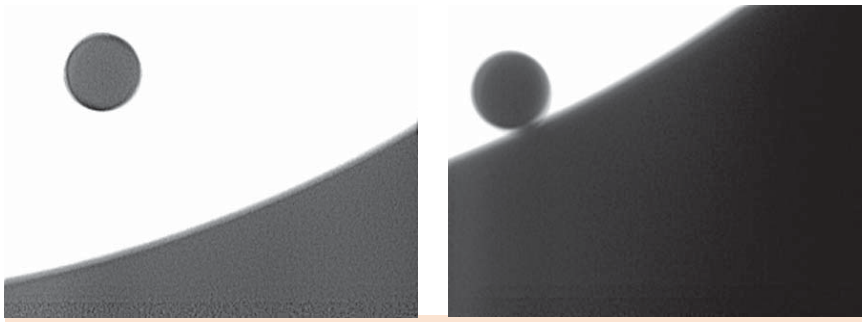
# Notes and News

*From the President*

## Completing the wish list



The transit of Venus, 2004 June 8, imaged by Tom Boles with a 250mm SCT and Philips ToUcam webcam. Each frame is a composite of 20 images.

Thinking back over the last few years we have been very lucky with the quantity and quality of astronomical phenomena that we have been able to see. We have had total solar eclipses, transits of Mercury and Venus and several good comets to help to keep us satisfied.

I was lucky enough to be in a part of the country free from clouds on June 8 and witnessed the only transit of Venus seen by anyone alive today. This event brought to a close a whole sequence of astronomical phenomena that I looked forward to as a boy. I can well recall looking at the tables of astronomical events to come at the back of one of Patrick Moore's books and inwardly complaining about the poor geographical location where I lived. Nothing much seemed to happen here and it appeared to occur almost everywhere else in the world. I can clearly recall seeing the 1999 eclipse in Cornwall listed, and this year's transit of Venus. Both seemed a very long way off for a boy and I remember thinking that, with luck, I should manage to live long enough to see both.

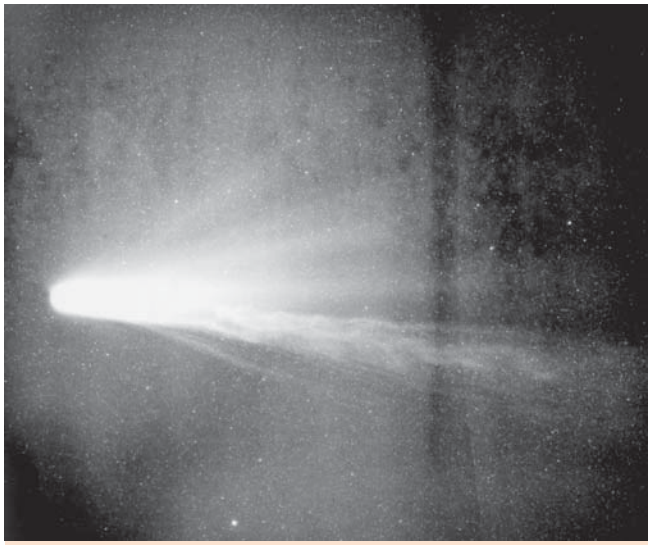
Both of these events were therefore very special for me. I went to view the 1999 eclipse in Cornwall in the full knowledge that it might well be clouded out. As we all know, with a very few exceptions, it was. It was a British eclipse and I felt committed at least to try to see it from this country. Many fellow astronomers visited Cornwall rather than going abroad for this reason.

The transit of Mercury was a success but it didn't hold the same significance for me as that of Venus. I had looked forward to the Venus transit for so long. I did expect the planet to look big as it passed in front of our star but its size still surprised me. It was easily seen using only the solar viewer supplied with our June *Journal*. Moreover, with its stark blackness, the perfect disk contrasted against the two small sunspots near the centre of the Sun making them look a pale grey colour. It was hard not to think about the historical significance of previous transits. Johannes Kepler, Jeremiah Horrocks, Edmund Halley and James Cook were all involved with this rare event.

Another part of astronomical nostalgia was experienced when I was reading a paper by Richard McKim on Henry McEwan, and happened to notice the name of my first-ever astronomy tutor among the references. We had lost touch for many years. A friend and I had to promise to a full lecture room at Glasgow University to wheel him out in his bath chair to view Halley's Comet when it arrived in 1986. This was an event so far in the future that it seemed an eternity away. This was pure mischievousness on his part to get even with two 17 year olds who had proven to be quite a handful. I have recently contacted him and was pleased to find that he is now 95 years old; he doesn't own a bath chair; he remembers those two boys and yes, he did see Halley's Comet in 1986 without us. If you are reading this Dr Tannahill, thank you for an excellent introduction to a lifetime's enjoyment.

Not all of my wish list is yet complete. What would I like to see in the next ten or twenty years? How about a nice close (but not too close) daylight galactic supernova? It should be bright enough so that it would be visible for many months. One can but hope. Maybe, with a little luck, I might live that long…

**Tom Boles,** *President*



Halley's Comet photographed on 1986 April 12 by the Michigan Schmidt telescope at Cerro Tololo Interamerican Observatory. *Courtesy NASA/JPL.*

*Meteor Section*

## Prepare for the Perseids!

Following a rather lean year in 2003, when moonlight pretty much accounted for the most active parts of the main major showers, meteor observers can look forward to better prospects for the remainder of 2004. A string of favourable viewing opportunities begins with a reasonably well-placed Perseid return this August. The shower is present from about July 25 to August 20, with the main activity in the ten days or so centred on maximum, August 12.

In a normal year, the Perseids show a slow, steady increase in activity through the first week or so of August: by about Aug 7–8, observed rates have reached a respectable 10–15 meteors/hr, and with accompanying good sporadic activity and the Delta Aquarids and Alpha Capricornids augmenting the picture, a careful observer can record a good meteoric haul at this time.

Activity steps up to yet higher levels over the next couple of nights, and it is really from this point that productive observations will first prove possible in 2004. The Moon reaches last quarter on August 7, and its glare will still be a significant nuisance to meteor observers from late evening until about Aug 10–11. As the Moon wanes further and retreats into the morning sky, however, the 'window' of dark sky for productive Perseid-watching widens, just in time for the shower peak.

Perseid maximum is expected around 07h UT on August 12, which means that the pre-dawn hours of Aug 11–12 (a Wednesday night to Thursday morning) may prove the most active for observers in the British Isles. Moonrise on this night comes a little after midnight local time. Glare from the waning crescent will still be something of a problem, and observers should seek viewing directions so that the Moon isn't directly visible, especially later in the night.

Mathematical modelling of the Perseid stream by Esko Lyytinen and Tom Van Flandern[1] has raised the interesting possibility that rates could be enhanced on Aug 11–12. Their model predicts a short-lived interlude of elevated rates, comprising mostly faint meteors, around Aug 11d 21h UT – just as the sky is getting properly dark for most UK-based observers; it may be worth getting set up early in the night just in case. This putative enhancement is connected with recently ejected material from the parent comet (109P/Swift–Tuttle). It is also possible, however, that the regular, established 'annual' shower component will be enhanced as a result of gravitational perturbations by Jupiter. Similar circumstances may have brought about the markedly high return of 1980.[2]

In recent years, peak observed rates for the Perseids have typically been of the order of 60–70/hr from a dark location with the radiant (near the northern end of Perseus bordering on Cassiopeia) high in the northeastern sky. At the most recent well-observed return (for which a report is in preparation) in 2002, peak corrected Zenithal Hourly Rate was 100–120, fairly 'normal' for the Perseids, and showing no sign of the brief, very high activity found in the years close to 109P/Swift–Tuttle's 1992 perihelion.

While August 11–12 looks like being the prime night, Perseid activity should still be high as dusk falls on Aug 12–13, and early-evening watches ought to be particularly rewarding on this occasion. Rates may begin to tail off as the night wears on, but with the Perseids still producing upwards of 20 meteors/hr right through until Aug 14–15, watches remain rewarding during the early declining phase of the shower. By Aug 15–16 the decline has become more rapid, and Perseid activity quickly dwindles away by August 20.

Observations in 2003 were severely hampered by moonlight, but some Meteor Section contributors persevered under the bright skies, recording reasonable rates (up to about 15–20 per hour at maximum) with the usual sprinkling of bright events which make the Perseids such an attractive target for photographers. The darker skies of 2004's return favour this pursuit – as ever, an SLR camera equipped with a standard 50mm or wide-angle 28mm lens and loaded with ISO 400 film stands a fair chance of capturing brighter Perseids in exposures of 10–15 minutes' duration aimed towards Cygnus or the Square of Pegasus. During the 2002 return, Andrew Wilson captured several Perseids on CCD exposures, but for the moment meteor imaging remains one of the final bastions of conventional as opposed to electronic photography.

Whether or not the forecast enhancements occur, the 'regular' activity of the Perseids is sufficient in most years to fire the enthusiasm of most observers, and as ever we need to keep the shower under surveillance whenever possible – observations before and after maximum are every bit as valuable as those from the peak itself. The Meteor Section will welcome reports of watches made by its standard methods (outlined at **http://www.britastro.org/meteor).**

A bright Perseid at 21:47 UT on 2002 August 12–13, caught on Kodak Elite 400 ISO colour slide film by Neil Bone observing at Chichester.

**Neil Bone,** *Director*

1 Lyytinen E. & Van Flandern T., *WGN* **32**(2), 51–53 (2004)
2 Mason J. W. & Sharp I. D., *J. Brit. Astron. Assoc.*, **91**(4), 368–390 (1981)

## Aurora Section

Dr Alastair Simmons has reported to the Section on his winter visit to the Adventdalen Aurora Observatory on Spitsbergen. From 2004 January 9 to 28 he observed some 65 auroral events, together with two events from Tromsø in Norway on Jan 28 and 29 when in transit home. Each day was split into three observing periods respectively: 00:00–12:00, 12:00–18:00 and 1800–2400 UT.

Of the 60 periods, in 45% the skies were clear of cloud, 16.7% were partly clear and 38.3% were overcast. The overall average temperature was –21.7°C, the highest temperature being –12.8° and the lowest –30.4°.

The sunless Arctic winter enabled the aurorae occurring in daytime to be observed. During his sojourn on Spitsbergen Alastair recorded the following auroral events:

| | |
|---|---|
| *Dayside aurorae* | |
| Patchy prenoon | 13 |
| Noon time (cusp) | 9 |
| Postnoon arcs | 11 |
| Cleft | 7 |
| *Discrete polar cap aurorae* | |
| Morning arcs | 2 |
| Afternoon arcs | 13 |
| Theta arcs | 2 |
| Substorm | 7 |
| *Total* | 65 |

The two events seen from Tromsø were substorm aurorae. For full details of the auroral forms and their origin, see Simmons D. A. R., 'A classification of auroral forms', *J. Brit. Astron. Assoc.*, **108**(5), 247 (1998).

The first and second weeks of 2004 April were geomagnetically very quiet. Transient magnetic storms took place on the nights of April 03/04 and 05/06 when the planetary magnetic index Kp reached a value of 6+. Thereafter activity declined. Minor events took place on April 09, 16, 23, 28 and 30. The general level of geomagnetic activity in April was less than in the previous months.

Six observers in Scotland noted glows and rays on April 03/04. There was one report of an auroral glow from Yorkshire. A glow was reported by RAF Kinloss on 04/05 while glows, arcs and an active rayed band were seen on 05/06 from Edinburgh low down on the northern horizon. A quiet arc was noted by a BA pilot on 07/08 when flying over Newfoundland.

At Glen Ullin in North Dakota, glows and arcs were observed on April 07/08, 09/10, 11/12, 15/16 and April 30/May 01. More active aurorae with arcs and rays were recorded on 05/06, 08/09 and 22/23.

Magnetic observers found May to be generally quiet. There has been a decline in the level of background disturbance since the turn of the year. Only seven reports of auroral observations were received so far for 2004 May. A suspected glow was seen from St Andrews on May 01/02. A similar glow was seen on 06/07 from Trelogan. A minor aurora with glows and rays to an elevation of 10° was also reported from Glen Ullin, North Dakota on 06/07 and 13/14. A BA pilot overflying Canada near Lake Athabaska reported minor active ray activity and quiet banding to an elevation of 15° on May 22/23. A quiet arc and glow to 12° was seen from Glen Ullin on 28/29.

All the indications from geomagnetic and our own auroral observations suggest that the maximum of solar-generated geophysical disturbance in sunspot cycle 23 took place in 2003. Although the first half of 2004 is much quieter than 2003, there is always the possibility of a resurgence in the second half of the year, which has been the tendency in the last three years. Note that much of the background geomagnetic activity in the declining years of the sunspot cycle derives from high speed solar wind streams emanating from coronal holes developing in the lower solar latitudes. Periods of disturbance are recurrent as the coronal holes rotate with the Sun.

The situation in recent times is summarised in the Table.

**Auroral activity seen in recent years**

| *Year* | *Aurorae at Aberdeen* | | | *Geomagnetic activity* | | |
|---|---|---|---|---|---|---|
| | *Diffuse glow or arc* | *Discrete with rays etc.* | *Total aurorae* | *Days with planetary magnetic index Kp* | | |
| | | | | *≥5* | *≥6+* | *SSC* |
| 1996 | 11 | 15 | 26 | 32 | 2 | 9 |
| 1997 | 20 | 20 | 40 | 28 | 10 | 26 |
| 1998 | 24 | 17 | 41 | 47 | 16 | 31 |
| 1999 | 22 | 22 | 44 | 53 | 9 | 29 |
| 2000 | 17 | 25 | 42 | 67 | 24 | 41 |
| 2001 | 36 | 27 | 63 | 50 | 19 | 40 |
| 2002 | 31 | 27 | 58 | 48 | 15 | 35 |
| 2003 | 17 | 52 | 69 | 117 | 19 | 13 |
| 2004 (Jan to April) | 19 | 4 | 23 | 22 | 7 | 7 |

**R. J. Livesey,** *Director*

***Asteroids & Remote Planets Section***

## Nearest and farthest

March saw two records broken in the Solar System. On 2004 March 18 a 30metre diameter rock (some reports estimated the size at 20m) passed the Earth at a distance of some 26,500km. This is the closest pass ever observed that did not at least graze the atmosphere. 2004 FH was spotted a couple of days before the approach and at its closest reached magnitude approximately 11.5. Initially there is always a need for accurate positional data to assess whether there is a risk of Earth impact which, in every case to date, fortunately there was not.

The Earth has been hit many times in the past and has many scars discovered – the Moon of course has a pockmarked surface showing many more. An object this size would probably airburst and not give rise to much of a crater, unless it was metallic when it may well have hit ground. If it burst over Marble Arch it would have flattened the middle of London and damaged most of the capital. More likely, like Tunguska in 1908, it would have come to an uninhabited area unless we were very unlucky. There has been much debate during the last two years about the many literature references to unexplained catastrophies giving rise to the loss of major civilisations overnight.

NASA is funding a number of programmes to identify objects larger than 1km that pass close to the Earth and could potentially impact. To be complete it will pick up smaller bodies and a good record of those at least 300m diameter is now available. What size is a risk? If you are underneath it 1m would hurt you a great deal but not affect life on Earth. 10km would probably give rise to global extinction. In between we find continent killers and city flatteners, all having a different global effect. We are now more aware than ever how precarious our existence is.

During the same week there was the announcement of the discovery of the furthest solar system object from the Earth, although some of the comets discovered in the inner solar system have an aphelion further out than 2003 VB12. The discovery was made in 2003 November by a team led by Dr Mike Brown, California Institute of Technology (Caltech), Pasadena, California but not announced until 2004 March. It has an eccentric orbit with a period of some 10,500 years. It has been popularly, and unofficially, named Sedna. It should be noted that to be given an official name it must have a well defined orbit (which in view of the period may take many years – if not centuries – to define) and be approved by the Small Bodies Naming Committee before adoption. 2003 VB12 was discovered at about three times farther from the Sun than Pluto, making it easily the discovery at the greatest heliocentric distance in the Solar System to date.

It is a very dark body as are all out there. The diameter is speculated to be anything up to two-thirds that of Pluto and it has yet again revived the debate about whether Pluto should qualify as a major planet. When the asteroids were first discovered they were treated as planets and indeed the first ten or so were given symbols as the major planets until they were given the name 'asteroid' by William Herschel. So there is a precedence for reclassification in the Solar System; though to my simple mind the fact that Pluto has a high albedo and the rest have a low one means it is different, so I am content to keep it as a major planet for the time being. How many Pluto sized (or bigger) objects are out there? We not only don't know, we are unlikely ever to know.

Of course you could query why the furthest object qualifies for inclusion on the Near Earth Objects webpage. Apart from saying it is interesting and needs to be brought to attention I have to agree.

**Andrew J. Hollis,** *Director*

*Mercury and Venus Section*

# Visual observations of Mercury in 2003: First interim report

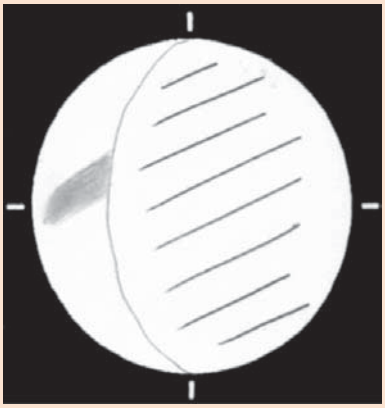


**Figure 1.** Drawing by Gianluigi Adamoli (Cerro, VR, Italy). 108mm OG at f/11 ×140; W25 filter. 2003 April 21, UT 18:40 to 18:55. Seeing IV Ant. Solitudo Criophori visible like a 'dark diagonal streak just south of the equator'. South is at the top in all the drawings.

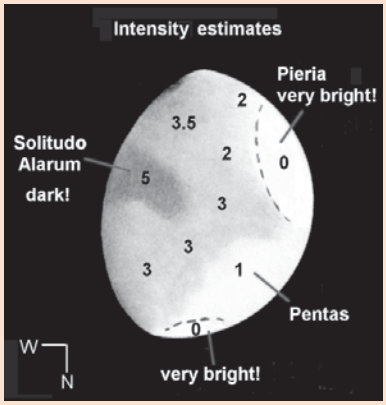



**Figure 2.** Drawing by Mario Frassati (Crescentino, VC, Italy). 203mm SCT at f/10 ×250; W23A filter. 2003 June 21, UT 11:55. Seeing IV Ant. Solitudo Alarum, very bright Pieria, Pentas, and very bright areas near the north polar region.

**Figure 3.** Drawing by David Fisher (Sittingbourne, Kent). 216mm Newt. at f/6.4 ×153 & ×345. Apod. screen. 2003 October 5, UT 11:00 to 11:25. Seeing III Ant. Some shading, a smooth terminator and 'a slightly brighter area near south region'.

There were seven elongations of Mercury during 2003: four evening and three morning apparitions. Interesting albedo detail was visually observed on a number of occasions. The most pronounced are described in this interim report.

## Dark markings

Mario Frassati (Crescentino, VC, Italy) observed Solitudo Phoenicis, one of the more prominent features, on April 4, 8 and 12. He described it as a dark oblique marking situated between longitude 200° and 270° in the north hemisphere of Mercury. Another dark patch just south of the equator, identified as Solitudo Criophori, was well seen by Gianluigi Adamoli (Cerro, VR, Italy) between April 16 and April 23 (Figure 1). Again Adamoli remarked upon a dark 'equatorial streak' between July 22 and August 3, probably Solitudo Lycaonis, a feature already observed by Frassati between the end of July and the first week of August 2002. Interesting dark albedo features were observed by Detlev Niechoy (Gottingen, Germany) during the morning apparition of September–October 2003, CM longitude 79° to 109°.

## Bright spots and bright regions

A number of bright spots were reported. One in the equatorial region between longitudes 180°–190° was seen by Frassati on April 4. On June 19, 20, 21 and 23, the same observer in company with his son Lorenzo, noted two more of particular interest (Figure 2). Brightness on the south-following limb was almost certainly Pieria, while a luminous area in the northern hemisphere has been identified as Pentas. On October 5 at CM longitude 128.2°, David Fisher (Sittingbourne, Kent) remarked that the 'following limb was bright, with a slightly brighter area near the south region' (Figure 3). Five days later Frassati detected a bright zone in Liguria. During the last elongation of the year, a luminous circular white spot was spotted by Tim Wilson (Jefferson City, MO., USA), on December 11, and Frassati, December 8, 11, 14, in the position of the bright ray crater Kuiper. The Director is working with Richard Baum on a short paper dealing with visual observations and webcam images in 2003 of the Kuiper ray system.

## Aspect of the north polar region

A bright zone was observed near the north polar region by Frassati in daylight on June 19, 20, 21 and 23 during the morning elongations (Figure 2). The CM was 294° to 311° and the phase estimated to be 70% to 80%.

A second interim report will analyse CCD and webcam images of the planet received during 2003.

## Acknowledgment

I wish to thank Richard Baum for his kind help and assistance.

**Mario Frassati,** *Director*

1 Mario Frassati, Raffaello Braga & Richard Baum, 'A new optical map of the regolith albedo of Mercury', *J. Brit. Astron. Assoc.*, **112**(3), 125–129 (2002)

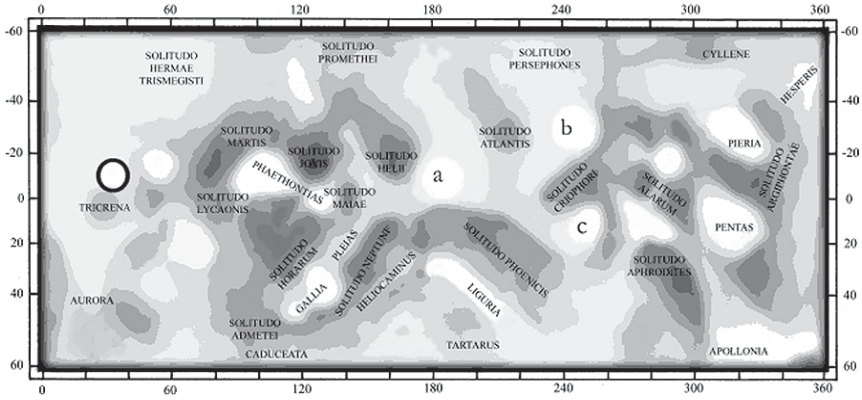



**Figure 4.** Mercury map 1997–2001 by Mario Frassati.[1] The ringed area is the bright ray crater Kuiper.

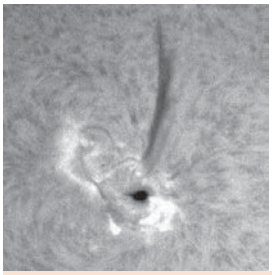
# Solar Section

It is with great sadness that I have to report that George Bowler and Lou Marsh died recently. Both were regular contributors to the Section and will be sadly missed.

## 2004 March

March saw a very small rise in the sunspot MDF. However, the southern hemisphere became more active than the northern which was spotless from March 2 until March 10.

On March 1 the sunspot group at +12°/162° was lying close to the W limb and consisted of six small spots enveloped in faculae. Also drawing near the W limb was a pair of spots just south of the equator at –3°/145°. Further east, and approaching the CM, was a group at –14°/71°. It consisted of a penumbral spot preceded by several small satellite spots. By March 2 the small preceding spots had developed penumbrae just as they were about to cross the CM, and by March 4 another penumbral spot had appeared in the centre of the group and the group was classed as type Eao. The group went into decay as it approached the W limb.



*Left:* A plume-like filament observed on 2004 March 30 at 09:15 UT. *Right:* A high arch-type prominence on the E limb at 11:17 UT, also on March 30. *Images by Eric Strach.*

A single penumbral spot came over the E limb on March 5 at –14°/305° and produced two limb flares in H-alpha as it did so. Three small follower spots had come into view over the E limb by March 7. The leader and follower spots underwent further development so that by March 9 it was 760 msh in area and was visible to the naked eye, the larger leader spot spanning 4° of longitude and showing three umbrae on March 10. By March 13 the group had passed the CM and although surprisingly still visible to the naked eye, the leader spot had split into four smaller spots and the follower spots had decayed. By March 15 two penumbral spots remained and they had gone over the limb by March 18. See the composite image by Peter Paice.

From March 18 a spot was seen very close to the equator at –0.5°/152°. By March 24 it had developed a satellite spot. Eric Strach observed a bright plage in H-alpha light just to the east of the spot coursing southwards from it. From March 19 only small spots were visible. These comprised of a pair of spots near the SW limb at –16°/268° and three groups clustered on the NE quadrant at +14°/146° and –3°/182° plus the near equatorial spot already mentioned. There was some slight development in the three groups as they headed westwards.

Carl Bowron reported a very faint dark patch at +44°/117° on March 23 at 09:30 UT. I am unsure what this might have been but I suspect it was a developing high latitude sunspot. I would welcome confirmation of this if anyone else observed this event.

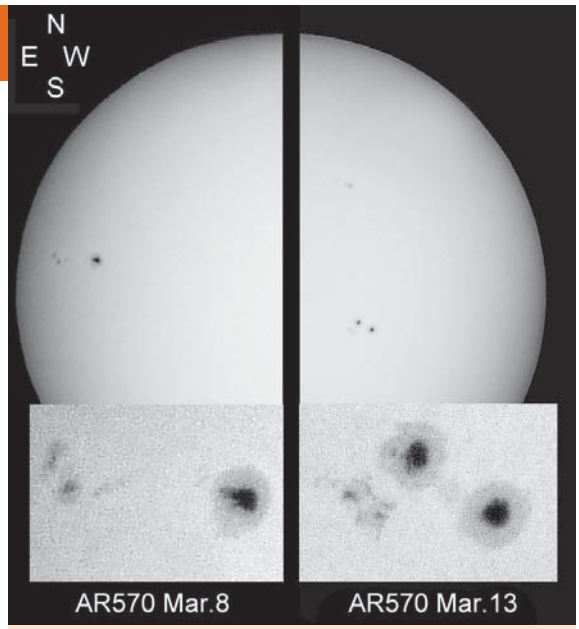
At the end of March three groups were visible: one on the northern hemisphere at +14°/58° and two on the southern hemisphere at –3°/61° and –14°/12°. The northern group showed a main penumbral leader spot with smaller following spots. It was visible to the naked eye on March 30 and 31 and was also very active in H-alpha light.

### *Hydrogen alpha*

Prominence MDF for March 3.79 (7 observers). There was another decline in the MDF but a number of different types were seen and many were in the sunspot zones.

A low mound prominence was seen on the E limb on March 1 at latitude +47° to +56°. It had fragmented by March 2. A densely structured prominence was seen on March 9 at lat. –23° to –30° on the E limb. It connected with two filaments, one of which led to the sunspot group at –14°/305°. Later in the month Eric Strach observed a prominence eruption on the W limb at lat. –27° at 09:30 UT on March 21. A CCD image was captured at 09:39 UT and only four minutes later at 09:43 UT it erupted (see images). By 09:49 UT only a small detached prominence remained. A high arch type prominence was seen on March 30 on the E limb (see image). It arose from two interactive prominences at lats. +3° and +13°. The arch prominence was seen ejected from the limb by March 31.

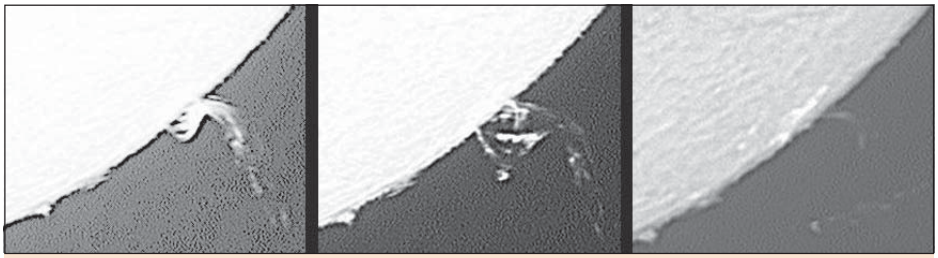
Several filaments were seen. The most interesting was a plume-like filament coming from the spot group at +12°/62° on March 30. Both Ray Emery and Eric Strach observed and imaged this activity. The filament was associated with a 1b flare.




A composite image of the Sun on March 8 and 13, showing the rapidly changing sunspot group at –14°/305°. *Peter Paice.*

## 2004 April

In April the sunspot MDF remained about the same as the previous month. Sunspot



A very active eruptive prominence on 2004 March 21. *Left:* 09:39 UT; *centre:* 09:43 UT; *right:* 09:49 UT. *Eric Strach.*

activity was low for much of the month except the naked eye spot in mid to late April. The southern hemisphere remained the more active, something that has been very noticeable in the past four months. Throughout the month some observers reported that several groups seemed to decline in activity as they crossed the CM (for example the groups at –13°/316° and –8°/110°).

Early April saw four groups. Of these the one at –13°/316° (Hsx) was the most interesting and active. On April 4 this showed several small satellite spots, and to the south of these a penumbral spot. On April 5 the satellite spots had developed penumbrae. By April 7 the group was classed Dao and was nearing the CM but it also seemed to lose its vigour. On April 9 the group was near the centre of the disk and the main spot showed four umbrae.

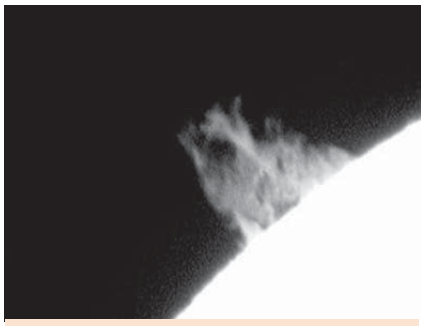
On April 17 two groups appeared over the E limb at –7°/128° followed by another group at –6°/110°. Extensive faculae were seen around both on that day. The following group, at –6°/110°, then developed into a type Ekc within a few days, the leader spot becoming larger until it reached its maximum extent on April 20 and was visible to the naked eye until at least April 24. The leading group, at –7°/128°, became bipolar but unlike its neighbour it quickly faded after crossing the CM on April 22. This group was, however, still visible in hydrogen-alpha light as a strong plage preceded by a filament.

### Hydrogen alpha

Prominence MDF for April 5.94. (6 observers).

Prominence activity this month began spectacularly with the appearance of a very large complex prominence on the E limb. A number of UK members saw this extraordinary prominence despite cloudy weather. Lee Macdonald draw my attention to it and he provided the colour image on page 187 using his Baader H-alpha coronagraph. Where sky conditions were not so clear the prominence took on the appearance of a giant 'Y' with each arm extending to the north and south, one arm reaching a small spot group at latitude +19° and the other reaching a further prominence at –11°.

Hedgerow type prominences were seen on the W limb at lat. +23° to +41° on April 17 & 18. On April 19 a large spire-like prominence was seen around the same area. Tall spike/pillar prominences were seen on the NW limb on April 22, and also a hedgerow type on the W limb at lat. +20° to +39°. Also that day there was an almost solid block-like prominence on the E limb at lat. +22° to +29°. It remained visible next day showing much detail and two 'horns' at the top of the structure (see image). A dense filament was closely associated with this prominence.



2004 April 23, 09:42 UT. *Eric Strach*.

## A new Director

I have enjoyed my time as Solar Section Director and prior to that as Assistant Director to the late Bruce Hardie. From August 1 this year Mike Beales will take up the Directorship of the Section. Mike has been involved with the Solar Section for many years and has been my able Assistant for the past five years. The Section will be in good hands and I wish Mike well in his new role.

**Geoff Elston,** *Director*

## BAA sunspot data, 2004 March–April

| | *March* | | *April* | |
|---|---|---|---|---|
| *Day* | *g* | *R* | *g* | *R* |
| 1 | 3 | 49 | 3 | 63 |
| 2 | 2 | 37 | 4 | 59 |
| 3 | 2 | 31 | 4 | 50 |
| 4 | 1 | 28 | 4 | 62 |
| 5 | 3 | 48 | 4 | 58 |
| 6 | 3 | 51 | 3 | 39 |
| 7 | 3 | 49 | 3 | 37 |
| 8 | 3 | 48 | 2 | 27 |
| 9 | 3 | 43 | 1 | 18 |
| 10 | 3 | 42 | 2 | 15 |
| 11 | 2 | 39 | 2 | 15 |
| 12 | 3 | 48 | 2 | 24 |
| 13 | 3 | 54 | 3 | 34 |
| 14 | 3 | 47 | 3 | 43 |
| 15 | 3 | 40 | 4 | 40 |
| 16 | 3 | 44 | 3 | 33 |
| 17 | 5 | 63 | 4 | 51 |
| 18 | 4 | 57 | 5 | 64 |
| 19 | 4 | 69 | 5 | 67 |
| 20 | 4 | 64 | 5 | 69 |
| 21 | 3 | 58 | 4 | 63 |
| 22 | 4 | 67 | 4 | 56 |
| 23 | 4 | 71 | 3 | 34 |
| 24 | 3 | 67 | 3 | 38 |
| 25 | 6 | 94 | 3 | 35 |
| 26 | 7 | 101 | 3 | 38 |
| 27 | 7 | 105 | 4 | 29 |
| 28 | 6 | 84 | 4 | 29 |
| 29 | 4 | 71 | 3 | 23 |
| 30 | 3 | 59 | 4 | 39 |
| 31 | 4 | 61 | | |
| *MDFg* | | 3.56 (51) | | 3.35 (51) |
| *Mean R* | | 57.76 (47) | | 41.70 (44) |

## North & south MDF of active areas g

| | *MDFNg* | *MDFSg* |
|---|---|---|
| *March* | 1.00 | 2.44 (31) |
| *April* | 0.74 | 2.14 (32) |

g = active areas (AAs)
MDF = mean daily frequency
R = relative sunspot number
The number of observers is given in brackets.

*Campaign for dark skies*

# 'Encouraging progress' for Armagh Observatory's dark sky campaign

Due to increased astronomical observing activities at the Armagh Observatory, Mark Bailey and Apostolos Christou anticipated the need to minimise the growth of light pollution in the City. In 2003 January they produced a dark sky leaflet: *Light Pollution and the City of Armagh,* to emphasise the detrimental environmental effects of poor lighting, and how to improve the general public's access to dark skies. This excellent leaflet, available free on application to the lead author, also may be downloaded from the web site: http://star.arm.ac.uk/darksky/armagh.html.

During the summer of 2003, one of the Observatory's work experience students, Ms Lindsay Magill, of the Wallace High School, Lisburn, carried out a project on the city of Armagh's exterior lighting. She surveyed the street lights in Armagh to determine the economic and environmental cost of poor lighting, and examined a thoroughfare through the City noting the various forms of luminaire and coding the different types employed, including full cutoff and semi cutoff units. It was found that there were no full cutoff lights on the route, and less than one-eighth were semi cutoff. About one-third of the street lamps surveyed were so poorly designed, that they sent more than one-third of their light skywards. This translates to the staggering sum of £80,000 per annum being needlessly wasted to illuminate the night sky from street lamps of just one small town. Lindsay's full report can be viewed at: http://star.arm.ac.uk/~csj/essays/lmagill/skyglow.htm.

Mark Bailey spoke to the Armagh City and District Council in the spring of 2003 to express his concern over the growing problem of light pollution in the City, owing to new buildings and commercial developments. With the Armagh Observatory now carrying out more observational astronomy, the issue was one of the long-term sustainability of this part of the Observatory's work. A draft resolution was placed before the Council's Environment, Health and Recreation Committee, and this and the Local Strategy Partnership Committee recommended that the Council should adopt a new policy on the matter. Welcoming the Committees' report, the City's Mayor, Mrs Anna Brolly, said that this was a very important issue concerning the Observatory and the wider Armagh community, both now and for future generations, and she was glad to endorse the proposed change.

Mark Bailey and Apostolos Christou also provided background material to the Parliamentary Science and Technology Committee for its Light Pollution and Astronomy investigation. The Committee's report, HC 747 Vol. I: Light Pollution and Astronomy, Seventh Report of Session 2002–03, published by The Stationery Office Ltd on 6 October 2003, can be viewed at: http://www.breckastro.supanet.com/light pollution.htm. HC 747 Vol. II, which contains the evidence presented, can be purchased from The Stationery Office Ltd. under House of Commons Science and Technology Committee: Light Pollution and Astronomy, HC 747–II Oral and Written Evidence, for the sum of £21.50.

Future steps will now be aimed at monitoring how existing and new illumination is brought into line with the new Council policy. A key provision of the Council's adopted policy reads: 'The Council will endeavour to ensure that all external lighting under its control is fit for the purpose and minimalistic and that such lighting is power efficient, downward directed and shielded so as to avoid light pollution and minimise cost, energy waste and other environmental consequences.' A further provision states: 'The Council will endeavour to persuade, through the planning consultation process and the advisory role of the Building Control and Environmental Health and Protection departments that new developments adopt the above guidelines.' For those seeking to advance a light pollution policy in their own particular area, we refer readers to the useful 'further reading' list given at the end of the document http://star.arm.ac.uk/darksky/armagh.html.

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Armagh Observatory with comet Hale–Bopp in 1997, photographed by John McFarland. The building is illuminated by a light shining directly from the centre of Armagh.