

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-04T22:40:44.460
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3416185101401242112
 2Mass ID (if available) : 05304197+2325378

ICRS Star Coord at Epoch: 05h 30m 41.96964s +23:25:37.52587s

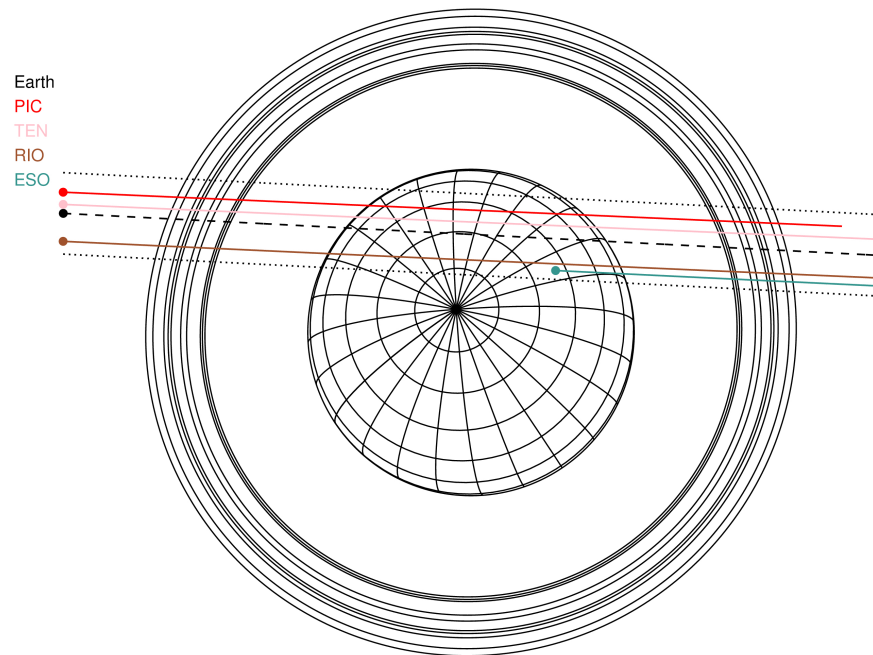
RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.397
 G magnitude : 18.167
 RP magnitude : 17.096
 BP magnitude : 19.345
 DUPflag : 0
 Distance (au) : 19.419
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.48
 Sun-Target sep (deg) : 68.02
 Sun-Moon sep (deg) : 137.61
 B (ring opening deg) : 80.32
 PA of pole (deg) : 32.46

#	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



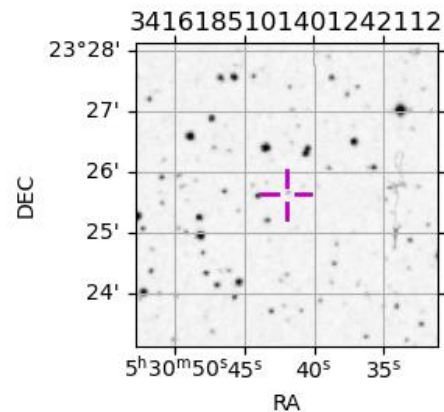
2032-04-04T22:40:44.4600 ex: 05 30 41.9696 s: +23 25 37.526 C/A 1.095° PA 177.06 deg v_sky +17.48 km/s D 19.42 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2032-04-04T22:40:44 K14.40 G18.17 PgtRgt



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

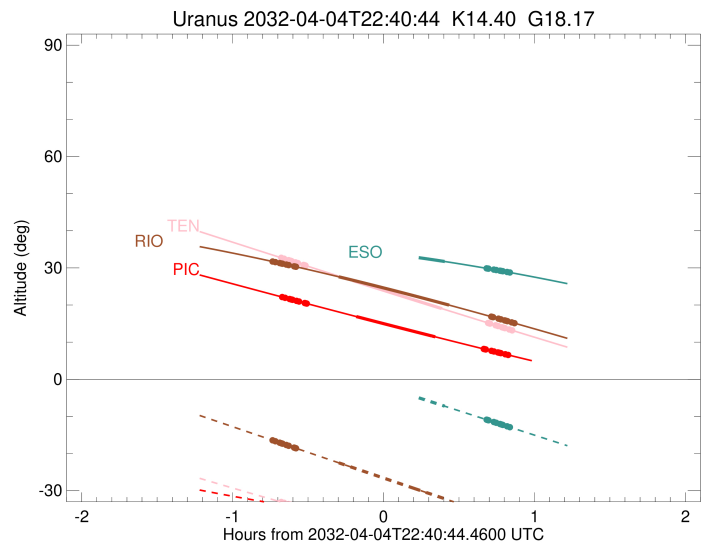
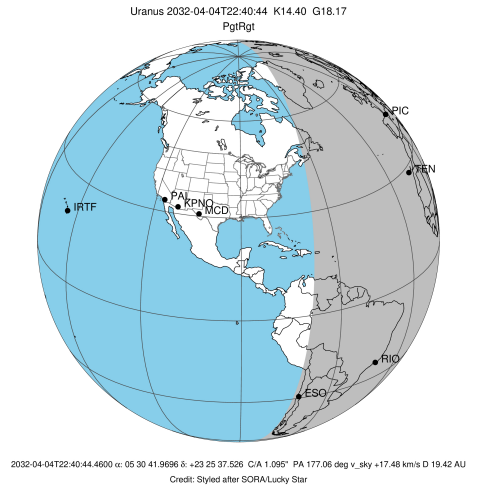
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	APR 04 22:00 - APR 04 23:30	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
MCD	McDonald Obs. 2.7m	30.7	256.0					PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	APR 04 21:59 - APR 04 23:31	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	+++++	+ +	+++++	APR 04 21:56 - APR 04 23:32	PieRie
ESO	European Southern Obs	-29.3	289.3		+	+++++	APR 04 23:05 - APR 04 23:30	PneRne
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



3416185101401242112

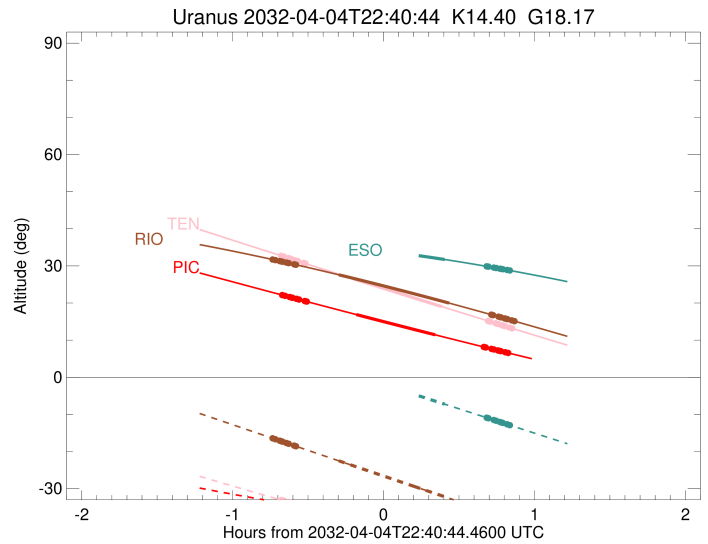
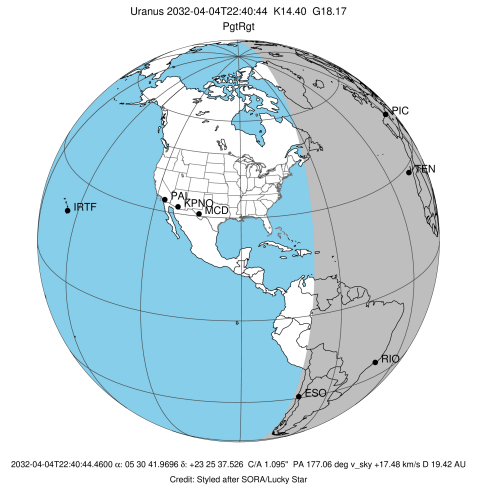
23°28'
 27'
 26'
 25'
 24'
 5h30m50s45s 40s 35s
 RA

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-04T22:45:14.180
 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 : 3416185101401242112
 2Mass ID (if available) : 05304197+2325378
 ICRS Star Coord at Epoch: 05h 30m 41.96964s +23:25:37.52587s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.397
 G magnitude : 18.167
 RP magnitude : 17.096
 BP magnitude : 19.345
 DUPflag : 0
 Distance (au) : 19.419
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.48
 Sun-Target sep (deg) : 68.02
 Sun-Moon sep (deg) : 137.29
 B (ring opening deg) : 80.32
 PA of pole (deg) : 32.46
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.360
 C/A sky separation (km) : 19155.8
 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



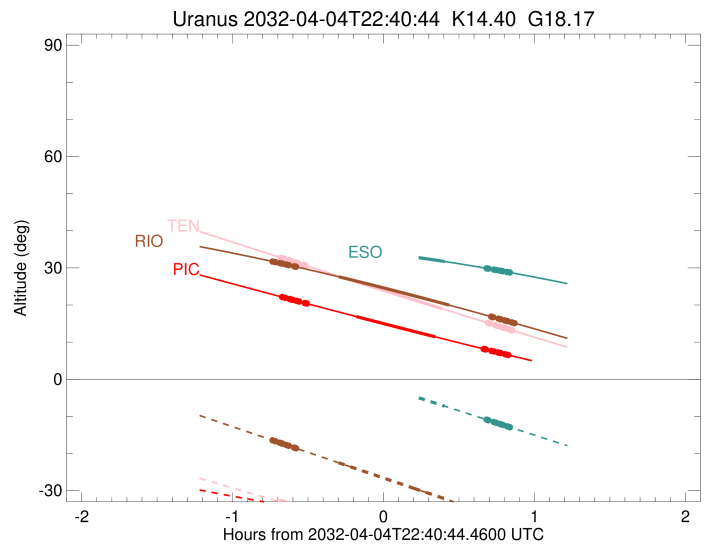
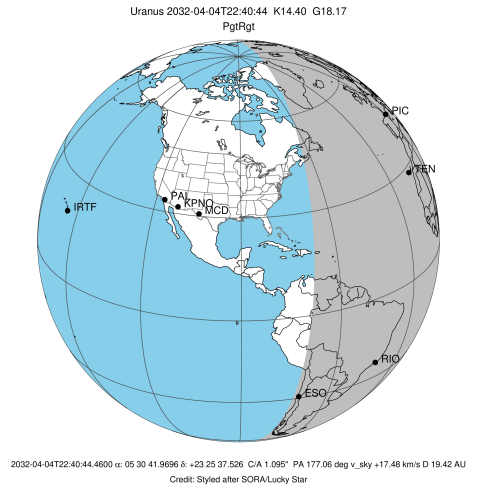
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-04-04T22:00:14.653		22.19	-33.80	51378.69	-16.24		
lambda	I	2032-04-04T22:01:38.302		21.94	-33.95	50026.71	-16.13		
delta	I	2032-04-04T22:03:25.686		21.61	-34.15	48300.35	-16.03		
gamma	I	2032-04-04T22:04:07.952		21.49	-34.23	47623.94	-15.98		
eta	I	2032-04-04T22:04:35.997		21.40	-34.28	47176.12	-15.95		
beta	I	2032-04-04T22:06:10.717		21.12	-34.45	45670.54	-15.84		
alpha	I	2032-04-04T22:07:09.133		20.95	-34.55	44745.16	-15.77		
4	I	2032-04-04T22:09:30.098		20.52	-34.80	42534.73	-15.59		
5	I	2032-04-04T22:09:47.237		20.47	-34.83	42272.37	-15.57		
6	I	2032-04-04T22:10:12.351		20.40	-34.87	41874.43	-15.52		
Uranus	I	2032-04-04T22:29:55.397		16.89	-36.78	24993.95		9.64	10.09
Uranus	E	2032-04-04T23:01:18.140		11.44	-39.15	25526.17		2.28	2.38
6	E	2032-04-04T23:20:32.897		8.17	-40.16	41799.05	15.63		
5	E	2032-04-04T23:21:02.992		8.09	-40.18	42270.73	15.69		
4	E	2032-04-04T23:21:24.997		8.03	-40.19	42614.44	15.70		
alpha	E	2032-04-04T23:23:36.035		7.66	-40.28	44685.48	15.90		
beta	E	2032-04-04T23:24:36.009		7.50	-40.32	45641.50	15.97		
eta	E	2032-04-04T23:26:11.739		7.23	-40.38	47176.12	16.09		
gamma	E	2032-04-04T23:26:39.571		7.15	-40.40	47624.29	16.12		
delta	E	2032-04-04T23:27:21.453		7.04	-40.43	48300.35	16.16		
lambda	E	2032-04-04T23:29:07.894		6.74	-40.49	50026.71	16.27		
epsilon	E	2032-04-04T23:30:20.645		6.54	-40.53	51213.01	16.39		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-04T22:45:53.000
 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 : 3416185101401242112
 2Mass ID (if available) : 05304197+2325378
 ICRS Star Coord at Epoch: 05h 30m 41.96964s +23:25:37.52587s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.397
 G magnitude : 18.167
 RP magnitude : 17.096
 BP magnitude : 19.345
 DUPflag : 0
 Distance (au) : 19.419
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.48
 Sun-Target sep (deg) : 68.02
 Sun-Moon sep (deg) : 137.29
 B (ring opening deg) : 80.32
 PA of pole (deg) : 32.46
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.228
 C/A sky separation (km) : 17288.0
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



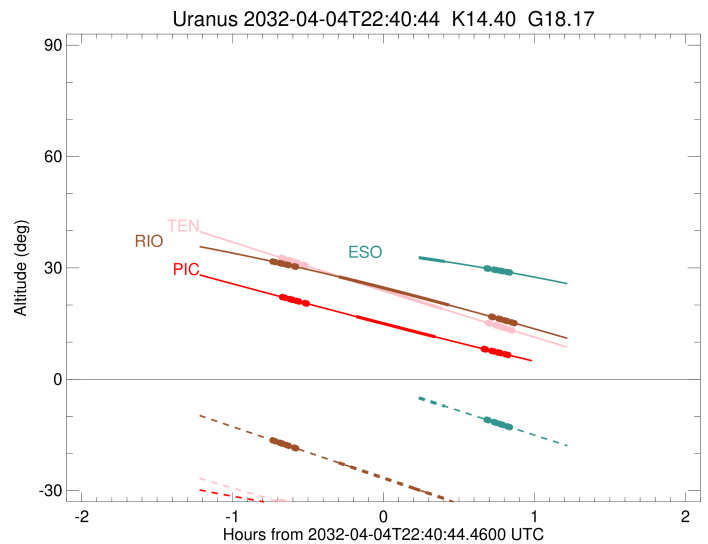
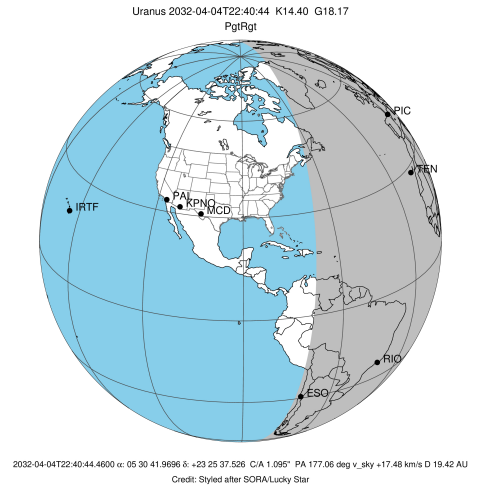
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-04-04T21:59:52.695		32.77	-33.02	51365.06	-16.37		
lambda	I	2032-04-04T22:01:14.807		32.47	-33.29	50026.71	-16.27		
delta	I	2032-04-04T22:03:01.165		32.09	-33.62	48300.35	-16.19		
gamma	I	2032-04-04T22:03:42.972		31.93	-33.76	47624.15	-16.16		
eta	I	2032-04-04T22:04:10.721		31.83	-33.84	47176.12	-16.13		
beta	I	2032-04-04T22:05:44.257		31.50	-34.14	45671.34	-16.05		
alpha	I	2032-04-04T22:06:41.892		31.29	-34.32	44746.12	-15.99		
4	I	2032-04-04T22:09:00.873		30.79	-34.76	42533.44	-15.85		
5	I	2032-04-04T22:09:17.893		30.73	-34.81	42268.75	-15.84		
6	I	2032-04-04T22:09:42.301		30.64	-34.89	41875.43	-15.79		
Uranus	I	2032-04-04T22:28:31.653		26.58	-38.35	25011.16		9.49	9.93
Uranus	E	2032-04-04T23:03:54.529		19.04	-44.36	25548.46		1.29	1.35
6	E	2032-04-04T23:22:16.145		15.18	-47.14	41798.18	15.93		
5	E	2032-04-04T23:22:45.504		15.08	-47.21	42267.21	15.97		
4	E	2032-04-04T23:23:07.407		15.00	-47.26	42615.05	15.99		
alpha	E	2032-04-04T23:25:16.249		14.55	-47.57	44685.17	16.14		
beta	E	2032-04-04T23:26:15.375		14.35	-47.71	45641.70	16.20		
eta	E	2032-04-04T23:27:49.818		14.02	-47.93	47176.12	16.29		
gamma	E	2032-04-04T23:28:17.317		13.92	-47.99	47624.50	16.32		
delta	E	2032-04-04T23:28:58.687		13.78	-48.09	48300.35	16.35		
lambda	E	2032-04-04T23:30:43.959		13.41	-48.33	50026.71	16.44		
epsilon	E	2032-04-04T23:31:55.060		13.17	-48.49	51197.69	16.54		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-04T22:44:41.630
 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 : 3416185101401242112
 2Mass ID (if available) : 05304197+2325378
 ICRS Star Coord at Epoch: 05h 30m 41.96964s +23:25:37.52587s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.397
 G magnitude : 18.167
 RP magnitude : 17.096
 BP magnitude : 19.345
 DUPflag : 0
 Distance (au) : 19.419
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.48
 Sun-Target sep (deg) : 68.02
 Sun-Moon sep (deg) : 137.36
 B (ring opening deg) : 80.32
 PA of pole (deg) : 32.46
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.805
 C/A sky separation (km) : 11332.5
 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	2032-04-04T21:56:29.096		31.74	-16.40	51322.40	-16.79		
lambda	I	2032-04-04T21:57:46.438		31.55	-16.70	50026.71	-16.74		
delta	I	2032-04-04T21:59:29.650		31.29	-17.10	48300.35	-16.71		
gamma	I	2032-04-04T22:00:10.094		31.19	-17.25	47624.80	-16.70		
eta	I	2032-04-04T22:00:36.973		31.12	-17.35	47176.12	-16.69		
beta	I	2032-04-04T22:02:07.124		30.90	-17.70	45673.61	-16.65		
alpha	I	2032-04-04T22:03:02.601		30.76	-17.91	44748.60	-16.63		
4	I	2032-04-04T22:05:16.206		30.41	-18.43	42530.17	-16.57		
5	I	2032-04-04T22:05:32.984		30.37	-18.49	42257.55	-16.57		
6	I	2032-04-04T22:05:55.520		30.31	-18.58	41877.80	-16.55		
Uranus	I	2032-04-04T22:22:56.909		27.61	-22.50	25113.00		8.53	8.92
Uranus	E	2032-04-04T23:06:51.618		19.97	-32.59	25545.63		-1.45	-1.52
6	E	2032-04-04T23:23:31.593		16.88	-36.39	41796.06	16.68		
5	E	2032-04-04T23:23:59.010		16.79	-36.50	42255.60	16.70		
4	E	2032-04-04T23:24:20.820		16.72	-36.58	42616.31	16.70		
alpha	E	2032-04-04T23:26:24.374		16.33	-37.05	44684.64	16.77		
beta	E	2032-04-04T23:27:21.413		16.15	-37.27	45642.60	16.79		
eta	E	2032-04-04T23:28:52.624		15.86	-37.61	47176.12	16.83		
gamma	E	2032-04-04T23:29:19.293		15.78	-37.71	47625.19	16.84		
delta	E	2032-04-04T23:29:59.357		15.65	-37.86	48300.35	16.86		
lambda	E	2032-04-04T23:31:41.637		15.33	-38.25	50026.71	16.90		
epsilon	E	2032-04-04T23:32:47.917		15.12	-38.50	51147.42	16.95		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-04-04T22:42:21.080
 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 : 3416185101401242112
 2Mass ID (if available) : 05304197+2325378
 ICRS Star Coord at Epoch: 05h 30m 41.96964s +23:25:37.52587s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.397
 G magnitude : 18.167
 RP magnitude : 17.096
 BP magnitude : 19.345
 DUPflag : 0
 Distance (au) : 19.419
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.48
 Sun-Target sep (deg) : 68.02
 Sun-Moon sep (deg) : 137.71
 B (ring opening deg) : 80.32
 PA of pole (deg) : 32.46
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.734
 C/A sky separation (km) : 10340.4
 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_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	2032-04-04T21:53:42.919		36.85	8.21x	51316.70	-16.81		
lambda	I	2032-04-04T21:54:59.818		36.80	7.93x	50026.71	-16.77		
delta	I	2032-04-04T21:56:42.871		36.74	7.57x	48300.35	-16.74		
gamma	I	2032-04-04T21:57:23.240		36.71	7.42x	47624.89	-16.73		
eta	I	2032-04-04T21:57:50.075		36.69	7.33x	47176.12	-16.72		
beta	I	2032-04-04T21:59:20.026		36.63	7.00x	45673.89	-16.69		
alpha	I	2032-04-04T22:00:15.378		36.59	6.81x	44748.88	-16.67		
4	I	2032-04-04T22:02:28.668		36.49	6.33x	42529.80	-16.62		
5	I	2032-04-04T22:02:45.469		36.48	6.27x	42256.00	-16.62		
6	I	2032-04-04T22:03:07.837		36.46	6.19x	41878.05	-16.60		
Uranus	I	2032-04-04T22:20:00.828		35.54	2.55x	25131.90		8.34	8.73
Uranus	E	2032-04-04T23:05:05.581		31.72	-7.25	25536.17		-1.90	-1.99
6	E	2032-04-04T23:21:40.723		29.89	-10.88	41795.78	16.67		
5	E	2032-04-04T23:22:08.020		29.83	-10.97	42253.36	16.69		
4	E	2032-04-04T23:22:29.998		29.79	-11.05	42616.43	16.69		
alpha	E	2032-04-04T23:24:33.665		29.54	-11.51	44684.62	16.74		
beta	E	2032-04-04T23:25:30.799		29.43	-11.71	45642.82	16.77		
eta	E	2032-04-04T23:27:02.168		29.25	-12.05	47176.12	16.80		
gamma	E	2032-04-04T23:27:28.902		29.19	-12.14	47625.32	16.81		
delta	E	2032-04-04T23:28:09.050		29.11	-12.29	48300.35	16.82		
lambda	E	2032-04-04T23:29:51.595		28.90	-12.66	50026.71	16.85		
epsilon	E	2032-04-04T23:30:57.487		28.77	-12.90	51137.61	16.90		