

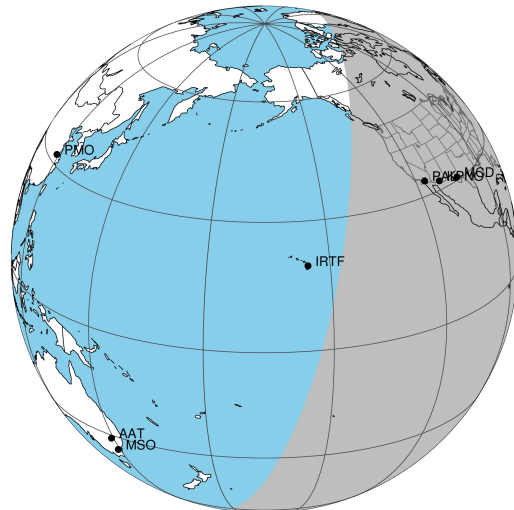
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-05-03T04:08:41.460
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 674540973368423040
 2Mass ID (if available) : 07461977+2143283

Uranus 2039-05-03T04:08:41 K14.99 G16.82 PgtRgt

ICRS Star Coord at Epoch: 07h 46m 19.77789s +21:43:28.15276s

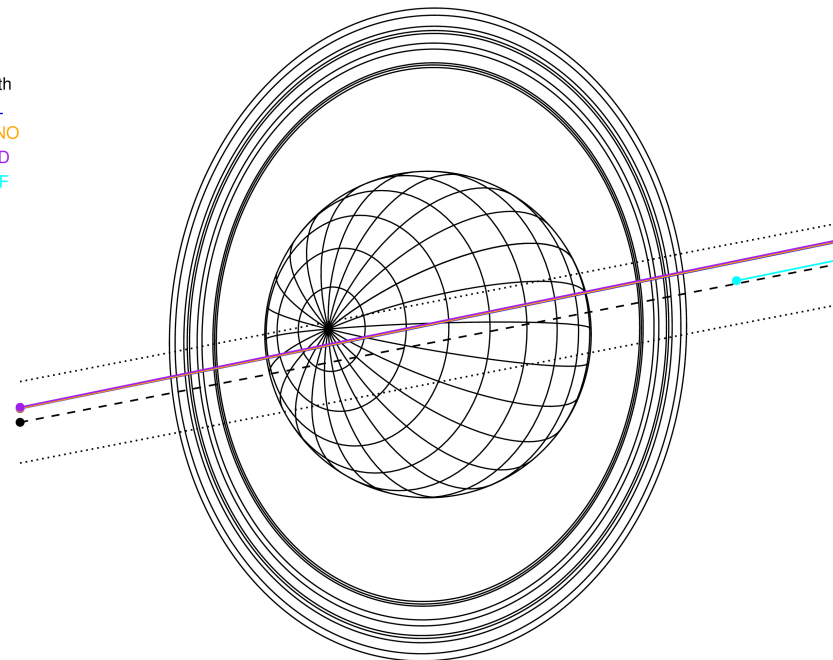
RUWE (>1.4 is poor) : 4.70
 K magnitude : 14.989
 G magnitude : 16.820
 RP magnitude : 16.146
 BP magnitude : 17.079
 DUPflag : 0
 Distance (au) : 18.907
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.47
 Sun-Target sep (deg) : 72.49
 Sun-Moon sep (deg) : 36.59
 B (ring opening deg) : 52.28
 PA of pole (deg) : 86.87

Uranus 2039-05-03T04:08:41 K14.99 G16.82
 PgtRgt



2039-05-03T04:08:41.4600 cr: 07 46 19.77789 s: +21 43 28.153 C/A 0.089° PA 10.95 deg v_sky +15.48 km/s D 18.91 AU
 Credit: Styled after SORA/Lucky Star

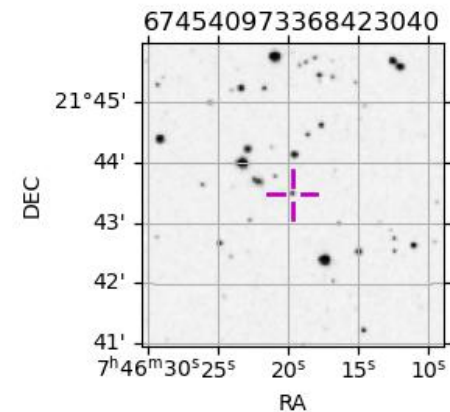
Earth
 PAL
 KPNO
 MCD
 IRTF



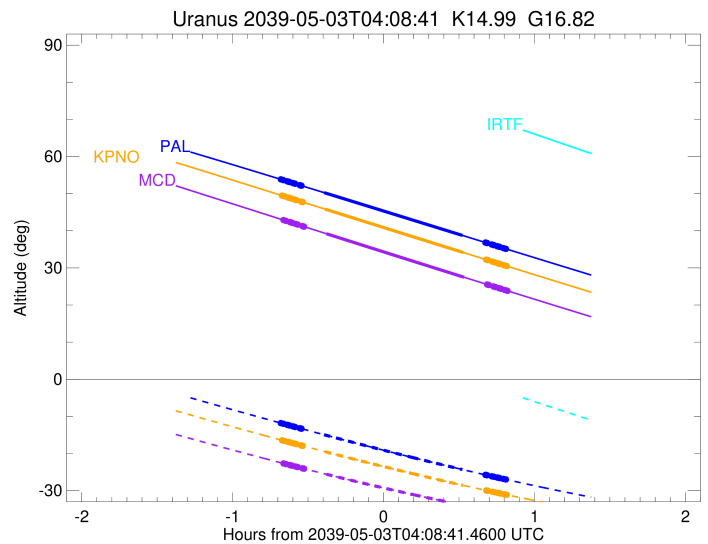
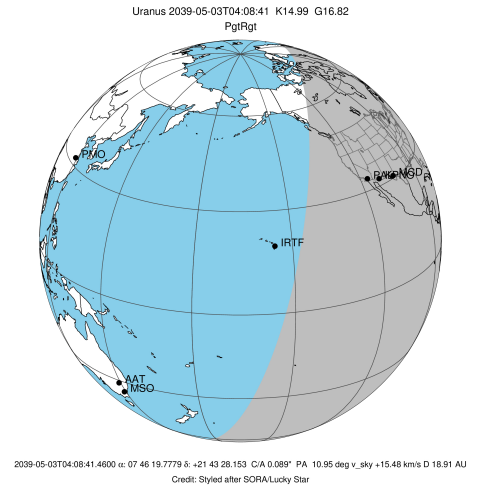
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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	+++++	+ +	+++++	MAY 03 03:28 - MAY 03 04:57	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	MAY 03 03:28 - MAY 03 04:57	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	MAY 03 03:29 - MAY 03 04:58	PieRie
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



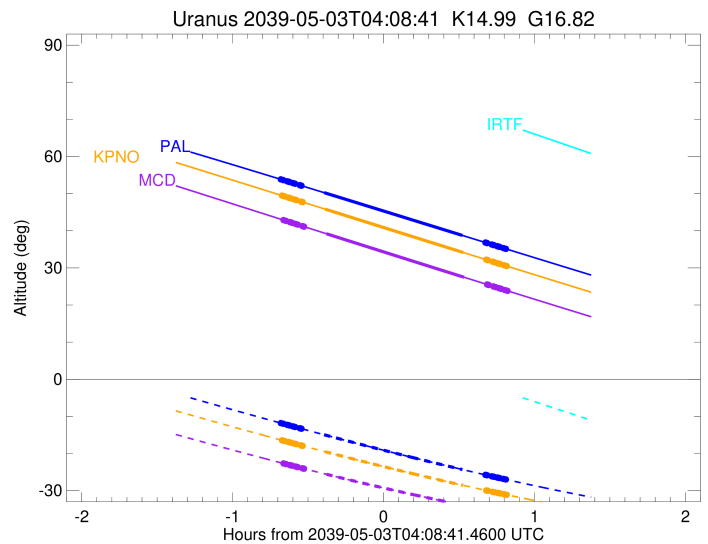
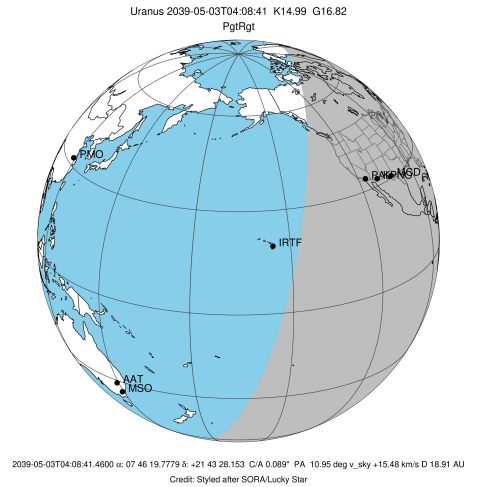
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-05-03T04:12:35.110
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 674540973368423040
 2Mass ID (if available) : 07461977+2143283
 ICRS Star Coord at Epoch: 07h 46m 19.77789s +21:43:28.15276s
 RUWE (>1.4 is poor) : 4.70
 K magnitude : 14.989
 G magnitude : 16.820
 RP magnitude : 16.146
 BP magnitude : 17.079
 DUPflag : 0
 Distance (au) : 18.907
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.47
 Sun-Target sep (deg) : 72.49
 Sun-Moon sep (deg) : 36.53
 B (ring opening deg) : 52.28
 PA of pole (deg) : 86.87
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.100
 C/A sky separation (km) : 1370.0
 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_itrff93_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	2039-05-03T03:28:13.652		53.78	-11.87	50788.05	-18.95		
lambda	I	2039-05-03T03:28:53.830		53.64	-11.99	50026.71	-18.95		
delta	I	2039-05-03T03:30:24.929		53.33	-12.27	48300.35	-18.95		
gamma	I	2039-05-03T03:31:00.361		53.20	-12.38	47628.87	-18.95		
eta	I	2039-05-03T03:31:24.250		53.12	-12.46	47176.12	-18.95		
beta	I	2039-05-03T03:32:44.556		52.84	-12.70	45653.13	-18.95		
alpha	I	2039-05-03T03:33:34.589		52.67	-12.86	44713.38	-18.96		
4	I	2039-05-03T03:35:27.129		52.28	-13.20	42590.43	-18.96		
5	I	2039-05-03T03:35:42.622		52.22	-13.25	42308.37	-18.97		
6	I	2039-05-03T03:36:02.985		52.15	-13.31	41858.86	-18.94		
Uranus	I	2039-05-03T03:45:02.439		50.28	-14.94	25208.28		36.83	38.10
Uranus	E	2039-05-03T04:40:03.998		38.75	-24.32	25227.35		-35.63	-36.89
6	E	2039-05-03T04:49:13.112		36.83	-25.75	41817.96	19.09		
5	E	2039-05-03T04:49:27.988		36.78	-25.79	42163.86	19.12		
4	E	2039-05-03T04:49:48.714		36.71	-25.85	42549.45	19.12		
alpha	E	2039-05-03T04:51:43.114		36.31	-26.14	44725.63	19.12		
beta	E	2039-05-03T04:52:32.935		36.13	-26.27	45670.22	19.12		
eta	E	2039-05-03T04:53:51.644		35.86	-26.47	47176.12	19.12		
gamma	E	2039-05-03T04:54:15.059		35.78	-26.53	47623.93	19.13		
delta	E	2039-05-03T04:54:50.424		35.65	-26.61	48300.35	19.13		
lambda	E	2039-05-03T04:56:20.668		35.34	-26.84	50026.71	19.13		
epsilon	E	2039-05-03T04:57:38.653		35.07	-27.04	51518.90	19.14		

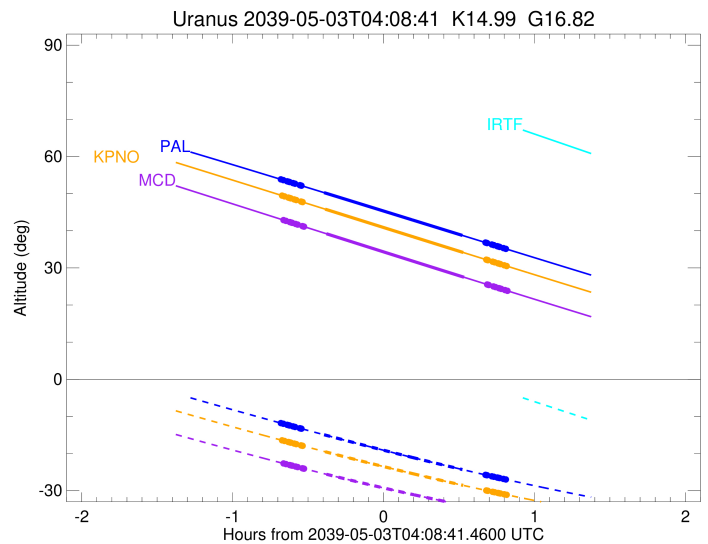
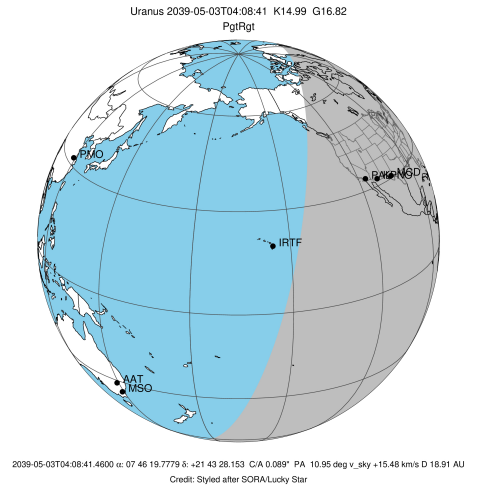
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target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2039-05-03T04:12:58.440
Event type           : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 674540973368423040
2Mass ID (if available) : 07461977+2143283
ICRS Star Coord at Epoch: 07h 46m 19.77789s +21:43:28.15276s
RUWE (>1.4 is poor) : 4.70
K magnitude           : 14.989
G magnitude           : 16.820
RP magnitude          : 16.146
BP magnitude          : 17.079
DUPflag              : 0
Distance (au)        : 18.907
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 15.47
Sun-Target sep (deg) : 72.49
Sun-Moon sep (deg)   : 36.45
B (ring opening deg) : 52.28
PA of pole (deg)     : 86.87
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.106
C/A sky separation (km) : 1449.7
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
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Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-05-03T03:28:41.796		49.40	-16.51	50788.29	-18.98		
lambda	I	2039-05-03T03:29:21.932		49.26	-16.63	50026.71	-18.98		
delta	I	2039-05-03T03:30:52.907		48.94	-16.90	48300.35	-18.98		
gamma	I	2039-05-03T03:31:28.289		48.81	-17.01	47628.88	-18.98		
eta	I	2039-05-03T03:31:52.146		48.73	-17.08	47176.12	-18.98		
beta	I	2039-05-03T03:33:12.340		48.45	-17.33	45653.15	-18.98		
alpha	I	2039-05-03T03:34:02.303		48.27	-17.48	44713.43	-18.98		
4	I	2039-05-03T03:35:54.692		47.87	-17.81	42590.36	-18.99		
5	I	2039-05-03T03:36:10.158		47.81	-17.86	42308.42	-19.00		
6	I	2039-05-03T03:36:30.490		47.74	-17.92	41858.92	-18.97		
Uranus	I	2039-05-03T03:45:28.863		45.83	-19.52	25207.88		36.86	38.13
Uranus	E	2039-05-03T04:40:24.023		34.15	-28.59	25228.06		-35.59	-36.85
6	E	2039-05-03T04:49:32.705		32.21	-29.95	41818.04	19.13		
5	E	2039-05-03T04:49:47.555		32.16	-29.99	42163.94	19.16		
4	E	2039-05-03T04:50:08.232		32.09	-30.04	42549.36	19.16		
alpha	E	2039-05-03T04:52:02.419		31.69	-30.31	44725.69	19.16		
beta	E	2039-05-03T04:52:52.141		31.51	-30.43	45670.26	19.16		
eta	E	2039-05-03T04:54:10.696		31.23	-30.62	47176.12	19.16		
gamma	E	2039-05-03T04:54:34.065		31.15	-30.68	47623.94	19.16		
delta	E	2039-05-03T04:55:09.361		31.03	-30.76	48300.35	19.17		
lambda	E	2039-05-03T04:56:39.427		30.71	-30.98	50026.71	19.17		
epsilon	E	2039-05-03T04:57:57.274		30.44	-31.16	51519.19	19.18		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-05-03T04:13:24.730
 Event type : PgtRgt
 : Uranus occs: geocentric, 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 : 674540973368423040
 2Mass ID (if available) : 07461977+2143283
 ICRS Star Coord at Epoch: 07h 46m 19.77789s +21:43:28.15276s
 RUWE (>1.4 is poor) : 4.70
 K magnitude : 14.989
 G magnitude : 16.820
 RP magnitude : 16.146
 BP magnitude : 17.079
 DUPflag : 0
 Distance (au) : 18.907
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.47
 Sun-Target sep (deg) : 72.49
 Sun-Moon sep (deg) : 36.34
 B (ring opening deg) : 52.28
 PA of pole (deg) : 86.87
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.119
 C/A sky separation (km) : 1636.4
 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_itrff93_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	2039-05-03T03:29:16.705		42.81	-22.73	50788.93	-19.02		
lambda	I	2039-05-03T03:29:56.779		42.66	-22.85	50026.71	-19.02		
delta	I	2039-05-03T03:31:27.537		42.34	-23.11	48300.35	-19.02		
gamma	I	2039-05-03T03:32:02.834		42.21	-23.22	47628.89	-19.02		
eta	I	2039-05-03T03:32:26.635		42.12	-23.28	47176.12	-19.02		
beta	I	2039-05-03T03:33:46.632		41.84	-23.52	45653.22	-19.03		
alpha	I	2039-05-03T03:34:36.474		41.66	-23.66	44713.56	-19.03		
4	I	2039-05-03T03:36:28.608		41.25	-23.98	42590.19	-19.04		
5	I	2039-05-03T03:36:44.023		41.20	-24.02	42308.56	-19.04		
6	I	2039-05-03T03:37:04.300		41.13	-24.08	41859.07	-19.01		
Uranus	I	2039-05-03T03:46:00.596		39.20	-25.60	25206.91		36.92	38.19
Uranus	E	2039-05-03T04:40:44.729		27.48	-33.97	25229.66		-35.49	-36.74
6	E	2039-05-03T04:49:53.139		25.53	-35.18	41818.21	19.19		
5	E	2039-05-03T04:50:07.953		25.48	-35.21	42164.11	19.22		
4	E	2039-05-03T04:50:28.546		25.41	-35.26	42549.19	19.21		
alpha	E	2039-05-03T04:52:22.407		25.01	-35.50	44725.84	19.22		
beta	E	2039-05-03T04:53:11.973		24.83	-35.61	45670.33	19.22		
eta	E	2039-05-03T04:54:30.287		24.56	-35.77	47176.12	19.22		
gamma	E	2039-05-03T04:54:53.586		24.47	-35.82	47623.96	19.22		
delta	E	2039-05-03T04:55:28.773		24.35	-35.90	48300.35	19.22		
lambda	E	2039-05-03T04:56:58.564		24.03	-36.08	50026.71	19.23		
epsilon	E	2039-05-03T04:58:16.203		23.76	-36.24	51519.81	19.24		