

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-13T07:07:50.200  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3382409134990846080  
 2Mass ID (if available) : 06381192+2328409

ICRS Star Coord at Epoch: 06h 38m 11.92441s +23:28:40.73841s

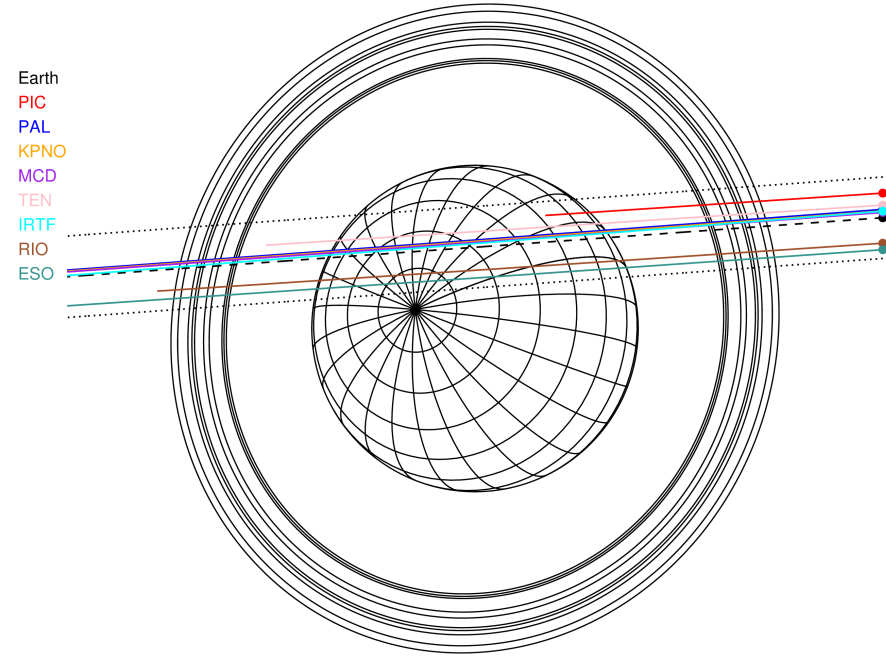
RUWE (>1.4 is poor) : 1.06  
 K magnitude : 14.525  
 G magnitude : 16.114  
 RP magnitude : 15.552  
 BP magnitude : 16.505  
 DUPflag : 0  
 Distance (au) : 17.953  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.94  
 Sun-Target sep (deg) : 162.09  
 Sun-Moon sep (deg) : 169.82  
 B (ring opening deg) : 67.47  
 PA of pole (deg) : 72.41

#	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



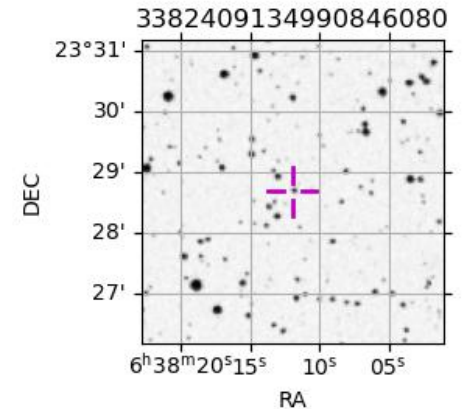
2034-12-13T07:07:50.2000 α: 06 38 11.9244 δ: +23 28 40.738 C/A 0.983° PA 184.14 deg v\_sky -21.94 km/s D 17.95 AU  
 Credit: Styled after SORA/Lucky Star

Uranus 2034-12-13T07:07:50 K14.53 G16.11 PgtRgt

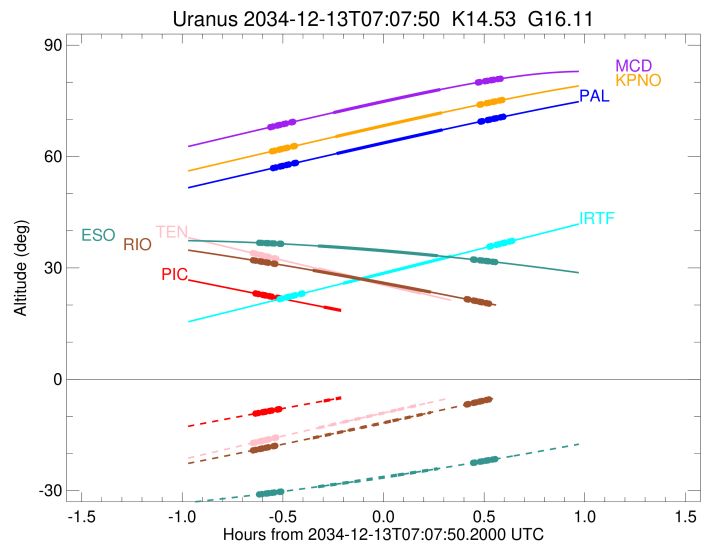
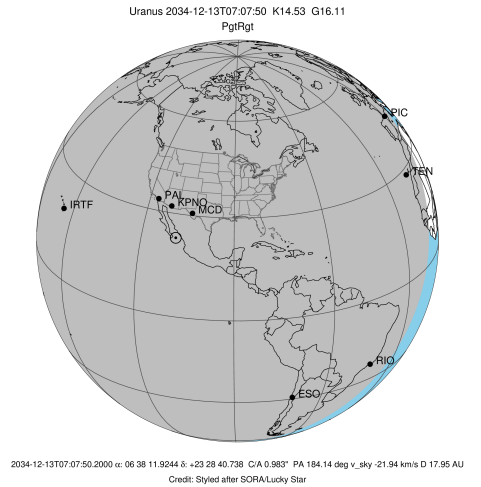


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+		DEC 13 06:29 - DEC 13 06:50	PinRin
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	DEC 13 06:34 - DEC 13 07:43	PieRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	DEC 13 06:34 - DEC 13 07:42	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	DEC 13 06:33 - DEC 13 07:42	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +		DEC 13 06:28 - DEC 13 07:18	PieRin
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	DEC 13 06:36 - DEC 13 07:45	PieRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++	+ +	+++++	DEC 13 06:28 - DEC 13 07:39	PieRie
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	DEC 13 06:30 - DEC 13 07:40	PieRie
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

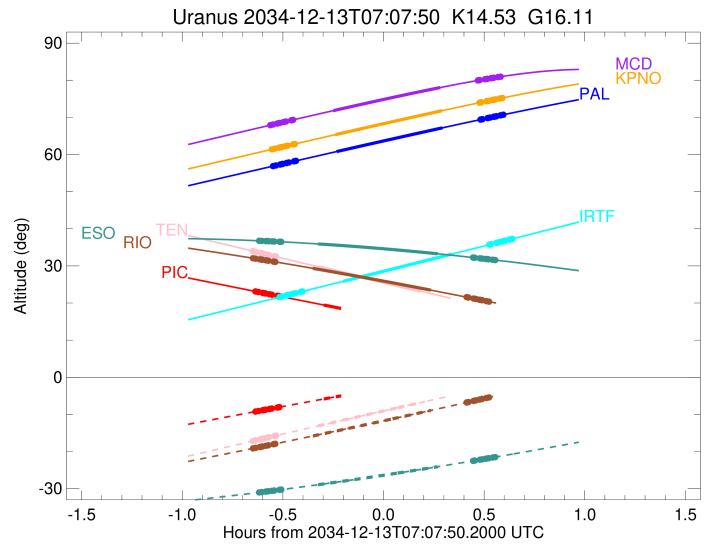
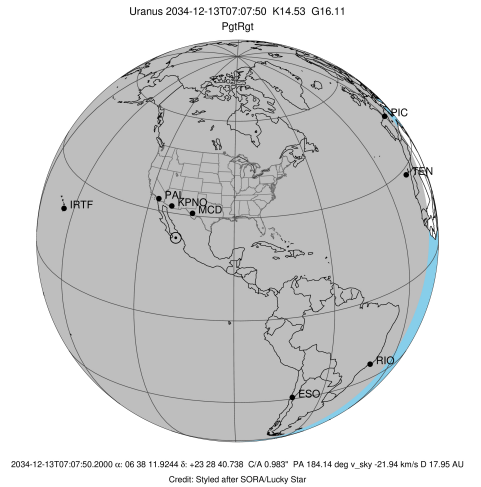


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-13T07:04:26.390  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 3382409134990846080  
 2Mass ID (if available) : 06381192+2328409  
 ICRS Star Coord at Epoch: 06h 38m 11.92441s +23:28:40.73841s  
 RUWE (>1.4 is poor) : 1.06  
 K magnitude : 14.525  
 G magnitude : 16.114  
 RP magnitude : 15.552  
 BP magnitude : 16.505  
 DUPflag : 0  
 Distance (au) : 17.953  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.94  
 Sun-Target sep (deg) : 162.09  
 Sun-Moon sep (deg) : 169.56  
 B (ring opening deg) : 67.47  
 PA of pole (deg) : 72.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.301  
 C/A sky separation (km) : 16943.6  
 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



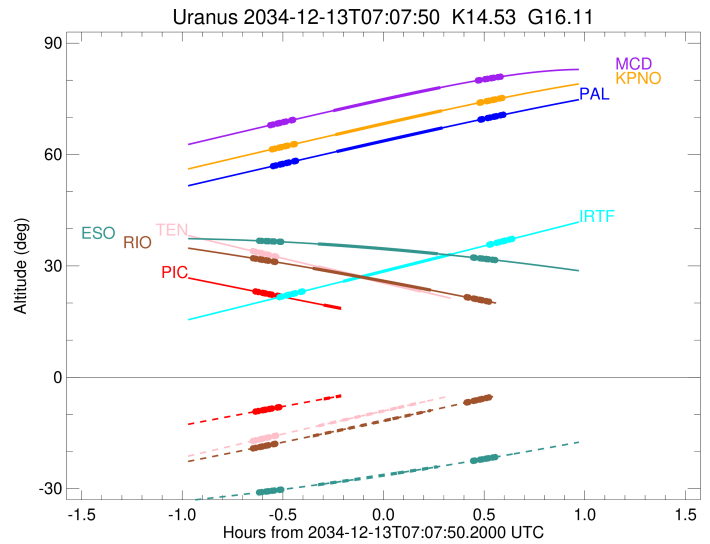
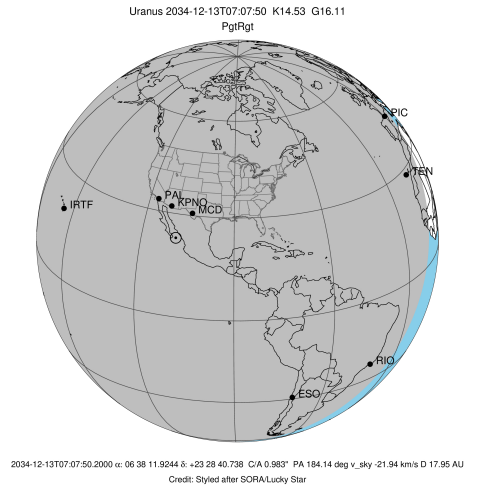
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-13T06:29:23.390		23.17	-9.29	51537.58	-22.21		
lambda	I	2034-12-13T06:30:31.486		22.97	-9.10	50026.71	-22.14		
delta	I	2034-12-13T06:31:49.639		22.73	-8.88	48300.35	-22.03		
gamma	I	2034-12-13T06:32:20.502		22.64	-8.79	47621.01	-21.99		
eta	I	2034-12-13T06:32:40.751		22.58	-8.74	47176.12	-21.96		
beta	I	2034-12-13T06:33:49.133		22.37	-8.55	45678.45	-21.84		
alpha	I	2034-12-13T06:34:34.436		22.24	-8.42	44687.24	-21.76		
4	I	2034-12-13T06:36:09.943		21.95	-8.15	42614.25	-21.57		
5	I	2034-12-13T06:36:31.515		21.88	-8.09	42155.68	-21.53		
6	I	2034-12-13T06:36:44.188		21.85	-8.06	41879.23	-21.49		
Uranus	I	2034-12-13T06:50:01.031		19.47	-5.85	25454.45		-9.98	-10.45
Uranus	E	2034-12-13T07:18:32.146		14.43	-1.26x	25122.57		20.96	21.86
6	E	2034-12-13T07:30:48.695		12.31	0.65x	41804.43	21.42		
5	E	2034-12-13T07:31:11.519		12.24	0.71x	42296.84	21.45		
4	E	2034-12-13T07:31:24.319		12.20	0.74x	42552.69	21.49		
alpha	E	2034-12-13T07:33:05.867		11.91	1.00x	44749.87	21.68		
beta	E	2034-12-13T07:33:47.519		11.79	1.11x	45655.81	21.76		
eta	E	2034-12-13T07:34:57.158		11.60	1.28x	47176.12	21.87		
gamma	E	2034-12-13T07:35:17.928		11.54	1.34x	47630.66	21.90		
delta	E	2034-12-13T07:35:48.476		11.45	1.41x	48300.35	21.94		
lambda	E	2034-12-13T07:37:06.956		11.22	1.61x	50026.71	22.05		
epsilon	E	2034-12-13T07:37:40.787		11.13	1.70x	50773.40	22.12		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-13T07:09:47.710  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : 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 : 3382409134990846080  
 2Mass ID (if available) : 06381192+2328409  
 ICRS Star Coord at Epoch: 06h 38m 11.92441s +23:28:40.73841s  
 RUWE (>1.4 is poor) : 1.06  
 K magnitude : 14.525  
 G magnitude : 16.114  
 RP magnitude : 15.552  
 BP magnitude : 16.505  
 DUPflag : 0  
 Distance (au) : 17.953  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.94  
 Sun-Target sep (deg) : 162.09  
 Sun-Moon sep (deg) : 170.36  
 B (ring opening deg) : 67.47  
 PA of pole (deg) : 72.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.061  
 C/A sky separation (km) : 13816.7  
 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



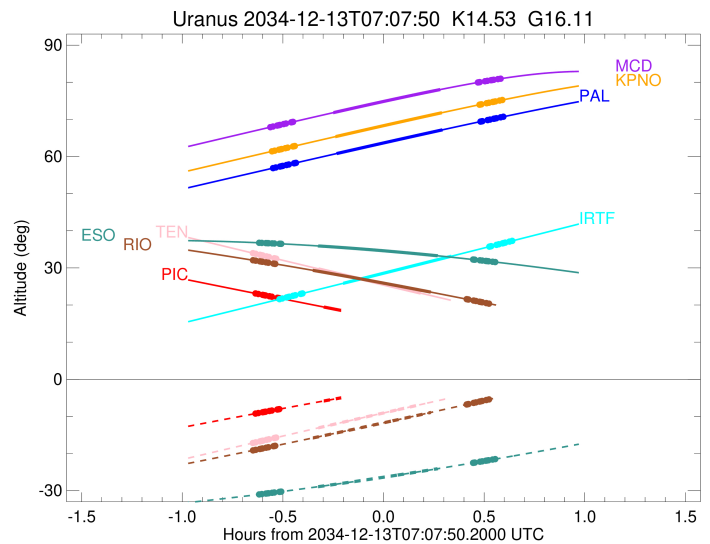
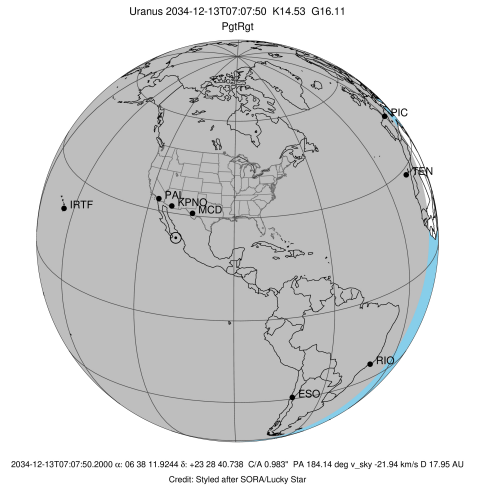
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-13T06:34:37.818		56.82	-72.21	51543.65	-22.94		
lambda	I	2034-12-13T06:35:43.981		57.05	-72.41	50026.71	-22.90		
delta	I	2034-12-13T06:36:59.482		57.31	-72.64	48300.35	-22.83		
gamma	I	2034-12-13T06:37:29.259		57.41	-72.72	47620.97	-22.80		
eta	I	2034-12-13T06:37:48.779		57.48	-72.78	47176.12	-22.78		
beta	I	2034-12-13T06:38:54.650		57.71	-72.98	45677.75	-22.71		
alpha	I	2034-12-13T06:39:38.199		57.86	-73.11	44686.43	-22.66		
4	I	2034-12-13T06:41:09.782		58.18	-73.37	42613.12	-22.53		
5	I	2034-12-13T06:41:30.463		58.25	-73.43	42155.04	-22.51		
6	I	2034-12-13T06:41:42.527		58.29	-73.47	41879.60	-22.49		
Uranus	I	2034-12-13T06:53:51.967		60.80	-75.50	25390.09		-12.75	-13.34
Uranus	E	2034-12-13T07:25:26.232		67.20	-79.37	25079.51		22.05	22.98
6	E	2034-12-13T07:36:42.935		69.41	-79.92	41802.17	22.53		
5	E	2034-12-13T07:37:04.908		69.48	-79.92	42301.08	22.56		
4	E	2034-12-13T07:37:16.720		69.51	-79.93	42549.18	22.58		
alpha	E	2034-12-13T07:38:53.714		69.83	-79.95	44750.83	22.71		
beta	E	2034-12-13T07:39:33.378		69.95	-79.96	45654.27	22.76		
eta	E	2034-12-13T07:40:40.080		70.17	-79.97	47176.12	22.84		
gamma	E	2034-12-13T07:40:59.984		70.23	-79.97	47630.88	22.86		
delta	E	2034-12-13T07:41:29.254		70.32	-79.97	48300.35	22.89		
lambda	E	2034-12-13T07:42:44.561		70.56	-79.97	50026.71	22.96		
epsilon	E	2034-12-13T07:43:16.628		70.66	-79.96	50763.41	23.00		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-13T07:09:28.080  
 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 : 3382409134990846080  
 2Mass ID (if available) : 06381192+2328409  
 ICRS Star Coord at Epoch: 06h 38m 11.92441s +23:28:40.73841s  
 RUWE (>1.4 is poor) : 1.06  
 K magnitude : 14.525  
 G magnitude : 16.114  
 RP magnitude : 15.552  
 BP magnitude : 16.505  
 DUPflag : 0  
 Distance (au) : 17.953  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.94  
 Sun-Target sep (deg) : 162.09  
 Sun-Moon sep (deg) : 170.29  
 B (ring opening deg) : 67.47  
 PA of pole (deg) : 72.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.046  
 C/A sky separation (km) : 13617.5  
 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\_itrff93\_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	2034-12-13T06:34:18.432		61.35	-76.62	51544.10	-22.99		
lambda	I	2034-12-13T06:35:24.464		61.58	-76.81	50026.71	-22.95		
delta	I	2034-12-13T06:36:39.788		61.84	-77.01	48300.35	-22.88		
gamma	I	2034-12-13T06:37:09.493		61.95	-77.10	47620.97	-22.86		
eta	I	2034-12-13T06:37:28.965		62.01	-77.15	47176.12	-22.84		
beta	I	2034-12-13T06:38:34.673		62.24	-77.33	45677.69	-22.77		
alpha	I	2034-12-13T06:39:18.110		62.40	-77.44	44686.37	-22.71		
4	I	2034-12-13T06:40:49.447		62.72	-77.69	42613.02	-22.60		
5	I	2034-12-13T06:41:10.072		62.79	-77.74	42155.01	-22.57		
6	I	2034-12-13T06:41:22.098		62.83	-77.77	41879.62	-22.55		
Uranus	I	2034-12-13T06:53:27.728		65.35	-79.49	25385.43		-12.93	-13.52
Uranus	E	2034-12-13T07:25:11.564		71.79	-81.30	25077.86		22.09	23.03
6	E	2034-12-13T07:36:25.437		73.96	-80.66	41802.06	22.59		
5	E	2034-12-13T07:36:47.368		74.03	-80.63	42301.28	22.61		
4	E	2034-12-13T07:36:59.133		74.06	-80.62	42549.00	22.64		
alpha	E	2034-12-13T07:38:35.907		74.37	-80.47	44750.87	22.76		
beta	E	2034-12-13T07:39:15.476		74.49	-80.41	45654.19	22.81		
eta	E	2034-12-13T07:40:22.039		74.70	-80.30	47176.12	22.88		
gamma	E	2034-12-13T07:40:41.902		74.76	-80.27	47630.89	22.90		
delta	E	2034-12-13T07:41:11.112		74.85	-80.22	48300.35	22.93		
lambda	E	2034-12-13T07:42:26.272		75.08	-80.08	50026.71	23.00		
epsilon	E	2034-12-13T07:42:58.258		75.18	-80.03	50762.97	23.05		

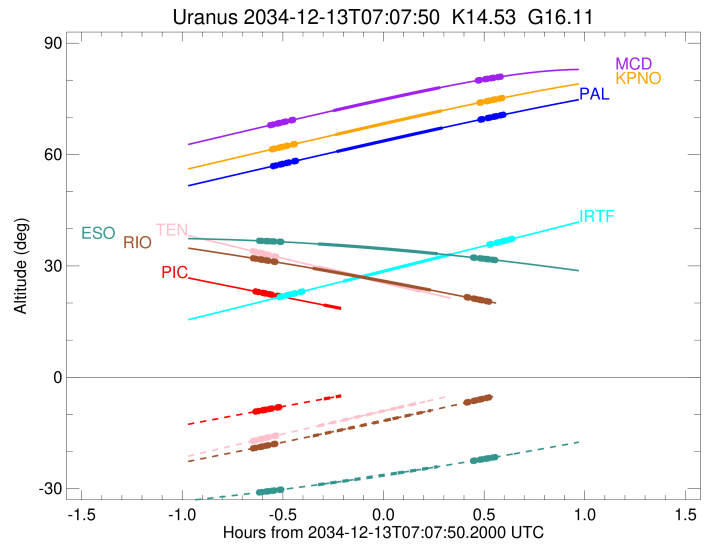
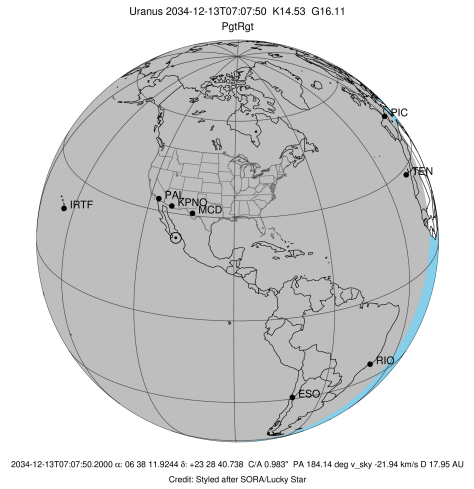
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-13T07:08:57.240  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : MCD  
 Location : McDonald Obs. 2.7m  
 Latitude (deg) : 30.67158  
 E. Longitude (deg) : 255.97844  
 Altitude (km) : 2.075  
 Gaia source ID : 3382409134990846080  
 2Mass ID (if available) : 06381192+2328409  
 ICRS Star Coord at Epoch: 06h 38m 11.92441s +23:28:40.73841s  
 RUWE (>1.4 is poor) : 1.06  
 K magnitude : 14.525  
 G magnitude : 16.114  
 RP magnitude : 15.552  
 BP magnitude : 16.505  
 DUPflag : 0  
 Distance (au) : 17.953  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.94  
 Sun-Target sep (deg) : 162.09  
 Sun-Moon sep (deg) : 170.21  
 B (ring opening deg) : 67.47  
 PA of pole (deg) : 72.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.032  
 C/A sky separation (km) : 13437.4  
 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\_itrff93\_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	2034-12-13T06:33:48.291		67.85	-81.79	51544.52	-23.05		
lambda	I	2034-12-13T06:34:54.189		68.08	-81.90	50026.71	-23.01		
delta	I	2034-12-13T06:36:09.335		68.35	-82.01	48300.35	-22.94		
gamma	I	2034-12-13T06:36:38.969		68.45	-82.05	47620.97	-22.91		
eta	I	2034-12-13T06:36:58.393		68.52	-82.08	47176.12	-22.89		
beta	I	2034-12-13T06:38:03.940		68.75	-82.17	45677.63	-22.83		
alpha	I	2034-12-13T06:38:47.265		68.90	-82.22	44686.32	-22.77		
4	I	2034-12-13T06:40:18.359		69.22	-82.33	42612.93	-22.66		
5	I	2034-12-13T06:40:38.929		69.29	-82.35	42154.98	-22.63		
6	I	2034-12-13T06:40:50.920		69.33	-82.36	41879.64	-22.61		
Uranus	I	2034-12-13T06:52:52.979		71.82	-82.62	25381.04		-13.10	-13.70
Uranus	E	2034-12-13T07:24:45.046		78.04	-79.35	25076.50		22.12	23.06
6	E	2034-12-13T07:35:56.400		79.95	-77.43	41801.97	22.64		
5	E	2034-12-13T07:36:18.292		80.01	-77.36	42301.45	22.66		
4	E	2034-12-13T07:36:30.015		80.04	-77.33	42548.86	22.69		
alpha	E	2034-12-13T07:38:06.592		80.29	-77.03	44750.90	22.81		
beta	E	2034-12-13T07:38:46.076		80.39	-76.91	45654.13	22.86		
eta	E	2034-12-13T07:39:52.513		80.55	-76.71	47176.12	22.93		
gamma	E	2034-12-13T07:40:12.341		80.60	-76.65	47630.90	22.95		
delta	E	2034-12-13T07:40:41.497		80.67	-76.56	48300.35	22.98		
lambda	E	2034-12-13T07:41:56.525		80.85	-76.32	50026.71	23.04		
epsilon	E	2034-12-13T07:42:28.442		80.93	-76.22	50762.61	23.09		

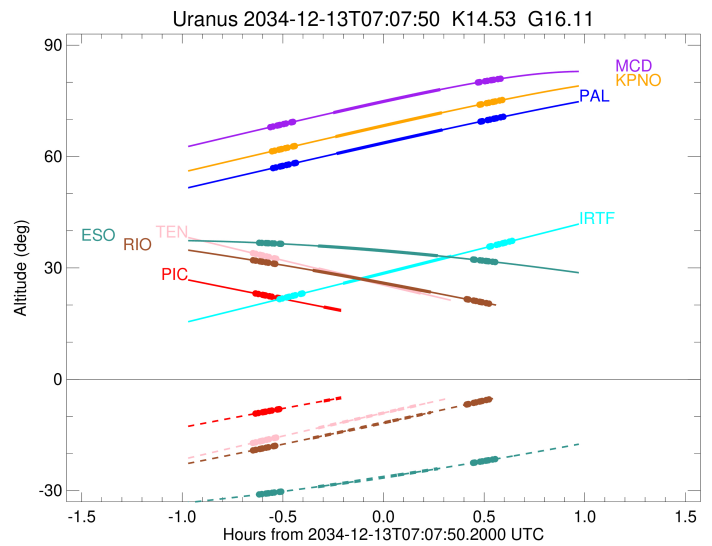
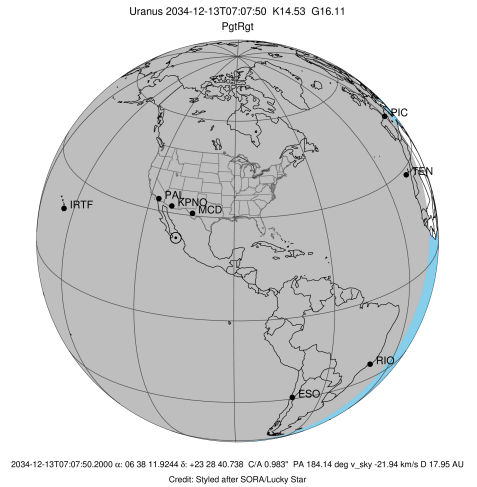


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-13T07:03:49.910  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : TEN  
 Location : Teide Obs./Tenerife  
 Latitude (deg) : 28.30050  
 E. Longitude (deg) : 343.48909  
 Altitude (km) : 2.395  
 Gaia source ID : 3382409134990846080  
 2Mass ID (if available) : 06381192+2328409  
 ICRS Star Coord at Epoch: 06h 38m 11.92441s +23:28:40.73841s  
 RUWE (>1.4 is poor) : 1.06  
 K magnitude : 14.525  
 G magnitude : 16.114  
 RP magnitude : 15.552  
 BP magnitude : 16.505  
 DUPflag : 0  
 Distance (au) : 17.953  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.94  
 Sun-Target sep (deg) : 162.09  
 Sun-Moon sep (deg) : 169.39  
 B (ring opening deg) : 67.47  
 PA of pole (deg) : 72.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.162  
 C/A sky separation (km) : 15134.7  
 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



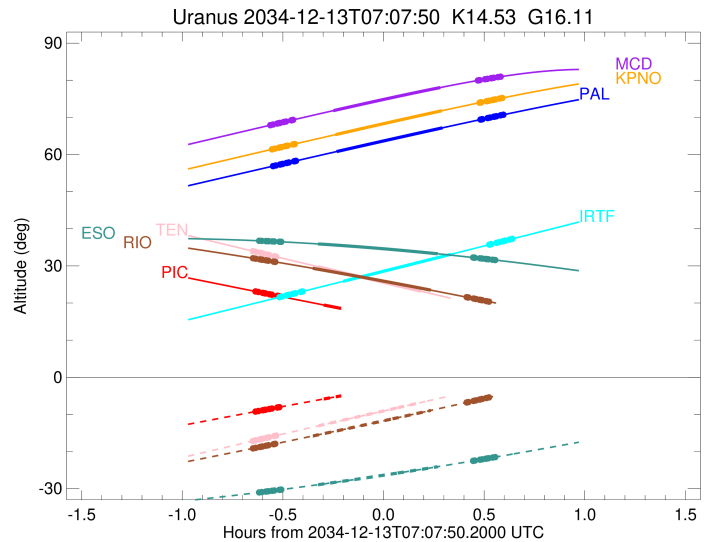
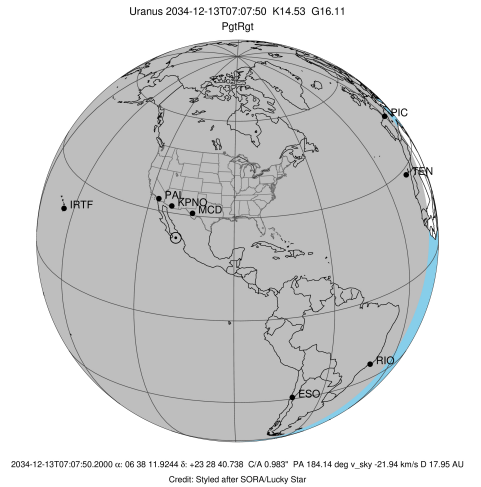
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-13T06:28:37.292		34.04	-17.23	51541.87	-22.62		
lambda	I	2034-12-13T06:29:44.326		33.80	-16.99	50026.71	-22.57		
delta	I	2034-12-13T06:31:00.968		33.52	-16.72	48300.35	-22.48		
gamma	I	2034-12-13T06:31:31.213		33.41	-16.62	47620.98	-22.44		
eta	I	2034-12-13T06:31:51.046		33.34	-16.55	47176.12	-22.42		
beta	I	2034-12-13T06:32:57.999		33.10	-16.31	45677.98	-22.33		
alpha	I	2034-12-13T06:33:42.301		32.94	-16.16	44686.68	-22.26		
4	I	2034-12-13T06:35:15.560		32.60	-15.83	42613.52	-22.11		
5	I	2034-12-13T06:35:36.628		32.52	-15.76	42155.21	-22.08		
6	I	2034-12-13T06:35:48.942		32.48	-15.72	41879.50	-22.05		
Uranus	I	2034-12-13T06:48:24.955		29.75	-13.09	25414.70		-11.76	-12.31
Uranus	E	2034-12-13T07:18:57.843		23.19	-6.81	25095.86		21.64	22.56
6	E	2034-12-13T07:30:40.625		20.70	-4.44x	41803.21	21.96		
5	E	2034-12-13T07:31:03.037		20.62	-4.36x	42299.11	21.99		
4	E	2034-12-13T07:31:15.329		20.58	-4.32x	42550.84	22.02		
alpha	E	2034-12-13T07:32:54.650		20.23	-3.99x	44750.39	22.17		
beta	E	2034-12-13T07:33:35.334		20.08	-3.85x	45655.01	22.23		
eta	E	2034-12-13T07:34:43.577		19.84	-3.62x	47176.12	22.32		
gamma	E	2034-12-13T07:35:03.939		19.77	-3.55x	47630.77	22.34		
delta	E	2034-12-13T07:35:33.888		19.66	-3.45x	48300.35	22.37		
lambda	E	2034-12-13T07:36:50.900		19.39	-3.20x	50026.71	22.46		
epsilon	E	2034-12-13T07:37:23.888		19.28	-3.09x	50768.09	22.51		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-13T07:12:05.830  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : IRTF  
 Location : Mauna Kea/IRTF  
 Latitude (deg) : 19.82622  
 E. Longitude (deg) : 204.52800  
 Altitude (km) : 4.168  
 Gaia source ID : 3382409134990846080  
 2Mass ID (if available) : 06381192+2328409  
 ICRS Star Coord at Epoch: 06h 38m 11.92441s +23:28:40.73841s  
 RUWE (>1.4 is poor) : 1.06  
 K magnitude : 14.525  
 G magnitude : 16.114  
 RP magnitude : 15.552  
 BP magnitude : 16.505  
 DUPflag : 0  
 Distance (au) : 17.953  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.94  
 Sun-Target sep (deg) : 162.09  
 Sun-Moon sep (deg) : 170.62  
 B (ring opening deg) : 67.47  
 PA of pole (deg) : 72.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.018  
 C/A sky separation (km) : 13254.7  
 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	2034-12-13T06:36:33.317		21.52	-39.12	51544.35	-22.81		
lambda	I	2034-12-13T06:37:39.877		21.76	-39.38	50026.71	-22.78		
delta	I	2034-12-13T06:38:55.775		22.05	-39.67	48300.35	-22.71		
gamma	I	2034-12-13T06:39:25.702		22.16	-39.78	47620.97	-22.69		
eta	I	2034-12-13T06:39:45.318		22.23	-39.85	47176.12	-22.67		
beta	I	2034-12-13T06:40:51.504		22.48	-40.11	45677.65	-22.61		
alpha	I	2034-12-13T06:41:35.246		22.64	-40.27	44686.33	-22.56		
4	I	2034-12-13T06:43:07.203		22.99	-40.62	42612.94	-22.45		
5	I	2034-12-13T06:43:27.964		23.07	-40.70	42154.99	-22.43		
6	I	2034-12-13T06:43:40.066		23.11	-40.75	41879.63	-22.41		
Uranus	I	2034-12-13T06:55:47.507		25.84	-43.52	25379.83		-13.14	-13.74
Uranus	E	2034-12-13T07:28:06.626		33.16	-50.92	25074.01		22.18	23.12
6	E	2034-12-13T07:39:21.101		35.71	-53.50	41801.73	22.51		
5	E	2034-12-13T07:39:43.152		35.80	-53.59	42301.90	22.53		
4	E	2034-12-13T07:39:54.903		35.84	-53.63	42548.46	22.55		
alpha	E	2034-12-13T07:41:32.077		36.21	-54.00	44751.00	22.67		
beta	E	2034-12-13T07:42:11.783		36.36	-54.15	45653.94	22.72		
eta	E	2034-12-13T07:43:18.629		36.62	-54.41	47176.12	22.79		
gamma	E	2034-12-13T07:43:38.577		36.69	-54.49	47630.92	22.81		
delta	E	2034-12-13T07:44:07.908		36.80	-54.60	48300.35	22.84		
lambda	E	2034-12-13T07:45:23.388		37.09	-54.89	50026.71	22.90		
epsilon	E	2034-12-13T07:45:55.449		37.21	-55.01	50761.48	22.95		

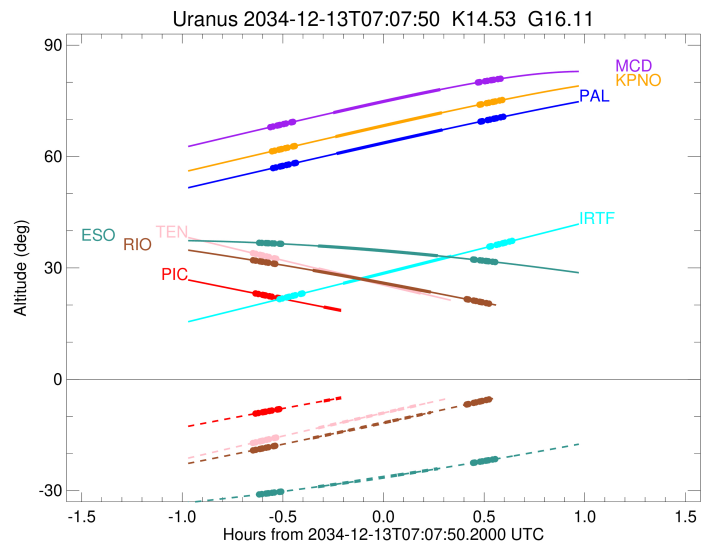
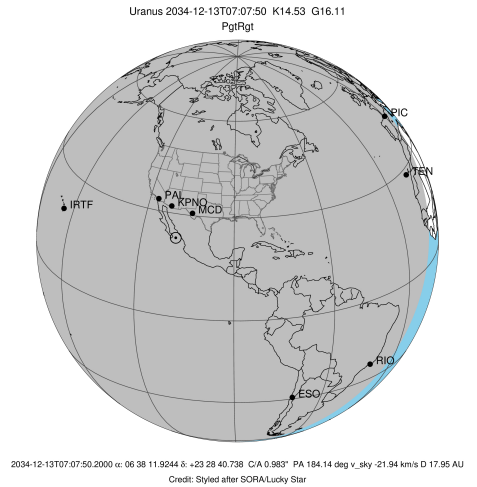
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-13T07:04:25.540  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : RIO  
 Location : Rio de Janeiro  
 Latitude (deg) : -22.89506  
 E. Longitude (deg) : 316.77708  
 Altitude (km) : 0.033  
 Gaia source ID : 3382409134990846080  
 2Mass ID (if available) : 06381192+2328409  
 ICRS Star Coord at Epoch: 06h 38m 11.92441s +23:28:40.73841s  
 RUWE (>1.4 is poor) : 1.06  
 K magnitude : 14.525  
 G magnitude : 16.114  
 RP magnitude : 15.552  
 BP magnitude : 16.505  
 DUPflag : 0  
 Distance (au) : 17.953  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.94  
 Sun-Target sep (deg) : 162.09  
 Sun-Moon sep (deg) : 169.11  
 B (ring opening deg) : 67.47  
 PA of pole (deg) : 72.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.699  
 C/A sky separation (km) : 9095.7  
 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	2034-12-13T06:28:39.532		32.11	-19.21	51551.54	-23.49		
lambda	I	2034-12-13T06:29:44.472		31.95	-19.01	50026.71	-23.47		
delta	I	2034-12-13T06:30:58.085		31.77	-18.79	48300.35	-23.44		
gamma	I	2034-12-13T06:31:27.083		31.69	-18.70	47620.96	-23.42		
eta	I	2034-12-13T06:31:46.079		31.65	-18.64	47176.12	-23.41		
beta	I	2034-12-13T06:32:50.165		31.49	-18.44	45676.32	-23.38		
alpha	I	2034-12-13T06:33:32.422		31.38	-18.31	44685.36	-23.36		
4	I	2034-12-13T06:35:01.158		31.16	-18.03	42610.64	-23.30		
5	I	2034-12-13T06:35:21.153		31.11	-17.97	42154.93	-23.29		
6	I	2034-12-13T06:35:32.787		31.08	-17.93	41879.70	-23.28		
Uranus	I	2034-12-13T06:46:45.178		29.35	-15.81	25283.67		-16.42	-17.16
Uranus	E	2034-12-13T07:21:56.164		23.48	-8.94	25059.90		22.53	23.48
6	E	2034-12-13T07:32:35.627		21.59	-6.79	41799.72	23.21		
5	E	2034-12-13T07:32:57.254		21.52	-6.72	42305.68	23.22		
4	E	2034-12-13T07:33:08.311		21.49	-6.68	42545.01	23.23		
alpha	E	2034-12-13T07:34:42.986		21.20	-6.36	44751.72	23.28		
beta	E	2034-12-13T07:35:21.566		21.09	-6.23	45652.41	23.30		
eta	E	2034-12-13T07:36:26.878		20.89	-6.01	47176.12	23.33		
gamma	E	2034-12-13T07:36:46.377		20.83	-5.95	47631.11	23.34		
delta	E	2034-12-13T07:37:15.045		20.74	-5.85	48300.35	23.35		
lambda	E	2034-12-13T07:38:28.934		20.52	-5.60	50026.71	23.38		
epsilon	E	2034-12-13T07:39:00.029		20.43	-5.49	50753.85	23.40		



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-13T07:06:14.400  
 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 : 3382409134990846080  
 2Mass ID (if available) : 06381192+2328409  
 ICRS Star Coord at Epoch: 06h 38m 11.92441s +23:28:40.73841s  
 RUWE (>1.4 is poor) : 1.06  
 K magnitude : 14.525  
 G magnitude : 16.114  
 RP magnitude : 15.552  
 BP magnitude : 16.505  
 DUPflag : 0  
 Distance (au) : 17.953  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.94  
 Sun-Target sep (deg) : 162.09  
 Sun-Moon sep (deg) : 169.34  
 B (ring opening deg) : 67.47  
 PA of pole (deg) : 72.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.605  
 C/A sky separation (km) : 7879.1  
 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\_itrff93\_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	2034-12-13T06:30:29.142		36.78	-31.05	51552.63	-23.64		
lambda	I	2034-12-13T06:31:33.692		36.73	-30.93	50026.71	-23.63		
delta	I	2034-12-13T06:32:46.786		36.69	-30.79	48300.35	-23.61		
gamma	I	2034-12-13T06:33:15.572		36.67	-30.74	47620.97	-23.60		
eta	I	2034-12-13T06:33:34.426		36.65	-30.70	47176.12	-23.59		
beta	I	2034-12-13T06:34:38.033		36.61	-30.58	45676.00	-23.57		
alpha	I	2034-12-13T06:35:19.946		36.58	-30.50	44685.19	-23.55		
4	I	2034-12-13T06:36:47.947		36.51	-30.33	42610.03	-23.51		
5	I	2034-12-13T06:37:07.757		36.50	-30.29	42155.07	-23.50		
6	I	2034-12-13T06:37:19.294		36.49	-30.27	41879.64	-23.49		
Uranus	I	2034-12-13T06:48:19.588		35.92	-28.94	25260.14		-17.14	-17.90
Uranus	E	2034-12-13T07:24:00.254		33.26	-24.09	25061.40		22.49	23.45
6	E	2034-12-13T07:34:30.652		32.26	-22.52	41799.09	23.47		
5	E	2034-12-13T07:34:52.116		32.22	-22.47	42306.87	23.47		
4	E	2034-12-13T07:35:02.936		32.20	-22.44	42543.84	23.48		
alpha	E	2034-12-13T07:36:36.673		32.05	-22.20	44751.91	23.52		
beta	E	2034-12-13T07:37:14.824		31.98	-22.11	45651.87	23.54		
eta	E	2034-12-13T07:38:19.515		31.87	-21.94	47176.12	23.56		
gamma	E	2034-12-13T07:38:38.827		31.84	-21.89	47631.17	23.57		
delta	E	2034-12-13T07:39:07.218		31.79	-21.82	48300.35	23.57		
lambda	E	2034-12-13T07:40:20.412		31.66	-21.63	50026.71	23.60		
epsilon	E	2034-12-13T07:40:51.124		31.61	-21.55	50751.55	23.61		