

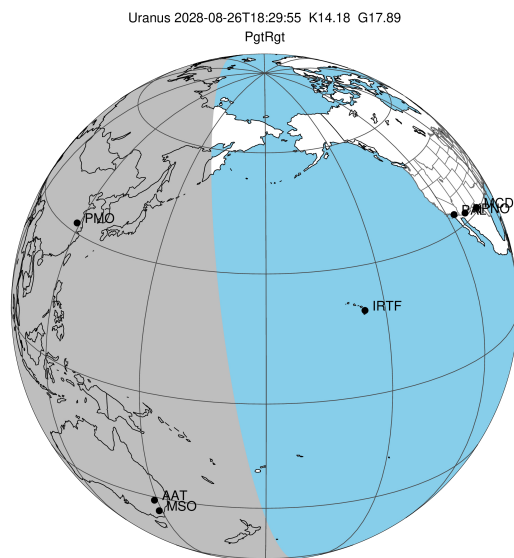
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-08-26T18:29:55.980
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3412873411034053888
 2Mass ID (if available) : 04485437+2223198

Uranus 2028-08-26T18:29:55 K14.18 G17.89 PgtRgt

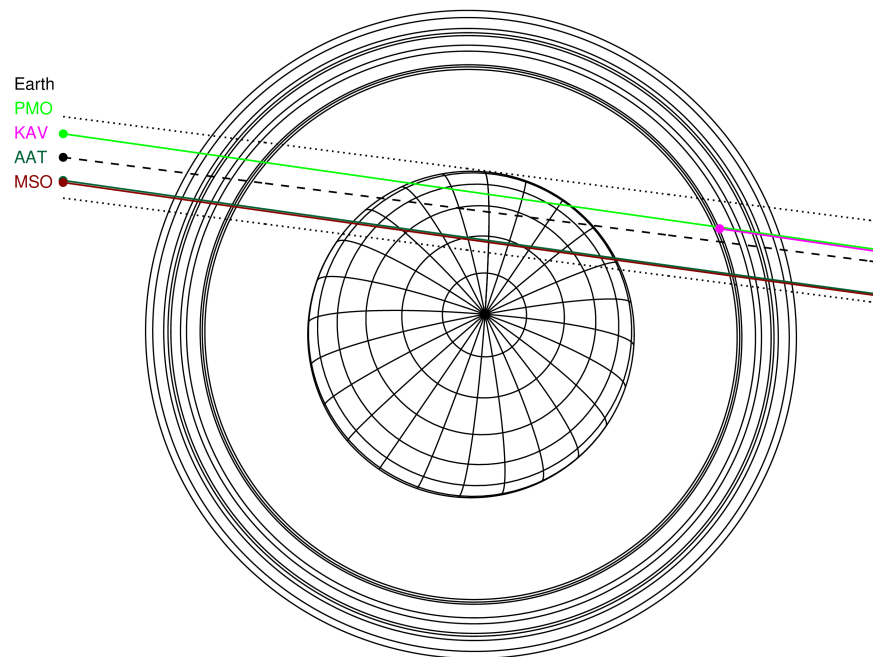
ICRS Star Coord at Epoch: 04h 48m 54.36408s +22:23:19.53437s

RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.177
 G magnitude : 17.890
 RP magnitude : 16.785
 BP magnitude : 19.267
 DUPflag : 0
 Distance (au) : 19.462
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 11.47
 Sun-Target sep (deg) : 80.03
 Sun-Moon sep (deg) : 165.75
 B (ring opening deg) : 81.33
 PA of pole (deg) : -34.57

#	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

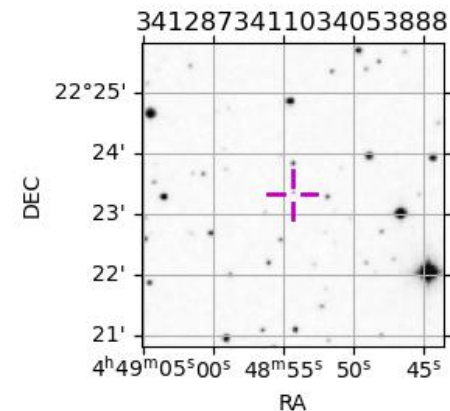


2028-08-26T18:29:55.9800 ex: 04 48 54.3641 8: +22 23 19.534 C/A 1.376° PA 172.67 deg v_sky +11.47 km/s D 19.46 AU
 Credit: Styled after SORA/Lucky Star

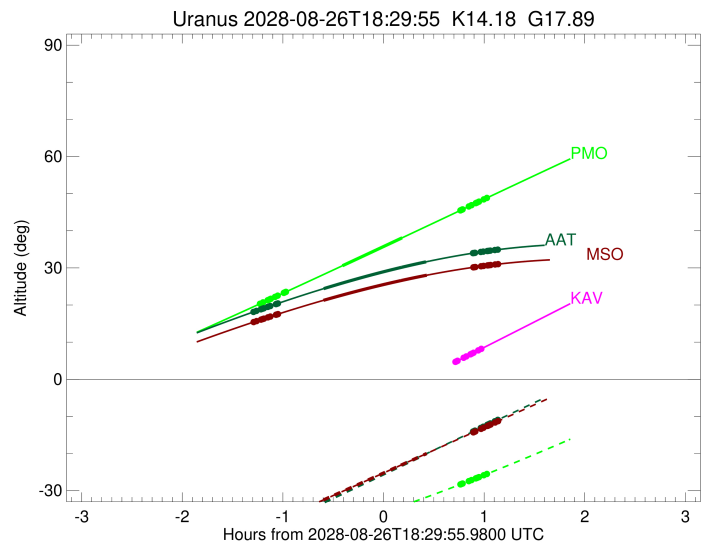
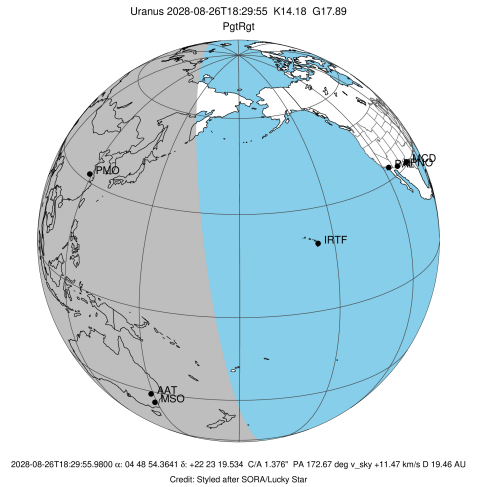


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	AUG 26 17:15 - AUG 26 19:31	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			+++++	AUG 26 19:17 - AUG 26 19:28	PnnRne
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	+++++	+ +	+++++	AUG 26 17:12 - AUG 26 19:38	PieRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+ +	+++++	AUG 26 17:12 - AUG 26 19:38	PieRie



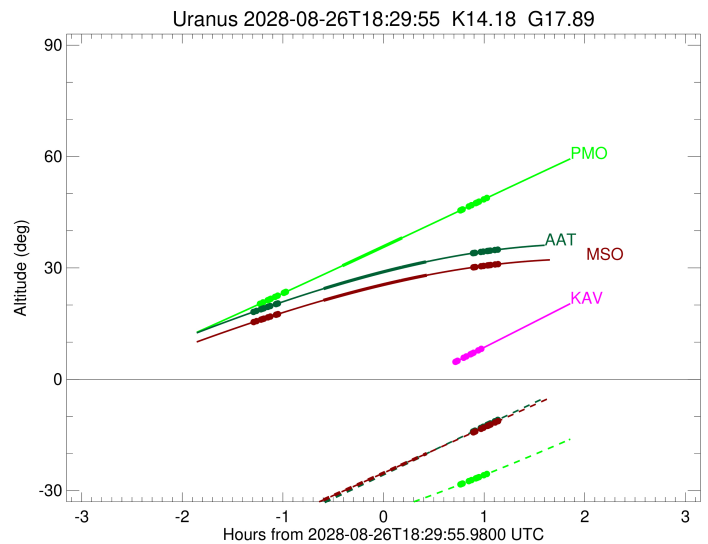
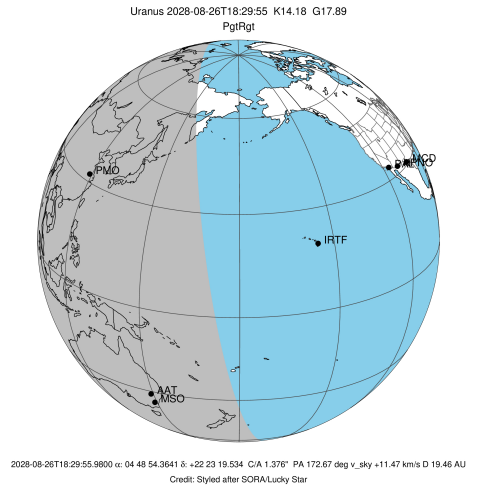
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-08-26T18:23:51.270
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3412873411034053888
 2Mass ID (if available) : 04485437+2223198
 ICRS Star Coord at Epoch: 04h 48m 54.36408s +22:23:19.53437s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.177
 G magnitude : 17.890
 RP magnitude : 16.785
 BP magnitude : 19.267
 DUPflag : 0
 Distance (au) : 19.462
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 11.47
 Sun-Target sep (deg) : 80.03
 Sun-Moon sep (deg) : 165.16
 B (ring opening deg) : 81.33
 PA of pole (deg) : -34.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.566
 C/A sky separation (km) : 22110.1
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

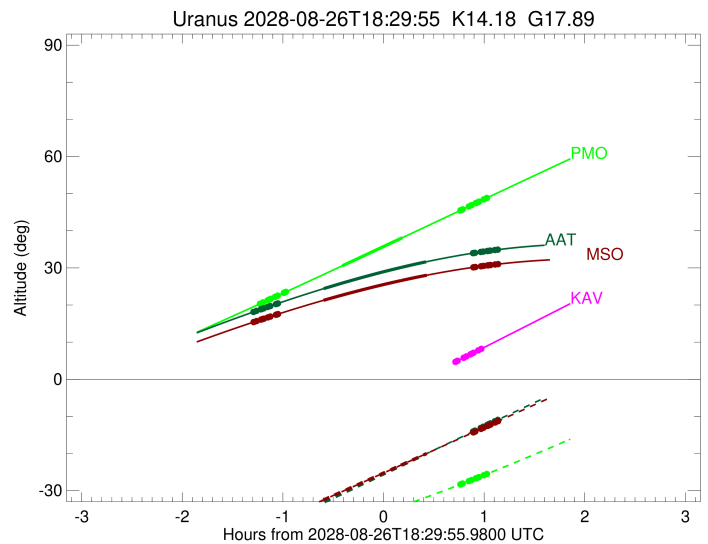
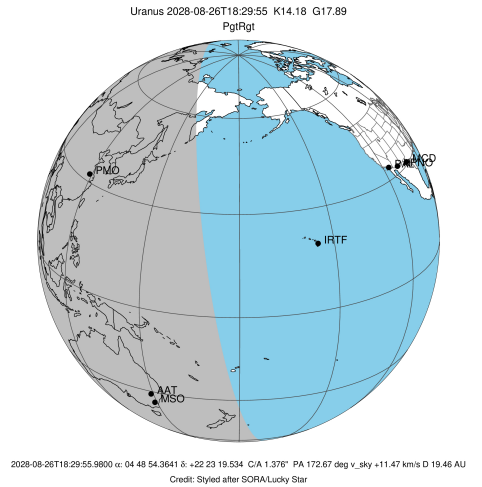
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2028-08-26T17:15:50.189		20.25	-44.89	51429.74	-10.36		
lambda	I	2028-08-26T17:18:06.507		20.72	-44.69	50026.71	-10.26		
delta	I	2028-08-26T17:20:55.640		21.30	-44.43	48300.35	-10.16		
gamma	I	2028-08-26T17:22:01.666		21.52	-44.33	47631.07	-10.12		
eta	I	2028-08-26T17:22:46.704		21.68	-44.25	47176.12	-10.09		
beta	I	2028-08-26T17:25:17.556		22.20	-44.01	45662.14	-9.99		
alpha	I	2028-08-26T17:26:50.005		22.52	-43.86	44742.24	-9.91		
4	I	2028-08-26T17:30:27.380		23.27	-43.49	42605.82	-9.73		
5	I	2028-08-26T17:30:58.080		23.38	-43.44	42307.71	-9.71		
6	I	2028-08-26T17:31:42.127		23.53	-43.36	41879.69	-9.67		
Uranus	I	2028-08-26T18:05:32.023		30.60	-39.31	25374.24		4.86	5.08
Uranus	E	2028-08-26T18:41:02.007		38.10	-34.11	24986.75		8.67	9.07
6	E	2028-08-26T19:15:44.665		45.48	-28.33	41820.75	9.51		
5	E	2028-08-26T19:16:21.733		45.61	-28.22	42172.33	9.54		
4	E	2028-08-26T19:16:59.442		45.74	-28.11	42529.48	9.57		
alpha	E	2028-08-26T19:20:42.461		46.53	-27.46	44685.64	9.73		
beta	E	2028-08-26T19:22:24.256		46.90	-27.16	45677.70	9.80		
eta	E	2028-08-26T19:24:56.483		47.44	-26.71	47176.12	9.89		
gamma	E	2028-08-26T19:25:41.868		47.60	-26.57	47625.45	9.91		
delta	E	2028-08-26T19:26:49.820		47.84	-26.37	48300.35	9.95		
lambda	E	2028-08-26T19:29:42.544		48.45	-25.85	50026.71	10.04		
epsilon	E	2028-08-26T19:31:39.009		48.86	-25.50	51198.92	10.13		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-08-26T18:21:55.930
 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 : 3412873411034053888
 2Mass ID (if available) : 04485437+2223198
 ICRS Star Coord at Epoch: 04h 48m 54.36408s +22:23:19.53437s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.177
 G magnitude : 17.890
 RP magnitude : 16.785
 BP magnitude : 19.267
 DUPflag : 0
 Distance (au) : 19.462
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 11.47
 Sun-Target sep (deg) : 80.03
 Sun-Moon sep (deg) : 164.81
 B (ring opening deg) : 81.33
 PA of pole (deg) : -34.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.553
 C/A sky separation (km) : 21921.2
 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



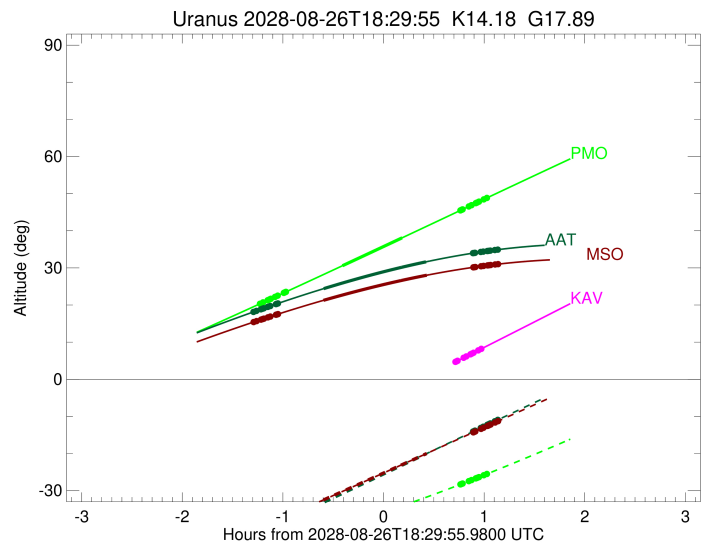
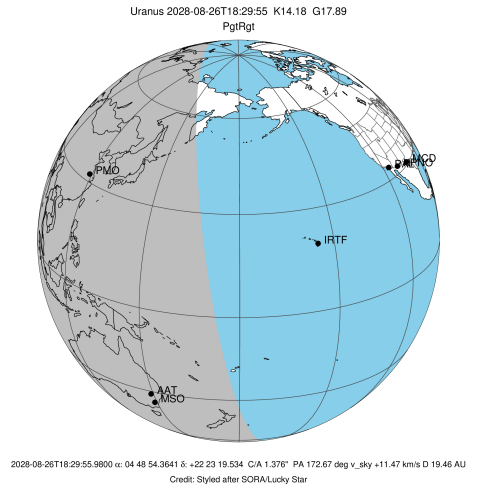
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2028-08-26T17:15:26.854	-21.20x	-58.12	51427.98	-10.64			
lambda	I	2028-08-26T17:17:39.407	-20.73x	-58.50	50026.71	-10.53			
delta	I	2028-08-26T17:20:24.043	-20.15x	-58.97	48300.35	-10.44			
gamma	I	2028-08-26T17:21:28.305	-19.92x	-59.16	47631.05	-10.39			
eta	I	2028-08-26T17:22:12.134	-19.76x	-59.28	47176.12	-10.37			
beta	I	2028-08-26T17:24:38.931	-19.24x	-59.69	45662.01	-10.26			
alpha	I	2028-08-26T17:26:08.842	-18.92x	-59.94	44742.40	-10.19			
4	I	2028-08-26T17:29:40.250	-18.17x	-60.51	42606.02	-10.01			
5	I	2028-08-26T17:30:10.094	-18.06x	-60.59	42307.94	-9.98			
6	I	2028-08-26T17:30:52.953	-17.91x	-60.70	41879.67	-9.95			
Uranus	I	2028-08-26T18:03:33.438	-10.82x	-65.10	25382.98			4.74	4.96
Uranus	E	2028-08-26T18:39:12.677	-2.90x	-67.42	24987.31			8.66	9.07
6	E	2028-08-26T19:12:47.389	4.67x	-66.55	41820.51	9.76			
5	E	2028-08-26T19:13:23.511	4.81x	-66.51	42172.03	9.79			
4	E	2028-08-26T19:14:00.277	4.95x	-66.46	42529.37	9.81			
alpha	E	2028-08-26T19:17:37.710	5.77	-66.18	44685.60	9.98			
beta	E	2028-08-26T19:19:16.989	6.15	-66.05	45677.63	10.04			
eta	E	2028-08-26T19:21:45.507	6.71	-65.83	47176.12	10.13			
gamma	E	2028-08-26T19:22:29.791	6.88	-65.76	47625.42	10.16			
delta	E	2028-08-26T19:23:36.110	7.13	-65.66	48300.35	10.20			
lambda	E	2028-08-26T19:26:24.716	7.77	-65.39	50026.71	10.28			
epsilon	E	2028-08-26T19:28:18.231	8.20	-65.19	51196.80	10.37			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-08-26T18:25:09.270
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 3412873411034053888
 2Mass ID (if available) : 04485437+2223198
 ICRS Star Coord at Epoch: 04h 48m 54.36408s +22:23:19.53437s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.177
 G magnitude : 17.890
 RP magnitude : 16.785
 BP magnitude : 19.267
 DUPflag : 0
 Distance (au) : 19.462
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 11.47
 Sun-Target sep (deg) : 80.03
 Sun-Moon sep (deg) : 165.57
 B (ring opening deg) : 81.33
 PA of pole (deg) : -34.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.060
 C/A sky separation (km) : 14956.3
 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	2028-08-26T17:12:04.549		18.09	-41.95	51381.67	-10.81		
lambda	I	2028-08-26T17:14:10.353		18.42	-41.52	50026.71	-10.75		
delta	I	2028-08-26T17:16:51.202		18.85	-40.97	48300.35	-10.71		
gamma	I	2028-08-26T17:17:53.785		19.01	-40.75	47630.62	-10.69		
eta	I	2028-08-26T17:18:36.317		19.13	-40.60	47176.12	-10.68		
beta	I	2028-08-26T17:20:58.712		19.50	-40.11	45658.62	-10.64		
alpha	I	2028-08-26T17:22:24.643		19.72	-39.81	44746.20	-10.60		
4	I	2028-08-26T17:25:46.679		20.24	-39.11	42610.76	-10.53		
5	I	2028-08-26T17:26:14.954		20.31	-39.01	42312.88	-10.52		
6	I	2028-08-26T17:26:56.400		20.42	-38.87	41878.46	-10.50		
Uranus	I	2028-08-26T17:54:15.715		24.41	-33.12	25543.70		1.39	1.45
Uranus	E	2028-08-26T18:55:20.040		31.64	-20.09	25099.51		7.73	8.10
6	E	2028-08-26T19:23:14.603		33.97	-14.11	41813.65	10.36		
5	E	2028-08-26T19:23:48.694		34.01	-13.99	42164.10	10.37		
4	E	2028-08-26T19:24:23.813		34.05	-13.86	42526.95	10.38		
alpha	E	2028-08-26T19:27:50.589		34.28	-13.13	44684.70	10.45		
beta	E	2028-08-26T19:29:25.415		34.39	-12.79	45675.53	10.48		
eta	E	2028-08-26T19:31:48.357		34.54	-12.28	47176.12	10.52		
gamma	E	2028-08-26T19:32:30.984		34.58	-12.13	47624.61	10.53		
delta	E	2028-08-26T19:33:35.127		34.65	-11.90	48300.35	10.54		
lambda	E	2028-08-26T19:36:18.591		34.81	-11.32	50026.71	10.58		
epsilon	E	2028-08-26T19:38:03.635		34.91	-10.95	51139.14	10.63		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-08-26T18:25:16.520
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MSO
 Location : Mt. Stromlo Observatory
 Latitude (deg) : -35.32000
 E. Longitude (deg) : 149.00833
 Altitude (km) : 0.770
 Gaia source ID : 3412873411034053888
 2Mass ID (if available) : 04485437+2223198
 ICRS Star Coord at Epoch: 04h 48m 54.36408s +22:23:19.53437s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.177
 G magnitude : 17.890
 RP magnitude : 16.785
 BP magnitude : 19.267
 DUPflag : 0
 Distance (au) : 19.462
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 11.47
 Sun-Target sep (deg) : 80.03
 Sun-Moon sep (deg) : 165.58
 B (ring opening deg) : 81.33
 PA of pole (deg) : -34.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.040
 C/A sky separation (km) : 14676.6
 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	2028-08-26T17:12:09.535		15.36	-40.78	51379.56	-10.84		
lambda	I	2028-08-26T17:14:14.798		15.67	-40.38	50026.71	-10.78		
delta	I	2028-08-26T17:16:55.182		16.07	-39.86	48300.35	-10.74		
gamma	I	2028-08-26T17:17:57.578		16.22	-39.66	47630.60	-10.73		
eta	I	2028-08-26T17:18:39.978		16.33	-39.52	47176.12	-10.71		
beta	I	2028-08-26T17:21:01.933		16.68	-39.06	45658.48	-10.67		
alpha	I	2028-08-26T17:22:27.554		16.89	-38.78	44746.34	-10.64		
4	I	2028-08-26T17:25:48.872		17.37	-38.12	42610.93	-10.57		
5	I	2028-08-26T17:26:17.042		17.44	-38.03	42313.03	-10.55		
6	I	2028-08-26T17:26:58.362		17.54	-37.89	41878.38	-10.54		
Uranus	I	2028-08-26T17:54:07.185		21.26	-32.50	25546.23		1.27	1.33
Uranus	E	2028-08-26T18:55:43.905		28.03	-19.98	25105.66		7.68	8.04
6	E	2028-08-26T19:23:26.896		30.15	-14.31	41813.41	10.41		
5	E	2028-08-26T19:24:00.846		30.19	-14.20	42163.84	10.42		
4	E	2028-08-26T19:24:35.833		30.23	-14.08	42526.89	10.43		
alpha	E	2028-08-26T19:28:01.790		30.44	-13.38	44684.69	10.49		
beta	E	2028-08-26T19:29:36.247		30.53	-13.05	45675.45	10.52		
eta	E	2028-08-26T19:31:58.673		30.67	-12.57	47176.12	10.55		
gamma	E	2028-08-26T19:32:41.144		30.71	-12.43	47624.59	10.56		
delta	E	2028-08-26T19:33:45.064		30.77	-12.21	48300.35	10.58		
lambda	E	2028-08-26T19:36:27.968		30.92	-11.65	50026.71	10.61		
epsilon	E	2028-08-26T19:38:12.460		31.01	-11.30	51136.98	10.66		