Notes and News

From the President

Firstly, let me say it is a great honour to be able to head the organisation that I have belonged to since 1966. Never did I dream that I would be given this opportunity and I will endeavour to serve the Association to the best of my ability.

Next, I must pass on my sincere thanks to Richard Miles for steering the Association through difficult times whilst we have been away from home. And, of course, to Jean Felles, our Office Manager, without whom none of it would have been possible. I'm grateful that both will be close at hand to help the new President get to grips with his new position.

So, who is this guy who is your new President – apart from the fact that he has directed the Variable Star Section for the past eight years, a post that he has held continuously for longer than any modern VSS Director?

Like many lads of twelve I suspect, I was introduced to astronomy by my father. But progress was slow as I didn't have a telescope, just an old pair of opera glasses of my father's. However, I did manage to observe comet Arend–Roland with its famous anti-tail in 1957. Things got better when I started work, as a senior colleague, I soon learnt, was very interested in astronomy and had already built his own 18cm Newtonian. I decided to copy his design and build a 21.5cm Newtonian, and like my colleague, purchase Wildey optics. But this was during the dreadful winter of 1963 and the snow was so bad that Henry (Wildey) was unable to get to his workshop to make my mirror and eyepieces! It seemed a very long time before I was finally able to take delivery in late spring.

Having looked at all the usual sights over the next few years I was getting a little bored with no real purpose to my astronomy. But then something happened that has transformed my life ever since – I joined the Crayford Manor House Astronomical Society and soon afterwards the BAA. At Crayford, I was introduced to meridian transit timings on Jupiter, as well as observing Saturn, lunar domes and, of course, variable stars. It was also through Crayford that I met my wife. She was not a member, but her father was and apparently he told her that it would be no good trying to go out with me as I was far too dedicated to astronomy! However, although I did submit to her charms and get married in 1970, I stipulated that wherever we lived had to be within driving distance of Crayford.

In the early '70s I became Variable Star Section Director at Crayford, and encouraged almost half the membership to make at least one VS observation at one time or another. The 1980s introduced me to the technique of photoelectric photometry (PEP), and by the end of the decade a place on the newly formed Professional-Amateur Liaison Committee (PALC-VS). This was set up in 1988 following a meeting at UCL the previous year (organised by Crayford) to discuss ways in which professionals and amateurs could liaise more closely in the field of variable star research. The idea was that amateurs would produce the observations under the guidance of professionals who would then carry out the analysis. (Incidentally, the VS was placed after PALC in the initials to indicate that the Committee only dealt with variable star matters, as it was hoped that other committees would be formed dealing with other areas of cooperation; sadly they never were.) But times have changed and the rapid development of the Internet and email has meant that it is now far easier to work with professionals via that medium, and so PALC was disbanded at the end of 2003.

In the 1990s I also took over the position of organising the weekly lectures at Crayford (it is basically an evening class). Lecturers usually come from the universities, and when I first joined, Gordon Taylor, our Computing Section Director, who was based at the Royal Greenwich Observatory ▸

Memorable... the annular eclipse at dawn on 2003 May 31, photographed from Cawdor, Scotland by John Rogers.

Meteor Section

Geminids and Quadrantids to round off a fine meteor season

Despite some of the worst summer weather conditions for many years, 2007 proved a remarkably productive year for Perseid observations by UK-based watchers. Good coverage was obtained in the week or so up to, and including, the August 12–13 maximum, and a first look at the results indicates a fairly 'average' return, with corrected Zenithal Hourly Rate (ZHR) reaching 65–70 on this night.

Lunar phasing has also favoured the Orionids and Leonids in the autumn, and this happy situation continues into the close of the most active part of the year for meteor observing with the Geminids in mid-December and Quadrantids in early January.

Active between December 7–16, the Geminids are currently the most prolific of the annual showers, producing ZHR in excess of 100 at maximum. Close to peak, Geminids seem to come in bursts of up to half a dozen per minute, interspersed by brief lulls in activity. The incoming meteoroids impact on the upper atmosphere at a relatively slow 35 km/sec and as a consequence of this (and probably, also, their origin from a rocky, asteroidal body – 3200 Phaethon) the resulting meteors often last longer in luminous flight than those from most other showers. Bright Geminids, particularly, sometimes fragment in flight and are visible for a second or more.

The shower is expected to peak around Dec 14d 11h UT, during daylight from UK longitudes. The maximum is broad, however, and rates should be well up by midnight on the Thursday night to Friday morning of Dec 13–14. The radiant, just north of Castor, is high in the southern sky from ▸

at Herstmonceux, was the permanent lecturer at Crayford. (Incidentally, a post he held for 10 years). It therefore became the norm, when Gordon wanted a break, for him to bring in a colleague, either from Herstmonceux or one of the universities, for a week or two or even longer. This tradition continues to this day. However, I was unwise enough to start another tradition – to invite the current President of the BAA to speak at Crayford – and they have wasted no time in contacting me this year!

Also in the 1990s the introduction of (relatively) inexpensive CCDs led to a revolution in astronomical observing, which coincided with my interest in PEP, computing and gadgets. In addition, as you get older you tend to dislike the cold more and more and the thought that I could use a telescope and CCD remotely connected to a PC was very appealing. Nowadays, I find that I can observe long into the night if necessary, something I could never do as a visual observer.

However, although most of my observing is carried out remotely in the pursuit of variable stars, I still enjoy taking the occasional picture of some of the 'pretties' in the sky and if possible observing any visual event of note. I still look through the eyepiece or use my binoculars as the occasion demands and love to photograph the aurora, having seen some spectacular ones when I lived in Kent. In addition, I even organised a holiday in Scotland just a few years back to coincide with the annular eclipse visible just as the sun was rising – a very memorable event and in some ways more spectacular than a total eclipse. So I am keen to encourage people to get out there and observe for themselves, by whatever means they have at their disposal.

Finally, it is interesting to note how many Crayford members both past and present have served the Association: our retiring accountant, Roy Dowsett, (who was also partly responsible for my meeting my future wife); Jean Felles, our Office Manager; Library Committee member, Dick Chambers (Dick is a founder member of Crayford); and former office assistant, Val Stoneham. Dare I go on?

But for the next two years I must turn my attention to the needs of the Association in general and not just the Variable Star Section; two posts which I'm hoping to find time to combine effectively.

Roger Pickard, *President*

Meteor Section (continued)

late evening, and observations into the predawn hours should be productive.

An enticing prospect for photographers is the increased abundance of bright Geminids some hours after the maximum. Early evening observers on Dec 14–15 may well find numerous events in the magnitude 0 and brighter range, even with the Geminid radiant still relatively low in the east: this was certainly the case under very similar circumstances in 2003. Geminids can be captured photographically in time exposures (10–15 minutes) on ISO 400 at f/2.8, using a standard 50mm or wideangle 28mm lens aimed in the general direction of Taurus in early evening, and perhaps Leo/Ursa Major after midnight.

The Moon, an early-setting 4-day waxing crescent on Dec 13–14, will interfere minimally with the 2007 Geminids. New Year 2008 also opens with fairly moonless skies for the narrow peak of the Quadrantid shower on the Thursday-Friday of January 3–4: on this date it is a late-rising waning crescent four days from New.

Although detectable from January 1–6, the Quadrantids only produce really significant activity in a roughly 10-hour period centred on maximum, expected close to Jan 04d 06h UT in 2008, just as dawn is breaking over the British Isles. Those at more northerly locations are slightly favoured by their later sunrise.

A bright Perseid meteor imaged by Nick James on 2007 August 12–13 at 22:31–22:37 UT. Canon 10D digital SLR, 16mm lens at f/3.5.

The Quadrantid radiant, in northern Bootes, is circumpolar, but for most of the evening hours scrapes low over the northern horizon. By 02h, however, it is climbing in the northeast, and by dawn is a healthy 60° up, meaning that observed rates could be substantial. When last well covered by BAA observers in 1992, the Quadrantids produced ZHR *ca.* 120.[1]

Like Geminids, Quadrantid meteors are relatively slow (meteoroid entry velocity 42 km/sec), and there are some similarities in characteristics: both showers often show bluish or greenish meteors. Identification of a parent body for the Quadrantid stream has proved difficult thanks to its rapid orbital evolution. The currently-accepted most likely candidate[2] is asteroid 2003EH1, a possible break-up product of Comet 1490Y1 following the latter's close approach to Jupiter in 1650. This raises the possibility that, like the Geminids, the Quadrantids are a stream of essentially asteroidal (rather than cometary) origin, perhaps explaining some of the observational similarities.

Both the Geminids and Quadrantids are worthy of observation, and will, close to maximum, amply reward the determined observer prepared to face the cold of a winter night – clear skies permitting. Reports will, as ever, be welcomed by the Meteor Section.

Neil Bone, *Director*

References

1 Evans S. J. & Steele C. D. C., *J. Brit. Astron. Assoc.*, **105**(2), 83–88 (1995)
2 Koten P. *et al.*, *MNRAS* **366**, 1367–1372 (2006)

Comet Section

Comet prospects for 2008

2008 is a fairly good year, with four comets likely to come within binocular range. 8P/Tuttle may even be naked-eye visible at the start of the year. There are a further nine comets that should be observable visually with larger telescopes and many more for our CCD observers.

Theories on the structure of comets suggest that any comet could fragment at any time, so it is worth keeping an eye on some of the fainter periodic comets, which are often ignored. This would make a useful project for CCD observers. Perhaps the most spectacular example of such fragmentation is 73P/Schwassmann–Wachmann, which exhibited a debris string of over 60 components as it passed close to Earth in 2006 May.

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

6P/d'Arrest makes its 19th observed return, and it is a good one with the comet reaching perihelion when near opposition. It was first observed by La Hire in 1678 and only four other periodic comets (Halley, Tempel–Tuttle, Swift–Tuttle and Ikeya–Zhang) have a longer observational interval. At previous good returns d'Arrest has reached naked eye brightness, but orbital perturbations have increased the perihelion distance over the past few returns and predictions suggest that it is unlikely to get brighter than mag 9 this year. It should come within visual range in June and reaches perihelion just after opposition in August. It heads south and will become invisible to UK observers, but southern hemisphere observers will be able to follow it as it fades out of visual range in October. It spends June and July in Aquila, but rapidly heads south in August and is in Microscopium by the end of the month.

Comets reaching perihelion in 2008

Comet	*T*	*q*	*P*	*N*	H_1	K_1	*Peak mag*
McNaught (2005 L3)	Jan 16.0	5.59			4.0	10.0	15
8P/Tuttle	Jan 27.0	1.03	13.61	11	7.3	15.0	5
46P/Wirtanen	Feb 2.5	1.06	5.44	9	8.1	13.7	9
110P/Hartley	Feb 3.5	2.49	6.89	3	8.0	15.0	14
P/Tichy (2000 U6)	Feb 7.3	2.14	7.34	1	13.5	10.0	19
44P/Reinmuth	Feb 18.3	2.11	7.07	9	10.5	15.0	15
P/Kowalski (2006 F1)	Feb 19.9	4.12	10.14	0	8.0	10.0	17
LINEAR–NEAT (2001 Q5)	Feb 21.0	2.16	6.74	1	12.0	10.0	18
LINEAR (2000 B3)	Feb 26.0	1.71	8.04	1	16.0	10.0	18
186P/Garradd (2007 B3)	Mar 20.5	4.26	10.64	2	7.5	10.0	17
113P/Spitaler	Mar 23.4	2.13	7.09	3	12.5	5.0	16
26P/Grigg–Skjellerup	Mar 23.7	1.12	5.31	18	12.0	40.0	13
D/Denning (1894 F1)	Apr 2.9	1.67	9.87	1	10.5	10.0	15?
16P/Brooks	Apr 12.6	1.47	6.14	15	9.0	15.0	13
139P/Vaisala–Oterma	Apr 19.4	3.40	9.60	2	7.0	15.0	17
Siding Spring (2007 K3)	Apr 21.8	2.05			9.5	10.0	14
124P/Mrkos	Apr 27.2	1.47	5.75	3	13.1	15.0	14
11P/Tempel–Swift–LINEAR	May 4.6	1.55	6.31	5	15.0	10.0	19
183P/Korlevic–Juric (2006 Y1)	May 9.1	3.89	9.56	1	13.0	10.0	17
LINEAR (1998 VS_{24})	May 18.3	1.06	4.85	1	16.5	5.0	18
173P/Mueller	May 18.5	4.21	13.62	1	7.5	10.0	16
86P/Wild	May 20.0	2.30	6.91	4	8.5	15.0	15
146P/Shoemaker–LINEAR	May 21.4	1.42	8.08	2	15.0	10.0	18
148P/Anderson–LINEAR	May 22.7	1.70	7.07	2	17.0	5.0	20
P/LINEAR (2003 KV_2)	May 24.7	3.42	9.60	1	11.0	10.0	19
180P/NEAT (2006 U3)	May 26.7	2.47	7.53	2	11.0	10.0	16
79P/du Toit–Hartley	May 28.4	1.23	5.28	4	14.0	15.0	15
Spacewatch (2006 U6)	Jun 5.5	2.50			8.0	10.0	14
51P/Harrington	Jun 19.4	1.69	7.13	6	10.0	20.0	16
15P/Finlay	Jun 22.6	0.97	6.50	13	12.0	10.0	13
McNaught (2006 Q1)	Jul 3.8	2.76			5.0	10.0	11
33P/Daniel	Jul 20.4	2.17	8.10	9	10.5	20.0	20
19P/Borrelly	Jul 22.3	1.35	6.85	13	7.0	12.7	13
P/LONEOS (2001 R1)	Aug 5.2	1.35	6.45	1	14.0	10.0	17
McNaught (2007 M1)	Aug 12.2	7.47			6.0	10.0	19
6P/d'Arrest	Aug 15.0	1.35	6.54	18	10.0	20.0	9
Skiff (2007 B2)	Aug 20.6	2.97			6.0	10.0	13
P/Larsen (1997 V1)	Aug 27.4	3.27	10.87	1	9.0	10.0	16
61P/Shajn–Schaldach	Sep 6.1	2.11	7.05	6	10.0	10.0	15
D/Giacobini (1896 R2)	Sep 9.9	1.53	6.66	1	10.0	10.0	11?
Broughton (2006 OF_2)	Sep 15.7	2.43			5.5	10.0	11
147P/Kushida–Muramatsu	Sep 23.0	2.76	7.43	2	14.0	10.0	20
7P/Pons–Winnecke	Sep 26.6	1.25	6.36	22	10.0	15.0	15
187P/LINEAR (2007 E3)	Oct 6.3	3.69	9.40	1	9.0	10.0	17
P/LINEAR (2001 CV_8)	Oct 11.3	2.16	7.66	1	13.0	10.0	18
172P/Yeung	Oct 12.8	2.24	6.58	2	13.0	10.0	18
25D/Neujmin	Oct 15.0	1.27	5.39	2	10.5	10.0	13?
P/NEAT (2001 J1)	Nov 6.8	0.94	7.67	1	16.0	10.0	16
P/Catalina (1999 XN_{120})	Nov 12.5	3.30	8.57	1	13.5	5.0	18
LINEAR (2007 G1)	Nov 16.2	2.65			5.5	10.0	12
150P/LONEOS	Nov 26.0	1.77	7.68	3	13.5	10.0	17
Catalina (2007 M2)	Dec 8.4	3.54			8.0	10.0	16
P/LINEAR–NEAT (2001 TU_{80})	Dec 9.6	1.94	7.02	1	14.0	10.0	17
85P/Boethin	Dec 16.4	1.15	11.54	2	6.5	20.0	7
57P/du Toit–Neujmin–Delporte	Dec 26.0	1.72	6.41	6	12.5	15.0	18

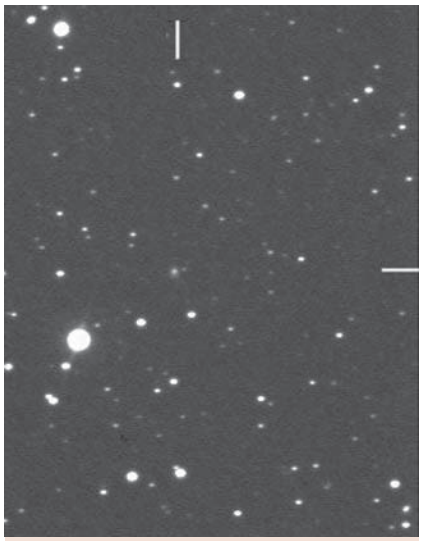
The date of perihelion (T), perihelion distance (q), period (P), the number of previously observed returns (N), the magnitude parameters H_1 and K_1 and the brightest magnitude (which must be regarded as uncertain) are given for each comet. The date of possible return of D/Denning and D/Giacobini must be regarded as highly uncertain, whilst 25D/Neujmin has not been seen since 1927.
Note: $m_1 = H_1 + 5.0 * \log(d) + K_1 * \log(r)$

8P/Tuttle is likely to be one of the brighter objects for visual observers in 2008, unless there is an exciting new discovery. It could be a binocular or even naked eye object at the beginning of the New Year as it makes a close pass of the Earth at 0.25 AU. It begins the year in Pisces, but is rapidly heading south and UK observers will lose it after the third week of January. Southern hemisphere observers should be able to follow it for another three months. The comet was discovered by Pierre Mechain in 1790 January from Paris, but the available observations were insufficient to compute an elliptical orbit and it was lost until a comet was discovered by Horace Tuttle at Harvard, USA in 1858 February. When an accurate orbit was computed it was found to be identical to Mechain's comet and it has been observed at every return since 1871 except for a very unfavourable one in 1953. The most favourable returns are those with a perihelion in December, January or February. The orbit is quite stable, due to the high inclination and the value of the argument of perihelion, and it intersects the Earth's orbit producing the Ursid meteor shower which peaks on December 23. Rates at maximum are usually only 10–15 per hour, but strong displays of around 100 per hour occurred in 1945 and 1986; in both cases the parent comet was near aphelion.

Alphonse Borrelly discovered comet **19P/Borrelly** in 1904 from Marseilles, France, during a routine comet search with a 160mm refractor. It was put into its discovery orbit by an encounter with Jupiter in 1889, which only made minor changes, and subsequent returns slowly became more favourable. Despite its having had several further moderately close approaches to Jupiter the orbit has only changed a little and the comet will next approach the planet in 2019. 2008 will be its 14th observed return, with two poor ones having been missed. At its best return in 1987 it reached mag 7.5. This is not a particularly good return, and the comet will remain close to the Sun until perihelion. It slowly emerges into the morning sky, and observations should be possible from July onwards as the comet fades from 11th magnitude.

29P/Schwassmann–Wachmann is an annual comet that has outbursts, which in recent years seem to have become more frequent and were more or less continuous in 2004. At many recent outbursts it has reached 12th magnitude. It spends the first third of the year in Auriga before sinking into solar conjunction. It emerges into the morning sky of Gemini in August, and spends the last third of the year in Cancer. Unusually there is no opposition in 2008. The comet is an ideal target for those equipped with CCDs and should be observed at every opportunity. It is again well placed this year and UK based observers should be able to follow it for much of the year.

Carl A. Wirtanen discovered **46P/Wirtanen** at Lick Observatory in 1948. It is in a chaotic orbit, and its perihelion distance was much reduced due to approaches to Jupiter in 1972 and '84. It has been reported to outburst, but BAA data suggest that it was just rejuvenated after the perihelion distance was reduced. A December perihelion would give a close approach to the Earth, and as the present period is now less than 5.5 years this will be achieved in 2018, when the comet could reach 3rd magnitude. 2008 is a relatively good return with the comet reaching 9th magnitude in the evening sky around the time of its February perihelion. The comet travels eastwards, not very far from the ecliptic, crossing to northern declinations in late January and north of the ecliptic in early February. It should be possible to continue observations until May as it fades.



Comet 2006 OF_2 (Broughton) on 2007 September 10 at 23:13 UT. 10×60s exposures with 110mm refractor and SXV CCD. *David Strange*.

Leo Boethin discovered **85P/Boethin** visually with a 200mm reflector at Bangued, Abra, Philippines on 1975 January 4. The last return was the worst of the century and the comet was not recovered. The orbit is evolving in response to encounters with Jupiter and Saturn. The comet passed 0.046 AU from Jupiter in 2007 May, in an encounter which made significant changes to the angular elements. The return at the end of 2008 is favourable and the comet could become visible in binoculars. It comes into visual range in August when it is near opposition, but initially remains too far south for UK observers, who should be able to pick it up in October. By then it is 10th magnitude and steadily brightens, perhaps reaching 7th magnitude in the December evening sky. It is another near-ecliptic comet and ends the year in Pisces.

Two periodic comets for 2009 come into visual range by the end of the year, however the second is poorly placed. Of these, **144P/Kushida** was discovered by Yoshio Kushida (his second discovery within a month) on Technical Pan 6415 film ex-

posed on 1994 January 8.8 with a 100mm, f4.0 patrol camera at Yatsugatake South Base Observatory, Japan. The comet was 13th magnitude, diameter 1–2' with a strong central condensation. It proved to be a short period comet with a period of 7.4 years and was found at a favourable opposition. With an aphelion just outside the orbit of Jupiter, it belongs to the Jupiter family of comets, and its most recent close approach to the planet before discovery was just over 1 AU in 1960. A similar approach followed in 1995 on the outbound leg of its post-discovery orbit. The comet was moved into something close to its present orbit in a close encounter with Jupiter in 1782. Since then encounters have been more distant and there have only been slow changes in the elements. This is a favourable apparition and the comet could reach 11th magnitude by the end of the year.

2003 K2 (P/Christensen). This object discovered by the Catalina Sky Survey on 2003 May 26.18 was quickly confirmed as cometary. It passed perihelion at 0.55 AU in April, but was intrinsically faint. It was visible in SWAN imagery and at brightest probably reached 10th magnitude; it seems likely that it was the same object as reported in SWAN imagery between April 5 to 19, but which was not confirmed visually due to low elevation and poor elongation from the Sun. An orbit by Marsden gives the period as 5.75 years, however the observed arc is relatively short. It should be recovered by southern hemisphere astrometric observers by October, but it will remain poorly placed for northern observers until after perihelion.

With sky surveys getting ever deeper, long period comets are being discovered a considerable time from perihelion, and several are likely to be visible in 2008. Some two months after John Broughton discovered asteroid **2006 OF_2 (Broughton)** it was found to show a coma, not altogether surprisingly given the provisional highly eccentric orbit. It should emerge from solar conjunction in 2008 June as a 12th magnitude object and peak at 11th magnitude in November. It is circumpolar for northern hemisphere observers when brightest during the autumn of 2008, and will remain visible until 2009 May.

2006 Q1 (McNaught) may reach 11th magnitude in 2008 July, when it is at perihelion, however it is then a southern hemisphere object. By December, when it becomes visible from the UK, it will have faded to 13th magnitude.

2007 G1 (LINEAR) reaches perihelion at 2.7 AU in mid-November 2008. The comet might come within visual range in 2008 March, reaching 12th magnitude for southern hemisphere observers near the time of perihelion, and remain visible into 2009.

2007 N3 (Lulin) reaches perihelion early in 2009, but should be observable by southern hemisphere observers during their 2008 winter at around 12th magnitude. UK observers will have to wait until the new year and it may reach 6th magnitude in February.

The other periodic and parabolic comets that are at perihelion during 2008 are unlikely to become brighter than 13th magnitude or are poorly placed. Ephemerides for these can be found on the CBAT WWW pages. **25D/Neujmin** has not been seen since 1927. Searches at favourable returns in the intervening period have failed to reveal the comet and it is possible that it is no longer active.

Looking ahead to 2009, **85P/Boethin** will still be visible as a binocular object at the start of year and **2007 N3 (Lulin)** is well placed in February. Reaching 9th magnitude over the summer, **22P/Kopff** is the brightest of the periodic comets returning to perihelion, whilst **81P/Wild** and **P/Christensen** (2003 K2) should both reach 10th magnitude.

Jonathan Shanklin, *Director*

References and sources

Belyaev N. A. *et al.*, *Catalogue of Short Period Comets*, Bratislava (1986)

Kozlov E. A. *et al.*, *Catalogue of Short Period Comets, 2nd edn.*, **http://astro.savba.sk/cat/** (2003)

Kronk G. W., *Cometographia*, Cambridge University Press, (1999, 2004) and **http://www.cometography.com**

Marsden B. G., *Catalogue of Cometary Orbits, 16th edn.*, IAU CBAT (2005)

Minor Planet Circulars

Nakano Notes at **http://www.oaa.gr.jp/~oaacs/nk/**

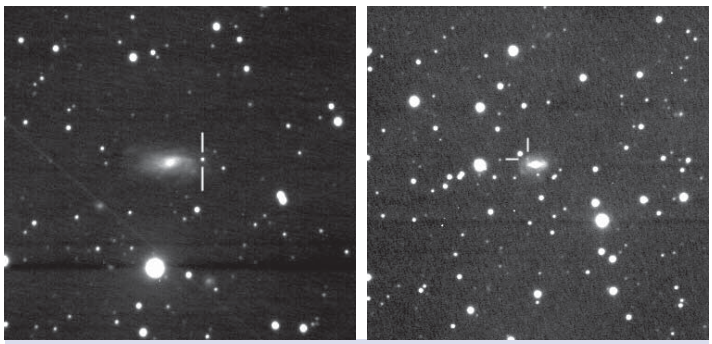
Nakano S. & Green D. W. E., *eds.*, *International Comet Quarterly 2007 Comet Handbook* (2006)

Shanklin J. D., *Observing Guide to Comets, 2nd edn.*, BAA (2002)

Deep Sky Section

New supernova discoveries

After a lull – largely caused by the poor summer weather – following his discovery of SN2007ck in May (see the August *Journal* p. 167), Tom Boles has had two further successes. The first, discovered on the night of September 12, was in galaxy UGC 3416, a magnitude 14.6 galaxy in Camelopardalis. The supernova, designated 2007iq, was at magnitude 17.5 at discovery, and lay 39.9" west and 3.9" north of the centre of the galaxy. At the time of writing the supernova type had not been determined. Details were released in IAU *Circular* CBET 1064 and *TA Electronic Circular* E2375.

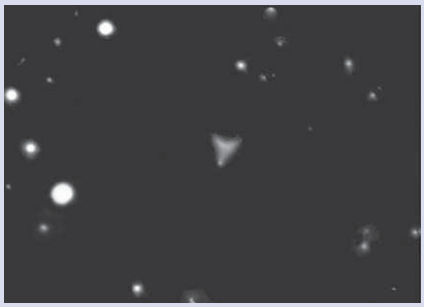


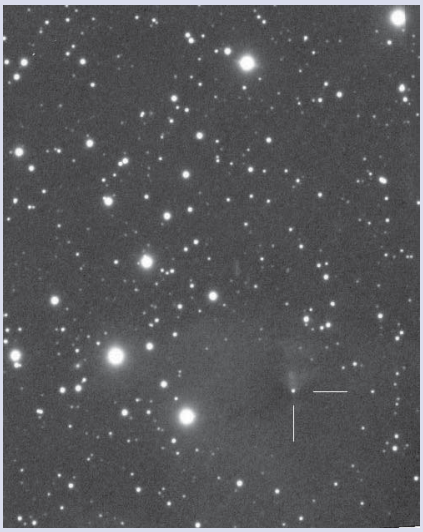
Left: SN 2007 iq in UGC 3416, 35cm SCT with Apogee AP7 CCD camera. *Right:* SN 2007 iv in UGC 12917; equipment as above. *Images:Tom Boles.*

Two nights later, on September 14, Tom detected a 'new' star on the edge of UGC 12917, a magnitude 14.7 galaxy in Andromeda. This supernova, which appeared buried in the halo of the galaxy, was much fainter at magnitude 19.6 and following confirmation images has been designated 2007iv. It lies 11.0" east and 7.3" north of the centre of the galaxy. A spectrum, obtained by the 4m Mayall telescope on Kitt Peak, shows it to be a type II supernova. Full details are available in IAU *Circulars* CBET 1070 and CBET1072 and in *TA Electronic Circular* E2377.

These latest discoveries bring Tom's total to 108. Both were made using a 0.35m Schmidt–Cassegrain telescope and unfiltered Apogee AP7 CCD camera on a robotic Paramount equatorial mounting.

In an age when most supernovae are discovered using sophisticated and often expensive equipment, it is pleasing that there are still opportunities for visual observers to make discoveries using relatively basic telescopes – assuming that they have an encyclopaedic knowledge of the appearance of many hundreds of galaxies through the eyepiece. The Revd Robert Evans of Hazelbrook





Above: Gyulbudaghian's Nebula when bright. 35cm SCT at f/5 with DSI Pro CCD camera, 2006 October 4. *Image: Fred Stevenson.*

Right: Gyulbudaghian's Nebula after fading. 20cm M809 Mak-Cass at f/10 with SXV-H9 CCD camera, 2007 Sept 17. *Image: Andrea Tasselli.*

in the Blue Mountains near Sydney, Australia, has just made his 41st visual discovery, picking up supernova 2007it in the Lupus galaxy NGC 5530 with a 0.41m reflector. He made his first discovery in 1981 and is still patrolling.

Fading of Gyulbudaghian's nebula

Most deep sky objects appear permanent and unchanging through amateur telescopes over human time scales. Exceptions are so-called variable nebulae, where a variable star associated with the nebula causes both the shape and brightness of the nebula to change – sometimes over quite short time periods. A popular target is Hubble's Variable Nebula (NGC 2261) in Monoceros, which changes regularly and is usually easy to observe; another is Hind's Nebula (NGC 1554-55) in Taurus which, although usually faint, brightened briefly in 2005.

One of the least observed variable nebulae is Gyulbudaghian's in Cepheus, associated with the star PV Cephei. Although always a very difficult visual target, it is usually relatively easy to image. On September 17 a report was received by the Director from Frank J. Melillo in Holtsville, New York, to say that it had faded so much that he was unable to image it. A request for images from Section members resulted in an observation by Andrea Tasselli of Lincoln, who confirmed it had faded significantly, while a few weeks later an image by Fred Stevenson of Amersham, Bucks., suggested it had already started to brighten again. This brightening was confirmed by further images from Grant Privett and Andrea Tasselli. Lying in Cepheus at RA 20h45m55s and Dec 67°57'45" (2000.0) the nebula is circumpolar and readily accessible in the evening sky during December and January. If you have imaged the nebula recently, or intend to in the next few months, please send all observations to the Director at the address given at the rear of the *Journal*. Please send images in JPG format, but retain raw data along with all imaging details for possible future analysis. If you intend observing the nebula on a regular basis, please image as far as is possible under identical equipment conditions.

Two images of Gyulbudaghian's nebula are shown here. The one showing the nebula bright was obtained by Fred Stevenson on 2006 October 4 using a 14-inch (35cm) Meade SCT at f/5 and DSI Pro CCD camera. The image showing significant fading was obtained by Andrea Tasselli almost a year later on 2007 Sept 17 with an Intes Micro M809 Mak-Cass at f/10 and Starlight Xpress SXV-H9 CCD.

Stewart L. Moore, *Director*

Solar Section

2007 July

Activity for July was slightly down on last month and mostly remained within the southern hemisphere. Most observers reported a blank disk on July 20 with all observers reporting a blank disk from 21 to 27 inclusive. The month opened with the two groups from the previous month on the disk.

AR961 S10°/221° was close to the CM on Jul 1, type Cao, with an area of 70 millionths. The umbra had split in two with some small spots visible around the main spot and also a pore on the same latitude but well to the east of the main group. By Jul 3 the umbra had split into two equal well separated halves and the smaller spots had faded. The group started to decline on Jul 5 and rounded the western limb on Jul 7.

AR962 S08°/194° survived from the previous month but much reduced as a single Axx spot. The group was not seen thereafter.

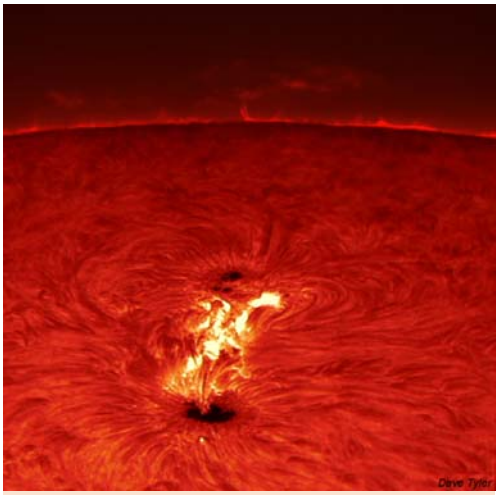
AR963 S06°/058° rounded the eastern limb on Jul 7, type Hsx, and was type Dso by the following day. The group developed into type Ekc by Jul 10 with an area of 370 millionths. The group sported an asymmetric leader penumbral spot followed by several smaller penumbral spots and was visible with the protected naked eye on Jul 11. The group then started to decay with the leader spot reducing in size and the number of following spots declining. By Jul 15 the group had an area of 150 millionths and was type Cso by Jul 17. The group was last seen on Jul 19 close to the western limb as a single Hsx spot.

AR964 N04°/084° first seen on Jul 12 type Bxi, the only northern hemisphere group of the month. The group persisted until Jul 16 to the west of AR963 as type Cso with an area of 40 millionths but was not seen on Jul 17.

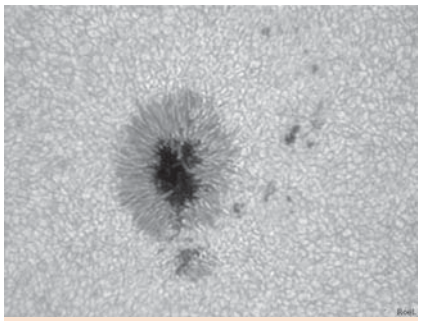
AR965 S11°/195° arrived on Jul 28 after a run of spotless days. The group was type Cao but decayed to type Axx, being still visible on Jul 30.

A short lived group was seen by three observers on July 29 and 30 in the S hemisphere to the west of AR965, but does not seem to have received an official designation.

The quality number (Q) for July was 2.93.



AR963 on 2007 July 9 at 08:56 UT. *Dave Tyler.*



AR961 on July 1. Image by Eric Roel, 152mm f12 refractor.

H-alpha

Prominences

14 observers reported a prominence MDF of 2.65 for July.

Several observers reported Jul 6 and 7 as particularly notable days. Eric Strach saw a brilliant prominence at S06º on the eastern limb at 13:00 UT. By 14:20 it had lost some of its brightness and split into three parts. He concluded that it was associated with the subsequent appearance of AR961 and that the 'brilliant prominence' was possibly a limb flare emanating from the spot beyond the eastern limb. Mike Houchen also reported a 'limb flare' at 14:40 UT on this date on the eastern limb at S05º.

Peter Meadows reported a 'smoking chimney' type prominence on the SE limb where the 'smoke' extended some 5º along the limb towards the south. Lee Macdonald confirmed this sighting. By 16:45 UT the following day a very bright prominence was seen by Peter also on the SE limb but closer to the equator. By 17:55 UT it was still bright but not as high above the limb. Arthur Bowyer also reported a small bright prominence on the southern limb on Jul 7 which was a 'long spike with a barb' by 16:50 UT but had greatly diminished by 17:30. Ken Medway also saw a 'tall slender pillar' on the SE limb on Jul 7. Helen Thomas reported an 'incredible surge prominence' at 12:35 UT on the same day appearing to originate from just inside the disk rather than on the SW limb.

Monty Leventhal reported a prominence on the NE limb extending to a height of 112,000km on Jul 15 and a large hedgerow prominence at 22:30 UT on Jul 18 extending 177,000km along the SE limb and to a height of 84,000km.

An 'array' of prominences was seen on the SW limb on Jul 19 extending from S02º to S28º which consisted of three main parts interacting at times. The configuration changed constantly throughout the day. Two sets of flame type prominences were seen on the SE limb near to AR963.

Brian Mitchell reported a prominence on Jul 30 on the NE limb 40–50º in size which was the largest he had observed all month. It was still present the following day although reduced in size.

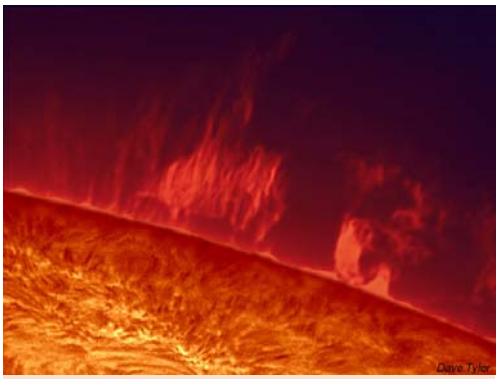
Filaments and plage

No filaments or plage of any note were recorded this month although Peter Meadows noted that plage accompanied AR963 as it crossed the disk, fading as it did so. Brian Mitchell recorded a bright area next to AR961 on Jul 1 and filament around S25º/210º on Jul 30 and 31.

2007 August

Activity was slightly down on last month and again most activity occurred in the southern hemisphere. Most observers reported a blank disk between Aug 1 and 3 and between Aug 13 and 20, and all observers reported a blank disk on Aug 2 and between Aug 16 and 20.

AR966 S06º/067º was first seen on Aug 3 at the eastern limb. On Aug 4 it was clearly a single Hsx spot and it remained unchanged on the following day. By Aug 6 it had developed four satellite spots type Cso. It crossed the CM between Aug 9 and 10, type Dso by 9th. After Aug 12 it started to fade and was no longer seen on 13th.



Prominences on 2007 Aug 18 at 11:01 UT. *Dave Tyler.*

AR967 N05º/148º made a short appearance on Aug 8 as a single Axx type spot but was not seen thereafter.

AR968 N03º/026º was first seen on Aug 12 type Axx which had grown to type Bxo the following day. It quickly faded and was not evident on Aug 15.

AR969 S06º/189º rotated onto the disk on Aug 21. It was a single penumbral spot with one satellite spot type Hsx on 22nd but a second satellite spot had developed by 23rd. The spot developed a double umbra on Aug 24 which had split into three by Aug 25 with an area of 70 millionths. It crossed the CM on 27th type Cao and was seen on 31st approaching the western limb.

AR970 S06º/124º was seen as a single Axx spot on Aug 30 and 31.

The quality number (Q) for August was 2.28.

H-alpha

Prominences

14 observers reported a prominence MDF of 2.76 for August.

Ken Medway reported 'tall spire-like' prominences on Aug 1 and 2 on the SW limb. Brian Mitchell observed a 'large mass' prominence on Aug 5 on the western limb, S20º to 30º, which developed from a filament seen on Aug 3 at S25º/210º.

A high jet prominence was seen on the western limb by Eric Strach on Aug 10 at N36º reaching a height of 170,000km. The

BAA sunspot data, 2007 July–August

	July		August	
Day	*g*	*R*	*g*	*R*
1	2	22	0	1
2	1	15	0	0
3	1	12	0	1
4	1	12	1	10
5	1	12	1	10
6	1	12	1	13
7	1	10	1	11
8	1	13	1	15
9	1	18	1	13
10	1	22	1	13
11	1	22	1	11
12	1	23	1	8
13	2	31	0	5
14	2	36	0	1
15	2	32	0	1
16	2	24	0	0
17	1	16	0	0
18	1	13	0	0
19	1	9	0	0
20	0	1	0	0
21	0	0	1	10
22	0	0	1	11
23	0	0	1	12
24	0	0	1	13
25	0	0	1	12
26	0	0	1	12
27	0	0	1	12
28	1	12	1	12
29	1	12	1	12
30	1	10	1	15
31	0	0	2	22
MDFg		0.83 (50)		0.66 (52)
Mean R		12.56 (42)		8.24 (45)

North & south MDF of active areas g

	MDFNg	*MDFSg*
July	0.07	0.74 (32)
August	0.04	0.68 (35)

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

jet was still in the same position at a reduced height on 13th.

Peter Meadows reported a 'striking prominence' on Aug 16 on the NW limb having the appearance of an airport windsock. Mark Walters reported a 'large surge and spray prominence' on the W limb on the same day. The 'windsock' prominence was still present on Aug 17 but had split into several parts. Eric Strach reported two arrays of prominences on 17th, one in the SW extending from S18º to S34º and the other on the NE limb extending from N25º to N44º. On 17th Peter Meadows observed two spike-like prominences on the NW limb giving a 'V' appearance.

Monty Leventhal reported a prominence on the NE limb rising to a height of 65,000km. All prominences for the remainder of the month were small.

Filaments and plage

A small but sharp arc filament was seen in association with AR966 to the south of the group on Aug 10, 11 and 13 even after the spot was no longer visible. A small filament was seen at N07º/020º surrounded by bright plage on Aug 13.

As AR969 moved onto the disk on Aug 21, it was associated with a short but strong filament with bright plage. On 22nd an inverted J-shaped filament preceded the spot by 25º and was still evident the following day.

Flares

Monty Leventhal in Australia reported a 1N type flare in association with AR966 at 01:40 UT on Aug 6 and a 2B type flare in association with AR969 on Aug 24 starting at 23:15, peaking at 23:30 and ending at 23:50 UT.

Ernest Richardson reported a flare on Aug 6 at 09:40 UT, and Mark Walters reported flares in association with AR969 on 25th at 13:30 UT and on 26th at 15:00 UT.

Lyn Smith, *Director*

Asteroids and Remote Planets Section

Members new and not so new

We would like to welcome the following new member to the Section: Javier Temprano González – MPC observatory code J59 (Observatorio Linceo, Santander).

You will be pleased to hear that John Fletcher made a speedy recovery from his recent heart bypass operation. This was made all the more difficult by the summer's floods which knocked out his water, telephone, electricity and TV for a while. Very truly it 'never rains but it pours'.

25th anniversary

This year is the 25th anniversary of the formation of the Minor Planets Group within the Terrestrial Planets Section. The Group became the Minor Planets Section in 1984 and changed its name to the current one in 1985.

Observations

After the period of very poor weather earlier in the year, August and September showed some improvement. Astrometry was received from Peter Birtwhistle (whose observatory but not his house and garden were spared from the floods), David Briggs, Javier Temprano González and Lawrence Harris; video reports from Richard Sargent; visual photometry from Bob Middleton; and negative occultation reports from Andrew Elliott and Richard Miles. Images were obtained by Maurice Gavin.

Peter Birtwhistle's observations of Apollo asteroid 2007 RS1, discovered by the Catalina Sky Survey, are worthy of special mention. When imaged by Peter on 2007 September 4 it was 0.55 'lunar distances' (LDs) from Earth and eventually closed to 0.19 LDs. It holds the record for the asteroid with the faintest absolute magnitude, 30.98 ± 0.36, which indicates a likely diameter of 1 or 2 metres. (By the end of September Peter's asteroid discovery total had reached 82.)

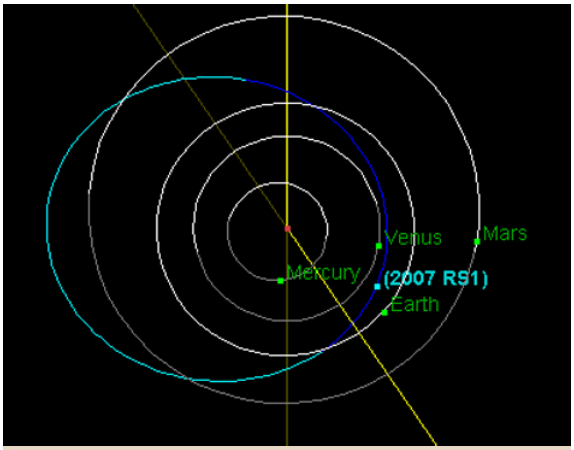


Figure 1. The orbit of asteroid 2007 RS1 relative to the inner solar system on 2007 October 8 (*JPL*).

2007 RS1 does not fall into the 'Mars crosser' category even though its orbit crosses that of the planet. A request on the Minor Planet Mailing List by Section member Alan Cahill for a definition of such asteroids was answered by Dr Alan Harris, who stated that 'asteroids which cross only the orbit of Mars have a quite long collision lifetime (of the order of the age of the solar system), whereas those that actually cross the Earth's orbit have much shorter collision lifetimes, and also the time scales for major orbit modification (due to close passes by the planets) are much different. Thus on dynamical grounds it is important to distinguish between asteroids that cross only the orbit of Mars from those that cross the orbits of Earth and/or Venus. Therefore, in common usage, we usually do not include Amors (q [perihelion] < 1.3 AU) or Apollos and Atens as Mars crossers although most do actually cross the orbit of Mars as well. So in practical terms, objects that would be referred to as 'Mars-crossers' would be those with 1.300 < q < 1.665.'

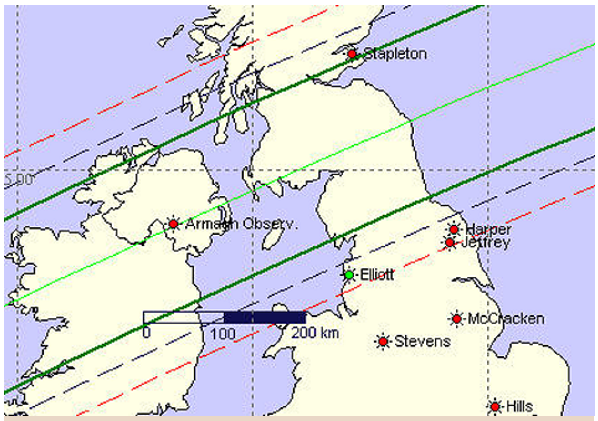


Figure 2. The predicted path of the 137 Meliboea occultation on July 24, showing Andrew Elliott's station outside the predicted track. (*Euraster*).

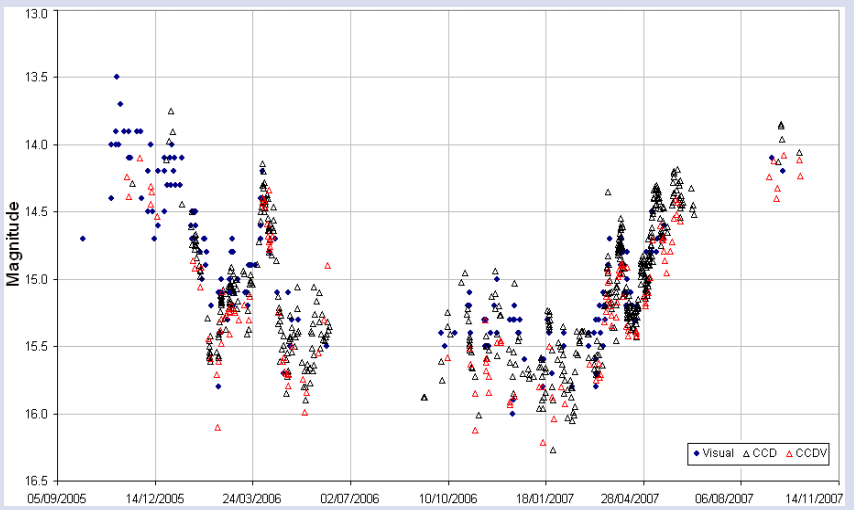
Congratulations to Andrew Elliott for his positive video observation of the occultation of TYC 0464-02162-1 by asteroid 137 Meliboea on July 24 (see Figure 2). The occultation was also recorded by Armagh Observatory's asteroidal occultation group. Andrew's success illustrates the importance of observing occultations even if your observatory appears to be outside the predicted track – such a result can help to refine both the orbit of the asteroid and the known position of the star. ▸

Variable Star Section

OJ287 campaign – Success!

Since Autumn 2005, a network of observers from around the world has been monitoring the binary black hole candidate OJ287, and reporting their data to the BAAVSS observing campaign.[1,2] Following the success of detecting the first of two outbursts in 2005, all eyes were looking to OJ287 in this year's early September dawn skies, hoping to detect the second predicted outburst. Dr Mauri Valtonen (Dept of Physics, Tuorla Observatory, University of Turku, Finland, and Dept of Physics, University of the West Indies, Trinidad) who has analysed all the BAAVSS & TA data received over the past thirteen years, made the prediction that OJ287 would be rising to outburst in early September, with the start of the outburst occurring on September 13 (revised slightly after the December 2006 *JBAA* news item). Confirmation of this prediction would go a long way to confirming the binary black hole nature of this object, something which is not yet universally accepted.

Observations at this time are extremely hard to undertake, as the field in Cancer is just emerging from solar conjunction in the early morning sky. Despite this,VSS Director Roger Pickard managed to image OJ287 on the morning of 2007 September 4, with Gary Poyner visually and Albert Sanchez with CCD observing the field on the morning of September 7 (three of the earliest post-conjunction observations ever made by amateurs). These observations revealed OJ287 to be bright at magnitudes 14.24V, 14.1 visual and 13.81R, and rising. Further data received confirmed that the long awaited outburst was indeed in progress, with the magnitude peaking on September 16.1 UT at magnitude 13.85C. Dr Valtonen commented that further analysis of the light curve, including the post conjunction data, showed that the true outburst started on Sep 12.3 UT, some 16 hours earlier than predicted. He also adds that considering the return of Halley's Comet in 1986 was calculated to within five hours of the correct time, we are doing pretty well for such a distant object!



Lightcurve of OJ287 during its recent activity.

The current observing campaign will continue until the end of 2007, although the main aim of the campaign has been achieved with great success. Observers are however encouraged to continue to monitor OJ287 at regular intervals, as it remains a most interesting object to observe 'between' outbursts.

Gary Poyner
[http://www.garypoyner.pwp.blueyonder.co.uk/oj_camp.html]

1 Poyner G., *J. Brit. Astron. Assoc.*, **116**(4), 163–164 (2006)
2 Poyner G., *J. Brit. Astron. Assoc.*, **116**(6), 297 (2006)

Asteroids named after BAA members

A request for information on this subject in a recent Section newsletter resulted in an initial list of names being provided by Brian Marsden. Any information on this subject would be most welcome so that a definitive list can be compiled.

Space missions

After a delay of several months the *Dawn* spacecraft lifted off from Cape Canaveral on September 27. *Dawn* is scheduled to reach asteroid (4) Vesta in 2011 and dwarf planet (1) Ceres in 2015.

Dwarf planets

The furore over this new nomenclature appears to have died down. However Pluto's place in the planetary hierarchy was further diminished by the recent announcement by Mike Brown, the discoverer of Eris, that this dwarf planet is 27% more massive than the original ninth 'planet'.

Roger Dymock, *Director*

Nanotechnology goes to Mars with *Phoenix*

In 2001 the American Mars missions *Mars Surveyor* and *Mars Polar Lander* were abandoned, and the landing craft and instrumentation were kept, unfinished, in clean storage ready to be used. Now, under the leadership of the University of Arizona, the project has been revived by NASA and christened *Phoenix*. *Phoenix* will land in Mars' northern arctic and like the *Vikings*, swing a robot arm out to take samples from the surface and shallow, scraped trenches. The hope is that amongst all the bits of ordinary rock there will be grains of ice that a nanoprobe can identify.

NASA's latest Martian lander *Phoenix*.

Nanotechnology is much talked of, recently. The term means technology at the scale of the wavelength of light (hundreds of nanometres). It might seem obvious that the miniaturisation inherent in nanotechnology should be used for spaceprobes, but the backup equipment is often bulky and exist-

Notice

The BAA Awards and Medals

Early in the New Year, Council will consider nominations for the Association's Medals and Awards for 2008. If any members wish to nominate a fellow member for some notable contribution, please send a suitably worded citation to the Business Secretary no later than 2008 March 7. All nominations must be in writing and signed by two sponsors, who must be BAA members. Please try to confine citations to one side of an A4 sheet of paper.

Conditions relating to each award are given below. Members are requested to read the conditions carefully and to ensure that citations comply with the conditions for the relative award. A list of previous recipients of the Awards and Medals may be obtained from the BAA Office.

Walter Goodacre Medal & Gift

This award, which is the senior award made by the Association, shall be made only provided that the recipient's subscription has been fully paid and nothing be due from him or her to the Association. It is normally awarded at intervals of not less than two years and not more than four years since the last award.

This award shall be given in recognition of the recipient's contribution to the progress of astronomy over many years, special regard being had to his or her work communicated to the Association, this work being communicated in any form, and not necessarily in writing, provided that the recipient is a member of at least five years standing in the Association at the date of the Annual General Meeting in the year of the award.

Merlin Medal & Gift

The award shall ordinarily be made not more than once in any year and not less often than once every five years, the year being reckoned to start at each Annual General Meeting.

This award shall be made in recognition of a notable contribution to the advancement of astronomy. If two or more persons have been jointly concerned in any particular work, a joint award may be made, in which case each recipient shall receive a medal and gift.

Lydia Brown Medal & Gift

This award shall be made at the discretion of the Council.

The award shall be in recognition of meritorious service to the Association in an honorary capacity over many years, on grounds that would not qualify the nominee for either the Walter Goodacre or Merlin Awards. If two or more persons have been jointly concerned in any particular work, a joint award may be made, in which case each recipient shall receive a medal and gift.

The Steavenson Award

This award shall be made at the discretion of the Council.

It shall be awarded to a member who has made an outstanding contribution to observational astronomy.

Horace Dall Medal & Gift

The award shall be made at the discretion of the Council but not more than once in any calendar year. It shall be made to a person, whether or not a member of the Association, who has shown marked ability in the making of Astronomical Instruments. If two or more people have been jointly concerned in a particular work then each person may receive a medal and gift.

Ron Johnson, *Business Secretary*

ing instruments are highly specific in design and use, which is often medical.

Mars is too cold and the atmosphere too thin for liquid water to exist on its surface for more than the short time it takes for some to evaporate and the rest to freeze. *Mars Express* has come up with convincing (to me, anyway) evidence of former Martian seas and we've all seen those sinuous river-like valleys in pictures from various probes and telescopes. What is needed is something from the ground.

Phoenix' robot arm will carry samples of soil to a suite of analysing instruments. Part of each sample lands on a 'sample wheel', which brings the material round to be examined by a nanoprobe.

There are eight 'cantilevers' on the probe. Only one is used at a time and there is a cutter ready to shear off any cantilever that fails or gets clogged. The cantilevers are small, flat strips with a hard, sharp point attached perpendicular to the end. The cantilever bends, when an electric current is applied, and, because of its ultra-small size, can flex and recover very rapidly. Thus, it can be dragged passively across the surface of a soil grain and obtain a profile of that surface – like an old-fashioned record stylus running in its groove. Alternatively, the cantilever can be set to a suitable frequency and beat a rapid tattoo on the moving surface to show how hard or soft it might be. In fact, the probe can even turn to advantage a particular problem, that of a tiny sub-grain adhering to the end. The size and nature of this sub-grain can be worked out before it and the cantilever are discarded. Many scans across a grain build up sample images down to 10 nanometers – the smallest scale ever examined on Mars, giving clues not only to its shape, but its composition.

Phoenix was launched from Cape Canaveral in early August and will land in the Martian arctic after a ten-month voyage. The website is **http://phoenix.lpl.arizona.edu/**

Thanks to the University of Basel who kindly gave me a place on a study-tour, where I learned about all this.

Roger O'Brien

Special announcement – Colour in the BAA *Journal*

Observant readers will have noticed a change in this issue of the *Journal*. Instead of restricting colour images to a maximum of four or eight pages per issue, we are now able to print in colour on every page. This has been achieved by making use of new printing technology, at little extra cost to the Association.

As well as allowing more colour for editorial material, this has also enabled us substantially to reduce our rates for colour advertising . Contact Sheridan Williams at 01525 237270 [baa@clock-tower.com] for full details of *Journal* advertising rates, including a special discount for BAA members!

Hazel McGee, *Editor*