T10:43:01.584		28.23	-8.91	44713.01	-20.13		
4	I	2030-08-08T10:44:46.928		28.46	-8.54	42612.52	-19.75		
5	I	2030-08-08T10:45:04.157		28.49	-8.48	42273.96	-19.70		
6	I	2030-08-08T10:45:26.592		28.54	-8.40	41832.34	-19.60		
Uranus	I	2030-08-08T11:02:33.576		30.60	-4.78x	25334.33		-5.34	-5.59
Uranus	E	2030-08-08T11:17:34.094		32.22	-1.64x	24987.15		-8.63	-9.03
6	E	2030-08-08T11:35:02.435		33.87	1.98x	41878.00	19.56		
5	E	2030-08-08T11:35:23.569		33.90	2.05x	42283.28	19.65		
4	E	2030-08-08T11:35:37.932		33.93	2.10x	42571.21	19.70		
alpha	E	2030-08-08T11:37:27.704		34.08	2.48x	44750.66	20.08		
beta	E	2030-08-08T11:38:12.733		34.15	2.63x	45658.08	20.21		
eta	E	2030-08-08T11:39:27.407		34.25	2.89x	47176.12	20.43		
gamma	E	2030-08-08T11:39:49.609		34.28	2.97x	47630.43	20.49		
delta	E	2030-08-08T11:40:22.230		34.32	3.08x	48300.35	20.58		
lambda	E	2030-08-08T11:41:45.699		34.44	3.36x	50026.71	20.78		
epsilon	E	2030-08-08T11:42:57.159		34.53	3.61x	51517.65	20.91		