

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-09-05T13:46:06.690
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3377578778547732608
 2Mass ID (if available) : 06220811+2334439

Uranus 2033-09-05T13:46:06 K14.09 G16.59 PgtRgt

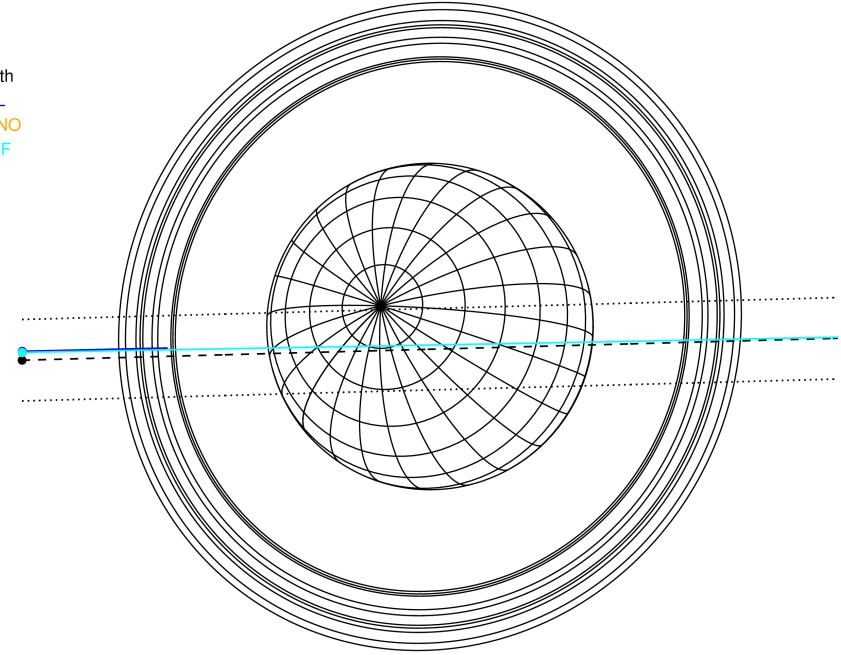
ICRS Star Coord at Epoch: 06h 22m 08.12401s +23:34:43.54088s

RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.093
 G magnitude : 16.585
 RP magnitude : 15.782
 BP magnitude : 17.271
 DUPflag : 0
 Distance (au) : 19.331
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.64
 Sun-Target sep (deg) : 67.78
 Sun-Moon sep (deg) : 159.42
 B (ring opening deg) : 70.89
 PA of pole (deg) : 67.21



2033-09-05T13:46:06.6900 α: 06 22 08.12401 δ: +23 34 43.541 C/A 0.250° PA 1.54 deg v_sky +17.64 km/s D 19.33 AU
 Credit: Styled after SORA/Lucky Star

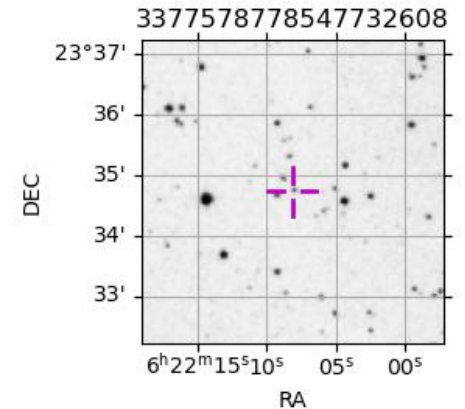
Earth
 PAL
 KPNO
 IRTF



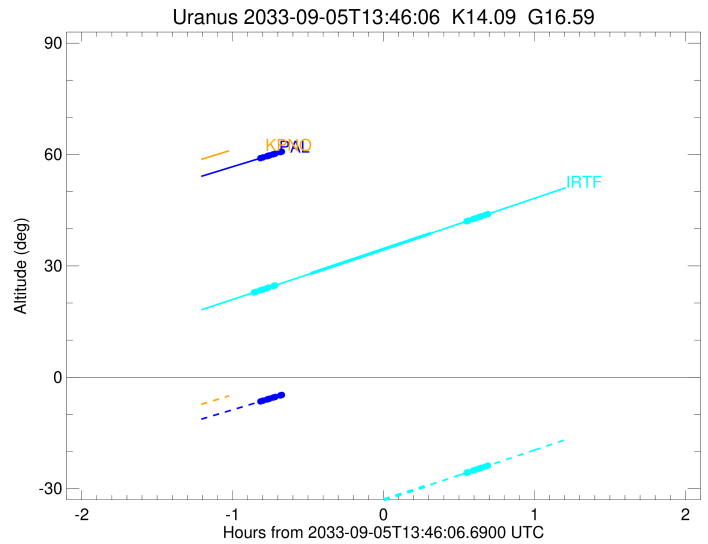
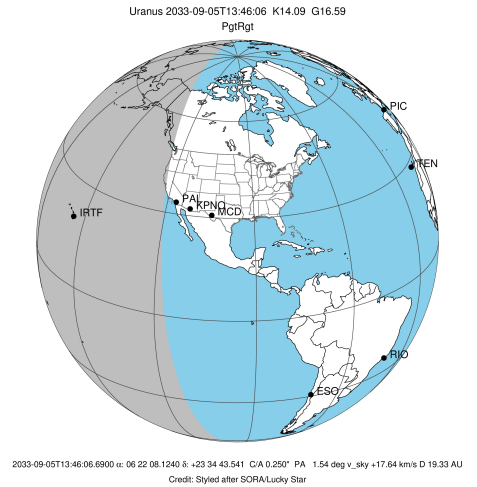
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	++++++			SEP 05 12:57 - SEP 05 13:03	PnnRin
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
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	+++++++	+ +	+++++++	SEP 05 12:54 - SEP 05 14:27	PieRie
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					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

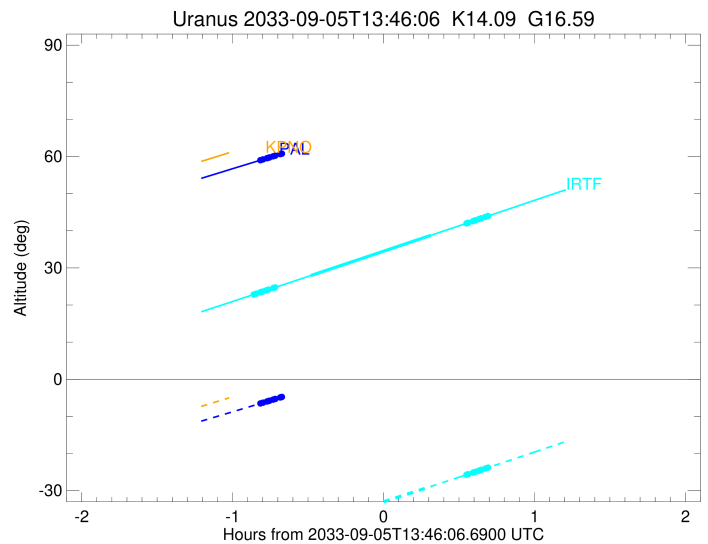
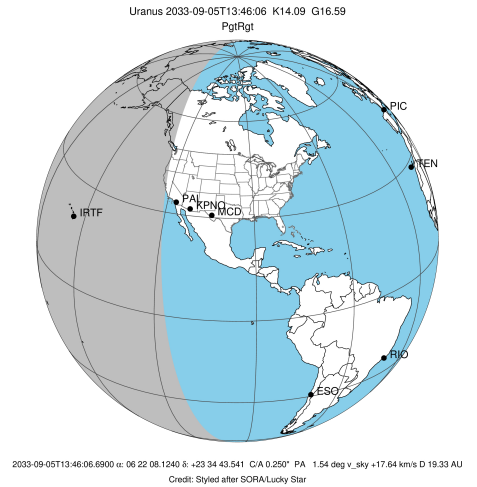


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-09-05T13:44:11.590
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3377578778547732608
 2Mass ID (if available) : 06220811+2334439
 ICRS Star Coord at Epoch: 06h 22m 08.12401s +23:34:43.54088s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.093
 G magnitude : 16.585
 RP magnitude : 15.782
 BP magnitude : 17.271
 DUPflag : 0
 Distance (au) : 19.331
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.64
 Sun-Target sep (deg) : 67.78
 Sun-Moon sep (deg) : 160.05
 B (ring opening deg) : 70.89
 PA of pole (deg) : 67.21
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.172
 C/A sky separation (km) : 2406.0
 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	2033-09-05T12:57:11.933		59.02	-6.51	51134.29	-18.14		
lambda	I	2033-09-05T12:58:12.967		59.23	-6.30	50026.71	-18.15		
delta	I	2033-09-05T12:59:48.117		59.56	-5.97	48300.35	-18.14		
gamma	I	2033-09-05T13:00:25.232		59.69	-5.85	47627.07	-18.14		
eta	I	2033-09-05T13:00:50.092		59.77	-5.76	47176.12	-18.14		
beta	I	2033-09-05T13:02:12.589		60.06	-5.48	45681.01	-18.14		
alpha	I	2033-09-05T13:03:04.612		60.24	-5.30	44733.33	-18.13		
4	I	2033-09-05T13:05:04.558		60.65	-4.89x	42567.46	-18.13		
5	I	2033-09-05T13:05:26.332		60.72	-4.82x	42168.57	-18.12		
6	I	2033-09-05T13:05:41.964		60.78	-4.77x	41879.31	-18.12		
Uranus	I	2033-09-05T13:20:02.868		63.71	-1.81x	25161.25		16.53	17.27
Uranus	E	2033-09-05T14:08:18.000		73.10	8.22x	25088.68		-18.06	-18.86
6	E	2033-09-05T14:22:30.222		75.56	11.19x	41794.76	18.04		
5	E	2033-09-05T14:22:57.635		75.63	11.29x	42295.72	18.05		
4	E	2033-09-05T14:23:13.036		75.68	11.34x	42580.11	18.05		
alpha	E	2033-09-05T14:25:11.430		75.99	11.76x	44707.09	18.05		
beta	E	2033-09-05T14:26:02.945		76.13	11.94x	45641.70	18.05		
eta	E	2033-09-05T14:27:28.018		76.35	12.23x	47176.12	18.05		
gamma	E	2033-09-05T14:27:52.881		76.42	12.32x	47624.93	18.05		
delta	E	2033-09-05T14:28:30.297		76.51	12.45x	48300.35	18.05		
lambda	E	2033-09-05T14:30:05.928		76.76	12.78x	50026.71	18.05		
epsilon	E	2033-09-05T14:31:06.465		76.91	12.99x	51119.60	18.05		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-09-05T13:41:05.470
 Event type : PgtRgt
 : Uranus occs: geocentric, 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 : 3377578778547732608
 2Mass ID (if available) : 06220811+2334439
 ICRS Star Coord at Epoch: 06h 22m 08.12401s +23:34:43.54088s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.093
 G magnitude : 16.585
 RP magnitude : 15.782
 BP magnitude : 17.271
 DUPflag : 0
 Distance (au) : 19.331
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 17.64
 Sun-Target sep (deg) : 67.78
 Sun-Moon sep (deg) : 160.36
 B (ring opening deg) : 70.89
 PA of pole (deg) : 67.21
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.207
 C/A sky separation (km) : 2907.2
 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



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	2033-09-05T12:54:34.679		22.84	-43.88	51132.34	-18.34		
lambda	I	2033-09-05T12:55:34.951		23.07	-43.68	50026.71	-18.34		
delta	I	2033-09-05T12:57:09.089		23.42	-43.36	48300.35	-18.34		
gamma	I	2033-09-05T12:57:45.813		23.56	-43.23	47627.04	-18.33		
eta	I	2033-09-05T12:58:10.411		23.65	-43.15	47176.12	-18.33		
beta	I	2033-09-05T12:59:32.043		23.96	-42.87	45681.03	-18.33		
alpha	I	2033-09-05T13:00:23.520		24.15	-42.70	44733.52	-18.32		
4	I	2033-09-05T13:02:22.227		24.60	-42.29	42567.76	-18.32		
5	I	2033-09-05T13:02:43.820		24.68	-42.22	42168.27	-18.31		
6	I	2033-09-05T13:02:59.282		24.73	-42.17	41879.27	-18.31		
Uranus	I	2033-09-05T13:17:12.819		27.94	-39.21	25167.71		16.39	17.12
Uranus	E	2033-09-05T14:04:57.026		38.78	-28.88	25080.90		-18.22	-19.02
6	E	2033-09-05T14:19:03.682		42.00	-25.73	41794.75	18.15		
5	E	2033-09-05T14:19:30.888		42.10	-25.63	42294.79	18.15		
4	E	2033-09-05T14:19:46.277		42.16	-25.57	42580.89	18.15		
alpha	E	2033-09-05T14:21:44.001		42.61	-25.13	44707.64	18.15		
beta	E	2033-09-05T14:22:35.201		42.81	-24.94	45641.79	18.15		
eta	E	2033-09-05T14:23:59.800		43.13	-24.63	47176.12	18.15		
gamma	E	2033-09-05T14:24:24.522		43.22	-24.53	47624.85	18.15		
delta	E	2033-09-05T14:25:01.737		43.36	-24.39	48300.35	18.15		
lambda	E	2033-09-05T14:26:36.848		43.73	-24.04	50026.71	18.15		
epsilon	E	2033-09-05T14:27:36.711		43.95	-23.81	51113.27	18.14		