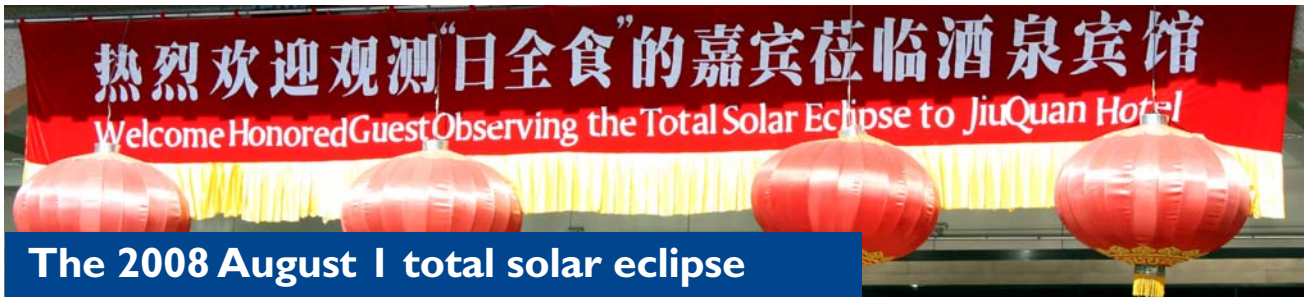
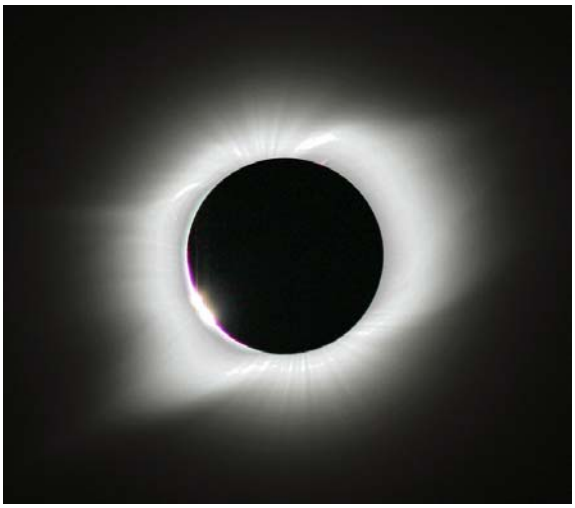


The 2008 August 1 total solar eclipse

The umbra of the total eclipse of 2008 August 1 touched down near the sunrise terminator in northern Canada at 09:21 UTC. It then passed across northern Greenland and within 7º of the North Pole before landfall in northern Russia at 10:10 UTC. By 10:45 the umbra reached Russia's third most populous city, Novosibirsk, where the inhabitants saw a total eclipse of 2m 18s. The shadow moved on into northwestern China reaching the Gobi Desert city of Jiuquan at 11:15 UTC. Six minutes later the shadow lifted off the Earth's surface near to the Chinese city of Xi'an. For most of its path in the far north the weather prospects were poor but the situation improved dramatically towards the end of the track with the clearest conditions expected in northwestern China.

Several groups of BAA members travelled to see the eclipse. Most headed to the far end of the track for better weather but Mike Maunder had a great view for just under 3 minutes from an aircraft at 36,000ft at 82ºN, just off Franz Josef Land in the Russian Arctic. He reports that of additional objects, only Mercury and Venus were seen from the air in spite of the clarity at that height.

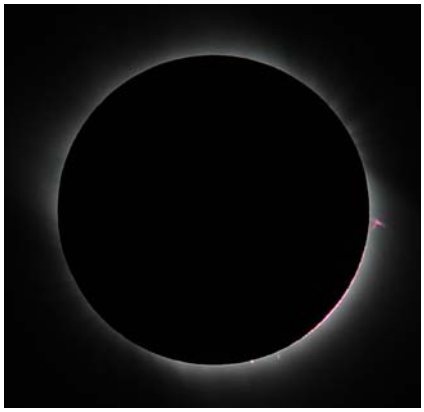


Much further along the track Martin Mobberley observed the eclipse with the Voyages Jules Verne (VJV) group at Lake Ob, outside Novosibirsk. The lake provided an opportunity to get widefield images of the eclipse with the corona reflected in the water, but wind speeds at the site were so high that Martin decided to shelter behind one of the tour buses. This was a good move since he managed to get some very sharp images of second contact and the corona.

Sheridan Williams, observing with the Ancient World Tours (AWT) group at Weizixia, around 120km from Hami, China, had some scares with cloud but, in the end, had a supurb view in a very clear sky. Other observers in the same general area were not so lucky and their view of totality was spoiled by cloud at the critical moment.

Further along the track an Explorers Tours group of 305 people assembled around 60km NE of the Chinese town of Jinta in the Gobi Desert. I was in this group and we had some worries when we arrived at the site since there were a number of low, very slow moving cumulus clouds near the Sun. As is traditional John Mason had acquired a 'lucky eclipse hat' and he wore this during a pre-eclipse piece to camera which was shot just as the Sun was obscured by a particularly large cloud. We all knew that a small cloud in the wrong place at the wrong time could easily ruin our view of totality. The hat trick seemed to work though and shortly after the shot was finished the Sun emerged into a clear sky in time for first contact. As it happened clouds would not trouble us again.

As second contact nears the light changes in a way that is difficult to describe but which is well known to eclipse chasers. The anticipation rises and then suddenly Baily's Beads



Images

Top of page: A welcoming banner at the Explorers group hotel in Jiuquan. *Hazel McGee*
Left, top: Baily's Beads at 2nd contact. 1/2000s, Canon 40D, 560mm FL, f/8. Explorers site, Gobi Desert. *James West*
Left, below: Dr John Mason talking to camera prior to first contact. Note the very effective lucky eclipse hat. This video will appear on an eclipse DVD which will be available from the BAA in due course. *Nick James*
Above, top: Tak FS60c (355mm FL, f/5.9), Canon 300D, ISO 400, composite of frames from 1/2000s–1/13s. Stacked and radially unsharp masked. Novosibirsk. *Martin Mobberley.*
Above, lower: Tak Sky 90 (FL 500mm). Canon 10D, ISO100, 1/640s. Explorers site. *Gary Gawthrope*

Third contact. Tak Sky 90, Canon 5D, 1/1250s, ISO 100. Explorers site. *Tony Morris*.

appear and the corona flashes into view. James West's image from the Explorers site taken at 11:12:52 shows these well, together with a number of small prominences near the second contact point. Martin Mobberley's image, taken from the VJV site, is a composite of several different exposures processed to show second contact and the detailed structure in the corona. Since the Sun is very quiet at the moment we expected a classic solar minimum corona and we were not disappointed. Sheridan Williams' image on the cover, taken from the AWT site, also shows the streamers well.

Given the low level of solar activity we were lucky that a number of prominences were on view. Of particular note was a large prominence at the 3 o'clock position which was visible well before second contact but whose full extent was revealed just before third contact. Gary Gawthrope's image taken from the Explorers site shows this well.

Mercury and Venus were easily visible during totality as shown in my widefield picture on the cover. This is a composite of two consecutive exposures processed to show the foreground and the sky simultaneously. It shows how lucky we were to dodge the clouds at our site but it also gives some idea of the naked-eye view during totality. In fact, my main memory of this eclipse is the view around the horizon, particularly the vividly illuminated, snow-capped mountains to the southwest.

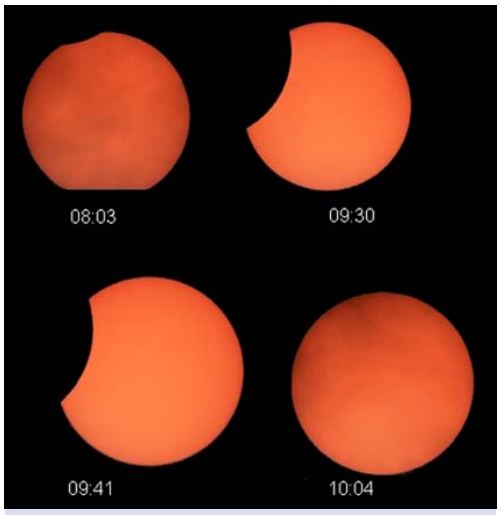
After only 1m 50s at the Explorers site the eclipse was over with a dramatic diamond ring, captured beautfully by Tony Morris at 11:14:42 UTC. The large prominence at 3 o'clock is still clearly visible in this image along with some smaller prominences near the third contact point.

The eclipse was over but many of us continued on our travels over the next few days. On a visit to the Chinese city of Xi'an on August 5 Sheridan Williams obtained this photo of an amazing motorcycle-trailer-based telescope. The owner was charging 10 Yuan (around 80p) for a close-up look at the young crescent Moon. *Sheridan Williams*.

A large telescope seen on the streets of Xi'an on August 5. The owner was charging 10 Yuan (around 80p) for a close-up look at the young crescent Moon. *Sheridan Williams*.

The eclipse was, of course, visible as a small partial from the UK and the weather cooperated in many places. Geoffrey Johnstone from Warwickshire submitted the images of the partial eclipse shown here.

Nick James



The partial eclipse imaged from Warwickshire by Geoffrey Johnstone.

From the President

Robotic telescopes

As I write this (mid August) we seem to be experiencing one of the worst spells of poor (and hence cloudy) weather for some years, certainly as far as summer months are concerned. Therefore the proposal in the last *Journal* from Richard Miles and Roger Dymock for a remote observing scheme under the auspices of the Ridley Grant seems doubly attractive. What is more, the bad weather does not seem to have been restricted to the UK as more and more variable star observers, at least, from across Europe have been reporting observations made with the Bradford Robotic Telescope.

I don't know about you, but I saw very little of the recent solar eclipse and was very jealous of those who went to China. Then the Perseids were virtually totally clouded out. Even worse was the email I then received from fellow variable star observer Colin Henshaw, on holiday on the island of Mauritius, in the Indian Ocean. He wrote that a nice clear night was looming, he had just detected Venus in the western sky and there was a touch of Earth shadow along the eastern horizon during twilight...

Observers' Forum

I hear the occasional moan that the *Journal* doesn't carry enough members' images/photographs, or those that do appear are always from the same people! Ever wondered about that? The answer is surely obvious. And as well as your images, what is needed is a little descriptive text, not just about the image itself but perhaps about the obstacles you had to overcome to obtain it.

For example, I gave a talk to a local astronomy group some years ago about photoelectric photometry. With that particular technique around 1000V has to be applied to the photomultiplier, albeit at a very small current. Now, it was a nice damp autumnal night and as you probably know, damp and volts don't take too kindly to one another. So, I was at the eyepiece, aligning my star, when I heard this regular ticking noise. A little investigation revealed it was coming from the photometer where a little bit of that voltage was leaking to earth through the casing of the photometer tube, via the telescope! Needless to say, I quickly turned it off, but did I shut down and wait for the next day to effect repairs? No, I got my soldering iron out and around mid-

night, made good the bad connection so that I could continue observing and get a good time of minimum for the eclipsing binary I was observing. You can't afford to miss a really good clear night, can you? Anyway, the audience seemed to find the anecdote amusing! So, if you have a story to tell, don't keep it to yourself, especially if you have an interesting observation to accompany it.

My first year as President

By the time you read this my first year as your President will be drawing to a close and it's been interesting looking back at some of the topics discussed at Council meetings. These have ranged from such obvious things as the Association's finances and the Library (the latter especially so with the turmoil that resulted from our temporary removal to other premises) to matters of a much lighter nature. These have included whether we should consider Sunday meetings (I believe we plan to try one soon) and whether we should attempt to organise another Christmas lunch! In the main though, Council meetings are fairly serious affairs and Council members are always extremely aware that we must not just attract new members but retain them once they have joined. This was one reason I was keen to endorse the proposal for a new members' coordinator a while back. It will be interesting to see what the next year brings.

Don't forget to send in your ballot paper for next year's Council before the closing date of October 15. Council members are always grateful for your endorsement of their work by the votes you cast.

International Year of Astronomy

I have been corresponding since the Cambridge VSS/AAVSO meeting with new member Carl Knight, who is keen to take astronomy into the classroom (not that he is a teacher, but he does have three children). He, in turn, found Pamela Gay's short talk at that meeting on 'Peer-to-Peer Astronomy Education' (see the last Variable Star Section *Circular* for details) very stimulating. Since then he has been working with Pamela and myself with the intention to produce a pack to stimulate interest by several means: podcasts, contact with local astronomers and via the BAA, etc.

Pamela has also been very busy working on her 'Portal to the Universe' website (see below), that seeks help from all those involved in astronomy and especially those who are responsible for making information available via the Web. So, if any member is already involved in providing such content or knows of a member at their local astronomical society who does, perhaps they could get in touch with Pamela?

Roger Pickard, *President*

International Year of Astronomy

A web-based 'Portal to the Universe'

The International Year of Astronomy Cornerstone Project 'Portal to the Universe' (PTTU) seeks information on all RSS-based astronomy content feeds (Blogs / Podcasts / Vodcasts / etc.) and embeddable widgets. The Portal to the Universe seeks to become a one-stop shop for finding online astronomy content, including news, blogs, pod/vodcasts, image feeds, and astronomy related widgets. We will not be creating content - we will be showcasing content from the community. Details on the Portal to the Universe can be found here: **http://www.astronomy2009.org/cornerstone-projects-mainmenu-80/the-portal-to-the-universe-mainmenu-85.html**

We are set to go into beta on 2008 December 1, and to make that launch a success we are working to index all blogs, pod/vodcasts, image feeds and other new media content. If you are a new media content provider and would like your content included in the beta release of PTTU, can you please contact Dr Pamela L. Gay at **pamela@starstryder.com**.

We will also be building a 'yellow pages' of astronomy, including all astronomy community participants, from machinists building mounts to artists creating space-related jewelry, and all the observatories, vendors, and science centers in between. If you would like to be notified when online forms are available to sign up to be in the directory, please also email **pamela@starstryder.com**.

Pamela Gay

Meteor Section

A bright Taurid year?

In most years, meteor observers give the majority of their autumn attention to the reasonably strong activity of the Orionids during the third week of October, while more recently the Leonids in mid-November have enjoyed intense interest around the time of the enhanced rates associated with the return of their parent comet. Neither shower is well-placed in 2008, with strong moonlight seriously affecting their most active periods. Instead, observers are encouraged this year to carry out watches during the rather neglected Taurid shower, which is active at relatively low levels from mid-October until late November.

The Taurids are produced by debris shed from Comet 2P/Encke, a swathe of material containing more mass than even the 109P/Swift–Tuttle (Perseid) stream, but ancient and very much spread out across the inner solar system by the gravitational influence of the planets. As a result, the shower has a broad, somewhat flat activity profile, lacking the short, sharp peak found in the likes of the Perseids. Rather, activity shows a steady rise to broad maximum, reaching sky- and radiant-altitude corrected Zenithal Hourly Rate about 10 during the first week of November.[1] Observed rates of between 5 to 8 meteors/hr are typical late on an evening in early November when the two radiants – a northern branch near the Pleiades, and a southern to the west of the Hyades – are high in the southern sky. The double radiant structure of the Taurids may be a result of separate epochs of material ejection from 2P/Encke in the past.

Taurid meteoroids enter the atmosphere at relatively low velocities (*ca.* 30 km/s) and over the years the shower has gained a reputation as a source of slow, bright events. Analysis of BAA observations from the 1980s shows that while the Taurids in some years do exhibit a marked abundance of fireballs (meteors of magnitude –5 or brighter), in a typical year the shower on average produces no

A spectacular Taurid fireball captured on 1991 November 8–9, during that night's major auroral display. *Image: John Fletcher.*

greater frequency of very bright events than others such as the Perseids or Geminids.[2]

Years when enhanced numbers of bright Taurids do occur are identified as coinciding with encounter between Earth and a 'swarm' of larger material ejected from 2P/Encke into the meteoroid stream. Several larger objects are thought to be members of the extended Taurid complex, including a couple of Apollo asteroids: a plausible candidate for the Tunguska fireball of 1908 may be a particularly large 2P/Encke-derived debris fragment. Larger meteoroids in the Taurid 'swarm' are trapped in a 7:2 gravitational resonance with Jupiter, leading to regular encounters. It is these which give rise to the elevated frequency of bright Taurids in some years but not others. We last encountered the 'swarm' in 2005, and during the closing week of October and opening week of November in that year, several Taurid fireballs were reported to the Meteor Section (many by casual observers). Previous encounters in 1988 and 1991 also led to large numbers of fireball reports: one notable example was seen by several witnesses during the auroral storm of 1991 November 8–9. The 2P/Encke debris stream model developed by Asher & Izumi[3] suggests that we should again see numerous Taurid fireballs in early November 2008 – giving added incentive for observing this under-watched shower this autumn.

Absence of moonlight favours late-evening observations in late October and early November (although there will doubtless be the usual distractions of bonfires and fireworks early in the evening at this time). The first quarter Moon sets well before midnight before November 6, and productive watches in dark sky conditions should be possible as late as Nov 9–10. As for other showers, observers are encouraged to carry out standard watches,[4] recording relevant details for all Taurid and sporadic meteors. Although rates will in all probability be low, photographic observers may like to attempt capture of bright Taurids on 10–15-minute exposures at ISO400 using wide-field exposures directed towards Aries/Andromeda in early evening, and perhaps Orion/Gemini after midnight.

It would certainly be of interest to have some more concentrated watch-time devoted to this shower after some years of neglect. Like other showers, the Taurids are capable of springing occasional surprises, and only by maintaining coverage year after year can we really be sure of their longer-term behaviour.

Neil Bone, *Director*

1 Bone N. M., *J. Brit. Astron. Assoc.*, **101**(3), 145–152 (1991)
2 Evans S. J., *ibid.*, **103**(3), 111–114 (1991)
3 Asher D. J. & Izumi, K., *Mon. Not. R. Astron. Soc.*, **297**, 23–27 (1998)
4 Bone N., *J. Brit. Astron. Assoc.*, **114**(4), 215–218 (2004)

Jupiter Section

Jupiter in 2008: Aftermath of the global upheaval

In 2007, Jupiter displayed the spectacle of a 'global upheaval', with large-scale changes in colour and vigorous outbreaks of fast-moving spots in several latitude bands. In 2008 the planet is gradually returning to normal, but not without exciting new phenomena, which have been discovered now as we are observing this phase of the climatic cycle in far greater detail than ever before. The main features are indicated on Figure 1; compare with appearances in 2007 (*Journal*, 2007 June, p.113; 2007 Oct., p.226; 2008 Feb., p.9). Full details of the events in this report are on our web site, **http://www.britastro.org/jupiter/2008reports.htm**

South Tropical Region: The Baby Red Spot is shredded by the Great Red Spot

The South Equatorial Belt (SEB) had almost fully revived by the end of 2007, but there is again intense turbulence within it, arising in three sectors. One is the usual 'wake' following the GRS, and the other sectors arose as mid-SEB outbreaks on March 8 (at L2= 100, just preceding the GRS) and March 21 (at L2= 258). The persistence of this intense convective activity may explain why the SEB has not yet developed the red colour that usually follows Revivals.

The South Tropical Zone has shown an unusual eddying tendency since summer 2006, which in 2007 was manifested as two South Tropical Disturbances, which in turn led to spectacular circulating current. By early 2008, this vorticity had evolved into yet another novel form: two dark anticyclonic ovals. They were probably derived from the jet-stream vortices that recirculated and merged in summer 2007, and they belonged to a rare class of ovals that emerge drifting east from a STropD. Remarkably, one of them had a vivid red core (dubbed the Baby Red Spot, BRS). It was alongside a third red spot (Oval BA, now only pale or-

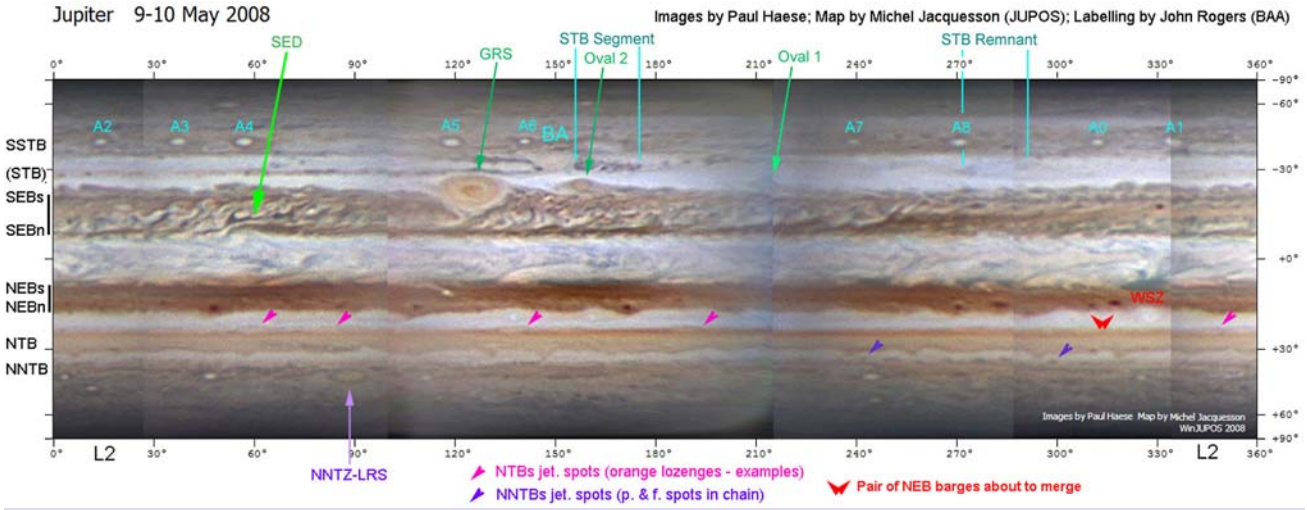


Figure 1. Map of the planet, 2008 May 9–10. Images by Paul Haese (Australia), map by Michel Jacquesson using the *WinJUPOS* program. Long-lived anticyclonic ovals and some other features are labelled. The 'Baby Red Spot' is Oval 2.

Figure 2A. Jupiter on 2008 June 6, 16:40 UT; Anthony Wesley (Australia). The three red spots are at upper left (GRS, BRS, and Oval BA).

ange), and both were moving towards the GRS (Figure 2A).

These ovals are huge anticyclones, whose reddish cloud colour may indicate that they are particularly vigorous and deep-rooted, and this was a unique opportunity to see what would happen when they came into contact. The event was watched intently by both amateur and professional observers (Figure 2B). The BRS approached the GRS from the west, and encountered its periphery on June 30 - by coincidence, just as oval BA was passing. The BRS was suddenly swept up by the powerful winds around the GRS, and by July 2 it was being pulled apart as it squeezed into the very narrow jetstream that separated the GRS from oval BA. Two main parts of it then emerged. The leading part was marked by several bright spots orbiting rapidly on the north rim of the GRS on July 4–6, and was apparently still present in an image on July 8–9 from the Hubble Space Telescope (HST), connected to the trailing part by a 360° spiral around the GRS. The trailing part – the main remnant of the BRS – re-emerged more slowly preceding (east of) the GRS on July 5–6, becoming a slightly orange bright spot at the preceding end of a dark grey streak (red arrow in Figure 2B).

Amateur images in the near-infrared methane band were invaluable in showing that a high-altitude cloud cap was again present over or adjacent to this spot (July 7–15), as it was over the original BRS. This remnant drifted north and then west, colliding with the GRS again on July 16. Images from July 17–25 showed probable remnants of it orbiting slowly and irregularly around the north side of the GRS. Thus the BRS itself seems to have ended up being swallowed (in at least two gulps) by the GRS. However the dark streak, which emerged from the GRS rim following the BRS remnant, continued extending east; and there may be persistent smaller-scale effects both within and preceding the GRS.

Equatorial Region: Stable dark features give way to fast-moving spots

In the Equatorial Zone, all the exceptional darkness of 2006–2007 has disappeared, leaving only faint tenuous streaks, which however are complex and beautiful in hi-res images.

The south and north edges of the EZ have evolved to unusually similar states, with numerous tiny spots showing rapid speeds ahead of the few major features. On the SEBn edge the South Equatorial Disturbance is still an impressive feature, with small but high-contrast projections accelerating ahead of it up to DL1= –67°/mth. On the NEBs edge, the typical large projections have become subdued and few in number, and the space vacated by them is occupied by small spots and projections with unprecedentedly fast speeds, up to DL1= –60°/mth. We wait to see whether this will be more than a passing phase.

North Tropical Region: Barges and ovals, appearing and merging

The North Equatorial Belt (NEB)is still strongly reddish (as in 2007) and has also acquired numerous small dark cyclonic spots called 'barges' on its north edge. Both phenomena typically occur about a year after a major episode of activity in the NEB. Although the NEB had not shown any outbreak as dramatic as in other belts in 2007, there was actually much activity in it: a large, long-lived rifted region grew to encompass one third of the circumference, and with other rifts elsewhere, plus the extreme turbulence on its north side during the NTBs outbreak, most of the

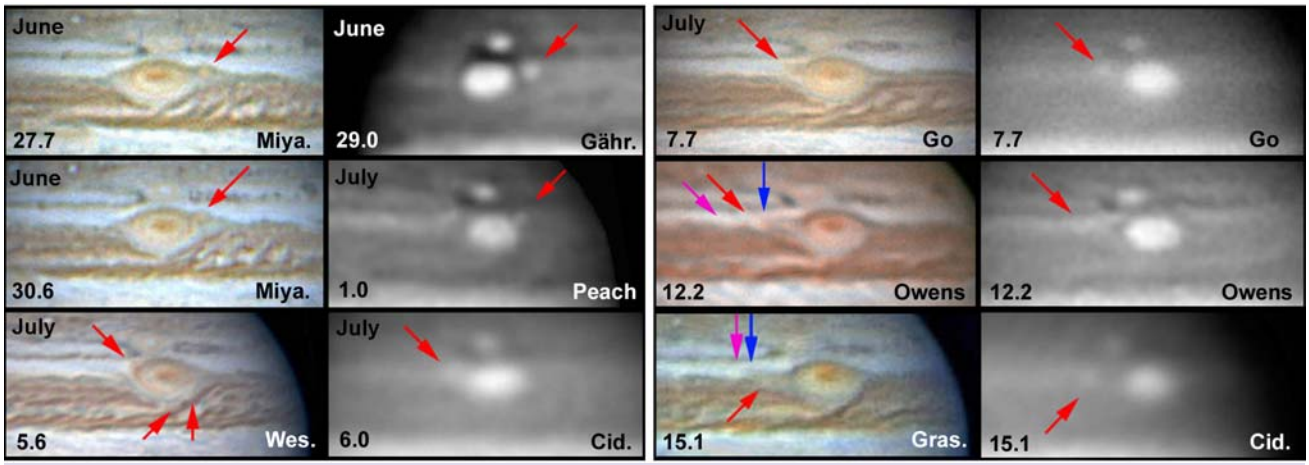


Figure 2B. The collision between the Baby Red Spot (red arrow) and the Great Red Spot. *Left*, colour images; *right*, images in the methane absorption band at 0.89 microns, which detects high-level haze. Oval BA is directly above the GRS; both are bright in methane images. In the later images, the blue arrow indicates the p. end of a dark grey band extending from the GRS with the BRS remnant, and the purple arrow indicates a pre-existing white spot. (The last methane image was rotated in *Photoshop* to improve visibility.) Full names of observers are as follows: Antonio Cidadão (Portugal); Bernd Gährken (Germany); Christopher Go (Philippines); Guilherme Grassmann (Brazil); Isao Miyazaki (Japan); Larry Owens (Georgia, USA); Damian Peach (UK); Anthony Wesley (Australia).

pre-existing barges and white ovals were destroyed. In summer 2007 there appeared both strong reddish colour and some new barges, and by early 2008 there were at least nine barges (though many were small), and eight white bays between them.

Although most were slow-moving in L2, there was still white spot Z, with DL2= –11°/mth. Some of the barges and white ovals preceding it shared this rapid drift, and were colliding with others which did not. In April there was a collision between white ovals, in which one of them was destroyed; then in April and May there were four mergers between barges, which confirmed the general pattern of such mergers that we have recently reported.

North Temperate Region: The belt revives and the jetstream decelerates

Last year's dramatic outburst of super-fast storms on the NTBs jetstream led to the revival of the North Temperate Belt South [NTB(S)] component as a prominent orange belt, which is still very strong. The reddish colour is a typical aftermath of such an outburst. Hi-res images detect pale 'lozenges' on its south edge, possibly incipient vortices, with a speed of DL1= –78°/mth (133 m/s in System 3). These are enabling us, for the first time, to follow the deceleration of the jetstream to its more normal state (Figure 3), and to gain insight into the deep structure of the jetstream.

The rapidity of the change, together with HST observations and modelling published by A. Sanchez–Lavega and colleagues, supports a model in which the deep jetstream has a permanent speed of at least DL1~ –160°/mth (170 m/s), but the wind speed at cloud-top level alternates between two stable states. In one state (1991–2002), the cloud-top jet speed is ~135 m/s, linked to shallow vortices travelling at 125 m/s. In the other state (1970–1990, and 2007), the vortices are absent and the cloud-top speed accelerates towards the underlying permanent jet speed of ~170 m/s, allowing vigorous convective storms to erupt upwards from a deep cloud layer.

These discoveries also imply more similarity than was previously recognised between the major components of a global upheaval: the outbreaks in the NTB and the SEB. Both start with a convective upsurge resembling a giant thunderstorm which can rise up from a deep level – probably the hypothetical water cloud layer – only when special conditions prevail in the upper cloud layer. Moreover, the proximity of these two outbreaks in 2007 February and May is consistent with other global upheavals since 1970, in which the super-fast NTBs outbreak and the SEB Revival outbreak commonly occur within a few months of each other. So these two outbreaks may be triggered by a single global process, which is not understood but which manifests in the global upheaval.

Meanwhile the NTB(N) has been reviving as a sinuous grey band, faint at the start of the year but quite strong now (2008 August). Its remarkable wavy pattern was actually present though faint in HST images before the 2007 outbreak, but has become conspicuous as the belt darkened, and dark grey streaks or barges are now forming in some of the waves. The orange colour, the sinuous N edge, and the formation of barges by eddying within the waves, all resemble the phenomena of the NEB, and may be a similar response to the vigorous outbreak within the previous year.

John H. Rogers, *Director*

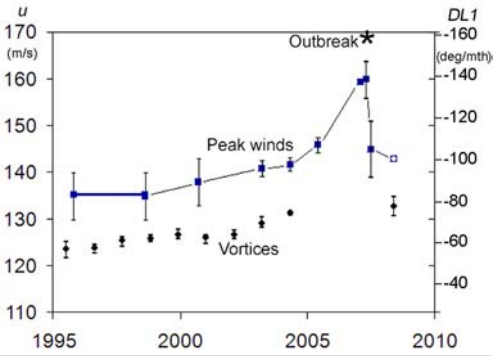


Figure 3. Chart of the NTBs cloud-top speed, 1995–2008. Data from HST, *Cassini*, and *JUPOS* (1995–2001); *JUPOS* (2002–2005); *New Horizons* and HST (2007, pre- and post-outbreak); JHR & *JUPOS* (2008). *Diamonds:* Speed of vortices. *Squares:* Peak jet speed from smaller cloud tracers. The present speed can be estimated as 143 m/s by assuming that the orange lozenges are vortices, again travelling 10 m/s slower than the peak jet speed.

International Year of Astronomy

Dark Sky Discovery 2009

This is an invitation to BAA members to take part in Dark Sky Discovery, a project that is being developed for International Year of Astronomy (IYA) 2009. Dark Sky Discovery will be based on the successful Dark Sky Scotland project, a Scotland-wide programme of astronomy events, involving sessions for families, schools and teachers run by Dan Hillier and his enthusiastic team from the Royal Observatory, Edinburgh.

The 35 Dark Sky Scotland events run during 2007/2008 brought the undoubted appeal of astronomy and the latest discoveries in space science to over 6,800 people. The sessions ranged from getting to know the night sky to the latest on space missions, the search for extra-solar planets, Dark Matter and telescope technology.

The Dark Sky Discovery sessions will be run on the same lines. The project is currently setting up Dark Sky Partnerships in each of the nine English regions, Wales and Northern Ireland. These partnerships will include university groups, amateur societies, public observatories and science centres which will organise and run the events. The events are aimed at families, but all are welcome and the content will be accessible but definitely not 'dumbed down'.

The events involve daytime and cloudy weather activities, and the skies do not need to be really dark (or even clear!) Daytime activities will include demonstrations such as making a comet from dry ice, rocket making and other practical displays; in a nutshell, all good hands-on educational fun. The events will need the assistance of knowledgeable amateurs, preferably with their own portable telescopes, willing to share their enthusiasm for astronomy by showing the night sky to members of the public. BAA members are invited to volunteer to help in this capacity; showing someone the wonders of the night sky through a telescope for the first time in their lives is an experience not to be missed!

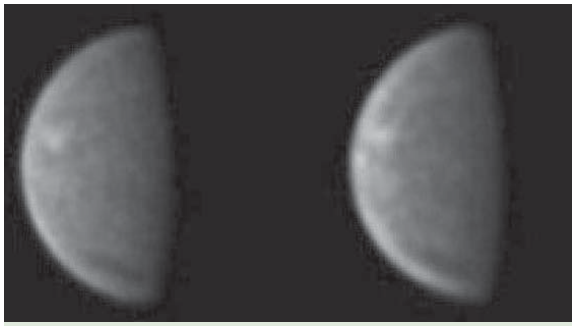
Please look at the website **www.darkskyscotland.org.uk.** The pictures of young families enjoying a day out and learning some real science speak for themselves.

If you would like to get involved please contact Dave Chalton, Dark Sky Project Officer at the Royal Observatory Edinburgh [**dsc@roe.ac.uk** or 0131 668 8406]. Please tell Dave where you are based in the UK – he will then pass your details on to your local Dark Sky partnership, once this is up and running.

Martin Male

Mercury & Venus Section

Mercury at eastern elongation, 2008 May



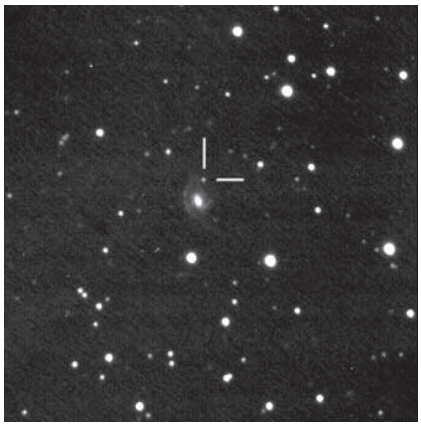
Mercury imaged on 2008 May 5d 22h 49–51m, 320mm refl. & DMK 21AU04.AS camera with Baader IR-pass filter, CML= 81°, *Sean Walker*. South is up.

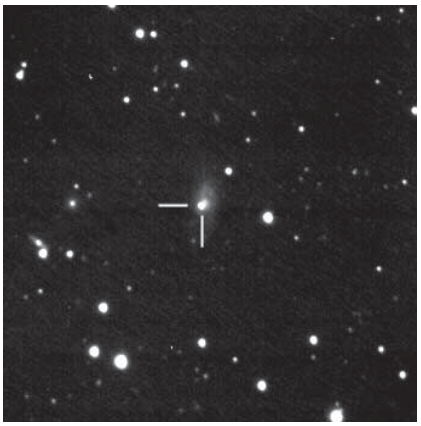
Mercury came to greatest elongation east on 2008 May 14, the most favourable evening elongation for northern hemisphere observers, and several observers submitted data to the Section. Images showing contrasty surface details were submitted by Sean Walker of Chester, New Hampshire, USA. His views of May 5, secured under excellent seeing conditions when the planet was just 6.6 arcseconds in diameter, are reproduced here. Note the very bright spot at the limb, which corresponds to high albedo ejecta surrounding and involving the 60km diameter crater *Kuiper* (lat. −11°, long. 31.5°). *Kuiper* can clearly be seen to be progressively approaching the limb in the images for CML= 48–65° published in my recent Section note in the *Journal* (**118**(1), 6–9 (2008)). More high resolution images of this planet will be welcome.

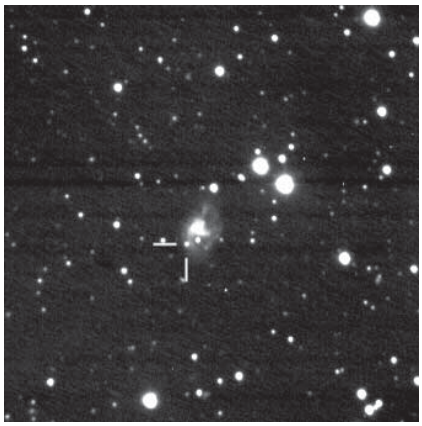
Richard McKim, *Director*

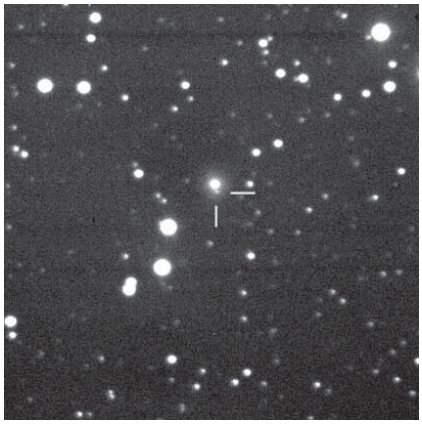
Deep Sky Section

Another four supernova discoveries for Tom Boles









For the second time in 2008, and for the fifth time since his first discovery in 1997 October, Tom Boles has found three supernovae in a single night. This time however Tom excelled himself – not only were the discoveries all made within an hour of each other, but they were all in the same constellation, Andromeda. The supernovae, 2008en, 2008eo and 2008ep were discovered on 2008 August 3.063, 3.076 and 3.093 respectively.

The first SN, 2008en *(top left)*, was in UGC 564, a magnitude 16.6 Sbc galaxy at RA 0h 55m 13.56s and Dec +35° 26' 26.2" (2000.0) which put it 5.4" west and 22.7" north of the galaxy centre. At discovery the supernova was at magnitude 18.2. Eighteen minutes later SN2008eo *(top centre)* was discovered in UGC 442, a 16th magnitude Scd spiral. At RA 0h 41m 52.04s and Dec +32° 59' 25.2", this supernova lay 2.4" east and 0.9" south of the galaxy centre. The brightest of the three, it was at magnitude 16.0 when discovered. The final discovery of the night *(top right)* came when a further 25 minutes of searching yielded SN2008ep in magnitude 15.5 Sb galaxy UGC 826. At magnitude 18.1 it was at RA 1h 17m 40.68s and Dec +43° 38' 38.9", 10.2" east and 16.3" south of the centre of the galaxy. These three supernovaewere announced on CBET 1459 and TA *Circulars* E2469, E2470 and E2471, from which some of this information is taken.

Two days later, on Aug 5.101, Tom discovered his 9th supernova of the year when he picked up 2008er *(right)* in UGC 1563, a 14.9 magnitude elliptical galaxy in Perseus. At RA 2h 4m 36.27s and Dec +47° 56' 10.4" the supernova lay 1.2" west and 8.1" south of the galaxy centre. The discovery was announced on CBET 1461.

Tom's discovery images for the four supernovae are shown here. All discoveries were made from his observatory in Coddenham, Suffolk using a 35cm Schmidt–Cassegrain telescope and Apogee AP7 CCD camera. At the time of writing (2008 August 10) the supernova types for these latest discoveries have not been determined. They bring Tom's personal total to 117.

Stewart L. Moore, *Director*

Mercury & Venus Section

Venus near inferior conjunction, 2007

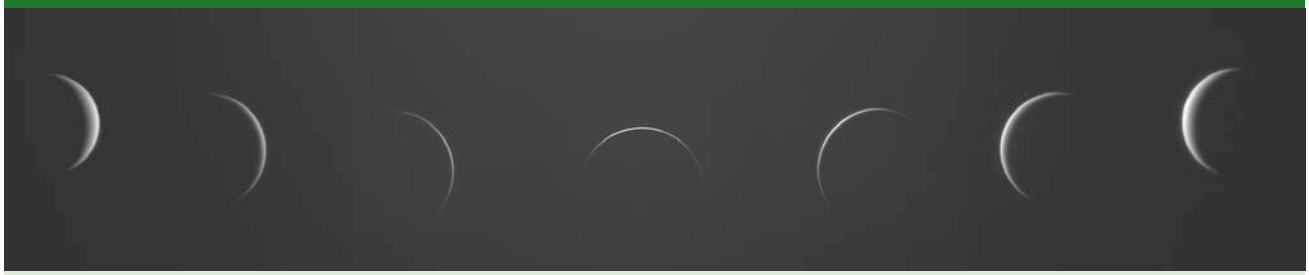


Figure 1. Venus at inferior conjunction, 2007 July 25 to September 8. A composite of 7 separate images, taken with a C9.25 at f/30 and a SKYnyx 2.0 CCD camera, *A.van Kranenburg*. North is up.

The Section received many observations of Venus during the E (evening) and W (morning) elongations of 2007. Colour filter work was discussed in the last Venus note (*Journal*, **117**(5), 229–230 (2007)), and here we report upon some of the data obtained near the inferior conjunction (IC) of 2007 August.

Cusp extensions

The Director has often followed Venus near IC in previous years, and had seen very long extensions of the cusps (or horns) to about 270°, but never the full circle. In 2007 I had better luck, a long run of fine days, and a 10cm Cooke refractor with accurate setting circles to hand. From July 28 onward I found slight extensions of both horns, and the crescent extended to about 225° on August 5, to 270° on Aug 9 and to 300° on Aug 11. In the last three observations the S. horn was by far the most extended one, an impression confirmed by Gianluigi Adamoli (Verona, Italy, 24cm SCT) on July 31 and Aug 12. On Aug 13 the Director repeatedly had the impression that the horns extended to a full circle, though the last quarter-circle was very faint. The best views were had with a very low power, ×40–120. The clarity of the sky greatly helped: the smallest amount of sunlit haze will blot out any extensions and moreover will make the field of view painfully bright in the vicinity of the Sun. Of course, one must always take care with finding the planet by offsetting from the Sun, a point often discussed in the *Journal*. Cusp extensions at the E elongation were also reported by David Fisher and Ian Hancock.

Venus reached IC on Aug 18, and Elias Chasiotis (Markopoulo, Greece, 28cm SCT) caught the planet on the same day, his image showing small cusp extensions. On Aug 23 Mario Frassati (Crescentino, Italy, 20cm SCT) also found small extensions. A collage by Arnaud van Kranenburg (Vlaardingen, Netherlands, 23cm SCT) beautifully shows the change in position angle of the direction of the crescent about IC: see Figure 1.

Nightside thermal emission

Just after IC, there was some successful imaging of the infrared thermal emission from the night side. Van Kranenburg used a filter passing IR wavelengths longer than 990nm to capture it on September 13, 14 and 16 (Figure 2), thereby joining the very select group of those who have achieved this feat. David Arditti's comments from Sept 25 (see below) are also pertinent. See the 2004 and 1999–2006 Section Reports (*Journal*, **117**(2), 65–76 (2006) and **118**(3), 131–144 (2008)) for a full discussion of the earlier work. Thermal emission is, however, a different phenomenon from the Ashen Light, which we must now discuss.

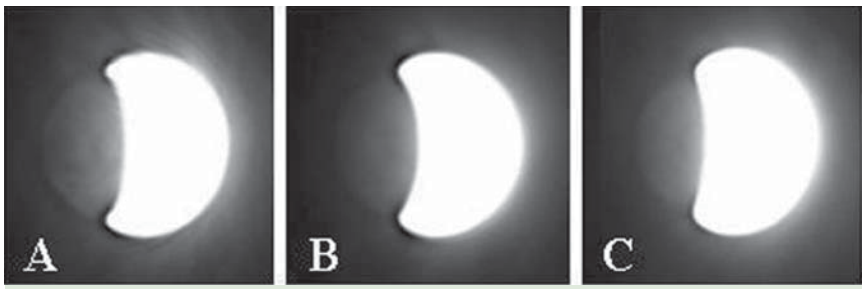


Figure 2. Overexposed infrared images of Venus showing thermal emission from the nightside, *A.van Kranenburg*. Equipment as in Figure 1, with Asahi 990nm long-pass filter. Each image was obtained between *ca*. 03:30m and 05:00, and was composed of 5–7 separate stacks of 150 images each. Each stack was recorded at a different camera angle to cancel out optical effects due to glare from the dayside. Some surface details are visible, but the observer warns that they may not be entirely real. South is up. **A.** 2007 Sept 13; **B.** 2007 Sept 14; **C.** 2007 Sept 16.

Ashen Light

The Ashen Light (AL), recently discussed by Patrick Moore and the writer (*Journal*, **117**(5), 265–272 (2007)) requires a nearly dark sky for its detection, and therefore a good eastern or western horizon. There were no definite reports of the AL at the E elongation, but because the planet was nearly 8° south of the Sun at IC, it could not be observed against a dark enough sky, at least not from the UK. By late September, Venus was well north of the Sun, and could be observed fairly high up against a dark pre-dawn sky.

In 2007 September and October, David Gray (42cm Dall–Kirkham Cass.) reported the AL on several occasions. On Sept 23 Gray observed at 05h 10m UT with the planet quite high, seeing very good and the sky fairly dark. Of the dark hemisphere he wrote: 'Nothing definite was noticed until the W22 filter was applied... Some patchiness was apparent... I combined the Baader Neodymium with the W22, and this made the features much more definite.' The patches moved with the planet when the latter was moved about the field of view, and as shown in Figure 3A, the patches were lighter areas against the faint general illumination of the dark side.

Arnaud van Kranenburg imaged the planet in visible, UV and near-IR wavebands at 05h 40m as the sky was brightening, and in poorer seeing. No sign of the AL was registered, but the observations need not contradict Gray's as the observer did not attempt to overexpose the crescent. A daylight UV image was also received from Gabriele & Jörg Ackermann (Zaberfeld-Michelbach, Germany, 18cm Mak-Cass). Detlev Niechoy (Göttingen, Germany, 20cm SCT) observed in daylight and reported nothing, but in fact on Sept 17 and 19 he had already recorded strong impressions of the AL against a dark

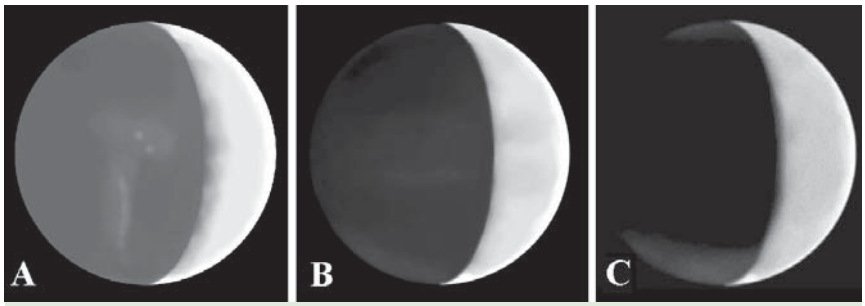


Figure 3. Drawings to show the Ashen Light as observed visually with a 415mm Dall–Kirkham Cass., ×365, W22 filter (with W23A in C), *D.Gray*. South is up.
A. 2007 Sept 23d 05h 10m; **B.** 2007 Sept 26d 05h 00m; **C.** 2007 Oct 7d 05h 20m.

sky. He secured another positive observation on Sept 24.

The Director issued an email alert on the very day of Gray's observation. There was a good response. David Arditti on Sept 25 observed visually (36cm Schmidt–Cass.) with a negative result, but adds: 'I then did another of my experiments in severely overexposing the planet in the IR. I have tried this at 807nm before, and got negative results on the night side, but this is the first time I have used so large an aperture as the C-14. I imaged at f/11. Subjecting this image to a substantial and careful levels stretch in Photoshop, it seems to me that the night side glow may just about be detected. This has been demonstrated before with 1000nm and 990nm filters, where the effect seems to be much more visible. It may be faintly present at 807nm as well, but it is not clear... I doubt the connection between the visual Ashen Light reports and the IR images of the night side. These images require extreme processing to produce, and the gap between the wavelength region they use, 800–1000nm, and the visible, is very large. All attempts to image the night side at wavelengths closer to the visual have failed, and, the thermal glow effect, if it exists at all, is seen to be excessively weak even at 807nm, which is still well beyond the visible.' On the same morning Chris Hooker (20cm Mak–Cass.) also took overexposed filter images (red, green and infrared) against a dark sky but in poor seeing, with negative results.

On Sept 26 to Gray (Figure 3B) under similar conditions the dark hemisphere was much fainter: nonetheless, lighter local structures were evident, at the limit of vision, in the form of two diffuse horizontal streaks. The effect was seen both with a single eyepiece and with a binocular viewer. Alan Heath observed visually about half an hour later and did not detect the AL, whilst the Ackermanns contributed a UV image taken at 06:55m UT, by which time the sky was too light. On Sept 30 to Gray (Figure 3C) the dark side was merely suspected for the most part, but diffuse light patches were seen near the cusps. A brief view on Oct 7 suggested two faint horizontal streaks, suspected both with and without an occulting bar. UV images by Ralf Vandebergh (Wittem, Netherlands, 25cm refl.) at 06:10 UT do not show anything on the darkside, and Niechoy saw nothing in daylight. Niechoy again recorded positive impressions of the AL upon dark skies on Oct 8, 10, 15, 17 and 20. On Oct 10, however, under very good conditions at 05:20–05:35 UT, Gray saw no trace of AL, marking the only slight disagreement within these runs of observations. On Oct 10, Niechoy had observed shortly before 04:00 UT.

As we have seen with the imaging data, most of the CCD/webcam images were taken in full daylight, when the diffuse scattering of sunlight by the foreground sky would swamp any trace of the feeble glow of the AL.

In conclusion, I would urge all of our image-makers to catch Venus upon a *dark* sky. Our visual observers too should observe the crescent as often as possible. The elongations of 2009 will offer a very good opportunity of adding to our knowledge of this elusive phenomenon. Until the Section has concrete negative evidence, the question of the Ashen Light will remain an open one.

Richard McKim, *Director*

Solar Section

2008 May

Activity for May remained low and on a similar level to that of April. The southern hemisphere was the more active of the two. The solar disk remained blank for most of the month with a minor outbreak on May 3/4 and more sustained activity from May 16 to 20.

AR993 S29°/086° first appeared on the disk on May 3 type Bxo consisting of two sunspots of the new solar cycle 24. The group was seen on the following day and much reduced on May 5 but not thereafter.

AR994 S11°/310° first observed on May 16 type Bxo consisting of 2 spots. By May 18 the group had grown to 7 spots type Csi. The group declined the next day and was not seen on May 20 or thereafter.

AR995 N12°/292° was also seen on May 16 type Bxo consisting of 2 sunspots but was not seen the following day.

AR996 N10°/256° was the third group to emerge on May 16, also type Bxo consisting of 2 spots. The group remained visible on the 17th and by the next day consisted of 4 small spots still type Bxo. The final sighting of this group was on May 19 still type Bxo.

North & south MDF of active areas g

	MDFNg	*MDFSg*
May	0.07	0.16 (35)
June	0.01	0.35 (35)

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

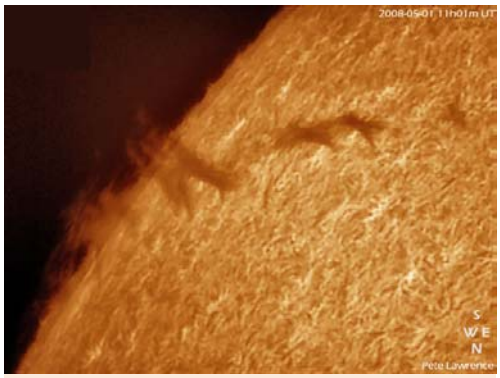
H-Alpha

Prominences

14 observers reported a prominence MDF of 2.34 for May. Several prominences were seen on May 1 on the western limb includ-

BAA sunspot data, 2008 May–June

	May		*June*	
Day	*g*	*R*	*g*	*R*
1	0	1	0	0
2	0	0	0	0
3	0	10	0	0
4	0	5	0	0
5	0	3	0	3
6	0	0	0	2
7	0	0	0	0
8	0	0	0	1
9	0	0	0	0
10	0	0	1	10
11	0	0	1	10
12	0	0	1	11
13	0	1	0	3
14	0	0	0	0
15	1	7	0	3
16	1	16	1	9
17	1	10	1	11
18	1	15	1	11
19	1	14	1	11
20	1	6	1	12
21	0	1	1	11
22	0	1	1	9
23	0	0	0	0
24	0	0	0	0
25	0	1	0	0
26	0	1	0	0
27	0	0	0	0
28	0	0	0	0
29	0	1	0	0
30	0	0	0	0
31	0	0		
MDFg	0.22 (50)		0.34 (49)	
Mean R	2.68 (41)		3.91 (43)	



A prominence and filament on 2008 May 1 at 11:01 UT. *Pete Lawrence*.

ing a broad prominence on the SW limb S40º to S49º extending to a height of 84,000km, which persisted on May 2.

On May 6 a large 'hedge' of 3 flame prominences was observed just N of the W limb. A large arch prominence was seen just E of the N limb point on May 8 with a small brighter prominence at the N limb point. On May 13 a large 'curtain' prominence appeared on the SW limb, consisting of 3 connected pillars. This prominence stretched across the limb by 140,000km and rose to a height of 47,000km.

The following day a dynamic prominence was seen on the SE limb. At 07:15 UT it was a tower of hydrogen above the limb, turning through a right angle and then falling back towards the limb. By 16:45 UT the shape had changed to appear more like a windsock and was changing shape over the course of a few minutes, with regions of hydrogen appearing and disappearing. A second active prominence was seen on the SE limb but not as bright or active as the first. A large prominence was also reported on this day on the NE limb extending northwards like smoke in a strong wind.

On May 15 a high pillar prominence was seen at S21º on the E limb, which had started the previous day as an incomplete low arch at S28º veering northwards to S17º.

A bright prominence appeared on the NE limb on May 16, appearing as a 'spike' at 08:00 UT but it had noticeably grown in height by 09:00. By 09:15 the top part had become detached and by 09:25 the prominence had faded, disappearing completely by 09:30 UT.

A spectacular prominence on the NW limb on June 4. *Nick Howes*.

Filaments

2 observers reported a filament MDF of 0.26 for May.

Filaments were few and far between during the month, seen mainly between May 19 and 22. A dark filament was seen on May 15 towards the ENE limb. A striking filament was seen on May 21 in the SE quadrant. Plage was also noted around AR944 on May 18 and 19 and around AR966 on 18, 19 and 22.

On May 29 a dark filament was observed near the NW limb.

2008 June

Another very quiet month as this current solar minimum continues. Although it has seemed a very long time indeed, this minimum is not unusual. The average solar minimum is 131 months with a standard deviation of 14 months; the current minimum being 142 months in duration so well within the standard deviation and therefore not abnormal (Hathaway – NASA).

The vast majority of observers reported no activity in the northern hemisphere throughout the entire month. Most observers reported a blank disk from June 1–9, 13–15 and 23–30.

AR998 S09º/292º first appeared on June 10 type Axx and had developed to type Cso on June 11 and 12. The group was not observed thereafter.

AR999 S02º/204º was first seen on June 15 type Axx on the eastern limb. By the 18th the group was type Hsx . The group remained on the disk until June 22 when it faded to type Axx and was not seen later.

H-Alpha

Prominences

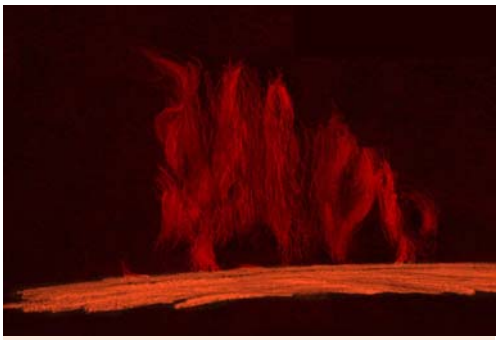
15 observers reported a prominence MDF of 2.83 for June. Prominences were fairly active for the whole month but most were small and quiescent in nature.

On June 4 a faint but extensive loop prominence was seen in the NW at N36º. The loop developed into a huge and visually spectacular eruptive arch prominence, which disconnected and reconnected to the magnetic field at different locations over the limb. Estimated height 160,000km and total length 190,000km.

On June 7 there was an interesting tree type prominence on the SE limb which had become a pyramid type structure by the next day. A large triple arch prominence was also seen on June 7 on the eastern limb which was still present on June 8 but had decreased in height.

An unusual prominence was seen on June 14 at 07:52 UT which may have been associated with a long winding filament in the SE quadrant. The following day a very active prominence reached a height of 61,000km on the SE limb and another on June 20 reached a height of 65,000km.

On the SW limb a prominence remained active approximately between 20º and 30º south of the equator from June 20–30. A western limb prominence at S45º remained for 5 days from 26–30. The first two days it was seen as a large blob, which split into two broad spikes by the final two days. On June 25 a large arch prominence was observed on the eastern limb and a very distinctive prominence shaped like a backwards 'F' was seen on the NE limb.



Prominence on June 26 at 09:20 UT. Drawing by Les Cowley.

Filaments & plage

5 observers reported a filament MDF of 0.83 for June.

Plage was seen around AR998 and AR999. On June 10 a distinctive round plage was seen on its own in the northern hemisphere.

A faint broken chain of 3 filaments was seen on the eastern limb on June 13 and 4 short faint filaments were seen to the east of AR998 on June 14. Also that day a long winding filament was observed in the SE quadrant following the 40º parallel. This became fragmented the next day and another filament was seen SE from the centre of the disk. 5 filaments were also seen on the eastern limb. The following day, fragmented filaments were observed along the 40º parallel in the southern hemisphere on the western side.

On June 26 a highly unusual plage was observed at 10:00UT at very low southerly latitude near the preceding limb. The area was very bright even against mild limb darkening, and was soft in outline but the rest of it seemed typical faculae in shape and extent. Observing conditions deteriorated and the object was glimpsed between clouds but the form and brightness appeared to vary over 20 minutes.

Lyn Smith, *Director*