

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-02-08T00:15:44.790
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3379588857600733056
 2Mass ID (if available) : 06483738+2321349

ICRS Star Coord at Epoch: 06h 48m 37.37818s +23:21:34.62563s

RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.456
 G magnitude : 16.027
 RP magnitude : 15.502
 BP magnitude : 16.371
 DUPflag : 0
 Distance (au) : 18.025
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -17.30
 Sun-Target sep (deg) : 142.84
 Sun-Moon sep (deg) : 18.11
 B (ring opening deg) : 65.20
 PA of pole (deg) : 75.23

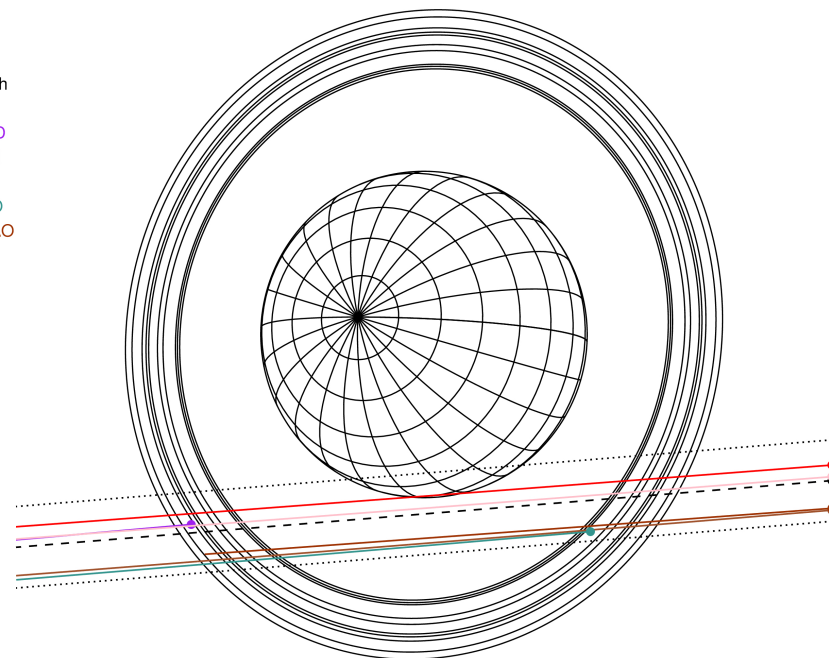
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2036-02-08T00:15:44.7900 α: 06 48 37.3782 δ: +23 21 34.626 C/A 2.136° PA 4.67 deg v_sky -17.30 km/s D 18.02 AU
 Credit: Styled after SORA/Lucky Star

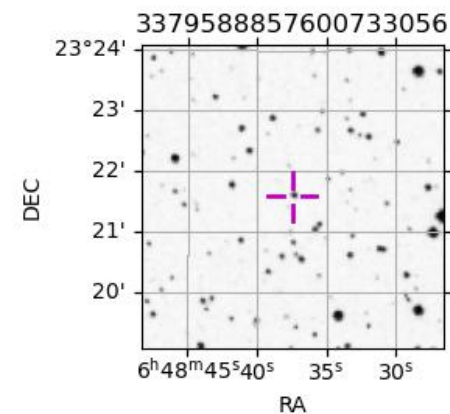
Uranus 2036-02-08T00:15:44 K14.46 G16.03 PtRgt

Earth
 PIC
 MCD
 TEN
 RIO
 ESO
 SAAO

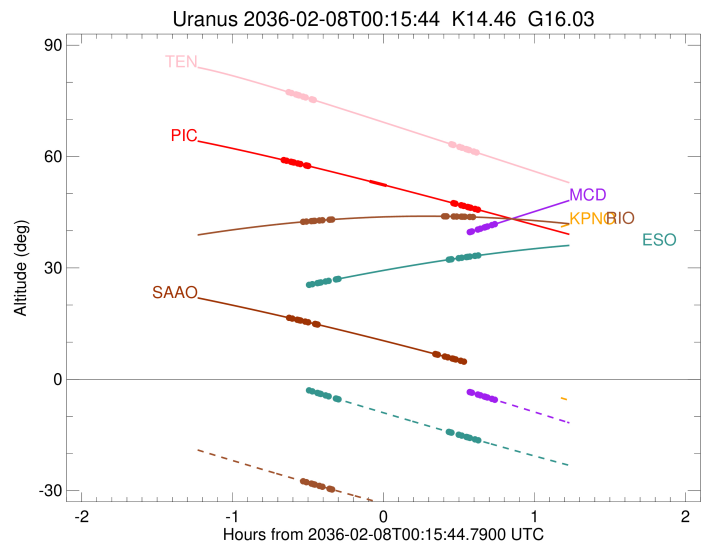
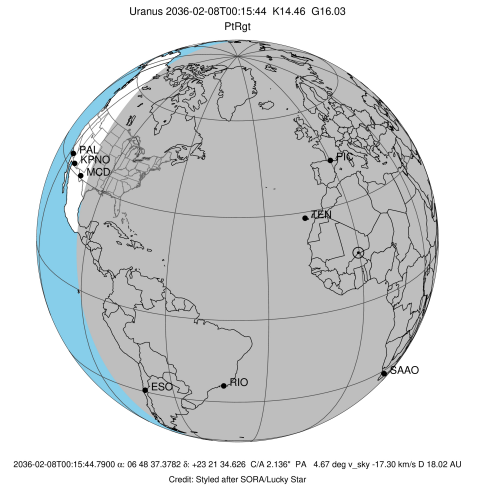


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	FEB 07 23:36 - FEB 08 00:53	PieRie
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			++	FEB 08 00:58 - FEB 08 01:00	PnnRne
TEN	Teide Obs./Tenerife	28.3	343.5	+++++		+++++	FEB 07 23:38 - FEB 08 00:53	PnnRie
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	+++++		+++++	FEB 07 23:43 - FEB 08 00:51	PnnRie
ESO	European Southern Obs	-29.3	289.3		+++	+++++	FEB 07 23:56 - FEB 08 00:53	PnnRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++		+++++	FEB 07 23:38 - FEB 08 00:44	PnnRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

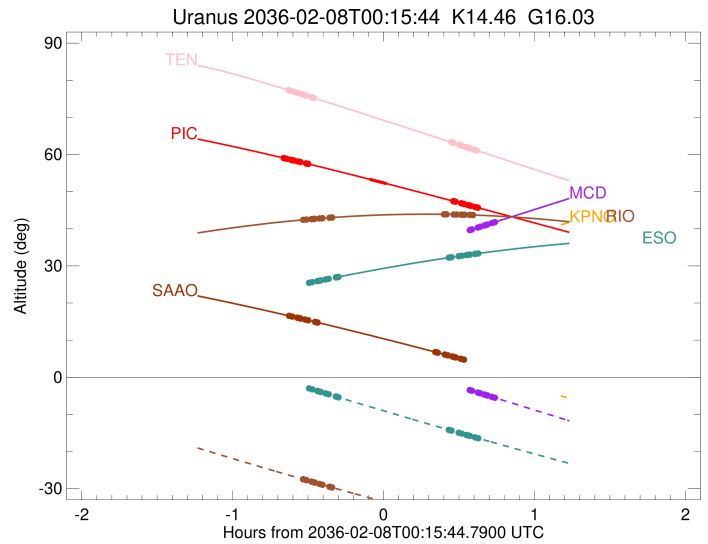
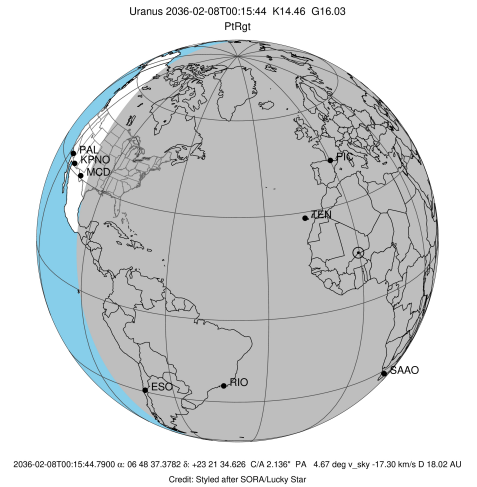


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-02-08T00:13:18.340
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3379588857600733056
 2Mass ID (if available) : 06483738+2321349
 ICRS Star Coord at Epoch: 06h 48m 37.37818s +23:21:34.62563s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.456
 G magnitude : 16.027
 RP magnitude : 15.502
 BP magnitude : 16.371
 DUPflag : 0
 Distance (au) : 18.025
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -17.30
 Sun-Target sep (deg) : 142.84
 Sun-Moon sep (deg) : 18.87
 B (ring opening deg) : 65.20
 PA of pole (deg) : 75.23
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.932
 C/A sky separation (km) : 25251.0
 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_itrfr93_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	2036-02-07T23:36:15.715	59.02	-61.32	50994.41	-16.69		
lambda	I	2036-02-07T23:37:14.137	58.86	-61.37	50026.71	-16.51		
delta	I	2036-02-07T23:38:59.383	58.58	-61.47	48300.35	-16.29		
gamma	I	2036-02-07T23:39:41.008	58.47	-61.51	47623.98	-16.20		
eta	I	2036-02-07T23:40:08.702	58.39	-61.54	47176.12	-16.14		
beta	I	2036-02-07T23:41:44.248	58.14	-61.62	45646.53	-15.91		
alpha	I	2036-02-07T23:42:41.764	57.98	-61.67	44737.17	-15.75		
4	I	2036-02-07T23:45:00.505	57.60	-61.78	42567.26	-15.34		
5	I	2036-02-07T23:45:22.073	57.54	-61.79	42248.54	-15.31		
6	I	2036-02-07T23:45:50.030	57.46	-61.82	41805.63	-15.18		
Uranus	I	2036-02-08T00:10:12.431	53.34	-62.43	25461.06		-10.77	-11.27
Uranus	E	2036-02-08T00:16:57.669	52.16	-62.43	25542.77		-4.35	-4.56
6	E	2036-02-08T00:43:30.254	47.45	-61.69	41817.91	15.12		
5	E	2036-02-08T00:44:02.388	47.35	-61.66	42307.27	15.25		
4	E	2036-02-08T00:44:16.640	47.31	-61.65	42529.07	15.28		
alpha	E	2036-02-08T00:46:35.266	46.89	-61.53	44685.46	15.69		
beta	E	2036-02-08T00:47:38.472	46.70	-61.48	45679.43	15.85		
eta	E	2036-02-08T00:49:12.295	46.42	-61.39	47176.12	16.07		
gamma	E	2036-02-08T00:49:40.585	46.33	-61.36	47631.58	16.13		
delta	E	2036-02-08T00:50:21.930	46.21	-61.32	48300.35	16.22		
lambda	E	2036-02-08T00:52:07.675	45.89	-61.21	50026.71	16.43		
epsilon	E	2036-02-08T00:53:39.976	45.61	-61.12	51550.83	16.61		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-02-08T00:20:27.720
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3379588857600733056
 2Mass ID (if available) : 06483738+2321349
 ICRS Star Coord at Epoch: 06h 48m 37.37818s +23:21:34.62563s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.456
 G magnitude : 16.027
 RP magnitude : 15.502
 BP magnitude : 16.371
 DUPflag : 0
 Distance (au) : 18.025
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -17.30
 Sun-Target sep (deg) : 142.84
 Sun-Moon sep (deg) : 17.61
 B (ring opening deg) : 65.20
 PA of pole (deg) : 75.23
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.021
 C/A sky separation (km) : 26424.5
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



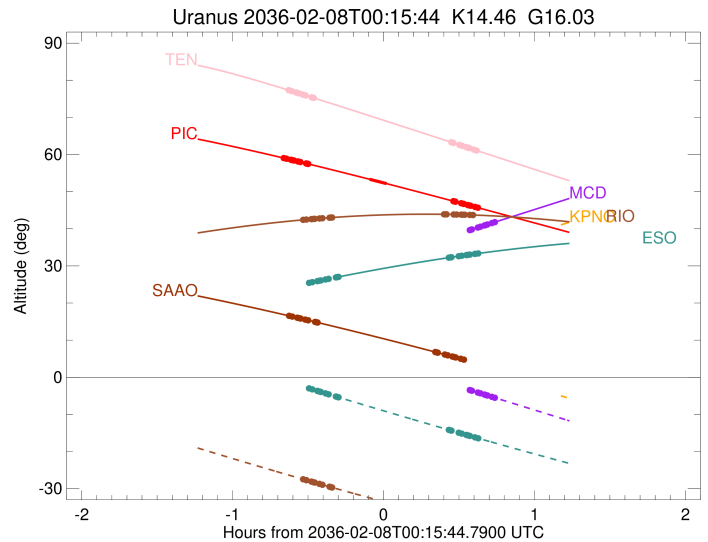
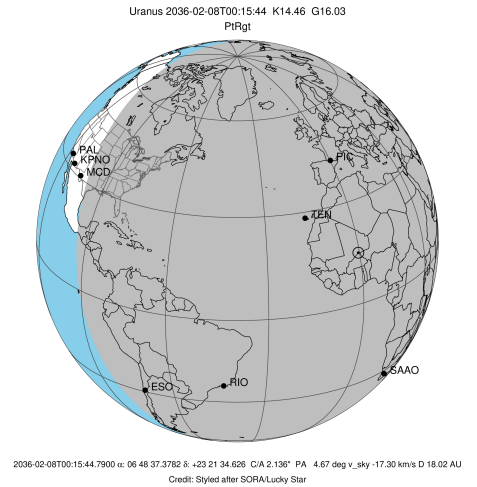
Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-02-07T23:43:52.295	25.56	9.94x	51000.13	-16.26		
lambda	I	2036-02-07T23:44:52.659	25.77	9.74x	50026.71	-16.07		
delta	I	2036-02-07T23:46:40.887	26.15	9.39x	48300.35	-15.83		
gamma	I	2036-02-07T23:47:23.734	26.30	9.24x	47624.06	-15.73		
eta	I	2036-02-07T23:47:52.267	26.40	9.15x	47176.12	-15.66		
beta	I	2036-02-07T23:49:30.781	26.75	8.83x	45646.81	-15.42		
alpha	I	2036-02-07T23:50:30.242	26.96	8.63x	44736.57	-15.24		
4	I	2036-02-07T23:52:53.946	27.46	8.16x	42566.19	-14.79		
5	I	2036-02-07T23:53:16.134	27.54	8.08x	42250.44	-14.75		
6	I	2036-02-07T23:53:45.352	27.65	7.99x	41804.94	-14.61		

No planet occultations

6	E	2036-02-08T00:50:00.720	39.64	-3.44x	41816.08	14.67		
5	E	2036-02-08T00:50:34.091	39.76	-3.56x	42308.87	14.81		
4	E	2036-02-08T00:50:48.594	39.81	-3.61x	42528.33	14.85		
alpha	E	2036-02-08T00:53:11.033	40.32	-4.10x	44685.83	15.32		
beta	E	2036-02-08T00:54:15.671	40.55	-4.32x	45679.05	15.49		
eta	E	2036-02-08T00:55:51.537	40.89	-4.66x	47176.12	15.75		
gamma	E	2036-02-08T00:56:20.396	41.00	-4.76x	47631.57	15.82		
delta	E	2036-02-08T00:57:02.542	41.15	-4.90x	48300.35	15.92		
lambda	E	2036-02-08T00:58:50.177	41.53	-5.28	50026.71	16.16		
epsilon	E	2036-02-08T01:00:24.084	41.87	-5.60	51552.89	16.35		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2036-02-08T00:13:55.150
Event type           : PtRgt
: Uranus occs: topocentric, not geocentric
: 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       : 3379588857600733056
2Mass ID (if available) : 06483738+2321349
ICRS Star Coord at Epoch: 06h 48m 37.37818s +23:21:34.62563s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 14.456
G magnitude           : 16.027
RP magnitude          : 15.502
BP magnitude          : 16.371
DUPflag              : 0
Distance (au)         : 18.025
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -17.30
Sun-Target sep (deg) : 142.84
Sun-Moon sep (deg)   : 18.74
B (ring opening deg) : 65.20
PA of pole (deg)     : 75.23
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.076
C/A sky separation (km) : 27137.2
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_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```



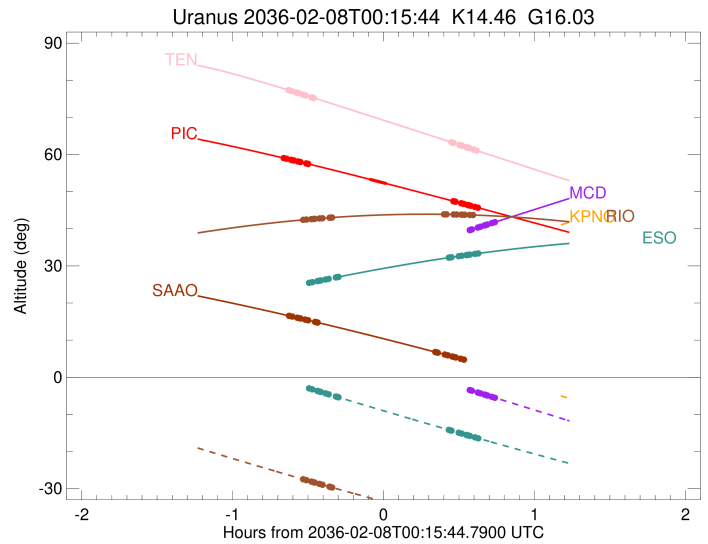
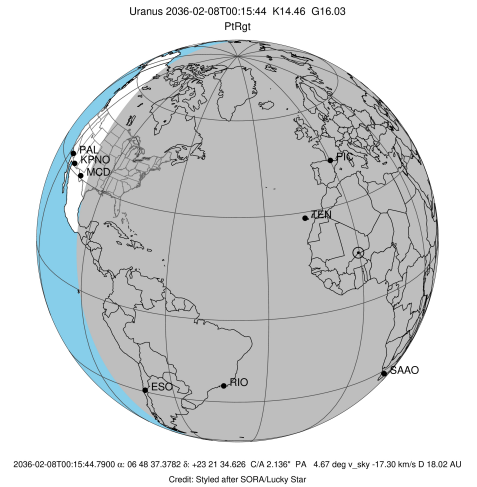
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-02-07T23:38:10.905		77.31	-63.12	51010.49	-16.35		
lambda	I	2036-02-07T23:39:11.591		77.10	-63.32	50026.71	-16.14		
delta	I	2036-02-07T23:40:59.363		76.72	-63.69	48300.35	-15.89		
gamma	I	2036-02-07T23:41:42.063		76.57	-63.83	47624.21	-15.78		
eta	I	2036-02-07T23:42:10.527		76.47	-63.92	47176.12	-15.70		
beta	I	2036-02-07T23:43:48.834		76.13	-64.25	45647.25	-15.43		
alpha	I	2036-02-07T23:44:48.343		75.92	-64.45	44735.67	-15.24		
4	I	2036-02-07T23:47:12.324		75.41	-64.92	42564.72	-14.74		
5	I	2036-02-07T23:47:34.320		75.33	-65.00	42253.02	-14.70		
6	I	2036-02-07T23:48:03.897		75.23	-65.09	41804.04	-14.55		

No planet occultations

6	E	2036-02-08T00:42:40.393		63.31	-74.42	41815.70	14.51		
5	E	2036-02-08T00:43:14.183		63.19	-74.50	42309.19	14.66		
4	E	2036-02-08T00:43:28.806		63.14	-74.53	42528.18	14.70		
alpha	E	2036-02-08T00:45:52.561		62.61	-74.82	44685.91	15.20		
beta	E	2036-02-08T00:46:57.673		62.37	-74.95	45678.98	15.38		
eta	E	2036-02-08T00:48:34.169		62.01	-75.14	47176.12	15.65		
gamma	E	2036-02-08T00:49:03.196		61.91	-75.19	47631.57	15.73		
delta	E	2036-02-08T00:49:45.574		61.75	-75.27	48300.35	15.83		
lambda	E	2036-02-08T00:51:33.730		61.35	-75.46	50026.71	16.09		
epsilon	E	2036-02-08T00:53:08.031		61.00	-75.62	51553.08	16.29		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2036-02-08T00:15:49.840
Event type           : PtRgt
: Uranus occs: topocentric, not geocentric
: Ring occs: geocentric, topocentric
Observer code        : RIO
Location             : Rio de Janeiro
Latitude (deg)       : -22.89506
E. Longitude (deg)   : 316.77708
Altitude (km)        : 0.033
Gaia source ID       : 3379588857600733056
2Mass ID (if available) : 06483738+2321349
ICRS Star Coord at Epoch: 06h 48m 37.37818s +23:21:34.62563s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 14.456
G magnitude           : 16.027
RP magnitude          : 15.502
BP magnitude          : 16.371
DUPflag              : 0
Distance (au)        : 18.025
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -17.30
Sun-Target sep (deg) : 142.84
Sun-Moon sep (deg)   : 18.14
B (ring opening deg) : 65.20
PA of pole (deg)     : 75.23
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.495
C/A sky separation (km) : 32616.5
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_itrfr93_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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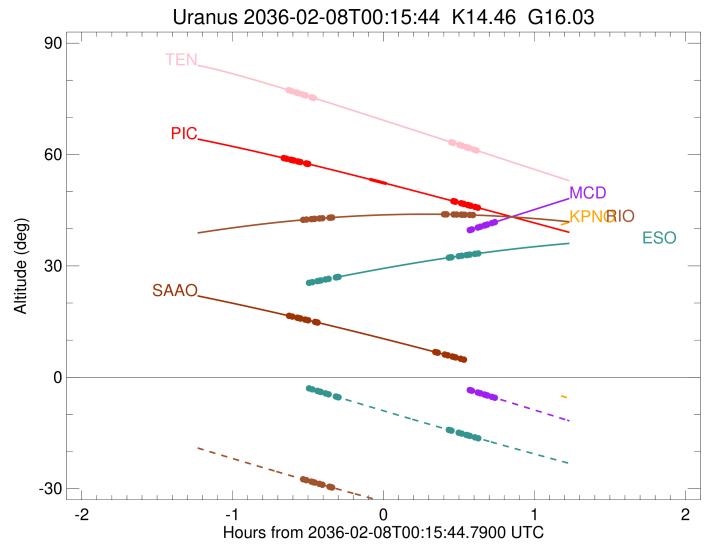
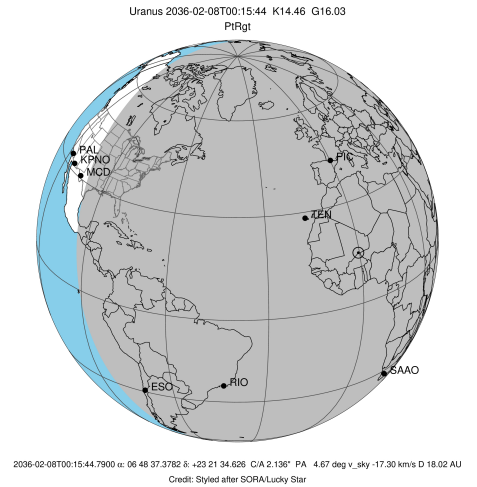


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-02-07T23:43:55.170		42.41	-27.50	51061.23	-14.86		
lambda	I	2036-02-07T23:45:05.792		42.48	-27.72	50026.71	-14.54		
delta	I	2036-02-07T23:47:06.225		42.60	-28.11	48300.35	-14.13		
gamma	I	2036-02-07T23:47:54.338		42.65	-28.27	47624.95	-13.95		
eta	I	2036-02-07T23:48:26.657		42.68	-28.37	47176.12	-13.83		
beta	I	2036-02-07T23:50:18.987		42.78	-28.73	45649.72	-13.38		
alpha	I	2036-02-07T23:51:28.554		42.84	-28.95	44730.62	-13.06		
4	I	2036-02-07T23:54:19.770		42.98	-29.50	42556.69	-12.21		
5	I	2036-02-07T23:54:44.599		43.00	-29.58	42267.09	-12.12		
6	I	2036-02-07T23:55:22.342		43.03	-29.70	41799.63	-11.87		

No planet occultations

6	E	2036-02-08T00:39:45.049		43.90	-37.69	41808.96	11.87		
5	E	2036-02-08T00:40:27.184		43.89	-37.81	42313.66	12.12		
4	E	2036-02-08T00:40:44.349		43.89	-37.86	42526.30	12.20		
alpha	E	2036-02-08T00:43:35.007		43.85	-38.33	44687.98	13.05		
beta	E	2036-02-08T00:44:50.010		43.83	-38.54	45677.21	13.37		
eta	E	2036-02-08T00:46:40.233		43.80	-38.84	47176.12	13.82		
gamma	E	2036-02-08T00:47:13.030		43.79	-38.93	47631.47	13.95		
delta	E	2036-02-08T00:48:00.691		43.78	-39.06	48300.35	14.12		
lambda	E	2036-02-08T00:50:01.165		43.74	-39.39	50026.71	14.53		
epsilon	E	2036-02-08T00:51:45.174		43.70	-39.67	51555.08	14.85		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-02-08T00:18:01.970
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3379588857600733056
 2Mass ID (if available) : 06483738+2321349
 ICRS Star Coord at Epoch: 06h 48m 37.37818s +23:21:34.62563s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.456
 G magnitude : 16.027
 RP magnitude : 15.502
 BP magnitude : 16.371
 DUPflag : 0
 Distance (au) : 18.025
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -17.30
 Sun-Target sep (deg) : 142.84
 Sun-Moon sep (deg) : 17.70
 B (ring opening deg) : 65.20
 PA of pole (deg) : 75.23
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.522
 C/A sky separation (km) : 32972.9
 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

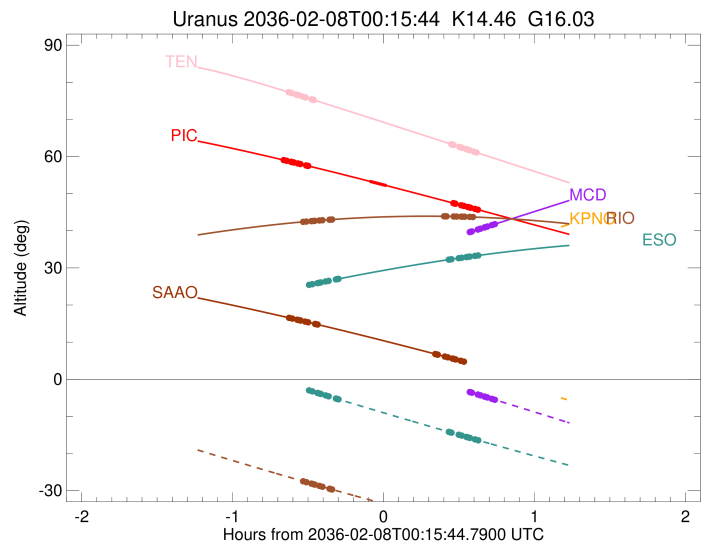
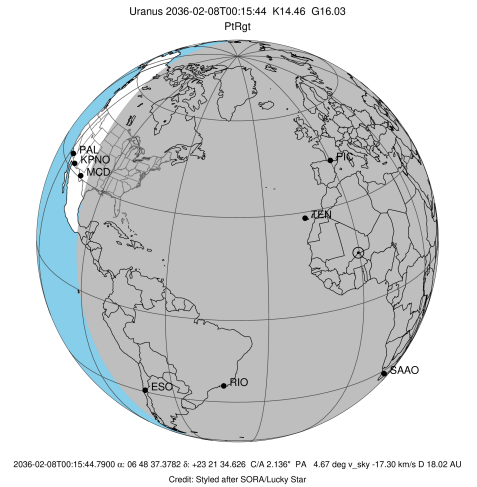


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-02-07T23:46:16.034		25.45	-3.02x	51063.41	-14.65		
lambda	I	2036-02-07T23:47:27.808		25.62	-3.26x	50026.71	-14.33		
delta	I	2036-02-07T23:49:30.050		25.90	-3.68x	48300.35	-13.91		
gamma	I	2036-02-07T23:50:18.924		26.01	-3.85x	47624.98	-13.73		
eta	I	2036-02-07T23:50:51.773		26.09	-3.96x	47176.12	-13.60		
beta	I	2036-02-07T23:52:46.028		26.35	-4.35x	45649.84	-13.14		
alpha	I	2036-02-07T23:53:56.913		26.51	-4.60x	44730.36	-12.81		
4	I	2036-02-07T23:56:51.713		26.90	-5.19	42556.27	-11.94		
5	I	2036-02-07T23:57:17.014		26.96	-5.28	42267.83	-11.85		
6	I	2036-02-07T23:57:55.746		27.05	-5.41	41799.43	-11.59		

No planet occultations

6	E	2036-02-08T00:41:40.123		32.22	-14.16	41808.38	11.61		
5	E	2036-02-08T00:42:23.254		32.29	-14.30	42313.94	11.87		
4	E	2036-02-08T00:42:40.756		32.32	-14.36	42526.20	11.96		
alpha	E	2036-02-08T00:45:34.647		32.61	-14.93	44688.22	12.84		
beta	E	2036-02-08T00:46:50.827		32.73	-15.17	45677.02	13.17		
eta	E	2036-02-08T00:48:42.686		32.91	-15.53	47176.12	13.63		
gamma	E	2036-02-08T00:49:15.931		32.97	-15.64	47631.45	13.76		
delta	E	2036-02-08T00:50:04.223		33.04	-15.80	48300.35	13.94		
lambda	E	2036-02-08T00:52:06.172		33.23	-16.19	50026.71	14.36		
epsilon	E	2036-02-08T00:53:51.323		33.39	-16.52	51554.86	14.69		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2036-02-08T00:11:14.470
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3379588857600733056
 2Mass ID (if available) : 06483738+2321349
 ICRS Star Coord at Epoch: 06h 48m 37.37818s +23:21:34.62563s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.456
 G magnitude : 16.027
 RP magnitude : 15.502
 BP magnitude : 16.371
 DUPflag : 0
 Distance (au) : 18.025
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -17.30
 Sun-Target sep (deg) : 142.84
 Sun-Moon sep (deg) : 18.73
 B (ring opening deg) : 65.20
 PA of pole (deg) : 75.23
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.435
 C/A sky separation (km) : 31835.3
 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	2036-02-07T23:38:20.021		16.53	-41.26	51055.96	-14.96		
lambda	I	2036-02-07T23:39:29.724		16.35	-41.19	50026.71	-14.66		
delta	I	2036-02-07T23:41:28.997		16.03	-41.08	48300.35	-14.28		
gamma	I	2036-02-07T23:42:16.574		15.91	-41.03	47624.86	-14.12		
eta	I	2036-02-07T23:42:48.495		15.82	-41.00	47176.12	-14.00		
beta	I	2036-02-07T23:44:39.287		15.53	-40.88	45649.42	-13.58		
alpha	I	2036-02-07T23:45:47.650		15.35	-40.81	44731.23	-13.29		
4	I	2036-02-07T23:48:35.278		14.90	-40.63	42557.66	-12.51		
5	I	2036-02-07T23:48:59.711		14.84	-40.60	42265.39	-12.43		
6	I	2036-02-07T23:49:36.268		14.74	-40.56	41800.12	-12.20		

No planet occultations

6	E	2036-02-08T00:36:17.151		6.80	-36.31	41810.15	12.15		
5	E	2036-02-08T00:36:58.200		6.68	-36.23	42313.04	12.38		
4	E	2036-02-08T00:37:15.070		6.63	-36.20	42526.53	12.45		
alpha	E	2036-02-08T00:40:02.870		6.13	-35.88	44687.52	13.22		
beta	E	2036-02-08T00:41:17.081		5.91	-35.74	45677.58	13.51		
eta	E	2036-02-08T00:43:06.323		5.59	-35.52	47176.12	13.92		
gamma	E	2036-02-08T00:43:38.902		5.49	-35.46	47631.49	14.03		
delta	E	2036-02-08T00:44:26.288		5.35	-35.36	48300.35	14.19		
lambda	E	2036-02-08T00:46:26.299		4.99x	-35.13	50026.71	14.57		
epsilon	E	2036-02-08T00:48:10.154		4.67x	-34.92	51555.29	14.86		