

## Meteor Section

### Project Perseid 2010

Always the summer's main attraction for meteor observers, this August's display of the Perseid meteors should be particularly favourable given that the peak occurs just a couple of days after New Moon, and consequently there will be absolutely no interference from moonlight. It is hoped that observers will make every effort to cover the shower well this year, and send in their observations to the Meteor Section.

Perseid activity may be evident as early as the third week of July, although there will be considerable interference from moonlight at the end of July since the Moon is Full on July 26. Activity takes a marked 'kick' around August 7/8, but by this time the Moon will be virtually New and watches may be carried out from this date right through until August 15/16 under dark, moonless skies. It is hoped that, weather permitting, observers will cover shower activity throughout this period, including nights away from the main peak.

The Perseids are expected to peak around 22h UT on August 12, making the hours from dusk on August 12 to dawn on August 13 probably the most productive for observers in the UK this year. Good observed rates may be expected in the early morning hours on August 11/12 and 12/13 as the shower radiant (RA 03h 04m Dec +58°) climbs high into the eastern sky. Perseid shower activity will be starting to decline by the time darkness falls on August 13.

All else being equal, the best observed rates are found when the Perseid radiant – near the 'Sword Handle' star cluster on the Perseus/Cassiopeia border at maximum – is highest in the sky during the pre-dawn hours. However, even in the early evening, the radiant is already at quite a favourable altitude as the table below shows:

Local time (53°N)	Radiant altitude	Local time	Radiant altitude
21h	28.1°	01h	52.8°
22h	32.8°	02h	59.3°
23h	38.4°	03h	67.1°
00h	44.7°		

Observers should bear in mind the nightly eastwards 'drift' of the Perseid radiant due to Earth's orbital motion. In early August, the radiant is 15° west of its position at maximum (given above), to the north of Andromeda.

#### The Perseids' parent comet

The Perseids are associated with Comet 109P/Swift-Tuttle, which was last at peri-

helion in 1992. Enhanced activity accompanied that return, and was evident for several years, up to at least 1997. The 2005 and 2007 returns of the shower proved fairly 'normal', with a single sharp peak to ZHR *ca.* 80 in 2005 (perhaps slightly lower – *ca.* 70 – in 2007), and the usual slow rise to and steep decline from maximum. In 2008, there was a notable sharp spike in activity rising to in excess of 100 m/h after the 'normal' maximum. As always, the 2010 return of the shower requires careful scrutiny on all possible clear nights (and not just at maximum!) The normal limits of the shower are from July 23 until August 20.

#### Photography

The Perseids are well known for the abundance of fast, bright meteors close to their maximum. Perseid meteoroids enter the atmosphere at a velocity of 60 km/sec, and the resulting meteors often leave behind persistent ionisation trains. The large numbers of bright events in the five-day interval centred on Perseid maximum makes this an excellent target for photography, considering the absence of interference from moonlight this year. Conventional film now remains the medium of choice for relatively few observers, with most having made the transition to digital SLR cameras.

With a static (undriven) digital camera, mounted on a sturdy tripod, and operated by a pre-programmed digital timer control unit, exposures should be kept short – about 30 seconds duration – with the speed set to ISO 1600 and a wide-angle lens set to maximum aperture. Remember that a super wide-angle 20mm focal length lens on a Canon DSLR, for example, has the coverage of only a 32mm lens on a full frame 35mm camera and 18mm becomes the equivalent of a 29mm lens on 35mm full frame. Such a setup,



A bright Perseid cuts across the corner of the Great Square of Pegasus shortly before dawn on 2009 August 12. (Peter Lawrence)

under good sky conditions, can capture meteors of magnitude 0 and brighter. Ideal aiming directions are about 20–30° to one side of the radiant at 50° altitude above the horizon – Cygnus in the early evening, the Square of Pegasus later in the night, or towards the north celestial pole, for best results.

#### Reporting

For further information, .copies of report forms, observing notes, and details of how to carry out group meteor watches, please visit the BAA Meteor Section website at <http://britastro.org/meteor> or contact the Acting Director of the Section at the address below.

Please submit your observations to the Section as soon as possible after you have made them, and at any rate within one month at the most. Observations should be sent to the Acting Director who will be pleased to answer any queries regarding further aspects of visual meteor work.

**John W. Mason, Acting Director**

51 Orchard Way, Barnham, West Sussex PO22 0HX.  
[docjohn@dircon.co.uk]



## From the President

### Bob Mizon awarded an MBE

Firstly, our warmest congratulations to Bob Mizon, coordinator of the BAA Campaign for Dark Skies, who has been awarded an MBE in the Queen's Birthday Honours List 'for voluntary service to Astronomy and to the Environment'.

Bob has been a tireless campaigner for protection of the night time environment and against the excesses of light pollution for many years and this recognition of his efforts is very well deserved. Well done Bob!



### The BAA Weblog and Twitter

As many of you may have noticed, the BAA now publishes a regular Weblog, or 'blog', providing information about current astronomical events and alerting people to interesting observing opportunities. We are doing this both to raise awareness of the BAA as an observing organisation and to promote astronomy among the general public. Within just its first week the blog has reported on another supernova discovery by Tom Boles, information on where to see the new Comet McNaught, discovery of a new Trans-Neptunian object, opportunities to observe noctilucent clouds, news of yet another asteroid impact on Jupiter, a spectacular image of the Sun and much more.

We have also started a BAA Twitter feed to provide high quality astronomical tweets (140-character text messages) within this hugely popular social networking environment. This is a powerful new way of reaching people who are not yet in the mainstream of amateur astronomy, but who might be tempted to participate in one of the coordinated observing events we are planning during the coming year.

Both of these new services are being run for us by Steve Owens, the new BAA Outreach Coordinator, as part of the Beyond IYA project which I mentioned last month. (See Steve's article about these new initiatives on the next page). You will find links to both these new services on the front page of the BAA website at <http://www.britastro.org/>.

### Spectroscopy for the amateur

Spectroscopy is one of the new frontiers in amateur astronomy. Now that high resolution spectrographs such as the LHIRES III (see <http://www.astrosurf.com/thizy/lhires3/index-en.html>) are available commercially, amateurs have access to equipment which will enable them to make scientifically useful spectroscopic observations of stars brighter than about 8th magnitude. The BAA is organising a weekend meeting at the Norman Lockyer Observatory near Sidmouth in September on the Formation and Evolution of Stars, which will feature talks from the leading amateur spectroscopists in the UK and France. Details of the meeting were circulated with the June *Journal* and there is a link for this meeting on the home page of the BAA website. If you are interested in finding out more about the potential for amateur spectroscopy, and in hearing talks from several excellent speakers, this will be a good opportunity.

Several BAA observing Sections issue newsletters or circulars which report recent observations and provide suggestions of what to observe and how to go about it. In many cases, these are available to download from the relevant Section's pages within the BAA website. Other Sections provide similar information online through their websites. I encourage you to investigate these, even if

### BAA Section Newsletters

you are not an active observer in that particular Section – you might well find something of interest and you never know, you might be persuaded to broaden your observing horizons!

### Explore the Moon with 'Moon Zoo'

This is the latest in a series of 'Zooniverse' projects following on from *Galaxy Zoo*. As they say on their website 'with your help, we hope to study the lunar surface in unprecedented detail'.

The project invites you to explore images from NASA's *Lunar Reconnaissance Orbiter* which show the lunar surface in remarkable detail, including features as small as 50cm across. At this resolution you should be able to see individual boulders on the lunar surface and, if you're lucky, the remains of previous missions to the Moon. The scientific aim of Moon Zoo is to provide detailed crater counts for as much of the Moon's surface as possible. Because the Moon has no weather, craters remain intact essentially for ever and provide a record of bombardment of the Moon's surface from the time of its creation. If this sounds interesting, visit the Moon Zoo website at <http://www.moonzoo.org/>.

### Time to renew your membership

August is the month for renewing your BAA membership. Please try to do this promptly as it saves the office having to send out reminder letters. I know these are difficult times for many of us but your continued membership of the BAA will help to keep alive your interest in astronomy and provide the stimulus to get out and observe. Observing the heavens on a clear dark night must be one of the best therapies for recovering from the stresses of everyday life and putting our presence here on the Earth into perspective.

Very best wishes and clear skies to all.

David Boyd, *President*

## New Honorary Members

Congratulations to the following, who have been members of the Association for a continuous period of fifty years at the start of the 2010–2011 session, and therefore now become Honorary Members:

	<i>Date elected</i>		<i>Date elected</i>
Mr J. Armitage	1959 Nov 25	Mr D. E. Shenton	1960 Jan 27
Dr E. L. G. Bowell	1960 Apr 27	Mr R. F. Smith	1960 Jun 29
Mr T. H. Fowler	1959 Nov 25	Mr P. J. Sneesby	1960 Jan 27
Mr G. Holt	1959 Nov 25	Mr J. W. Kent	1959 Nov 25
Mr E. J. Legg	1959 Nov 25	Mr D. Howitt	1959 Nov 25
Prof. E. Roemer	1959 Nov 25	Dr J. B. Tatum	1960 Jun 29
Mr R. J. Salisbury	1960 Jun 29	Mr J. E. Wilkinson	1959 Nov 25





## Beyond the International Year of Astronomy

The International Year of Astronomy (IYA2009) is over, and we are working to build upon its legacy. Many of the projects that ran during IYA2009 have come to an end, but the networks that developed and ran them – networks of amateur and professional astronomers, science communicators, educators – are still here, passionate about continuing to engage the public with astronomy.



'From Earth to the Universe', IYA2009 outdoor exhibition at Oxford University Parks (Ben Holloway).

One of my key duties as IYA2009 UK Coordinator was to support and develop these networks, and it is that support that would be most sorely missed had IYA2009 just petered out at the end of last year. Fortunately that hasn't happened, and the three main IYA2009 project partners – the Royal Astronomical Society, the Science and Technology Facilities Council, and the Institute of Physics – have been joined by two others – the Society for Popular Astronomy and the British Astronomical Association – in *Beyond IYA*.

Beyond IYA aims to consolidate and build upon the networks and projects developed during IYA2009. We'll be running more *Twitter Meteorwatches* (10,000 people took part in last year's Perseid Twitter Meteorwatch), another *Moonwatch* (20,000 people attended over 300 events during last year's Spring and Autumn Moonwatches), and offering continued support to the 1000 schools that were given a free telescope as part of the SPA's *Telescopes for Schools* project.

Within the Beyond IYA project I have taken on the new role of the BAA's Outreach Coordinator. As such I have access to an invaluable resource – you, the BAA members. Over the next few months, I'll be encouraging you all to let me know about any public observing events you might be involved in, as well as giving you information on how to get involved yourselves in the *Meteorwatches*, *Moonwatches* and other national events.

I'm also running the BAA's new weblog (<http://www.britastro.com/blog>) and Twitter account (<http://twitter.com/britastro>). I'm always looking for new content for the blog to complement the regular features, so

THE UNIVERSE  
YOURS TO DISCOVER



B E Y O N D  
INTERNATIONAL YEAR OF  
ASTRONOMY

if you have any images or articles you would like included then please let me know. I will also be building up a list of BAA members on Twitter, so let me know if you tweet, and I'll add your feed to the list.

You, as part of the amateur astronomy community, made IYA2009 what it was, and I hope that we can maintain that momentum and energy **Beyond IYA**.

### Steve Owens

Steve Owens is UK Coordinator of Beyond IYA, and Outreach Coordinator for the BAA. Contact him at [steve.owens@britastro.org](mailto:steve.owens@britastro.org)

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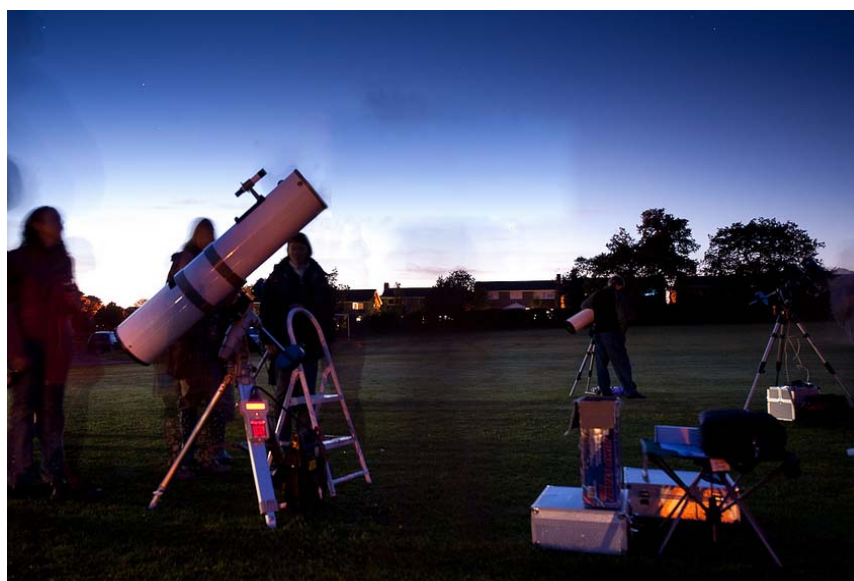
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Members of the public at an IYA2009 star party hosted by Macclesfield Astronomical Society (Andrew Greenwood).



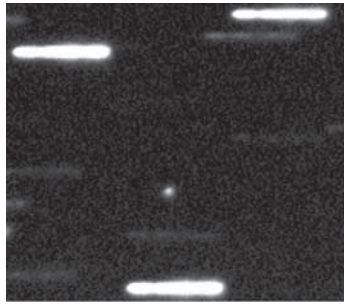
## Asteroids & Remote Planets Section

### Project NeilBone: a great success!

Last October, the ARPS initiated a new observing project to make photometric observations of asteroids which reach a phase angle of  $0.2^\circ$  or less at opposition. The stimulus for this followed the naming last year of asteroid (7102) in honour of Neil Bone, our former Meteor Section Director, who sadly died last year. It turned out that (7102) would reach opposition on January 18 this year at an unusually low phase angle – just  $0.03^\circ$ . This is so small an angle that if you were standing on the asteroid on this date, you would be able to see the Earth transiting across the face of the Sun! The probability that (7102) would attain such a low phase angle is about once in several hundred years. So our project was set up with a view to observing its namesake along with a selection of thirteen other asteroids, which also happened to pass through very low phase angle at their opposition during the period 2009 October–2010 March.

Thanks to the Faulkes Telescope (FT) Project, Darryl Sergison and I were able to use the 2.0m FT North in Hawaii and the 2.0m FT South in Australia to image (7102) at various times during November through March. Despite the fact that (7102) was extremely faint, just 17–18th magnitude, we obtained a series of excellent images including one taken live at the BAA Christmas Meeting on December 12 (see page 8 of the 2010 February *Journal*).

The most crucial time comprised the hours leading up to and following the moment of opposition on January 18.3 during which period it was essential to have clear skies. From the UK, the night of Jan 17/18 proved clear so I did my best to obtain images even though I had to use a V filter, which cuts out a large fraction of the light thus making the 17th magnitude target seem even fainter. Fortunately, during the two hours that images were taken the trajectory of (7102) avoided any stars or galaxies and so it was possible to obtain an uncontaminated image of the object and hence to measure its brightness – see Figure 1. Later the next day when it was daytime in the UK, it was also clear in Hawaii and so the FT North was used to obtain the all-important, high signal-to-noise images at the time of opposition – a great success – one of which Neil himself would



**Figure 1.** (7102) Neilbone imaged at a phase angle of  $0.1^\circ$ , nine hrs before opposition. Stack of 200x30sec exposures, 0.28m SCT+V filter. Mid-time of stack 2010 Jan 17, 23:59 UT. Mean V magnitude =  $17.48 \pm 0.025$ . (R. Miles, Golden Hill Observatory, Dorset.)

have been proud.

In all, some 39 observing runs were made using Faulkes, some involving only a single image, others a series of images, and covering in total some 29 nights. The magnitudes of the asteroid and nearby comparison stars selected from the Sloan Digital Sky Survey were analysed using the software *AstPhot32*, written by professional astronomer Stefano Motola. The composite lightcurve in Figure 2

was obtained by reducing the magnitudes to the standard distance of 1AU from the Earth and 1AU from the Sun, while also allowing for a change in brightness with phase angle. Once the magnitudes had been reduced to an absolute value in this way, it

was found that all of the data folded nicely onto a single curve having an unambiguous repeat period of 6.1781 hours. Thus we now know that (7102) Neilbone spins once on its axis every six hours or so.

To generate the composite lightcurve, it was necessary to apply a linear correction versus phase angle of 0.055 mag/deg. Furthermore, at phase angles of less than  $2^\circ$ , a small opposition effect correction was required for the data to properly fit on the rotational lightcurve (see Figure 3, depicting the extent to which the phase curve departs from the linear phase coefficient). The shape of this opposition effect has been defined with high accuracy and together with results on the other 13 asteroids in the programme, the results of Project NeilBone should substantially add to the body of knowledge in this area.

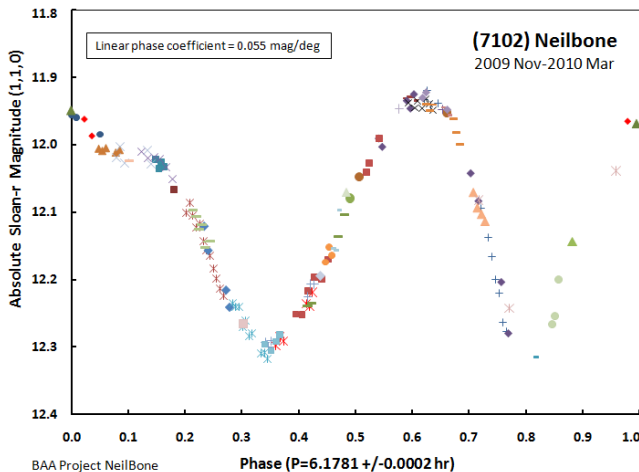
From our work, (7102) Neilbone appears to be a C-type object seemingly having a very low albedo. In April, the NASA *WISE* spacecraft made a dozen observations of (7102) using four infrared filters. These observations will furnish an accurate measure of its albedo, the value of which is an important parameter in modelling the light-scattering properties of any asteroid.

Recently, it was announced that the C-type asteroid (24) Themis has been found to



**The Faulkes Telescope South at Siding Spring, Australia, with the open dome of the Anglo-Australian Telescope in the background, illuminated by the light from the Moon on 2010 March 24. This remotely-operated telescope along with its partner, the Faulkes Telescope North, was used in support of the Project Neilbone programme. 30-sec exposure by Richard Miles with a Canon EOS 40D (10mm f/3.5, ISO 1600).**

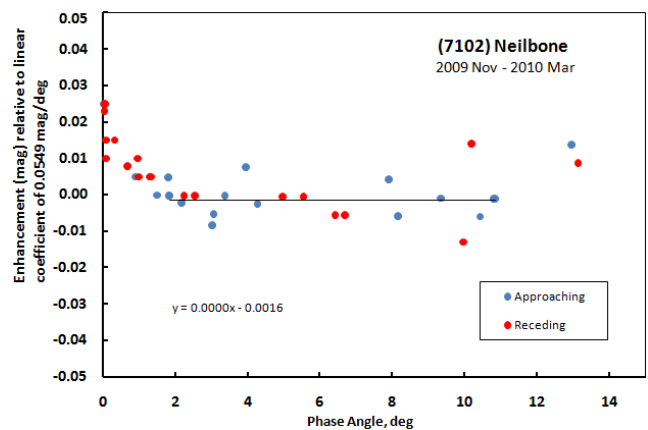




**Figure 2.** Composite lightcurve of (7102) Neilbone showing asymmetric maxima and minima, imaged with the Faulkes Telescope North.

harbour water ice on its surface (H. Campkins *et al.*, *Nature* **464**, 1320–1321, 2010 April 29). This finding is very important since it supports the distinct possibility that the Earth's current supply of water was delivered by asteroids some time after the collision that created the Moon. Accurate meas-

urement of the opposition effect for various C-type asteroids is a sensitive way of studying the reflection properties of their surfaces. (24) Themis unusually shows a rather large opposition effect, which may be a consequence of the presence of ices on its surface. Further studies of other C-types may reveal



**Figure 3.** Phase curve showing a very small 0.02 magnitude opposition effect at zero phase angle.

other examples of anomalous scattering characteristics. Thanks to our team of keen observers, Project NeilBone has already amassed a large amount of data on 14 asteroids, analysis of which will no doubt reveal some exciting new findings.

**Richard Miles**, Director  
[arps@britastro.org]

## Solar Section

### 2010 March

Activity decreased slightly in March mainly due to the northern hemisphere quietening down. However the southern hemisphere showed an increase in sunspot activity which kept the Relative Sunspot number at the higher rate of recent months. Again, a sunspot was recorded by a Section member every day of the month, although most observers reported the disk blank on March 6–10 inclusive.

**AR1051** N16°/323° remained on the disk from the previous month type Hsx. The group remained the same on March 2 but decayed to a single Axx spot the next day and had faded by Mar 5.

**AR1052** S18°/350° was present on the disk on Mar 1 type Bxo with a larger leader spot and several followers. The group developed to type Cso the next day but declined again on Mar 3 and was not seen on Mar 5.

**AR1053** S22°/359° appeared on the disk on Mar 2 south of AR1052 type Bxo. The group briefly developed to type Cso before fading and was not seen on Mar 5.

An unclassified single Axx spot was reported on Mar 7 N23°/238° but lasted for less than 24 hours and was not given a Boulder number.

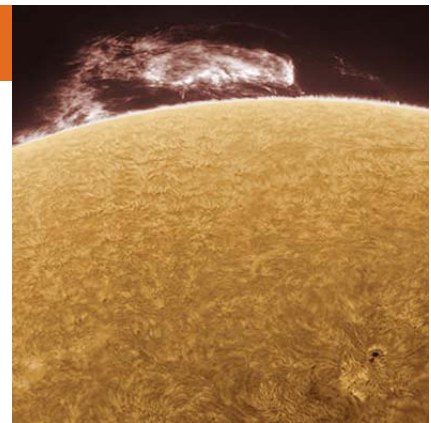
**AR1054** N15°/149° was reported visible on Mar 11 type Cso. This group rapidly developed and was type Dac with an area of 210 millionths by Mar 14 and on the following day displayed three separate umbrae within its penumbral region group type Eai, easily visible to the protected naked eye. The group then began a steady decay with the penumbral sunspot reducing in area and fewer spots visible within the group. The group was last seen on Mar 19 as a single Axx spot which rotated around the western limb.

**AR1055** S23°/206° made a brief appearance on the disk on Mar 11/12 type Cso.

**AR1056** N18°/064° appeared on Mar 17 type Bxo. The group remained small until Mar 21 when it developed to type Csi but then declined again and was not seen after Mar 23.

**AR1057** N16°/322°, a possible return of AR1051, was seen near the eastern limb on Mar 24 type Bxo. By Mar 27 the group had developed to type Dki and by the following day had an area of 400 millionths. The largest penumbral spot was the follower. The group was still present on the disk west of the CM at the end of the month type Cko.

**AR1058** N27°/012 appeared briefly as an Axx type spot on Mar 25/26.



**Prominence and AR1054 (bottom right of image) on 2010 March 17.** Alan Friedman.

**AR1059** S21°/265° rounded the eastern limb on Mar 27 type Hsx. This group remained on the disk unchanged until the end of the month.

7 observers reported a Quality Number Q = 3.18.

### H-alpha

#### Prominences

16 observers reported a prominence MDF of 2.81 for March.

On Mar 1 a hedge consisting of one double prominence and two single prominences was seen on the NE limb between 11:35 and 11:55 UT. Detached ejecta were seen extending between the double and the single prominences. Also an extensive hedge of 3 prominence



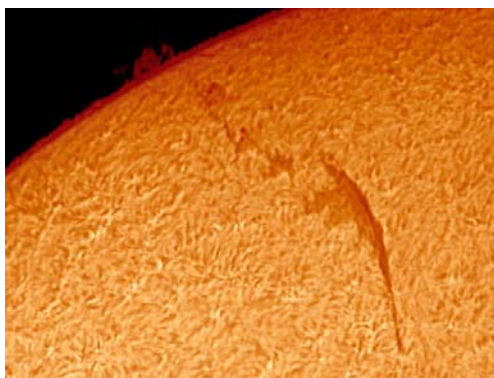
groups was seen just north of the W limb with matter connecting the 3 groups making a spectacular and complex single hearth. A bright double prominence just south of the SW limb was also present.

On Mar 3 an active prominence stretched across the NE limb for 214,000km.

Two flat 'table top' shaped prominences were seen on Mar 4 at NE40° together with small outbursts of activity alongside.

On Mar 11 a magnificent prominence group was seen on the ESE limb consisting of a tall pillar and adjacent complex arch. The tall pillar element was later estimated at a height of 102,000km.

A complex prominence hedge was seen on Mar 13 between 12:00 and 12:20 UT on the W limb spanning 10°+ in extent and appear-



**Filaprom on March 8 at 11:34 UT, imaged by Dave Tyler.**

ing very bright. An active prominence appeared on the NW limb on Mar 15 which grew very large and by Mar 19 reached an approximate height of 140,000km, arching from 40° to 60° around the limb. The prominence finally disappeared after Mar 22. A tall spike prominence

was also seen on Mar 19 at the SW limb.

On Mar 24 another active prominence on the SW limb stretched across the limb for 233,000km at 21:30 UT, observed from Australia. Earlier that same day a single large flat-topped prominence was observed at NW30°.

### Filaments & plage

12 observers reported a filament MDF of 2.48 for March.

March 1 produced a dark spot and plage in the SW quadrant and a dark filament near the S limb. Also a major area of bright plage was present halfway between the disk centre and the N limb with a spot between the plage and the N limb.

On Mar 5 an inverted 'V' filament was seen near the N limb protruding as a small prominence on the limb. This feature remained until Mar 8 with the filament being described as a 'striking dark filament' on Mar 7.

A dark filament extended over 20° in longitude on Mar 10 near the NE limb.

A long dark filament was also seen on the following day described as two-thirds of the way from the disk centre to the N limb, which could well be the same feature.

Also on Mar 11 was a chain of 4 'strange extensive dark patches' in the NW quadrant, three-quarters of the way from the disk centre to the limb. The largest was to the NW getting progressively smaller as the chain ran round to the north. Also a long looping dark filament was seen at the W limb with a group of small dark spots to the south. AR1055 was also seen as an area of bright plage just south of the disk centre.

### North & south MDF of active areas g

	MDFNg	MDFSg
March	0.88	0.41 (43)
April	0.45	0.23 (41)

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

AR1054 was seen on Mar 13 with an area of bright plage. Several dark filaments were also observed in the NW quadrant and a small dark spot, possibly a filament to the SSE of the disk centre.

Several small filaments were observed in the northern hemisphere on Mar 14 along with plage around AR1054.

Five filaments were seen on Mar 21 including one associated with AR1056 where a small region of plage could also be seen.

### CaK

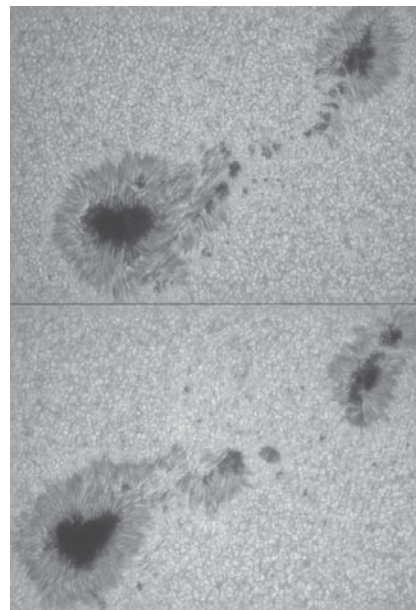
CaK patches were seen during the month, some with and some without spots, mainly in the northern hemisphere. The large 'comet' shaped patch reported in the last bulletin came around again, still extensive but not quite so strong and showed a small spot on March 7 only (the unclassified N23°/238° reported above).

### 2010 April

Sunspot activity continued to decline during April showing activity levels comparable with 2009 November. Activity was mainly confined to the first half of the month, most observers reporting a blank disk on April 11 and from April 14 to the end of the month. Several sporadic spots were reported during the month which did not receive official designation.

AR1057 N16°/320° survived from March but much reduced in size of 230 millionths type Hax. The group was last seen on Apr 4 approaching the western limb.

AR1059 S22°/265° also survived from the previous month but was now type Cai



**Active region AR1057 on March 27 and 28, imaged by Eric Roel.**

### BAA sunspot data, 2010 March–April

Day	March		April	
	g	R	g	R
1	2	20	2	25
2	3	31	2	26
3	2	29	2	25
4	2	31	2	28
5	1	12	2	29
6	0	1	2	29
7	1	7	2	25
8	0	3	1	17
9	0	0	1	11
10	0	3	1	6
11	2	29	0	3
12	1	27	1	13
13	1	27	1	6
14	1	28	0	0
15	1	24	0	0
16	1	20	0	0
17	2	22	0	0
18	2	20	0	0
19	1	14	0	0
20	1	15	0	0
21	1	20	0	2
22	1	14	0	2
23	1	13	0	0
24	1	14	0	0
25	1	16	0	2
26	1	18	0	0
27	2	28	0	0
28	2	30	0	3
29	2	30	0	0
30	2	30	0	6
31	2	26		

MDFg	1.29 (56)	0.68 (53)
Mean R	19.37 (47)	8.66 (46)





consisting of 3 small spots. The group eventually decayed to a single Axx spot and was last seen on the disk on Apr 5.

**AR1060** N24°/176° appeared on Apr 4 near the eastern limb as a single Hsx spot but was type Cso by the following day with an area of 50 millionths. The group decayed again to type Hsx and was last seen as a single Axx spot on Apr 8.

**AR1061** N13°/232° formed on the disk just past the central meridian on Apr 5 type Bxo. The group had formed into a small Dso type by the following day with an area of 90 millionths. The group decayed to type Cso on Apr 8 and was last seen the next day near the western limb type Hsx.

**AR1062** S18°/134° appeared on the disk near the CM type Bxo on Apr 12 and was seen the next day but not thereafter.

**AR1063** N16°/264° made a brief appearance on Apr 28 type Bxo.

**AR1064** N15°/223° appeared on Apr 30 type Bxo.

7 observers reported a Quality Number Q = 1.65

## H-alpha

### Prominences

15 observers reported a prominence MDF of 2.78 for April.

On Apr 1 an active prominence stretched across the NE limb for 251,000km and reached a height of 102,000km. Later that day the same feature was observed as 2 tall prominences with detached ejecta between. The prominence hearth was seen on Apr 2, 3 & 4 in various shapes, reaching a height of 112,000km on Apr 3.

A fine hook prominence was seen on the SW limb also on Apr 3.

On Apr 7, the NE limb was still active. A low arch prominence was seen on the SW limb on Apr 6 & 8. A bright detached prominence was seen on the E limb on Apr 8 and also a large curtain prominence graced the S limb accompanied by a fainter tall pillar.

Another long prominence stretched across the NW limb on Apr 12 for 345,000km and reached a height of 112,000km reported by Monty Leventhal at 22:35 UT from Australia. This was no doubt the start of the event widely reported on Apr 13 as an active prominence/CME occurring approximately between 08:00 and 11:00 UT. Ken Medway reported that this 'was without doubt the largest event that I have seen in 36 years of prominence observing.' (See images above).

A large curtain prominence was reported just east of the N limb point on Apr 17 accompanied by a group of 2 prominences on



The massive prominence/coronal mass ejection seen on April 13 on the northwest limb. Left: 08:22 UT by Andy Devey; right, 09:09 by Dave Tyler.

the ESE limb and a hedge of 4 prominences at the E limb.

The remainder of the month produced only small and unremarkable prominence activity.

### Filaments & plage

11 observers reported a filament MDF of 1.51 for April.

A long curving filament was seen below AR1059 curving south then east on Apr 2. Also a short filament was evident south of AR1057.

Plage was seen around AR1061 on Apr 5. Prominent plage was seen around AR1060 on Apr 8 in the middle of a line of five filaments stretching across the northern hemisphere. A large filamentary complex was also present to the SE.

A short (5° long) filament was seen N22°/136° aligned almost north/south on Apr 13. Also an area of filaments, spots and plage was noted near the W limb adjacent to the CME. A group of small dark filaments was observed just east of the N limb. Plage was seen around AR1062.

On Apr 17 a dark filament was seen at the N limb but did not appear as a filaprom. Also an area of bright plage was seen at the NNE limb. Three further filaments were observed near the WNW limb and a further dark filament in the NW quadrant. A dark filament was seen near the W limb with a further dark filament to the SE of it. An area of bright plage and filaments

was also present two-thirds of the way from the centre of the disk to the NW limb.

A cluster of filaments was seen near the W limb on Apr 18.

On Apr 30 a dark curling filament was seen to the west of AR1064 and another long dark straight filament was seen in the SE quadrant aligned north/south.

### CaK

Brian Mitchell reported that the large feature seen on two previous rotations returned, becoming more diffuse but larger in area on April 2. The mass consisted of two areas, one 20°/265° to 40°/245° and the other from 30°/240° to 40°/210°. The feature returned yet again on Apr 30 but was not so prominent.

Ken Medway reported a long sliver of plage near the eastern limb on Apr 4.

Lyn Smith, Director

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## Radio Astronomy Group

### More evidence of increasing solar activity

The lengthening days of summer and the increase in activity as Solar Cycle 24 gets under way have produced some welcome results for observers of Sudden Ionospheric Disturbances (SIDs). SIDs are caused by dramatic increases in solar radiation hitting the upper regions of the atmosphere, which change the way radio waves are reflected, and hence the strength of the received signal at ground level monitored by SID observers.

The past 18 months have tended to be characterised by the plots shown in Figure 1, with sunrise and sunset effects dominating a midday 'desert'. However two SID

events are instantly recognisable in the plot for May 5 (Figure 2). A C8.8 flare at 11:40 UTC resulted in strong increases in received signal levels from two Very Low Frequency (VLF) radio transmitters: St Assise in France (at a frequency of 20.9kHz), and Skelton in Cumbria (22.1kHz). There was an even more pronounced reduction in the signal received from Anthorn (19.6kHz), also in Cumbria. An M1.3 event at 17:15 produced even larger disturbances.

Not quite so obvious is the disturbance caused by a C2.3 event at 07:10, though closer inspection shows the telltale signs of

a fast initial change in signal level as ionisation levels in the 'D' Layer of the Earth's atmosphere quickly rise, followed by a much slower return to normal signal levels.

There are now more than a dozen SID observers providing data to John Cook who produces a monthly consolidated report for members. His report for the last 12 months can be found in the June edition of the *Journal*. Further information on SIDs and the equipment for observing them can be found on the RAG website, [www.britastro.org/radio](http://www.britastro.org/radio).

**Paul Hyde, Coordinator**

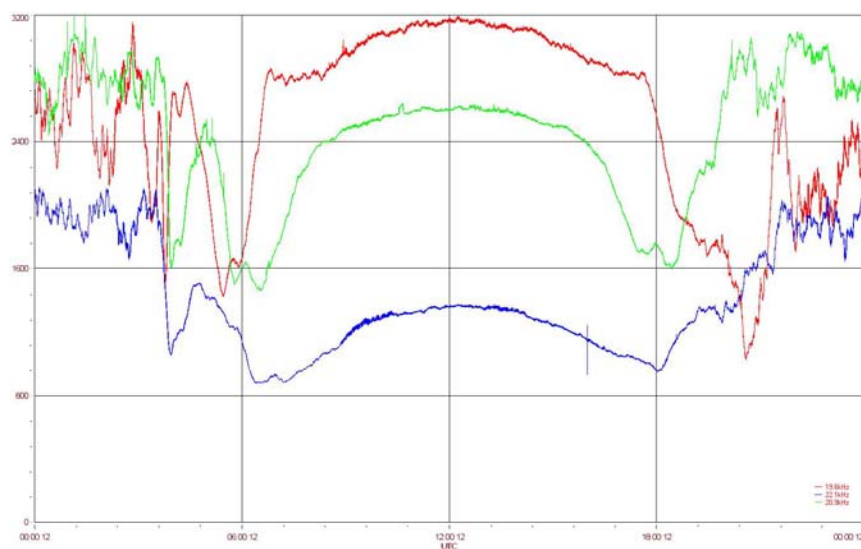


Figure 1. Received signal levels on 2010 May 1. Paul Hyde, Basingstoke, UK

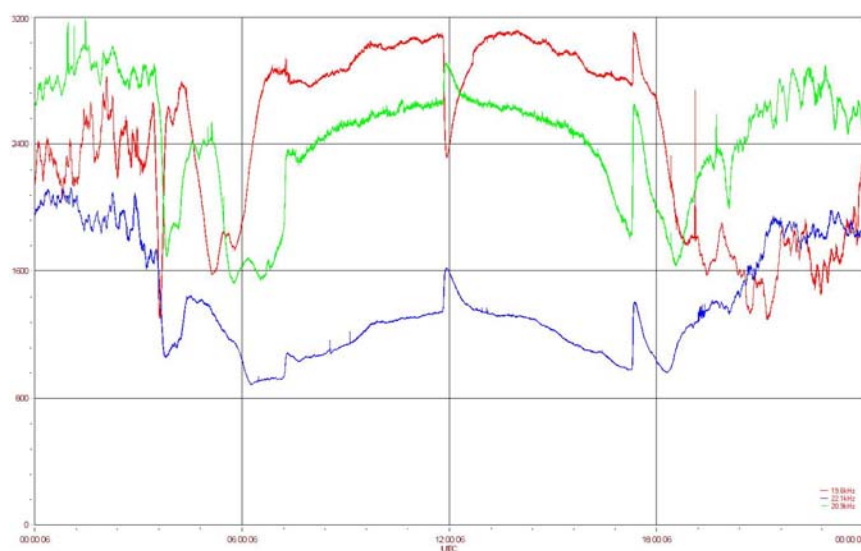


Figure 2. Received signal levels on 2010 May 5. Paul Hyde, Basingstoke, UK

## Deep Sky Section

### Supernova news



On 2010 June 3.086UT, Tom Boles made his 130th supernova discovery when he imaged a magnitude 18.5 'new star' in MCG +8-1-3, a mag 15.6 galaxy in Andromeda on the border with Cassiopeia. Located at RA 23h 52m 13.04s and Dec +47° 23' 42.5" (2000.0), the supernova lay 16.4" east and 1.1" south of the centre of the galaxy. The discovery was made using one of Tom's 35cm Schmidt-Cassegrain patrol telescopes from his observatory in Coddendam, Suffolk. It has been designated 2010dr. Details were announced on CBET 2304 and TA *Electronic Circular* E2649, from which some of this information is taken.

Tom's discovery image is shown above. At the time of writing the supernova type has not been determined.

**Stewart L. Moore, Director**

**Erratum:** In the June *Journal*, p. 129, the telescope used for Ron Arbour's discovery image of SN 2010au was wrongly described in the figure caption as a 40cm f/8 Newtonian. The correct specification is a 40cm f/5 Newtonian. The accompanying text. Apologies – Ed.