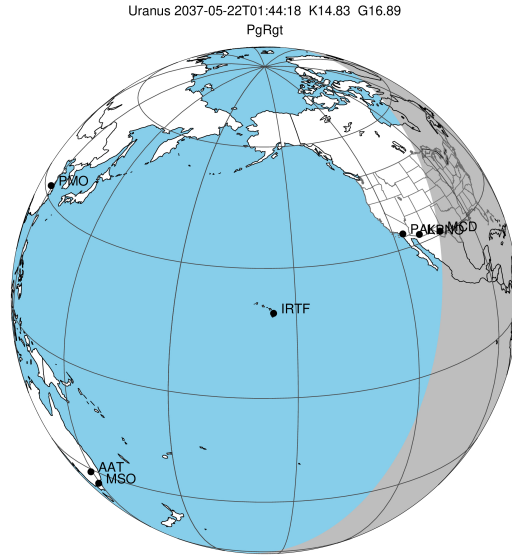


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2037-05-22T01:44:18.990
 Event type : PgRgt
 : Uranus occs: geocentric, not topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3367526321690358912
 2Mass ID (if available) : 07114699+2250288

ICRS Star Coord at Epoch: 07h 11m 46.98373s +22:50:28.75420s

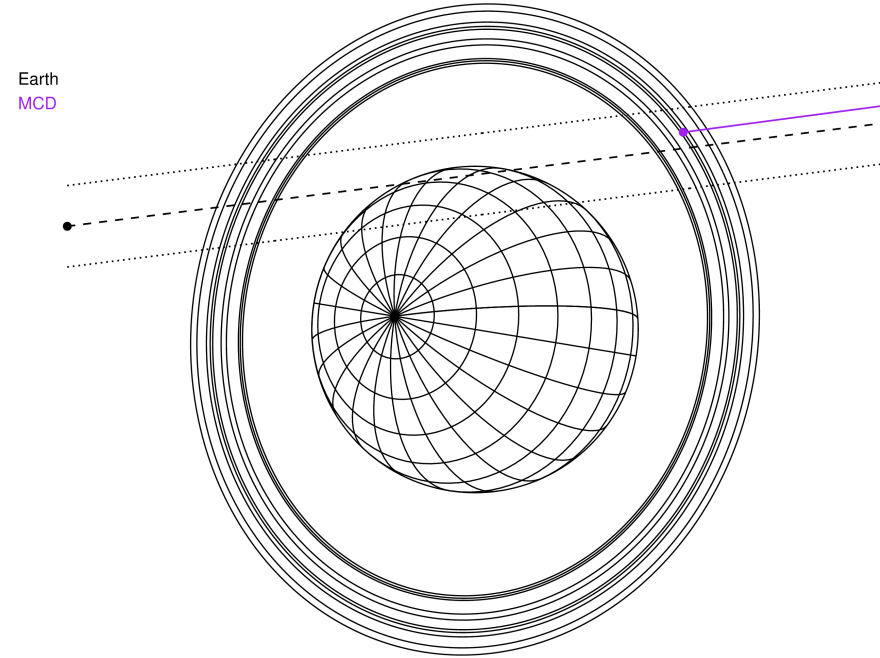
RUWE (>1.4 is poor) : 0.98
 K magnitude : 14.833
 G magnitude : 16.891
 RP magnitude : 16.269
 BP magnitude : 17.352
 DUPflag : 0
 Distance (au) : 19.435
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 27.28
 Sun-Target sep (deg) : 45.68
 Sun-Moon sep (deg) : 40.29
 B (ring opening deg) : 60.10
 PA of pole (deg) : 80.63

#	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



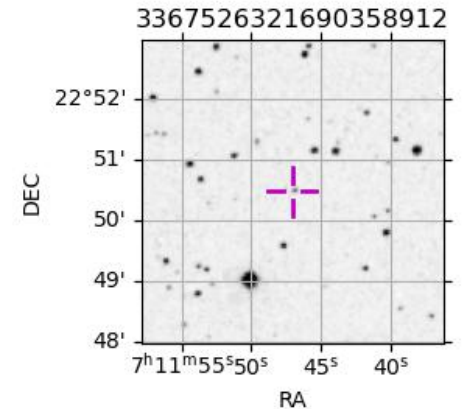
2037-05-22T01:44:18.9900 ex: 07 11 46.9837 s: +22 50 28.754 C/A 1.713° PA 187.20 deg v_sky +27.28 km/s D 19.44 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2037-05-22T01:44:18 K14.83 G16.89 PgRgt

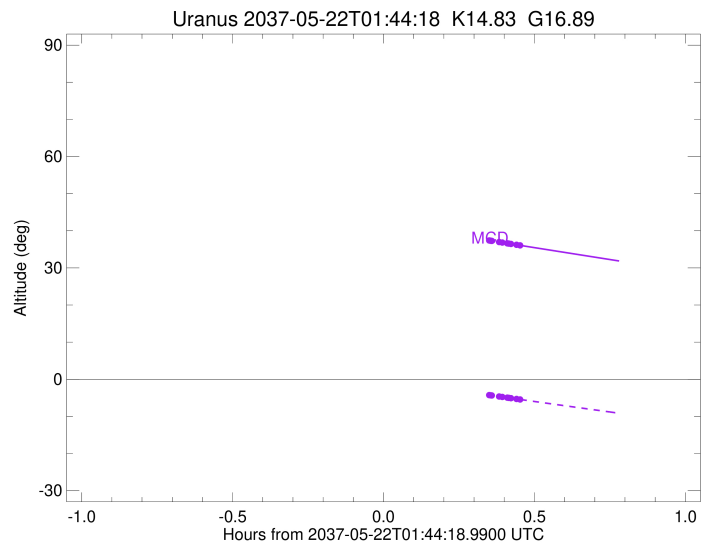
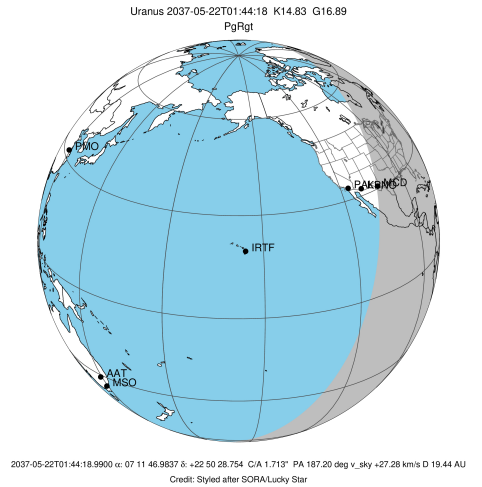


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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					PnnRnn
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			++++	MAY 22 02:09 - MAY 22 02:11	PnnRne
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					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 : 2037-05-22T01:46:47.180
 Event type : PgRgt
 : Uranus occs: geocentric, not topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3367526321690358912
 2Mass ID (if available) : 07114699+2250288
 ICRS Star Coord at Epoch: 07h 11m 46.98373s +22:50:28.75420s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 14.833
 G magnitude : 16.891
 RP magnitude : 16.269
 BP magnitude : 17.352
 DUPflag : 0
 Distance (au) : 19.435
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 27.28
 Sun-Target sep (deg) : 45.68
 Sun-Moon sep (deg) : 40.21
 B (ring opening deg) : 60.10
 PA of pole (deg) : 80.63
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.869
 C/A sky separation (km) : 26343.5
 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



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	2037-05-22T01:24:07.092	46.26	3.83x	51546.00	-26.43		
lambda	I	2037-05-22T01:25:04.944	46.05	3.64x	50026.71	-26.11		
delta	I	2037-05-22T01:26:11.534	45.81	3.42x	48300.35	-25.73		
gamma	I	2037-05-22T01:26:38.013	45.72	3.33x	47621.10	-25.57		
eta	I	2037-05-22T01:26:55.451	45.65	3.27x	47176.12	-25.46		
beta	I	2037-05-22T01:27:55.256	45.44	3.07x	45663.53	-25.06		
alpha	I	2037-05-22T01:28:34.517	45.30	2.94x	44684.65	-24.77		
4	I	2037-05-22T01:30:00.077	44.99	2.66x	42597.37	-24.06		
5	I	2037-05-22T01:30:14.545	44.94	2.61x	42240.60	-23.99		
6	I	2037-05-22T01:30:34.523	44.87	2.54x	41794.92	-23.78		

No planet occultations

6	E	2037-05-22T02:05:18.765	37.39	-4.26x	41841.43	23.84		
5	E	2037-05-22T02:05:38.258	37.32	-4.33x	42312.11	24.04		
4	E	2037-05-22T02:05:47.430	37.29	-4.36x	42529.43	24.12		
alpha	E	2037-05-22T02:07:17.488	36.97	-4.64x	44729.87	24.83		
beta	E	2037-05-22T02:07:55.602	36.83	-4.77x	45679.27	25.13		
eta	E	2037-05-22T02:08:54.709	36.62	-4.95x	47176.12	25.53		
gamma	E	2037-05-22T02:09:12.334	36.55	-5.01	47627.08	25.64		
delta	E	2037-05-22T02:09:38.505	36.46	-5.09	48300.35	25.81		
lambda	E	2037-05-22T02:10:44.905	36.22	-5.31	50026.71	26.19		
epsilon	E	2037-05-22T02:11:23.425	36.09	-5.43	51039.41	26.52		