

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-03T06:03:42.810
 Event type : PRgt
 : Uranus occs: not geocentric or topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3425390320125767168
 2Mass ID (if available) : 06090188+2341525

Uranus 2034-02-03T06:03:42 K14.23 G16.32 PRgt

ICRS Star Coord at Epoch: 06h 09m 01.89295s +23:41:52.10288s

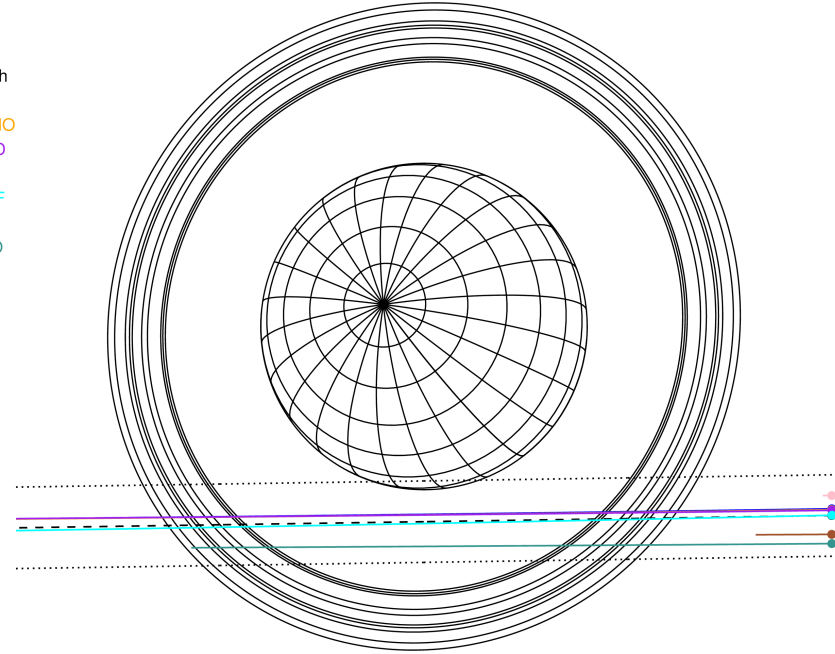
RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.233
 G magnitude : 16.315
 RP magnitude : 15.680
 BP magnitude : 16.780
 DUPflag : 0
 Distance (au) : 18.202
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.77
 Sun-Target sep (deg) : 138.07
 Sun-Moon sep (deg) : 40.09
 B (ring opening deg) : 73.55
 PA of pole (deg) : 61.51

Uranus 2034-02-03T06:03:42 K14.23 G16.32 PRgt



2034-02-03T06:03:42.8100 α: 06 09 01.89295 δ: +23 41 52.103 C/A 2.308° PA 0.87 deg v_sky -15.77 km/s D 18.20 AU
 Credit: Styled after SORA/Lucky Star

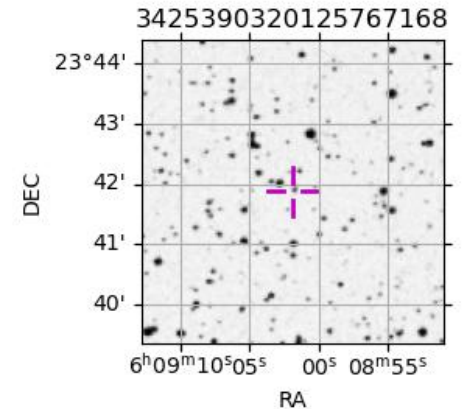
Earth
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO



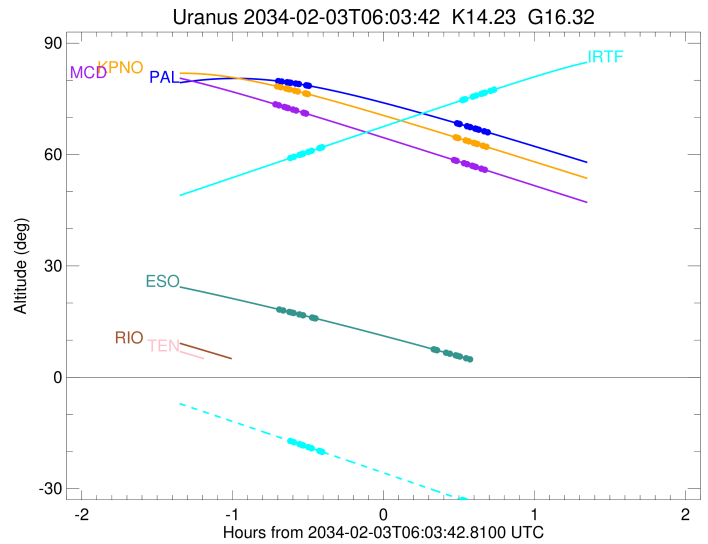
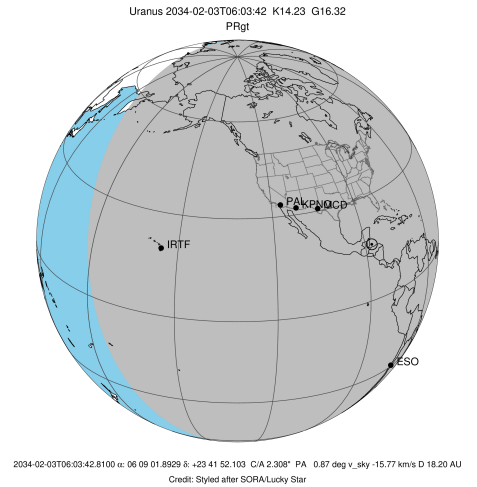
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon

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				FEB 03 05:21 - FEB 03 06:45	PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+++++		+++++	FEB 03 05:21 - FEB 03 06:45	PnnRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8				FEB 03 05:21 - FEB 03 06:44	PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	FEB 03 05:21 - FEB 03 06:44	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	FEB 03 05:20 - FEB 03 06:44	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5				FEB 03 05:26 - FEB 03 06:47	PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++		+++++	FEB 03 05:26 - FEB 03 06:47	PnnRie
KAV	Kavalur Observatory	12.6	78.8				FEB 03 05:21 - FEB 03 06:36	PnnRnn
RIO	Rio de Janeiro	-22.9	316.8				FEB 03 05:21 - FEB 03 06:36	PnnRnn
ESO	European Southern Obs	-29.3	289.3	+++++		+++++	FEB 03 05:21 - FEB 03 06:36	PnnRie
AAT	Siding Spring (AAT)	-31.3	149.1				FEB 03 05:21 - FEB 03 06:36	PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8				FEB 03 05:21 - FEB 03 06:36	PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0				FEB 03 05:21 - FEB 03 06:36	PnnRnn



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-03T06:02:25.010
 Event type : PRgt
 : Uranus occs: not geocentric or 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 : 3425390320125767168
 2Mass ID (if available) : 06090188+2341525
 ICRS Star Coord at Epoch: 06h 09m 01.89295s +23:41:52.10288s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.233
 G magnitude : 16.315
 RP magnitude : 15.680
 BP magnitude : 16.780
 DUPflag : 0
 Distance (au) : 18.202
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.77
 Sun-Target sep (deg) : 138.07
 Sun-Moon sep (deg) : 40.55
 B (ring opening deg) : 73.55
 PA of pole (deg) : 61.51
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.229
 C/A sky separation (km) : 29420.4
 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

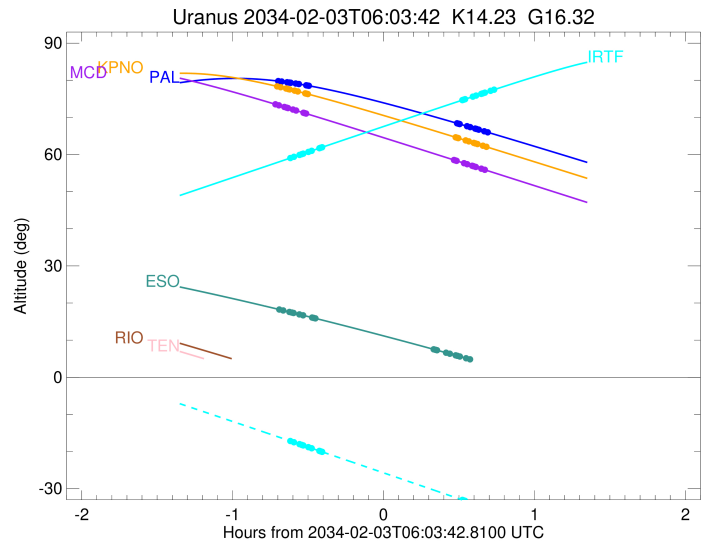
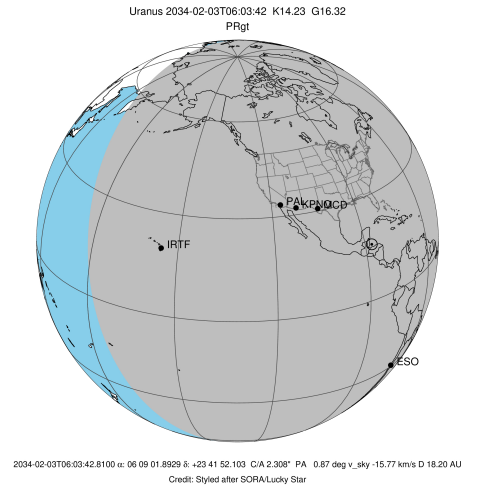


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-02-03T05:21:27.012		79.82	-50.43	51503.80	-13.66		
lambda	I	2034-02-03T05:23:16.216		79.67	-50.79	50026.71	-13.42		
delta	I	2034-02-03T05:25:26.126		79.47	-51.23	48300.35	-13.15		
gamma	I	2034-02-03T05:26:17.309		79.39	-51.40	47630.12	-13.04		
eta	I	2034-02-03T05:26:52.240		79.33	-51.52	47176.12	-12.96		
beta	I	2034-02-03T05:28:52.095		79.12	-51.92	45641.07	-12.66		
alpha	I	2034-02-03T05:30:05.888		78.99	-52.16	44711.15	-12.47		
4	I	2034-02-03T05:32:58.110		78.65	-52.74	42616.24	-11.95		
5	I	2034-02-03T05:33:33.440		78.58	-52.86	42189.94	-11.82		
6	I	2034-02-03T05:34:02.760		78.52	-52.95	41841.60	-11.75		

No planet occultations

6	E	2034-02-03T06:32:59.156		68.41	-64.05	41879.54	11.73		
5	E	2034-02-03T06:33:23.785		68.33	-64.12	42169.06	11.79		
4	E	2034-02-03T06:33:58.416		68.21	-64.21	42575.34	11.93		
alpha	E	2034-02-03T06:36:57.112		67.63	-64.72	44752.27	12.44		
beta	E	2034-02-03T06:38:09.689		67.39	-64.92	45663.40	12.63		
eta	E	2034-02-03T06:40:08.120		66.99	-65.25	47176.12	12.92		
gamma	E	2034-02-03T06:40:42.518		66.88	-65.35	47621.84	13.00		
delta	E	2034-02-03T06:41:34.492		66.71	-65.49	48300.35	13.11		
lambda	E	2034-02-03T06:43:44.810		66.27	-65.85	50026.71	13.38		
epsilon	E	2034-02-03T06:45:12.940		65.98	-66.08	51213.10	13.62		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-03T06:01:55.760
 Event type : PRgt
 : Uranus occs: not geocentric or 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 : 3425390320125767168
 2Mass ID (if available) : 06090188+2341525
 ICRS Star Coord at Epoch: 06h 09m 01.89295s +23:41:52.10288s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.233
 G magnitude : 16.315
 RP magnitude : 15.680
 BP magnitude : 16.780
 DUPflag : 0
 Distance (au) : 18.202
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.77
 Sun-Target sep (deg) : 138.07
 Sun-Moon sep (deg) : 40.48
 B (ring opening deg) : 73.55
 PA of pole (deg) : 61.51
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.235
 C/A sky separation (km) : 29505.7
 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



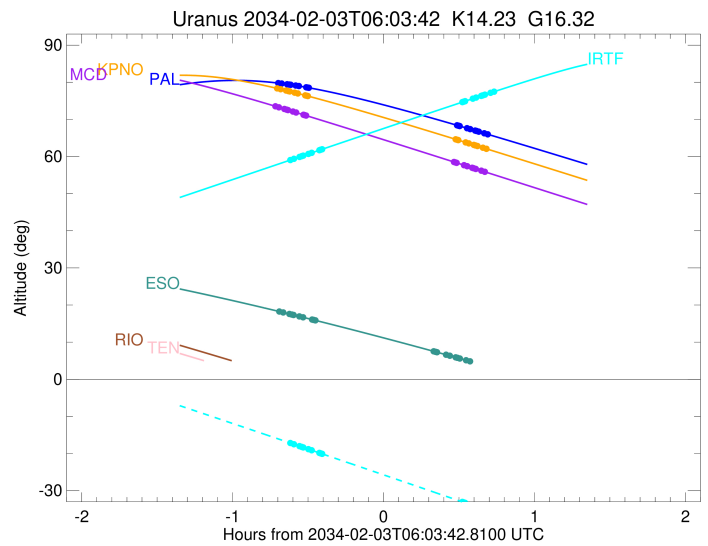
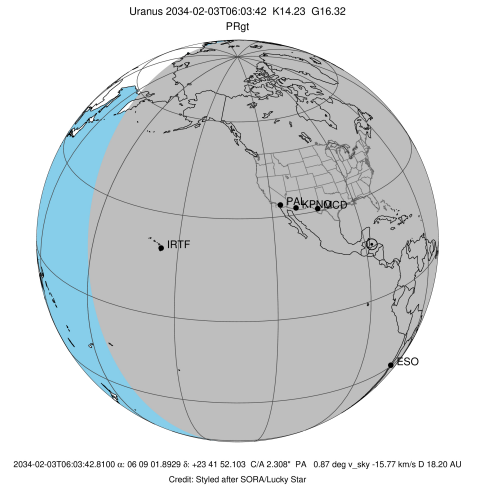
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-02-03T05:21:01.327		78.43	-54.99	51504.37	-13.65		
lambda	I	2034-02-03T05:22:50.722		78.13	-55.36	50026.71	-13.40		
delta	I	2034-02-03T05:25:00.833		77.78	-55.80	48300.35	-13.13		
gamma	I	2034-02-03T05:25:52.103		77.64	-55.97	47630.11	-13.01		
eta	I	2034-02-03T05:26:27.096		77.54	-56.08	47176.12	-12.93		
beta	I	2034-02-03T05:28:27.181		77.20	-56.49	45641.07	-12.63		
alpha	I	2034-02-03T05:29:41.123		76.99	-56.73	44711.26	-12.44		
4	I	2034-02-03T05:32:33.774		76.48	-57.31	42616.25	-11.92		
5	I	2034-02-03T05:33:09.220		76.38	-57.42	42189.70	-11.79		
6	I	2034-02-03T05:33:38.590		76.29	-57.52	41841.75	-11.72		

No planet occultations

6	E	2034-02-03T06:32:25.576		64.63	-68.31	41879.54	11.69		
5	E	2034-02-03T06:32:50.280		64.55	-68.38	42168.96	11.75		
4	E	2034-02-03T06:33:25.039		64.43	-68.47	42575.42	11.89		
alpha	E	2034-02-03T06:36:24.272		63.80	-68.94	44752.26	12.40		
beta	E	2034-02-03T06:37:37.047		63.55	-69.13	45663.36	12.59		
eta	E	2034-02-03T06:39:35.788		63.13	-69.43	47176.12	12.89		
gamma	E	2034-02-03T06:40:10.271		63.01	-69.52	47621.85	12.97		
delta	E	2034-02-03T06:41:02.369		62.83	-69.65	48300.35	13.08		
lambda	E	2034-02-03T06:43:12.984		62.37	-69.97	50026.71	13.35		
epsilon	E	2034-02-03T06:44:41.339		62.07	-70.18	51213.59	13.59		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-03T06:01:15.110
 Event type : PRgt
 : Uranus occs: not geocentric or 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 : 3425390320125767168
 2Mass ID (if available) : 06090188+2341525
 ICRS Star Coord at Epoch: 06h 09m 01.89295s +23:41:52.10288s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.233
 G magnitude : 16.315
 RP magnitude : 15.680
 BP magnitude : 16.780
 DUPflag : 0
 Distance (au) : 18.202
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.77
 Sun-Target sep (deg) : 138.07
 Sun-Moon sep (deg) : 40.38
 B (ring opening deg) : 73.55
 PA of pole (deg) : 61.51
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.236
 C/A sky separation (km) : 29520.6
 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_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

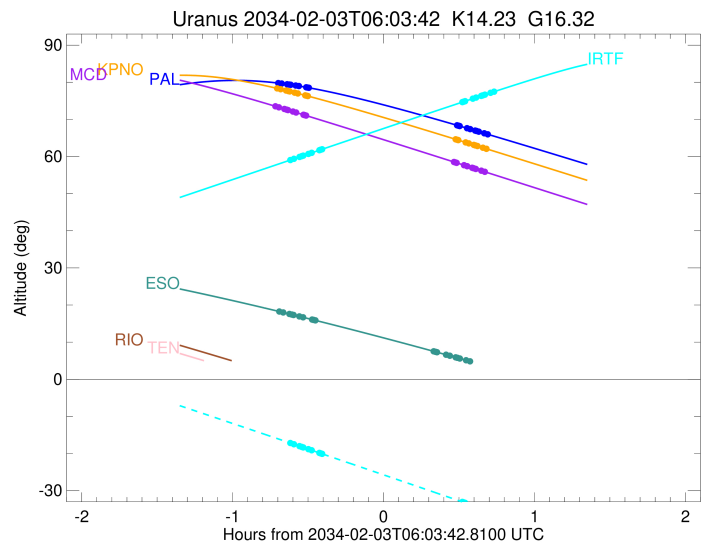
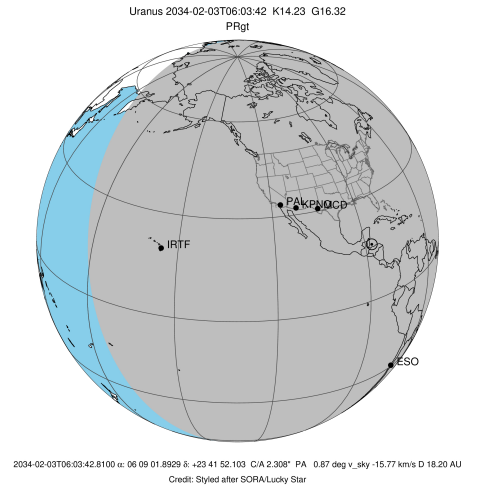
Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-02-03T05:20:19.656	73.62	-61.38	51504.68	-13.64		
lambda	I	2034-02-03T05:22:09.138	73.25	-61.74	50026.71	-13.39		
delta	I	2034-02-03T05:24:19.333	72.81	-62.17	48300.35	-13.12		
gamma	I	2034-02-03T05:25:10.640	72.64	-62.33	47630.10	-13.00		
eta	I	2034-02-03T05:25:45.657	72.52	-62.45	47176.12	-12.92		
beta	I	2034-02-03T05:27:45.833	72.11	-62.84	45641.07	-12.62		
alpha	I	2034-02-03T05:28:59.831	71.85	-63.08	44711.31	-12.43		
4	I	2034-02-03T05:31:52.638	71.26	-63.64	42616.26	-11.91		
5	I	2034-02-03T05:32:28.126	71.13	-63.75	42189.59	-11.78		
6	I	2034-02-03T05:32:57.509	71.03	-63.84	41841.82	-11.71		

No planet occultations

6	E	2034-02-03T06:31:46.014	58.52	-73.51	41879.54	11.67		
5	E	2034-02-03T06:32:10.764	58.43	-73.55	42169.00	11.73		
4	E	2034-02-03T06:32:45.580	58.31	-73.62	42575.39	11.87		
alpha	E	2034-02-03T06:35:45.125	57.66	-73.97	44752.26	12.38		
beta	E	2034-02-03T06:36:58.025	57.40	-74.10	45663.38	12.57		
eta	E	2034-02-03T06:38:56.966	56.97	-74.31	47176.12	12.86		
gamma	E	2034-02-03T06:39:31.507	56.85	-74.36	47621.84	12.94		
delta	E	2034-02-03T06:40:23.693	56.66	-74.45	48300.35	13.06		
lambda	E	2034-02-03T06:42:34.528	56.19	-74.66	50026.71	13.33		
epsilon	E	2034-02-03T06:44:03.008	55.87	-74.79	51213.27	13.57		

```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2034-02-03T06:06:05.170
Event type            : PRgt
: Uranus occs: not geocentric or 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        : 3425390320125767168
2Mass ID (if available) : 06090188+2341525
ICRS Star Coord at Epoch: 06h 09m 01.89295s +23:41:52.10288s
RUWE (>1.4 is poor)  : 1.08
K magnitude           : 14.233
G magnitude           : 16.315
RP magnitude          : 15.680
BP magnitude          : 16.780
DUPflag              : 0
Distance (au)         : 18.202
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -15.77
Sun-Target sep (deg)  : 138.07
Sun-Moon sep (deg)    : 40.93
B (ring opening deg)  : 73.55
PA of pole (deg)      : 61.51
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.337
C/A sky separation (km) : 30856.4
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
    
```

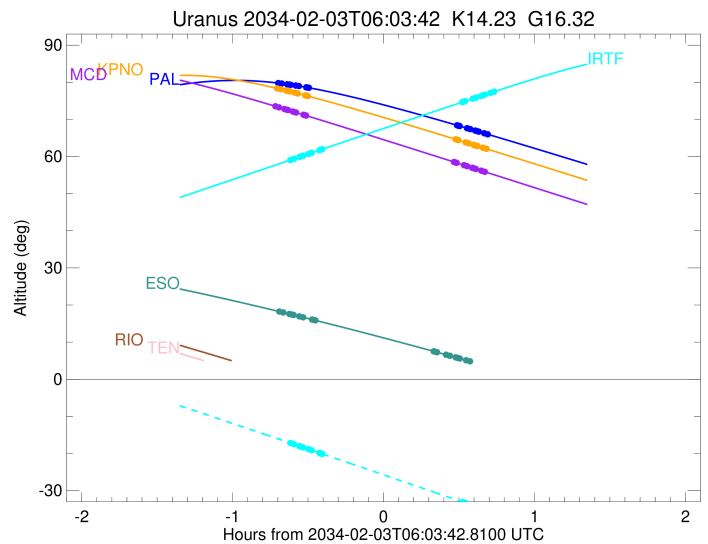
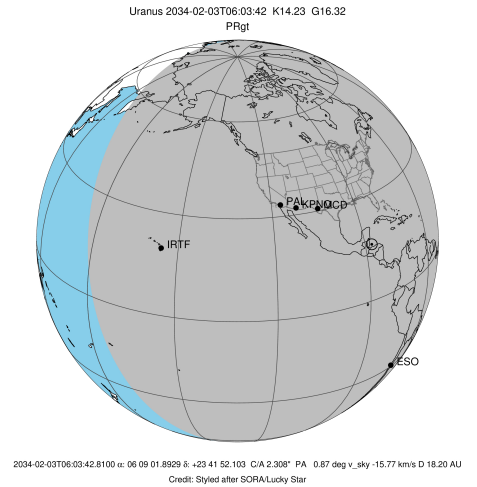


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-02-03T05:26:14.210		58.96	-17.07	51509.34	-13.30		
lambda	I	2034-02-03T05:28:06.976		59.39	-17.51	50026.71	-13.03		
delta	I	2034-02-03T05:30:20.997		59.90	-18.02	48300.35	-12.73		
gamma	I	2034-02-03T05:31:13.936		60.10	-18.22	47630.00	-12.60		
eta	I	2034-02-03T05:31:50.095		60.24	-18.36	47176.12	-12.51		
beta	I	2034-02-03T05:33:54.505		60.72	-18.84	45641.06	-12.17		
alpha	I	2034-02-03T05:35:11.280		61.01	-19.14	44712.41	-11.95		
4	I	2034-02-03T05:38:11.749		61.70	-19.83	42616.43	-11.36		
5	I	2034-02-03T05:38:49.178		61.84	-19.97	42187.10	-11.21		
6	I	2034-02-03T05:39:19.693		61.96	-20.09	41843.47	-11.13		

No planet occultations

6	E	2034-02-03T06:35:06.146		74.67	-33.05	41879.71	11.15		
5	E	2034-02-03T06:35:31.787		74.76	-33.15	42166.59	11.23		
4	E	2034-02-03T06:36:08.482		74.90	-33.29	42577.83	11.38		
alpha	E	2034-02-03T06:39:14.568		75.60	-34.01	44752.06	11.98		
beta	E	2034-02-03T06:40:29.758		75.88	-34.31	45662.41	12.20		
eta	E	2034-02-03T06:42:32.150		76.33	-34.78	47176.12	12.53		
gamma	E	2034-02-03T06:43:07.593		76.46	-34.92	47621.98	12.63		
delta	E	2034-02-03T06:44:01.046		76.66	-35.13	48300.35	12.76		
lambda	E	2034-02-03T06:46:14.749		77.15	-35.65	50026.71	13.06		
epsilon	E	2034-02-03T06:47:46.169		77.49	-36.01	51229.71	13.33		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-03T05:58:52.970
 Event type : PRgt
 : Uranus occs: not geocentric or topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 3425390320125767168
 2Mass ID (if available) : 06090188+2341525
 ICRS Star Coord at Epoch: 06h 09m 01.89295s +23:41:52.10288s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.233
 G magnitude : 16.315
 RP magnitude : 15.680
 BP magnitude : 16.780
 DUPflag : 0
 Distance (au) : 18.202
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.77
 Sun-Target sep (deg) : 138.07
 Sun-Moon sep (deg) : 39.60
 B (ring opening deg) : 73.55
 PA of pole (deg) : 61.51
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.609
 C/A sky separation (km) : 34442.7
 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	2034-02-03T05:21:47.873		18.33	-44.01	51526.97	-12.25		
lambda	I	2034-02-03T05:23:52.277		17.99	-43.94	50026.71	-11.90		
delta	I	2034-02-03T05:26:19.905		17.59	-43.85	48300.35	-11.48		
gamma	I	2034-02-03T05:27:18.778		17.43	-43.81	47629.52	-11.30		
eta	I	2034-02-03T05:27:59.110		17.31	-43.79	47176.12	-11.18		
beta	I	2034-02-03T05:30:19.323		16.93	-43.69	45641.20	-10.71		
alpha	I	2034-02-03T05:31:46.698		16.68	-43.63	44716.87	-10.40		
4	I	2034-02-03T05:35:17.908		16.09	-43.47	42616.46	-9.55		
5	I	2034-02-03T05:36:03.450		15.97	-43.43	42177.99	-9.34		
6	I	2034-02-03T05:36:38.563		15.87	-43.40	41849.82	-9.21		

No planet occultations

6	E	2034-02-03T06:23:42.720		7.52	-39.81	41879.59	9.16		
5	E	2034-02-03T06:24:13.320		7.43	-39.76	42161.88	9.29		
4	E	2034-02-03T06:24:58.395		7.29	-39.68	42583.26	9.50		
alpha	E	2034-02-03T06:28:36.825		6.61	-39.30	44751.32	10.34		
beta	E	2034-02-03T06:30:03.358		6.34	-39.15	45660.35	10.64		
eta	E	2034-02-03T06:32:22.723		5.91	-38.90	47176.12	11.10		
gamma	E	2034-02-03T06:33:02.695		5.78	-38.83	47622.29	11.22		
delta	E	2034-02-03T06:34:02.640		5.60	-38.72	48300.35	11.40		
lambda	E	2034-02-03T06:36:31.394		5.13	-38.44	50026.71	11.80		
epsilon	E	2034-02-03T06:38:14.824		4.81x	-38.24	51261.18	12.15		