Notes and News

From the President

A BAA survey of amateur astronomical societies

Several of you will have contributed, either directly or indirectly, to our recent online survey to find out how active amateur astronomical societies are in organising public outreach events and how many of our members are involved in these activities. About a quarter of the local societies in the UK responded and the results were impressive. The average number of public outreach events carried out by these societies over the past two years was about 27 per society. If we assume the societies which responded to the survey are representative of the rest, then about 40% of BAA members are also members of local societies and about a third of these have been actively involved in their society's outreach activities.

Of the societies which responded, 84% indicated that they were either positive about, or interested enough to want to know more about, having an association with the BAA in running future public outreach events. Clearly the door is open for us to work more closely with local astronomical societies in supporting and encouraging our members who are involved in these activities, and through them in helping their societies. To this end, at our December Council meeting we set up a small working group to look into how we can most effectively do this. In the meantime, if you have any thoughts on this, please get in touch with me and I will pass them on to the relevant people.

Passing on our enthusiasm for astronomy

From the statistics we've gathered in this survey, it seems that many of you have had similar experiences to my own recently in helping a teacher at a local school run a four week after-school masterclass in astronomy. The school has a science specialism and appreciated the potential of astronomy for getting students interested in science, but the teachers did not have sufficient grounding in the subject to give the students the intensive experience they felt was necessary. I was invited to go along and support the teacher who was running the class.

We used some of the educational resources available on the Faulkes Telescope website to take the students through the process of making composite colour images of various types of deep sky object from separate RGB images, constructing colour-magnitude diagrams of some open clusters from images taken with B and V filters, and measuring the fading lightcurve of a supernova using images obtained over a 3 month period. The underpinning theme of the class was the life cycle of stars, and at the end of the course the students each made up an A2 colour poster explaining in their own words their understanding of the topic, illustrating it with the images and graphs they had made themselves.

Hopefully these students have learnt something about astronomy and now have a feel for the sort of things scientists do in handling real data and using it to gain a better understanding of the universe. I certainly got a feeling of personal satisfaction from helping them achieve this. So if you get a call one day from a local school asking if you would like to help them, be bold and say yes. You won't regret it.

Bring in a new member and get a discount on your subscription

As an incentive to help increase our membership, we are introducing a subscription discount for existing BAA members who introduce a new member. This is how it will work. If you introduce a new member to the BAA, we will give you a discount of 10% on your next annual subscription. This is cumulative up to a maximum of 5 new members which would entitle you to a 50% discount. So ask around at your local society and see if you can persuade any keen fellow amateurs to join us. In return you will get a financial 'thank you' from us.

Astrofest is here again!

By the time you are reading this, the 2011 Astrofest Conference and Exhibition in Kensington will almost be upon us. This year the BAA is taking a bigger stand than usual so we will be better able to show off the work of our members and encourage new members to join us. We have a great tradition of encouraging and supporting amateur astronomy and we are keen to get this message over to the many amateur astronomers who regularly attend Astrofest and are not members of any astronomical organisation.

If you are attending the show, please drop by the BAA stand and introduce yourself. We will have a couple of exciting new publications on sale for the first time: a completely rewritten *Observing Guide* and a new *Introduction to DSLR Astrophotography* written by Council member Tony Morris, plus all our usual aids to observing. If you are not able to attend the show, these will also be available from BAA Sales online – follow the link labelled *Shop* on the BAA home page.

Lunar Section Director Bill Leatherbarrow *(right)* with David Boyd *(left)* and organiser Alan Dowdell at last year's Winchester weekend. *(Photo: Nicky Fleet).*

The BAA Winchester Weekend

It's also time to book for this year's Winchester Weekend if you haven't already done so. The dates this year are April 15–17. Our new venue at Sparsholt College is proving very popular and we again have an excellent programme of talks plus, this year, a meeting of the Lunar Section on Saturday afternoon. We have managed to hold the price at £160 for members and £180 for non-members again this year. For this you get a full weekend of talks, the company of other astronomy enthusiasts, comfortable en-suite accommodation and all your meals. The food is particularly noteworthy since the kitchens are accustomed to catering for hungry agricultural students!

Your next BAA President

Finally, I am delighted to be able to tell you that Council, at its December meeting, endorsed my nomination of Professor Bill Leatherbarrow as my successor as BAA President. Subject to your approval in the Council elections, Bill will take over from me at the AGM in October. Bill has been doing an excellent job leading the Lunar Section and has made a valuable contribution to our discussions in Council. I'm sure Bill will bring the same enthusiasm and organising ability to this new role while continuing to look after the Lunar Section.

As you read this 2011 will be well underway, but as I write it, midnight on 2010 December 31 is rapidly approaching: so I wish you all clear skies and good observing in 2011.

David Boyd, *President*

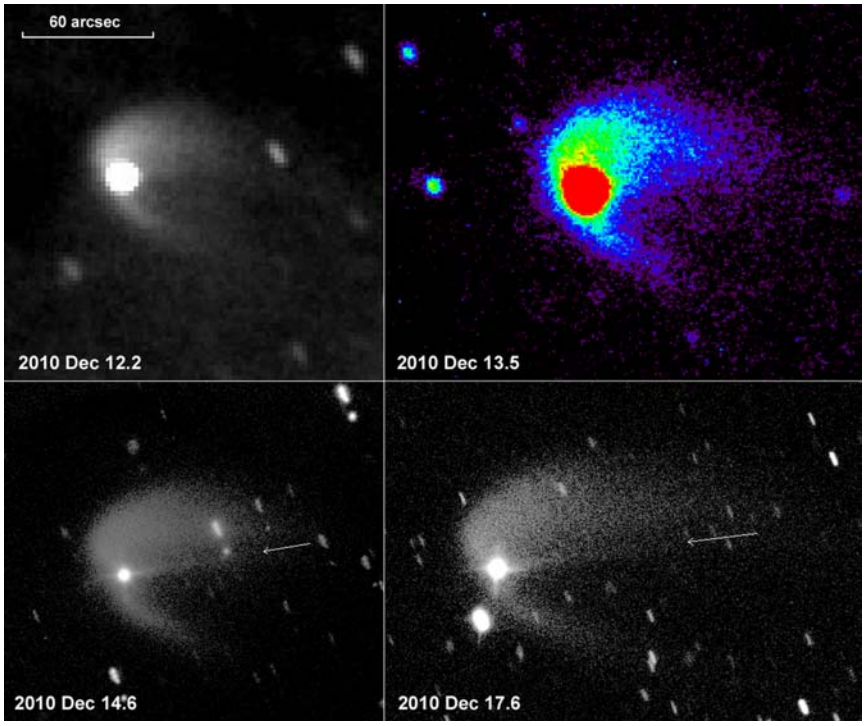
Asteroids & Remote Planets Section

A possible collision involving the large main-belt asteroid (596) Scheila

On 2010 December 11.5, Steve Larson of the Lunar and Planetary Laboratory, University of Arizona, observing with the 0.68m f/1.8 Schmidt telescope of the Catalina Sky Survey, found that the minor planet (596) Scheila appeared to be exhibiting comet-like behaviour. This unique phenomenon is thought to be the result of a high-speed collision between Scheila (diameter ~113km) and a much smaller object, possibly some 10–100 metres across, orbiting in the outer regions of the Main Belt. The discovery was reported in Central Bureau Electronic Telegram no.2583 issued by the IAU on December 12.

When asteroids were first discovered in the early 1800s, Schröter and Herschel initially reported that Ceres and Pallas were surrounded by a nebulosity which was subject to frequent changes, but their observations are now known to have been erroneous. Indeed precious little evidence for the existence of nebulosity or coma associated with minor planets can be found in the historical literature. In a 1931 article by N. T. Bobrovnikoff in the *Publications of the Astronomical Society of the Pacific* entitled 'The Origin of Asteroids', the question of nebulosities around asteroids is addressed. He reports that J. Comas Sola mentions in a 1928 publication that (224) Oceana and (182) Elsa were observed by him surrounded by a nebulosity, but follow-up observations with large apertures at Lick and Yerkes observatories failed to confirm these observations. Bobrovnikoff also reported that a well-known astronomer had told him that images on two plates showed asteroid (899) Jokaste with a halo of 3–5 arcseconds.

BAA member Peter Birtwhistle obtained images of (596) Schiela from Great Shefford Observatory between December 12.18–12.20 showing the presence of a large arc to the north and smaller arc to the south (see Figure). Eric Watkins also obtained follow-up images the next night using the remote telescope facility at Sierra Stars in N. America. His image is shown in false colour to bring out details in the coma. Finally higher resolution images were taken on December 14 and 17 using the Faulkes Telescope North in Hawaii and have been reproduced to the same scale. Analysis of the expansion of the coma and its fading indicates that dust and debris have been ejected from the asteroid at speeds of typically 50–70 km/s, with traces of material moving at up to three times this speed. Extrapolating the expansion backwards in time suggests that the original collision/outburst took place around 2010 December 1–3.



Minor planet (596) Schiela and associated coma, 2010 December.

Dec 12.2: 74×20s, unfiltered, 0.40m f/6 Schmidt–Cass, linear stretch. *P. Birtwhistle, Great Shefford Observatory.*

Dec 13.5: 10×60s, unfiltered, 0.61m f/10 Cass (Sierra Stars), linear stretch/false colour. *E. Watkins.*

Dec 14.6: 6×120s, Sloan-r' filter, 2.00m f/10 Ritchey–Chrétien (Faulkes Telescope North), log stretch. *Friesland School, Nottingham; Observatory Science Centre, Herstmonceux.*

Dec 17.6: 11×60s, Faulkes Telescope North (as above), log stretch. *Nick Howes.*

N.B. Arrows mark the direction of a linear 'tail' directed in p.a. 279°, roughly the anti-solar direction, similar to an ion tail of a comet.

It should be pointed out that minor planet Scheila is very unusual in that, based on its spectral reflectance characteristics, it belongs to a relatively rare class of asteroid, the T-type. This asteroid type is considered to be amongst the most primitive and to be akin to comets, having a very low albedo (Scheila= 0.038). Both T-type and the related D-type asteroids are very similar in their spectral reflectance to the porous carbonaceous Tagish Lake meteorite. These considerations do open up the possibility that some dormant comets are masquerading as 'ordinary' main belt asteroids located towards the outer edge of the Main Belt.

Looking at the high-resolution images it can be seen that there exists a rather weak straight tail emanating from Scheila in roughly the anti-solar direction. This tail may be similar to the ion tail of a comet, in that following a collision volatile materials may have been released into the vacuum of space. On the other hand no collision may have taken place and we are instead witnessing a spontaneous outburst from an otherwise dormant comet of very large dimensions. My view is that this is a collision-induced phenomenon, since statistically speaking collisions of this sort are expected to occur with a frequency of the order of 10–100 years, and that using modern technology we may very well detect other less conspicuous instances of collisions in the Main Belt.

'Ordinary' main-belt asteroids will never be quite the same again, and we should now consider initiating a Section monitoring programme of say the 1000 brightest asteroids to see whether other such events can be detected in years to come.

Richard Miles, *Director*

Saturn Section

A bright storm on Saturn: An interim report of the 2010/2011 apparition

Figure 1. 2010 Dec 08d, 02h12m UT. 280mm Schmidt– Cassegrain *(Sadegh Gomadazeh)*. The first amateur image of the new storm on Saturn, which appears on the central meridian (CM).

Up to the date of writing this note (2010 December 31), observations of Saturn for the 2010/2011 apparition have been received from Paul Abel, Tomio Akutsu, Trevor Barry, Stefan Buda, Jaume Castella, David Gray, Simon Kidd, Damian Peach, Jim Phillips, Andrew Robertson, Sadegh Gomadazeh, John Sussenbach, Anthony Wesley and the Director. The first observation of the apparition so far reported was made by Gray on 2010 October 25.

Undoubtedly the main event recently has been the appearance of a major bright storm in Saturn's North Tropical Zone (NTropZ). The first amateur observation was made on December 8 at 02:12 UT by Gomadazeh in Iran (Figure 1). The longitude of the spot was approximately 248° (System 3) with an approximate latitude of 37.5° (planetographic). A BAA e-bulletin was subsequently issued to alert observers.

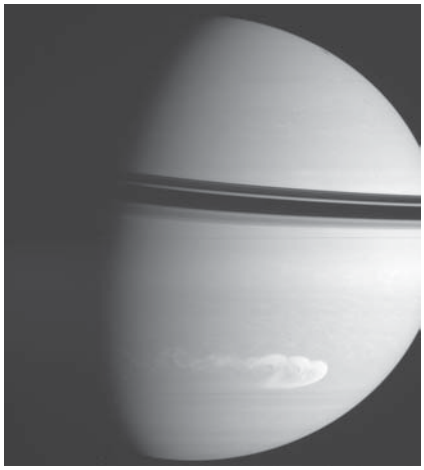


Figure 3. Image by the *Cassini* spacecraft, 2010 Dec 24. Raw image W00065999. *NASA/ESA/CiCLOPS imaging team.*

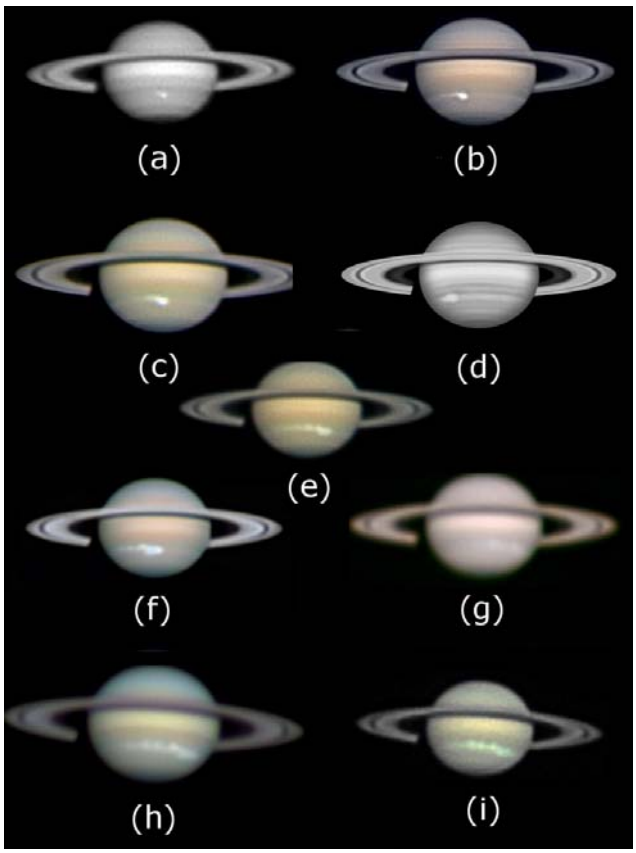


Figure 2. Amateur observations showing the evolution of the NTropZ storm in 2010 December. (All CCD images except where noted).
a) 2010 Dec 10d, 18h13m UT. 370mm Newtonian *(Wesley)*. Image in the infrared (>742nm) showing the appearance of a second bright spot in the NTropZ, p. the initial outbreak.
b) 2010 Dec 13d, 21h36m UT. 356mm Schmidt–Cass *(Akutsu)*.
c) 2010 Dec 14d, 18h32m UT. 370mm Newtonian *(Wesley)*.
d) 2010 Dec 19d, 06h05m UT. 415mm Dall–Kirkham Cass (*Drawing by Gray*).
e) 2010 Dec 22d, 18h10m UT. 406mm Newtonian *(Barry)*.
f) 2010 Dec 25d, Time to be confirmed. 200mm OG *(Phillips)*.
g) 2010 Dec 26d, 06h38m UT. 356mm Schmidt–Cass *(Kidd)*.
h) 2010 Dec 26d, 07h12m UT. 356mm Schmidt–Cass *(Peach)*.
i) 2010 Dec 30d, 07h13m UT. 280mm Schmidt–Cass *(Sussenbach)*.

The storm was observed by the *Cassini* spacecraft a few days earlier on Dec 5 when it appeared much smaller. By Dec 10 the storm had brightened and an additional spot appeared p. at a slightly lower latitude in the NTropZ. This zone then became disturbed p. with the appearance of additional white spots, and by the end of December the disturbance had extended in longitude by approximately a third of the way around the planet. Some darker spots have also been observed. Further, the storm at the original site had started to extend further north in latitude.

Figure 2 shows a selection of amateur observations of the storm during December. This and other figures have south upwards. Figure 3 shows the storm as seen by the *Cassini* spacecraft on December 24.

The storm has also been observed visually. On Dec 19, Gray observed the original spot and found it to be astonishingly bright (with an intensity greater than 0) even though he was observing through thin cloud with his 415mm Dall–Kirkham Cassegrain. He was also easily able to detect it with a 76mm refractor ×120. On Dec 26, Andrew Robertson could detect two patches of the disturbed NTropZ using a 203mm Maksutov Newtonian ×163.

At the time of writing this note, only a provisional analysis of the many observations received has been made. The original bright spot appears to have had a positive drift of two to three degrees per day with respect to system 3.

Interestingly, over recent apparitions, bright storms have been observed at a similar latitude in the southern hemisphere. The southern hemisphere storm observed during the spring of 2010 also expanded in longitude within the South Tropical Zone (STropZ).

Also on Dec 8, Gray observed a small light spot at a similar latitude but at a system 3 longitude of 29°, and at a similar position on Dec 12 but so far there have been no other observations of this feature.

The NTropZ storm is still developing and the Section welcomes further observations of this event

Mike Foulkes, *Director*

Solar Section

2010 September

Last month's increase in activity was maintained during September with the southern hemisphere out-performing the north. The relative sunspot number was the highest in Section records since 2006 April. Sunspots were recorded on most days throughout the month although most observers reported a blank disk on Sep 8, 9 & 10.

AR1101 N12°/083° remained on the disk from the previous month type Hsx. The group continued its progress towards the western limb still type Hsx and with an area of 130 millionths on Sep 3 being last seen on Sep 5.

AR1102 N28°/104° also remained on the disk from August type Cao on Sep 1 with an area of 80 millionths. By Sep 3 the group had decayed to a single Axx spot as it approached the western limb and was not seen thereafter.

AR1103 N26°/084° formed on the disk on Sep 2 type Bxo. The group was also reported on Sep 4 & 5 having decayed to type Axx by Sep 5 as it approached the western limb.

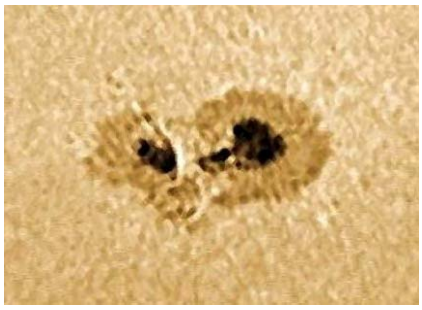
AR1104 N24°/075° made a very brief appearance on Sep 2 type Bxo.

AR1105 N19°/048° formed on the disk on Sep 3 type Cso. The group increased to type Dri the next day consisting of 13 spots but many of these had disappeared by Sep 5. The group was last seen on Sep 7 type Hsx near the western limb.

AR1106 S19°/209° rounded the eastern limb on Sep 11, a possible return of AR1100. The group was a single penumbral spot type Hsx. The group rapidly developed becoming type Fao on Sep 14 containing 14 spots. The group continued to widen in longitude until leader and follower drifted more than 10° apart becoming countable as two separate active areas. Magnetically the group remained one with NOAA referring to both elements as one active region. By Sep 19 the follower had declined to a single Axx spot leaving the leader dominant type Cso containing 3 spots. By Sep 21 only a single Axx spot remained as it approached the western limb.

AR1107 N33°/204° this single Axx spot made a brief appearance on the disk on Sep 12 only.

AR1108 S29°/143° appeared around the eastern limb on Sep 16 type Dao. This group also rapidly lengthened with a trailing spot that also became countable as a separate active region, although NOAA allocated only one number to the entire group. On Sep 21 the leader had an area of 290 millionths. The group approached the western limb on Sep 28 and was reported as visible with the protected naked eye on Sep 20, 22 and 23.



AR1108 on the disk on 2010 Sep 20. *Peter Paice.*

AR1109 N21°/066° was seen close to the eastern limb on Sep 22 type Dso. By Sep 24 the group had 13 spots type Eai and the next day was type Eac with an area of 310 millionths. The group was reported visible with the protected naked eye on Sep 30, type Dhi containing 13 spots.

AR1110 N20°/086° was first seen on Sep 26 type Bxi containing 3 small spots. The group developed a maximum of 7 spots on Sep 29 type Dso and reduced back to type Bxo containing 3 spots the following day.

AR1111 N23°/346° was seen on Sep 28 type Axx. The group remained on the disk until Sep 30 unchanged.

5 observers reported a Quality number Q = 5.24

H-alpha

Prominences

16 observers reported a prominence MDF of 3.75 for September.

The month started with a prominence on the NE limb associated with a long line of broken filament (filaprom). Also a prominence hearth including one large inclined pillar just north of the E limb point. Two tall pillars were also seen on the NNW limb.

A large irregular prominence was observed at the NW limb on Sep 15 together with a hedgerow at the SE limb and a small bright loop at the N limb.

At 09:15 UT on Sep 16 a substantial flame prominence was seen on the S limb. By 15:45 that day the prominence was still impressive but appeared thinner forming more of a column or spire. A towering tree shaped prominence at the N limb was also noted that day. By Sep 17 the spire on the S limb was still visible but shorter and fainter. The following day saw a further decline and a brighter pyramid shaped prominence appeared to the north of it.

On Sep 17 a large complex pyramid-shaped prominence group graced the N limb and a large hedge of activity was seen between the ENE and E limb, including a fine braided arch at the E limb.

A prominence on the NE limb reached a height of about 84,000km on Sep 20 and by the next day had grown to about 121,000km.

A large wispy prominence was seen on the NW limb on Sep 24 consisting of two components, a flame and a jet. The jet was

Aurora Section

A new Director for the Aurora Section

As from 2011 January 1, Dr Dave Gavine handed over the Aurora Section Directorship to Ken Kennedy, who has been Assistant Director for the last five years, with special responsibility for Noctilucent Clouds, currently the Section's most important work.

Ken Kennedy (left) with Dave Gavine at the 2009 Exhibition Meeting at Greenwich. *Photo by Melvyn Taylor.*

Ken is Director of Observations of Dundee Astronomical Society, helps to run the Mills Observatory and has been an expert observer and photographer of aurora and NLC since the 1960s. Dave and former Director Ron Livesey will continue as his assistants.

Dave Gavine

leaning westward towards the flame. A long hedgerow but quite diffuse was on the NE limb consisting of three components. The following day a fine loop was seen on the NW limb and a smaller flatter loop, but brighter was observed on the E limb.

Filaments & plage

11 observers reported a filament MDF of 2.96 for September.

On Sep 1 a string of filaments was seen near the E limb and another was on the disk east of the disk centre. Plage was present around AR1101.

Bright oval plage was seen around AR1105 on Sep 3 and a short dark filament was seen emerging to the SE from AR1101.

On Sep 5 bright plage was still around AR1105 and a long dark curving filament was seen near the E limb roughly aligned east/west. This filament was still present the following day about 5° in length.

On Sep 11 a former prominence came onto the SE limb as a filament. The following day this filament became much larger and was associated with AR1106.

A large dark smudge filament was seen near the NNW limb on Sep 14 and also a row of four filaments near the N limb. An area of bright plage was seen near the E limb and an extensive active region consisting of two long filaments, a dark spot and a large area of plage was seen near the S limb.

A long string of three filaments aligned east/west was seen in the northern hemisphere on Sep 16. The next day two dark filaments were near the NW limb and a further two filaments were two-thirds of the way from the disk centre to the S limb with an area of plage to the east.

Two dark filaments were seen in the southern hemisphere on Sep 20 and a broad line was seen at S30° aligned east/west on Sep 21 & 22. Two filaments were seen in association with AR1109 on Sep 24 and one in association with AR1108 plus another in the SW quadrant.

Two strong filaments were seen behind the leader of AR1109 on Sep 26, one was short and the other stretched between the leader and the main following spots. The month ended with a dark filament following AR1109 and another in the NE quadrant.

2010 October

Activity in October was similar to that reported in August and September with the northern hemisphere remaining dominant. Sunspots were recorded on most days with a blank disk reported between October 5–9.

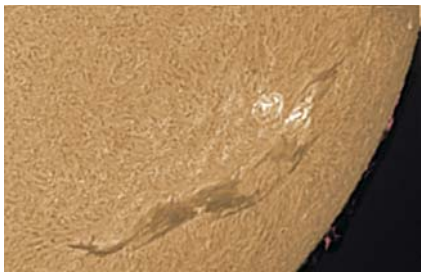
AR1109 N21°/066° remained on the disk from the previous month. On Oct 2 it was nearing the western limb type Dko with an area of 350 millionths. The group was last reported on Oct 4 type Hsx.

AR1110 N20°/086° also remained on the disk from September. The group was type Axx on Oct 1 & 2 and was not seen thereafter.

AR1111 N24°/341° also endured through to October type Axx on Oct 2 & 4 but was not seen the following day.

AR1112 S18°/202° was first reported on Oct 9 from Australia being first seen by European observers the next day. The group was classed as type Bxo containing 3 small spots close to the SE limb. By Oct 11 the group was type Hsx with an area of 50 millionths. It was of similar appearance on Oct 12 but had developed into a type Dac group by Oct 17 comprising several small penumbral spots with a total area of 110 millionths. By the following day it was type Esi comprising of 7 small spots. The group then declined and was last seen on Oct 20 as a single Axx spot on the western limb.

AR1113 N17°/141° appeared close to the NE limb on Oct 13 as a single Hsx spot with an area of 130 millionths. This group progressed across the solar surface remaining largely unchanged throughout its passage. The group was last reported approaching the western limb on Oct 25.



Filament nearing the W limb on Oct 18 at 15:10 UT, imaged by Sheri Lynn Karl.

AR1114 S22°/244° appeared on Oct 15 approaching the western limb. The group was a short lived Axx spot and was not seen again.

AR1115 S29°/125° emerged round the SE limb on Oct 15 as a single penumbral spot type Hsx. The group was 190 millionths in area on Oct 17 and progressed across the solar disk remaining largely unchanged. The group was last reported on Oct 25 approaching the western limb.

AR1116 N22°/178° appeared on the disk on Oct 17 but was short lived and was not seen the following day.

AR1117 N22°/060° rounded the NE limb on Oct 19 type Hsx. By Oct 23 this group had developed into type Cso with the appearance of a few small sunspots to the south-east of the penumbral spot. The development continued on Oct 24 with the appearance of more sunspots, now type Dao with an area of 120 millionths. By Oct 27 the group had crossed the CM, consisting of four main penumbral spots with a total area of 310 millionths and was visible with the protected naked eye. The group was seen on Oct 30 and 31 type Cho containing 4 spots approaching the western limb.

AR1118 N16°/076 made a brief appearance on Oct 19 type Axx.

AR1119 N22°/097° also made a brief appear-

BAA sunspot data, 2010 September–November

	September		*October*		*November*	
Day	*g*	*R*	*g*	*R*	*g*	*R*
1	2	30	2	26	1	19
2	3	43	2	25	1	13
3	3	40	2	23	1	13
4	3	44	1	13	1	17
5	2	36	0	6	1	15
6	1	23	0	0	2	28
7	11	14	0	0	2	29
8	0	0	0	1	2	28
9	0	0	0	3	2	29
10	0	3	1	13	3	36
11	1	10	1	12	2	38
12	1	14	1	12	2	36
13	1	19	2	19	3	50
14	1	20	2	31	4	55
15	2	23	3	40	3	46
16	2	38	3	40	3	43
17	3	43	4	48	3	46
18	3	41	3	45	3	41
19	3	35	4	49	3	39
20	2	31	4	40	3	31
21	2	28	3	34	2	25
22	2	31	3	35	1	15
23	2	32	3	40	1	14
24	2	33	3	48	1	12
25	2	34	4	57	2	18
26	2	39	3	52	1	13
27	3	45	1	30	1	12
28	2	40	1	23	1	25
29	3	40	2	26	1	19
30	2	37	2	25	1	18
31			2	25		
MDFg	1.96 (49)		1.98 (51)		1.89 (49)	
Mean R	28.82 (42)		27.13 (45)		27.42 (40)	

North & south MDF of active areas g

	MDFNg	*MDFSg*
September	0.97	1.05 (34)
October	1.14	0.78 (36)
November	1.20	0.81 (33)

g = active areas (AAs)
MDF = mean daily frequency
R = relative sunspot number
The no. of observers is given in brackets.

ance on Oct 24 type Bxo.

AR1120 N39°/283° was first seen on Oct 30 near to the eastern limb type Axx. By the following day the group consisted of 3 small spots type Bxo maintaining its high latitude position.

5 observers reported a Quality number Q= 4.95

H-alpha

Prominences

15 observers reported a prominence MDF of 3.49 for October.

The month started quietly. On Oct 10 several observers reported a combined prominence and filament close to the SE limb. A large tree-like prominence was seen at the SE limb on Oct 12 which showed intricate detail.

On Oct 15 a hedgerow prominence stretched across the NW limb for approximately 186,000km.

At NW65° an upright tall spike appeared on the limb on Oct 20 which developed into a large Eiffel Tower the next day and a double tower on Oct 24.

Also on Oct 20 at NW35° a small prominence was seen which developed into a huge haystack on Oct 22. A large active prominence was observed on Oct 27 on the SW limb reaching a height of approximately 186,000km.

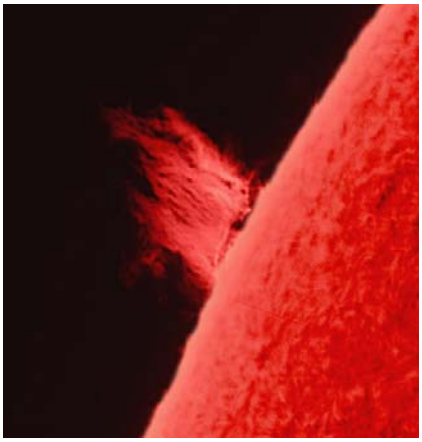
Filaments & plage

11 observers reported a filament MDF of 2.33 for October.

The filaprom reported on Oct 10 became a prominent feature during its passage across the solar disk, remaining to the south of AR1112. By Oct 17 the filament was estimated stretching across the solar disk for 233,000km.

A long zig-zag filament was seen from N15°/215° to N30°/205° from Oct 16 to 19 to the SE of AR1113.

Plage was seen near AR1112 on Oct 16 and also near the eastern limb on Oct 20. Plage was also seen on Oct 31 around both elements of AR1120.



Prominence on 2010 Nov 19 at 13:34 UT. *Dave Tyler*.

2010 November

Observers reported sunspots every day throughout the month with overall activity being very similar to that recorded in October.

AR1120 N40°/286° remained on the disk from the previous month, now type Dro. After Nov 2, the group gradually declined and dissolved on the disk on Nov 5.

AR1121 S18°/215° (possible return of AR1112) rounded the eastern limb on Nov 5 and was reported as a Bxo group the following day. The group rapidly grew to type Eai on Nov 7 containing a string of seven small spots. After a few days of activity the group rapidly declined again as it approached the CM and was last seen on Nov 10 as a cluster of small spots.

AR1122 N13°/263° appeared on the disk near the CM on Nov 7 type Bxo. The group was short lived and was last seen on Nov 8.

AR1123 S23°/193° appeared in the SE quadrant on Nov 10 type Csi consisting of 10 small spots. By Nov 13 the group was type Dri before it declined and was not seen on Nov 15.

AR1124 N14°/168° formed on the disk in the NE quadrant on Nov 10 type Bxo. The group developed to type Dso consisting of 7 small spots on Nov 13 and was type Eao with an area of 250 millionths by the following day. The group was type Dai consisting of 9 spots on Nov 15. The group remained largely unchanged as it neared the western limb rounding the limb on Nov 19.

AR1125 N19°/160° appeared on the disk in the NE quadrant on Nov 12 as a single Axx spot which had increased to 3 small spots by the following day type Cro. However this group was not seen thereafter.

AR1126 S30°/108° was also seen on Nov 12 very close to the SE limb. The group was a single Hsx spot the next day but was bipolar type Bxi consisting of 6 spots by Nov 15. The following day the group was type Cao with an area of 80 millionths. The group persisted until Nov 23 when it was approaching the western limb.

AR1127 N25°/056° rounded the NE limb on Nov 16 as a single Hsx spot. The spot had an area of 140 millionths by Nov 18. The group was seen again on Nov 24, 26 and 27 but had reduced in size and was now approaching the western limb.

AR1128 S16°/310° rounded the SE limb on Nov 25 type Axx but was only seen thereafter as H-alpha and CaK plage.

AR1129 S25°/042° developed on the disk on Nov 27 type Axx. The group was short lived and was not seen thereafter.

AR1130 N13°/330° developed on the disk near the CM on Nov 29 type Dao with an area of 120 millionths. The group was the sole centre of white light activity as the month ended.

5 observers reported a Quality number Q= 5.30

H-alpha

Prominences

11 observers reported a prominence MDF of 4.03 for November.

A prominence observed on the NE limb on Nov 2 grew to a height of 121,000km on Nov 7. The next day it had rotated onto the disk as a strong filament.

A large hearth of 3 diffuse fan prominences was seen on the SE limb behind AR1121 on Nov 7. A filaprom was observed close to the SE limb on Nov 10 and also a spike-shaped prominence at the E limb which may have been detached.

A substantial Eiffel tower type prominence was seen at NW60° on Nov 13 which possibly remained until Nov 16 when it was smaller and fainter. Also a flame prominence on the SE limb which had a hearth of 3 separate prominences to the south of it. This hearth consisted of 2 tall pillars leaning towards each other, the northernmost pillar had a stream of plasma arching northward onto a third smaller prominence. This hearth persisted as a large hedgerow through Nov 15, breaking up on the next day and as a single block on Nov 18.

A spectacular comet-shaped prominence was seen at the W limb on Nov 19 inclined at about 45°. Also on this day a prominence on the SW limb was ejected reaching a height of 168,000km.

Filaments & plage

8 observers reported a filament MDF of 2.33 for November.

A long dark filament was seen near the S limb on Nov 2. The prominence on the NE limb reported above on Nov 2 rotated onto the disk as a strong filament on Nov 8 and remained on the disk until Nov 12.

3 long filaments were seen in the western hemisphere on Nov 17, one in the north and the other two south. AR1121 was at the end of one of the southern filaments. Plage was seen around AR1121 on Nov 10 and 17.

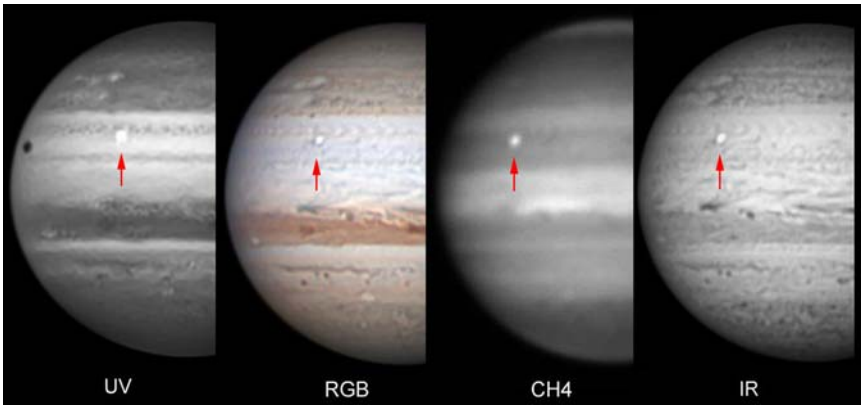
Plage was seen between the leader and follower spots of AR1024 on Nov 15 and also plage around AR1026.

Lyn Smith, *Director*

Jupiter Section

Brilliant storm-cloud initiates the revival of Jupiter's belt

Image of the SEB Revival on 2010 Dec 3 by Glenn Jolly (Arizona).



A set of Don Parker's multispectral images, 2010 Nov 9/10.

The spectacular revival of Jupiter's South Equatorial Belt (SEB), expected ever since it started fading in 2009, is now under way. It began on 2010 Nov 9, when Christopher Go, a well-known observer in the Philippines, noticed a tiny bright spot in the faded belt. He alerted observers worldwide, and on the next rotation Don Parker, in Florida, took images at multiple wavelengths which showed that the spot was then amazingly bright in all wavelengths, proving that it was an exceptionally vigorous cloud plume, propelled far above the normal cloud-tops. From this source, the outbreak has spread out east and west just like the great SEB Revivals recorded in BAA reports over the past century. But whereas they were observed visually only every couple of days, this is being captured every ten hours by modern imaging, often at high resolution, and is also being followed intently by professional astronomers.

The outbreak has already confirmed several hypotheses about these events. First, that they begin with a bright convective plume: the very dark features, more familiar to visual observers, then developed around it. Second, that the plume can arise in the centre of a cyclonic circulation called a barge: several such barges persisted since 2009, even though their normal dark brown colour had turned to white, and the outbreak appeared in one of these. (So did the initial white plume of the 2007 SEB Revival – which was also first discovered by Chris Go.) Third, that similar plumes arise successively from the same source: four have been observed up to early December.

By this time the outbreak had generated the typical prominent disturbances spreading out from it. These will continue to unfold over the coming months, until the SEB is restored as a broad dark belt.

John H. Rogers, *Director*

Campaign for Dark Skies

CfDS award for sugar processing plant

On 2010 October 27, Campaign for Dark Skies coordinator Bob Mizon and John Prockter, CfDS local officer for North Norfolk, met Ian Redhead and Julia Collings of the British Sugar Environment team at British Sugar's beet processing plant at Cantley, in rural Norfolk. Also present was local resident Beverley Turner.

Bob and John presented the company with a BAA CfDS Good Lighting Award. More than two hundred of these awards have now been given to organisations both large and small for good lighting practice, protecting the night sky and reducing light intrusion. British Sugar had responded to concerns about light spill into the surrounding area by installing new, mast-mounted lights severely restricting their emissions only onto the site, and Mrs Turner expressed her approval of the prompt way in which the company had taken action. 'We live about three-quarters of a mile away, and at last it's dark at night', she said. BAA members seeking to reward and publicise 'sky-friendly' lights should contact CfDS via their website **www.britastro.org/dark-skies**.

From left: Julia Collings, Bob Mizon, Ian Redhead, Beverley Turner and John Prockter at the presentation. *Photo: British Sugar.*

Bob Mizon, *Coordinator*

Observers needed for a new Orion Star Count

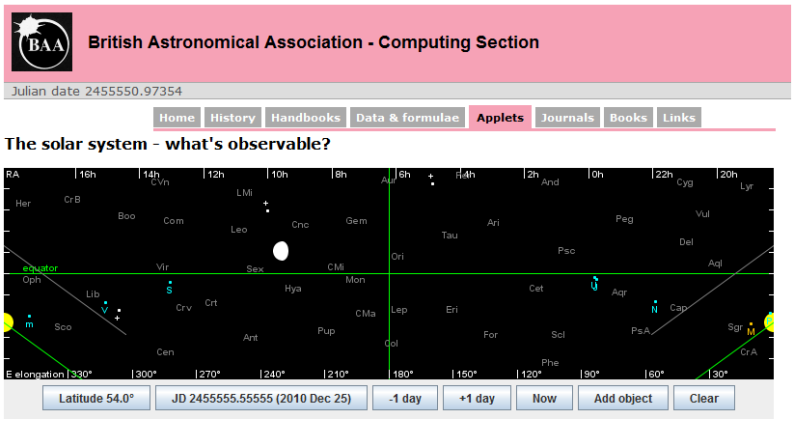
Between January 31 and February 6, all BAA members are invited to take part in a second Orion Star Count, organised by the Campaign for the Protection of Rural England (CPRE) and our own Campaign for Dark Skies (CfDS). This will help assess the problem of light pollution in the British Isles and provide evidence for the campaign against it. See page 50 for further details!

Computing Section

What's observable tonight?

by Graham Relf

Imagine that a clear sky is promised for tonight. How do you determine what to observe? You could grab a star atlas from your bookshelf but that will not help much with solar system objects. You could use the BAA *Handbook* to plot moving objects on relevant charts but this can be a lot of work. You might also need a planisphere made for your latitude to see where the objects lie in relation to the horizon at various times during the night. You may well have a planetarium-style application on your personal computer which will cover most of the above, but what if you want to obsereve minor planets for example? Can you see easily where all the brighter ones are? Maybe not without a lot of panning and zooming.

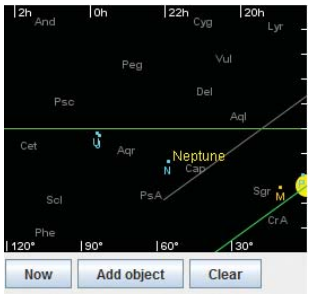


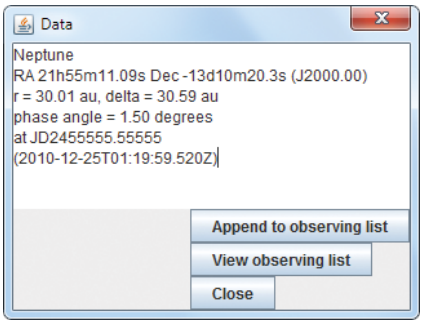
With this in mind, the BAA Computing Section's website at **http://britastro.org/computing** provides a simple graphical display for any date, which shows a large number of objects and enables you to assemble a detailed observing list quickly and easily. The sub-page is accessed from a link under the Applets (small applications) tab. On first entry the top part of the page will look like the above.

This plot shows a band 45° either side of the celestial equator. That is enough to include all objects within 20° of the ecliptic so nearly all objects in the solar system can be shown, except for some bodies with high orbital inclinations. As first displayed, the plot shows the Sun, Moon and major planets (labelled with their initial letters and light blue except for orange Mars, to distinguish him from Mercury). In the background we see an indication of the positions of constellations. Most importantly the position and phase of the Moon indicate whether it will interfere significantly with observability. In the example above, the fact that the Moon is well to the left of the central line (the full significance of which is explained below) means that the first part of the night will be nicely dark.

Getting details of an object

Moving a mouse over the plot highlights the name of the object nearest to the mouse cursor, as at right. Clicking the mouse when a name is highlighted like this brings up another window containing numerical data for the highlighted object (right).

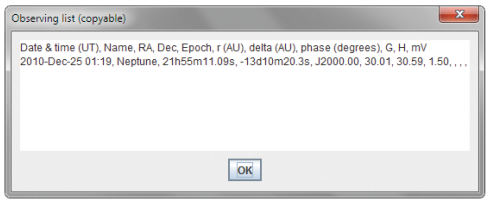




The initial plot only uses mean orbital elements for calculating planet positions but when a data window is opened a much more accurate (and lengthy) calculation is done for the planet using the VSOP87 theory, as described in Chapter 32 of *Astronomical Algorithms* by Jean Meeus (2nd edn). The Earth's position is always calculated using VSOP87, so the basis of the plot is accurate. Also the Moon's position and phase are calculated accurately using Chapront's theory (Meeus chapters 47 & 48). The data displayed are selectable and can be copied directly from this window, for pasting into any other application.

Making an observing list

The contents of the data window can also be added as a row in another table that the applet maintains: the observing list. After using the first two buttons in the data window above we can see Neptune as the first entry in the list:

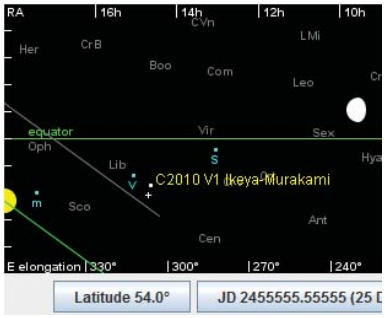


The observing list does not appear to be well laid out as a table, because it is in a special format, CSV (comma-separated values) which is suitable for pasting into spreadsheets where all will then appear nicely in headed columns. The contents of the observing list are designed to be selected and copied easily (in Windows use Ctrl-A to select all the text and Ctrl-C to copy it to the clipboard; in other operating systems there are equivalent key combinations).

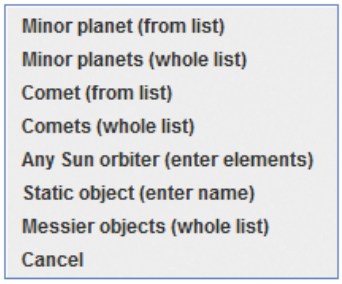
Text in the data window and observing list deliberately does not contain Greek letters or any other special characters, to maximise the likelihood that you can copy it and use it in whatever system you may be running.

Other objects in the plot

Sometimes there are also some small white dots on the plot labelled with crosses. These are recently discovered objects or ones of special interest at the current time, such as Near-Earth Objects (NEOs). Typically these will be observable only for a few days or weeks, after which they will be removed from the applet by the Computing Section.



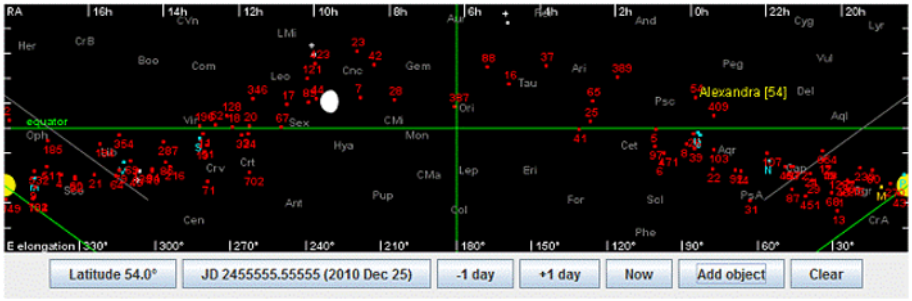
At right is an example, a comet discovered late in 2010. Data for

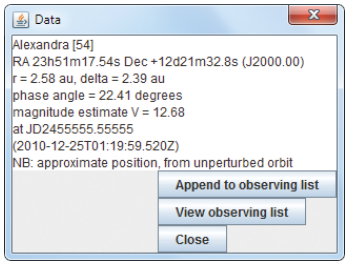


these kinds of objects may of course also be added to the observing list. Potentially there may be hundreds of other objects on display. The 'Add object' button, in the row of active buttons beneath the plot, presents a menu (above).

Currently there are more than 90 minor planets listed, about 30 periodic comets and more than 80 Messier objects that lie within 45° of the equator.

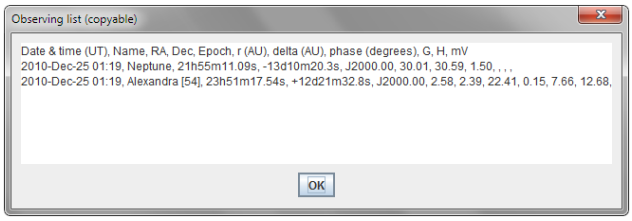
To find out which minor planets are likely to be observable on a particular night, select the second option from the 'Add object' menu, to get a display of all minor planets listed in the applet. (A similar action can be done for comets.) In the following example the mouse is causing the name of one minor planet to be highlighted. The rest are just red dots labelled by their IAU numbers:





From this we can see that Alexandra (minor planet no. 54) is well positioned for evening viewing on 2010 Dec 25, a little more than 10° north of Jupiter on the border between Pisces and Pegasus. Clicking the mouse gets the position more precisely (above).

Notice that for minor planets we get phase angle and a magnitude estimate too. Magnitude estimates are made using the standard G and H parameters as described by Roger Dymock (*J. Brit. Astron. Assoc.*, **117(6), 2007** p.342). All of that information goes into the entry if we append this object to our observing list:



	A	B	C	D	E	F	G	H	I	J	K
1	Date & time (UT)	Name	RA	Dec	Epoch	r (AU)	delta (AU)	phase (degrees)	G	H	mV
2	25/12/10 01:19	Aspasia [409]	23h23m35.55s	+05d11m37.6s	J2000.00	2.71	2.69	21.00	0.29	7.62	12.79
3	25/12/10 01:19	Alexandra [54]	23h51m17.54s	+12d21m32.8s	J2000.00	2.58	2.39	22.41	0.15	7.66	12.68
4	25/12/10 01:19	Proserpina [26]	23h55m30.60s	-02d20m12.5s	J2000.00	2.82	2.73	20.31	0.15	7.50	12.95
5	25/12/10 01:19	Flora [8]	00h05m50.03s	-06d28m59.1s	J2000.00	1.86	1.65	31.86	0.28	6.49	10.08
6	25/12/10 01:19	Laetitia [39]	23h53m27.82s	-08d27m54.9s	J2000.00	2.46	2.39	23.36	0.15	6.10	11.05
7	25/12/10 01:19	Jupiter	23h45m37.81s	-02d57m54.2s	J2000.00	4.95	4.98	11.34			
8	25/12/10 01:19	Uranus	23h48m57.01s	-02d00m15.9s	J2000.00	20.09	20.17	2.79			
9	25/12/10 01:19	Papagena [471]	00h42m16.30s	-10d08m32.0s	J2000.00	2.22	1.95	26.31	0.37	6.73	10.81
10	25/12/10 01:19	Hebe [6]	00h46m12.96s	-13d38m59.4s	J2000.00	1.95	1.65	30.24	0.24	5.71	9.42
11	25/12/10 01:19	Klotho [97]	00h57m48.37s	-07d24m11.3s	J2000.00	2.04	1.67	28.62	0.15	7.63	11.55
12	25/12/10 01:19	Astraea [5]	00h54m34.18s	-00d33m16.9s	J2000.00	2.62	2.28	21.76	0.15	6.85	11.78
13	25/12/10 01:19	Hera [103]	23h22m50.79s	-08d38m28.7s	J2000.00	2.54	2.61	21.99	0.15	7.66	12.82

It is easy to build up a list of all the minor planets that might be observable in a given evening. Above is a list of minor planets that are near Jupiter and Uranus on 2010 Dec 25, after copying and pasting into a spreadsheet.

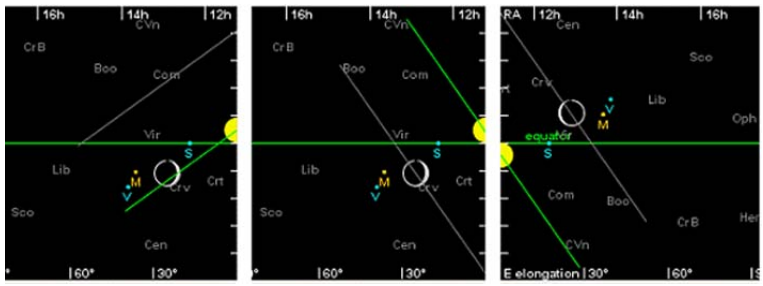
This list took less than five minutes to prepare.

More about the plot layout

The Sun's right ascension determines the origin of the plot because it is drawn so that the Sun is always at both ends. Therefore the right half of the plot shows what may be seen in the evening after sunset and the left half is the morning sky, before sunrise. The vertical green line in the middle is the meridian at midnight. So the Moon is full and the planets are at opposition when they cross that line.

The green lines through the Sun are the local (latitude-dependent) horizon at sunrise and sunset. The grey lines are 18° above the horizon lines and parallel to them, to give a very rough indication of objects that will only be seen in twilight because they are too close to the Sun. Astronomical twilight ends when the Sun is 18° below the horizon. Of course some days, even here in the UK, that never occurs. For latitudes near the poles the applet indicates 24-hour sunshine or darkness by detaching the horizon lines from the Sun.

The applet determines latitude from the system in which the browser is running, as the mean latitude of the user's country. A button displays the latitude in degrees and also enables any other value to be entered. That makes it quick and easy to see why sometimes certain objects are easily visible from some parts of the world but not from others. For example, on 2010 September 10 we had the above line-up.



The view on the left shows horizon and twilight zone for latitude 54°N (mid-UK), where there was no hope of observing any of the 4 objects. In the middle is the view from latitude 35°S, where at least 3 of the objects (Venus, Mars, Moon) should have been easily visible after sunset. The third view, on the right, is what the southern observer would expect, with west on the left when looking towards the equator. The applet offers either a northern or a southern view of the equatorial region and starts with the appropriate view for the user's latitude.

I want to observe variable stars

This is catered for too. The menu from the 'Add object' button contains the option to add a static object – one that is way outside the solar system (see right). All you need is a name. Suppose you want to know whether Omicron Ceti can be observed tonight. Click the button, select from the menu, enter at least the first 3 letters of each part of the name and the star should appear on the plot in dark blue.

So it is an evening star on the date in question. (Entering Mira as the name also works.)

Get animated

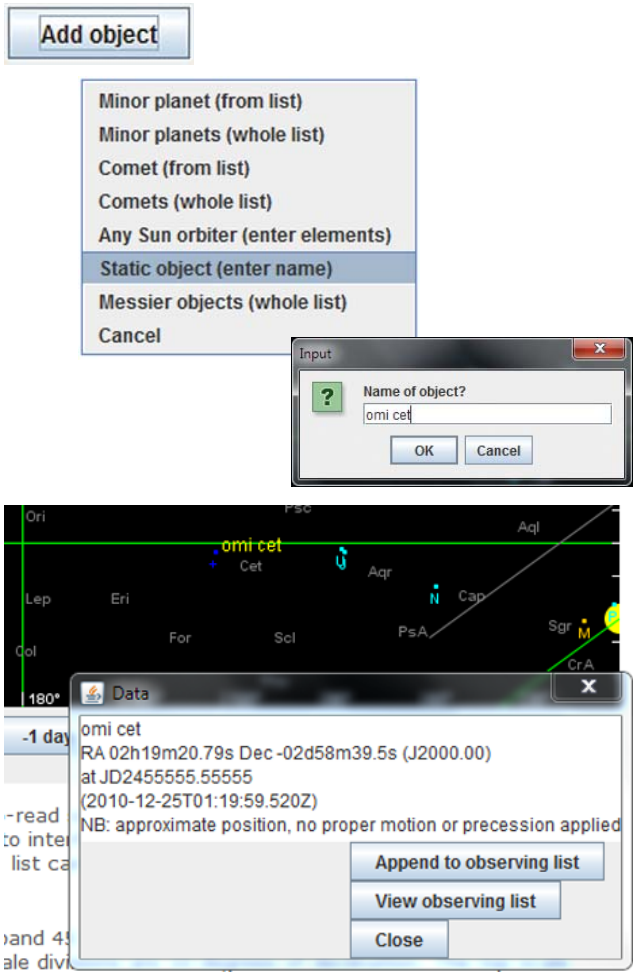
It is particularly educational to press the '+1 day' button repeatedly and see how the Sun and Moon march through the constellations along the ecliptic. On this plot though, the Sun is fixed so the constellations appear to flow across the midnight meridian and past the Sun. At the same time the direct and retrograde motions of all the planets may be seen. Note that, since the sizes of the Sun and Moon are exaggerated you should not read too much into overlaps with other objects.

Furthermore...

The great advantage to BAA members of having such code written by our own Computing Section is that it can easily be tailored and enhanced to suit our needs.

Which objects should be on the minor planet and comet lists? Would a list of variable stars be useful? Or other objects? What other data columns should be in the observing list or should it be formatted differently? What other functionality would make the applet even more useful? Let us know if there are any features that you would like to see added to the program.

Graham Relf *[graham.relf@fsmail.net]*



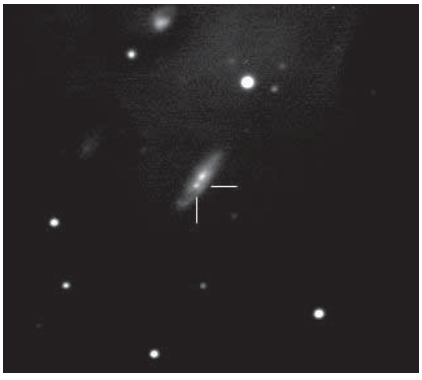
Deep Sky Section

Two more supernova discoveries for Tom Boles

Tom Boles has made two further supernova discoveries, bringing his total to 138 since his first discovery in 1997 October. On 2010 October 21 he found a mag 17 interloper in NGC 2929, a 1.2'×0.3' mag 13.8 Sc galaxy in the head of Leo. At RA 9h 37m 30.24s and Dec +23° 09' 33.3" (2000.0) the SN lay 5.9" east and 8.7" south of the galaxy centre. Determined as a type 1a the supernova has been designated 2010jn. Details were released on *CBET* 2541 and TA *Circular* E2687 from which some of this information is taken.

Just over 2 weeks later, on November 7, an even fainter SN (mag 18.1) was discovered in UGC 4294, a 1.1'×0.2' mag 15.7 Sbc galaxy in Ursa Major. With a position of RA 8h 16m 49.66s and Dec +60° 29' 46.1" the SN lay 2.6" east and 11.2" north of the galaxy centre. This SN has been determined as a type IIn. Details were released on *CBET* 2546/2548 and TA *Circular* E2688 from which some of this information is taken.

Stewart L. Moore, *Director*



Left: Discovery image for SN 2010jn in NGC 2929, 2010 October 21. *Above:* SN2010js, discovered on 2010 November 7. *Tom Boles.*