

Notice**BAA Awards and Medals for 2003**

Early in the new year Council will consider nominations for the Association's Medals and Awards for 2003. 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 2003 January 10. All nominations must be in writing and signed by two sponsors. Please try to confine citations to one side of an A4 sheet of paper. Thank you.

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 may be obtained from the Business Secretary.

Merlin Medal and Gift

'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 and Gift

'This award shall be in recognition of meritorious service to the Association in an honorary capacity over many years on grounds which would not qualify a 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.'

Steavenson Award

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

Horace Dall Medal and Gift

'The award 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*

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as the skies will not be completely clouded up, and the climate change isn't all down to human activities as the output of the Sun directly influences global temperatures.

Conclusions: Will it be clear tonight? We don't know! How might global warming affect cloud cover? Cloud cover will increase, so get in as much observing as possible when you can. However, this is not certain and we should be far more worried about the effect of light pollution.

On the following day, Saturday, the first speaker was Nick James whose talk, about cataclysmic variable stars, was entitled 'Dealing with superhumps'.

Dealing with superhumps

The cataclysmic variable family is a large one, ranging from the classical novae, which have outburst amplitudes of up to 19 magnitudes but are usually observed only once, to the dwarf novae which brighten by only 3 to 6 magnitudes but which repeat after only a few weeks or months. All CVs are binary systems where a main-sequence secondary star is transferring mass to a compact white dwarf primary. In dwarf novae the material from the secondary forms an accretion disc around the primary before falling onto the white dwarf. This accretion disc is the main source of the light when the system is in outburst.

Since CVs are binary systems we can see eclipses if the orbital plane is nearly aligned with our line of sight. Eclipses are a powerful tool in probing the secrets of CVs. Amateur observers equipped with CCD cameras can observe these eclipses and produce really useful scientific data. It is also possible to watch the eclipses visually and, since they may only last a few minutes, the star can be seen to fade and brighten in real time.

The next speaker was Stewart Moore and his talk was about 'Visual enjoyment of the Deep Sky'.

Visual enjoyment of the Deep Sky

To enjoy the Deep Sky the equipment used doesn't have to be expensive or complicated. Binoculars are ideal and they are easy to use. There are plenty of objects within range of binoculars, for example the open clusters M36 and M38 in Auriga. The Coma cluster only fits into the field of view of binoculars and even some IC objects are visible, e.g. IC4665 in Ophiuchus. A lot of IC objects are large open clusters.

The naked eye is also good for observing the Milky Way, but a dark site is essential. Ships are ideal for observing, but avoid cruise ships and ferries as they are brightly lit. Container ships which take passengers are excel-

lent as they are dark. The top of the bridge is good, but avoid getting fried by the radar.

Telescopes: you don't need a computer-driven 'scope. Objects will be in view for enough time in which to make a drawing. The other item required is a Telrad or finderscope. A mask or a patch over the observing eye is ideal to preserve night vision.

Keep records in a logbook in date order. Note the date, time and sky conditions, and your notes will contain descriptions of the object – size, shape, magnitudes, density, etc. Even write down the things you don't see.

Things to look at: Messier objects, which are easy for observers in the northern hemisphere, as Messier observed from Paris. M7 is the most southerly of these objects at -34.5 south (4° above the horizon from Winchester). Some objects are more observed than others e.g. M27 is more observed than M76. Many Messier objects are visible with the naked eyes in good skies. See how many you can pick out in this way.

Observe near the zenith so you are not looking through so much atmosphere. For southern objects you have to go south, but Omega Centauri is visible from southern Europe.

Herschel 400: this list is published by the Ancient City Astronomical Society in the US. At least a 200mm (8-inch) scope is required and of the 400 objects, 330 are galaxies, so this is pretty challenging stuff.

Deep sky objects include planetary nebulae. These come in a variety of sizes from large and faint to small and bright. Filters can be used on planetaries to help cut out light pollution. Filters such as OIII only let through the light from the object, but may not be effective on anything smaller than 150mm. Some planetaries look nice without a filter e.g. NGC3242 (the Ghost of Jupiter) in Hydra or NGC6369 (Little Ghost) in Ophiuchus.

Filters also work on other objects such as emission nebulae. NGC281 and IC1590, cluster and emission nebula are very nice in a UHC filter, as are IC59 and IC63 in Cassiopeia. UHC filters are only useful on emission nebulae. On the Veil nebula a UHC is better than an OIII.

Globular clusters are excellent objects to observe. Interesting objects include NGC2419, the Intergalactic Wanderer, which is the most distant globular in our galaxy at 182,000 light years from the Sun.

There are a lot of galaxies in Virgo and Canes Venatici. CVn is higher up in the sky than Virgo. These constellations are filled with many interesting galaxies with a lot of bright ones. Try to find NGC253 in Sculptor from the UK. This is very southerly, but was discovered by Caroline Herschel from Slough.

Galaxy clusters are difficult from the UK, due to climate and light pollution.

Make an observing plan for the year, so

you are prepared for clear nights. You don't have to be scientific, but observing is fun!

The Alfred Curtis Memorial Lecture

The evidence for our cosmic origin

This was the 24th Alfred Curtis Memorial Lecture and this year's speaker was Chandra Wickramasinghe, Professor of Applied Science at Cardiff University, who was introduced by the BAA President, Guy Hurst.

In 1955 Fred Hoyle and collaborators showed how carbon, nitrogen, oxygen, phosphorus and metals are made in stars and supernovae scatter them into space. These elements make up living things, so we are in essence made of 'stardust'. The speaker believed that life probably came from space, but all books state that life came out of primordial 'soup' here on Earth. Life first appeared 4000 million years ago on Earth.

Pasteur's experiments disproved spontaneous generation of life – microbes came from pre-existing microbes. In 1874 Hermann von Helmholtz thought life came from other planets and in 1908 Svante Arrhenius wrote *Worlds in the Making* which proposed that starlight 'pressure' would move bacterial spores –

'Panspermia' – from one star system to another.

Recent developments have shown that micro-bacteria can survive in space, from examples here on Earth of bacteria living in deep-sea thermal vents and in Antarctic permafrost. At Lake Vostok in Antarctica, colonies of micro-organisms have been found living deep in ice where there is no light. One strain of bacteria survived on a TV camera on the Moon for a period of time. Some have even survived in a nuclear reactor, as well as some discovered at extreme pressure in the Earth's crust. Microbes are not destroyed easily.

In the 1950's scientists achieved spontaneous generation from simple chemicals thought to be present on the primitive Earth. Electricity was passed through these chemicals and amino acids and nucleotide bases and sugars from water, as well as ammonia and methane resulted. It is improbable that this happened on Earth. In the Big Bang, hydrogen deuterium and helium were formed.

Star forming regions are rich in gaseous



Prof. Chandra Wickramasinghe. (Photo: Richard Flux)

molecules and interstellar molecules include glycolaldehyde and vinegar which have been detected in Sag B2 which is rich in interstellar molecules.

In 1974 cosmic dust was shown to be largely organic; in 1977 a connection was made between life and cosmic dust; in 1981 there was compelling evidence of 'panspermia' – 3% of interstellar carbon is tied up in the form of 'bacteria-like' particles. The dust is indistinguishable from freeze-dried bacteria. Microbes can replicate in comets and a microbe doubles in 2 to 3 hours – in 12 days a whole cometary interior could become microbial material. Some comets become active in the depths of space and this could be caused by biological activity.

In February 1999 NASA launched its *Stardust* mission to look for signs of interplanetary life. This analysed the dust that it found. The object had had an impact of 30km/s which broke up particles. Surviving structures resembled bacterial cell walls.

The early Earth survived an intense cometary bombardment and comets still strike planetary bodies today e.g. Jupiter and Shoemaker–Levy 9. 100 tonnes of cometary debris still reaches Earth on a daily basis, although a lot burns up as meteors in the atmosphere. The Martian meteorite found in Antarctica in 1996 was thought to contain bacteria and scientists are still arguing. However interplanetary transfer of life is obviously possible.

The Galilean moon Europa may harbour life beneath the ice crust and the pink colour may be due to bacteria. Jupiter creates tidal forces which keeps the interior of Europa warm and the infrared spectrum of the pink cracks matches that of frozen bacteria. There will be a future NASA mission to Europa to drill through the ice to look for life.

Indian scientists collaborated with British scientists to collect stratospheric air aseptically. A balloon was launched from Hyderabad in January 2001 with cryosampler probes. The cylinders were parachuted back to Earth. Precautions were taken to avoid contamination. Clumps of cells showed up as fluorescent and DNA was found. This appears to be proof that life is a cosmic phenomenon, and this would indicate life will be on every inhabitable planet.

The speaker's conclusion: Life is cosmic.

Perihelic oppositions of Mars

On Sunday morning the first speaker was Dr Richard McKim, Director of the BAA's Mars Section.

In this past apparition, Mars was a featureless blob due to large dust storms. The next opposition is in 2003. The planet is closest to Earth in July and August, when it

will show a large disk.

Historically, Mars has been observed by Robert Hooke and Christiaan Huygens, etc. Schroter also observed Mars, but he wasn't very good at drawing. The dark markings were thought to be vegetation and the light polar caps were thought to be ice and snow. In 1830 Mars was at a close perihelic opposition. Wilhelm Beer produced the first map of the planet to show all the details. The telescopes were not big enough to show all the changes.

The Martian atmosphere was studied at the 1862 apparition. Lockyer made drawings and studied the clouds and realised the planet had an atmosphere.

Schiaparelli made the first accurate maps of Mars with 'canali' – channels, or 'canals'. Nathaniel Green, who was BAA President in 1898, was a watercolour artist and drawing master to the young Queen Victoria: he made Mars observations from Madeira.

From his private observatory in Arizona, Percival Lowell made observations of Mars. In 1892, the BAA Mars Section was formed and Camille Flammarion published two volumes on Mars – all work done on Mars to date was published in this book.

In the late 19th century photography began. In 1909 Antoniadi observed Mars using an 800mm (33-inch) reflector. He knew dust was being blown around, therefore Mars was a very dry world.

In the 1920s large telescopes were in use in the United States. Mars' temperature was measured and it was found to be very cold with a very thin atmosphere. In 1924 there was a large dust storm. The media offered a prize to anyone who could prove they had communicated with aliens, but this didn't include Mars as that would be too easy!

In 1939 Gerard de Vaucouleurs established the Martian atmosphere was not more than 10% of the Earth's.

In the 1960s and 1970s, probes *Mariners 7* and *9* found Mars was cratered but there were definitely no canals. The Martian satellites, Phobos and Deimos, were looked at as was a huge dust storm on the planet. In the 1970s the *Viking* probes landed.

Maps were made of the dust storms. 1988, Mars was at perihelic opposition. It was discovered that the planet had experienced floods in the past and had an active geological history. During the 2001 opposition there was another dust storm.

The final talk of the weekend was given by Denis Buczynski.

Conder Brow Observatory

Dennis told us about the Observatory and its location near Lancaster, overlooking the river Conder. Denis' first telescope was a 3" f/15 refractor and he built the observatory in

1995. Equipment over the years has included a 55cm f/5 Newtonian reflector used as a photographic/visual scope, a 27" f/5 Zeiss Astrograph for comet photography which was also used to confirm George Alcock's 1991 nova, a 15cm f/6 wide field refractor with an ex-MOD Wray lens and a 2° field, and a Hilger plate measuring machine in use from 1986 to 1996.

Denis gave up 'serious' photography in favour of CCD work. His new scope was a 33cm f/3.5 Newtonian reflector with an automatic GOTO system, an ST4 autoguider and an SXL8 CCD camera. The first CCD image with the 33cm was M51, using 2× 150 second exposures made with the SXL8 camera. This also disproved a Japanese supernova discovery claim.

A Meade LX200 25cm f/10 SCT was acquired which belonged to Dame Kathleen Ollerenshaw and this is used to view the Moon and planets. Other instruments include a 4-inch Ross apochromatic f/12 refractor, BAA instrument no. 66, which originally belonged to George Alcock.

Denis also visits the Scottish Highlands where he has installed a 23cm f/4 Newtonian. Here the skies, when clear, are very dark and transparent. More recently, Denis has built a 60cm f/4 telescope.

Members' session

Sunday afternoon is dedicated to what some would describe as the highlight of the weekend, the Members' Session, when members get a short slot to describe their astronomical activities.

First up was Bob Mizon of the Campaign for Dark Skies with some positive news. Road lights are improving with only downward lighting being used on motorways and 'A' roads and many local councils are including lighting clauses in planning applications.

More good news is that the Czech Republic has banned light pollution with effect from June 2002. He then showed the audience pictures he had taken of the Moon and other objects.

Next was Rita Whiting with pictures of the June 2001 eclipse in Zimbabwe. She showed slides of southern constellations including Sagittarius, Crux (and Pointers) and Scorpius.

Following Rita John Wall talked about his latest telescope making project, this time a 30-inch refractor he built for Hanwell Castle observatory near Coventry. This is the biggest refractor in the UK and the biggest built by an amateur. He also showed some eclipse slides from Africa in 2001.

Next was a joint presentation by Paul Carter and Mike Foulkes, who had taken CCD images of Jupiter with a Meade 10" LX200 with a Starlight Xpress CCD. Their images have improved over time.



NEW from the BAA:

Observers' Workshops

The BAA has designed a series of Workshops to encourage the amateur astronomy enthusiast to enjoy practical observing and to introduce project work that may prove useful to the scientific astronomical community. The majority of the talks will be aimed at the relative newcomer who may be looking for guidance after purchasing a telescope, but there will be some lectures on more advanced techniques for more experienced amateurs seeking new challenges.

The talks are to be given by many of the most experienced amateur observers in the United Kingdom, all of whom have much experience in their field. Come and tap into this expertise!

The Workshops will be spread over the year and at locations around the country. The provisional programme is shown below. Each of the Workshops stands alone, so if you cannot attend all three, try to make one or two when you can. If this series is successful, more Workshops will be arranged for 2004.

All are welcome, whether BAA members or not. For more details, updates and enquiries, please see the Association's Website at www.britastro.org and look under 'Meetings'.

Nick Hewitt, *Meetings Secretary*

Workshop 1 Saturday 2003 February 15, 11am – 6pm The Institute of Astronomy, Cambridge

Introduction to the BAA Observers' Workshops	Guy Hurst / Nick Hewitt	
Imaging comets	Martin Mobberley	Former President, BAA
Why observe variable stars?	Karen Holland	Variable Star Section, BAA
Measuring double stars	Bob Argyle	President, the Webb Society
Visual observations of Jupiter	John Rogers	Director, Jupiter Section, BAA
Astrometry of minor planets	Nick James	CCD Adviser, Comet Section, BAA
Observing variable nebulae	Nick Hewitt	Director, Deep Sky Section, BAA

Workshop 2 Saturday 2003 April 26, 9.15am – 6pm BAA Weekend, King Alfred College, Winchester

Nova patrolling	Guy Hurst	President, BAA
Atmospheric phenomena	Mike Frost	Chairman, Coventry and Warwick AS
The Moon in all her aspects	Jeremy Cook	Former Director, Lunar Section, BAA
Visual observation of meteor showers	Neil Bone	Director, Meteor Section, BAA
Solar observing with small telescopes	Lee Macdonald	Newbury Astronomical Society
Drawing the deep sky	Stewart Moore	Deep Sky Section and Webb Society
Eclipsing binaries – a beginner's guide	Tony Markham	Eclipsing Binary Secretary, BAA VSS
Observing the transit of Venus in 2004	Robin Gorman	Hampshire Astronomical Group
Starting out in spectroscopy	Maurice Gavin	Former President, BAA

Workshop 3 Saturday 2003 September 6, 10am – 6pm The Priory Street Centre, York

Visual observations of comets	Jonathan Shanklin	Director, Comet Section, BAA and SPA
Observing variable stars with binoculars	Melvyn Taylor	Binocular Secretary, Variable Star Section, BAA
Photometry of variable stars and minor planets	Richard Miles	Assistant Director, Asteroids Section, BAA
Auroral forms and how to report them	Dave Gavine	Aurora Section, BAA
Micrometry and filter observations of Mars	Richard McKim	Director, Mars Section, BAA
Photographic measurements of meteors	Steve Evans	Photographic Co-ordinator, Meteor Section, BAA
Video recording of occultations	Andrew Elliott	Occultation Co-ordinator, Lunar Section, BAA

Sidney Crump was next with pictures of his observatory in Wolverhampton. He has been measuring earthquakes and earth-tides and has found 80 or 90 earthquakes a day.

Derek Hatch (sincere apologies, Derek, I missed your talk!) was followed by Roger Dymock speaking about asteroid occultations, including an 11.8 magnitude star being occulted by 76 Freia.

Following the conclusion of the Members' Session, and Richard's farewell remarks, was the end of the Winchester Weekend for another year. After tea, everyone went their separate ways.

The Winchester Weekend is an excellent way to spend a couple of days, and is highly recommended. This year we had fairly nice weather especially on Sunday, the birds were

singing and the cherry blossom was out. Along with the good food and like-minded people it makes a nice weekend. Predictably it was cloudy at night and nobody saw comet Ikeya-Zhang! If you have never been to Winchester, I do recommend you book for next year, as it is money very well spent.

Faith Jordan