

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-12-06T18:25:39.090
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3412524178654162816
 2Mass ID (if available) : 04595197+2244565

ICRS Star Coord at Epoch: 04h 59m 51.98441s +22:44:56.37731s

RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.737
 G magnitude : 16.812
 RP magnitude : 16.135
 BP magnitude : 17.309
 DUPflag : 0
 Distance (au) : 18.240
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.46
 Sun-Target sep (deg) : 178.35
 Sun-Moon sep (deg) : 165.81
 B (ring opening deg) : 82.11
 PA of pole (deg) : -16.71

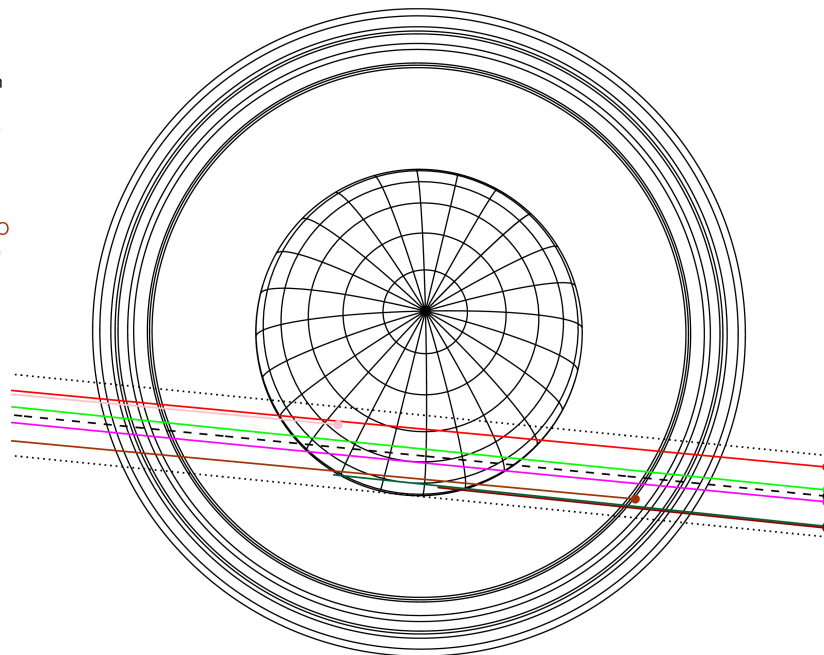
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2029-12-06T18:25:39.0900 ra: 04 59 51.9844 s: +22 44 56.377 C/A 1.444 PA 354.31 deg v_sky -23.46 km/s D 18.24 AU
 Credit: Styled after SORA/Lucky Star

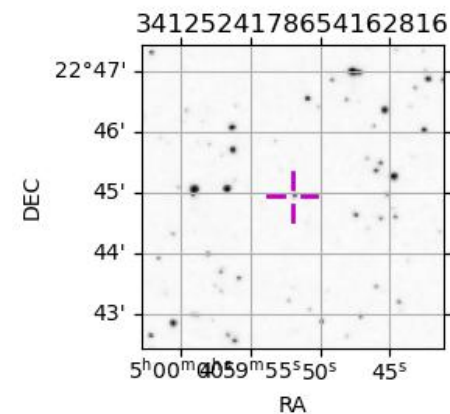
Uranus 2029-12-06T18:25:39 K14.74 G16.81 PgtRgt

Earth
 PIC
 PMO
 TEN
 KAV
 AAT
 SAAO
 MSO

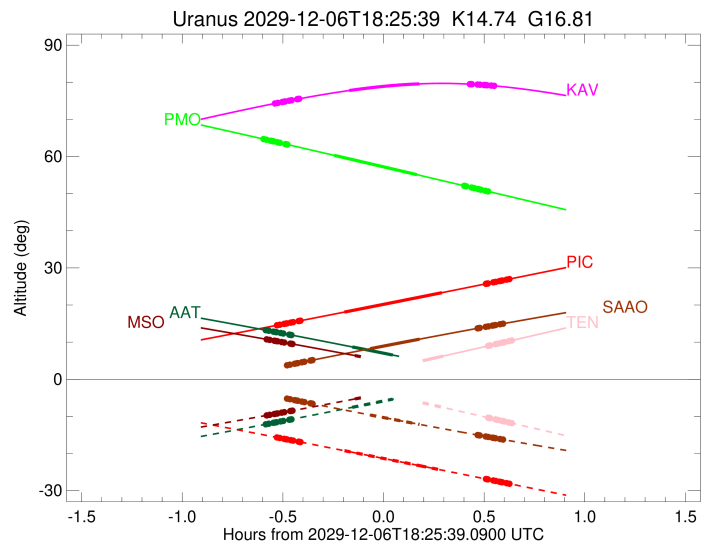
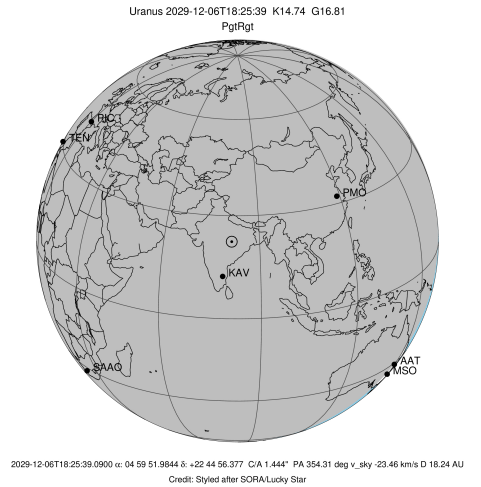


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	DEC 06 17:53 - DEC 06 19:02	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	DEC 06 17:49 - DEC 06 18:56	PieRie
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		+	+++++	DEC 06 18:43 - DEC 06 19:03	PneRne
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	DEC 06 17:53 - DEC 06 18:58	PieRie
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	+++++	+ +		DEC 06 17:50 - DEC 06 18:28	PieRin
SAAO	So. Afr. Astro. Obs.	-32.4	20.8		+++	+ +	DEC 06 18:03 - DEC 06 19:00	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+		DEC 06 17:50 - DEC 06 18:17	PinRin

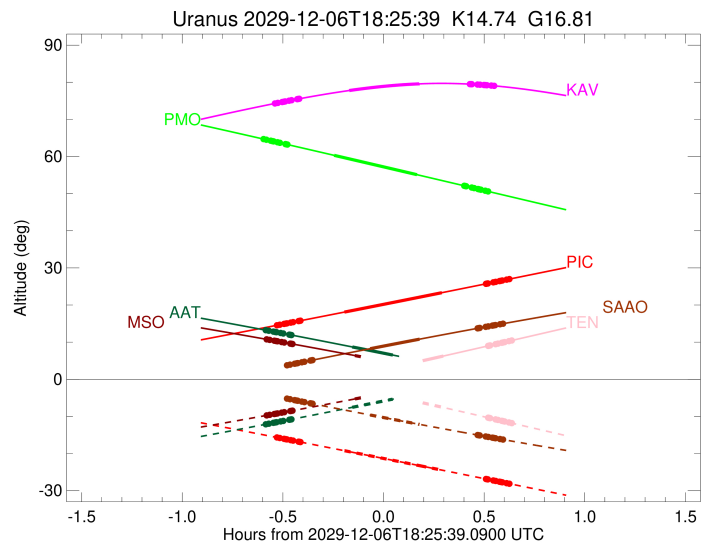
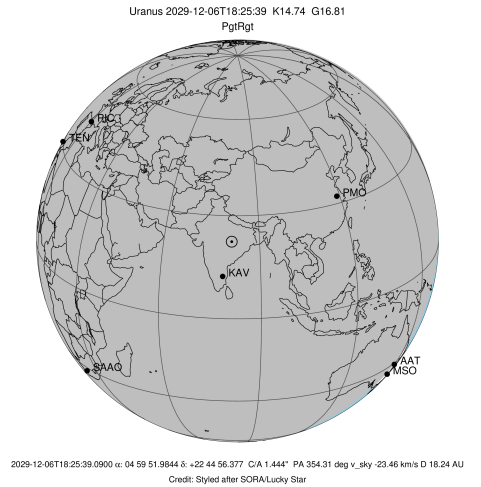


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-12-06T18:28:36.820
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3412524178654162816
 2Mass ID (if available) : 04595197+2244565
 ICRS Star Coord at Epoch: 04h 59m 51.98441s +22:44:56.37731s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.737
 G magnitude : 16.812
 RP magnitude : 16.135
 BP magnitude : 17.309
 DUPflag : 0
 Distance (au) : 18.240
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.46
 Sun-Target sep (deg) : 178.35
 Sun-Moon sep (deg) : 166.55
 B (ring opening deg) : 82.11
 PA of pole (deg) : -16.71
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.134
 C/A sky separation (km) : 15002.7
 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



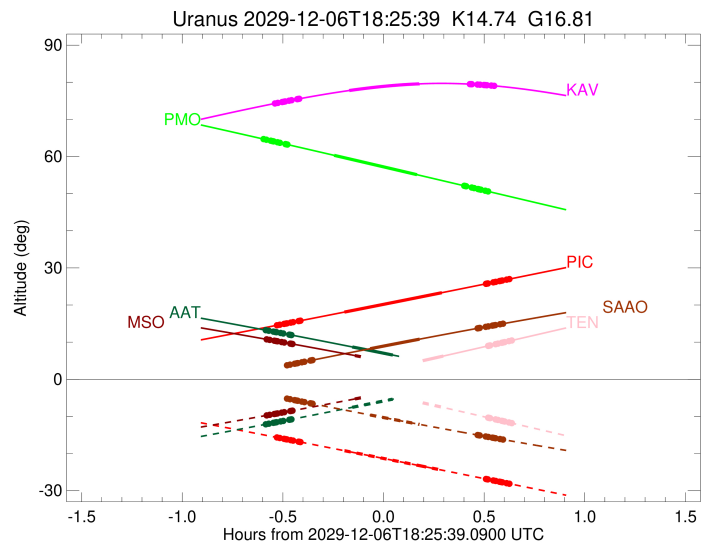
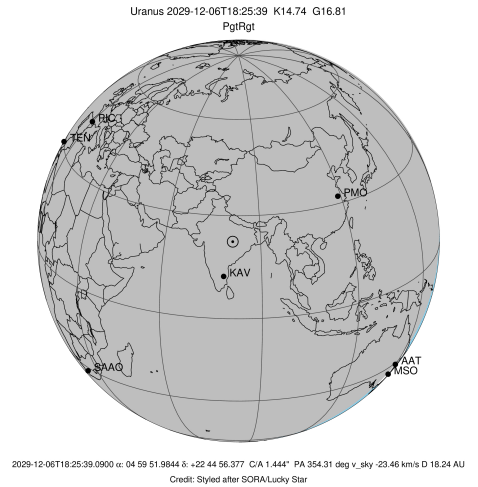
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-12-06T17:53:40.023		14.50	-15.64	51456.87	-22.37		
lambda	I	2029-12-06T17:54:43.944		14.69	-15.82	50026.71	-22.34		
delta	I	2029-12-06T17:56:01.348		14.92	-16.05	48300.35	-22.26		
gamma	I	2029-12-06T17:56:31.765		15.01	-16.14	47623.73	-22.23		
eta	I	2029-12-06T17:56:51.913		15.07	-16.20	47176.12	-22.20		
beta	I	2029-12-06T17:57:59.690		15.26	-16.40	45673.97	-22.12		
alpha	I	2029-12-06T17:58:44.329		15.40	-16.53	44687.95	-22.06		
4	I	2029-12-06T18:00:18.642		15.67	-16.81	42614.13	-21.92		
5	I	2029-12-06T18:00:32.238		15.71	-16.85	42315.25	-21.90		
6	I	2029-12-06T18:00:52.271		15.77	-16.91	41878.43	-21.86		
Uranus	I	2029-12-06T18:14:01.016		18.10	-19.24	25455.24		-3.30	-3.45
Uranus	E	2029-12-06T18:43:00.382		23.31	-24.47	25238.51		-5.84	-6.11
6	E	2029-12-06T18:56:10.166		25.71	-26.86	41799.73	21.94		
5	E	2029-12-06T18:56:27.233		25.76	-26.91	42175.19	21.97		
4	E	2029-12-06T18:56:44.266		25.81	-26.96	42548.86	22.00		
alpha	E	2029-12-06T18:58:23.226		26.11	-27.26	44732.74	22.14		
beta	E	2029-12-06T18:59:05.087		26.24	-27.39	45660.76	22.21		
eta	E	2029-12-06T19:00:13.206		26.44	-27.60	47176.12	22.29		
gamma	E	2029-12-06T19:00:33.604		26.51	-27.66	47631.10	22.32		
delta	E	2029-12-06T19:01:03.568		26.60	-27.75	48300.35	22.35		
lambda	E	2029-12-06T19:02:20.650		26.83	-27.99	50026.71	22.44		
epsilon	E	2029-12-06T19:02:52.671		26.93	-28.08	50745.73	22.46		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-12-06T18:23:23.300
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3412524178654162816
 2Mass ID (if available) : 04595197+2244565
 ICRS Star Coord at Epoch: 04h 59m 51.98441s +22:44:56.37731s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.737
 G magnitude : 16.812
 RP magnitude : 16.135
 BP magnitude : 17.309
 DUPflag : 0
 Distance (au) : 18.240
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.46
 Sun-Target sep (deg) : 178.35
 Sun-Moon sep (deg) : 165.53
 B (ring opening deg) : 82.11
 PA of pole (deg) : -16.71
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.368
 C/A sky separation (km) : 18091.4
 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



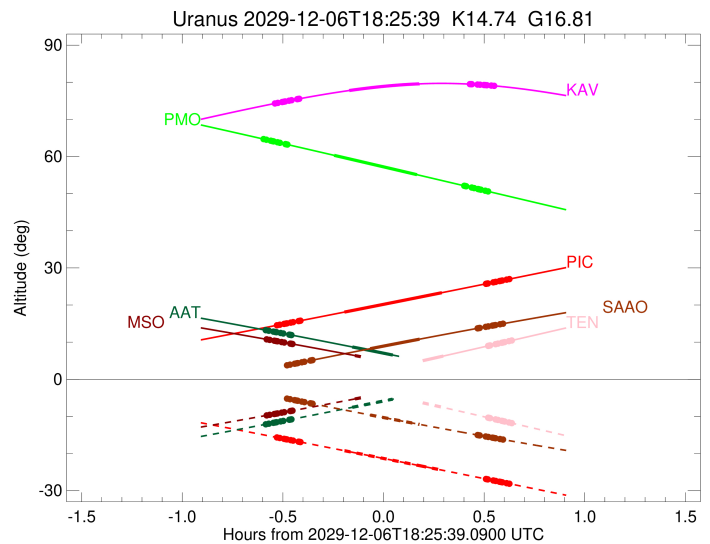
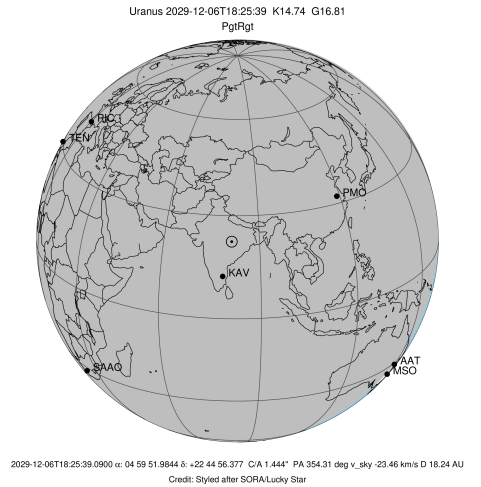
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-12-06T17:49:41.228		64.74	-63.16	51436.94	-22.21		
lambda	I	2029-12-06T17:50:44.709		64.53	-62.94	50026.71	-22.17		
delta	I	2029-12-06T17:52:02.803		64.26	-62.67	48300.35	-22.04		
gamma	I	2029-12-06T17:52:33.520		64.15	-62.57	47624.10	-21.99		
eta	I	2029-12-06T17:52:53.910		64.08	-62.50	47176.12	-21.95		
beta	I	2029-12-06T17:54:02.482		63.84	-62.26	45675.18	-21.82		
alpha	I	2029-12-06T17:54:47.875		63.69	-62.10	44686.84	-21.72		
4	I	2029-12-06T17:56:23.707		63.36	-61.77	42615.24	-21.51		
5	I	2029-12-06T17:56:37.603		63.31	-61.72	42314.93	-21.47		
6	I	2029-12-06T17:56:58.119		63.24	-61.65	41877.33	-21.42		
Uranus	I	2029-12-06T18:10:55.691		60.32	-58.74	25369.35		-4.47	-4.68
Uranus	E	2029-12-06T18:35:38.169		55.11	-53.53	25151.83		-6.60	-6.91
6	E	2029-12-06T18:49:41.152		52.13	-50.56	41801.29	21.37		
5	E	2029-12-06T18:49:58.795		52.07	-50.50	42179.19	21.43		
4	E	2029-12-06T18:50:16.193		52.00	-50.43	42551.72	21.46		
alpha	E	2029-12-06T18:51:57.210		51.65	-50.08	44730.66	21.68		
beta	E	2029-12-06T18:52:40.092		51.50	-49.93	45662.07	21.78		
eta	E	2029-12-06T18:53:49.440		51.25	-49.68	47176.12	21.90		
gamma	E	2029-12-06T18:54:10.203		51.18	-49.61	47631.22	21.94		
delta	E	2029-12-06T18:54:40.668		51.07	-49.50	48300.35	21.99		
lambda	E	2029-12-06T18:55:58.956		50.79	-49.22	50026.71	22.11		
epsilon	E	2029-12-06T18:56:31.359		50.68	-49.11	50743.99	22.16		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-12-06T18:29:17.900
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 3412524178654162816
 2Mass ID (if available) : 04595197+2244565
 ICRS Star Coord at Epoch: 04h 59m 51.98441s +22:44:56.37731s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.737
 G magnitude : 16.812
 RP magnitude : 16.135
 BP magnitude : 17.309
 DUPflag : 0
 Distance (au) : 18.240
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.46
 Sun-Target sep (deg) : 178.35
 Sun-Moon sep (deg) : 166.63
 B (ring opening deg) : 82.11
 PA of pole (deg) : -16.71
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.176
 C/A sky separation (km) : 15551.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl1.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



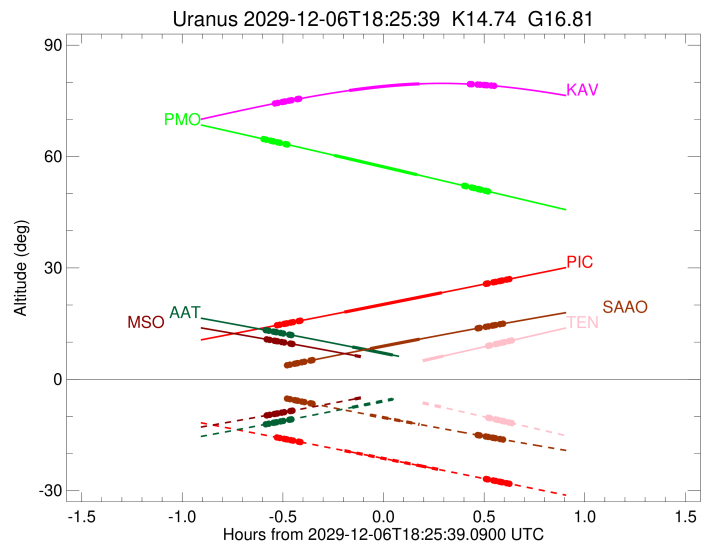
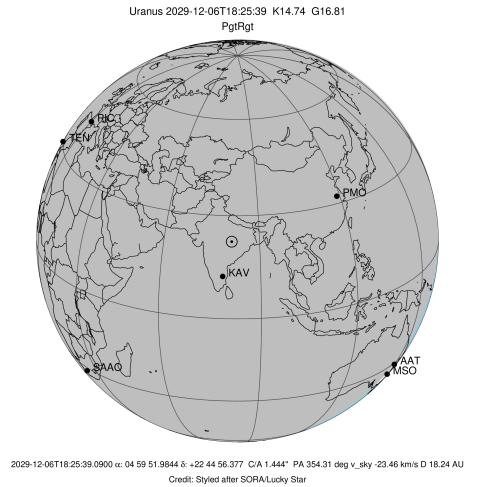
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-12-06T17:54:18.364	-3.57x	2.27x	51453.99	-22.18			
lambda	I	2029-12-06T17:55:22.712	-3.36x	2.06x	50026.71	-22.15			
delta	I	2029-12-06T17:56:40.810	-3.11x	1.81x	48300.35	-22.06			
gamma	I	2029-12-06T17:57:11.503	-3.01x	1.71x	47623.79	-22.03			
eta	I	2029-12-06T17:57:31.840	-2.94x	1.64x	47176.12	-22.00			
beta	I	2029-12-06T17:58:40.250	-2.72x	1.42x	45674.16	-21.91			
alpha	I	2029-12-06T17:59:25.342	-2.57x	1.27x	44687.77	-21.84			
4	I	2029-12-06T18:01:00.595	-2.26x	0.96x	42614.32	-21.69			
5	I	2029-12-06T18:01:14.337	-2.22x	0.91x	42315.24	-21.67			
6	I	2029-12-06T18:01:34.595	-2.15x	0.84x	41878.28	-21.63			
Uranus	I	2029-12-06T18:14:56.243	0.49x	-1.81x	25443.03	-3.49		-3.65	
Uranus	E	2029-12-06T18:43:26.690	6.24	-7.59	25222.29	-5.99		-6.27	
6	E	2029-12-06T18:56:49.173	8.99	-10.35	41800.03	21.72			
5	E	2029-12-06T18:57:06.436	9.05	-10.41	42175.99	21.76			
4	E	2029-12-06T18:57:23.623	9.11	-10.46	42549.44	21.79			
alpha	E	2029-12-06T18:59:03.471	9.45	-10.81	44732.31	21.94			
beta	E	2029-12-06T18:59:45.742	9.60	-10.96	45661.04	22.01			
eta	E	2029-12-06T19:00:54.444	9.83	-11.19	47176.12	22.10			
gamma	E	2029-12-06T19:01:15.016	9.90	-11.26	47631.13	22.13			
delta	E	2029-12-06T19:01:45.230	10.01	-11.37	48300.35	22.17			
lambda	E	2029-12-06T19:03:02.940	10.28	-11.64	50026.71	22.26			
epsilon	E	2029-12-06T19:03:35.194	10.39	-11.75	50745.24	22.29			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-12-06T18:26:01.300
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 3412524178654162816
 2Mass ID (if available) : 04595197+2244565
 ICRS Star Coord at Epoch: 04h 59m 51.98441s +22:44:56.37731s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.737
 G magnitude : 16.812
 RP magnitude : 16.135
 BP magnitude : 17.309
 DUPflag : 0
 Distance (au) : 18.240
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.46
 Sun-Target sep (deg) : 178.35
 Sun-Moon sep (deg) : 166.13
 B (ring opening deg) : 82.11
 PA of pole (deg) : -16.71
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.531
 C/A sky separation (km) : 20258.5
 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



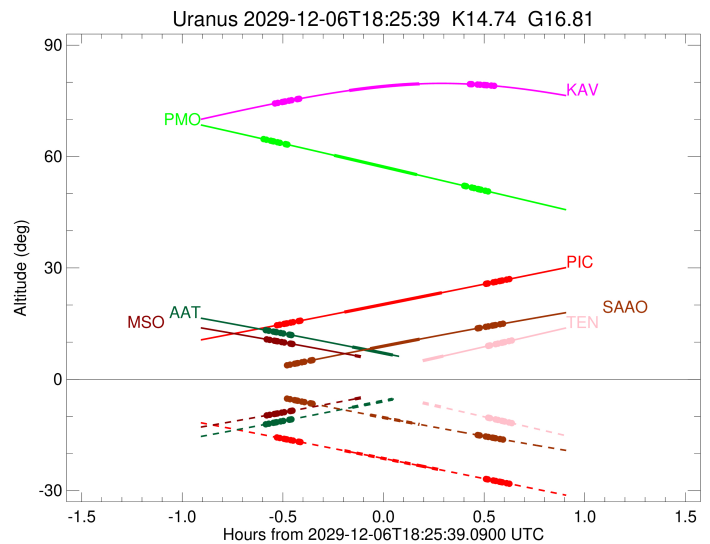
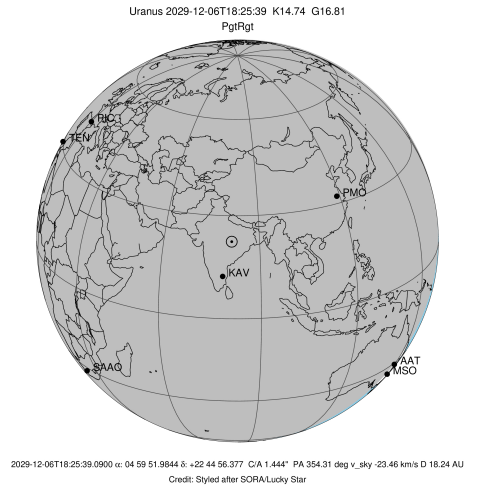
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-12-06T17:53:04.955		74.26	-75.66	51424.82	-21.87		
lambda	I	2029-12-06T17:54:08.901		74.45	-75.84	50026.71	-21.80		
delta	I	2029-12-06T17:55:28.361		74.69	-76.06	48300.35	-21.64		
gamma	I	2029-12-06T17:55:59.642		74.78	-76.14	47624.32	-21.58		
eta	I	2029-12-06T17:56:20.436		74.84	-76.20	47176.12	-21.53		
beta	I	2029-12-06T17:57:30.382		75.04	-76.39	45675.86	-21.37		
alpha	I	2029-12-06T17:58:16.839		75.18	-76.51	44686.28	-21.24		
4	I	2029-12-06T17:59:54.960		75.45	-76.77	42615.76	-20.96		
5	I	2029-12-06T18:00:09.251		75.49	-76.80	42314.43	-20.91		
6	I	2029-12-06T18:00:30.365		75.55	-76.86	41876.51	-20.84		
Uranus	I	2029-12-06T18:15:27.463		77.79	-78.80	25296.28		-5.28	-5.53
Uranus	E	2029-12-06T18:36:20.136		79.58	-79.91	25083.95		-7.15	-7.48
6	E	2029-12-06T18:51:22.188		79.51	-79.26	41802.80	20.85		
5	E	2029-12-06T18:51:40.393		79.50	-79.24	42182.92	20.92		
4	E	2029-12-06T18:51:58.137		79.48	-79.21	42554.31	20.97		
alpha	E	2029-12-06T18:53:41.139		79.39	-79.06	44728.77	21.25		
beta	E	2029-12-06T18:54:24.993		79.35	-78.99	45663.22	21.38		
eta	E	2029-12-06T18:55:35.508		79.27	-78.88	47176.12	21.54		
gamma	E	2029-12-06T18:55:56.616		79.25	-78.84	47631.32	21.59		
delta	E	2029-12-06T18:56:27.555		79.21	-78.79	48300.35	21.66		
lambda	E	2029-12-06T18:57:46.969		79.11	-78.65	50026.71	21.82		
epsilon	E	2029-12-06T18:58:19.777		79.07	-78.59	50743.51	21.88		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-12-06T18:22:30.380
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 3412524178654162816
 2Mass ID (if available) : 04595197+2244565
 ICRS Star Coord at Epoch: 04h 59m 51.98441s +22:44:56.37731s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.737
 G magnitude : 16.812
 RP magnitude : 16.135
 BP magnitude : 17.309
 DUPflag : 0
 Distance (au) : 18.240
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.46
 Sun-Target sep (deg) : 178.35
 Sun-Moon sep (deg) : 165.11
 B (ring opening deg) : 82.11
 PA of pole (deg) : -16.71
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.781
 C/A sky separation (km) : 23558.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ural11.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ural11.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



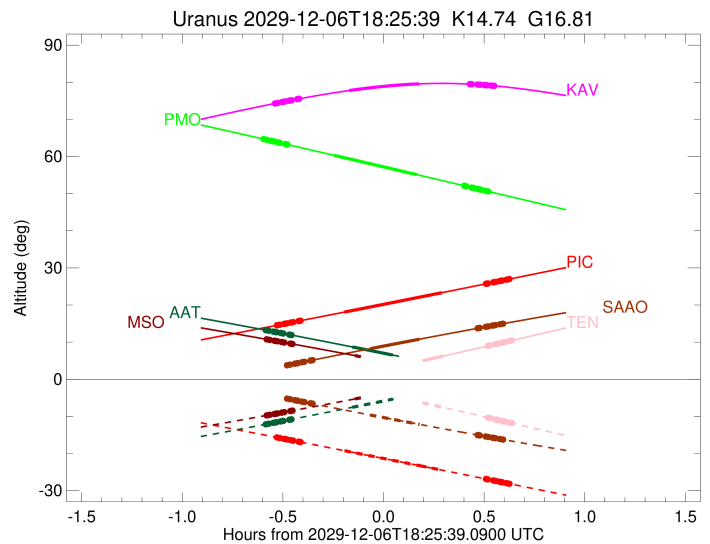
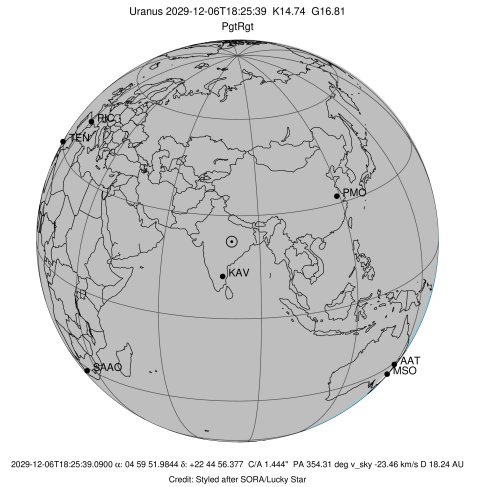
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-12-06T17:50:21.976		13.26	-12.16	51400.04	-20.93		
lambda	I	2029-12-06T17:51:27.637		13.07	-11.97	50026.71	-20.83		
delta	I	2029-12-06T17:52:50.942		12.83	-11.73	48300.35	-20.61		
gamma	I	2029-12-06T17:53:23.798		12.74	-11.63	47624.76	-20.51		
eta	I	2029-12-06T17:53:45.703		12.68	-11.57	47176.12	-20.45		
beta	I	2029-12-06T17:54:59.433		12.46	-11.36	45677.04	-20.22		
alpha	I	2029-12-06T17:55:48.710		12.32	-11.21	44685.44	-20.04		
4	I	2029-12-06T17:57:32.995		12.02	-10.91	42616.38	-19.64		
5	I	2029-12-06T17:57:48.324		11.98	-10.86	42312.88	-19.57		
6	I	2029-12-06T17:58:10.977		11.91	-10.80	41874.65	-19.47		
Uranus	I	2029-12-06T18:16:19.880		8.71	-7.56	25133.88		-6.75	-7.07
Uranus	E	2029-12-06T18:28:24.089		6.53	-5.35	24997.25		-7.80	-8.16
6	E	2029-12-06T18:46:41.501		3.14x	-1.94x	41805.09	19.41		
5	E	2029-12-06T18:47:01.241		3.08x	-1.87x	42188.31	19.51		
4	E	2029-12-06T18:47:20.148		3.02x	-1.81x	42557.91	19.58		
alpha	E	2029-12-06T18:49:09.805		2.67x	-1.47x	44726.20	19.97		
beta	E	2029-12-06T18:49:56.615		2.53x	-1.32x	45664.74	20.14		
eta	E	2029-12-06T18:51:11.240		2.29x	-1.08x	47176.12	20.37		
gamma	E	2029-12-06T18:51:33.553		2.22x	-1.01x	47631.43	20.44		
delta	E	2029-12-06T18:52:06.208		2.12x	-0.91x	48300.35	20.53		
lambda	E	2029-12-06T18:53:29.838		1.86x	-0.64x	50026.71	20.75		
epsilon	E	2029-12-06T18:54:04.355		1.75x	-0.53x	50744.44	20.84		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-12-06T18:29:10.870
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 3412524178654162816
 2Mass ID (if available) : 04595197+2244565
 ICRS Star Coord at Epoch: 04h 59m 51.98441s +22:44:56.37731s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.737
 G magnitude : 16.812
 RP magnitude : 16.135
 BP magnitude : 17.309
 DUPflag : 0
 Distance (au) : 18.240
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.46
 Sun-Target sep (deg) : 178.35
 Sun-Moon sep (deg) : 166.60
 B (ring opening deg) : 82.11
 PA of pole (deg) : -16.71
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.726
 C/A sky separation (km) : 22829.4
 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_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	2029-12-06T17:56:41.749		3.73x	-5.18	51408.79	-21.02		
lambda	I	2029-12-06T17:57:47.540		3.93x	-5.38	50026.71	-20.93		
delta	I	2029-12-06T17:59:10.413		4.19x	-5.63	48300.35	-20.73		
gamma	I	2029-12-06T17:59:43.083		4.29x	-5.72	47624.61	-20.64		
eta	I	2029-12-06T18:00:04.844		4.35x	-5.79	47176.12	-20.58		
beta	I	2029-12-06T18:01:18.078		4.57x	-6.01	45676.66	-20.37		
alpha	I	2029-12-06T18:02:06.933		4.72x	-6.16	44685.69	-20.21		
4	I	2029-12-06T18:03:50.274		5.04	-6.47	42616.23	-19.84		
5	I	2029-12-06T18:04:05.420		5.08	-6.51	42313.47	-19.78		
6	I	2029-12-06T18:04:27.808		5.15	-6.58	41875.29	-19.69		
Uranus	I	2029-12-06T18:21:41.046		8.24	-9.62	25181.65		-6.35	-6.65
Uranus	E	2029-12-06T18:36:23.109		10.80	-12.15	25011.19		-7.70	-8.06
6	E	2029-12-06T18:53:40.843		13.72	-15.02	41804.82	19.75		
5	E	2029-12-06T18:54:00.224		13.77	-15.07	42187.70	19.84		
4	E	2029-12-06T18:54:18.827		13.82	-15.12	42557.52	19.91		
alpha	E	2029-12-06T18:56:06.780		14.12	-15.41	44726.46	20.28		
beta	E	2029-12-06T18:56:52.875		14.25	-15.54	45664.60	20.44		
eta	E	2029-12-06T18:58:06.451		14.45	-15.73	47176.12	20.66		
gamma	E	2029-12-06T18:58:28.458		14.51	-15.79	47631.42	20.72		
delta	E	2029-12-06T18:59:00.675		14.60	-15.88	48300.35	20.81		
lambda	E	2029-12-06T19:00:23.222		14.82	-16.10	50026.71	21.02		
epsilon	E	2029-12-06T19:00:57.301		14.91	-16.19	50744.32	21.10		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2029-12-06T18:22:40.970
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MSO
 Location : Mt. Stromlo Observatory
 Latitude (deg) : -35.32000
 E. Longitude (deg) : 149.00833
 Altitude (km) : 0.770
 Gaia source ID : 3412524178654162816
 2Mass ID (if available) : 04595197+2244565
 ICRS Star Coord at Epoch: 04h 59m 51.98441s +22:44:56.37731s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.737
 G magnitude : 16.812
 RP magnitude : 16.135
 BP magnitude : 17.309
 DUPflag : 0
 Distance (au) : 18.240
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.46
 Sun-Target sep (deg) : 178.35
 Sun-Moon sep (deg) : 165.13
 B (ring opening deg) : 82.11
 PA of pole (deg) : -16.71
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.802
 C/A sky separation (km) : 23841.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ural11.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ural11.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	2029-12-06T17:50:38.206		10.78	-9.76	51398.08	-20.85		
lambda	I	2029-12-06T17:51:44.026		10.61	-9.58	50026.71	-20.75		
delta	I	2029-12-06T17:53:07.676		10.38	-9.35	48300.35	-20.52		
gamma	I	2029-12-06T17:53:40.675		10.29	-9.26	47624.79	-20.42		
eta	I	2029-12-06T17:54:02.680		10.23	-9.20	47176.12	-20.35		
beta	I	2029-12-06T17:55:16.755		10.03	-9.00	45677.13	-20.12		
alpha	I	2029-12-06T17:56:06.290		9.89	-8.86	44685.39	-19.93		
4	I	2029-12-06T17:57:51.152		9.61	-8.57	42616.41	-19.52		
5	I	2029-12-06T17:58:06.579		9.57	-8.53	42312.73	-19.45		
6	I	2029-12-06T17:58:29.376		9.50	-8.46	41874.49	-19.35		
Uranus	I	2029-12-06T18:17:06.581		6.39	-5.31	25116.40		-6.89	-7.22
Uranus	E	2029-12-06T18:27:58.299		4.52x	-3.42x	24991.81		-7.84	-8.20
6	E	2029-12-06T18:46:44.052		1.21x	-0.08x	41805.32	19.29		
5	E	2029-12-06T18:47:03.930		1.15x	-0.02x	42188.86	19.39		
4	E	2029-12-06T18:47:22.935		1.09x	0.04x	42558.27	19.47		
alpha	E	2029-12-06T18:49:13.153		0.76x	0.37x	44725.94	19.87		
beta	E	2029-12-06T18:50:00.213		0.62x	0.52x	45664.89	20.05		
eta	E	2029-12-06T18:51:15.173		0.40x	0.74x	47176.12	20.28		
gamma	E	2029-12-06T18:51:37.583		0.33x	0.81x	47631.44	20.35		
delta	E	2029-12-06T18:52:10.374		0.23x	0.91x	48300.35	20.45		
lambda	E	2029-12-06T18:53:34.334		-0.02x	1.16x	50026.71	20.67		
epsilon	E	2029-12-06T18:54:08.988		-0.13x	1.27x	50744.63	20.77		