

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2043-01-07T21:31:57.410  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 631939910017841536  
 2Mass ID (if available) : 09142586+1644058

Uranus 2043-01-07T21:31:57 K13.25 G16.35 PgtRgt

ICRS Star Coord at Epoch: 09h 14m 25.84149s +16:44:05.95077s

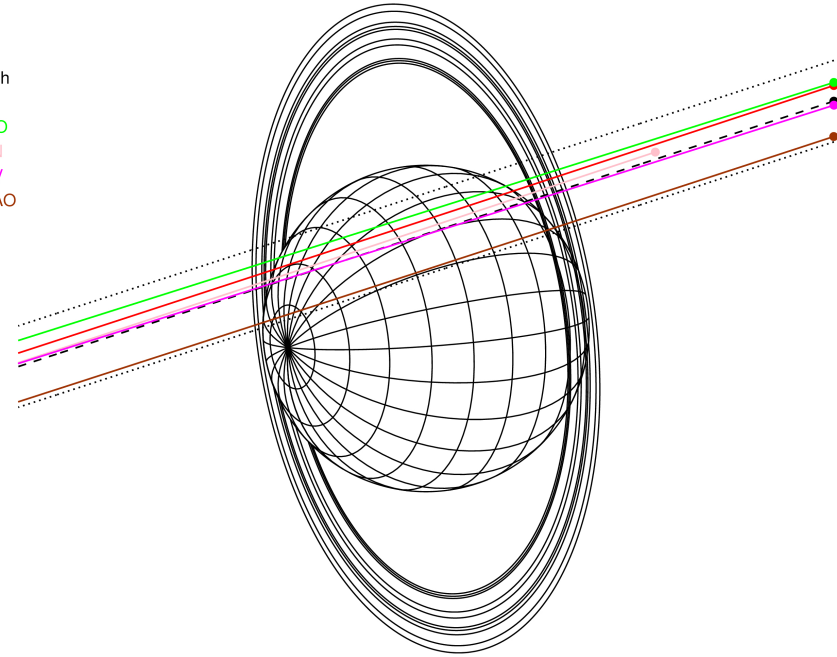
RUWE (>1.4 is poor) : 0.98  
 K magnitude : 13.250  
 G magnitude : 16.351  
 RP magnitude : 15.360  
 BP magnitude : 17.340  
 DUPflag : 0  
 Distance (au) : 17.577  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -19.40  
 Sun-Target sep (deg) : 150.94  
 Sun-Moon sep (deg) : 111.45  
 B (ring opening deg) : 31.28  
 PA of pole (deg) : 97.88

Uranus 2043-01-07T21:31:57 K13.25 G16.35  
 PgtRgt



2043-01-07T21:31:57.4100 cc: 09 14 25.8415 s: +16 44 05.951 C/A 1.116° PA 198.02 deg v\_sky -19.40 km/s D 17.58 AU  
 Credit: Styled after SORA/Lucky Star

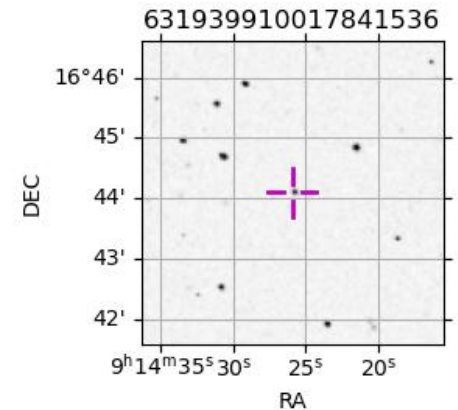
Earth  
 PIC  
 PMO  
 TEN  
 KAV  
 SAAO



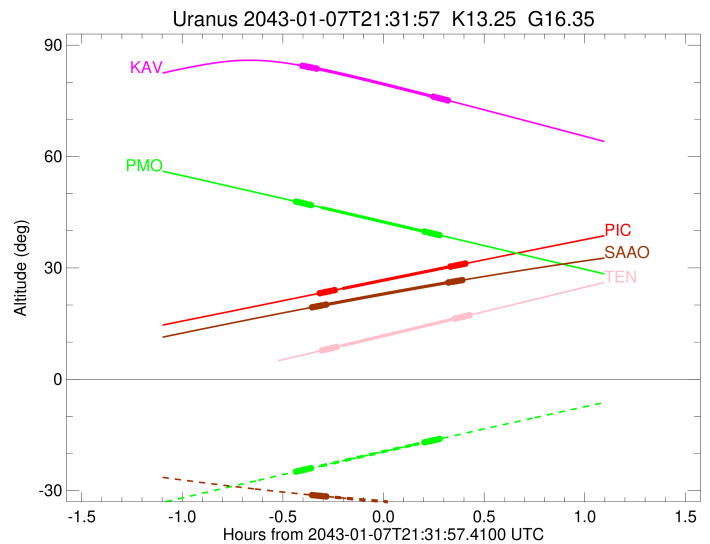
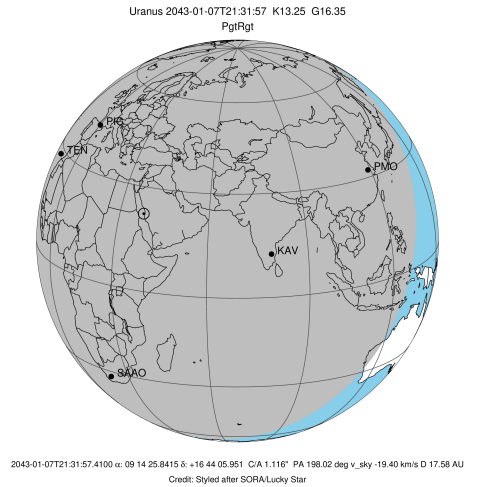
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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	+++++	+ +	+++++	JAN 07 21:12 - JAN 07 21:56	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	JAN 07 21:05 - JAN 07 21:48	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	+++++	+ +	+++++	JAN 07 21:13 - JAN 07 21:57	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	JAN 07 21:07 - JAN 07 21:51	PieRie
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					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++	+ +	++	JAN 07 21:10 - JAN 07 21:55	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

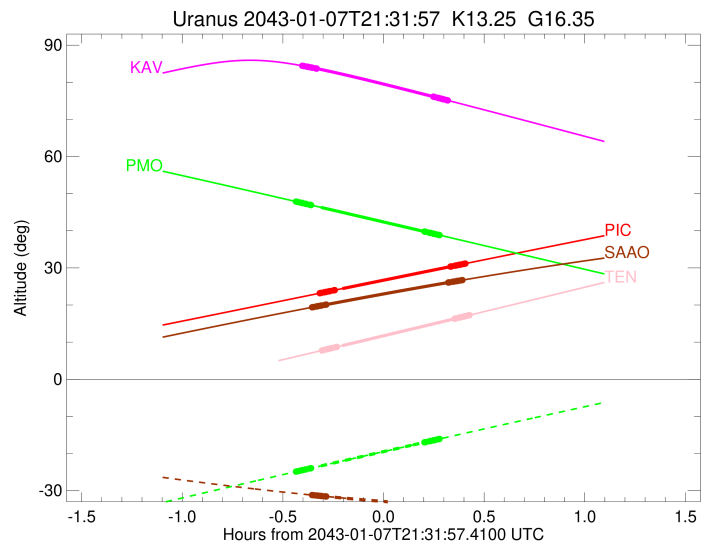
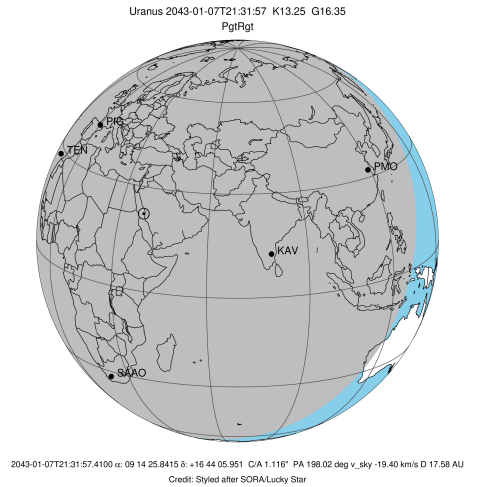


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2043-01-07T21:36:29.670  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 631939910017841536  
 2Mass ID (if available) : 09142586+1644058  
 ICRS Star Coord at Epoch: 09h 14m 25.84149s +16:44:05.95077s  
 RUWE (>1.4 is poor) : 0.98  
 K magnitude : 13.250  
 G magnitude : 16.351  
 RP magnitude : 15.360  
 BP magnitude : 17.340  
 DUPflag : 0  
 Distance (au) : 17.577  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -19.40  
 Sun-Target sep (deg) : 150.94  
 Sun-Moon sep (deg) : 111.54  
 B (ring opening deg) : 31.28  
 PA of pole (deg) : 97.88  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.270  
 C/A sky separation (km) : 16191.1  
 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\_itrf93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



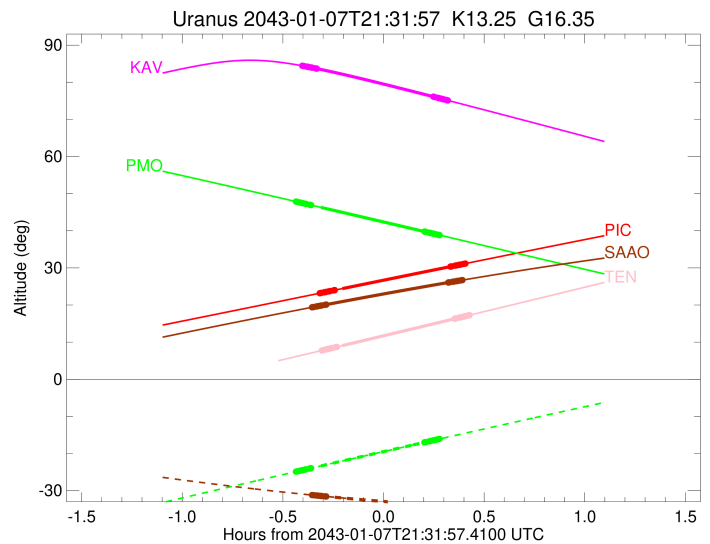
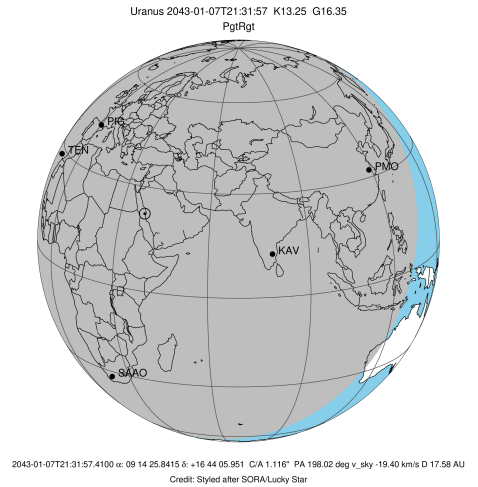
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2043-01-07T21:12:50.083		23.16	-48.82	51445.42	-35.26		
lambda	I	2043-01-07T21:13:30.459		23.28	-48.94	50026.71	-35.08		
delta	I	2043-01-07T21:14:19.775		23.44	-49.09	48300.35	-34.93		
gamma	I	2043-01-07T21:14:39.027		23.49	-49.14	47628.54	-34.86		
eta	I	2043-01-07T21:14:52.012		23.53	-49.18	47176.12	-34.82		
beta	I	2043-01-07T21:15:35.656		23.67	-49.31	45656.80	-34.65		
alpha	I	2043-01-07T21:16:03.147		23.75	-49.39	44701.68	-34.56		
4	I	2043-01-07T21:17:05.822		23.95	-49.57	42550.20	-34.27		
5	I	2043-01-07T21:17:17.965		23.98	-49.61	42186.08	-34.30		
6	I	2043-01-07T21:17:29.055		24.02	-49.64	41801.78	-34.18		
Uranus	I	2043-01-07T21:19:41.996		24.42	-50.03	25493.15		-33.54	-34.77
Uranus	E	2043-01-07T21:53:12.548		30.59	-55.74	25439.51		48.20	49.50
6	E	2043-01-07T21:51:53.853	b	30.34	-55.53	41844.80	34.26		
5	E	2043-01-07T21:52:05.668	b	30.38	-55.56	42314.70	34.38		
4	E	2043-01-07T21:52:17.016	b	30.42	-55.59	42614.59	34.36		
alpha	E	2043-01-07T21:53:17.934		30.60	-55.76	44750.92	34.65		
beta	E	2043-01-07T21:53:44.036		30.68	-55.83	45651.18	34.75		
eta	E	2043-01-07T21:54:27.840		30.82	-55.95	47176.12	34.92		
gamma	E	2043-01-07T21:54:40.585		30.85	-55.98	47621.43	34.96		
delta	E	2043-01-07T21:54:59.983		30.91	-56.04	48300.35	35.03		
lambda	E	2043-01-07T21:55:49.152		31.06	-56.17	50026.71	35.19		
epsilon	E	2043-01-07T21:56:18.973		31.15	-56.25	51077.41	35.37		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2043-01-07T21:29:05.000  
 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 : 631939910017841536  
 2Mass ID (if available) : 09142586+1644058  
 ICRS Star Coord at Epoch: 09h 14m 25.84149s +16:44:05.95077s  
 RUWE (>1.4 is poor) : 0.98  
 K magnitude : 13.250  
 G magnitude : 16.351  
 RP magnitude : 15.360  
 BP magnitude : 17.340  
 DUPflag : 0  
 Distance (au) : 17.577  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -19.40  
 Sun-Target sep (deg) : 150.94  
 Sun-Moon sep (deg) : 112.18  
 B (ring opening deg) : 31.28  
 PA of pole (deg) : 97.88  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.371  
 C/A sky separation (km) : 17477.0  
 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\_itrf93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



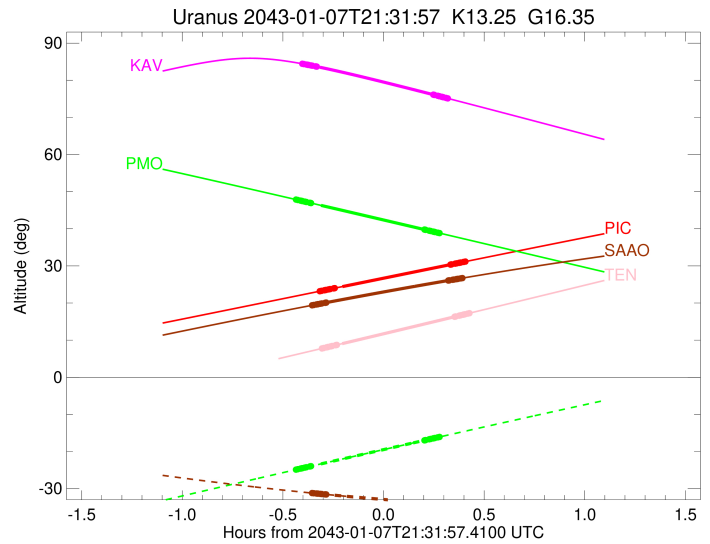
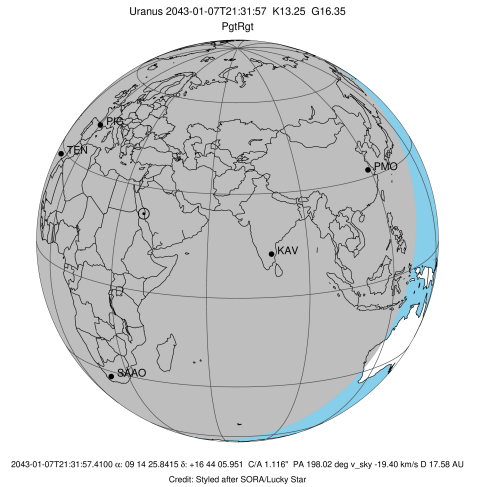
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2043-01-07T21:05:44.152		47.89	-24.91	51451.10	-35.21		
lambda	I	2043-01-07T21:06:24.759		47.75	-24.77	50026.71	-35.01		
delta	I	2043-01-07T21:07:14.200		47.58	-24.60	48300.35	-34.82		
gamma	I	2043-01-07T21:07:33.516		47.51	-24.53	47628.43	-34.75		
eta	I	2043-01-07T21:07:46.543		47.47	-24.48	47176.12	-34.69		
beta	I	2043-01-07T21:08:30.379		47.31	-24.33	45656.32	-34.49		
alpha	I	2043-01-07T21:08:57.964		47.22	-24.24	44702.43	-34.38		
4	I	2043-01-07T21:10:01.050		47.00	-24.02	42551.30	-34.04		
5	I	2043-01-07T21:10:13.186		46.95	-23.98	42187.85	-34.05		
6	I	2043-01-07T21:10:24.495		46.91	-23.94	41801.14	-33.92		
Uranus	I	2043-01-07T21:13:18.628		46.31	-23.34	25501.75		-31.01	-32.18
Uranus	E	2043-01-07T21:44:48.665		39.65	-16.86	25450.24		45.32	46.63
6	E	2043-01-07T21:44:08.871	b	39.79	-17.00	41843.17	33.84		
5	E	2043-01-07T21:44:20.850	b	39.75	-16.96	42315.00	33.97		
4	E	2043-01-07T21:44:32.313	b	39.71	-16.92	42615.05	33.96		
alpha	E	2043-01-07T21:45:33.866		39.49	-16.71	44751.26	34.30		
beta	E	2043-01-07T21:46:00.214		39.40	-16.62	45650.57	34.41		
eta	E	2043-01-07T21:46:44.455		39.24	-16.47	47176.12	34.61		
gamma	E	2043-01-07T21:46:57.312		39.20	-16.43	47621.36	34.66		
delta	E	2043-01-07T21:47:16.881		39.13	-16.36	48300.35	34.74		
lambda	E	2043-01-07T21:48:06.451		38.95	-16.19	50026.71	34.92		
epsilon	E	2043-01-07T21:48:36.863		38.85	-16.09	51090.10	35.12		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2043-01-07T21:37:18.790  
 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 : 631939910017841536  
 2Mass ID (if available) : 09142586+1644058  
 ICRS Star Coord at Epoch: 09h 14m 25.84149s +16:44:05.95077s  
 RUWE (>1.4 is poor) : 0.98  
 K magnitude : 13.250  
 G magnitude : 16.351  
 RP magnitude : 15.360  
 BP magnitude : 17.340  
 DUPflag : 0  
 Distance (au) : 17.577  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -19.40  
 Sun-Target sep (deg) : 150.94  
 Sun-Moon sep (deg) : 111.29  
 B (ring opening deg) : 31.28  
 PA of pole (deg) : 97.88  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.170  
 C/A sky separation (km) : 14919.6  
 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	2043-01-07T21:13:29.093		7.74	-36.20	51438.43	-35.38		
lambda	I	2043-01-07T21:14:09.112		7.88	-36.35	50026.71	-35.23		
delta	I	2043-01-07T21:14:58.204		8.06	-36.53	48300.35	-35.10		
gamma	I	2043-01-07T21:15:17.353		8.13	-36.60	47628.67	-35.05		
eta	I	2043-01-07T21:15:30.272		8.17	-36.64	47176.12	-35.01		
beta	I	2043-01-07T21:16:13.646		8.33	-36.80	45657.36	-34.87		
alpha	I	2043-01-07T21:16:41.006		8.42	-36.90	44700.83	-34.79		
4	I	2043-01-07T21:17:43.181		8.65	-37.13	42548.97	-34.56		
5	I	2043-01-07T21:17:55.326		8.69	-37.17	42184.12	-34.59		
6	I	2043-01-07T21:18:06.168		8.73	-37.21	41802.54	-34.48		
Uranus	I	2043-01-07T21:19:37.275		9.05	-37.54	25483.80		-36.20	-37.47
Uranus	E	2043-01-07T21:54:55.191		16.68	-45.28	25431.16		50.47	51.75
6	E	2043-01-07T21:53:07.694	b	16.29	-44.88	41846.23	34.59		
5	E	2043-01-07T21:53:19.384	b	16.34	-44.93	42314.33	34.70		
4	E	2043-01-07T21:53:30.641	b	16.38	-44.97	42614.11	34.67		
alpha	E	2043-01-07T21:54:31.093	b	16.60	-45.19	44750.58	34.92		
beta	E	2043-01-07T21:54:57.017		16.69	-45.28	45651.73	35.00		
eta	E	2043-01-07T21:55:40.505		16.85	-45.44	47176.12	35.14		
gamma	E	2043-01-07T21:55:53.172		16.89	-45.49	47621.50	35.18		
delta	E	2043-01-07T21:56:12.452		16.96	-45.56	48300.35	35.24		
lambda	E	2043-01-07T21:57:01.349		17.14	-45.74	50026.71	35.37		
epsilon	E	2043-01-07T21:57:30.712		17.25	-45.85	51066.39	35.53		

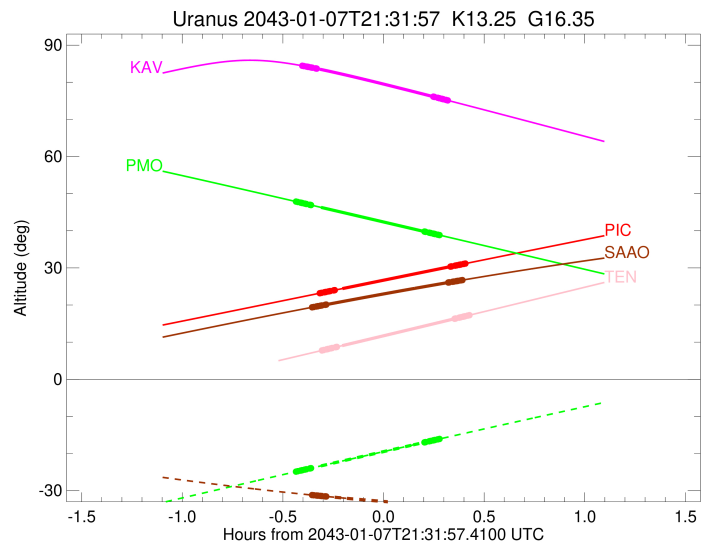
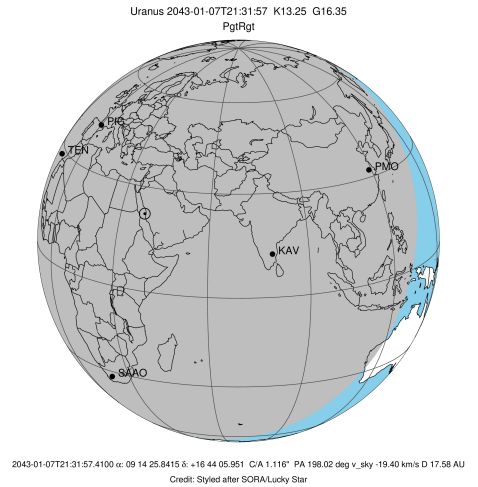
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2043-01-07T21:30:53.250  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : KAV  
 Location : Kavalur Observatory  
 Latitude (deg) : 12.57556  
 E. Longitude (deg) : 78.83167  
 Altitude (km) : 0.722  
 Gaia source ID : 631939910017841536  
 2Mass ID (if available) : 09142586+1644058  
 ICRS Star Coord at Epoch: 09h 14m 25.84149s +16:44:05.95077s  
 RUWE (>1.4 is poor) : 0.98  
 K magnitude : 13.250  
 G magnitude : 16.351  
 RP magnitude : 15.360  
 BP magnitude : 17.340  
 DUPflag : 0  
 Distance (au) : 17.577  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -19.40  
 Sun-Target sep (deg) : 150.94  
 Sun-Moon sep (deg) : 112.34  
 B (ring opening deg) : 31.28  
 PA of pole (deg) : 97.88  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.099  
 C/A sky separation (km) : 14010.2  
 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\_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	2043-01-07T21:07:37.842		84.47	-56.05	51430.87	-36.36		
lambda	I	2043-01-07T21:08:16.572		84.36	-55.90	50026.71	-36.21		
delta	I	2043-01-07T21:09:04.321		84.22	-55.72	48300.35	-36.10		
gamma	I	2043-01-07T21:09:22.938		84.17	-55.65	47628.80	-36.05		
eta	I	2043-01-07T21:09:35.502		84.13	-55.60	47176.12	-36.01		
beta	I	2043-01-07T21:10:17.648		84.01	-55.44	45657.93	-35.89		
alpha	I	2043-01-07T21:10:44.279		83.93	-55.34	44699.99	-35.82		
4	I	2043-01-07T21:11:44.622		83.75	-55.11	42547.77	-35.60		
5	I	2043-01-07T21:11:56.509		83.71	-55.07	42182.24	-35.63		
6	I	2043-01-07T21:12:06.882		83.68	-55.03	41803.31	-35.53		
Uranus	I	2043-01-07T21:12:59.806		83.51	-54.83	25474.98		-38.64	-39.93
Uranus	E	2043-01-07T21:48:44.141		75.68	-46.64	25427.57		51.46	52.73
6	E	2043-01-07T21:46:47.187	b	76.14	-47.09	41846.95	35.51		
5	E	2043-01-07T21:46:58.570	b	76.09	-47.04	42314.12	35.61		
4	E	2043-01-07T21:47:09.545	b	76.05	-47.00	42613.86	35.57		
alpha	E	2043-01-07T21:48:08.510	b	75.82	-46.77	44750.40	35.79		
beta	E	2043-01-07T21:48:33.815	b	75.72	-46.68	45652.00	35.86		
eta	E	2043-01-07T21:49:16.261		75.56	-46.51	47176.12	35.99		
gamma	E	2043-01-07T21:49:28.632		75.51	-46.47	47621.53	36.02		
delta	E	2043-01-07T21:49:47.465		75.44	-46.40	48300.35	36.07		
lambda	E	2043-01-07T21:50:35.249		75.25	-46.21	50026.71	36.18		
epsilon	E	2043-01-07T21:51:03.819		75.14	-46.10	51061.43	36.33		



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2043-01-07T21:34:02.980  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : SAAO  
 Location : So. Afr. Astro. Obs. (Sutherland)  
 Latitude (deg) : -32.37953  
 E. Longitude (deg) : 20.81070  
 Altitude (km) : 1.768  
 Gaia source ID : 631939910017841536  
 2Mass ID (if available) : 09142586+1644058  
 ICRS Star Coord at Epoch: 09h 14m 25.84149s +16:44:05.95077s  
 RUWE (>1.4 is poor) : 0.98  
 K magnitude : 13.250  
 G magnitude : 16.351  
 RP magnitude : 15.360  
 BP magnitude : 17.340  
 DUPflag : 0  
 Distance (au) : 17.577  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -19.40  
 Sun-Target sep (deg) : 150.94  
 Sun-Moon sep (deg) : 111.66  
 B (ring opening deg) : 31.28  
 PA of pole (deg) : 97.88  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.688  
 C/A sky separation (km) : 8765.6  
 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\_itrfr93\_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	2043-01-07T21:10:33.808		19.37	-31.19	51399.67	-36.85		
lambda	I	2043-01-07T21:11:11.119		19.48	-31.24	50026.71	-36.78		
delta	I	2043-01-07T21:11:58.080		19.61	-31.31	48300.35	-36.74		
gamma	I	2043-01-07T21:12:16.349		19.67	-31.34	47629.30	-36.72		
eta	I	2043-01-07T21:12:28.692		19.70	-31.36	47176.12	-36.71		
beta	I	2043-01-07T21:13:09.947		19.82	-31.42	45660.24	-36.66		
alpha	I	2043-01-07T21:13:36.186		19.89	-31.46	44696.77	-36.64		
4	I	2043-01-07T21:14:34.922	b	20.06	-31.54	42543.12	-36.55		
5	I	2043-01-07T21:14:46.858	b	20.10	-31.56	42175.06	-36.61		
6	I	2043-01-07T21:14:56.354	b	20.12	-31.57	41806.84	-36.54		
Uranus	I	2043-01-07T21:13:48.415		19.93	-31.47	25441.94		-47.55	-48.85
Uranus	E	2043-01-07T21:54:14.070		26.52	-34.27	25407.07		57.29	58.47
6	E	2043-01-07T21:51:14.674	b	26.06	-34.11	41852.47	36.62		
5	E	2043-01-07T21:51:25.695	b	26.09	-34.12	42311.60	36.69		
4	E	2043-01-07T21:51:36.338	b	26.12	-34.13	42611.43	36.63		
alpha	E	2043-01-07T21:52:33.872	b	26.26	-34.18	44748.69	36.73		
beta	E	2043-01-07T21:52:58.615	b	26.33	-34.20	45654.28	36.75		
eta	E	2043-01-07T21:53:39.992	b	26.43	-34.24	47176.12	36.81		
gamma	E	2043-01-07T21:53:52.100	b	26.47	-34.25	47621.85	36.82		
delta	E	2043-01-07T21:54:10.523	b	26.51	-34.26	48300.35	36.84		
lambda	E	2043-01-07T21:54:57.355	b	26.63	-34.30	50026.71	36.89		
epsilon	E	2043-01-07T21:55:24.230	b	26.70	-34.33	51018.41	36.96		