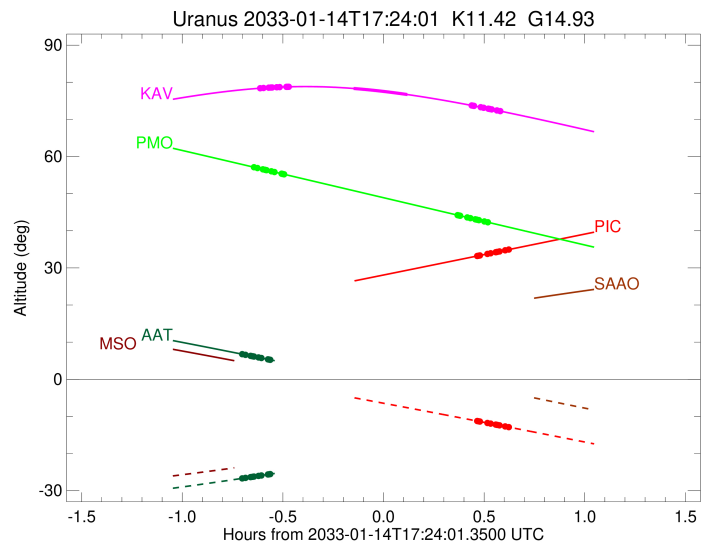
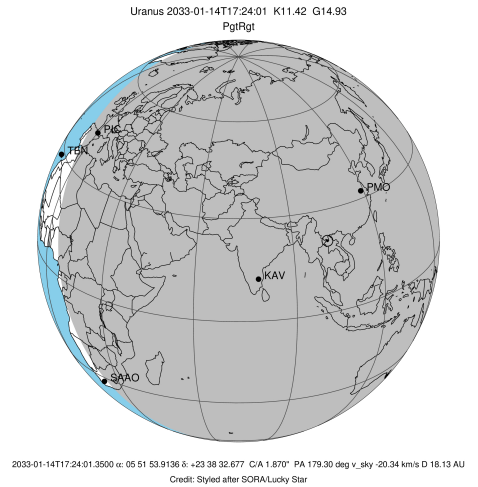


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-01-14T17:27:47.310
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3427500076781260800
 2Mass ID (if available) : 05515391+2338326
 ICRS Star Coord at Epoch: 05h 51m 53.91362s +23:38:32.67668s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 11.418
 G magnitude : 14.928
 RP magnitude : 13.924
 BP magnitude : 15.957
 DUPflag : 0
 Distance (au) : 18.128
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.34
 Sun-Target sep (deg) : 153.74
 Sun-Moon sep (deg) : 18.37
 B (ring opening deg) : 76.86
 PA of pole (deg) : 51.80
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.123
 C/A sky separation (km) : 27914.9
 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

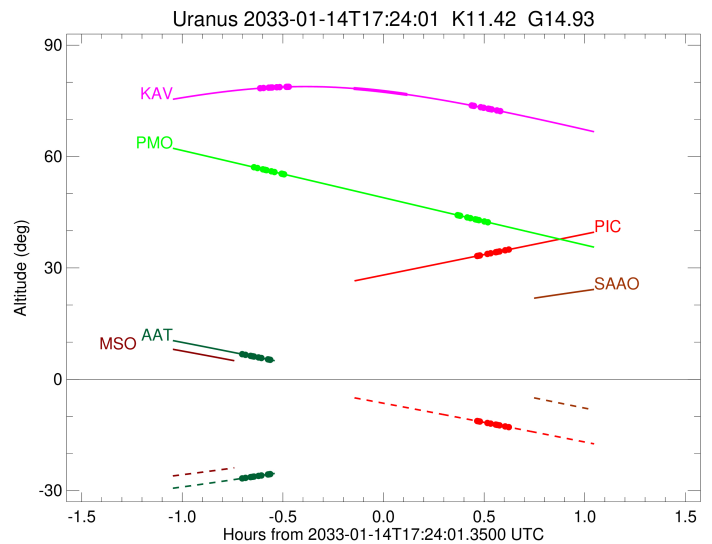
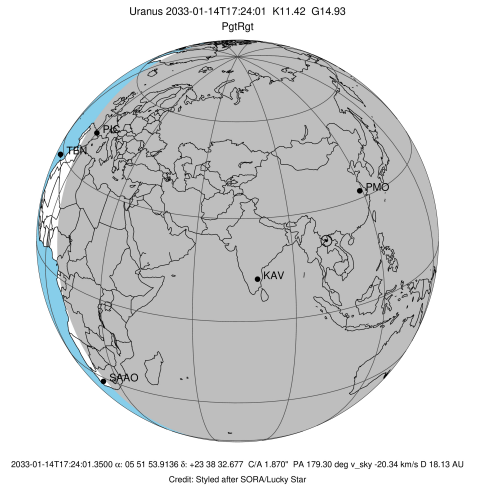


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-01-14T16:53:01.609		22.46	-1.32x	51093.98	-17.39		
lambda	I	2033-01-14T16:54:03.601		22.65	-1.49x	50026.71	-17.13		
delta	I	2033-01-14T16:55:45.208		22.95	-1.77x	48300.35	-16.84		
gamma	I	2033-01-14T16:56:25.071		23.07	-1.88x	47631.41	-16.72		
eta	I	2033-01-14T16:56:52.374		23.15	-1.95x	47176.12	-16.63		
beta	I	2033-01-14T16:58:23.345		23.43	-2.20x	45677.14	-16.32		
alpha	I	2033-01-14T16:59:21.273		23.60	-2.35x	44737.56	-16.12		
4	I	2033-01-14T17:01:35.187		24.00	-2.72x	42615.53	-15.55		
5	I	2033-01-14T17:01:59.836		24.08	-2.79x	42235.58	-15.48		
6	I	2033-01-14T17:02:28.276		24.16	-2.86x	41798.89	-15.31		

No planet occultations

6	E	2033-01-14T17:51:55.818		33.20	-11.24	41822.34	15.36		
5	E	2033-01-14T17:52:27.305		33.30	-11.34	42314.70	15.52		
4	E	2033-01-14T17:52:43.491		33.35	-11.38	42556.29	15.60		
alpha	E	2033-01-14T17:55:00.809		33.77	-11.78	44742.08	16.17		
beta	E	2033-01-14T17:55:57.981		33.94	-11.95	45669.17	16.38		
eta	E	2033-01-14T17:57:29.063		34.22	-12.21	47176.12	16.69		
gamma	E	2033-01-14T17:57:55.941		34.31	-12.29	47626.01	16.78		
delta	E	2033-01-14T17:58:35.972		34.43	-12.41	48300.35	16.91		
lambda	E	2033-01-14T18:00:17.174		34.74	-12.70	50026.71	17.20		
epsilon	E	2033-01-14T18:01:44.514		35.01	-12.96	51539.61	17.46		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-01-14T17:20:45.760
 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 : 3427500076781260800
 2Mass ID (if available) : 05515391+2338326
 ICRS Star Coord at Epoch: 05h 51m 53.91362s +23:38:32.67668s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 11.418
 G magnitude : 14.928
 RP magnitude : 13.924
 BP magnitude : 15.957
 DUPflag : 0
 Distance (au) : 18.128
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.34
 Sun-Target sep (deg) : 153.74
 Sun-Moon sep (deg) : 17.26
 B (ring opening deg) : 76.86
 PA of pole (deg) : 51.80
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.979
 C/A sky separation (km) : 26015.7
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

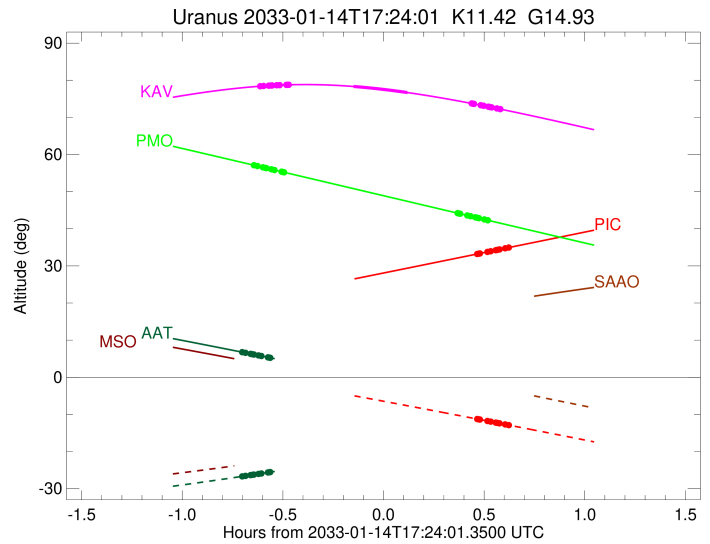
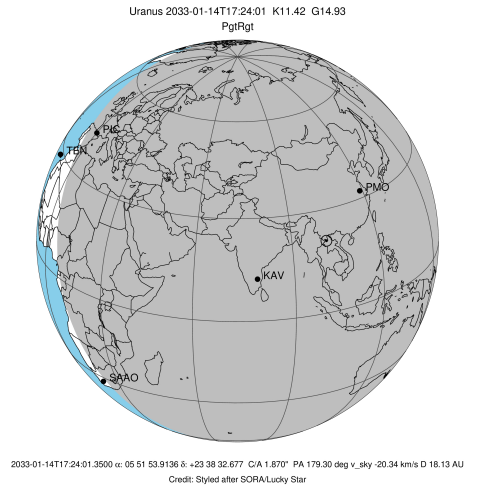


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-01-14T16:45:29.393		57.10	-77.16	51071.79	-18.11		
lambda	I	2033-01-14T16:46:27.586		56.90	-77.04	50026.71	-17.89		
delta	I	2033-01-14T16:48:04.764		56.55	-76.83	48300.35	-17.64		
gamma	I	2033-01-14T16:48:42.811		56.42	-76.75	47631.32	-17.53		
eta	I	2033-01-14T16:49:08.832		56.33	-76.69	47176.12	-17.46		
beta	I	2033-01-14T16:50:35.409		56.02	-76.50	45676.33	-17.19		
alpha	I	2033-01-14T16:51:30.404		55.83	-76.37	44735.69	-17.02		
4	I	2033-01-14T16:53:36.639		55.38	-76.08	42616.09	-16.54		
5	I	2033-01-14T16:54:00.240		55.30	-76.03	42229.91	-16.47		
6	I	2033-01-14T16:54:26.506		55.20	-75.96	41800.31	-16.34		

No planet occultations

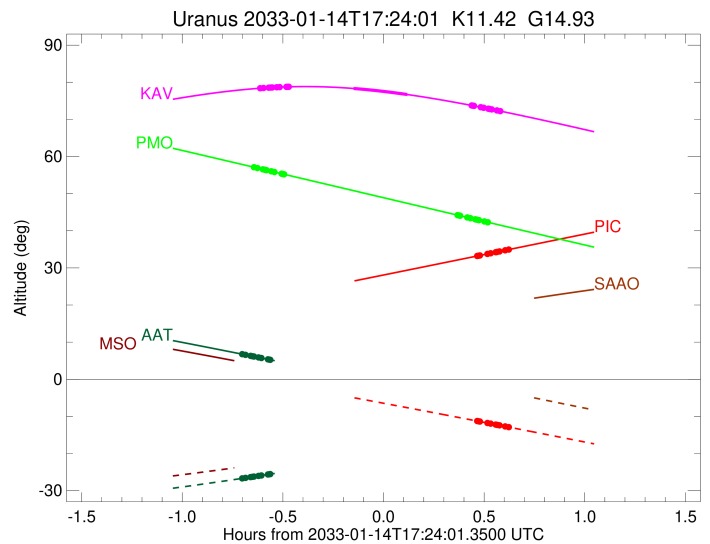
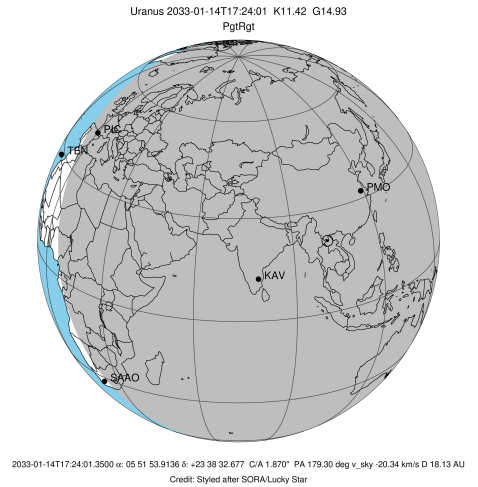
6	E	2033-01-14T17:46:05.163		44.22	-66.82	41824.31	16.28		
5	E	2033-01-14T17:46:34.770		44.11	-66.73	42314.16	16.42		
4	E	2033-01-14T17:46:50.026		44.06	-66.68	42554.28	16.48		
alpha	E	2033-01-14T17:49:00.590		43.60	-66.25	44741.02	16.95		
beta	E	2033-01-14T17:49:55.222		43.40	-66.07	45668.41	17.13		
eta	E	2033-01-14T17:51:22.574		43.09	-65.78	47176.12	17.38		
gamma	E	2033-01-14T17:51:48.389		43.00	-65.69	47625.81	17.46		
delta	E	2033-01-14T17:52:26.914		42.87	-65.56	48300.35	17.56		
lambda	E	2033-01-14T17:54:04.521		42.52	-65.24	50026.71	17.81		
epsilon	E	2033-01-14T17:55:28.798		42.22	-64.96	51535.78	18.03		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-01-14T17:23:30.560
 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 : 3427500076781260800
 2Mass ID (if available) : 05515391+2338326
 ICRS Star Coord at Epoch: 05h 51m 53.91362s +23:38:32.67668s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 11.418
 G magnitude : 14.928
 RP magnitude : 13.924
 BP magnitude : 15.957
 DUPflag : 0
 Distance (au) : 18.128
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.34
 Sun-Target sep (deg) : 153.74
 Sun-Moon sep (deg) : 17.64
 B (ring opening deg) : 76.86
 PA of pole (deg) : 51.80
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.770
 C/A sky separation (km) : 23271.6
 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	2033-01-14T16:47:21.093		78.41	-58.58	51049.23	-18.86		
lambda	I	2033-01-14T16:48:15.688		78.46	-58.79	50026.71	-18.68		
delta	I	2033-01-14T16:49:48.599		78.55	-59.14	48300.35	-18.48		
gamma	I	2033-01-14T16:50:24.884		78.59	-59.28	47631.21	-18.40		
eta	I	2033-01-14T16:50:49.655		78.61	-59.37	47176.12	-18.34		
beta	I	2033-01-14T16:52:11.929		78.67	-59.69	45675.41	-18.14		
alpha	I	2033-01-14T16:53:04.038		78.70	-59.89	44733.61	-18.01		
4	I	2033-01-14T16:55:02.701		78.77	-60.34	42616.46	-17.64		
5	I	2033-01-14T16:55:25.235		78.78	-60.42	42223.82	-17.60		
6	I	2033-01-14T16:55:49.355		78.79	-60.51	41802.05	-17.49		
Uranus	I	2033-01-14T17:15:06.018		78.33	-64.87	25529.13		2.97	3.12
Uranus	E	2033-01-14T17:31:07.983		76.70	-68.42	25141.58		11.32	11.84
6	E	2033-01-14T17:50:17.019		73.77	-72.51	41827.86	17.47		
5	E	2033-01-14T17:50:44.382		73.69	-72.61	42312.75	17.58		
4	E	2033-01-14T17:50:58.561		73.65	-72.66	42550.80	17.63		
alpha	E	2033-01-14T17:53:01.173		73.29	-73.08	44738.96	17.99		
beta	E	2033-01-14T17:53:52.746		73.13	-73.25	45666.95	18.12		
eta	E	2033-01-14T17:55:15.535		72.89	-73.53	47176.12	18.32		
gamma	E	2033-01-14T17:55:40.018		72.81	-73.62	47625.42	18.38		
delta	E	2033-01-14T17:56:16.656		72.70	-73.74	48300.35	18.46		
lambda	E	2033-01-14T17:57:49.669		72.42	-74.05	50026.71	18.66		
epsilon	E	2033-01-14T17:59:09.750		72.17	-74.32	51526.74	18.83		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-01-14T17:19:36.110
 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 : 3427500076781260800
 2Mass ID (if available) : 05515391+2338326
 ICRS Star Coord at Epoch: 05h 51m 53.91362s +23:38:32.67668s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 11.418
 G magnitude : 14.928
 RP magnitude : 13.924
 BP magnitude : 15.957
 DUPflag : 0
 Distance (au) : 18.128
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.34
 Sun-Target sep (deg) : 153.74
 Sun-Moon sep (deg) : 16.65
 B (ring opening deg) : 76.86
 PA of pole (deg) : 51.80
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.587
 C/A sky separation (km) : 20869.5
 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_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	2033-01-14T16:42:00.658		6.74	-26.68	51025.94	-19.07		
lambda	I	2033-01-14T16:42:53.353		6.58	-26.56	50026.71	-18.92		
delta	I	2033-01-14T16:44:24.951		6.30	-26.35	48300.35	-18.77		
gamma	I	2033-01-14T16:45:00.669		6.20	-26.27	47631.07	-18.71		
eta	I	2033-01-14T16:45:25.019		6.12	-26.22	47176.12	-18.66		
beta	I	2033-01-14T16:46:45.840		5.88	-26.03	45674.42	-18.51		
alpha	I	2033-01-14T16:47:36.946		5.72	-25.91	44731.46	-18.40		
4	I	2033-01-14T16:49:32.637		5.37	-25.65	42616.57	-18.12		
5	I	2033-01-14T16:49:54.958		5.30	-25.59	42217.93	-18.09		
6	I	2033-01-14T16:50:17.977		5.23	-25.54	41803.95	-18.00		
Uranus	I	2033-01-14T17:07:35.016		2.04x	-23.03	25558.43		0.41	0.43
Uranus	E	2033-01-14T17:30:55.076		-2.39x	-19.41	25062.55		12.39	12.95
6	E	2033-01-14T17:48:08.540		-5.73x	-16.58	41830.47	17.91		
5	E	2033-01-14T17:48:35.063		-5.82x	-16.50	42311.38	17.99		
4	E	2033-01-14T17:48:48.891		-5.87x	-16.46	42548.38	18.02		
alpha	E	2033-01-14T17:50:49.169		-6.26x	-16.13	44737.40	18.30		
beta	E	2033-01-14T17:51:39.945		-6.42x	-15.98	45665.90	18.40		
eta	E	2033-01-14T17:53:01.683		-6.69x	-15.75	47176.12	18.55		
gamma	E	2033-01-14T17:53:25.866		-6.77x	-15.68	47625.15	18.59		
delta	E	2033-01-14T17:54:02.125		-6.89x	-15.58	48300.35	18.65		
lambda	E	2033-01-14T17:55:34.316		-7.19x	-15.32	50026.71	18.80		
epsilon	E	2033-01-14T17:56:53.481		-7.45x	-15.09	51519.40	18.94		