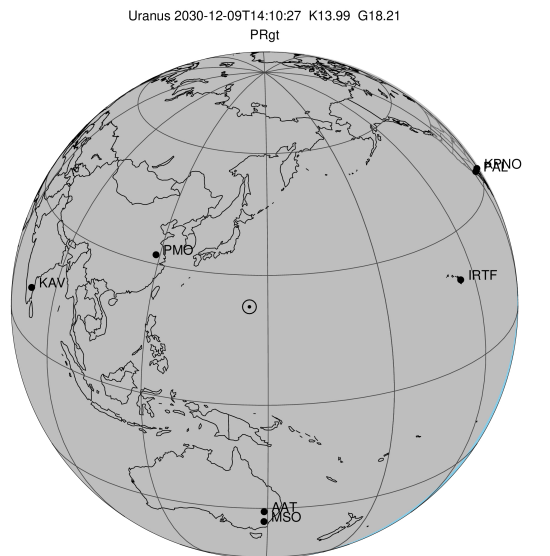


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-09T14:10:27.300
 Event type : PRgt
 : Uranus occs: not geocentric or topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3415599443958411904
 2Mass ID (if available) : 05185235+2311342

ICRS Star Coord at Epoch: 05h 18m 52.36628s +23:11:33.74408s

RUWE (>1.4 is poor) : 0.99
 K magnitude : 13.990
 G magnitude : 18.215
 RP magnitude : 16.963
 BP magnitude : 19.961
 DUPflag : 0
 Distance (au) : 18.173
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.39
 Sun-Target sep (deg) : 176.55
 Sun-Moon sep (deg) : 7.31
 B (ring opening deg) : 81.67
 PA of pole (deg) : 16.24

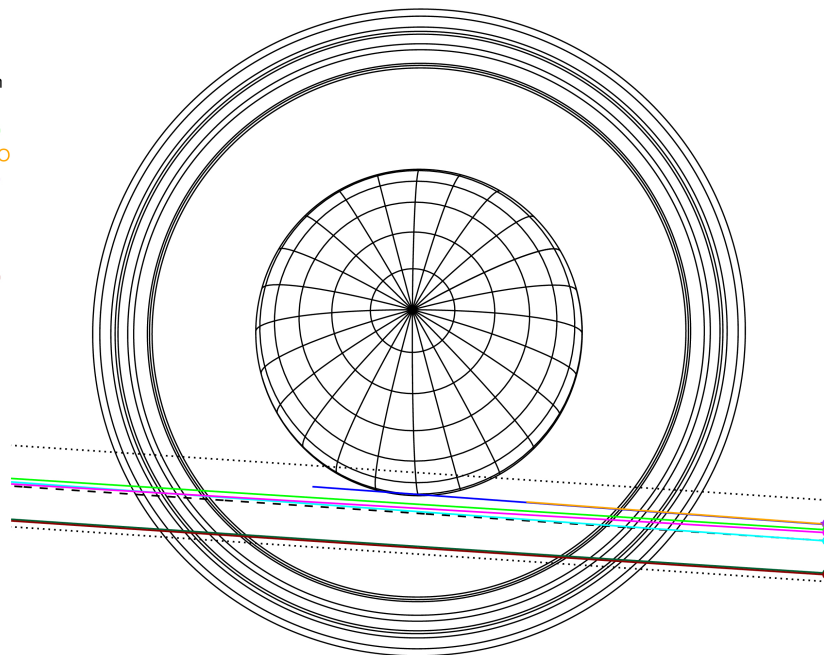
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2030-12-09T14:10:27.3000 ra: 05 18 52.3663 ec: +23 11 33.744 C/A 2.139° PA 356.15 deg v_sky -23.39 km/s D 18.17 AU
 Credit: Styled after SORA/Lucky Star

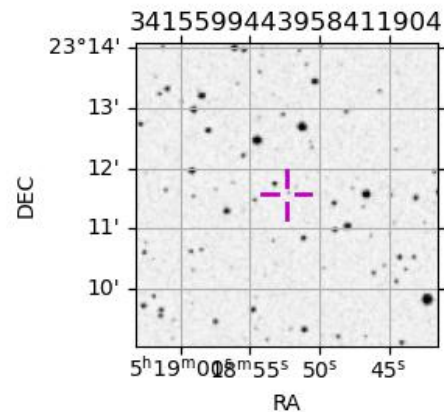
Uranus 2030-12-09T14:10:27 K13.99 G18.21 PRgt

Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 AAT
 MSO

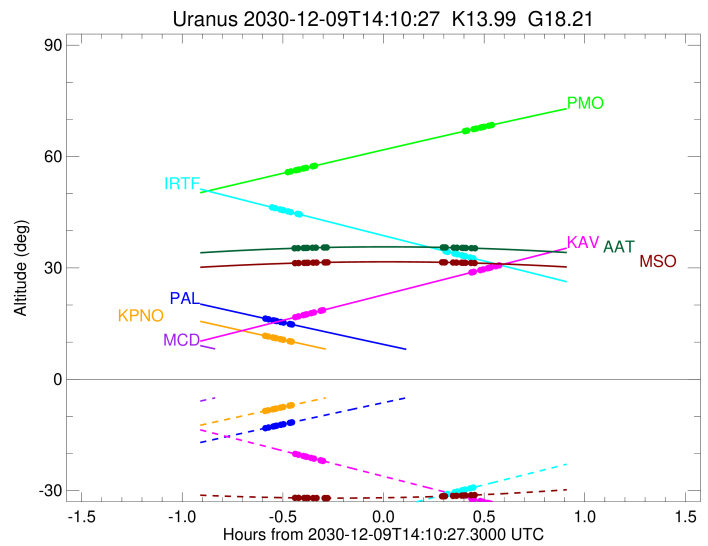
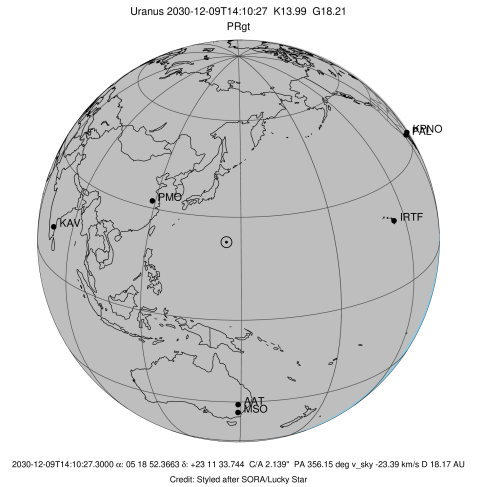


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++			DEC 09 13:35 - DEC 09 13:43	PnnRin
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++		+++++	DEC 09 13:42 - DEC 09 14:43	PnnRie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++			DEC 09 13:35 - DEC 09 13:43	PnnRin
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	+++++		+++++	DEC 09 13:37 - DEC 09 14:37	PnnRie
KAV	Kavalur Observatory	12.6	78.8	+++++		+++++	DEC 09 13:44 - DEC 09 14:45	PnnRie
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	+++++		+++++	DEC 09 13:44 - DEC 09 14:37	PnnRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++		+++++	DEC 09 13:44 - DEC 09 14:37	PnnRie



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-09T14:06:38.060
 Event type : PRgt
 : Uranus occs: not geocentric or 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 : 3415599443958411904
 2Mass ID (if available) : 05185235+2311342
 ICRS Star Coord at Epoch: 05h 18m 52.36628s +23:11:33.74408s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 13.990
 G magnitude : 18.215
 RP magnitude : 16.963
 BP magnitude : 19.961
 DUPflag : 0
 Distance (au) : 18.173
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.39
 Sun-Target sep (deg) : 176.55
 Sun-Moon sep (deg) : 8.15
 B (ring opening deg) : 81.67
 PA of pole (deg) : 16.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.920
 C/A sky separation (km) : 25307.7
 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

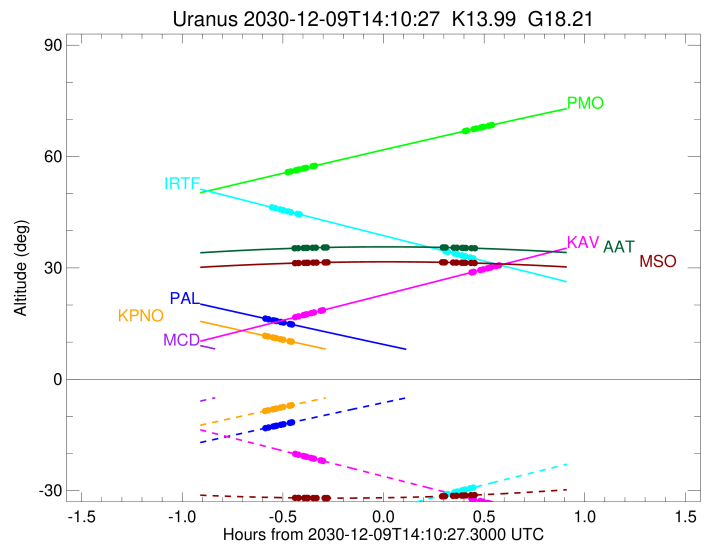
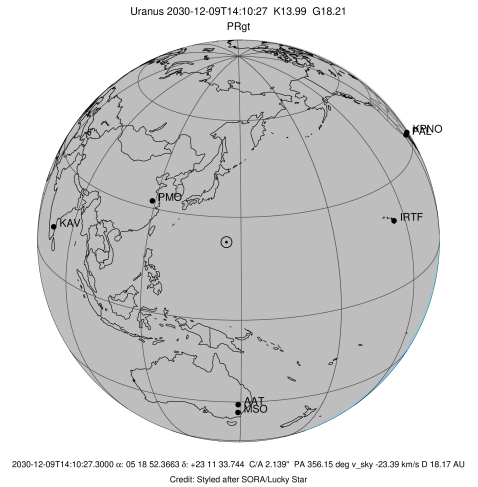


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-12-09T13:35:34.335		16.28	-13.11	50758.56	-20.29		
lambda	I	2030-12-09T13:36:10.545		16.16	-12.99	50026.71	-20.16		
delta	I	2030-12-09T13:37:36.733		15.87	-12.71	48300.35	-19.90		
gamma	I	2030-12-09T13:38:10.975		15.76	-12.59	47620.96	-19.78		
eta	I	2030-12-09T13:38:33.504		15.68	-12.52	47176.12	-19.71		
beta	I	2030-12-09T13:39:49.883		15.43	-12.27	45681.04	-19.43		
alpha	I	2030-12-09T13:40:40.102		15.26	-12.10	44709.10	-19.24		
4	I	2030-12-09T13:42:34.199		14.88	-11.73	42544.31	-18.75		
5	I	2030-12-09T13:42:49.992		14.83	-11.68	42248.44	-18.69		
6	I	2030-12-09T13:43:10.410		14.76	-11.61	41873.01	-18.57		

No planet occultations

6	E	2030-12-09T14:30:22.382		5.53	-2.51x	41850.20	18.51		
5	E	2030-12-09T14:30:46.866		5.46	-2.44x	42307.45	18.62		
4	E	2030-12-09T14:31:03.429		5.40	-2.39x	42613.80	18.69		
alpha	E	2030-12-09T14:32:56.289		5.04	-2.03x	44752.33	19.17		
beta	E	2030-12-09T14:33:43.224		4.90x	-1.88x	45656.25	19.36		
eta	E	2030-12-09T14:35:01.201		4.65x	-1.64x	47176.12	19.63		
gamma	E	2030-12-09T14:35:24.206		4.57x	-1.57x	47628.55	19.70		
delta	E	2030-12-09T14:35:58.203		4.47x	-1.46x	48300.35	19.81		
lambda	E	2030-12-09T14:37:24.756		4.19x	-1.19x	50026.71	20.07		
epsilon	E	2030-12-09T14:38:34.778		3.97x	-0.98x	51438.98	20.20		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-09T14:12:14.330
 Event type : PRgt
 : Uranus occs: not geocentric or 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 : 3415599443958411904
 2Mass ID (if available) : 05185235+2311342
 ICRS Star Coord at Epoch: 05h 18m 52.36628s +23:11:33.74408s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 13.990
 G magnitude : 18.215
 RP magnitude : 16.963
 BP magnitude : 19.961
 DUPflag : 0
 Distance (au) : 18.173
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.39
 Sun-Target sep (deg) : 176.55
 Sun-Moon sep (deg) : 7.06
 B (ring opening deg) : 81.67
 PA of pole (deg) : 16.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.038
 C/A sky separation (km) : 26860.2
 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

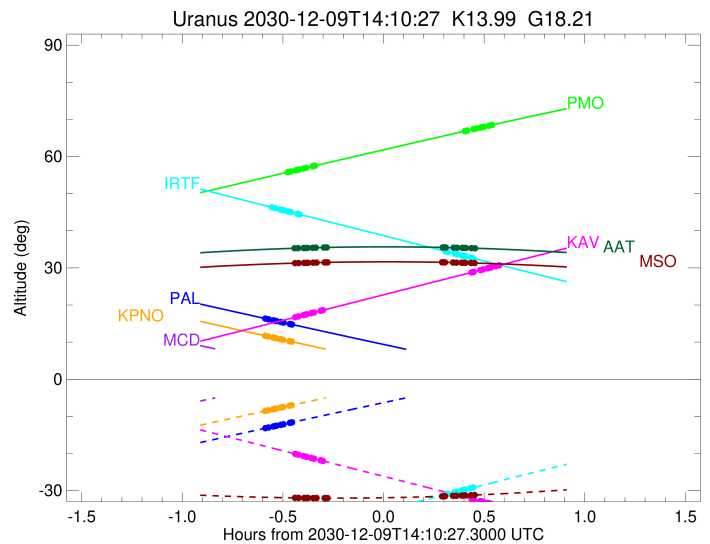
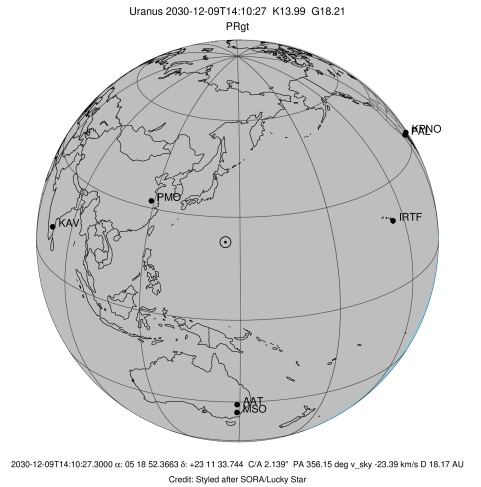


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-12-09T13:42:14.445		55.86	-58.87	50761.42	-20.07		
lambda	I	2030-12-09T13:42:51.212		55.99	-59.00	50026.71	-19.92		
delta	I	2030-12-09T13:44:18.517		56.30	-59.31	48300.35	-19.62		
gamma	I	2030-12-09T13:44:53.259		56.42	-59.43	47620.96	-19.49		
eta	I	2030-12-09T13:45:16.135		56.50	-59.51	47176.12	-19.40		
beta	I	2030-12-09T13:46:33.813		56.78	-59.78	45681.11	-19.08		
alpha	I	2030-12-09T13:47:24.949		56.96	-59.96	44710.16	-18.86		
4	I	2030-12-09T13:49:21.632		57.37	-60.37	42545.64	-18.28		
5	I	2030-12-09T13:49:37.766		57.43	-60.42	42251.33	-18.21		
6	I	2030-12-09T13:49:58.838		57.50	-60.50	41873.85	-18.07		

No planet occultations

6	E	2030-12-09T14:34:43.341		66.85	-69.65	41852.56	18.11		
5	E	2030-12-09T14:35:08.301		66.93	-69.73	42309.33	18.24		
4	E	2030-12-09T14:35:25.078		66.99	-69.79	42612.84	18.32		
alpha	E	2030-12-09T14:37:19.924		67.38	-70.17	44752.42	18.90		
beta	E	2030-12-09T14:38:07.544		67.54	-70.32	45657.28	19.12		
eta	E	2030-12-09T14:39:26.332		67.81	-70.58	47176.12	19.44		
gamma	E	2030-12-09T14:39:49.537		67.89	-70.65	47628.31	19.53		
delta	E	2030-12-09T14:40:23.829		68.00	-70.77	48300.35	19.66		
lambda	E	2030-12-09T14:41:50.941		68.30	-71.05	50026.71	19.97		
epsilon	E	2030-12-09T14:43:00.597		68.53	-71.27	51425.47	20.12		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-09T14:06:36.500
 Event type : PRgt
 : Uranus occs: not geocentric or 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 : 3415599443958411904
 2Mass ID (if available) : 05185235+2311342
 ICRS Star Coord at Epoch: 05h 18m 52.36628s +23:11:33.74408s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 13.990
 G magnitude : 18.215
 RP magnitude : 16.963
 BP magnitude : 19.961
 DUPflag : 0
 Distance (au) : 18.173
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.39
 Sun-Target sep (deg) : 176.55
 Sun-Moon sep (deg) : 8.14
 B (ring opening deg) : 81.67
 PA of pole (deg) : 16.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.914
 C/A sky separation (km) : 25232.8
 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

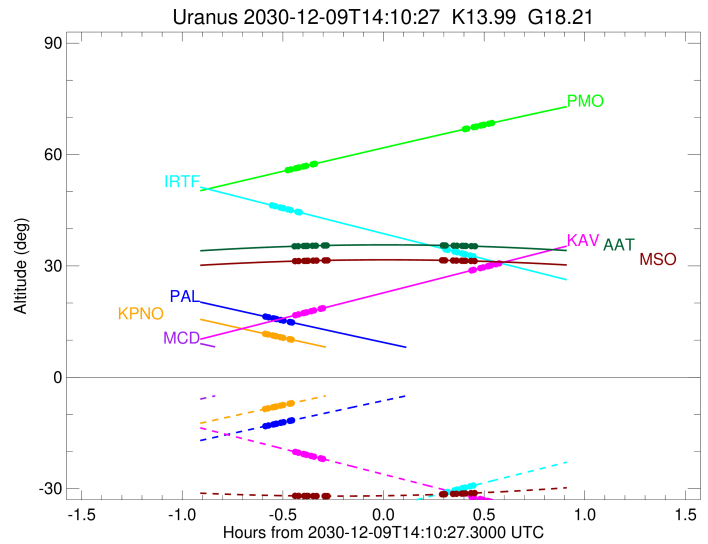
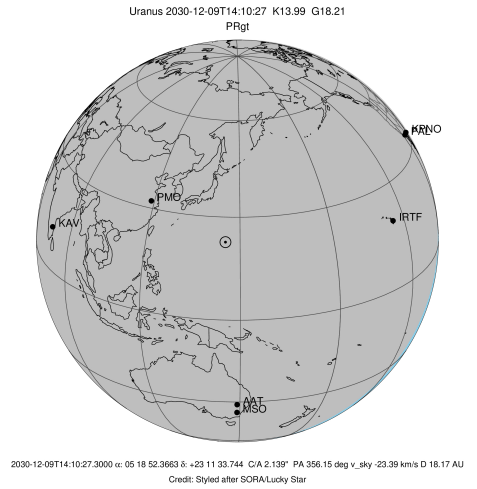


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-12-09T13:35:28.067		11.65	-8.48	50758.40	-20.28		
lambda	I	2030-12-09T13:36:04.285		11.53	-8.37	50026.71	-20.15		
delta	I	2030-12-09T13:37:30.507		11.24	-8.08	48300.35	-19.89		
gamma	I	2030-12-09T13:38:04.760		11.13	-7.97	47620.96	-19.78		
eta	I	2030-12-09T13:38:27.295		11.05	-7.90	47176.12	-19.70		
beta	I	2030-12-09T13:39:43.690		10.80	-7.65	45681.03	-19.43		
alpha	I	2030-12-09T13:40:33.917		10.63	-7.48	44709.04	-19.24		
4	I	2030-12-09T13:42:28.008		10.25	-7.11	42544.24	-18.75		
5	I	2030-12-09T13:42:43.803		10.20	-7.06	42248.28	-18.69		
6	I	2030-12-09T13:43:04.211		10.13	-6.99	41872.97	-18.58		

No planet occultations

6	E	2030-12-09T14:30:25.473	0.92x	2.08x	41850.11	18.52
5	E	2030-12-09T14:30:49.953	0.84x	2.15x	42307.37	18.63
4	E	2030-12-09T14:31:06.520	0.79x	2.21x	42613.84	18.69
alpha	E	2030-12-09T14:32:59.378	0.43x	2.56x	44752.33	19.17
beta	E	2030-12-09T14:33:46.319	0.29x	2.70x	45656.21	19.35
eta	E	2030-12-09T14:35:04.318	0.04x	2.94x	47176.12	19.62
gamma	E	2030-12-09T14:35:27.330	-0.03x	3.01x	47628.56	19.70
delta	E	2030-12-09T14:36:01.340	-0.14x	3.12x	48300.35	19.81
lambda	E	2030-12-09T14:37:27.931	-0.41x	3.38x	50026.71	20.06
epsilon	E	2030-12-09T14:38:38.017	-0.63x	3.60x	51439.50	20.19

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-09T14:07:03.340
 Event type : PRgt
 : Uranus occs: not geocentric or 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 : 3415599443958411904
 2Mass ID (if available) : 05185235+2311342
 ICRS Star Coord at Epoch: 05h 18m 52.36628s +23:11:33.74408s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 13.990
 G magnitude : 18.215
 RP magnitude : 16.963
 BP magnitude : 19.961
 DUPflag : 0
 Distance (au) : 18.173
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.39
 Sun-Target sep (deg) : 176.55
 Sun-Moon sep (deg) : 8.09
 B (ring opening deg) : 81.67
 PA of pole (deg) : 16.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.124
 C/A sky separation (km) : 27988.0
 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

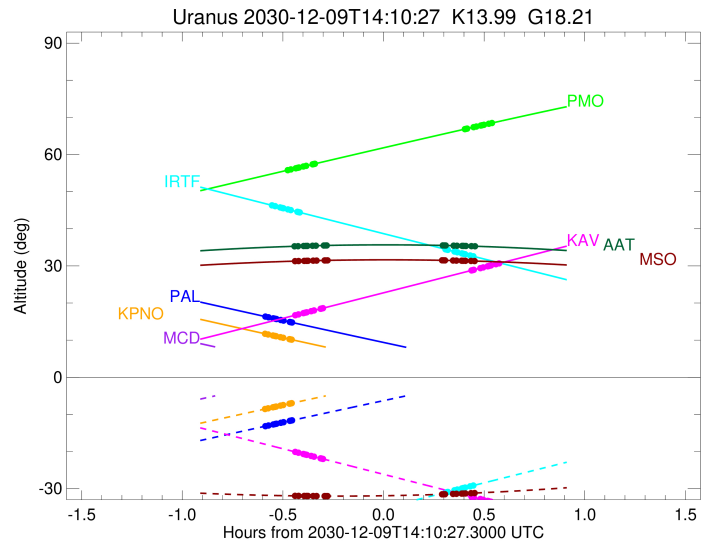
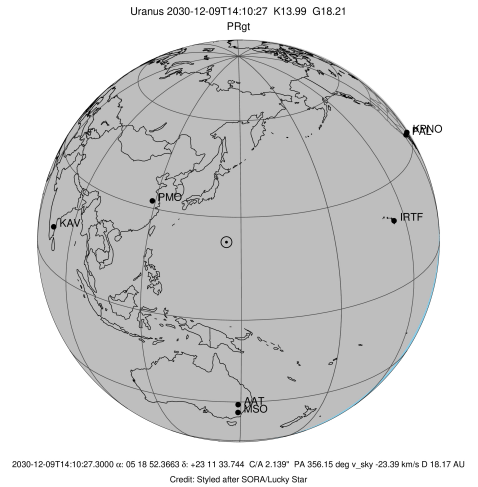


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-12-09T13:37:32.202		46.24	-42.77	50765.93	-19.73		
lambda	I	2030-12-09T13:38:09.859		46.09	-42.62	50026.71	-19.56		
delta	I	2030-12-09T13:39:38.861		45.75	-42.28	48300.35	-19.22		
gamma	I	2030-12-09T13:40:14.333		45.62	-42.15	47620.97	-19.08		
eta	I	2030-12-09T13:40:37.709		45.53	-42.06	47176.12	-18.98		
beta	I	2030-12-09T13:41:57.199		45.22	-41.76	45681.19	-18.62		
alpha	I	2030-12-09T13:42:49.569		45.02	-41.56	44711.54	-18.38		
4	I	2030-12-09T13:44:49.591		44.56	-41.10	42547.33	-17.73		
5	I	2030-12-09T13:45:06.155		44.50	-41.03	42254.84	-17.64		
6	I	2030-12-09T13:45:28.047		44.42	-40.95	41874.79	-17.49		

No planet occultations

6	E	2030-12-09T14:28:56.138		34.48	-31.05	41853.62	17.45		
5	E	2030-12-09T14:29:22.002		34.38	-30.95	42310.10	17.59		
4	E	2030-12-09T14:29:39.331		34.31	-30.89	42612.36	17.68		
alpha	E	2030-12-09T14:31:38.063		33.86	-30.44	44752.43	18.32		
beta	E	2030-12-09T14:32:27.169		33.68	-30.25	45657.72	18.56		
eta	E	2030-12-09T14:33:48.202		33.37	-29.95	47176.12	18.92		
gamma	E	2030-12-09T14:34:12.038		33.28	-29.86	47628.21	19.02		
delta	E	2030-12-09T14:34:47.250		33.15	-29.72	48300.35	19.16		
lambda	E	2030-12-09T14:36:16.568		32.81	-29.39	50026.71	19.49		
epsilon	E	2030-12-09T14:37:27.620		32.54	-29.12	51420.37	19.66		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-09T14:14:26.040
 Event type : PRgt
 : Uranus occs: not geocentric or 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 : 3415599443958411904
 2Mass ID (if available) : 05185235+2311342
 ICRS Star Coord at Epoch: 05h 18m 52.36628s +23:11:33.74408s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 13.990
 G magnitude : 18.215
 RP magnitude : 16.963
 BP magnitude : 19.961
 DUPflag : 0
 Distance (au) : 18.173
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.39
 Sun-Target sep (deg) : 176.55
 Sun-Moon sep (deg) : 6.55
 B (ring opening deg) : 81.67
 PA of pole (deg) : 16.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.087
 C/A sky separation (km) : 27501.8
 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

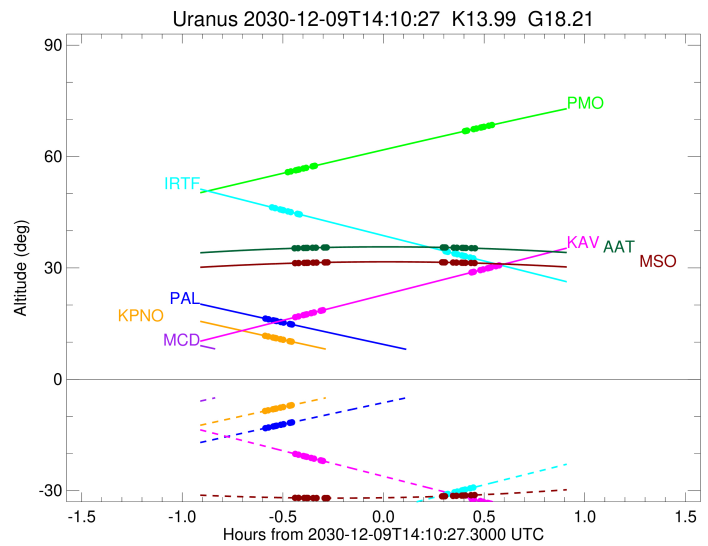
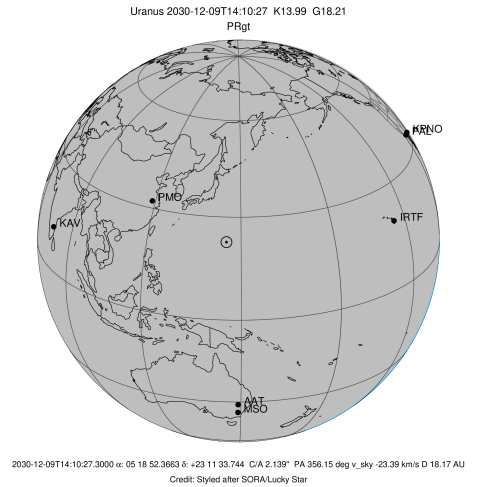


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-12-09T13:44:28.766		16.79	-20.18	50762.87	-19.70		
lambda	I	2030-12-09T13:45:06.308		16.93	-20.33	50026.71	-19.55		
delta	I	2030-12-09T13:46:35.342		17.27	-20.67	48300.35	-19.23		
gamma	I	2030-12-09T13:47:10.799		17.41	-20.80	47620.96	-19.09		
eta	I	2030-12-09T13:47:34.155		17.50	-20.89	47176.12	-19.00		
beta	I	2030-12-09T13:48:53.520		17.80	-21.19	45681.15	-18.66		
alpha	I	2030-12-09T13:49:45.799		18.00	-21.39	44710.66	-18.43		
4	I	2030-12-09T13:51:45.333		18.46	-21.85	42546.28	-17.82		
5	I	2030-12-09T13:52:01.854		18.52	-21.92	42252.67	-17.74		
6	I	2030-12-09T13:52:23.534		18.60	-22.00	41874.22	-17.60		

No planet occultations

6	E	2030-12-09T14:36:41.254		28.78	-32.19	41853.51	17.67		
5	E	2030-12-09T14:37:06.804		28.88	-32.28	42310.02	17.81		
4	E	2030-12-09T14:37:23.934		28.95	-32.35	42612.41	17.89		
alpha	E	2030-12-09T14:39:21.378		29.40	-32.80	44752.43	18.51		
beta	E	2030-12-09T14:40:10.008		29.58	-32.99	45657.70	18.74		
eta	E	2030-12-09T14:41:30.314		29.89	-33.30	47176.12	19.08		
gamma	E	2030-12-09T14:41:53.948		29.98	-33.39	47628.21	19.18		
delta	E	2030-12-09T14:42:28.871		30.12	-33.52	48300.35	19.31		
lambda	E	2030-12-09T14:43:57.500		30.46	-33.86	50026.71	19.64		
epsilon	E	2030-12-09T14:45:08.016		30.73	-34.13	51419.88	19.80		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-09T14:10:40.230
 Event type : PRgt
 : Uranus occs: not geocentric or 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 : 3415599443958411904
 2Mass ID (if available) : 05185235+2311342
 ICRS Star Coord at Epoch: 05h 18m 52.36628s +23:11:33.74408s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 13.990
 G magnitude : 18.215
 RP magnitude : 16.963
 BP magnitude : 19.961
 DUPflag : 0
 Distance (au) : 18.173
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.39
 Sun-Target sep (deg) : 176.55
 Sun-Moon sep (deg) : 7.30
 B (ring opening deg) : 81.67
 PA of pole (deg) : 16.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.537
 C/A sky separation (km) : 33441.8
 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

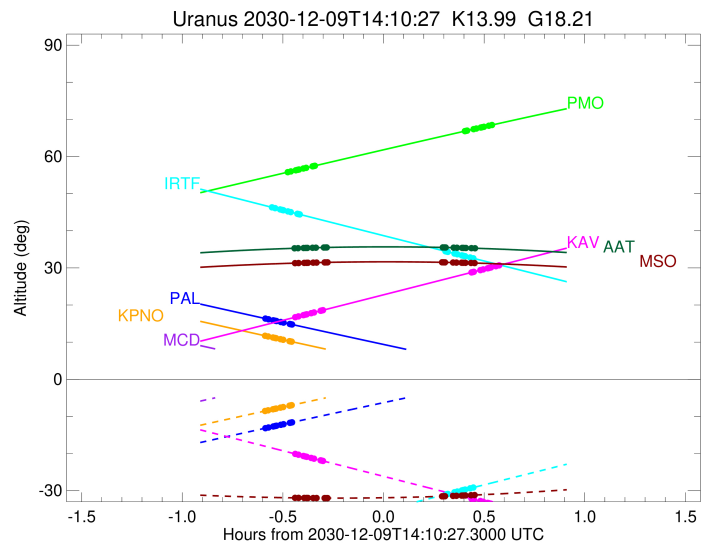
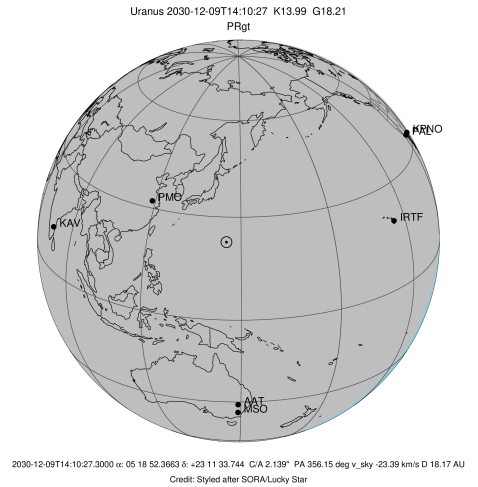


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-12-09T13:44:16.560		35.29	-35.97	50786.36	-17.83		
lambda	I	2030-12-09T13:44:59.563		35.31	-35.98	50026.71	-17.56		
delta	I	2030-12-09T13:46:39.417		35.36	-36.00	48300.35	-17.01		
gamma	I	2030-12-09T13:47:19.620		35.37	-36.00	47621.08	-16.78		
eta	I	2030-12-09T13:47:46.271		35.38	-36.01	47176.12	-16.62		
beta	I	2030-12-09T13:49:17.839		35.42	-36.02	45681.15	-16.02		
alpha	I	2030-12-09T13:50:18.738		35.44	-36.03	44717.10	-15.61		
4	I	2030-12-09T13:52:42.487		35.49	-36.04	42554.78	-14.50		
5	I	2030-12-09T13:53:02.467		35.50	-36.04	42268.94	-14.34		
6	I	2030-12-09T13:53:30.216		35.51	-36.04	41877.89	-14.08		

No planet occultations

6	E	2030-12-09T14:28:08.846		35.51	-35.50	41861.22	14.08		
5	E	2030-12-09T14:28:40.402		35.51	-35.48	42314.21	14.34		
4	E	2030-12-09T14:29:01.108		35.50	-35.47	42607.85	14.50		
alpha	E	2030-12-09T14:31:23.171		35.45	-35.38	44751.88	15.61		
beta	E	2030-12-09T14:32:20.668		35.43	-35.35	45661.14	16.03		
eta	E	2030-12-09T14:33:53.499		35.39	-35.29	47176.12	16.62		
gamma	E	2030-12-09T14:34:20.522		35.38	-35.27	47627.40	16.78		
delta	E	2030-12-09T14:35:00.343		35.37	-35.24	48300.35	17.02		
lambda	E	2030-12-09T14:36:40.182		35.32	-35.17	50026.71	17.56		
epsilon	E	2030-12-09T14:37:56.131		35.29	-35.12	51374.77	17.83		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-12-09T14:10:41.150
 Event type : PRgt
 : Uranus occs: not geocentric or 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 : 3415599443958411904
 2Mass ID (if available) : 05185235+2311342
 ICRS Star Coord at Epoch: 05h 18m 52.36628s +23:11:33.74408s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 13.990
 G magnitude : 18.215
 RP magnitude : 16.963
 BP magnitude : 19.961
 DUPflag : 0
 Distance (au) : 18.173
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.39
 Sun-Target sep (deg) : 176.55
 Sun-Moon sep (deg) : 7.29
 B (ring opening deg) : 81.67
 PA of pole (deg) : 16.24
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.556
 C/A sky separation (km) : 33688.0
 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	2030-12-09T13:44:25.671		31.29	-31.95	50787.56	-17.71		
lambda	I	2030-12-09T13:45:09.035		31.31	-31.95	50026.71	-17.43		
delta	I	2030-12-09T13:46:49.629		31.35	-31.97	48300.35	-16.88		
gamma	I	2030-12-09T13:47:30.158		31.37	-31.98	47621.09	-16.64		
eta	I	2030-12-09T13:47:57.033		31.38	-31.98	47176.12	-16.47		
beta	I	2030-12-09T13:49:29.442		31.41	-31.99	45681.13	-15.87		
alpha	I	2030-12-09T13:50:30.944		31.43	-32.00	44717.39	-15.45		
4	I	2030-12-09T13:52:56.410		31.48	-32.01	42555.19	-14.30		
5	I	2030-12-09T13:53:16.650		31.48	-32.01	42269.66	-14.14		
6	I	2030-12-09T13:53:44.835		31.49	-32.01	41878.02	-13.87		

No planet occultations

6	E	2030-12-09T14:27:56.224		31.50	-31.53	41861.57	13.87		
5	E	2030-12-09T14:28:28.214		31.50	-31.51	42314.34	14.14		
4	E	2030-12-09T14:28:49.182		31.49	-31.50	42607.59	14.31		
alpha	E	2030-12-09T14:31:12.960		31.45	-31.42	44751.83	15.45		
beta	E	2030-12-09T14:32:11.058		31.43	-31.39	45661.30	15.87		
eta	E	2030-12-09T14:33:44.730		31.39	-31.34	47176.12	16.48		
gamma	E	2030-12-09T14:34:11.979		31.38	-31.32	47627.36	16.64		
delta	E	2030-12-09T14:34:52.124		31.37	-31.30	48300.35	16.88		
lambda	E	2030-12-09T14:36:32.704		31.33	-31.23	50026.71	17.44		
epsilon	E	2030-12-09T14:37:49.038		31.30	-31.18	51372.57	17.72		