



Aurora Section

Look out for noctilucent clouds this summer

Noctilucent clouds (NLC) have been seen very frequently throughout the UK and Europe for the past number of years (see also page 152). Recently the frequency has been such that NLC have been reported from somewhere on almost every night in June and July. Previously believed to be a phenomenon most often seen in more northern latitudes, reports are now being received from as far south as Portugal and Spain. 2009 proved to be probably the most active year on record with NLC reported on 68 nights in 721 observations, and many displays were thought to be brighter than in previous years.

The Sun may have some effect on the frequency and brightness of NLC and having been at a low level of activity for some while is now showing signs of recovery. It will be interesting to see if increasing solar activity will change the pattern of NLC frequency and brightness over the next few years.

The Aurora Section recognises the huge amounts of data which BAA members provide every year and thanks members for their continuing effort. Many reports received contain data for an entire night, the observer finally giving up as the sky brightens with

dawn. This degree of dedication, however, is not necessarily required and any members who see NLC during the evenings and mornings this summer, even for a few minutes, are invited to send details to myself or post them on Tom McEwan's website www.nlcnet.co.uk. The essential details required are your name, when the NLC was seen, giving a double date for whatever time the observation is made, and the time (please state if UT, BST or other local time). The location is also useful as it is interesting to know the most southerly sighting on each

night. Details such as forms of NLC seen, brightness, elevation and azimuth may be given if the observer feels confident. Further details for observers may be found on Tom's website ('Observing noctilucent clouds') or on the BAA website www.britastro.org/aurora/.

Ken Kennedy, NLC co-ordinator
ken.kennedy42@btinternet.com

Top of page: NLC on the night of 2006 June 22/23, photographed from Dundee by Ken Kennedy.

From the President

A new Director for the Historical Section

I'm very pleased to let you know that Mike Frost has agreed to become Director of the Historical Section, with Lee Macdonald acting as his deputy. They are developing what sounds like a most interesting programme which will raise the profile of the Section, both within and outside the BAA. See Mike's article on the next page for more information about their plans.

Robotic telescope project

After helping us to get this exciting new project off the ground, Jeff Moreland has decided to step down as coordinator and Peter Meadows is taking over. I would like to take this opportunity to thank Jeff for all his efforts in establishing access for BAA members to the remote observing facilities at Sierra Stars and Global Rent-A-Scope. Peter will now be working to expand the use of these facilities by BAA members, particularly for projects in support of our observing Sections. Peter also

writes about his plans elsewhere in 'Notes and News'.

Radio Astronomy Group coordinator

Laurence Newell, who has coordinated the work of the Radio Astronomy Group for several years and overseen a great revival in its fortunes, has decided to step down to give himself more time to spend on software and hardware development projects. The group has recommended to Council that Paul Hyde take over from Laurence as coordinator and Council has approved that recommendation. We are very grateful to Laurence for leading the recent resurgence of radio astronomy in the BAA.

Beyond the International Year of Astronomy

Council has agreed that the BAA will participate in a national programme following on from the International Year of Astronomy 2009 called Beyond IYA. In this we will be joining the original sponsors of the IYA2009 project, the Royal Astronomical Society, the Science

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and Technology Facilities Council, the Institute of Physics and the Society for Popular Astronomy. This programme aims to maintain and further develop the infrastructure and momentum established in IYA2009 to promote public outreach in astronomy. We are fortunate that Steve Owens will continue to coordinate the programme as he has done very successfully for the past two years. In the next *Journal* Steve will tell us about the plans for Beyond IYA and the new ways in which the BAA will be reaching out to a larger audience for amateur astronomy.

BAA Archivist

In the course of moving temporarily out of Burlington House recently while it was being refurbished, it became clear as we worked our way through the cupboards and filing cabinets in our old offices, many of which had probably not been opened for years, that we had many items of great historical interest to the Association. We have now set in place a proper cataloguing and archiving procedure for these items, largely through the painstaking work of Dick Chambers. Recognising the long term importance of this collection, Council has now established the post of BAA Archivist and has appointed Dick as our first official Archivist, recognising the vital contribution he is making to preserving the early history of the Association.

Winchester Weekend

This year's event was generally reckoned to be one of the most successful in recent years. There was a strong theme of practical amateur observing, very much in the tradition of the first Winchester course organised by Alfred Curtis in 1967, and the Solar Section meeting on Saturday afternoon was well attended. Our thanks are due to the organisers, Alan Dowdell and Ann Davies, the volunteers who ran the registration desk, the exhibitors, the sales stands and the staff at Sparsholt College who made us welcome and, as always, fed us extremely well. Next year there will be a Lunar Section meeting on the Saturday afternoon. The dates are 2011 April 15–17 so do put these in your diary now and watch for the booking form in the *Journal*.

Commander Henry Hatfield

Many of our members will remember Cmdr Henry Hatfield RN, a prominent member of the Association for many years, who sadly passed away on April 1. Judging by the many responses I received to my e-Bulletin announcing his death, he was much liked and respected. I have fond memories of visiting his house in Sevenoaks with my local astronomical society many years ago and being



A massive arched prominence on the surface of the Sun imaged by NASA's new Solar Dynamics Observatory.

warmly welcomed by Henry and Mrs Hatfield. His pioneering work in many areas of astronomy was an inspiration to all of us. An obituary will appear in the *Journal* in due course.

The Sun as you've never seen it before

And finally, for those of you who haven't already visited their website, the Solar Dy-

namics Observatory <http://sdo.gsfc.nasa.gov/> is now returning the most amazing high resolution images and videos of solar activity. This is your chance to see how it really happens on the surface of a star. This project, in which UK solar scientists are closely involved, should greatly increase our understanding of dynamic processes on the Sun and how these affect the Earth.

David Boyd, President

Historical Section

A new Director for the Historical Section

Hello there. My name is Mike Frost, and as your new Historical Section Director, I have been asked by the President to write a few words to introduce myself.

My day job is in systems engineering, but astronomy has always been a major part of my life. I have an MSc in Astronomy from the University of Sussex; I am a past-chairman of Coventry and Warwickshire Astronomical Society, a member of the BAA since 1995, and a founder member of the Society for the History of Astronomy. Members may recognise me from astronomical trips around the world, from my appearance at the Winchester weekend a few years ago (lecturing on rainbows, glories and halos), or from the talks which I have given to astronomical societies around the country.

My research interests in the history of astronomy include the history and mythology of sky phe-

nomena, eclipses and transits, especially transits of Venus. I have a long-standing interest in the camera obscura and have visited many such structures here and abroad.

For the SHA, I have written about the lives of a number of astronomers born or active close to my home in Rugby. These include Sir Norman Lockyer, the solar astronomer who discovered helium; Revd Dr William Pearson, co-founder of the Royal Astronomical Society; and Henry Beighton FRS, an 18th century polymath. My most fruitful researches have been into the circle of astronomers centred on Samuel Foster, Gresham Professor of astronomy in the mid-17th century. Foster, who lived in Coventry, was a correspondent of Jeremiah Horrocks, whose life I wrote about in the 2005 June edition of the *Journal* (*JBAA*, **115**(3),2005).





I was surprised and honoured to be offered the Directorship of the Historical Section of the BAA – and very pleased to accept. I am also delighted to say that our President, David Boyd, has secured the services of a very capable deputy for me in Lee Macdonald, whose excellent paper on the history of the Isaac Newton telescope appeared in the previous edition of the *Journal*.

We propose to re-launch the Section at the Exhibition Meeting at Greenwich on June 26. We will have a stand at this meeting and will

be giving a presentation on our plans for the future of the Section. It is our aim to hold a Section meeting as soon as is practicable – we plan for late 2010 or early 2011. Lee will be editing a Section newsletter, to be distributed electronically twice a year. We aim to work very closely with the Society for the History of Astronomy, who can bring the expertise of professional historians to our subject, as well as a vast storehouse of knowledge.

We are keen to mentor and encourage BAA members who are undertaking research projects into the history of astronomy. Over

the years, the pages of the BAA *Journal* have featured many excellent papers on the history of our subject, so there is clearly much expertise out there in the Association. We cordially invite you to join our re-launched Section and share your knowledge with other enthusiasts. Please feel free to contact me through the address at the back of the *Journal* or by email from the BAA website, and please do come and see us at the Exhibition Meeting.

Mike Frost, Director

Deep Sky Section

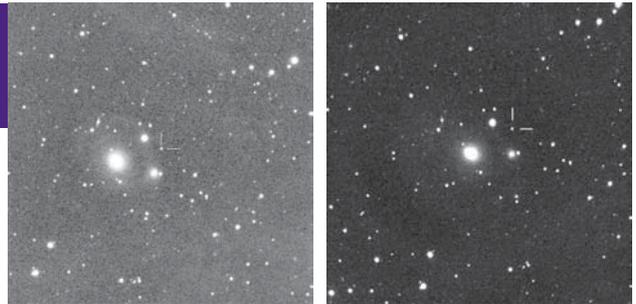
Supernova news

Both Tom Boles and Ron Arbour have had further supernova discovery success. Tom made his 129th discovery on 2010 March 4.808 when he imaged a mag 17.2 'new star' in galaxy NGC 3172, a mag 14.4 galaxy in the tail of Ursa Minor. Located at RA 11h 39m 19.3s and Dec +89° 6' 5.7" (2000.0) the supernova lies in the outer fringes of the galaxy and close to 16th mag galaxy MCG +15-1-10. The discovery was made using one of Tom's 35cm Schmidt-Cassegrain patrol telescopes from his observatory in Coddanham, Suffolk. It has been designated SN 2010af. Details were announced on *CBET* 2194 and *TA Electronic Circular* E2628, from which some of this information is taken. Images of the supernova by Martin Mobberley (March 6.838, Celestron C14 + SBIG ST9XE, 600s, field 13'x13', N up) and Nick James (March 7.2028, Celestron C11 + SBIG ST9XE, 10x600s, field 12.4'x12.4' N up) are shown here.

Ron's discovery was made on 2010 March 15.942 in PGC 82347, a very small (17"x14") mag 17.8 galaxy in Lynx close to the much brighter NGC 2780. It was discovered with his home built 40cm f/5 Newtonian from his observatory in South Wonston, Hampshire. The supernova, of

magnitude 16.7 and designated SN 2010au, brings his total to 23. It lies at RA 9h 12m 36.39s and Dec +34° 51' 17.0" which puts it only 2" east and 1" south of the centre of the galaxy. Details were announced on *CBET* 2217 and 2223, and *TA Electronic Circulars* E2630 and E2631, from which some of this information is taken.

A follow-up image of SN 2010au was obtained on 2010 March 20 by the co-ordinator, using the remotely operated Sierra Stars 0.61m Cassegrain telescope with financial subsidy kindly provided by the Association. The 2-min exposure with a V filter (limiting magnitude 20) showed a pronounced brightening in the same quadrant of the galaxy as noted by Ron Arbour, but the image proved difficult to measure for both magnitude and position. Follow-up observations by Weidong Li (Lick Observatory, University of California) ena-



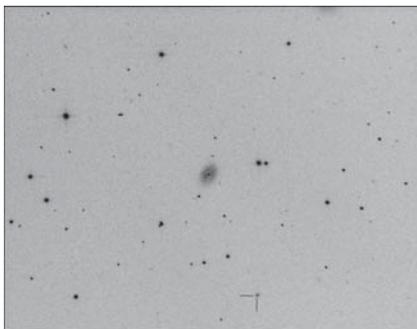
SN 2010af imaged on 2010 March 6 by Martin Mobberley (left) and on March 7 by Nick James. See text for details.

bled Tom Boles to measure positional end figures of RA 36.33s, Dec 16.8". Finally a spectrum was obtained by J. M. Silverman of the University of California, Berkeley on 2010 Mar 22 confirming it as a type Ia within about two days of maximum light (*CBET* 2223).

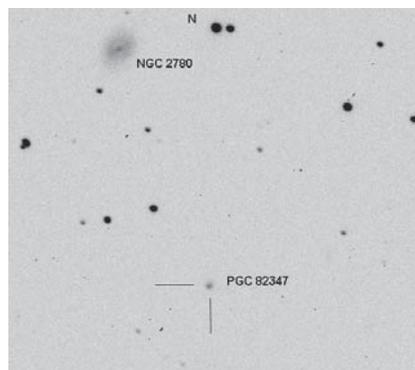
Ron's discovery image is shown here (the large galaxy in the field is NGC 2780) along with images by Guy Hurst (Mar 20 as mentioned above) and Martin Mobberley taken on April 4.860 (Celestron C14 + SBIG ST9XE, 120s 13'x13', N up).

Stewart L. Moore, Director

Guy M. Hurst, Co-ordinator, UK Noval Supernova Patrol



SN 2010au in PGC 82347, 2010 March 15.942. Discovery image by Ron Arbour, 40cm f/8 Newtonian.



Follow-up image of SN 2010au obtained by Guy Hurst on 2010 March 20, using the Sierra Stars 0.61m Cassegrain telescope in California, courtesy of the BAA Robotic Telescope Project. 2-minute exposure with V filter.



SN 2010au imaged by Martin Mobberley on April 4 with his 355mm SCT + SBIG ST9XE CCD.



Solar Section

2010 January

Solar activity continued its upward trend during January, mostly due to increased activity in the southern hemisphere. Most observers recorded Jan 5, 6, 7, 19 & 30 as a blank disk.

AR1039 S27°/054° remained on the disk from the previous month, type Dao, with an area of 100 millionths. On Jan 2 the group developed several additional smaller spots before starting to decline as it ap-

proached the western limb. The group was last seen on Jan 4 type Cao.

AR1040 N28°/240° appeared on the eastern limb type Axx, a probable return of AR1035 from its previous rotation. The group developed to type Bxo on Jan 9 and continued to grow as it crossed the solar disk. As the group neared the western limb on Jan 17 it was type Dao and was last seen rounding the limb on the following day.

AR1041 S24°/054° returned to the disk on Jan 20 (previously AR1039) type Csi on the eastern limb. The group developed to type Eai on Jan 23 before starting a gradual

decline. The group was last observed on Jan 29, type Axx.

AR1042 N22°/131° developed on the disk on Jan 22 type Bxi. The group developed to type Dai on Jan 24 but declined as it approached the western limb. The group was last seen on Jan 26 type Hsx.

AR1043 N25°/320° developed on the disk on Jan 30/31, type Csi containing 7 sunspots with an area totalling approximately 30 millionths.

7 observers reported a Quality Number Q=2.71

H-alpha

Prominences

16 observers reported a prominence MDF of 2.27 for January.

Most prominences throughout January were unremarkable. On Jan 9 a smoking chimney type prominence rose to an approximate height of 93,000km on the SW limb. A small loop type prominence was very active on the eastern limb on Jan 19 and the next day a jet prominence on the NW limb reached a height of 84,000km, with the top looping towards the west limb point.

A large hedgerow type prominence was seen on the NW limb on Jan 22 rising to 74,000km. A round prominence, nearly detached from the limb, was seen on Jan 26 on the NW limb at latitude N45°.

A large but faint prominence was seen at the eastern limb on Jan 30 along with a fine double-loop prominence group at the SSW limb.

Filaments & plage

12 observers reported a filament MDF of 1.07 for January.

Plage was seen around AR1039 on Jan 1, 2 & 3 with bright plage being seen on Jan 3 and 2 filaments. By the following day, the group included a very large filament.

On Jan 9 plage was seen near AR1040 and a short filament at N20°/230°. Plage was also noted around AR1040 on Jan 17. Another large filament was seen in association with AR1040 on Jan 10 stretching approximately 130,000km. A long filament interspersed with long oval plage was seen in the SW quadrant on Jan 30, with also a small filament in the SE quadrant.

Flares

M. Giuntoli reported 3 flares at 12:05UT on Jan 2 and a further 2 flares at 11:10 UT on Jan 23. R. Battaiola recorded the first M-class flare of cycle 24 at 13:40 UT on Jan 19.

M. Leventhal reported 2 sub-flares in association with AR1040 on Jan 15 and a further flare type 1B in association with the same group on Jan 17 (X-ray class C2).

CaK

CaK plage was seen around AR1039 early in

The Isle of Man on the ISS

Many members will remember the successful Out-of-Town meeting that we held in the Isle of Man, hosted by the IoM Astronomical Society. We visited the society's observatory and enjoyed their hospitality over a rather blustery weekend in 2004 September. I particularly remember talking to IoMAS member Dave Storey about his attempts to image the International Space Station as it flew over the island.

Last year was the society's 20th anniversary and I had the honour of attending their celebration dinner at the Creg Ny Baa hotel on the famous mountain section of the TT course. During that event I learned that they had a rather special member, US astronaut Nicole Stott. She is married to a Manxman and both have been members of the society since 2003.

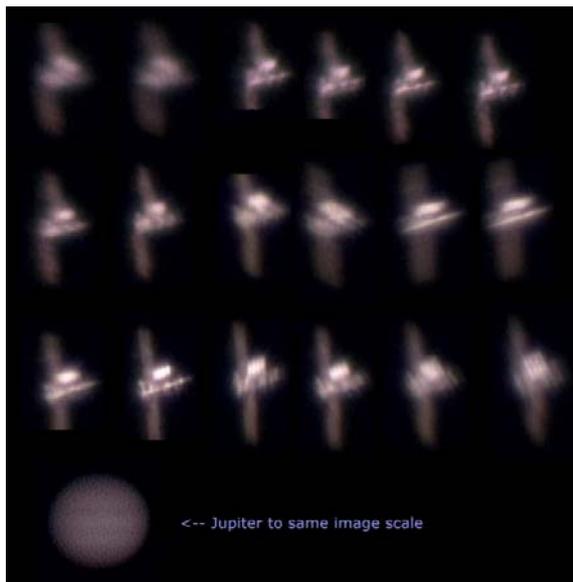


IoMAS member Nicole Stott on the International Space Station.

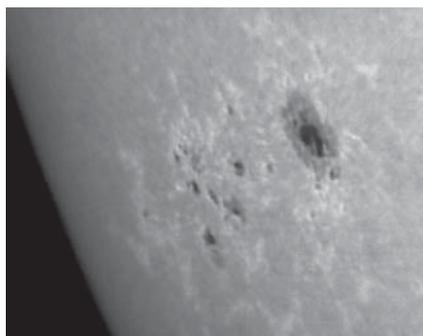
On 2009 August 28 Nicole was launched into space on the space shuttle as one of the crew of the STS-128 mission. Her role was to spend three months on the ISS as flight engineer. The society held its AGM in late September and, for obvious reasons, Nicole could not attend. She did however send down a photo showing a picture of the observatory and IoMAS members which she had placed in the window of the ISS with the Earth in the background. Dave Storey's images of the ISS also made their way to the same window.

Howard Parkin, Chairman of the Society also arranged a live video link-up with Nicole at the Manx Museum where he is employed as Public Services manager. Twelve Year 10 pupils had a unique opportunity to interview Nicole in space and ask her questions about spaceflight.

Nick James



Dave Storey's images of the ISS transit on 2009 September 15, 21:15-21:29 UT. 152mm f/8 refractor + x2.5 Barlow lens, TouCam webcam.



AR1041 imaged by Dave Tyler on 2010 January 21 at 12:20 UT.

the month. AR1040 also developed plage which was observed on Jan 8/9 and also on Jan 17.

Strong plage was noted around AR1042 on Jan 26, and like a tail following AR1041. On Jan 30 & 31 very large extended streaky plage was aligned north–south at S25°/055°. Small bright plage was also seen ahead of and amongst AR1043.

2010 February

February was the first month since 2007 January to record sunspot activity every day.

BAA sunspot data, 2010 January–February

Day	January		February	
	g	R	g	R
1	1	18	1	15
2	1	19	1	13
3	1	16	1	12
4	1	13	1	10
5	0	6	1	14
6	0	1	2	31
7	0	3	2	35
8	1	8	3	55
9	1	17	3	48
10	1	23	2	45
11	1	33	2	43
12	1	31	2	38
13	1	32	2	38
14	1	27	2	30
15	1	26	2	24
16	1	22	2	24
17	1	17	2	30
18	1	8	1	20
19	0	0	1	18
20	1	8	1	17
21	1	16	1	15
22	2	29	1	15
23	2	35	1	19
24	2	36	2	26
25	2	32	2	25
26	1	22	2	21
27	1	13	1	16
28	1	12	1	12
29	1	11		
30	0	1		
31	1	14		

MDFg 0.96 (52) 1.59 (52)
Mean R 17.63 (44) 25.26 (46)

The northern hemisphere continued to dominate, hosting substantial sunspots during the month.

AR1043 N25°/324° continued across the disk from the previous month, approaching the central meridian on Feb 1 type Hsx with an area of 30 millionths. The group remained unchanged until Feb 6 when it reduced to a single Axx spot approaching the western limb.

AR1044 N18°/314° made a brief appearance as a single Axx type spot on Feb 5.

AR1045 N23°/N252° was first seen on the disk on Feb 6 type Dai with an area of 90 millionths. By Feb 8 the group had extended in longitude to some 232,000km, type Fki with numerous small spots between the main active areas. The group was type Fac on Feb 10 but most of the small spots between the leader and follower had decayed by the following day leaving two distinct areas of spots. The group was last seen on Feb 13 approaching the western limb type Bxo.

AR1046 N24°/185° rounded the eastern limb on Feb 7 type Bxo. The group developed to type Csi on Feb 10 and to type Dao by the next day, consisting of several penumbral sunspots in the follower part of the group, giving a total area of approximately 140 millionths. The follower continued to develop more spots by Feb 13 type Cso. The group then slowly declined and was observed on Feb 17 as two Axx spots approaching the western limb and later that day as just a patch of faculae.

AR1047 S17°/165° made a brief appearance between Feb 8 and 9 type Axx.

AR1048 N21°/97° rotated over the eastern limb on Feb 14 type Bxo. The group remained unchanged until Feb 17 when it reduced to type Axx and then faded on the disk.

AR1049 S19°/119° formed on the disk on Feb 17 type Cso consisting of 12 sunspots. The group dominated the disk for the next few days growing to type Dsi with an area of 70 millionths by Feb 20. The group then slowly declined to type Cso on the next day and type Bxi consisting of just four small spots on Feb 22. The group rounded

the western limb on Feb 24.

AR1050 S19°/054° developed on the disk on Feb 23 type Bxo. The group progressed towards the western limb remaining unchanged but was not seen on Feb 27.

AR1051 N15°/324° first observed on Feb 24 rounding the eastern limb type Cso. The group remained unchanged until Feb 28 when it was type Hsx approaching the central meridian.

9 observers reported a Quality Number Q = 4.84

H-alpha

Prominences

15 observers reported a prominence MDF of 2.96 for February.

A very bright oak tree shaped prominence was seen on the NE limb on Feb 2. On Feb 6 several observers reported an 'outstanding' arch or pyramid shaped prominence on the NE limb at NE60°. On Feb 17 a very bright arching loop was seen on the SE limb which showed internal structure changes within a 15 minute period. The prominence reached an approximate height of 83,000km.

Two large prominences were observed on Feb 18, one on the NE limb and the other on the SE limb both achieving a height of 93,000km.

Feb 20 brought a spectacular flame shaped prominence on the NW limb which achieved a height of 102,000km. Also a striking prominence group at the SE limb was seen between 11:44 and 12:02 UT, consisting of an inclined spike and a '3' shaped prominence.

A fine loop prominence graced the NW limb on Feb 27.

Filaments & plage

11 observers reported a filament MDF of 1.28 for February.

The arch or pyramid type prominence of Feb 6 had 2 nearby filaments.

The highlight of the month was a long curving filament emanating from the follower spot of AR1045. The filament was first seen on Feb 10 extending some 140,000km northward at N30°/240° with the topmost section curving westward. It was still present two days later but shorter and in addition a small dark

North & south MDF of active areas g

	MDFNg	MDFSg
January	0.42	0.54 (39)
February	1.23	0.39 (40)

g = active areas (AAs)

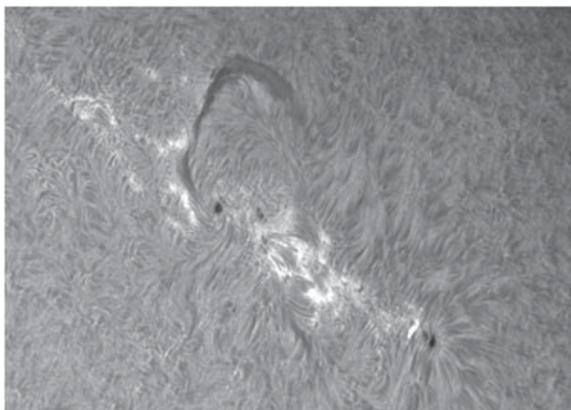
MDF = mean daily frequency

R = relative sunspot number

The no. of observers is given in brackets.



Flame prominence on February 6 at 13:03 UT, also by Dave Tyler



AR1045 & dark filament, 2010 Feb 10, 11:39 UT. Dave Tyler

filament was below it surrounded by bright plage.

Two filaments were seen on Feb 17 parallel to one another and near to the W limb. A very small filament appeared attached to a small prominence on the W limb.

Curve shaped plage was seen around AR1049 on Feb 20 and also bright plage near the E limb. A trail of dark filaments and spots across the ESE limb was also seen in association with the prominence group at the SE limb.

A long dark filament was also

present at the WNW limb along with a dark filament near the NNW limb.

Flares

M. Giuntoli reported 3 flares on Feb 7 at 10:40 UT and a further flare on Feb 8 at 12:30 UT.

M. Leventhal reported a class 1N type flare on Feb 8, active at the start of his observation, peaking at 22:00 UT and ending at 22:20 UT. The flare was in the region of AR1045, X-ray class C-2. Leventhal also reported a surge in association with AR1051 on Feb 26 between 22:20 and 22:26 UT.

Lyn Smith, Director

Radio Astronomy Group

Over the last 12 months, solar cycle 24 has at last started to show some real flare activity as active areas on the Sun begin to develop in complexity and size. The activity chart (Figure 1) shows our recorded Sudden Ionospheric Disturbances (SIDs) over the past 5 years. (As the SIDs that we record are from solar flares occurring only while the Sun is above the horizon, monthly figures are skewed by the varying day length over the year.) 2008 ended with a single C-class flare in December, then followed 6 months with no recorded flares. In 2009 July we recorded 2 C-class flares, while August and September were again blank. October included 3 B-class and 3 C-class flares, November was again blank, while December produced 6 C-class flares. The chart includes 2010 January which, despite the short day length, produced the highest level of activity in 31 months with 3 M-class and 10 C-class flares.

Figure 2 shows the visual relative sunspot number (R) over the same period, as recorded by the Solar Section. Visual activity is clearly rising through the first half of 2009 despite our lack of recorded flares. The active areas seen over this period were mostly small spots which were inactive, showed little complexity, and did not develop much while visible. The active areas in October and December showed more complexity (hence the higher 'R' recorded), while those in 2010 January grew quite rapidly. Note that the smoothed curve for 'R' is derived over 13 months, and so the last 6 months shown are provisional.

Observers in 2009 were Roberto Battaïola, Colin Clements, John Cook, Mark Edwards, Paul Hyde, Mike King, Peter King, Bob Middlefell and John Wardle.

John Cook [jacook@clara.co.uk]

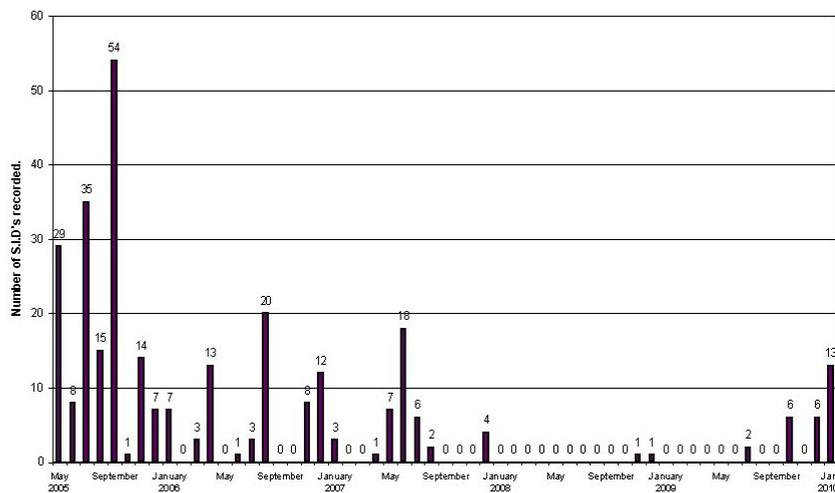


Figure 1. VLF flare activity recorded 2005–2010.

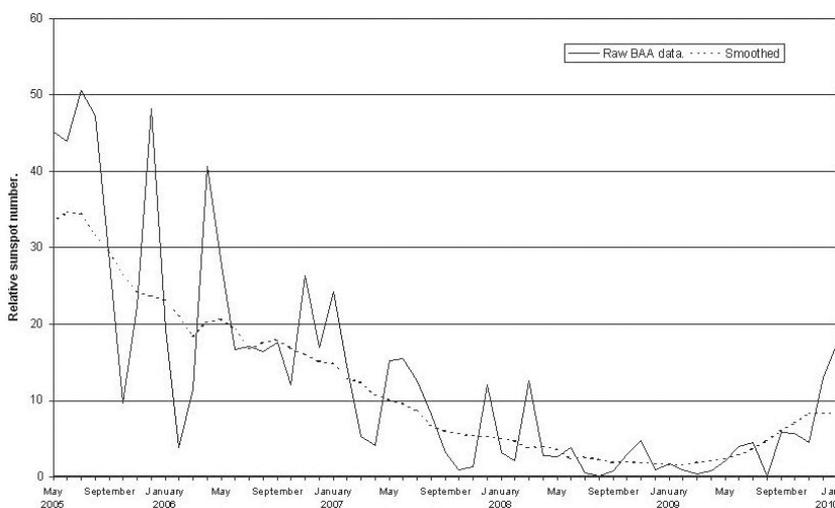


Figure 2. Relative sunspot no. 2005–2010.



Historical note

Johannes Kepler in Prague – and a new museum

Four centuries ago in 1610, the Kepler family were living in their last place of residence in Prague, in a house in a courtyard off Karlova Street (*Karlova ulice*), very close to the east end of Charles Bridge (*Karlův most*). The house is No.188, *U Francouzské koruny* (French Crown House), and has a passage through to Anenska Street. Kepler spent 12 years in the city, publishing his most important works including *Astronomia Nova*. As is well-known, he used Tycho Brahe's observations of Mars to demonstrate that the planets move in elliptical orbits, and to state his three laws of planetary motion. Kepler didn't know it at the time, but for him 1610 would prove to be the last of his happy years in Prague. By the end of 1611 his wife and one child would be dead, and his mentor Rudolph II deposed by the Emperor's brother, Matthias.^{1,2}

To commemorate the 400th anniversary of Kepler's birth in 1971 a wall plaque was installed in the passageway leading from the street. In the same year our *Journal* marked the occasion with a series of papers.³ In 2009 a small one-room museum was opened in the courtyard, and somewhere in this building – although it is no longer known where – the Kepler family lived. We do know for sure that he made observations from the tower shown in the picture, although Kepler was better with calculations on paper than with practical observational matters.

In 2009 December my family visited the new museum. Entry is 30 Czech crowns (€1). It has no Kepler artefacts, but cleverly uses the available space with wall and hang-

ing displays about his life and astronomical (and other) work, and has some nice decorations on the ceiling. One can buy a leaflet about the Astronomical Clock in the Old Town Square, and various badges. The museum is not far from the Klementinum, whose tower was also once used for astronomical observation, and which now offers fantastic views over the city.

Of course, Prague is rich in its astronomical affiliations. There is the Stefanik Observatory,⁴ which is open to the public at various times. You don't need to go far to see other fascinating sites. Catch the No. 22 tram from Malostranská square, enjoy the view over the city as it attacks the steep hill, then, as it reaches the top you will see on the left the Belvedere from where Brahe observed, and very soon Prague Castle comes into sight. Stay on the tram until you pass the Loreta, and finally reach the stop adjacent to the Jan Kepler Gymnazium (a secondary school marking the spot where a previous house of Brahe's once stood). There's a modern (1984) statue of Kepler and Brahe here, and walking a little further you come to the Strahov Monastery, where there is a phenomenal old library with large astronomical globes. Walking through Prague castle brings you to Golden Lane, a historical street within the castle complex where several astronomers and mathematicians lived. (Unfortunately entry is no longer free, due to the recent greediness of the castle authorities: now counted as part of the castle tourist route, you must pay 250 crowns to visit what is now, after all, just a tiny commercial street.)

Back in the Old Town Square you can see the famous astronomical clock in operation every hour, and the Tyn Church with Tycho Brahe's tomb just across the square. The 400th anniversary of his death was marked in 2001, when local astronomers placed flowers upon his tomb. If you are more adventurous you can also visit the castle of



A collage of recent photographs taken at the new Kepler Museum (R.J.McKim).

Benatky nad Jizerou just outside Prague, from where Tycho once observed. A complete history of Czech astronomy was published by Slouka.⁵ Finally, you might like to finish your tour at our family's favourite restaurant, Cafe Louvre on Narodni Street, where famous literary figures such as Capek and Kafka once used to meet, not to mention Albert Einstein during his brief sojourn in the city.

It is good to see a Kepler Museum in Prague after so many years, even if only a small one. Its opening times are 10:00–18:00, Mondays excepted.

Richard McKim

- 1 J. Hrubes & E. Hrubesova, *Foreigners in Prague*, Orion, n.d. (circa 2000)
- 2 P. A. Moore, *The Great Astronomical Revolution*, Albion Publishing, 1994
- 3 See the *BAA Journal* of 1971 December (82(1)) for several Kepler papers.
- 4 R. J. McKim, *J. Brit. Astron. Assoc.*, **117**(1), 7–8; **117**(2), 101 (2007)
- 5 H. Slouka, et al., *Astronomy in Czechoslovakia from its early beginning to present times*, Osveta, Prague, 1958 (in Czech)



Johannes (Jan) Kepler (1571–1630), reproduced from Ref. 5.



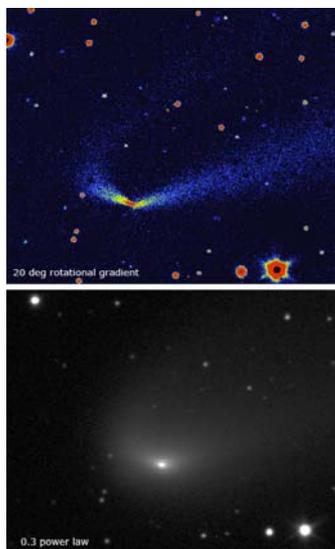
Instruments and Imaging Section

Robotic telescope observing with the BAA

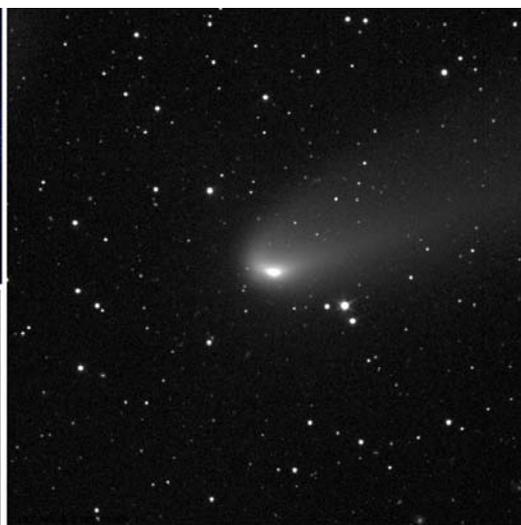
Have you ever wished you had access to a telescope that can image down to magnitude 20 from the comfort of your own home? This is now made possible by using the growing number of robotic telescopes around the world that are available for amateur astronomers to acquire such CCD imagery. These instruments are located at dark observing sites and usually have much better weather conditions than here in the UK. However, most require payment, an Internet connection for downloading the CCD imagery, and software for display and analysis of the object imaged.

In 2008, using income derived from the legacy of renowned BAA observer Harold Ridley, the Robotic Telescope Project was started to encourage members to contribute to the various BAA Observing Sections using robotic telescopes, by providing a 50% subsidy on commercial rates (up to a limit per member). The telescopes selected to be part of this project were the Sierra Stars Observatory Network (SSON, <http://www.sierrastars.com/>) and Global Rent-A-Scope (GRAS, <http://www.global-rent-a-scope.com/>). To date all members who have taken part in the project have used the SSON telescopes – the Sierra Stars 61cm f/10 Cassegrain research-grade telescope at Sierra Mountains in California, and the University of Iowa's 37cm f/14 Rigel Telescope in Sonoita, Arizona, USA. A third telescope at Grove Creek Observatory in New South Wales in Australia is currently being added to the SSON (this being a 0.36m f/6 Celestron C14 Schmidt-Cassegrain).

The Sierra Stars CCD images are some 1500 pixels by 1500 pixels covering about 20' by 20', with dark frame and flat field already applied. The 3MB zip file containing the image in FITS format is usually available for FTP download a few hours



Comet 81P Wild, imaged on 2010 March 11 with the 61cm Sierra Stars f/10 Cassegrain. FOV of main image 20'.4x20'.4, N up. Nick James.



after it was taken. These images with their reasonably large image size are ideally suited for imagery of deep sky objects, comets, variable stars, novae, supernovae or asteroids. An example of a deep sky object, NGC 2261 (Hubble's Variable Nebula) and a comet, 81P/Wild taken by Nick James accompany these notes while an example of a supernova image taken by Guy Hurst can be seen in the Deep Sky Section Supernova News in this *Journal*.

If you would like to take advantage of the BAA Robotic Telescope subsidy, please complete the form on the Instruments and Imaging Section Robotic Telescope web page (<http://www.britastro.org/iandi/>), then follow the link to the Robotic Telescope Project). On the form, a short summary of your proposed observations is required. This will then be reviewed, usually by the relevant Section Director, before telescope credit is allocated. One of the conditions of participating in the Project is that your imagery or measurements derived from your imagery should be submitted to one of the BAA Observing Sections or form part of a BAA *Journal* paper.

If you have any questions please email robotscope@britastro.org, where assistant coordinator

John Cave or myself will be happy to try to answer your query. We look forward to receiving your completed application forms and your participation in this exciting BAA project.

Peter Meadows, *Robotic Telescope Coordinator*

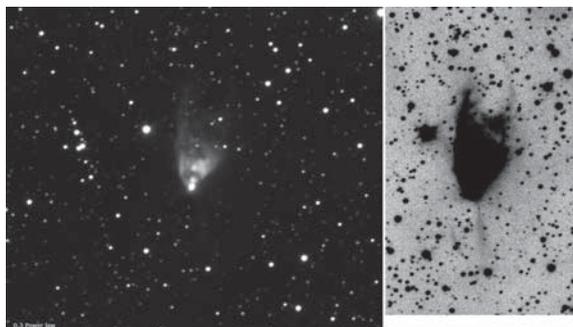
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NGC 2261 (Hubble's Variable Nebula), 2010 March 11, 03:29 UT. 300s unfiltered exposure. 61cm f/10 Cass. (Sierra Stars). Nick James.