

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2023-07-02T20:07:33.510
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 55715174757678592
 2Mass ID (if available) : 03162885+1749268

ICRS Star Coord at Epoch: 03h 16m 28.85353s +17:49:26.94488s

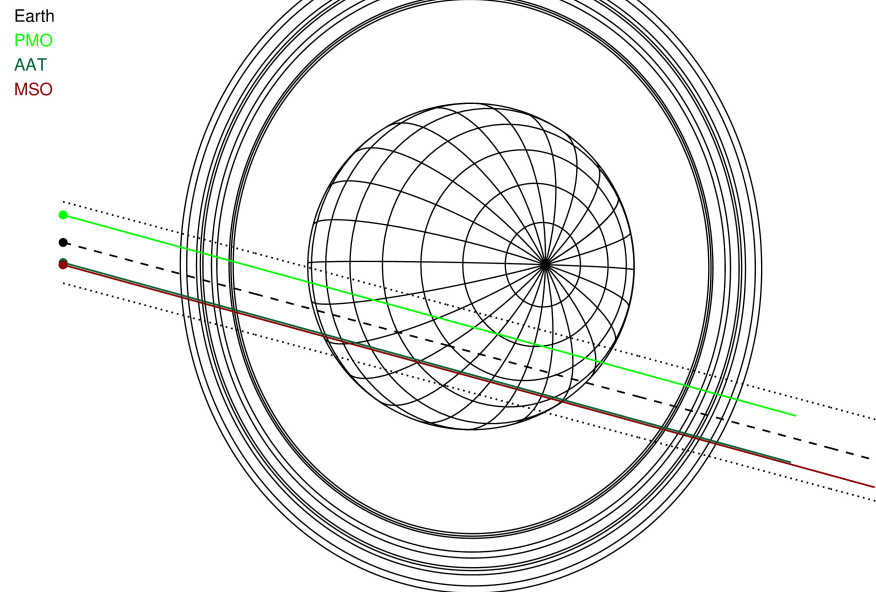
RUWE (>1.4 is poor) : 1.11
 K magnitude : 14.452
 G magnitude : 17.326
 RP magnitude : 16.454
 BP magnitude : 18.123
 DUPflag : 0
 Distance (au) : 20.295
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 25.92
 Sun-Target sep (deg) : 48.92
 Sun-Moon sep (deg) : 139.84
 B (ring opening deg) : 62.87
 PA of pole (deg) : -88.60

#	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



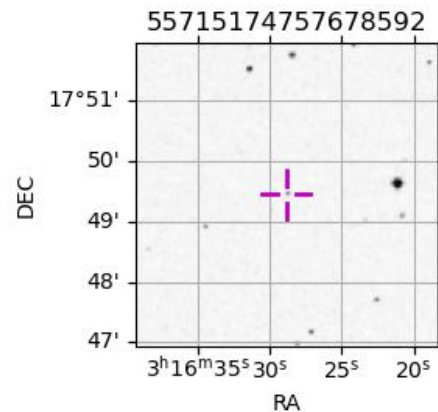
2023-07-02T20:07:33.5100 ex: 03 16 28.8535 8: +17 49 26.945 C/A 0.875° PA 344.99 deg v_sky +25.92 km/s D 20.30 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2023-07-02T20:07:33 K14.45 G17.33 PgtRgt

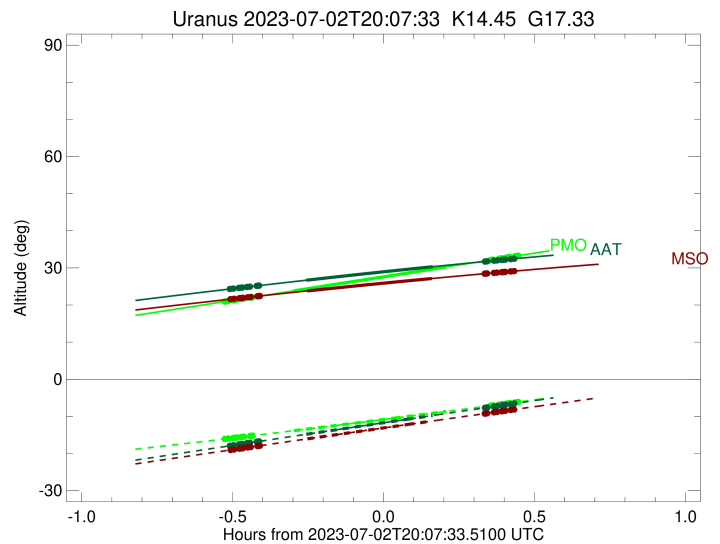
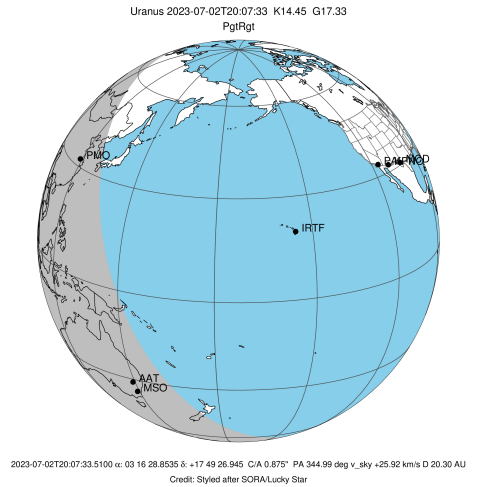


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
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	+++++	+ +	+++++	JUL 02 19:36 - JUL 02 20:34	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					PnnRnn
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	+++++	+ +	+++++	JUL 02 19:37 - JUL 02 20:33	PieRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+ +	+++++	JUL 02 19:37 - JUL 02 20:33	PieRie

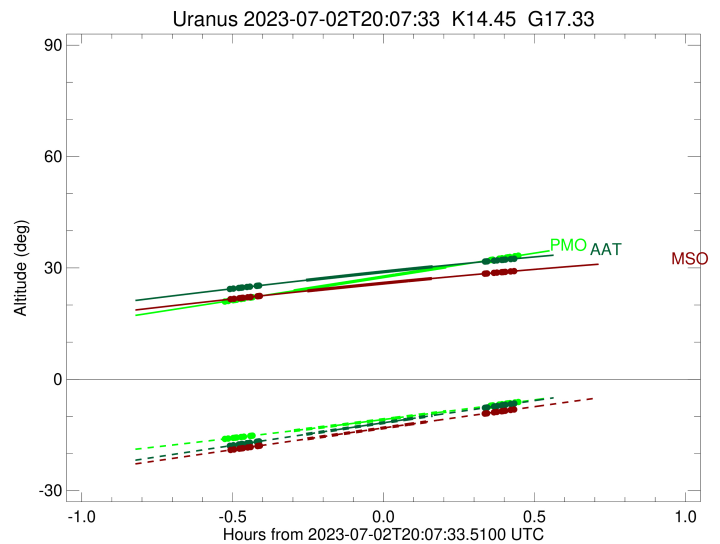
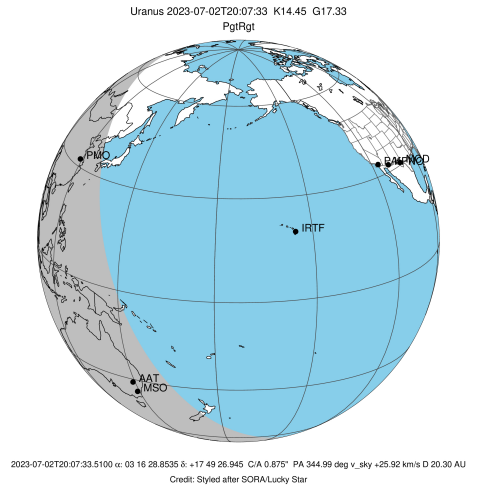


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2023-07-02T20:04:49.240
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 55715174757678592
 2Mass ID (if available) : 03162885+1749268
 ICRS Star Coord at Epoch: 03h 16m 28.85353s +17:49:26.94488s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 14.452
 G magnitude : 17.326
 RP magnitude : 16.454
 BP magnitude : 18.123
 DUPflag : 0
 Distance (au) : 20.295
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 25.92
 Sun-Target sep (deg) : 48.92
 Sun-Moon sep (deg) : 140.58
 B (ring opening deg) : 62.87
 PA of pole (deg) : -88.60
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.618
 C/A sky separation (km) : 9090.4
 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



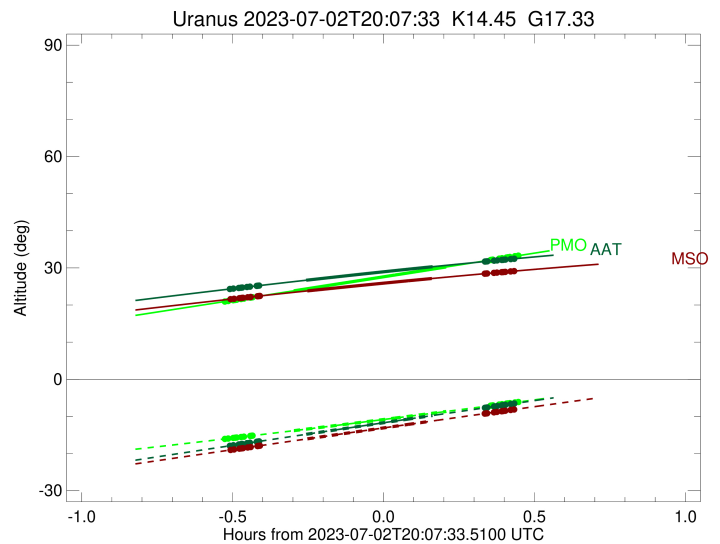
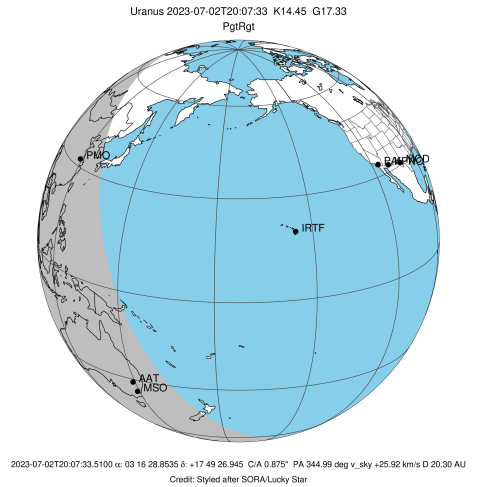
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2023-07-02T19:36:11.157		20.97	-16.05	50893.45	-28.30		
lambda	I	2023-07-02T19:36:41.761		21.08	-15.97	50026.71	-28.31		
delta	I	2023-07-02T19:37:42.780		21.29	-15.80	48300.35	-28.27		
gamma	I	2023-07-02T19:38:06.726		21.38	-15.74	47623.52	-28.26		
eta	I	2023-07-02T19:38:22.563		21.43	-15.70	47176.12	-28.25		
beta	I	2023-07-02T19:39:15.496		21.62	-15.56	45680.96	-28.21		
alpha	I	2023-07-02T19:39:50.522		21.74	-15.46	44689.30	-28.17		
4	I	2023-07-02T19:41:07.583		22.01	-15.25	42533.67	-28.12		
5	I	2023-07-02T19:41:15.134		22.04	-15.23	42314.49	-28.10		
6	I	2023-07-02T19:41:33.476		22.10	-15.18	41799.19	-28.08		
Uranus	I	2023-07-02T19:49:43.363		23.83	-13.85	25098.80		-27.04	-28.13
Uranus	E	2023-07-02T20:20:03.120		30.25	-8.67	25267.16		21.12	22.02
6	E	2023-07-02T20:28:51.794		32.13	-7.11	41879.74	27.99		
5	E	2023-07-02T20:29:01.719		32.16	-7.08	42158.45	28.00		
4	E	2023-07-02T20:29:17.697		32.22	-7.04	42616.01	28.02		
alpha	E	2023-07-02T20:30:33.669		32.49	-6.81	44738.31	28.07		
beta	E	2023-07-02T20:31:05.780		32.60	-6.71	45644.24	28.10		
eta	E	2023-07-02T20:32:00.206		32.80	-6.55	47176.12	28.14		
gamma	E	2023-07-02T20:32:16.231		32.85	-6.50	47627.08	28.15		
delta	E	2023-07-02T20:32:40.145		32.94	-6.43	48300.35	28.16		
lambda	E	2023-07-02T20:33:41.409		33.15	-6.25	50026.71	28.20		
epsilon	E	2023-07-02T20:34:25.550		33.31	-6.12	51271.79	28.18		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2023-07-02T20:04:38.620
 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 : 55715174757678592
 2Mass ID (if available) : 03162885+1749268
 ICRS Star Coord at Epoch: 03h 16m 28.85353s +17:49:26.94488s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 14.452
 G magnitude : 17.326
 RP magnitude : 16.454
 BP magnitude : 18.123
 DUPflag : 0
 Distance (au) : 20.295
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 25.92
 Sun-Target sep (deg) : 48.92
 Sun-Moon sep (deg) : 140.73
 B (ring opening deg) : 62.87
 PA of pole (deg) : -88.60
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.109
 C/A sky separation (km) : 16322.0
 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	2023-07-02T19:37:13.180		24.34	-17.88	50849.97	-27.00		
lambda	I	2023-07-02T19:37:43.643		24.42	-17.78	50026.71	-27.00		
delta	I	2023-07-02T19:38:47.731		24.59	-17.56	48300.35	-26.88		
gamma	I	2023-07-02T19:39:12.964		24.66	-17.47	47622.84	-26.82		
eta	I	2023-07-02T19:39:29.629		24.71	-17.42	47176.12	-26.79		
beta	I	2023-07-02T19:40:25.535		24.85	-17.23	45681.23	-26.66		
alpha	I	2023-07-02T19:41:02.748		24.95	-17.10	44686.81	-26.56		
4	I	2023-07-02T19:42:24.447		25.17	-16.82	42538.79	-26.36		
5	I	2023-07-02T19:42:32.912		25.19	-16.79	42311.21	-26.31		
6	I	2023-07-02T19:42:52.243		25.24	-16.73	41803.27	-26.27		
Uranus	I	2023-07-02T19:52:11.592		26.68	-14.82	25168.96		-24.69	-25.71
Uranus	E	2023-07-02T20:17:18.840		30.32	-9.76	25416.81		14.50	15.15
6	E	2023-07-02T20:27:44.602		31.71	-7.69	41879.16	26.21		
5	E	2023-07-02T20:27:55.424		31.74	-7.65	42164.02	26.25		
4	E	2023-07-02T20:28:12.274		31.77	-7.59	42616.55	26.30		
alpha	E	2023-07-02T20:29:32.670		31.95	-7.33	44733.34	26.50		
beta	E	2023-07-02T20:30:06.927		32.02	-7.22	45646.28	26.59		
eta	E	2023-07-02T20:31:04.272		32.14	-7.03	47176.12	26.71		
gamma	E	2023-07-02T20:31:21.111		32.18	-6.97	47626.24	26.75		
delta	E	2023-07-02T20:31:46.289		32.23	-6.89	48300.35	26.80		
lambda	E	2023-07-02T20:32:50.564		32.37	-6.68	50026.71	26.92		
epsilon	E	2023-07-02T20:33:34.589		32.46	-6.53	51213.41	26.92		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2023-07-02T20:04:41.400
 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 : 55715174757678592
 2Mass ID (if available) : 03162885+1749268
 ICRS Star Coord at Epoch: 03h 16m 28.85353s +17:49:26.94488s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 14.452
 G magnitude : 17.326
 RP magnitude : 16.454
 BP magnitude : 18.123
 DUPflag : 0
 Distance (au) : 20.295
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 25.92
 Sun-Target sep (deg) : 48.92
 Sun-Moon sep (deg) : 140.70
 B (ring opening deg) : 62.87
 PA of pole (deg) : -88.60
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.131
 C/A sky separation (km) : 16647.1
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2023-07-02T19:37:21.498		21.61	-19.01	50848.05	-26.95		
lambda	I	2023-07-02T19:37:51.950		21.68	-18.91	50026.71	-26.94		
delta	I	2023-07-02T19:38:56.172		21.84	-18.70	48300.35	-26.82		
gamma	I	2023-07-02T19:39:21.463		21.90	-18.61	47622.81	-26.76		
eta	I	2023-07-02T19:39:38.165		21.94	-18.56	47176.12	-26.73		
beta	I	2023-07-02T19:40:34.208		22.08	-18.37	45681.23	-26.59		
alpha	I	2023-07-02T19:41:11.524		22.18	-18.25	44686.71	-26.49		
4	I	2023-07-02T19:42:33.447		22.38	-17.98	42539.07	-26.28		
5	I	2023-07-02T19:42:41.961		22.40	-17.96	42310.99	-26.23		
6	I	2023-07-02T19:43:01.337		22.45	-17.89	41803.49	-26.18		
Uranus	I	2023-07-02T19:52:25.406		23.80	-16.05	25174.79		-24.49	-25.50
Uranus	E	2023-07-02T20:17:10.774		27.14	-11.26	25423.76		14.13	14.77
6	E	2023-07-02T20:27:42.369		28.45	-9.25	41879.10	26.13		
5	E	2023-07-02T20:27:53.239		28.47	-9.21	42164.33	26.17		
4	E	2023-07-02T20:28:10.128		28.50	-9.16	42616.54	26.22		
alpha	E	2023-07-02T20:29:30.736		28.66	-8.90	44733.11	26.43		
beta	E	2023-07-02T20:30:05.093		28.73	-8.80	45646.38	26.53		
eta	E	2023-07-02T20:31:02.568		28.84	-8.61	47176.12	26.65		
gamma	E	2023-07-02T20:31:19.443		28.88	-8.56	47626.20	26.69		
delta	E	2023-07-02T20:31:44.675		28.93	-8.48	48300.35	26.74		
lambda	E	2023-07-02T20:32:49.078		29.05	-8.28	50026.71	26.87		
epsilon	E	2023-07-02T20:33:33.086		29.14	-8.14	51210.79	26.87		