From your new President

When I first joined the BAA in March 1965 I little thought that more than 45 years later I would have the privilege of writing this, my first column as the new President of the Association. It is an honour and responsibility that I assume with trepidation and pride, as well as gratitude for the trust placed in me by Council and the membership. I shall do my very best over the next two years to live up to that trust.

My first task as President must be to extend the Association's thanks to the retiring Council members and to the outgoing President, David Boyd, for the immense amount of effort that they have devoted to the BAA. It is no sinecure serving as a member of Council: not only is there much work to be done, but in addition participation in Council's robust debates is not always for the faint of heart!

David's contribution during his presidential term has been outstanding. Not only has he spoken to the membership with imagination and enthusiasm via this regular column, but he has also made a point of attending a vast number of BAA meetings – all while continuing his activity as a variable star observer. In his role as chair he has brought authority, insight and sensitivity to the conduct of both Council and Ordinary meetings and has made the furthering of the Association's aims his consistent purpose as President. I have learned much from him, and am grateful for that, but he has set the bar high and will be a very hard act to follow.

As you will know, I have served as Lunar Section Director for some years, and this is a rôle I hope to continue during my term as President. Nevertheless, I should probably say a word or two in order to introduce myself to the broader membership. As a lunar and planetary observer, I come as an interruption to a long chain of BAA Presidents drawn from the 'dark side' of variable star, deep sky and asteroid observers! Having served my time as a visual observer, I am now making greater use of CCDs for high-resolution imaging of selected types of lunar formation and the brighter planets. I am thus in a position to appreciate that both visual and CCD work are of complementary value in amateur astronomy, and those who would seek to prioritise one over the other are missing the essential point.

I also enjoy observing the Sun in hydrogen-alpha light, and I regularly contribute my meagre results to the Solar Section. My specialisation in the brighter objects of the solar system was partly determined by the fact that my observing has always been done from relatively light-polluted urban sites. There is a lesson here for members new to the Association: you do not need pristine black skies in order to share fully in the observational activities of the BAA – the variety of our observing Sections means that there is something on offer for everyone.

By profession I am an academic, specialising in Russian Studies, although I am now retired from my post at the University of Sheffield – something that has allowed me the time to reinvigorate my astronomical interests. As a humanities scholar, I have had little in the way of formal scientific training, and there is I suppose another lesson here, this time for the beginner who may fear that the BAA is for the advanced amateur only: astronomy in general and the BAA in particular are not exclusively reserved for those with a scientific background! Members such as myself, who are amateurs in the fullest sense of the word, can still derive enormous pleasure and benefit from both.

My interest in astronomy goes back to a time when it was inconceivable that you could be an amateur astronomer in any meaningful sense in this country without also being a member of the BAA. I still wholeheartedly believe this to be the case and I continue to be amazed at the level of support that the Association offers me. However, things have changed, and they continue to do so. The amateur astronomy landscape, which the BAA once dominated unchallenged, has now become much more sophisticated and differentiated. Our Association now needs to identify a distinctive position and rôle

Lunar crater Copernicus imaged by Bill Leatherbarrow in 2009.

Aurora Section

The aurora is back!

It's good news for all those who have been missing auroral displays for the past four or five years. The late summer and autumn's solar activity has produced a number of displays, some of which have been seen from southern England. (See the front cover of this *Journal* for a selection of images.) Several strong M-class solar flares and a few X-class flares have produced aurorae which have been rather more active than the quiet arcs seen towards the end of 2010.

It is interesting to keep an eye on the websites **www.spaceweather.com** and **www.solarham.com** to find out about solar flare and CME activity, and these websites usually give an indication if the flare is likely to make contact with Earth. Following such a flare and warning, keep watching the three-hourly Kp level and when it rises, with a bit of luck, there may be some auroral activity.

for itself in an environment that includes competition from other national societies, from a proliferation of local societies, from the internet and internet forums, from star parties, and from popular astronomy magazines.

This variety is of great benefit to the amateur community and is to be welcomed, but it also brings considerable challenges to the BAA and to its President and officers. We need to be able to show that our Association can offer something that those other organisations cannot, and that membership brings benefits to all kinds of amateur astronomers, from beginners to advanced observers. As David Boyd mentioned in his final 'From the President' column in the 2011 October *Journal*, Council has set up a working group under the leadership of Tom Boles to look at our future direction and how we respond to these challenges. The report of that group is eagerly awaited, and I suspect that it will largely set the agenda for the Association for some time to come.

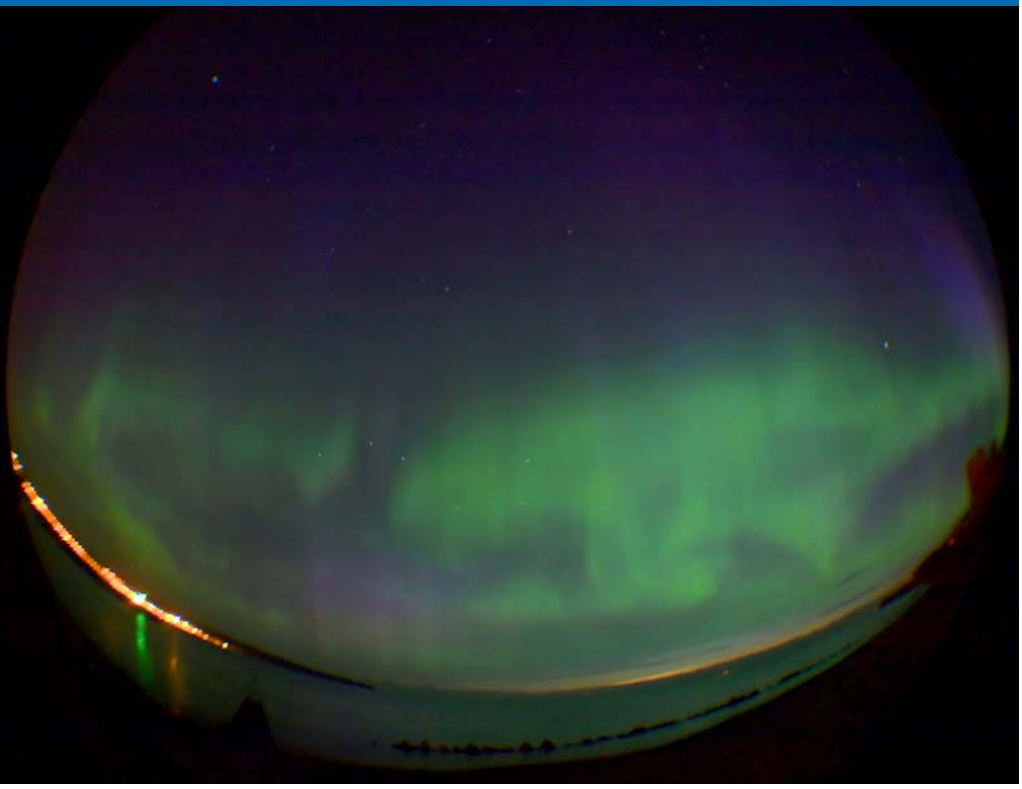
Like all previous Presidents, no doubt, I approach my term of office with a combination of anticipation and apprehension. A quick glance at the names of my illustrious predecessors over the past 120 years tells me that there is much to live up to! I draw confidence from the fact that the Association is in a strong position from which to move forward. It is served by a team of officers and staff whose dedication I have seen at first hand over the past few years and with whom it will be a pleasure to work. It also benefits from an outstanding membership, whose enthusiasm and expertise is clear at meetings and from the contributions made to the *Journal* and to the work of our observing Sections. One of the things I look forward to most over the next two years will be the opportunity to meet as much of that membership as possible.

Please feel free to get in touch if you feel that I can help in any way, and do make a point of introducing yourselves to me at future meetings.

Meanwhile, I wish you all clear skies – although, as the first President for some time who is not from the 'dark side', I won't go so far as to wish those skies to be moonless!

Bill Leatherbarrow, *President*

The aurora is back! *(continued from previous page)*



Fish-eye lens image by Gordon Mackie, Thurso, 2011 Aug 5/6, 01:04 UT.

Dave Gavine is collating auroral reports and has provided the following summary of activity from 2011 July to September:

'The Sun has become much more active in the second half of the year, with several instances of coronal mass ejections (CME), some of which interacted with the Earth's magnetic field to produce spectacular aurorae especially in high latitudes. Fine pictures of these can be enjoyed in the monthly aurora galleries of the website **Spaceweather.com**. Unfortunately Britain, especially Scotland, has endured yet another wet and cloudy summer and autumn.

July 4/5: 03:00–04:00 UT, green rayed bands reported from Michigan. (AB).

Aug 5/6: CME on 3rd & 4th, Kp index rose to 8 following a Sudden Storm Commencement (SSC) after 20:00 UT on Aug 5 when magnetometers registered stormy conditions. (DP). Strong radio aurora on 50, 70 & 144 MHz (FV). Active rayed bands observed over northern Scotland 21:55–01:20. (AT, GML, GM, JM, BS). At Wick (BS) blue ray tops were observed and at Thurso (GM) flaming and pulsating forms were seen with auroral light 30° south of the zenith, fading to a faint arc with noctilucent cloud in the north which persisted to 01:45. In Lothian light and rays were seen in cloud breaks (DG, GW), and the same in Whitehaven, Cumbria, the first aurora to be reported from England since 2004. (MW). Active rayed aurora, some with red rays, was seen in Germany, Poland, Denmark, Netherlands, Belgium, Michigan, Minnesota, Maine, Idaho, Montana, Utah, Wisconsin and Washington State.

Sept 9/10: SSC, Kp 6–7. 21:55– faint light in cloud, Edinburgh (DG), St Andrews (FV), bright rayed band in cloud at Inverurie 00:45–01:05 (GW).

Sept 10/11: 21:50– faint homogeneous arc in interference filter (DG, FV, KK). At Elgin light in cloud 21:45 then from Spynie 22:00–22:57 active rayed bands up to 30° with purple ray tops. Rayed bands from Thurso (SW).

Sept 11/12: rayed band reported from Lewis 20:45 (JG), rayed bands seen Michigan, Washington State, Minnesota, Montana, Vermont & Wisconsin.

Sept 26/27: SSC, Kp 6. Nr. Inverurie 19:20–23:00, bright rayed band in cloud gaps (GW), and near Wick (GML), light in cloud near Thurso 20:15–23:45 (GM), Elgin 00:00 (AT). Bright active rayed bands 02:40 (local) at Glen Ullin, N. Dakota (JB). 21:29–01:30 green glow & red ray tops at Whitstable, Kent (JK). 22:30–01:30 Three beams with red and green colouration seen from Kelling Heath, North Norfolk (DB). Faint rayed arc visible from Clanfield, Hampshire (DBr). Aurora seen also in N. Germany, Minnesota, Maine & NY State. Radio aurora reported Sept 26–29.

Sept 30/01: unconfirmed report of auroral light low on horizon at 00:15, Denham, Suffolk.'

Observers: AT: A. Tough (Elgin); DB: D. Balcombe (Norfolk); DBr: David Briggs (Clanfield); JG: J. Gray (Lewis); GM: G. Mackie (Thurso); GW: G. Whipps (Chapel of Garioch, Aberdeenshire); GML: G. MacLeod (Wick); BS: B. Stewart (Wick); JM: J. Mackintosh (Cromarty); FV: Fiona Vincent (St Andrews); KK: Ken Kennedy (Dundee); DG: D. Gavine (Edinburgh); DP: D. Pettitt (Carlisle); MW: M. Watson (Whitehaven); JK: J. Kemp (Whitstable); AB: A. Boyko (Michigan); JB: J. Brausch (N. Dakota); SW: Stewart Watt (Thurso).

Our thanks to all who have sent reports and images.

Ken Kennedy, *Director*

Exmoor – Europe's first International Dark Sky Reserve

On 2011 October 9 Exmoor National Park in the southwest of England was designated as Europe's first International Dark Sky Reserve by the International Dark Skies Association. This is a huge achievement, and follows three years of work by park authorities, local astronomers, lighting engineers and the resident community. Exmoor Dark Sky Reserve follows in the footsteps of Galloway Forest Dark Sky Park, set up in 2009, and Sark Dark Sky Island, established in January 2011.

Emma Dennis, landscape officer for Exmoor National Park Authority and the driving force behind the creation of the Dark Sky Reserve, began work on the project in 2009 as part of the International Year of Astronomy's Dark Sky Awareness Cornerstone objective. It had long been known that the southwest of England had exceptional dark skies, and a relatively favourable climate for astronomy.

The designation followed months of painstaking dark sky surveys, some of the most detailed that have been carried out in the UK, as well as the creation of a strict set of lighting controls governing all new developments within the national park.

Dr Nigel Stone, Chief Executive of Exmoor National Park, said: 'We are delighted that the importance of dark skies, one of Exmoor National Park's special qualities, has received this international recognition and we would like to thank all those who have helped in achieving this International Dark Sky Reserve award. We look forward to welcoming many more visitors in the future to enjoy the starlit skies at night as well as the spectacular scenery Exmoor has to offer during the day.' [example below – *Ed.*]

The designation was sought for two main reasons: 1) the park authority, working with the Campaign to Protect Rural England, recognises and values tranquillity as a key asset, and a dark sky is part of that mission; and 2) there is a real opportunity for Exmoor National Park to extend its tourist season throughout the winter months by using the dark skies to attract astro-tourists, something already being done by Sark and Galloway Forest Park.

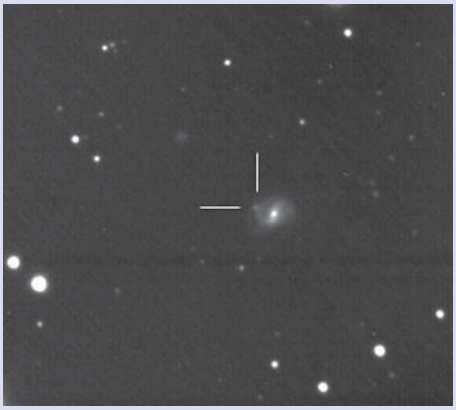
Exmoor's designation now means that the UK has a 'full-house' of IDA designations – the only country in the world to have this – in that it has a Dark Sky Park (Galloway Forest Park), a Dark Sky Community (Sark) and a Dark Sky Reserve (Exmoor). The differences between these designations are important. The Dark Sky Park designation is intended for parks with little or no human population (the model being US National Parks). Dark Sky Community status is aimed at communities – towns, cities, islands – that want to preserve their night sky. And Dark Sky Reserve status, while meant for large parks also, allows communities to exist within the Reserve, surrounding a dark sky core which is strictly protected, while public engagement and awareness-raising of the issues of light pollution spreads from that core to the surrounding reserve.

Exmoor National Park Authority was supported in its efforts by a grant from the British Astronomical Association that enabled it to engage the services of a qualified lighting engineer to write its lighting management plan.

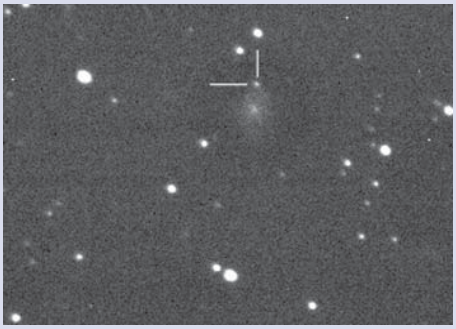
Steve Owens

Deep Sky Section

More supernova discoveries for BAA members



Both Tom Boles and Ron Arbour have made new supernova discoveries. Tom has made 3 further discoveries bringing his total to 145, while Ron has made 1 new discovery bringing his total to 26. Details are given below.



Tom Boles

2011 July 31.071, galaxy MCG +05-04-59. Mag 18.0. RA 1h 26m 34.69s, Dec +31° 37' 3.6". *(far left)*. This type II supernova has been given the interim designation J012634+3137036.

2011 Sep 30.113, galaxy MCG +13-05-36. Mag 18.0. RA 7h 6m 28.29s, Dec +77° 52' 31.8". *(left)*. This type 1a supernova has been designated 2011gn.

2011 Sep 30.146, galaxy MCG +07-15-2. Mag

Meteor Section

Draconid meteor outburst successfully observed

The Draconid meteors, which were widely predicted to produce a short-duration outburst on the evening of 2011 October 8 (see the October *Journal*, p.256) did indeed perform much as expected. However, for many UK observers trying to get a glimpse of the display it was a rather frustrating evening, and bright moonlight coupled with the faintness of the majority of the meteors meant that the shower was not as visually impressive as many had hoped.

The considerable advance publicity surrounding the shower, coupled with the fact that the peak was predicted for a Saturday evening, meant that a large number of observers right across Europe (and beyond) were out that night. Indeed, it has turned out to be one of the most successful international observing campaigns ever mounted by the BAA Meteor Section, with data being received from all over Europe and farther afield – from Saudi Arabia to Canada. From the observations received by the Section to date a clear picture of shower activity is emerging.

Overall, the timing of the observed Draconid outburst was a triumph for the theoreticians who, using the dust trail model, had predicted which of the older dust trails laid down by the parent comet 21P/Giacobini–Zinner the Earth would intersect near to the nodal crossing point. There was a fairly narrow range of predictions for the expected time of peak activity,[1] due to the 1900 and 1907 dust trails, on October 8: 19:52 UT (William Cooke & Danielle Moser, NASA MSFC); 20:01 UT (Jérémie Vaubaillon, IMCCE, Paris); 20:12 UT (Esko Lyytinen, Helsinki, Finland); 20:13 UT (Mikhail Maslov, Novosibirsk, Russia), and 20:36 UT (Mikiya Sato, National Astronomical Observatory of Japan). Estimates of the peak Zenithal Hourly Rate (ZHR) – the number of meteors that would be seen by an observer in a dark sky with the radiant overhead – were considerably more diverse, ranging from only 40–50 m/h to 500–750 m/h.

Visually, the Draconid ZHR was generally low (<50 m/h) until around 18:30 UT on Oct 8, when a noticeable increase in activity occurred. After 19:30 UT there was a sharp rise in rates, peaking between 20:05 and 20:15 UT. Thereafter there was a rapid decline, with Draconid rates returning to a generally low level after 21:30 UT. Preliminary analyses indicate a peak equivalent ZHR approaching 350 m/h between 20:05 and 20:15 UT, although correction factors are rather high due to the effect of the bright moonlight.

Conditions over much of the UK were very poor on the evening of Oct 8, but it is most encouraging that so many individuals and local society groups battled the elements in the hope of getting a view of the shower. The Director is extremely grateful to all those who contacted him with tales of great efforts thwarted by thick cloud cover and rain that night. A few observers were rewarded for their persistence, as a short period of partially clear weather enabled observers in parts of Sussex, Hampshire, Dorset, Wiltshire, Berkshire, Oxfordshire and Gloucestershire to glimpse the shower between about 19:00 and 21:00 UT. By a fortunate circumstance this was coincident with the main peak in shower activity.

In West Sussex, Graham Boots reports that members of the Worthing AS had some success, in spite of significant amounts of cloud. Alex Vincent recorded four Draconids from his garden in central Worthing between 19:10 and 19:30 UT, and from the society's observatory site in Goring-by-Sea, five Draconids were seen between 19:30 and 20:00 UT when thick cloud curtailed observations.

Also in Sussex, Nick Quinn reports that his group saw 11 meteors from Steyning in extremely cloudy conditions. Further west, near Romsey in Hampshire through gaps in the cloud, Alastair Acheson spotted 21 meteors between 20:00 and 20:50. Again through gaps in fast-moving cloud between 20:00 and 20:20 UT, Bob Mizon spotted four Draconids from Colehill, Dorset.

Taking advantage of rather better conditions, Richard Fleet, from near Pewsey in Wiltshire, saw 22 Draconids in a 43-minute watch beginning shortly after 20:00 UT; most were 2nd or 3rd magnitude and his best spell was three Draconids in a minute at 20:11. Tim Haymes of Maidenhead AS, observing near Reading, saw 10 Draconids in 30 minutes between 20:00 and 20:30 UT; all but one were 2nd or 3rd magnitude. At Upper Basildon in West Berkshire, Michael McNeil took advantage of breaks in the cloud to spot five Draconids between 20:10 and 20:25 UT. From Long Wittenham, South Oxfordshire, David Smith observed three Draconids between 19:30 and 20:00 UT, and six between 20:00 and 20:15. He reports that essentially he was looking through a hole in the clouds centred more or

More BAA supernova discoveries – *continued*

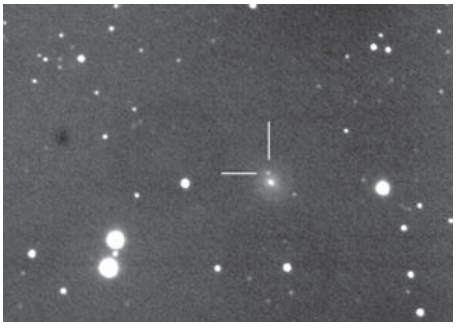
18.1. RA 6h 55m 51.00s, Dec +40° 41' 46.6". *(right)*. This type II supernova has been designated 2011go. Full details were issued on TA circular E2772.

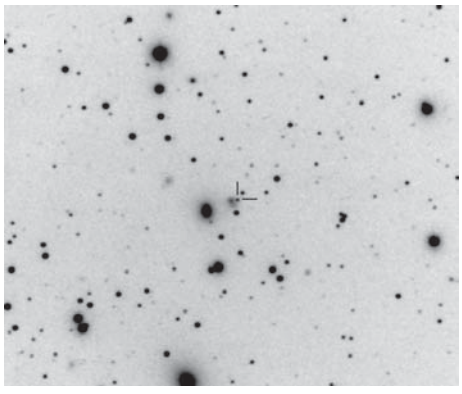
Tom's discovery images (0.35m Schmidt–Cassegrain telescope) are shown here, all imaged from his observatory in Coddenham, Suffolk.

Ron Arbour

2011 Sep 17.962, galaxy PGC 2159464. Mag 17.6. RA 18h 39m 53.93s, Dec +40° 1' 43.7". *(far right)*. This type IIP supernova has been designated 2011fy. Full details were issued on TA circular E2767.

An image of Ron's latest supernova obtained by him a few days after discovery using his 0.35m Schmidt–Cassegrain discovery telescope is shown on the right.





Stewart L. Moore, *Director*

less on the radiant. Near Cirencester in Gloucestershire, David Swain saw 12 Draconids in a 15-minute clear slot between clouds, commencing at 20:00 UT. Sadly, due to weather conditions no positive reports have been received so far from the north of England, Scotland or Ireland.

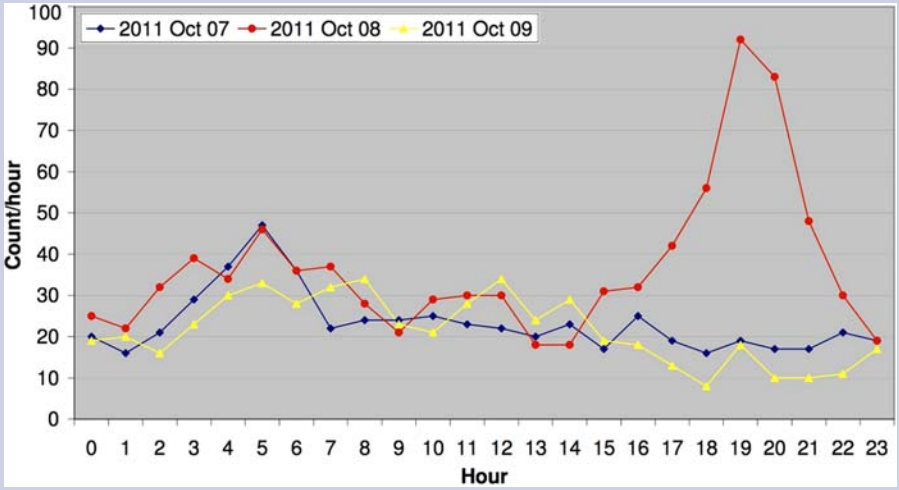
Many observers in the UK attempted to photograph the Draconid outburst and successful images have been sent in by Peter Lawrence (Selsey, West Sussex), Alex Vincent and Richard Fleet. Any additional images of Draconid meteors would be gratefully received.

Many observers across Europe have already contacted the Director and some enjoyed far better conditions than prevailed in the UK, although the greater altitude of the waxing gibbous Moon from southern Europe hampered watches from there. Marco Langbroek of the Dutch Meteor Society travelled to Schleswig–Holstein in northern Germany where he enjoyed really excellent conditions in a very transparent sky. He observed 41 Draconids between 19:57 and 20:10 UT and 27 between 20:10 and 20:19; again the majority of the meteors seen were of 2nd to 4th magnitude. From COAA in Portugal, Bev Ewen-Smith reports that 42 meteors were seen in the hour between 19:30 and 20:30 UT. In northern Tuscany, Massimo Giuntoli spotted 12 Draconids between 19:55 and 20:45 UT. From Mosta, Malta, Frank Ventura observed five Draconids in 15 minutes between 20:45 and 21:00 UT.

Nearby, while on holiday on the Maltese island of Gozo, Peter Carson recorded 41 Draconids between 19:40 and 21:00 UT, with 11 of these occurring between 20:00 and 20:10. The Director travelled with a group of observers to a site near Göreme in central Turkey in the hope of catching any early Draconid activity between 16:00 and 19:00 UT due to a series of rather old dust trails laid down by the parent comet between 1873 and 1894. In the event, no obvious enhancement in activity was seen during this time. However, in addition to the main peak between 20:05 and 20:15 UT, which was well observed by the Turkey group, it is possible that lesser, short-lived secondary bursts in Draconid activity were also noted around 19:15 and 19:38 UT.

Successful images have been submitted by Colin White and Ernest Swift, observing with the Director in central Turkey, Bev Ewen–Smith, and Bill Allen (Weyburn, Saskatchewan, Canada). Any additional images from overseas would also be most welcome.

The 2011 Draconid shower was also noteworthy for the number of observers who attempted to record the shower's activity using radio detection techniques. Such observations have so far been submitted by Simon Dawes (Crayford Manor House AS), David Farn & Brian Heath (Nottingham AS), Brian Legg (Coventry & Warwickshire AS), Gordon MacLeod, Nick Quinn, Bev Ewen–Smith, Julian Smith and Peter Vickers (Crawley AS). The Director gratefully acknowledges the assistance of Paul Hyde and the BAA Radio Astronomy Group in helping with the coordination of these observations.



Above: Hourly counts of meteor trails detected by the scattering of radio waves at 143.050 MHz from the transmitter at Graves, France on October 7, 8 and 9. The sharp peak in Draconid meteor rates on October 8 is well shown. *Observations by Nick Quinn.*
Previous page: A single bright Draconid in Cygnus imaged by Richard Fleet near the peak of the shower on 2011 October 8 using a Canon 5D from an observing site at Wilcot near Pewsey, Wilts.

The Director is extremely grateful to all those observers who have so far submitted their results or have contacted him. More observations of the Draconid outburst, using photographic, visual, and radio techniques, from individuals and groups in the UK and overseas, are urgently required to build up a full picture of the shower's rapidly changing activity. Even if you only glimpsed a few meteors during a short-lived break in the clouds, the Section would like to receive your report. Simple counts of meteors seen within given time periods would also be welcome.

A summary of all the observations received, crediting all the individual observers and society groups, will be published in the *Journal* as soon as all observations have been received and the analysis completed. There must be many observers – including many non BAA members – who witnessed the outburst of the Draconid shower, and we would like to encourage all these people to submit their observations to the Section, either via email to **meteor@britastro.org** or by post to Draconid Meteor Project 2011, British Astronomical Association, Burlington House, Piccadilly, London W1J 0DU.

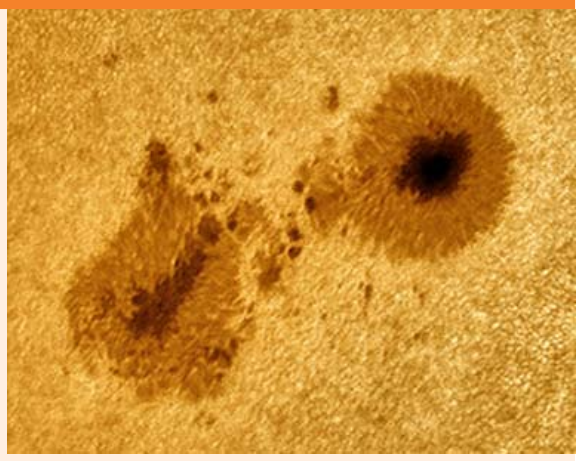
John W. Mason, *Director*

1 *IAU Electronic Telegram* **2819**, 2011 Sept 12

Solar Section

2011 August

Activity in August remained at a similar level to that in July in both hemispheres, with the northern hemisphere still dominant. Most observers recorded no sunspots on Aug 13 & 14.



AR1263 at 11:54 UT on 2011 August 1. *Pete Lawrence.*

AR1260 N20°/358° remained on the disk from July and was type Esc with an area of 360 millionths and observable with the protected naked eye on Aug 1 & 2. By Aug 2, its following penumbral sunspots had disappeared and the next day only a single Hax sunspot was evident approaching the western limb. The group was last seen on Aug 5.

AR1261 N17°/329° Also remained on the disk from July, a complex group of type Ekc with an area of 400 millionths. By Aug 2 it had lost some of its surrounding sunspots and was type Dac the next day with an area of 270 millionths. The group progressed to the western limb largely unchanged and was last seen on Aug 7.

AR1263 N18°/303° survived from July type Dko with an area of 580 millionths and visible to the protected naked eye between Aug 1 & 4. By Aug 3 it was still type Dko, how-

ever the group's total area had reduced to 460 millionths. On Aug 4 the group developed additional penumbral spots type Dkc and was of a similar appearance the following day. By Aug 7 the group had split into a string of penumbral sunspots type Eac with a total area of 400 millionths. As this group moved towards the western limb, the number of sunspots reduced and on Aug 10 only the following sunspot was seen.

AR1265 N18°/030° was the final group to remain on the disk from the previous month as a single Axx sunspot in the NW quadrant. The group was not reported on Aug 2 or thereafter.

AR1266 N18°/245° was observed on Aug 4 in the NE quadrant, type Bxo consisting of 3 small sunspots. It was not visible the next day but reappeared on Aug 7 as type Dso. By Aug 8 the group was a string of 10 small sunspots which started to degrade on the following day. The group faded on the disk on Aug 11.

AR1267 S17°/243° formed on the disk in the SE quadrant on Aug 5 type Cro consisting of 7 sunspots. The group developed to type Dso on Aug 6 & 7 before degrading to type Bxo on Aug 8 and was not seen thereafter.

AR1268 N17°/222° formed on the disk and was seen on Aug 8 as a single Axx spot to the east of AR1266. The group consisted of two small sunspots on Aug 9, still type Axx but was not seen after that.

AR1271 N16°/060° appeared on the NE limb on Aug 15 type Dso consisting of 3 sunspots. The group developed as it rotated further onto the disk being of type Esc by Aug 19. The next day the group unusually consisted of two penumbral sunspots in the leading region. By Aug 22 the group was approaching the CM, comprising several irregular penumbral and other sunspots with a total area of 170 millionths. The group was last seen on Aug 27 as a single Hsx sunspot close to the NW limb.

AR1272 S19°/057° was seen on Aug 17 close to the SE limb. By Aug 19 the group was type Cso consisting of a single small penumbral spot and a single follower. The group was unchanged the following day before developing to type Dao on Aug 21 and Dsi on Aug 22. The group then started to decline before fading on the disk.

AR1273 S18°/112° was seen on the disk in the SW quadrant on Aug 19 type Axx consisting of 2 small sunspots. It was not seen again.

AR1274 N18°/002° was seen just over the NE limb on Aug 20 a single Axx spot. The group developed to type Dso on Aug 22 before declining and fading on the disk.

AR1275 N07°/348° appeared over the NE limb on Aug 21 type Axx. The group was type Hsx on Aug 23 and was seen as a Bxo group consisting of 3 small spots on Aug 27. The group then faded on the disk.

AR1277 N17°/303° appeared over the NE limb on Aug 25 as a single Hsx sunspot. The group progressed across the disk unchanged and was still visible at the end of the month.

AR1279 N13°/292° was seen on Aug 27 close to the NE limb, a similar type of spot to AR1277 and following it a few degrees to the south. Similarly this sunspot progressed unchanged across the disk and was still visible on Aug 31.

AR1280 N12°/323° formed on the disk on Aug 27 near the CM, a Bxo type group consisting of 5 small spots. The group reduced in size the following day before fading on the disk.

AR1281 S20°/260° appeared over the SE limb on Aug 28 type Cso. The group remained on the disk to the end of the month.

AR1282 N25°/299°; **AR1283** N12°/225; **AR1284** S17°/357° all appeared on Aug 30 and remained on the disk to the close of the month. These groups were joined by **AR1285** N29°/334° on Aug 31, a small Axx spot which formed in the NW quadrant.

6 observers reported a Quality number of Q = 8.89

H-alpha

Prominences

14 observers reported a prominence MDF of 4.85 for August.

Several reports were received of a long hedgerow prominence stretching across the NE limb on Aug 3 for approximately 326,000km. By the following day, two shorter low prominence hearths stretched around the same limb.

On Aug 7 a very bright active arch prominence was seen on the NW limb which exhibited significant internal structure changes between 11:45 and 11:50 UT. A large angular arch was observed at NE30° on the same day. The following day a small well defined loop was seen on the NW limb and a bright sheet of plasma graced the SW limb.

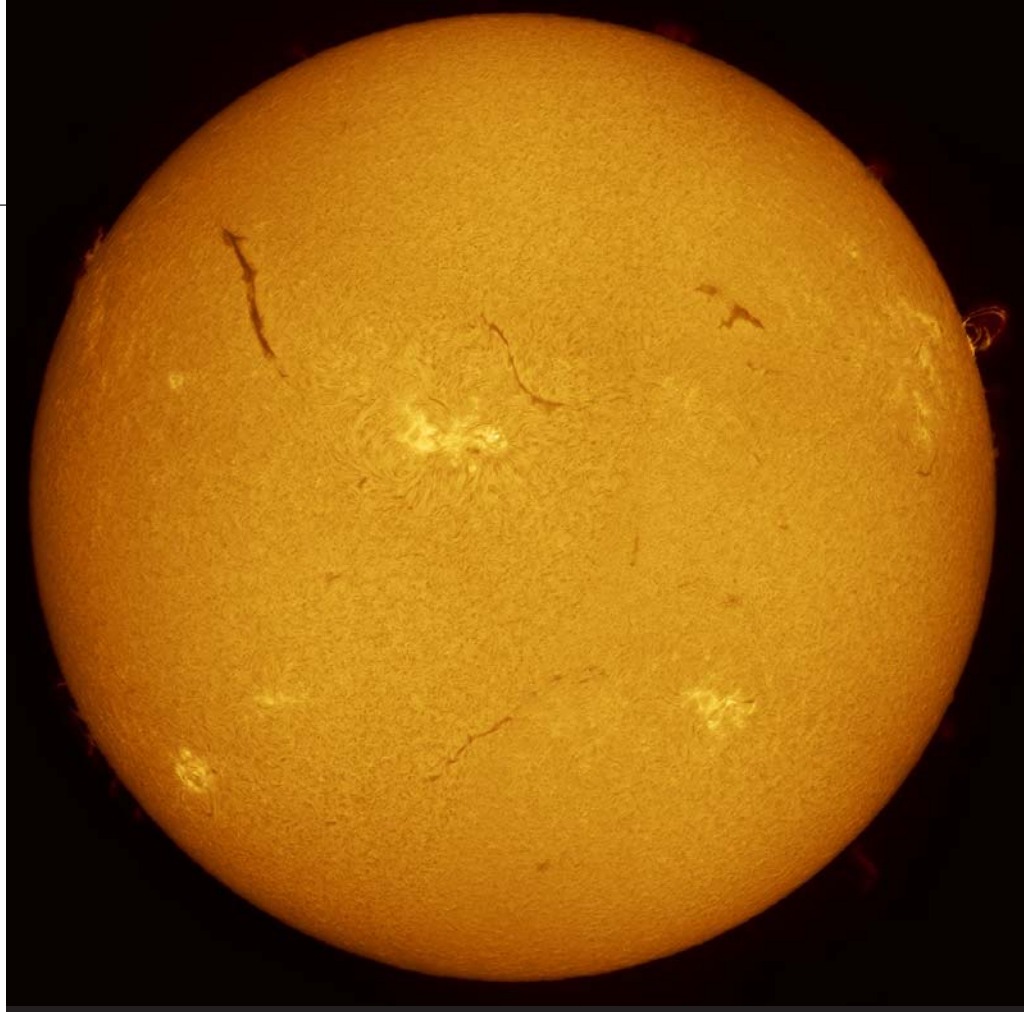
A very tall pillar prominence was on the SE limb on Aug 12. On Aug 14, five fine prominence hearths were counted around the E limb comprising a large tree shaped prominence on the SE limb and northward, a pyramid, jet, sail and a double loop.

Several prominences were reported on Aug 15; an arch on the SE limb at 07:50 UT; a hedgerow on the SW limb stretching across the limb for 240,000km and a high thick arch at NE40°.

Two substantial hearths were seen on the NW limb on Aug 19, one a hedgerow consisting of four elements and the other three jets quite close to one another. On Aug 21 a mass with two streamers from the top pointing southwards was seen at NW35°.

The western limb was reported to be very active on Aug 25 with several prominences reported, two of which reached a height of 112,000km. On Aug 27 a double spire was seen on the NW limb and a large dome shaped prominence with a broad base on the W limb with an estimated height of 90,000km. The dome prominence remained on Aug 28 but the upper portion had become spiked in appearance.

An extended arch was seen on the SW limb on Aug 31 at 13:10 UT and also a very long, almost horizontal streamer from the top of a low mass at NW40°.



Full disk image by Paul Haese, 2011 Sep 5 at 17:29 UT. [Note in particular the exquisite prominence on the NE limb – *Ed.*]

Filaments & plage

10 observers reported a filament MDF of 3.05 for August.

Filaments were seen in association with all sunspot groups on Aug 3 and a long dark filament aligned north-south, was to the SW of AR1266 on Aug 4. On Aug 8 a short dark filament was NW of AR1263 extending to the W limb. Also, a long broken filament, roughly north-south aligned in the NE quadrant and a long broken east-west filament in the SE quadrant. A short dark east-west filament was south of AR1267 which was still present the following day as was the one in the NE quadrant.

9 filaments were counted on Aug 19 including 3 long filaments in association with AR1271 and a dark curving filament to the south of AR1272. A long curving filament was near to the NW limb close to the 4-element prominence hearth.

A short dark filament was in association with AR1279 on Aug 27. Also an extended filament running almost from N to S was seen close to the W limb on Aug 27 & 28. On Aug 30, an indistinct double smudge was seen at N25°/260° which had formed a short arc filament by Aug 31.

Bright plage was seen around AR1263 on Aug 4 which was less bright the following day. Plage was seen in association with all sunspot groups on both days with AR1266 being seen as H-alpha plage only on Aug 5. AR1266 had reappeared in white light by Aug 8 and was exhibiting bright plage. Plage was also seen with AR1263 which persisted the following day. The plage with AR1266 was much fainter on Aug 9 as was that in association with AR1268.

On Aug 20 very bright plage was seen with AR1271 and plage also around AR1272. Plage was seen around AR1280 on Aug 27 and around AR1281 close to the eastern limb on Aug 28.

2011 September

Activity in September showed a marked increase largely due to an upturn in sunspots in the northern hemisphere. Southern hemisphere activity also increased but only slightly, however this activity level was still the highest recorded since 2006 November. Multiple sunspot groups were recorded on all days of the month.

AR1277 N19°/300° remained on the disk from August, a single Hsx sunspot. The group progressed unchanged rounding the western limb on Sep 6.

AR1279 N14°/292° a similar group to AR1277 remained on the disk from August type Hsx. By Sep 4 the sunspot appeared to be shrinking in size and was not recorded thereafter.

AR1280 N11°/326° after fading on the disk at the end of August the group reappeared type Cso. The group was approaching the western limb and by Sept 4 only one penumbral spot could be seen on the limb.

AR1281 S20°/259° also a survivor from August, the group developed to type Dao on Sep 2 however the trailing sunspot started to decline and by Sep 4 the group was type Csi. The group continued to decline and was type Bxo on Sep 7 approaching the SW limb.

AR1282 N25°/300° had formed on the disk at the close of August and was a well defined Eso type sunspot group by Sep 2. The group rapidly declined as it approached the NW limb rounding the limb on Sep 5.

AR1283 N13°/223° rounded the E limb on Aug 30 and was type Cai on Sep 1 still close to the NE limb. The next day two following penumbral spots had developed and its area had almost doubled to 190 millionths. Further penumbral sunspots developed the following day and by Sep 5, now type Eac with an area of 310 millionths, the group consisted of a collection of penumbral and other sunspots without any particular overall structure. The group then reduced in size being type Dso on Sep 8 and Csi on Sep 9. By Sep 11 the group consisted of only two penumbral spots very close to the NW limb.

AR1287 S31°/183° was seen on Sep 4 in the SE quadrant near to the limb type Cso. By Sep 8 the group consisted of a single penumbral sunspot and was last seen near the SW limb on Sep 14 type Dso.

AR1289 N24°/127° rounded the NE limb on Sep 6 and by Sep 8 was type Cho with a leading large penumbral sunspot containing two umbrae and smaller spots following. On Sep 11 the group consisting of a single irregularly shaped penumbral sunspot type Hkx, with an area of 400 millionths and nearing the CM. By Sep 13 the group had begun to decay but was still a substantial penumbral sunspot on Sep 15. The next day it had an area of 360 millionths and crossed the W limb on Sep 19. The group was visible to the protected naked eye from Sep 11 to 17.

AR1292 N08°/074° appeared in the NE quadrant on Sep 11 type Bxo consisting of two small spots. By Sep 15 the group was type Hsx consisting of a single penumbral sunspot but dissolved on the disk on Sep 17 after crossing the CM.

AR1295 N21°/056° appeared on Sep 12 to the east of AR1292. By Sep 15 the group was type Csi consisting of a leading penumbral sunspot and a further twelve smaller spots. The group developed to type Dhc by Sep 19 and was last seen on Sep 24 type Ekc rounding the NW limb.

AR1296 N27°/044° appeared to the east of AR1295 on Sep 13 type Dso. The group was still type Dso the next day consisting of two small penumbral sunspots and a smaller spot near to the leader. The group was last seen on Sep 23 type Axx.

AR1301 N21°/331° appeared over the NE limb on Sep 18 type Dso. The group developed to type Ekc by Sep 23 consisting of ten sunspots but by Sep 25 had declined to a penumbral spot and a single follower. Further small spots appeared the following day both following and preceding the group. The group then started to decline being a small penumbral sunspot on Sep 29 and a single Axx spot on Sep 30 approaching the NW limb.

AR1302 N14°/280° appeared over the NE limb on Sep 22 and was type Fkc the next day. By Sep 24 more of the group could be seen showing a large leading penumbral sunspot and several smaller penumbral following spots, a total area of 1100 millionths. The following day the group had a similar total area but the leading spot was more irregular and the number of following penumbral sunspots had reduced to two. On Sep 26 the leading penumbral sunspot had elongated and the central penumbral spot had disintegrated into a rash of smaller spots. The group was near the CM on Sep 28, now consisting of two irregular penumbral sunspots, the leader being more than twice the size of the follower, the total area reduced to 800 millionths. This group continued to reduce in size and on Sep 30 it was just 430 millionths, the leading sunspot having split

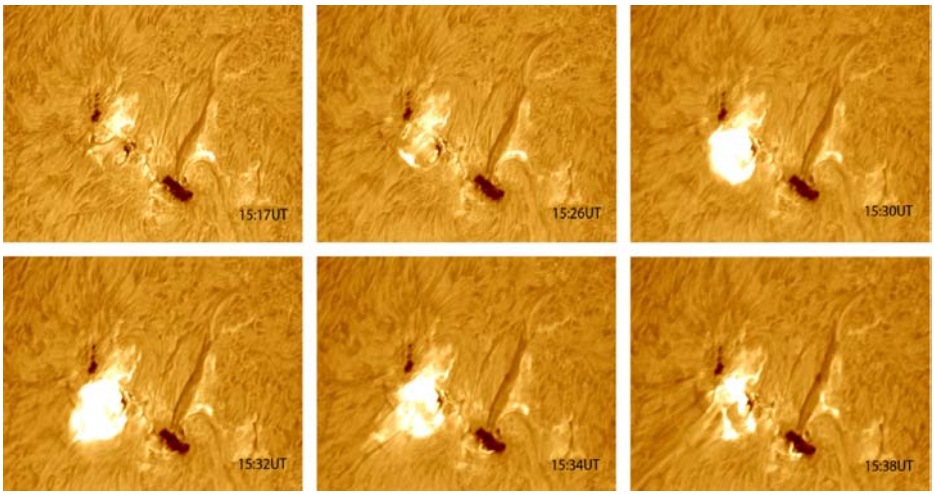
North & south MDF of active areas g

	MDFNg	*MDFSg*
August	2.54 (37)	0.75 (37)
September	4.61 (41)	1.46 (41)

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

BAA sunspot data, 2011 August–September

	August		*September*	
Day	*g*	*R*	*g*	*R*
1	4	87	6	96
2	4	76	6	106
3	3	69	6	101
4	4	76	5	82
5	4	72	5	81
6	3	64	4	66
7	3	56	3	49
8	3	51	3	43
9	2	39	4	55
10	2	26	5	64
11	2	23	5	73
12	1	19	7	100
13	0	6	8	115
14	0	1	9	134
15	1	10	9	142
16	2	29	10	153
17	2	38	8	127
18	3	47	6	113
19	3	42	7	113
20	3	45	5	91
21	3	57	5	81
22	4	71	5	76
23	4	67	4	70
24	3	48	5	86
25	3	48	5	90
26	5	72	5	80
27	5	58	5	83
28	4	49	5	83
29	3	39	6	92
30	5	64	5	82
31	7	98		
MDFg	3.05 (49)		5.67 (53)	
Mean R	49.91 (43)		90.99 (47)	



An M-class flare breaks across AR1302 on 2011 September 25. To view an animated sequence, see www.thesolarexplorer.net. *Andy Davey*.

into two. **AR1302** was visible to the protected naked eye from Sep 24 to 30.

AR1305 N13°/247° was close to the NE limb on Sep 25 a single penumbral sunspot type Hsx. The group was unchanged until Sep 29 when a smaller follower spot appeared. The next day this follower had disappeared but the main penumbral spot was preceded by an arc of small spots.

AR1306 N13°/250° rounded the NE limb on Sep 26, east of AR1305. The group consisted of a single small penumbral spot and remained unchanged to the end of the month.

AR1307 N16°/198° formed on the disk to the east of AR1306 on Sep 29 type Bxo. The group was unchanged the following day.

6 observers reported a Quality number of Q= 16.15

H-alpha

Prominences

16 observers reported a prominence MDF of 4.89 for September.

Several prominences were seen on Sep 1 including a faint but large arch on the E limb, a pyramid shaped prominence on the NW limb and a hedgerow on the SE limb. A hedgerow prominence was visible on the NE limb on Sep 2 & 3 and a large prominence on the NW limb on Sep 2 had dissipated to a smaller version by Sep 3.

A column type prominence on Sep 5 reached a height of approximately 112,000km on the NE limb. On Sep 9 a prominence stretched across the NW limb for approximately 251,000km and reached a height of 65,000km.

Three large prominences were visible and actively changing throughout Sep 11. The most active was on the E limb which faded as it expanded. A prominence on the NE limb diminished in size during the day whilst the SW prominence became more intense.

A total of eight long spikes and pillars were noted on Sep 12 along the SE limb.

At 12:30 UT on Sep 14 three active prominence hearths were visible. Two small bright jets on the NW limb were seen, the westernmost having detached by 13:10. A long faint streamer was seen on the NE limb which had dissipated by 14:00 and a large arch was seen on the NE limb with a thick northern arm. This arm had dissipated by 13:10 and the central mass had ejected. The southern arm looped over southward and formed a new smaller loop.

On Sep 25 a small loop prominence was on the SW limb ahead of AR1303 which was approaching the limb. A large pyramid prominence was located just to the south. A large prominence was seen on the NW limb on Sep 27 and also a tall pillar on the NE limb.

Filaments

12 observers reported a filament MDF of 4.03 for September.

Two long filaments were seen in the NE quadrant on Sep 1 and on Sep 2 a large filament was still visible there. Two additional filaments preceded AR1283. On Sep 4 a long dark broken filament, roughly aligned north-south was in the NE quadrant following AR1283. A long curving filament also preceded the group. The following filament was still present on Sep 8 which had taken on quite a broad fuzzy appearance.

A long dark filament was seen near the CM in the northern hemisphere on Sep 15 just west of AR1292. Filaments were associated with AR1295, AR1296 and AR1298 on Sep 16 & 17 with one dark filament prominent in the north for both days.

On Sep 25 a short dark filament was projecting northward from the leading sunspot of AR1302 which was still visible the following day. Two large filaments were associated with the group on Sep 27, 29 & 30. A further filament was seen stretching SE from AR1306 on Sep 30 and also two dark filaments in the SE quadrant, one being near to the limb.

Flares

September was a 'bumper' month for flare activity with reports being received from many observers.

AR1283 erupted into a large type 4B flare on Sep 6 starting at 22:10 UT, peaking at 22:20 and ending at 22:55 UT (X-ray class X-2).

On Sep 11 a flare was seen near AR1283 close to the NW limb at 09:15 UT. Also at 13:15 UT in the same location a further flare was reported and at 13:50 that day a flare was seen emanating from AR1289. This flare consisted of two brilliant points which changed into a curved streak before fading at 13:55 and disappearing by 14:02 UT.

AR1289 produced another flare on Sep 14 type 3N (X-ray class C-2) commencing at 23:00 UT, peaking at 23:30 and ending at 02:00 UT.

AR1297 in the SW also produced a flare at 16:40 UT on Sep 14 as did AR1296 in the NE.

AR1302 was very active at the end of the month producing several flares. On Sep 25 at 09:30 to 09:55 UT this group produced an M1.5 flare. Later that day it produced a type 2N flare (X-ray class C9.5) in progress at 22:40 UT and ending at 23:00 UT. On Sep 26 a bright flare was seen through thin cloud at 14:37 UT which the GOES satellite recorded as type 2B X-ray class M2.6, peaking at 14:46 and ending at 15:02 UT. On Sep 27 a further flare was reported, GOES satellite data showing a C1.8 flare commencing at 10:49 UT and peaking at 10:54 UT.

Lyn Smith, *Director*

Comet Section

The comets of 2012

Jonathan Shanklin outlines next year's observing prospects for these mysterious visitors to the inner solar system.

Comet 2009 P1 (Garradd) passing the 'Coathanger' asterism on 2011 Sept 2. A single-shot 300s exposure from New Mexico with the GRAS020 remotely operated Takahashi FSQ-ED 106mm refractor, and STL 8300C CCD. Field 230×156'. *R. Ligustri, Italy.*

The year starts with a bright, well placed, binocular comet on view. 2009 P1 (Garradd) was at perihelion at the close of 2011, and should be 7th magnitude during January and February. P/Levy (2006 T1) might be a similar magnitude over the same period if it follows the same brightness behaviour as at its discovery apparition. Comet 96P/Machholz is the brightest comet of the year, but is then too close to the Sun for ground-based observation.

Theories on the structure of comets suggest that any comet could fragment at any time, so it is worth keeping an eye on some of the fainter periodic comets, which are often ignored. They would make useful targets for CCD observers, especially those with time on instruments such as the Faulkes telescope.

Comet 29P/Schwassmann–Wachmann 1 in outburst on 2010 February 10, imaged with a 235mm SCT and SXVH9C CCD, 40×30sec exposures. *David Strange*.

In addition to those in the BAA *Handbook*, ephemerides for new and currently observable comets are published in the BAA *Circulars*, and on the Section, CBAT and Seiichi Yoshida's web pages. Complete ephemerides and magnitude parameters for all comets predicted to be brighter than about mag 21 are given in the International Comet Quarterly *Handbook*; details of subscription to the ICQ are available on the Internet. A Section booklet on comet observing is available from the BAA Office.

29P/Schwassmann–Wachmann is an annual comet that has outbursts, which over the last decade seem to have become more frequent. The comet had one of its strongest outbursts yet recorded in early 2010. The comet is an ideal target for those equipped with CCDs and should be observed at every opportunity. It begins the year in Corvus, less than a degree from M104, and completes its retrograde loop in nearby Virgo by midsummer. It crosses back into Corvus, before ending the year in Virgo. The comet is at opposition at the end of March and passes through solar conjunction in mid-October.

78P/Gehrels reaches perihelion in January, but its distance from the Earth is already increasing, so it is fading from its best in the autumn of 2011. It is however relatively well placed in the evening sky, and so a suitable target for telescopic observation.

Although **96P/Machholz** could be the brightest comet of the year, only the solar monitoring satellites will see it around perihelion. Southern hemisphere observers may see it as a relatively poorly placed telescopic object in the morning sky prior to perihelion, and in the evening sky post-perihelion.

185P/Petriew makes its third return, and although predicted to reach mag 11, it will be a morning object when at its best in early August.

1994 X1 (P/McNaught–Russell) makes its first return to perihelion this year. Although not observed visually at the discovery apparition, its brightness on the Schmidt plates suggests that it might have been within range, and the predictions are based on this assumption. It may become visible in July, and will be at its brightest in November and December, when it is well placed in the evening sky.

David Levy made the visual discovery of **2006 T1 (P/Levy)** on 2006 October 2.50. Observing near Saturn with his 0.41m reflector he noted a diffuse object of magnitude 10.5. The cometary nature of the object was confirmed by the BAA's Peter Birtwhistle and Richard Miles among others. The Japanese comet hunter Shigheki Murakami made an independent discovery of the comet on 2006 October 4, but by this time the object had been placed on the NEOCP and an IAUC issued.

This is a very good return, as the comet passes 0.19 AU from the Earth, which gives it the potential to become a binocular object, if it behaves as it did at the discovery return. It is a little surprising that the comet had not been discovered earlier, for example the 1991 return was relatively favourable, so on discovery it may have been caught in outburst. It had not been recovered by 2011 October, which strengthens this hypothesis. It is well placed in the evening sky when at its brightest, but is rapidly moving south, so that UK observers will lose it by mid-February. There is the possibility of a meteor shower from this comet with maximum on New Year's Eve.

2009 P1 (Garradd) currently holds out the best prospect for UK observers. It begins the year at mag 7, and whilst visible for a short time in the evening sky, it is best placed in the morning due to its location in Hercules. It is moving north, and passes less than 20' from globular cluster M92 on February 3, soon becoming visible all night. It is furthest north on March 12, at just over 70° declination, but is fading and by

Mercury & Venus Section

Venus in 2011–2012: first interim report

Venus entered eastern elongation from the date of superior conjunction, 2011 August 16. In 2012 June, at the next inferior conjunction, there will be another solar transit. To mark the special nature of this evening elongation we shall be submitting a short Venus report to each edition of the *Journal* for the next four or five issues. Observers should therefore send in all their work regularly. We want good images in the ultraviolet (UV), the near-infrared, series with the usual visual waveband filters, and of course careful drawings (in white light and particularly with either a yellow W15 filter or a blue-violet W47 filter) submitted on the Section's standard report forms, which are available either from the Director or at our website. The Director can also supply gelatine filters to visual observers.

Venus near superior conjunction, 2011 May–August

Immediately prior to superior conjunction Venus exhibited a nearly full, though rather tiny disk. For the period May–August we have to hand a number of visual observations, especially from Gianluigi Adamoli (Italy) and Stanislas Macsymowicz (France), as well as UV and other images from Willem Kivits and Dennis Put, both in the Netherlands. Here we review them briefly. Adamoli was able to continue his daylight observations up till August 2. Dennis Put (18 years old) submitted an excellent report in addition to providing images, as well as maps made using *WinJupos*.

Put used a 279mm SCT with a monochrome DMK21AU camera. Venus was imaged mostly

the end of April will be 9th magnitude. Telescopic observers should be able to follow it to the end of May, by which time it will have crossed half the sky to Cancer.

2011 R1 (McNaught) may just reach 11th magnitude and is then an exclusively southern hemisphere object. Circumpolar and lying below the pole, it will be visible in the evening sky, which may encourage some observers to turn their telescopes towards it.

The other periodic and parabolic comets that are at perihelion during 2012 are unlikely to become brighter than 12th magnitude or are poorly placed. Ephemerides for these can be found on the CBAT WWW pages. Several D/ comets have predictions for return, though searches at favourable returns in the intervening period have failed to reveal the comets and it is possible that they are no longer active. There is however always a chance that they will be rediscovered accidentally by one of the Sky Survey patrols.

Looking ahead to 2013, **2P/Encke** puts on a good showing for Northern Hemisphere observers and should be a binocular object in November. **2011 L4 (PanSTARRS)** could provide one of the brighter comets of the decade after its March perihelion. Otherwise, prospects for a comet brighter than 12th magnitude in 2013 are poor.

Jonathan Shanklin, *Director*

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Comets reaching perihelion in 2012

Comet	*T*	*q*	*P*	*N*	H_1	K_1	*Peak mag*
P/Spacewatch (2005 JN)	Jan 6.1	2.29	6.56	1	14.0	10.0	19
131P/Mueller	Jan 7.4	2.42	7.07	3	13.0	10.0	17
P/Gibbs (2011 C2)	Jan 9.5	5.39	20.0	0	9.0	10.0	19
P/Levy (2006 T1)	Jan 12.3	1.01	5.28	1	10.5	10.0	7
78P/Gehrels	Jan 12.9	2.01	7.23	5	3.5	20.0	10
P/McNaught (2005 J1)	Jan 15.8	1.54	6.75	1	16.5	10.0	20
McNaught (2011 Q2)	Jan 19.8	1.35			10.0	10.0	13
244P/Scotti	Jan 20.3	3.92	10.8	2	9.0	10.0	17
P/Spacewatch–Boattini (2011 JB_{15})	Jan 28.6	5.01	20.1	0	9.0	10.0	19
5D/Brorsen	Feb 5.3	0.53	5.61	5			
D/Brooks (1886 K1)	Feb 6.3	1.89	6.69	1			
Gibbs (2010 M1)	Feb 7.8	2.30			9.0	10.0	15
21P/Giacobini–Zinner	Feb 11.8	1.03	6.60	14	7.8	17.7	11
198P/ODAS	Feb 15.8	2.00	6.82	2	10.5	15.0	16
105P/Singer–Brewster	Feb 26.2	2.05	6.47	4	12.5	15.0	18
3D/Biela-A	Feb 27.0	0.80	6.59	6			
182P/LONEOS	Mar 5.4	1.01	5.10	2	18.0	10.0	17
P/Novochonok–Gerke (2011 R3)	Apr 3.3	3.56	10.7	0	11.0	10.0	19
242P/Spahr	Apr 3.5	3.98	13.0	2	8.0	10.0	17
58P/Jackson–Neujmin	Apr 10.0	1.37	8.22	6	11.0	15.0	18
163P/NEAT	Apr 12.8	2.06	7.30	3	14.5	10.0	19
LONEOS (2006 S3)	Apr 16.5	5.13			2.0	10.0	12
D/Denning (1894 F1)	Apr 16.8	1.36	8.11	1			
171P/Spahr	Apr 30.6	1.76	6.70	2	10.2	15.0	16
60P/Tsuchinshan	May 13.5	1.62	6.56	7	10.5	15.0	15
LINEAR (2010 R1)	May 18.9	5.62			6.0	10.0	17
P/Gibbs (2006 Y2)	May 20.8	1.26	5.35	1	18.0	10.0	20
P/ASH (2011 N1)	May 31.1	2.86	15.8	0	11.5	10.0	18
P/LINEAR (2003 O2)	Jun 10.7	1.50	8.75	1	14.5	10.0	18
138P/Shoemaker–Levy	Jun 11.7	1.70	6.90	3	15.0	10.0	19
P/Pan-STARRS (2011 U1)	Jun 29.2	2.23	8.76	0	14.5	10.0	20
152P/Helin–Lawrence	Jul 9.2	3.12	9.54	2	10.0	10.0	18
96P/Machholz	Jul 14.8	0.12	5.28	5	13.0	12.0	2
189P/NEAT	Jul 20.4	1.18	4.99	2	19.0	10.0	16
185P/Petriew	Aug 13.5	0.93	5.46	2	11.0	10.0	11
LINEAR (2011 O1)	Aug 18.5	3.89			7.0	10.0	15
P/LONEOS (2006 Q2)	Aug 22.0	1.34	5.96	1	19.5	10.0	19
P/McNaught (2005 K3)	Sep 12.7	1.50	7.02	1	13.5	10.0	14
160P/LINEAR	Sep 18.5	2.07	7.90	2	15.0	5.0	17
158P/Kowal–LINEAR	Sep 27.5	4.58	10.3	2	9.0	10.0	18
P/Larson (2005 N3)	Sep 29.4	2.19	6.78	1	14.0	10.0	18
168P/Hergenrother	Oct 1.7	1.41	6.89	2	15.5	10.0	15
P/Christensen (2005 T2)	Oct 7.1	2.21	7.47	1	14.5	10.0	19
Bressi (2011 U2)	Oct 9.2	2.49			10.0	10.0	16
3D/Biela-B	Oct 9.9	0.83	6.74	6			
McNaught (2011 R1)	Oct 19.7	2.08			6.5	10.0	11
P/McNaught–Russell (1994 X1)	Dec 4.5	1.28	18.3	1	10.0	10.0	11
P/Spacewatch (2006 F4)	Dec 14.1	2.34	6.63	1	15.0	10.0	21
P/LONEOS (1999 RO_{28})	Dec 17.6	1.22	6.58	1	18.0	5.0	19
P/Hermann (1999 D1)	Dec 18.4	1.64	13.8	1	15.0	10.0	18

The date of perihelion (T), perihelion distance (q), period (P), the number of previously observed returns (N), the magnitude parameters H_1 and K_1 and the brightest magnitude (which must be regarded as uncertain) are given for each comet. The magnitudes, orbits, and in particular the time of perihelion of the D/ comets, are uncertain. Note: $m_1 = H_1+5.0*\log(d)+K_1*\log(r)$

in ultraviolet light using the Astrodon J/C UV filter, which provides transmission below wavelengths of about 395nm. Until the end of May, a Wratten 47 violet filter was used in conjunction with a Schott BG40 glass in order to eliminate the filter's significant near-infrared leak. His ultraviolet images were all made between May 25 and July 20, when the planet's apparent diameter was about 10 arcsec. All images were obtained at dawn, the altitude of Venus being between 16 and 25°.

The results from this epoch show a consistently bright S. cuspidal area, which had been remarked upon earlier in the elongation; there were occasional brightenings in the north, but the general impression was of a dusky N. polar region. On July 1 Adamoli found the NPR visually particularly dark, in accord with Put's July 5 image, one atmospheric rotation later. On some dates specific bright UV clouds were recorded near the equator. On May 22 Detlev Niechoy found a small, very bright patch at the f. limb midway between pole and equator; this can be recognised on Put's image two rotations later, on June 3. Macsymowicz visually recorded the bright patch N. of the equator on the f. side of the disk that was also imaged by Put on June 2. Arranging the images in rows with 4-day or multiples of 4-day intervals between each row reveals some similarities from one rotation to the next, but also a lot of variation. The characteristic Y marking, with its tail lying along the equator, can be recognised a few times, and a dark equatorial streak was drawn by Adamoli on several dates.

UV images often show the typical, long-enduring Y- and psi-shaped markings. If we take Put's image of 2011 July 5d 04h 47m (JD 2455747.6993) he shows the Y marking distinctly, and its fork is some 25° (0.06944 rotations) past the CM. This may be compared (for instance) with a similar image (published previously) of the Y marking with its fork at the CM by Tiziano Olivetti from 2004 Oct 29d 23h 17m (JD 2453283.4701). Dividing the 2464.2292-day interval by a rough period of 4 days we derive 616.0573 rotations, close enough to an integral 616 rotations to show that the same part of the planet was on show. Carrying out the precise division by 616 plus 0.06944 additional rotations for the 25° displacement, the average equatorial UV rotation period over the 2004–2011 interval is found to be about 3.999 days, in excellent accord with past work which gives a more precise period (measured over many years) of 3.99525 days.[1,2] Later images on the morning of July 5 by Put and Kivits show this Y marking rotating to the right (with south at top).

The following also provided observations during the planet's W. elongation: Paul Abel, Tomio Akutsu, Barry Clark, Peter Edwards, David Finnigan, Mario Frassati, Sadegh Ghomizadeh, David Gray, Simon Johnson, Stanislas Macsymowicz, Roy Panther, Jean-Jacques Poupeau, Andrew Robertson, John Sussenbach, John Vetterlein, Kenkichi Yunoki and the Director.

Next year's transit of Venus: 2012 June 5

As in 2004, the Mercury and Venus Section would like to receive your observations of this great event. We shall have more to say about it later. For now, the question for many observers will be to decide whether to travel abroad in the hope of seeing more of (or all of) the event, or remaining in the UK with the chance of seeing just the 3rd and 4th contacts. A word of warning for those travelling: do try to establish in advance the likely seeing conditions at the observing site. Some who travelled overseas in search of cloudless skies in 2004 succeeded in finding them, but seeing conditions were much less favourable than many stay-at-homes experienced.

For those wanting to know what sort of observations can be made, please see either our final reports in the *Journal*[3,4] or the Venus transit CD-ROM published by the Association in 2004 (and still available from the Office). As in 2004, accurate timings of the event will be considered for publication in our BAA reports for the sake of historical completeness, even if such data are no longer able to improve upon our value of the Astronomical Unit.

The most interesting parts of the event will be to watch for the phenomena visible at ingress and egress, particularly the (irregular?) ring of illuminated atmosphere (often irregularly bright near the planet's pole) that can be seen when Venus is only partly projected upon the photosphere. The chance of catching the planet as a black disk against the inner corona is also of interest, and is a phenomenon that has actually been observed with transits or near-transits of Mercury.

The 2012 BAA *Handbook* gives the circumstances of the transit in some detail.

A Venus transit website and newsletter

A weblog was established earlier this year with a number of aims (both current and historical) set out at its website.[5] The Director explained that he would be coordinating the BAA observations of the transit, and contributed an article about observing Venus, together with links to available pdf copies of our BAA Venus reports cited in this note. The website offers the chance to sign up to receive the newsletter.

Conclusion

Venus is a challenging but fascinating planet to study. There are still puzzles to be investigated by the BAA, and some of these will feature in future reports. In the 2012 February *Journal* we hope to discuss any preliminary observations up to the end of 2011.

Richard McKim, *Director*

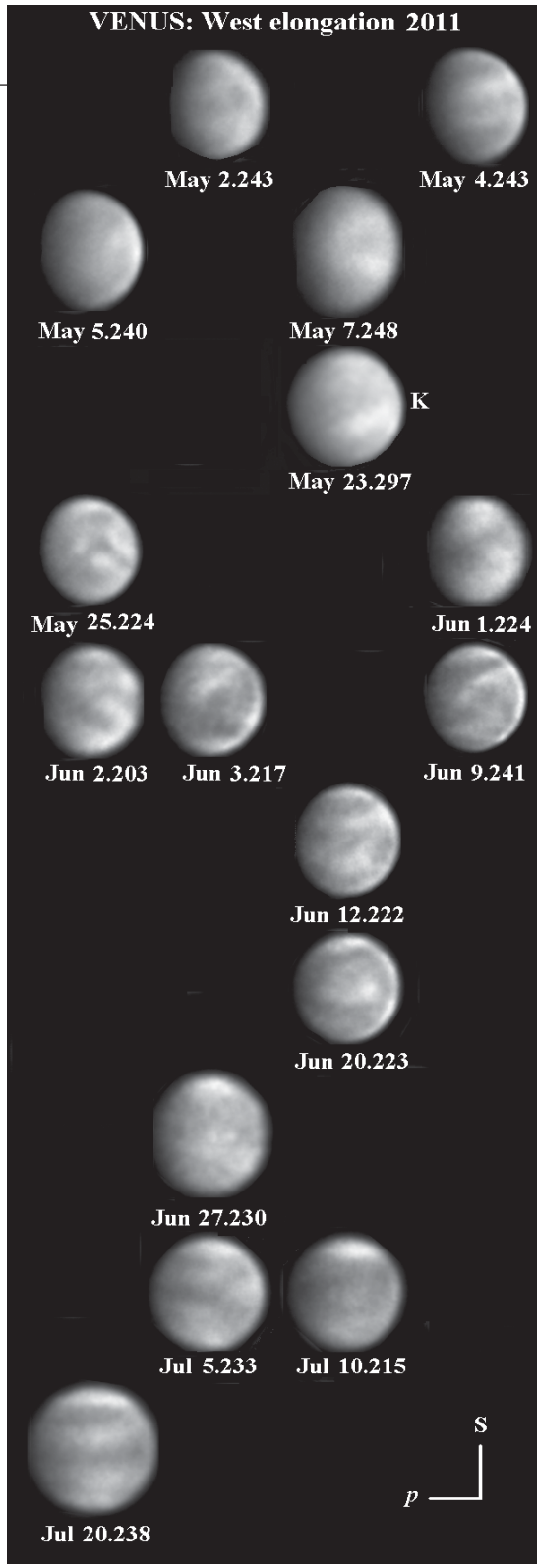

Figure 1. Violet and ultraviolet images of Venus during 2011 May–July by Dennis Put (for details, see text) arranged so that the vertical columns show near-identical longitudes. (In this interval of time the average drift of equatorial features to the right would be just 8.6°.) An image by Willem Kivits (355mm SCT, DMK camera, marked 'K'), has been added for completeness.

References

1 R. J. McKim, 'The elongations of Venus, 1999–2006', *J. Brit. Astron. Assoc.*, **118**(3), 131–144 (2008)

2 R. J. McKim, K. W. Blaxall & A. W. Heath, 'The elongations of Venus, 1991–1998', *J. Brit. Astron. Assoc.*, **118**(5), 254–269 (2008)

3 R. J. McKim, 'The transit of Venus, 2004 June 8: an introduction', *J. Brit. Astron. Assoc.*, **115**(3), 128–129 (2005)

4 R. J. McKim, K. W. Blaxall & A. W. Heath, 'Venus 2004: east and west elongations and solar transit', *J. Brit. Astron. Assoc.*, **117**(2), 65–76 (2007)

5 **http://www.transitofvenus.nl**.