

FAS Newsletter

Federation of Astronomical Societies

<http://www.fedastro.org.uk>

Jodrell Bank Future Secure - but at what cost?

Many of you will have joined the e-protest to Downing Street earlier in the year, when Jodrell Bank was threatened with closure.

The petition can be summarised as:

"We the undersigned petition the Prime Minister to reverse Gov't Plans and Save Jodrell Bank Observatory From Closure."

"recently it has been reported that the government plans to stop its funding of Jodrell Bank Observatory, which would undoubtedly cause its closure. This petition is to prevent this happening and keep Jodrell at the forefront of the Merlin project and British space exploration."

Well recently, Downing Street responded to all the e-petitioners with the following email:

"The University of Manchester and the Science and Technology Facilities Council have agreed a way forward for funding e-MERLIN which should ensure that Jodrell Bank remains as a global centre of research excellence in radio astronomy. The UK has an acknowledged international leading position in the development of radio astronomy facilities and science and the Government has no intention of letting that slip.

The Science and Technology Facilities Council (STFC) and its predecessor Research Councils, has provided grant funding for Jodrell Bank to carry out a number of research projects over the years.

The STFC has recently carried out a review of all its programmes, including the e-MERLIN project which is run by Jodrell Bank and involves a network of seven UK radio telescopes. This review, which involved advice from independent scientists, has been used to help set investment priorities for this spending review period (2008/9 – 2010/11). While the Government sets the overarching strategy, the research community itself, the Research Councils and researchers, set priorities and distribute funds through a process of peer review in line with the long-established Haldane principle. STFC released the results of its Programmatic Review on 3 July and announced a three year £1.9 billion investment programme which keeps the UK at the forefront of scientific excellence. Details of the results of the Programmatic Review can be found on STFC's website (www.scitech.ac.uk).

STFC made clear the strategic importance of e-MERLIN to the future of UK radio astronomy. It stated that it would continue working with the facility owners - the University of Manchester, and other stakeholders to find a solution for the financial support of e-MERLIN operations in the medium term on a shared cost basis. As

(Continued on page 2)

The Universe – Yours to Discover

In 2009 the world will celebrate the International Year of Astronomy to commemorate the 400th anniversary of Galileo's use of a telescope to study the night sky. Within the UK, to celebrate this historical anniversary, a constellation of events and activities will run throughout the year, allowing everyone to engage with the Universe, and to rediscover their place within it.

Beginning in 1609 Galileo, observing from Italy, saw things that no-one had ever seen before: the phases of Venus; the moons of Jupiter; the rings of Saturn; and the mountainous and cratered imperfect surface of the Moon. These observations overturned the world order and established our place on Earth amidst a much wider cosmos.

There is a second major anniversary happening in 2009: the 40th anniversary of Apollo 11 when Neil Armstrong became the first man to set foot on the Moon on 20th July 1969

One of the main aims during 2009 will be to get as many people as possible to see what Galileo saw, and to begin to ask questions about their place in the Universe.

There are many different projects, events and activities planned in the UK for IYA2009, from those being run by local astronomy enthusiasts in your nearest town, to regional and national activities happening around the country. These will occur throughout the year, but some specific dates have been established to focus activities: Spring MoonWatch (28 March to 05 April 2009), Autumn MoonWatch (24 October to 01 November 2009) and Schools Autumn Moonwatch (19 – 29 November 2009).

To give an idea of just some IYA2009 projects, the Society for Popular Astronomy are running "Telescopes for Schools", an ambitious programme where 1000 telescopes will be provided to 1000 secondary schools, along with a DVD showing how to set up and use the telescope, and contact with a local astronomer who can help set up a school astronomy club.

Other major projects which the UK are participating in include: Dark Skies Awareness, encouraging people to travel out of the towns and cities to see a dark sky, as well as educating about the problem of light pollution and the effect that has on the UK's heritage of dark skies; From Earth to the Universe, a touring exhibition of stunning astronomical photographs; She is an Astronomer, engaging with women and encouraging young women to consider science and astronomy as a career.

These projects are just a small selection of the myriad of activities that will happen in 2009. The UK website (www.astronomy2009.co.uk) has an interactive map and calendar which will allow you to find out what's happening in your area and around the UK during 2009.

Steve Owens in the UK Co-ordinator for the International Year of Astronomy 2009 contact him at: steve@astronomy2009.co.uk

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Presidents Spot

The first thing I'd like to say as the new President of the FAS is that I consider it an honour to be able to serve the member societies of the FAS in this post. I shall do my best together with fellow Council members to maintain and improve the quality of the services and value for money provided by the FAS. I have served on the FAS Council for 4 years, as Minutes Secretary and the NWGAS Regional Rep and also for the last two years as Vice President. I have been a keen amateur astronomer for 40 years, on the committee of Chester AS for about the last 16 years, and I was the secretary to the NWGAS regional group for 8 years.

To be honest when I first started attending FAS Council meetings I didn't know much about the FAS, and I wouldn't have volunteered to serve on it's Council had not Ron Kelley badgered me for a long time to take over the NWGAS rep role from him! I was busy with home, family and work commitments and any spare time I had for astronomy was taken up by the hobby itself and by local astronomical society duties. So I was like most of you reading this in so far as giving up my valuable time and effort for a national astronomy organisation I didn't know much about was pretty unthinkable.

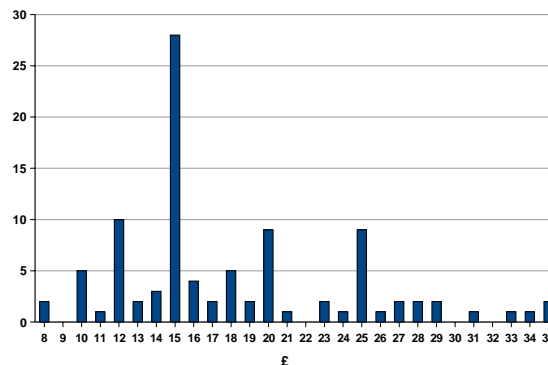
Hence I quite understand why it is so difficult to get people like you in the member societies of the FAS to put yourselves forward to serve on the FAS Council. And yet YOU should consider such service for without people like yourself putting themselves forward, the FAS would not be able to function and that would deprive its member societies, including yours of some very good services. Don't decide against putting yourself forward for a couple of year's service on Council because

someone else is bound to, they won't! Your FAS will need you to help, think about it, please.

That's enough about myself and the FAS let me now say a bit about you the member societies of the FAS. Using the links on the FAS website I took a quick look at over 100 member society websites. At least 92% of societies in the FAS have a presence on the World Wide Web. I did find 14 dead links so please make sure you tell us when your society's website address is changed. It was very interesting to see the different website designs and how societies present themselves on the web. I recommend anyone seeking to redesign their society website to do a survey of others via the FAS links to pick up some good ideas.

I gathered some interesting stats from my survey. The graph plots the number of societies against annual membership fees charged; some 70% of societies have annual subs between ten and twenty pounds with the most common subs being £15 per annum. A very small percentage also charged a meeting attendance fee. Two societies offered life membership for a single one off payment of approximately 10 times the normal annual subs. Obviously the graph does not include the 27% of societies who did not give any annual subs information on their websites.

Some 45% of societies owned and operated their own observatory, and most if not all societies indicated that they arranged observing sessions for their members. About 16% of societies also seemed to operate restricted access pages on their website or Yahoo group type arrangements for their members only to use. Did you know that the



FAS operates a Yahoo group for its member societies to use to exchange information online? At the moment the group has 75 members so a significant number of societies in the FAS might not be aware of this facility. For more details go to the FAS website.

Some 15% of societies were registered charities but this may be an underestimate as it was usually not easy to spot this status on society websites. The IYA 2009 logo and link was commonly found on many websites but at the time of my survey in early August there were understandably few if any details of what special events individual societies might be planning for IYA 2009. As Callum explained in the Summer newsletter the FAS is keen to hear from your society if there is something you want us to try and help you with for IYA 2009 or that you want to share with other societies. Don't forget the FAS website provides diary and events pages which member societies can use to publicise their meetings and activities, and in the printed Handbook you will find the list of speakers who give talks to societies. If you are intending to organise a public or private star party may I suggest you take a look at the Health & Safety article in the handbook section of the FAS website.

Well that's enough from me for now but I wish you all a successful IYA 2009 and hope that all your observing events public or society will be blessed with clear skies!

Richard Sargent

'I did find 14 dead links so please make sure you tell us when your society's website address is changed!'

(Continued from page 1)
a first stage in this process STFC has confirmed that it will continue its current contributions to the operating cost of e-MERLIN for the next 2 years.

The Jodrell Bank Observatory is involved in a number of other radio astronomy activities in addition to e-MERLIN. Researchers at Jodrell Bank and in Manchester are leading the consortium in Europe to design the Square Kilometre Array (SKA) radio astronomy facility. The proposed Square Kilometre Array will be a telescope array with unprecedented sensitivity, but it will need to be sited in a remote radio-quiet location for uninterrupted observations, and away from densely populated areas with significant radio interference, such as most of the UK. The Square Kilometre Array will be a global project, likely to be built in Australia or

South Africa, and represents the future of radio astronomy. The Government is determined that UK researchers should maintain their leading role in the SKA project, which in time will support world class research. Jodrell Bank already heads the global design office, and the Government has indicated that it is willing to invest some of the capital proceeds from the forthcoming auction of analogue TV spectrum to ensure continued UK leadership in pathfinder projects for the Square Kilometre Array.

Manchester will also host the UK's Atacama Large Millimetric Array (ALMA) support centre, with support provided by STFC. ALMA is a multi-million Euro telescope project under construction at a remote site in Chile, to which the UK contributes via its membership of the European Southern Observatory (ESO). The

regional ALMA centre will provide the key focus for the UK community in the use of this world-leading development utilising the skills of researchers and academics at Jodrell Bank and the University."

So that's OK then, isn't it?

Well no it isn't. The funding situation (and some would say a complete cock-up!!) is that there is no additional money to use for Jodrell Bank. This inevitably that monies will have to be taken from other aspects of the overall physics budget, meaning the UK will fall farther and farther behind—and more of our graduates will have to look overseas to further their careers - and now the 'Credit Crunch'.

The future for 'Technical Britain' seems bleak indeed.

REVIEWS

Atlas of the Messier Objects - Highlights of the Deep Sky

by Ronald Stoyan Cambridge University Press Hardback: ISBN-13: 9780521895545: £35.00

As Editor I receive quite a number of books for review, almost all of which I pass on to colleagues and friends to review. However occasionally a book of particular appeal or merit catches my attention and so I snaffle it for myself. The Atlas of the Messier Objects is such a book.

At first sight the description 'coffee table' - often a rather derogatory term—seems to apply. This initial impression quickly evaporates once the book is delved into.

The principal subjects of the book—the 110 Messier Objects are covered in exceptional detail. There is of course the basic ephemeris data, but this is backed up with much other interesting material. This includes the history, the Astrophysics and Observation.

The History covers the time and details of the discovery of the object together with interesting facts, such as comments made by Messier and others.

The Astrophysics deals with the physical and chemical details of the object. Its location, structure, distance and much other relevant information.

Observation, perhaps the most useful, explains what you can expect to see and how best to see it. It covers naked eye, binocular

and telescope observing of the object.

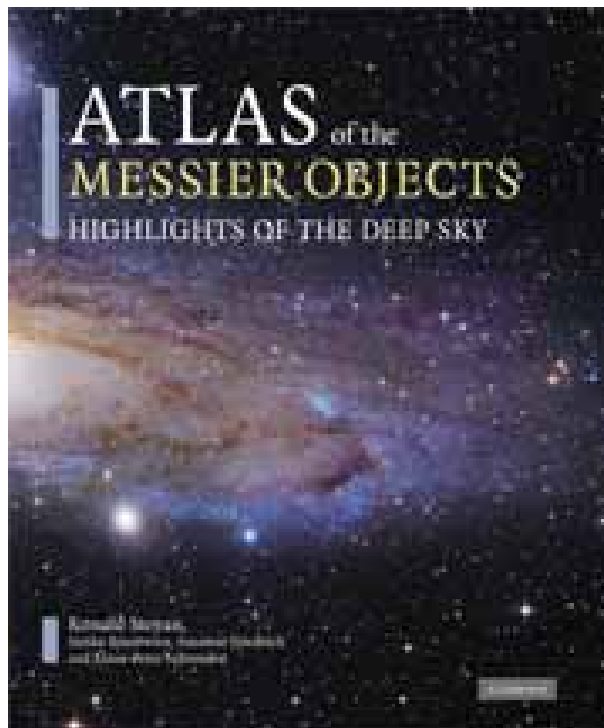
All this you might say, is what you would expect from a catalogue of objects like the Messier set. However this book contains much more.

For a start every object is shown in photographic form and often as sketches. The photos, as would be expected, are stunning, and the listing at the back of the book gives the photographic detail—telescope, camera, location, etc.

The first 70 or so pages covers much of the history of Messier himself and of the discoverers of the many objects. For example, Bode's Catalogue is listed in detail.

A section of particular interest to those who try (mostly in vain!!) to emulate these wonderful

photographs, includes a table on the preferred telescope focal length for a couple of photographic formats—very useful.



A great book, well researched and superbly produced.

Frank Johns

Stars – A journey through stellar birth, life and death

by Prof. Raman Prinja New Holland Publishing ISBN 978-1-84773-063-3 RRP: £29.99 (see below)

University College London professor of astrophysics Raman Prinja, tells the story of the Universe in this new book from publishers New Holland. First impressions of this book for myself were - "oh no, not another picture book". Don't get me wrong I love looking at fantastic images of the Universe but I've seen far too many books present astronomical pictures badly, using low resolution images, bad print and at worst incorrect (often with very little) text.

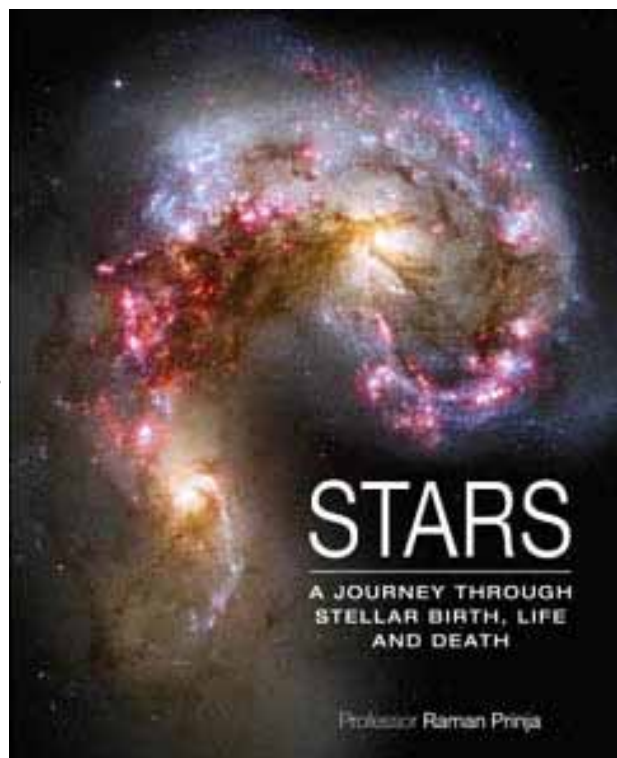
Thankfully, this is not one of those books. When first opening this book I was "wowed", like I normally am when I see pictures of the Universe, by the fantastic images on offer. I had to quickly look through all the images without reading the text.

With almost complete arrogance (I'm an astronomer I know all this stuff !!) I completely missed out the best part of this book. When I got over my fever to see all the images (and count how many I recognised, approximately 60% if you were interested) I got around to what you should do with this book – read it. The text is very well written, describing the Universe with such captivating words is very hard, especially when you are distracted by the marvellous images on offer.

The book provides a great introduction to the Universe, with images to back up the text. I'm pleased to say that the book has something to offer to even the most seasoned of astronomer. Prof Prinja has done an excellent job of not only covering the background science (and historical developments) but also presenting the key topics of current research.

In short, this is a book for all (easily accessible for most ages), it would make an interesting read for any astronomer and provide a great introduction to any new comer to the field.

Samuel George



The book costs £29.99 but the publishers have offered a t £4 discount to all FAS members, to get this please ring 01476 541080 with the offer code, NHSTARAS.

FAS Annual Convention 2008

- A Successful Return to Cambridge

The FAS Annual Convention returned to Cambridge after a couple of years at Birmingham, and this proved to be a great success. It is rather strange - if you don't live in the Southeast, Cambridge is not the easiest place to get to, yet the attendance at Cambridge is good.

We would be interested in receiving the views of members on this. Perhaps it is the Telescope Tour, or the excellent way the Cambridge AS look after us with refreshments, or maybe something else. We would like to know.

Once again Stan Waterman gathered an excellent array of speakers to entertain and inform. As Stan was standing down from this position at the AGM, he was thanked warmly for his past efforts. Sam George, the incoming Meetings Organiser has a lot to live up to.

The traders had set up by the time most of the 140 or so delegates had arrived and over a cuppa, many had an opportunity to browse.

After the opening remarks by President Callum Potter, the first lecture was given by Professor Andy Fabian. 'The Power of Black Holes'. This was the first of two talks in the programme covering Black Holes. It might seem that this would be overkill, but whilst the overall subject was essentially the same, the content of each was substantially different.

The talk immediately before the lunch break was 'Photographing the Night Sky' given by Nik Szymanek. Nik has kindly submitted a synopsis of his talk and this is reproduced on page 8 of the electronic version of this Newsletter (*the electronic version is sent to every member society - so if you want access to it, chase your society secretary*). In this synopsis Nik opens by stating 'It is easy to get started in skyshooting'. Whilst pedantically this is true, the implication is that 'skyshooting' is easy. I would certainly agree that Nik makes it seem ridiculously

easy, but we all know that he is the master - and the rest of us struggle!!

A highlight of this presentation was a beautifully put together short movie, mainly of around Las Palmas, with a haunting audio accompaniment.

During the lunch break, members of Cambridge AS conducted delegates around the Observatory and the historic telescopes. For many this is the highlight of the day, where they get the opportunity to see the old telescopes including the one used by George Biddel Airey and James Challis in the search for Neptune.

Also during the lunch period Steve Owens gave a presentation on the plans for IYA2009. Of great interest to many were the details related to grant funding that may be available for projects that meet the criteria as part of the Year of Astronomy. For more information go to the IYA2009 website: www.astronom2009.co.uk/.

Immediately after the lunch break came AGM. The normal business related to annual meetings was conducted in reasonably short time and some changes were made to Council - see panel on this page for the full listing of council members.

The first session after the lunch break is often called the 'graveyard shift' where delegates who imbibed too much at lunch fail to stay awake. Fortunately for the speaker in this slot, Professor Barrie Jones, the catering at Cambridge was non-existent, so the 'casualty rate' was low. Anyone who did nod off would have missed a very informative and entertaining talk entitled 'Life beyond the Solar System'. Barrie examined the factors sustaining forms of life on Earth and also examined what 'signature' the Earth would be displaying to those far off examining it using similar instruments to those that we use. He then covered the activities of SETI and the searches for exoplanets and the type of technologies suitable for assessing signs of life on them.

The final presentation entitled "Einstein's outrageous legacy- black holes, cosmic illusions and dark energy" was given by Dr. Somak Raychaudhury. Here Somak went through how and why Black Holes were found to exist and expounded on current thinking in relation to them. I think that all in attendance were better informed

about this strange phenomenon - I know I was.

The traders seemed to be reasonably happy with their attendance and so another successful convention was brought to a close just after 5 pm.

Important Notice

It's to your advantage

The FAS Council is planning to hold an Extraordinary General Meeting on March 7th, 2009 at Burlington House, London - formal notices and invitations will be mailed to Member Societies nearer the time. The meeting is being called to consider changes which Council are proposing that would align the Subscription year with the FAS financial year and simplify the management of PLI.

The practical effects of the proposals would be to extend the current 2008/9 subscription year to the end of March 2010 - a six month extension in membership and PLI (for those Societies who are part of the scheme) which would be **free of charge** to existing member Societies. The full details of Constitution changes and approval from HMRC are still being worked out and we'll be mailing all members with details in the New Year. In the meantime, should you have any questions or concerns please contact the Secretary or another member of Council.

Note! It is hoped that we will be able to use Proxy votes for those societies who are unable to send a representative. Full details will be sent out to all member societies in due course.

New Council for 2009

At the Annual General Meeting the new Council of the Federation as elected is:

President:	Richard Sargent
Vice President:	Callum Potter
Treasurer:	Peter Cooke
Secretary:	Shaun O'Dell
Newsletter Editor:	Frank Johns
Membership Secretary:	John Axtell
Publications Distribution & PLI Secretary:	Eric Hutton
Meetings Secretary:	Samuel George
Webmaster:	Gary Gawthrop
Regional Reps (not elected at the AGM):	
SAGAS Rep:	Keith Brackenborough
Midlands FAS Rep:	Dave Evetts
Yorkshire Group Rep:	Paul Harper
Chilterns & Thames Valley Rep:	Steve Williams



A welcome break!

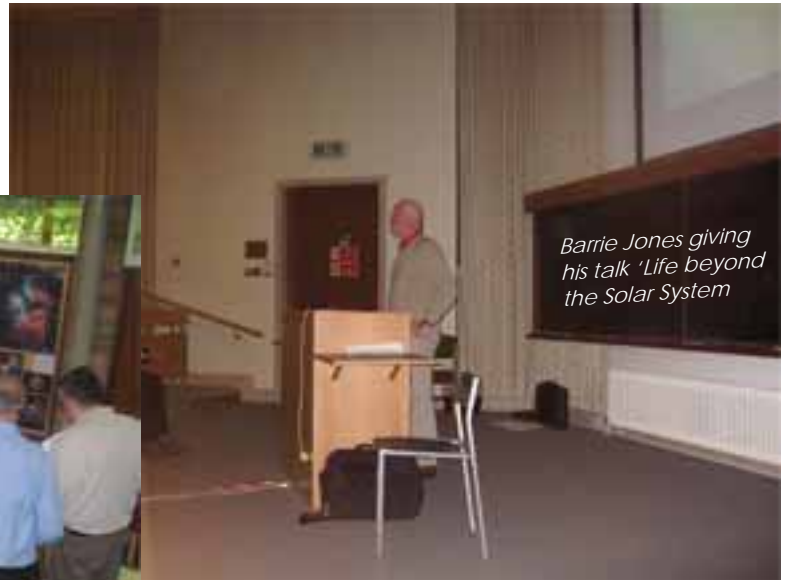
Images of the 2008 FAS Convention



Callum Potter and the Eric Zucker Award to Clive Down (who was not able to attend)



Somak Raychaudhury - an excellent talk on Black Holes



Barrie Jones giving his talk 'Life beyond the Solar System'



Now! - What would she say if I bought that one?



Steve Owens explaining IYA2009



Members of Cambridge AS providing the most essential service at the Convention - the refreshments

.....and yet more images

Eric Hutton and Peter Cooke obviously enjoying taking the money!!



Richard Sargent (towards the back). Perhaps drumming up support to be elected President? If so - he was successful.



Nik Szymanek preparing for "Photographing the Night Sky"



The incoming Meetings Organiser and President (Sam George and Richard Sargent) - Cooking something up?



A novel Dobsonian design



The outgoing Meetings Organiser and President (Stan Waterman & Callum Potter)



Sky at Night Star Party

Saturday 20th September 2008
Mark & Leanne Irving - Worthing AS

A few weeks previously, we were invited to join a star party hosted by Sir Patrick Moore at his home in Selsey. The event was organised by the Sky at Night team, for the filming of their October program, to celebrate the autumnal equinox.

People arrived early in the afternoon and began to set up their equipment and tents. It seemed that as soon as someone set up a telescope, someone else set up a larger one next to it! The same applied to tents; we thought we had a nice spot until we returned to the campsite to find a canvas palace on our doorstep...

It was a beautiful clear day, so those with solar equipment spent most of the afternoon observing and imaging solar flares, and were happy for everybody else to take a peek. Although there was no sunspot activity to be seen, one major prominence was visible, and we were able to watch as it changed throughout the afternoon.

As darkness fell, we discovered that Patrick had also arranged for clear skies for the whole night. Filming continued, and while Patrick recorded the introduction and first interview, we all had to pretend to do some astronomy in the background. We say 'pretend' because this was under the glare of the TV crew's flood lights, but after an hour or so they switched to infra-red lighting and cameras. We could then start to enjoy views of some DSO's in a particularly dark sky. As the moon rose later, illuminating the sky,



everyone pointed their telescopes towards it for a bit of lunar observing.

The night's clear sky provided us with our first really successful night of imaging. Since buying our scope a year ago, we have had many challenges; finally it all came together with a little help from a few friends! The result was images of M57 (Ring Nebula), M27 (Dumbbell Nebula), and our first Moon mosaic.

With a laptop full of images waiting to be processed, and slowly developing frostbite, we called it a night at 3:30am. We crawled into the tent for a couple of hours' sleep, leaving only a handful of die-hard enthusiasts to see it through to dawn.



It was wonderful to have the opportunity to talk with Patrick and to get some hints and tips from the experts. We would recommend attending any star party; the atmosphere was fantastic. Everyone was keen to share their telescopes and their experience, and a fun evening was had by all.



A photo opportunity with the great man!

CLACTON @ 40!!

Clacton & District Astronomical Association (CDAA), on the Essex coast, celebrates its 40th anniversary this January. This will include an anniversary dinner for members and guests and an anniversary lecture by a founder member Colin John on "40 Years of CDAA". The society formed in January 1969 initially as a result of interest in the Apollo moon missions. However, its aims were soon widened to furthering the understanding of the Universe and promoting a general interest in Astronomy in a friendly and informal environment.

Although a small society of about two dozen members, there is always a good turn out at its monthly meetings held at 7.30pm on the first Thursday of each month (except August) at the Friends Meeting House, Granville Road, Clacton-on-Sea. The Meeting Programme always includes a good selection of guest and in-house speakers, plus quizzes and monthly outline of the night sky for observers. Some members have their own telescopes and a couple even have their own back garden observatory for CCD imaging. There is also group observing when there are particular celestial events such as the transit of Venus in 2004, meteor watches etc.

Members of all ages, ranging from complete beginners to those with more advanced interests are always welcomed and catered for. Membership fees are £15 per year (£6 juniors) and £2 per evening for visitors. Further details are available at CDAA's web site www.clactonastronomy.co.uk, including the meeting programme, or from the secretary David Pugh tel.01255 429849.

Photographing the Night Sky by Nik Szymanek

It's easy to get started in skyshooting. Modern digital cameras do a great job and allow the results to be analysed immediately. Traditional targets include the planets, the Moon, sunsets, bright comets, aurorae, noctilucent clouds etc. Whilst these targets produce great pictures, things are even better if foreground objects such as trees and photogenic buildings are included. Star trail photography is quite easy and works particularly well with film as, if the sky is free from light pollution, long single images can be taken. Digital cameras can also be used but then multiple images will have to be blended using graphics software. Good results come from pointing the camera at Polaris to produce circular star trails.

Things get better when the camera is placed on an accurately-aligned equatorial mount. There are many to choose from these days and good examples are the SkyWatcher HEQ5 and EQ6 Pro mounts and the Vixen range. A very nice new drive is the AstroTrac TT320X, which is placed on a photo tripod and can accurately track lenses and small telescopes for up to 2 hours. Highly recommended! Of course, film shots work well from dark sites but many astrophotographers now use DSLR cameras. Great shots of the Milky Way can be taken using 3-5 minute exposures with 28-75mm lenses which can then be accurately stacked and aligned using free software like Deep Sky Stacker.

DSLRs can also be attached to telescopes using commercial adapters. For this you'll need to purchase an additional electronic cable release as most DSLRs will only allow 30 second exposures without the cable

release. Deep sky images are then aligned and stacked using the above software. It's possible to purchase specially modified DSLR cameras that are much more sensitive to hydrogen alpha wavelengths making them suitable for imaging gaseous nebulae such as M42 and the North America Nebula but expect to pay quite a bit more for this type of camera.

For planetary and high resolution lunar and solar work the webcam reigns supreme.



Lumenera and DMK webcams that, for a higher outlay, will produce outstanding results.



Solar imaging is now very popular. Not so long ago, this equipment would be beyond the budget of most amateur astronomers but happily now we have a great choice. Good entry-level solar scopes are the Coronado PST and CaK models (for Hydrogen Alpha and Calcium wavelength imaging respectively). A recent addition to the astro-marketplace is the range of solar telescopes from USA-based company Lunt. For deep sky work, the very best results come from using dedicated astronomical CCD

cameras. Unlike the early days of CCD imaging we are treated to a superb range of high quality cameras to suit most budgets. Most amateurs prefer the flexibility of using monochrome cameras with a selection of filters to produce colour images. Standard RGB filters can be used on galaxies and nebulae and for this it's necessary to take multiple exposures through each of the filters to build up strong images. Most amateurs tend to take fairly short exposures (typically 5-10 minutes) that can be co-added together to build up the signal quality. In this way any sub-exposures lost through bad tracking, aircraft trails etc. can be discarded. Stacking short sub-exposures will produce a final image almost equal to that of a much longer exposure, particularly if cameras with low noise levels are used. A very useful addition to the imager's arsenal is a set of narrowband filters. Typically comprising of Hydrogen Alpha, Oxygen III and Hydrogen Beta (or Sulphur II) these filters can produce stunning deep sky images of emission nebulae and are remarkable as they really inhibit the effects of light pollution. In this way great images of nebulae can be taken even from heavily light-polluted urban locations and when the Moon would normally be obtrusive enough to affect standard RGB imaging.

Good entry-level models, such as those made by Philip's, are available for High Street stores. With these you can shoot movie streams which are analysed mathematically using superb free software like Registax. The software will select the best frames which can then be aligned and stacked to produce marvellous high resolution images. Recent additions to the marketplace are the



Amateur Telescope Making by Brendan Martin

Whilst browsing Dave Thompson's web page on the remake of the 30" TRO - see the following link: (<http://datscope.wikispaces.com/30+inch+TRO+telescope>) I came across what can only be described as a work of art.

Jacques Civetta has tried and succeeded in making a lightweight and sturdy telescope using composite epoxy/fibre. The particular scope which caught my eye is the 460mm binocular telescope. He went down the bino route after making 4 truss type dobs, and working out shape and technical principles that suited him, he wanted to grab more photons, but moving to a 600mm would provide him with a whole new set of problems, so doubling the mirrors was the only solution.

Certain criteria had to be met for the bino's to work:

1. Two mirrors with identical size and focal ratio (+or - 1/5000 tolerance) or you could end up with a screaming headache as your brain cannot deal with the 2 images.
2. You should be able to independently adjust each focuser and be able to adjust the IDP (interpupillary distance)
3. You should be able to adjust each primary mirror independently in X and Y whilst looking through the focuser to make the fusion of the two images possible.



4. To make it easy to disassemble, transport and reassemble on your own.

I think you will agree Jacques has made a very good job of overcoming these problems and you can find out more @ http://www.astrosurf.com/altaz/460_bino_e.htm



Courtesy: L.A.S. News Circular - Liverpool Astronomical Society

Precious Gems Discovered on Mars

Discovery of a water-based mineral on Mars by the spectrometer on board the Mars Reconnaissance Orbiter suggests liquid water remained on the planet's surface a billion years later than was previously thought, and it likely played an important role in shaping the planet's surface and possibly hosting life. Hydrated silica, commonly known as opal, has been found across large region of Mars. "This is an exciting discovery because it extends the time range for liquid water on Mars, and the places where it might have supported life," said Scott Murchie, the principal investigator for the Compact Reconnaissance Imaging Spectrometer for Mars (CRISM) at the Johns Hopkins University Applied Physics Laboratory in Laurel, Md. "The identification of opaline silica tells us that water may have existed as recently as 2 billion years ago."

The water-based mineral deposits are telltale signs of where and when water was present on ancient Mars. On Earth, opals consist of at least 3-10% water, and Precious Opal, the variety used most often in jewelry, have pockets of spheres that diffract light at various wavelengths, creating colors and a beautiful, if not valuable look. Opal is found in Australia, England and the western US.

On Mars, the hydrated silica has been found around Mars "Grand Canyon". "We see numerous outcrops of opal-like minerals, commonly in thin layers extending for very long distances around the rim of Valles Marineris and sometimes within the canyon system itself," said Ralph Milliken of NASA's Jet Propulsion Laboratory in Pasadena, Calif.

Until now, only two major groups of hydrated minerals, phyllosilicates and hydrated sulfates, had been observed by

spacecraft orbiting Mars. Clay-like phyllosilicates formed more than 3.5 billion years ago where igneous rock came into long-term contact with water. During the next several hundred million years, until approximately 3 billion years ago, hydrated sulfates formed from the evaporation of salty and sometimes acidic water.

The newly discovered opaline silicates are the youngest of the three types of hydrated minerals. They formed where liquid water altered materials created by volcanic activity or meteorite impact on the Martian surface. One such location noted by scientists is the large Martian canyon system called Valles Marineris.

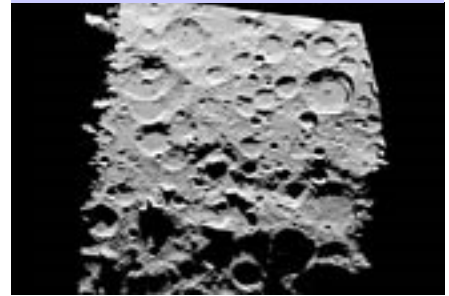
These types of minerals were also recently found in Gusev Crater by NASA's Mars rover Spirit, are widespread and occur in relatively young terrains.

In some locations, the orbiter's spectrometer observed opaline silica with iron sulfate minerals, either in or around dry river channels. This indicates the acidic water remained on the Martian surface for an extended period of time. Milliken and his colleagues believe that in these areas, low-temperature acidic water was involved in forming the opal. In areas where there is no clear evidence that the water was acidic, deposits may have formed under a wide range of conditions.

"What's important is that the longer liquid water existed on Mars, the longer the window during which Mars may have supported life," says Milliken. "The opaline silica deposits would be good places to explore to assess the potential for habitability on Mars, especially in these younger terrains."

Source: universetoday.com

Hopes Dashed for Ice on Moon



By Andrea Thomson
Senior Writer

posted: 23 October 2008 02:01 pm ET

A permanently shadowed crater at the moon's south pole has long been suspected of harboring water ice deposits that might be used by future lunar colonists. No such luck, a new study suggests.

Scientists have debated whether or not these cold craters, constantly shielded from sunlight, could contain water ice, which could be melted for drinking water and potentially converted into rocket fuel.

NASA's Lunar Prospector mission (1998-1999) recorded an enhanced signal of hydrogen in these features. Some scientists contend that this hydrogen is in the form of water ice.

The Pentagon's Clementine lunar orbiter (1994) gave positive indications of water ice in one of the cold depressions called Shackleton crater, some scientists think. Others have disputed this interpretation because Earth-based radar of that area reflected a signal more indicative of rock than ice.

New images of Shackleton taken by the Japanese lunar explorer satellite KAGUYA (SELENE) support the view that there likely aren't any exposed water ice deposits in the crater.

The images were made during lunar mid-summer, when enough sunlight is scattered off the upper inner wall of the crater to provide faint illumination of the inside of the crater.

Junichi Haruyama of the Japan Aerospace Exploration Agency and his team analyzed the images and data. They suggest that temperatures in the crater are less than -297 degrees Fahrenheit (-183 degrees Celsius), certainly cold enough to hold ice. But the images reveal no conspicuous brightness that would indicate a patch of pure water ice.

This new analysis, detailed in the Oct. 24 issue of the journal *Science*, could mean that there is no water ice present at all in Shackleton crater, or that any ice that exists is mixed into the lunar dirt in low amounts, Haruyama and his team concluded.

Source: space.com

*Want to Get Rich? -
you'll find the trip will be
expensive though!!*



GALWAY - ASTRONOMY CAPITAL OF IRELAND 2009

Stargazers at Galway Astronomy Club have every reason to look skyward as the city prepares to play host to Astronomy Capital of Ireland in 2009. The city's University campus is to become the main hub of activity in the country during International Year of Astronomy and those in the club have again organized a superb Astronomy Festival to add to the celebrations. The event now in its sixth year runs from Friday January 30th to Saturday night January 31st at the 4* Westwood House Hotel with no less than nine talks with topics ranging from Gamma Ray to Infrared Astronomy, Celestial Mechanics, Pulsars, Mars and a new search for Radio Emission from Hot Jupiter type Extra solar Planets. Entry is a very reasonable €25 and includes workshops, information stands, Dark sky

viewing and as Bonus attendees will get a tour of the "state of the art" NUI Galway Observatory.

The city is home to some of the darkest skies in western Europe and as with other Irish counties is steeped in astronomical history including an Englishman who discovered the a recurring nova T Coronae Borealis in 1866 and researcher at the then Queen's College Galway being the first person to suggest the existence of black holes way back in 1885.

Visitors from the UK are especially welcome with direct flights available to and from the city. For more info on how to attend the

Galway Astronomy Festival go to www.galwayastronomyclub.ie
<http://galwayastronomyclub.blogspot.com/>



Ronan Newman



Right:
General views at the
2008 event

Left:
Niall Griffin, Fred
Valencia and Tim
McInerney at the
2008 event



A claret-coloured cloud with a massive heart

A small cluster of stars has been found to be the home of one of the most massive double-star systems known to astronomers.

A new image released by the European Space Observatory (ESO) shows the amazing intricacies of a vast stellar nursery named Gum 29. In the center, a small cluster of stars – called Westerlund 2 – has been found to be the home of one of the

most massive double-star systems known to astronomers.

Gum 29 is a huge region of hydrogen gas. The intense radiation of the hot young stars at its center has stripped the region of its electrons. Astronomers call this an HII (pronounced "H-two") region, and this particularly stunning example stretches out across space for more than 200 light-years. The object is the 29th entry in the catalogue published by Australian astronomer Colin Stanley Gum in 1955.

Embedded deep within the huge, nebulous expanse of Gum 29, the relatively little known cluster of Westerlund 2 is seen clearly in the center of this image. The latest measurements indicate that it lies at a distance of some 6,000 light-years from Earth, placing it towards the outside edge of the Milky Way's Carina spiral. The cluster's distance has been the subject of intense scrutiny in the past as it is one of the parameters needed to understand this

intriguing object. Westerlund 2 is very young, too, at 1-2 million years old.

Previous observations have shown that two stars to the bottom right of the cluster are true leviathans. Together they form what is known as a double system. The two stars have masses of 82 and 83 times that of our Sun and rotate around each other in approximately 3.7 days. They are among the most massive stars known to astronomers.

Detailed observations of this intriguing pair also have shown that they are both Wolf-Rayet stars. These are massive stars nearing the end of their lives, expelling vast quantities of material as their final swansong. Observations made in X-rays have shown that streams of material from each star continually collide and create a blaze of X-ray radiation.

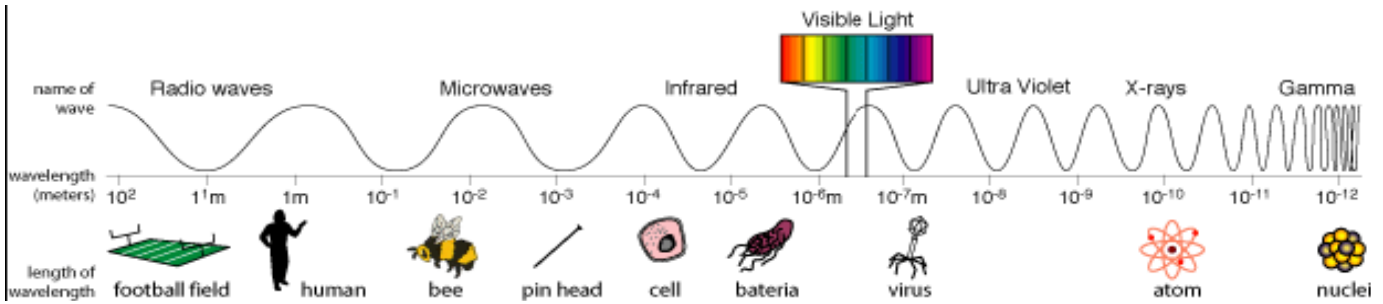


Stellar nursery Gum 29. ESO

ESO, Garching, Germany

For more information: astronomy.com

MULTI-WAVELENGTH OBSERVING - THE FUTURE by Brian Finney



Our electromagnetic wavelength detectors – eyes to you and me - are only sensitised to light in the visible part of the electromagnetic spectrum. Whilst I have a great respect for nature and its ability to even develop the eye, a magnificent piece of equipment, it has extreme limitations for the purposes of astronomy.

The diagram below shows that visible light forms a very small part of the full spectrum of electromagnetic radiation; when we, using our eyes, observe astronomical objects we are only seeing a part of what is there because we are only using the visible wavelengths of the electromagnetic spectrum.

Waves in the electromagnetic spectrum vary in size from very long radio waves the size of buildings, to very short gamma-rays smaller than the size of the nucleus of an atom.

Because of the mathematical relationship between the wavelength, frequency and energy we know that the shorter the wavelength the higher the energy. Radio waves with a long wavelength have a low energy and are safe to the human, they surround us in our daily life,

moving along the spectrum we reach the infrared region, with its shorter wavelength and therefore higher energy. Our eyes cannot detect infrared wavelength but our skin can feel the heat or infrared radiation from a warm body e.g. a piece of charcoal or coal that has been heated but no longer glows. All bodies with a temperature above absolute zero emit detectable infrared radiation to some extent.

Moving further along the spectrum past the visible light wavelengths we reach the ultra violet region with its ability to burn unprotected skin (sunburn); further along is the X-ray and Gamma ray regions – we really do not want to be here – very short wavelength and therefore very high energy with the potential to permanently damage human tissue.

For centuries man has observed in the visible light wavelengths, about 50 years ago we started to observe in the Radio spectrum e.g. Jodrell Bank and more recently with the ability to observe from above the earth's atmosphere we now observe in the infrared, visible, ultra violet, X-ray and Gamma ray wavelengths from space. The earth's atmosphere, as we all know, acts as a filter to

varying degrees to the differing wavelengths so the ability to observe from above the atmospheric shield provides with a wealth of new observing opportunities.

These new observing opportunities have been seized and are producing results; examples include the Hubble Space Telescope observing in visible and infrared wavelengths; Spitzer observing in the infrared; Chandra observing in the X-ray wavelengths; and GLAST, the recently launched Gamma Ray Large Area Space Telescope. And not to forget our very own Jodrell Bank observing in the radio wavelengths.

All of the above space telescopes have websites where you can view their images.

One particularly good site is Cool Cosmos The Multiwavelength Astronomy Gallery where you can view, with explanations, a range of astronomical objects each in various wavelengths.
http://coolcosmos.ipac.caltech.edu/cosmic_classroom/multiwavelength_astronomy/multiwavelength_museum/index.html

Courtesy L.A.S. News Circular
 Liverpool Astronomical Society



Another superb image
 by Nik Szymanek

An Astronomers Guide to Writing a Blog

by Samuel George

With the International Year of astronomy on our doorstep this is a great time to promote astronomy and of course in the technological world we live in this also means online. There are a large number of fascinating websites offering astronomical delights but few really have a personal touch. For IYA there is a global project called "Cosmic Diaries" that will involve a few professional astronomers writing about their daily lives (as a blog).

Sounds interesting, but I'm a bit unsure if this is entirely a good idea, for example will people be so open to tell us about their latest theory? I doubt it. Also professional astronomers tend not to have a huge amount of time spare and don't really do science that is readily accessible to the public. If I was to tell you about a double-double radio galaxy I'd discovered at 610 MHz with the GMRT then I'd have to spend an awful amount of space describing what this all meant. Now some might do that, but I doubt all would.

For those that know the stuff I'm sure it would be interesting, but for those that don't they will just leave with an impression of astronomy being impenetrable. This, as you all know, is not true. Amateurs are the foot soldiers of the astronomical community, you are the people who do this for fun... and make it fun for everyone else - you aren't the ones worrying about data analysis (well you might be but probably not of the astronomical kind) when you go to bed.

Thus, I'm going to suggest that you would be much better placed to run blogs for IYA. You will be able to put over that enthusiasm in a different way. So why not run a blog as an astronomy society? With 10 of you blogging content will be easily produced and will vary nicely - making an interesting read.

So how do you write a blog? Well if you where to use a popular search engine you will find countless documents on this, so I'd encourage you to do this.. but here are a few ideas.

The actual site - do I need my own website? Personally I run my own webserver with Moveable Type installed (if you are that way inclined then this is a rather simple installation) but if you are not or don't want the added cost of webspace then I'd suggest using one of the following (there are of course many others): Blogger.com, tumblr.com, livejournal.com, freeopen diary.com, wordpress.com, MuseCrafters.com, www.vox.com. For ease of use and setup Blogger and Tumblr can't be beaten in my opinion (I've run blogs on both). Be careful with your identity.

Remember, you can be anonymous to most of your readers. This is one of the best aspects of blogging. No one has to know who you are!

The content, what do we put on here?

Anything you like - just what you have observed might be interesting, or even just what your society is doing / has done. I'd always suggest using pictures when possible (but do remember copyright rules and give credit when appropriate). Don't expect to get too many visitors to begin with - writing a popular blog doesn't happen overnight.

The essence of the blog stems from journalling which means the blog is FOR YOU. Work it how you feel most appropriate but with multiple authors you will quickly amaze a range of interesting stuff. Since we are talking about writing a scientific blog then I'd very much encourage you to ensure that you try and explain every term you use, or at the least create a link to another website (wikipedia can normally do the trick) that has more details - and hopefully penetrable for all. Oh and don't forget to tell people about it. Register it with blogging monitors like technorati.. and tell your friends!

Just to give you an idea about a few blogs, here are two I maintain www.krioma.net/blog (my personal one) and starrydude.tumblr.com/ (my completely astronomy one). I'd also suggest taking a look at other peoples such as orbitingfrog.com/blog/ or blogs.discovermagazine.com/badastronomy/



Hi Frank,

Last night (25/09/08) at our observing session at INTECH, the group saw what appears to be a bright object travelling slowly across the sky at high altitude, leaving a long trail and it was breaking up.

The sighting lasted for 30-40 seconds. It was somewhere between Mag 0 and -2.

The direction was West to East at 20.56 (UT) Universal Time or 21:56pm in the UK. Graham Green managed to capture an image which is now on our website. There is a little tripod shake but you can clearly see the trail and the break up... attached is a copy.

Was it man-made? the ATV from the ISS isn't due to re-enter until the 29th Sept. Did it fully break up? It was heading towards Central Europe.

Did you see it? and where were you if you did as we are trying to build some data on what it was and where it originated from. Some 1200 objects pass through the Earth's atmosphere annually, and are seen by individuals but rarely are they seen by groups of observers or even imaged.

On our first real night out at INTECH, we've done both. Please e-mail your sighting to us and any info you may have. Planet Earth really is a Hard-Hat area...

David Woods HantsAstro.org

snippets

Comet Hunter to visit Birmingham

As part of their IYA 2009 celebrations, Birmingham AS hope to have a special Guest next year in the form of veteran comet hunter and astronomer, David H Levy, most famous for his co-discovery with Gene Shoemaker in 1993 of Comet Shoemaker-Levy 9, which collided with Jupiter in 1994.

The plan is for David to visit them for a few days in early March, staying in Birmingham University accommodation, and giving lectures there, at Thinktank and spending a special evening with us in their clubroom after a talk in the lecture theatre.....They are very excited about David's visit and hope all members will attend as many of these activities as possible. It will be a unique opportunity to meet and speak to David on a one-to-one basis. More news on this in due course.

Worthing AS—back on track

After a period of turbulence at Worthing things seem to now be back on an even keel.

At a recent AGM a new committee was formed and no doubt the Society looks forward to a period of consolidation and success.

The new committee elected is:

Chairman:	Ed Sampson
Vice-Chairman:	Trevor Little
Treasurer:	Mark Irving
Membership Sec:	Leanne Irving
Business Sec:	Alex Blows
Meeting Sec:	Graham Boots

At the time of publishing this Newsletter, their website was still not operational. Let us hope this window on the world will be running in the near future.

Bedford AS Open Day

Bedford AS is holding an Open Day at Eccleshill Library on:
Saturday 17th January 2009.
Opening at 10.30am until 4.00pm.
All Welcome - particularly beginners.

'Tea with the Scorpion' - Jim's Stellar Corner

Four o'clock in the afternoon. Ready for a break, you glide down the ecliptic to Sagittarius's Teapot. And who do you find for company in the next chair to keep you company? A giant scorpion. But fear not. Since ancient times, since the gods put him in the sky after doing in Orion, he has harmed no one. Instead, Scorpius and Sagittarius (to the east) bring spectacular glory to northern summer, and even more if you can travel to southern climes.

Bright and beautiful, the two figures are abundant in informal asterisms. Not only does the Archer pour his own tea from the fabled Teapot, he provides the milk from his five-star, upside-down, Little Milk Dipper. Perhaps Scorpius is placid because Sagittarius's Bow and Arrow point right at him, ready to repel if need be. The Scorpion provides his own sub-patterns with the Arteries (Tau and Sigma Sco) that surround his heart (Antares) and the Stinger at the end of the graceful curve of his body, with which he might threaten Sagittarius.

Between the classic constellation figures lies the Winter Solstice, which the Sun passes at its most southerly reach to mark the beginning of northern winter and perhaps to take some hot tea himself. Though the modern constellation boundaries give the Solstice to Sagittarius, Scorpius actually extends farther to the south (the ecliptic passing rather well to the north of both classic patterns). The farther you travel north of about 45 degrees north latitude, the more you will miss of the Scorpion's curved tail. **Scorpius** is best known for its luminary, first magnitude **Antares**, whose reddish color can confuse the beginner into thinking that it's Mars (hence the name, "Ant-Ares," Ares the Greek god of war). This magnificent red class M super giant is nominally the 15th brightest star in the sky, though instability caused by huge size (three-fifths that of the orbit of Jupiter) and luminosity (some 60,000 Suns) can change its rank. Weighing in at 15 or more solar masses, Antares began life only 10 million years ago as a hot, blue class O hydrogen-fusing main sequence dwarf. Now dying, most likely with a helium-fusing core (though the burning process could be farther along), it does not have much

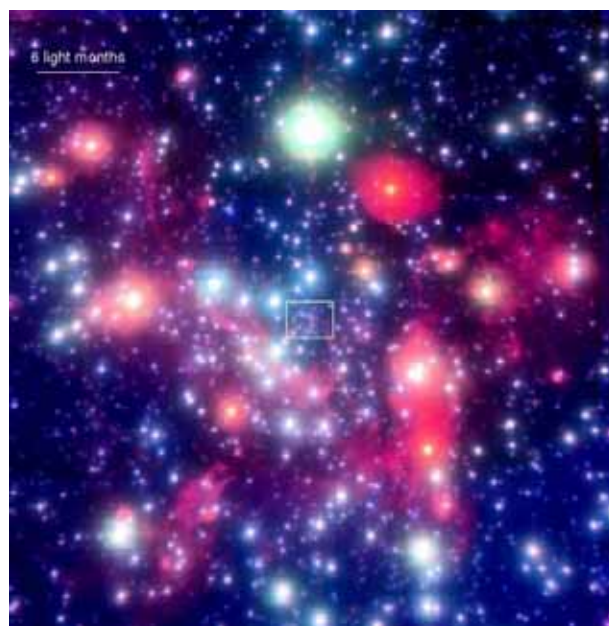
time left before it explodes as a supernova. If it were to go tonight, the destroyed star would shine in the sky with the light of a gibbous Moon even though 600 light years away.

The rest of the constellation is loaded with bright blue class B stars, many of which are related to each other through the **Scorpius-Centaurus Association**, which includes Antares and consists of at least three loose, expanding subgroups. Take the B stars away, and the Scorpion would vanish.

Among the more fascinating of them is **Dschubba** (Delta Scorpii). Normally shining at magnitude 2.3, in 2001-2002 it developed a surrounding disk in part as a result of rapid rotation, and turned itself into a "B-emission" star (the disk radiating bright emissions at colors characteristic of hydrogen). By 2004, the star had reached nearly first magnitude, which rather changed the appearance of the constellation. After a couple years, Dschubba settled down, though it has yet to return to normal, and may not for a long time. Over on the other side of the tea table, Sagittarius puts the lie to the standard notion that the "Alpha" star is always the brightest in the constellation. Alpha Sgr (**Rukbat**), far to the south of the classic figure, is a miserable fourth magnitude, while the luminary is bright second magnitude Epsilon (**Kaus Australis**, the southern star of the Bow), followed by, of all things, Sigma (**Nunki**, in the Dipper). Even the two Beta stars (Beta-1 and 2) are only fourth magnitude.

The true glory of the two constellations, however, is in their setting within the broadest and brightest part of the Milky Way, the combined light of the billions of stars that inhabit the disk of our Galaxy. Sadly, for those living in moderate northern latitudes, the Earth's thick atmosphere dims this part of the Milky Circle. The view from the southern hemisphere, with the Archer overhead,

is one of the most spectacular sights nature has to offer, with sheets of stars seeming to cascade downward toward the horizon like celestial waterfalls. By amazing coincidence, the Milky Way's center-line, the Galactic Equator, runs almost exactly through both the winter and summer solstices. There is nothing physical in the crossings; they are just products of our times and the 26,000-year precession of the Earth's axis, which has brought us a temporary alignment.



Set within the Milky Stream are hordes of clusters and both bright and dark nebulae, many of which are glorious in small telescopes or even binoculars. Just to the west of Antares, and thus easy to find, is the pretty globular cluster **Messier 4**. Containing maybe 200,000 or so stars, it shines at roughly sixth magnitude even though 5600 light years away. A few degrees north lies the grander globular **Messier 80**. One of the densest of all such ancient collections (which go back nearly to the time of the Galaxy's birth), the light from its nearly half-million stars is dimmed by a distance of 27,000 light years.

On the other side of the Scorpion, to the northeast of the Stinger, lies a fabulous splash of stars over a degree across. Easily seen by eye alone, the sprawling open cluster **Messier 7**, 975 light years distant, is perfect for binoculars. To the northwest of M7 is bright, young **Messier 6**. Swinging eastward, Sagittarius

contains one of the brightest of globular clusters, **Messier 22**, visible to the naked eye to the northeast of the Dipper's handle and a startling sight when happened upon with binoculars. "Only" 10,000 light years away, M 22 closes in on a million stars. In the general neighborhood of Sagittarius and Scorpius, and extending into southeastern Ophiuchus, is an immense concentration of fainter globulars.

Sagittarius also tops out in bright gaseous nebulae (made mostly of glowing hydrogen lit up by nearby hot stars). Foremost is the huge **Lagoon (Messier 8)**, an easy binocular object roughly 5000 light years away and centered on yet another young open cluster. Just to the northwest, and at about the same distance, lies the **Trifid Nebula, Messier 20**, which is cut by dark, dusty lanes and that, like the Lagoon, is set within dark clouds that are actively birthing stars. Vastly larger dark clouds thread their way through the Milky Way's background, the most prominent of which is the southern extension of the **Great Rift**, which to the south of central Cygnus splits the Milky Way in two. Some of the clouds are so dark and obvious, especially as seen from southern latitudes, that the Incas of Peru named them as "dark constellations." The Rift and associated features are made of myriad dusty clouds so opaque that they block out all light from the millions of stars in back of them, in a sense throwing their shadows toward the Earth.

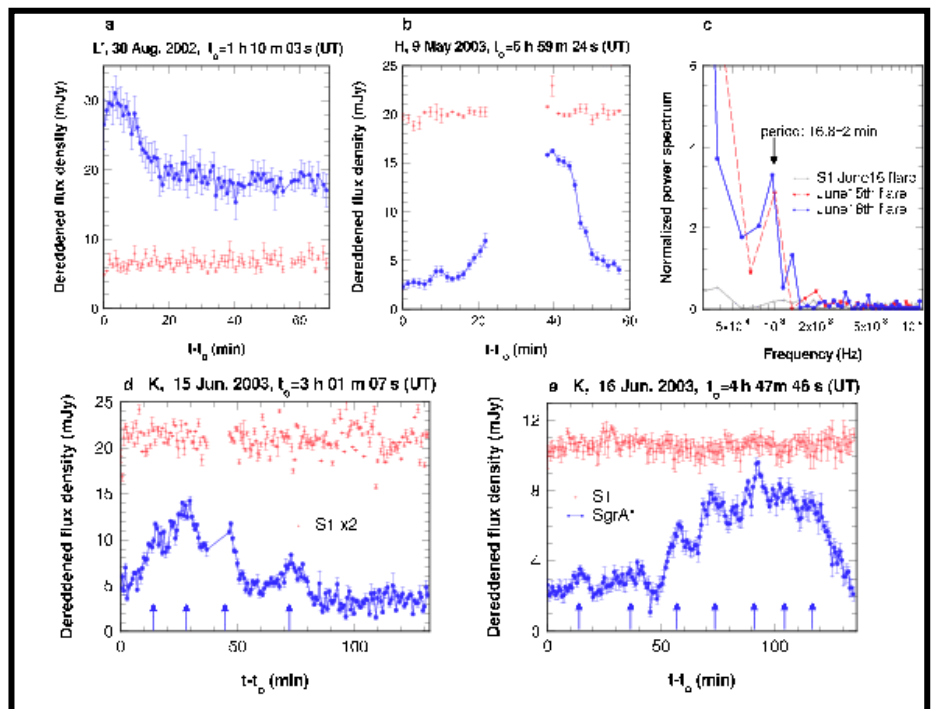
The dust keeps out heating starlight, and the darkest clouds are thus naturally cold, near absolute zero, which allows the formation of molecules and ultimately the collapse of the gas to form stars. Well over 100 such interstellar molecules have been discovered, including molecular hydrogen (which dominates), water, ammonia, methanol, ethanol, and formaldehyde, as well as several not found on Earth. The current record is one that contains 13 atoms, **cyanodecapentayne (HC10CN)**. Among the most interesting are those, such as acetic acid, that may lead to an understanding of the formation of life. The ancients eerily seem to be calling out to us, guiding our eye. Follow the Archer's arrow about four degrees (a bit less than the separation between the Big Dipper's bowl stars) southwest and you pass just two degrees south of the road

that leads to the center of the Galaxy, which lies just on the Sagittarius side of the border with Scorpius. The **Galactic Center, at a distance of 26,000 light years**, is vastly farther than the stars of either constellation, and more comparable to those of the globular clusters. There is so much dust in the line of sight that optical radiation is dimmed by 30 magnitudes: one ray of light in a trillion gets through. The Center was instead discovered by radio astronomers, radio waves easily penetrating the dust. In the early days of radio astronomy, no one knew how many discrete radio sources there were, so they were at first named after their constellations of residence. The first

most productive molecule factory known in the Galaxy. Among a huge number of other molecules, it contains **glycolaldehyde**, an eight-atom molecule touted as a form of "sugar."

So when teatime comes around again, Sagittarius may not only serve milk with your tea, but as you chat with the Scorpion, can sweeten it for you as well (one hopes with the real thing), much as these constellations sweeten the sky of northern summer

FIG 1 A HKL colour composite of the Galactic Centre region. The central black hole is located in the centre of the box which marks the area shown in the images above and below FIG 2 Stellar dynamics in the innermost



source found in Sagittarius – in the direction of the Galactic Center – was thus called "Sagittarius A." Within this extended radio patch is a point source, "Sagittarius A*," which is without much question the true center of the Galaxy itself. Measurements reveal it to be comparable to the size of the Solar System, while the orbits of the stars that surround it (observed in the transparent infrared) give a mass of more than three million Suns. Such conditions firmly indicate the center of the Galaxy to be a "super massive black hole." While no light can escape from within the beast itself, it glows around the outside with radiation from a circulating gaseous disk. Just a few hundred light years from the Galaxy's center lies **Sagittarius B**, which divides in two as **Sgr B1 and B2**. The northern part of Sgr B2 is the

region. Time resolved astrometry over a time span of now already 12 years allows a description of the proper motions of the Galactic Centre stars. The observations clearly show, that some stars in the immediate vicinity of Sgr A - i.e. in distances up to around 30 light days - move on Keplerian orbits around the central mass. From the shape of these orbits, the distance between earth and Sgr A* and the mass of Sgr A* could be calculated.*

Article courtesy: Lowestoft & Great Yarmouth Astronomical Society

The Siberian Eclipse (or 140 go mad in Russia) - Paul Whiting FRAS

A chance to ride on the Trans-Siberian Express as a means to view the eclipse was not to be missed, so six OASI members plus 3 other friends and partners set off early on Monday 28th July from the notorious Heathrow Terminal 5, not expecting to see our luggage again. However we were delighted to be re-united with it again in Moscow five hours later. Queues seem to be the order of the day in Russia – orderly queues by the Brits and scrummages by the rest! Passports, visas, entry forms and customs declarations later, we got into the airport arrivals hall. There we stayed for over an hour - someone had lost a case in the airport. We then split into two coaches – one for couples and one for singles – an odd split but hey. The first coach set off – followed 90 minutes later by the second. The first coach used the Moscow orbital motorway (Msk1 25 ?) and was never seen again – at least not for 3 hours. The second coach went through the city centre and saw the sights, but still took several hours to cover the relatively short journey to the hotel. [note: despite not travelling with Ryanair, we still ended up miles outside Moscow on the wrong side from the hotel] Finally we settled down to a fine buffet dinner at the Aerostar Hotel. Overall the meals in Russia were of a very high standard, but got very repetitive for the vegetarians amongst us.



The 'onion domes' in Moscow

The second day involved a tour of Moscow – especially the Kremlin and its constituent churches. Unfortunately Red Square was closed off as there was a civic send-off for the Russian Olympic team. Later, on the way to pick up the train, our coach was pulled over by the police to allow Russian President Medvedev and his cavalcade to pass at very high speed.

Finally we reached the train that was to become our home for the next six days. Fourteen carriages consisting of eight first class sleeping cars, one premium sleeping car (with wash basin), two restaurant cars, one bar/function car and a shower car. There was also a staff accommodation car.



The Trans Siberian Express train - our home for 6 days

Over the six days we were to travel over 5000 kilometres from Moscow to Irkutsk, via the eclipse site at Novosibirsk, crossing the Urals from Europe to Asia.

The average day on board consisted of reveille at 7am, breakfast between 7 & 9am, train pulling into stopping station around 10-12, tour round city until 5pm and then back to the train for dinner (in 2 sittings) between 6 & 8pm. The dulcet tones of our German train Manager, Angelika, kept us informed of what was happening and when. As already mentioned, the food was quite good. Salad, garlic and curried carrots, spiced aubergine, lumps of meat (various) and potatoes kept cropping up on the menu, both on the train and elsewhere. Occasional treats of hors d'ouvres such as caviar and olives also appeared. Having said all this, breakfast was a law unto itself. Hard boiled egg, porridge (if you were lucky), cheese/ham/salami (2 small slices of each), fruit, yogurt, chocolate éclairs, sweet cakes, butter ("only for breakfast"), white and black bread, juice ("apple or peach") and tea or coffee (allegedly) all or some served in random order by two very hard working waitresses. One of these resembled Pat Butcher from EastEnders and the other a young graduate in railway engineering working during her final vacation. There were other waitresses, but as we were constrained to the same dining car, I didn't get to meet the others.

We were in coach 1. Dinner was in coach 6. This meant that 30 doors had to be opened and closed from our coach to our dining car. All the other of the Suffolk contingent, I believe, had far fewer. This became the common unit of distance on the train. The bar was 42 doors away and the shower car 48 doors. The shower car was something else. Eight double showers with water that ran out often (despite being re-filled at least twice a day), that usually ran cold (they needed 90 minutes to heat up after a refill) and that usually dribbled out of the tap. But the shower gel and shampoo was provided!

"If I wanted to sit in a muddy field all day in the dark, I could sit in my garden at midnight"

First stop was Kazan, the Gateway to Siberia and the capital of Tatarstan (= Moscow time). A quick tour here – a river trip round a garbage scow and the sights of several power stations and back ashore to visit a rather beautiful mosque we had just seen from the boat. The city itself was of two halves – old and rundown and a new, renovated sector. State funding was slowly rolling out to Siberia, but tourism was also helping.

Second stop Yekaterinburg (Moscow time +2 hrs) and a visit to the church, which marks the site of where the last Romanov Tsar and his family were killed in 1918. The Russian Orthodox church has been built in their honour, despite their remains being buried in St. Petersburg. It was here the wife of one of our members (mentioning no names) lit a candle to ask for a clear sky for the eclipse the next day. The day ended as usual with an overcast downpour, followed by clear sunny weather.

After our tour, back on the train, our expert Dr Peter Cattermole presented a couple of lectures on what to do at the eclipse one for novices and one for "experts", although they were virtually the same talk! Being a geologist, Peter had presented a talk on the geology of the Ural mountains the day before.

I should point out at this point only about 30% of the train were eclipse chasers, the rest were holiday makers who mostly thought that the eclipse was a gross inconvenience to their train trip. For example one comment overheard – "If I wanted to sit in a muddy field all day in the dark, I could sit in my garden at midnight".

Third stop Novosibirsk (Moscow time + 3 hrs) – the day of the eclipse. The day started out OK – partly cloudy and some sun. A quick breakfast and we were on our designated coaches (4 in total, 3 of us plus a coach full of Danes who had joined our train at Moscow).

First we enjoyed a visit to a geology museum, which was excellent, including a large exhibit of meteorites. However the group I was in overran and so we didn't get to visit the train museum that everyone else enjoyed. We were given the opportunity to take photographs through the locked gates in the darkness much later in the day (wow!). After lunch we all headed to the eclipse site – fair drive out of Novosibirsk, in a village called Sosnovka on Lake Ob. The weather was good – some high cloud that should dissipate, however a lot of rain bearing cumulus suddenly appeared rapidly spreading in from the north-east. This was just as the pattern of the previous few days

had promised. The chances of seeing all of the eclipse were dropping rapidly. It was at this point that our coach caught fire – or at least smoke from a burnt out air-conditioning unit flooded into the coach, necessitating a mass evacuation. We were supposed to be awaiting a fleet of smaller minibuses to take us beyond where normal coaches couldn't pass, but of course there was no sign. The eclipse and the cloud drew nearer.

Peter Cattermole suggested that we should set up on the dirt road we were on, given we were only about 5 km from where we were supposed to be. However the minibuses eventually turned up, and the "experts" who needed time to set up their kit were invited to travel on first. The holiday makers would (perhaps) follow on. Luckily they did, the coach with the faulty a/c was still able to go on, despite now being a mobile sauna.

After a lot of driving around woods and fields trying to locate our advanced party, we arrived at the observation site – a field with low grass abutting Lake Ob. There was quite an on-shore breeze, with waves lashing the shingle beach, spray blowing onto our equipment (I knew that plastic bag would come in handy). The wind even blew my tripod over – I thought my video camera lenses were broken, but luckily the UV filter had acted as a sort of break fuse and no harm was done. But what of the cloud? It just disappeared – we had a virtually cloudless sky for the whole eclipse. The lighting of the candle at Yekaterinburg had worked – memo for next time. There were a lot of local people at the eclipse site, one person even had a telescope with a solar filter, but given the TAL telescope factory is in Novosibirsk I'm surprised there were not more about. There was even a cow. We came up with the idea of studying the effects of the eclipse on its behaviour. Perhaps it would lie down or walk off to be milked or something, but unfortunately the farmer came to collect it an hour before the eclipse!

So what of the eclipse. A wonderful 2 minutes and 20 seconds of totality, with the whole eclipse from 1st contact to 4th contact being cloud free. A standard solar minimum corona (round, regular and tight-in) with some linear streamers. No shadow bands were seen before or after. Two planets



First Contact

became visible (Mercury and Venus) out of the four possible that formed a nice little line close to the sun (the other two being Saturn and Mars).

A number of us bumped in to two of the three most successful eclipse chasers alive today. All of these guys have been under 27 total or annular eclipses. John Beattie (25 clear) and Jay Pasachoff (26 clear) were at Novosibirsk. John actually came up to have a look at the solarscope I was using to project the sun's image.

And so on to dinner back in Novosibirsk and back to the train and bar for the post eclipse celebration, and a sore head for some the next day.

Another hour forward and the next day we headed for fourth stop Krasnoyarsk (Moscow time +4 hrs). But before we



session, we disembarked for the final time. It rained. We got wet, our bags (which went on before us) got wet. Our day long coach tour of the city was a waste of time given that the windows were steamed up and it was raining so fast you couldn't see much anyway. The local tour guide (the best



Venus and Mercury become visible during the eclipse

arrived, Pieter Morpurgo (a former producer of the Sky at Night programme) treated us to a talk of anecdotes of working with Patrick Moore on programme assignments around the world. When we eventually started our town tour - another Kremlin, more domed churches, more statues of Lenin, more impressive railway stations (not that I was getting a bit jaded by this time), we were destined for a 45 minute cruise on the River Yeniseij. The first group set off and didn't come back – they broke down. Their cruise turned into a 90 minute ride of about 400 metres. We in the second group were very uncertain whether we should have a go, despite assurances that the boat was now repaired. In the end we did and spent 45 minutes 100 metres off the pier keeping pace with the fast flowing tide, just in case! Then back to the train and bar.

The final train destination was Irkutsk (Moscow time +5hrs). After a final breakfast and another "tipping everybody that moved"

English speaker to date) was quite intrepid. We had paid for multiple walks around and so, deluge or not, we were going to have these walks around. Some of us stood (or rather sat) firm in the dry, but others went on to take more photos of domed churches, statues of Lenin and another impressive railway station. Eventually they allowed us in to the former state controlled "InTourist" hotel, which had apparently been recently renovated. On our floor that meant putting new carpet over broken tiles or cobbles that cracked as you walked over them. A woman sat at a desk by the lift on each floor, to whom keys should be given when leaving the hotel, from whom water and other goodies could be purchased and through whom telephone calls could be made. At least the water purchase option worked OK.

The rooms here were OK, but you definitely had the feeling of microphones

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being present in the lampshades. The pillows were lumpy too ! However the great redeeming feature was the London Bar, where copious quantities of London Stout and Newcastle Brown were consumed. There was even a miniature red telephone box.

The second day at Irkutsk was spent in a coach ride to the shores of Lake Baikal and a nice little village consisting mainly of dachas or holiday homes for the folk of Irkutsk. Here we had time to chill and shop at the market. Hah. The market consisted of a house clearance table, twenty identical tables of the local tourist tat (animals made from the local mineral, stackable dolls etc) and a bar full of locals that stared at you if you dared to look in. We did, however, find



The London Pub in Irkutsk

a relatively pleasant little café to while away our free time here.

Legend had it that anyone who bathes in the water of Lake Baikal will look 10 years younger; I can tell you from experience it doesn't work.

On the way home to Irkutsk we stopped for a badly kept secret folklore evening – a dinner interspersed with local singers and dancers. I hate these sorts of things – I usually get dragged out to join in, but I must admit these guys were quite good and it was not all too embarrassing. The restaurant was in the middle of a muddy, wooded trail and small zoological garden, although they only appeared to have a couple of deer. One local told me that they had had a wild bear there a few weeks before but it had gone away. On the way back along the muddy trail to the coaches four of us spotted an easier method of transport – a Russian Troika or 3 horse pulled cart – great fun.

The next morning saw our long trek home. Firstly on a chartered Caucasus Mineral Water Airways flight (Mineral Water is actually a place in the Caucasus). This flight was late arriving (bearing in mind it brought our tickets with it) so no panic here then about missing the connecting flight back from Moscow to London. Our dinner and city tour around Moscow were cancelled, not with too much regret as the so called snack on each flight was very



The Author -(now promoted to General?)

filling. I also found time to sample some Turkmenistan dumplings and some caviar sushi at Moscow Airport.

A long day later (we started at 6 am (10pm BST); we arrived at Heathrow at 6pm (BST) after 20 hours of travelling. We then had to get home, which added another 3 or 4 hours on the day. At least the baggage didn't get lost anywhere along the way.

I haven't made reference to the public toilets in Russia, quite deliberately – I'm trying to forget.

Wycombe Astronomical Society hits its "Peak"

Steven Paterson a Public Outreach employee from the National Optical Astronomy Observatory (NOAO) at Kitt Peak in Tuscon Arizona, returned to the U.K. in June 2008 on holiday with his wife after a 45 year absence. He used to live at Naphill in Buckinghamshire, and contacted our Society kindly offering to give us and two other local Societies a talk about his work.

The Observatory was built in 1958 on a 13 acre Indian reservation site high up above the Sonoran Desert. It has the world's largest collection of telescopes with 25 optical and 2 radio telescopes, and represents 8 astronomical research institutions.

Steven gave us a slide show and talked about the huge McNath-Pierce solar telescope, the Mayall 4 metre, and the WIYN 3.5 metre telescope which has the most recently refined optics and is owned and operated by Wisconsin, Indiana and Yale Universities. He also talked about the Observatory relationship with the Indian people.

Kitt Peak is famous for scientific discoveries on galaxy rotation curves, high redshift galaxies and distance scales. It also provides nightly, overnight and advanced observing programmes for the public, all

with a "hands on" approach, including CCD, Webcam and DSLR imaging.

Steven showed us his own backyard "set-up" of equipment and some stunning photographs that he had taken. We thanked him for an unexpected addition to our monthly lecture schedule, and for a most enjoyable and interesting evening.

Since visiting us Steven has become an Honorary Member of our Society, and has promised to visit us again on his next trip to the U.K.

Jan Dell (Mrs)
Publications Officer
www.wycombeastro.org.uk



Steven Paterson

SAGAS Summer Meeting

July 19th 2008 Cliddesden Primary School, Basingstoke.
 The meeting was hosted by Basingstoke Astronomical Society

The venue was just outside of Basingstoke in a village nestled in idyllic farmland. It was remarked by many attendees that this must afford excellent night-time views at Basingstoke meetings.

The meeting was opened by Derrick Ward, Vice-Chairman of Basingstoke, and an official SAGAS welcome was then extended by John Axtell, Secretary of the Working Group. The meeting was then chaired by John Stapleton, Secretary of Basingstoke and Working Group member.

The meeting was attended by 54 persons representing nine SAGAS societies – Basingstoke, Cody, Crawley, Croydon, Farnham, Guildford, Hampshire AG, Vectis and Worthing. Visitors were also recorded from BAA, HantsAstro, Richmond & Kew AS and The Astronomer, as well as the wider community.

Speakers for the day were Dave Shave-Wall of Basingstoke who gave a very entertaining talk on the trials and tribulations of becoming an amateur astronomer entitled "An Amateur's Journey", Peter Birtwhistle of Great Sherford Observatory who gave a detailed talk on his work tracking NEO's in "Practical NEO work where Amateurs can still make a Contribution" which was a very inspiring talk by an amateur who is credited with several original discoveries and "The Search for Novae and Supernovae – From Visual to Laptop" by Guy Hurst, former President of the BAA and Honorary President of Basingstoke. The speaker is co-ordinator of the UK Nova Patrol and Editor of The Astronomer magazine and was able to deliver another inspiring talk on another aspect of observational work in which the amateur can make a significant contribution.

There were also refreshment breaks that presented ideal times for networking and to visit the attending trade stands, Aurora Books and Venturescopes. Unfortunately True Technology were unable to attend.

Tea was provided using a local catering company and Basingstoke members looked after the needs of visitors.

At the end of a very enjoyable and successful meeting thanks were extended to the speakers, Basingstoke Committee, for the organisation of the day, and members, for their help during the day, and to all visitors who travelled to attend by John Axtell.

John Stapleton

John Stapleton is the SAGAS Working Group member with responsibility for IYA2009, and also the organiser of the Basingstoke event, a society he helped to found and is Secretary there. The pictures are from William Bottaci of Croydon AS.



The Speakers from left to right Peter Birtwhistle, Dave Shave-Wall & Guy Hurst



Part of the display



Are you sitting comfortably?



Derrick Ward, Vice-Chairman



How much?



John Stapleton, outlining the day's programme



A cheerful delegate!



John Axtell, welcoming people on behalf of SAGAS

Total Eclipse Tour to China

On 27th July 2008, Sally and I drove down to Heathrow, to check in for our China Airways flight to Beijing.

There we checked in using the new, speedy ticketless electronic system - this of course involved a 45-minute wait while three different ladies who didn't know the system tried to work out what they were supposed to do... **Marcus Rose**, our Tour Manager from **Ancient World Tours**, moonlighting from his main job as a freelance photographer, kept an eye on the process to make sure we got through OK.

Mooching through the Duty-Free, we went to a perfumery, where I came across the Hermès stand. As editor of *Hermès*, the newsletter of the Shropshire Astronomical Society, I felt duty-bound to buy *Terre d'Hermès*. Given the amount of ground we were about to cover, it seemed doubly appropriate.

We then met **Ian Morison** of Jodrell Bank, who was our official astronomical expert for the trip, and our fellow travellers **Bernard & Margaret Creedon**, **David & Linda Storey** and **Julie Davenport**. Ancient World Tours had organised another Eclipse Tour, which was longer and visited more sites of interest in China. Most people had opted for the longer tour, but we all found that having a small group meant it was much easier to get to know each other.

The distance from Heathrow to Beijing is 8,161 kilometres, and the flight takes ten hours. And because we were flying West to East, and Beijing is seven hours ahead of the UK, we left at 20.40 on Sunday evening and arrived at Beijing at 12.57 in the afternoon on Monday. It was interesting to see that we had to pass through a machine which measured our temperature - anyone with a fever would not be allowed into the country. Predictably, the sky was grey with smog, despite the efforts of the government to reduce pollution by shutting down factories and restricting the use of vehicles.

Meeting us there was our tour guide from China International Travel Assistance, **Lang-Yen**, whose 'English' name was Susan - it seems that many Chinese who have regular dealings with foreigners adopt an English name to make life easier. Chinese names have the family name first, followed by the given name.

Susan told us that Terminal 3 at Beijing Airport was the largest in the world, and was built in the shape of a dragon, while the car park was in the shape of a turtle. During a 30-minute coach ride to the Central Business District and Traders Hotel,



Susan explained that Beijing had existed for 3,000 years, and had been the capital for the last 800 years. En route, she taught us a few Chinese words: *ni-how* - hello; *xia-xia* (pronounced she-she) - thank you; and *ding ding how* - brilliant!

After freshening up at the hotel, we went on a rickshaw ride to the Hutongs. These are the original local neighbourhoods of the city, and comprise narrow alleys - *hutongs* - formed by lines of *siheyuan*, or quadrangles, the traditional courtyard homes of ordinary people. Hutong itself is a corruption of the Mongolian word *hottog*, meaning 'water well'. Many of the hutongs have been demolished to make way for modern roads and skyscrapers, but a small number of the hutongs have been given protected area status in order to preserve them.



Tuesday 29th July

The next morning, Susan took us to Tiananmen Square, where she cleared up the mystery of why Peking is now known as Beijing. The first Chinese to have contact with the West were Cantonese traders, in whose language the city was called Peking. As the majority of the population speak Mandarin, it was sensible to make Beijing the official name.

Tiananmen means 'heavenly gate of peace', and is the main entrance to the Forbidden City in the centre of Beijing. At the North end of the Square is the Tiananmen Tower, built in 1417 during the Ming dynasty. Until 1911, only members of the Imperial family could enter the tower. At the South side, is Mao Zedong Memorial Hall, where the body of Chairman Mao lies in a crystal coffin. It's clear that Chairman

Mao is still highly revered here, judging by the number of images of him that were there.

As the 2008 Olympics were due to begin in a few days' time, it was perhaps not altogether surprising that there was a huge 'One World, One Dream' floral display dedicated to the Games. What was perhaps more surprising was the intense commercialisation. It seemed that virtually everywhere you went in China, Tiananmen Square included, it was almost impossible to go more than a few steps without someone trying to sell you some Olympic memorabilia or other.



The bright clothing people were wearing dispelled another preconception, that everyone would be in drab colours. It was as though Hong Kong had taken over China, rather than the other way round! Even the Military and Police personnel - who were ever-present but not intrusive - seemed to have uniforms designed by Jean-Paul Gaultier or some other famous fashion designer.

Naturally, we asked Susan about the military response to the Tiananmen Square protests of 1989 which had resulted in the deaths of hundreds of civilians. But although she had been able to give us information about events that took place hundreds of years ago, her diplomatic response to this was "I was *only five years old at the time, so I don't know much about it*". We didn't press the point, as it was clear she was uncomfortable talking about anything controversial.

Moving on from Tiananmen Square, we entered the Forbidden City, the Imperial Palace. This was built from 1406 to 1420



and took 230,000 skilled artisans and 1 million workers to complete. In 1987, it was declared a World Heritage Site. It was originally designed to have 9,999 bays of rooms (9 is the largest single odd number and is considered to be lucky in China). Today it has 980 surviving buildings and 8,707 bays of rooms.

As well as the main palaces, Susan showed us the self-contained courtyards where the Emperors' concubines and children lived. By the Qing dynasty, there were as many as 20,000 living there. Some of these became extremely rich, so there was intense competition for girls to become a concubine of the Emperor. The downside is that on the death of the emperor, it was expected (until about the 15th Century) that they be buried alive to keep him company in the afterlife.



A consequence of the presence of the concubines was that all the administrators had to be eunuchs so that there could be no doubt over the bloodline of the heir. These eunuchs carried the mummified remains of their testicles around with them, so that they could be reunited in the afterlife. Many of these eunuch administrators (around 2,000 in the 19th Century) became very wealthy and powerful as a result of their position at the centre of the Empire.

After the Forbidden City, we visited the Yuan Long Silk Shop, where we were shown how silk was harvested from the cocoons of the silkworms. Fed on a diet of Mulberry leaves, the silkworms spin the cocoon to protect them while they pupate. The cocoon is then collected and dropped into boiling water, and the thread is unwound.

Often, the cocoons of two silkworms will become entangled so that there are two silkworms in one cocoon. This makes it impossible to unwind the silk into a thread,



but it is not wasted. In this case, the silk is stretched out in order to provide the fibre for silk duvets or similar.

After being shown how this was done by the staff, some of us had a go - we were not entirely successful! But I don't think we did too badly for a first attempt. There is an enormous array of beautiful silk products for sale on three floors, and while we were all tempted, it was Julie who came away with a silk duvet to take home.

We then travelled 70km north-east to lunch at Xin Shuang Quan restaurant at Mu Tian Yu, near the Great Wall of China. It's somewhat difficult to say exactly how long the Great Wall is, because so many dynasties built, re-built or extended it. The usual length quoted is over 6,000 km for the final construction which took place in the Ming dynasty. Other estimates put it at just 2,400 km. Just to put this into perspective, the distance from London to Beijing is 8,161 km. More than a million people died in its construction.

The Great Wall, as well as safe-guarding the Silk Road, also facilitated transport and the exchange of information - arguably the original information superhighway. However, some information, such as how silk was produced, remained a closely-guarded secret for hundreds of years.

Incidentally, it's a complete myth that the Great Wall of China is the only man-made structure visible from Space or even the Moon, but somehow the idea has entered the popular consciousness:



We arrived at the Mu Tian Yu section, which is connected with Juyongguan Pass in the West and Gubeikou Gateway to the East. We had a cable-car ride up to the wall itself - except for Bernard, who's super-fit and managed to run up the steps to get to where the cable-car dropped us off, without breaking a sweat.

The Great Wall itself follows the contours of the mountains it traverses, which explains why the Wall is so long. At this section, it is interspersed at irregular intervals by twenty-two watchtowers.

The various contours of the Wall are such that in many places you have to climb some very steep steps. Bernard, Marcus and I climbed these steps as high as we could go before the way was blocked by rubble;



Bernard quite quickly, Marcus and I rather less so! They were so steep that it was fortunate it was a beautifully dry and hot sunny day; had it been raining, the steps would have become impossibly dangerous. Getting down the side of the mountain from the Wall involved a vast number of steps, no two of which were the same.

By the time we reached the base, we were hot, bothered and willing to pay just about any price for a bottle of water -with the exception of Marcus and Ian who both displayed excellent price negotiation skills.

After, that it was back to Traders Hotel for a quick shower, and an evening meal at the Fu Xiang Lo Restaurant.

Wednesday 30th July

Wednesday morning was an early start. Meeting in the lobby of the hotel at 06.00hrs, our coach driver Charlie drove us to the airport. Check-in here was very straightforward, and at 08.27hrs, we took off for Urumqi (pronounced urumchee), the capital of Xinjian Uyghur Autonomous Region. Now, everyone 'knows' that China is a huge country. But it's not until you get onto an internal flight, that you realise just how big it is. From Beijing to Urumqi is around 2,000 km. To put that into context, it's about a quarter of the way back to London, or about the same distance as Shrewsbury to Ancona in Italy!

Arriving at Urumqi at 11.58hrs, it was clear that this was a very different place from Beijing. Notably, most of the signs were dual-language Chinese and Arabic. Also, the people looked different. 91.5% of the population of China as a whole are Han Chinese, with the rest being comprised of a further 55 ethnic groups. Xinjian's majority indigenous population is Uyghur, though it contains 47 ethnic groups in total.

According to the tour guide who met us, **Rixat** (pronounced 'Richard', and pictured below centre), the Uyghur originated from Turkey centuries ago, travelling along the Silk Road and finally settling in Xinjiang, which is in the North-west of China, bordering Tibet, Qinghai, Gansu, Mongolia, Kazakhstan, Kirghizstan, Uzbekistan, Tadjhikistan, Afghanistan, Pakistan and India.

Urumqi means 'beautiful pasture', and according to Rixat, is known for 'white,

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black and red' - cotton, oil and tomatoes'. Because of its position in central Asia, it has a desert climate and has long cold winters and equally long but extremely hot summers. Economically, it produces a lot of consumer goods, and many Russians come over the border to purchase them. Rixat said that the Olympics were actually causing a lot of problems for the tourism industry in his area, as most overseas visitors this year were choosing to stay in Beijing for the Olympics, rather than visit other parts of China.

He took us to visit the Urumqi museum, where we saw several mummies which had been discovered since the 1980's in burial grounds in the shifting sands of the Gobi Desert, preserved by the arid conditions.



One of these, 'Beauty of Loulan' was estimated to be 4,000 years old. Another, 'Charchan Man' was 3,000 years old. Both looked as though they had only recently passed away, and were still wearing their original clothing. Unlike Ancient Egyptian mummies, they had not been prepared for mummification in any way; the desert alone was able to preserve them.

The burial sites where these were found in the Gobi Desert would have been covered and uncovered by the shifting sands many times over the millennia. They were indicated by a number of poles sticking up from the ground - a round pole indicating a female body, and a paddle-shaped one a male.

The most striking thing about these mummies was their features. They had obviously European features, not Chinese; and one of them, Yingpan Man, was two metres in height! Unsurprisingly, this has been seized upon by certain Uyghur militant separatists as proof that their region should be a country in its own right, rather than being an 'autonomous region' under the control of the Han Chinese. Indeed, two days after we returned to the UK,



sixteen local police were killed in the Xinjiang region, with the East Turkistan Islamic Movement believed to be responsible. Of course, one man's terrorist is another's freedom fighter...

It was then time to go to the museum shop. Both Ian and I fell in love with a large piece of amber which contained insects and vegetation preserved from the age of the dinosaurs. However, we were not so enamoured by the asking price - the equivalent of £280. Eventually, the lady came down to £150, and Ian and I were seriously considering a time-share on it. But just as I told the her that my wife would kill me if I bought the piece, Sally arrived at the counter and told me I was quite right! But about five minutes later, she told me I could have it if I really wanted it. I went back and haggled the assistant down to £110 and I was happy!

After the museum, we visited the bazaar before returning to our hotel. According to Marcus, who had visited Urumqi 15 years or so ago, the city had been transformed out of all recognition, with its bright modern buildings, while the bazaar had changed from being outside on a dusty track to being totally enclosed. There was almost nothing he recognised from his previous visit.

Thursday 31st July

Today was the 'Long March' for our intrepid band of travellers, as we had a 600km trek ahead of us in a minibus in order to get to Hami, the nearest large town to the observing site. Thankfully, the minibus, although clearly designed for short trips around the city rather than cross-country journeys, was air-conditioned.

The roads were incredibly bumpy, to the extent that we were sometimes literally bumped out of our seats. The state of the roads is down to the huge 50° C. range in temperature between Winter and Summer.

We had left Urumqi at 08.50, finally arriving at the Jon Yao Hotel, Hami at 19.40, stopping briefly for lunch at 13.20. The views of the desolate and at times snow-covered mountains were magnificent, but the attraction of hour after hour of magnificent desolation tended to pall after a while.

Hami is renowned for its melons, which are sold throughout China. There are reputedly over 180 varieties of Hami melon, which are supposedly the 'King of Melons'. As we neared the town, there were numerous stalls on the roadside selling the refreshing fruit.

After our evening meal, Ian talked us through what we could expect the following day, and then we went outside for an observing session, which included Jupiter and the Jovian moons as well as the constellations, following which we went to bed, as we still had a 400km round trip in store to the eclipse site close to the Mongolian border the next day.



Photo above by Marcus Rose

Friday 1st August

We left Hami at 08.25, heading for Yiwu, also known as Aratürük (the Place of the Turks). We drove through deep mountain gorges, winding our way through the steep mountain gorges either side. The roads were, if anything, even more bumpy than the day before. At intervals along the way, police guards were stationed, many of whom gave us a salute as we went past.



At one point, we went past an ancient watchtower for the Silk Road. We had a brief stop to stretch our legs by a sparkling stream at the roadside, with cattle on the other side of a rickety bridge gazing at us inquisitively.

The surroundings became gradually greener as we progressed, with the landscape often resembling the upland moors of Scotland. We then drove through a mountain grassland plain, 2,000 metres in height, grazed by sheep and goats, passing Yurts along the way.

The authorities had imposed strict limits on the numbers of people allowed to go to the official viewing site, and only those with permits were allowed to go. Ancient World Tours had ensured we had all the necessary documentation. This was comforting when there was a passport and baggage check at 11.40hrs at Quanshan,



Photo above by Marcus Rose

between Kowuk and Yiwu. A very smart young Military Police Officer who spoke excellent English came aboard our minibus to check everything was in order. This took twenty minutes just for the nine of us, plus Rixart and Mr Wong, the driver. At this point we were even more thankful to be part of a small group!

Everything was in order, so we carried on to Yiwu, where we had a short break,



before carrying on along extremely rugged terrain to the Weizi Gorge, a high, stone-covered mountain plain between two mountain ridges, with snow-capped peaks to our west reaching 3,700 metres. We arrived at 14.00hrs in blistering temperatures approaching 39°C. This gave us plenty of



Photo above by Marcus Rose

time to set up our equipment before the main event. This also allowed Mr Wong to park the minibus within easy walking distance of the portaloos - a very important consideration...

We were by no means the first to arrive, and already the gritty, sand desert site sparsely populated by vegetation struggling to survive in the intense heat

was being surveyed by the visitors, who were all keen to secure the best viewing position. However, there was more than enough room for all, as the authorities had laid out a grid of roads covering a large area, so we were able to find a good spot on a ridge which would allow us to see the eclipse shadow racing towards us. Ian had persuaded the staff at the Jon Yao hotel to lend him a white sheet so he could spread it



on the ground and use it to check for shadow bands - an unusual piece of astronomical equipment. Our choice of spot was vindicated when we spotted the NASA team who would be doing a live webcast of the eclipse camped nearby.

While we were waiting, we took the opportunity to walk the 100 metres or so to the Astropark which had been built specially for the event. We were greeted by the somewhat bizarre site of a bright green area roped off with Police tape, which on closer inspection turned out to be an astropark covered in astroturf - appropriate, I suppose. Upon this was a sundial, a mock-



Photo by Marcus Rose



3 Photos above by Sebastien Muller

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up of an observatory, a mini-stonehenge and a plinth from which all of the many dignitaries and guests (or 'Big Potatoes' as Rixat called them) would view the event, watched by live TV cameras. Needless to say, entry to this hallowed ground was by special invitation only, though only the flimsy tape was in our way.

There was also a motley collection of bright orange old-style VW Beetles and campervans which had been driven to China all the way from Holland by forty self-styled 'adventurers'.

And unsurprisingly, there was the usual collection of stalls selling memorabilia including the inevitable Eclipse tee-shirt - and more usefully, cold bottled water. There was also a stand from China Mobile, who seem intent on turning the entire country into one large advertising hoarding for themselves.

Returning to the observing site, we had an anxious wait for the eclipse to begin. We had been promised a 70% chance of good visibility, but would the visibility be there when it really mattered? Despite the heat, there were a lot of good-sized clouds in the sky which might well conspire to prevent our seeing the event. Some of the inhabitants of the village nearby had joined us, including several small children, to join us for this special event.

At 18.09.17, first contact began, with the tiniest of nibbles bitten from the disc of the Sun. As time went on, it was possible to see that more and more of the Sun's surface was being eaten away by the Moon, as we viewed through the safety of special eclipse glasses, or through telescopes and cameras protected by Baader film. For most of the eclipse, there seemed to be no visible effect, though in the minutes before totality, the light took on an eerie, almost magical quality - it was as though the Sun were trying to convey to us that it was being stifled and would soon be extinguished.

As totality approached, we feared we might have come all this way for nothing. Three minutes before, a large cloud had virtually obscured the Sun - surely there was no chance it would move in time? But just thirty seconds beforehand, the cloud edged just far enough away that our view was as clear as it possibly could be. And then at 19.07.45... totality!

This was my first total eclipse, and although you can read in astronomy books about Bailey's Beads, the Diamond Ring and the Corona which is normally drowned out by the Sun's brightness, nothing can possibly prepare you for the event itself

After waiting for nearly an hour, totality itself seemed to arrive in an instant. There were virtually no Bailey's Beads visible, as the edge of the Moon presented this time was very smooth, with few irregularities through which light could sneak at the start of totality.

But the Diamond Rings were beautiful, both at the beginning and especially at the end. And inbetween, was the utter blackness where the Moon was precisely between us and the Sun. The chromosphere was beautifully symmetrical, with a pinkish tinge, the corona as pearly white as a Hollywood actor's teeth. The eclipse revealed a conjunction of Mercury, Venus, Mars and Jupiter, which was captured by Marcus.

And then it was over! Just 1 minute and 58 seconds later, the Moon's shadow raced away to the distant mountains. It was the most marvellous sight I have ever seen, and I can quite understand how some people become totally obsessed with seeing them. We stayed until around 20.30hrs, giving a lift to Yiwu to three young people from Taiwan who had become separated from



their group, before continuing on our way along the bumpy track to Hami. The convoy was given a Police escort because the road was so dark, narrow and dangerous, though this didn't stop some drivers from fruitlessly jockeying for position. We finally arrived back at Hami at midnight, tired but elated.

Saturday 2nd August

Another early start. After an alfresco breakfast on the terrace (we'd actually got up before the staff had begun putting it out), we set off at 07.25hrs for Dun Huang, about 550km distant. There is an enormous amount of work being carried out on constructing new main roads traversing this part of China, but most of them are not open yet, and formed no part of our journey. The roads on which we travelled now were just as potholed as those we had already endured, and every so often, we had to leave the tarmac altogether as work being carried out forced us to take a short detour on earth tracks.

Shortly afterwards, at 08.05hrs, there was a huge hold-up, where a truck had broken down, completely blocking its side



of the road. The traffic coming in the opposite direction just kept on coming, with no-one willing to stop to allow opposing traffic through. Mind you, Ian did get out of the minibus after a while, and bravely performed traffic duty - I decided I was on holiday and could get quite enough of that sort of thing at home, thank you. We eventually started moving again at 08.50.

At 11.00, we had a brief stop at Xin Xing Xia for a comfort stop. By now, we had become used to fairly primitive toilet facilities in much of rural China. However, the 'toilet' here comprised an elevated concrete building, inside which were three rectangular holes. Below this, and effectively in the open air, were piles of, err, material. Unsurprisingly, several of us took the more favoured option of 'nipping behind a building while no-one's looking'.





We resumed along a road which was perfectly straight (though only in the horizontal plane!) on the outskirts of the Gobi Desert until we arrived at the Dun Huang International Hotel. This was sheer heaven, and if anything, was even more sumptuous than the Traders Hotel in Beijing. Dun Huang means 'Blazing Sun', and it certainly lived up to its name, as the temperature was around 40°C.

As it was 15.00 by now, we didn't delay, but went straight to the Mogao Grottoes, known as 'Thousand Buddha Cave', which became a World Heritage Site in 1987. It is forbidden to take any camera into the caves, in case the flash causes damage to the paintings inside. Between 366AD and 1368AD, buddhist monks excavated caves from the soft stone and painted frescoes of the Buddha.

The grottoes are also home to the fourth largest Buddhist statue in the world. Despite the ravages of weather and time, and also at times deliberate defacement of depictions of faces, many of the paintings remain intact.

The Mogao Grottoes are the best



example of this area of Buddhist devotion, although it is interesting to discover that since the 2001 destruction of the Buddhas of Bamyán by the Taliban in Afghanistan, fifty caves were revealed, twelve of which contained wall paintings similar to those at Mogao. The common theme is the Silk Road, which was a thread running through many parts of our trip.

From there we went to the Crescent Moon Lake by Mingsha Shan, the Singing Sand Mountain. Fed by a spring, the lake appears fragile and beautifully incongruous next to the sand dunes, with its lush vegetation and impressive pavilions. It's a very popular tourist attraction, there were lots of people scrabbling up the sand dunes in order to surf down again, camel rides and even a microlite buzzing around which would take you for a spin if you were brave enough.

Then back to Dun Huang International Hotel for a rest and evening meal. The dishes served here were a little unusual, for along with the familiar pork, chicken and beef, we also had Camel's Hoof, and Donkey.

Later, Bernard & Margaret, and Sally and I had a wander along the market stalls nearby, before going back to the hotel to have a beer with David & Linda, and Ian and also some others who had been in China for the eclipse, including astronomer **Neil Bone** who had led one of the other tours.

Sunday 3rd August

To Dun Huang Airport where we had to say goodbye to Mr. Wong and to Rixat. Mr. Wong had done an amazing job of driving us such huge distances in a vehicle which had proved surprisingly worthy of the challenge. We were very grateful to him. Rixat had been a wonderfully knowledgeable, funny and gently subversive companion and guide during our stay in

Xinjiang province. We were very sorry to say goodbye.

Check-in went smoothly, and we took off at 11.48, landing in Beijing smog, which was in stark contrast to the bright blue sky we had left in Dun Huang. On arrival, we were met again by Susan and taken back to the Traders Hotel.

After a rest and some free time, we were collected at 19.30 and taken to the most famous Peking Duck eating-house in Beijing, the Quanjude Restaurant. Located at the edge of a lake not far from the Forbidden City, on which were many small boats lit by red lanterns, the restaurant dates



back to 1864

Once inside, there was an acrobatic floor show taking place as we were ushered to our table. And of course when we sat down, there was the familiar glass turntable in the centre, upon which the many dishes were placed, with the inevitable knocking over of wineglasses as the turntable was revolved. The highlight of the meal was when two Peking Ducks - with certificates - arrived at the table to be carved for us, then eaten in small pancakes.

Monday 4th August

It was time to fly home. It had not been so much a holiday, as an adventure. We will have so many fantastic memories of the event, and we have made some wonderful new friends. Would we do it again? You bet!

Mark Wiggin



SOCIETY ROUND UP

ABINGDON AS www.abingdonastro.org.uk
2nd Mon at Methodist Church Hall, Dorchester Crescent, Abingdon
Email: chris.c.holt@ntlworld.com
Jun 9: t.b.a. Samuel George

ALTRINCHAM & DISTRICT AS
www.astronas.org.uk
1st Fri (exc Jul & Aug) at Scout's Building on Park Road, Timperley, Altrincham
Geoff Flood 0161 980 1675
email: geoffrey513flood@btinternet.com

AS OF GLASGOW
www.astronomicalsocietyofglasgow.org.uk/
Meetings 3rd Thurs. at Room 345, Uni of Strathclyde (Montrose St entrance)
Email: DDegan@aol.com

ANDOVER AS www.andoverastronomy.org.uk
3rd Thur (exc Aug) at Grateley Village Hall.
e-mail: secretary@andoverastronomy.org.uk

ASHFORD AS www.ashfordastro.org.uk
Last Mon (exc Bank Hols) 19.30 at Stanhope Rooms, Otterden Close, Ashford
Drew Wagar e-mail: drew@wagar.org.uk

AYLESBURY AS www.aylesburyastronomy.org.uk
1st Mon (exc Bank Hols) at the Scout Hut, Oakfield Road, Aylesbury.
Sue Macdonald suamcdonald@tiscali.co.uk

AYRSHIRE AS <http://ayraastro.thesmallearth.com/>
1st Tues at Ayr College
email: gm0dig@hotmail.com

May 19: How to Observe the Sun Lyn Smith
BASINGSTOKE AS www.basingstokeas.org.uk/
4th Thurs at Cliddesden Primary School
email: john.stapleton@tesco.net

BASSETLAW AS <http://beehive.thisisnottingham.co.uk/bassetlawastro>
Meets at The Village Hall, Tylden Rd, Rhodesia, Notts. S80 3HL

Andrew Patten email: andrew_patton@talk21.com
BATLEY & SPENDBOROUGH AS
Every Thurs at Milner K Ford Observatory, Wilton Park, Batley
I Newsome 01924-443860
email: bevan11@hotmail.com

BECKINGTON AS www.basnet.org.uk
3rd Fri (exc Jul, Aug & Dec) at Beckington Baptist Church Hall, Beckington,
email: info@basnet.org.uk

BEDFORD AS www.bedsastro.org.uk
Last Weds, Bedford School, Burnaby Road, Bedford, MK40 2TU
Email: society@bedsastro.org.uk

BIRMINGHAM AS www.birmingham-astronomy.co.uk
Every Weds at Aston Uni. & Last Tues—lecture
Email: john.spittle.homecall.co.uk

BLACKPOOL & DISTRICT AS
www.blackpoolastronomy.org.uk
1st Wed of month at St Kentigern's Church Hall, Newton Drive, Blackpool
Terry Devon Tel: 01253-625975
email: info@blackpoolastronomy.org.uk

BOLTON AS www.boltonastro.org.uk
1st & 3rd Tues at Bolton TIC Centre on Minerva Road (nr Bolton Royal Hospital)
Peter Miskiw. Email: petermiski@hotmail.com

BRADFORD AS www.bradfordastronomy.co.uk
Alt Mons in upstairs room at Eccleshill Library, Bolton Road, Bradford, BD2 4SR
Hilary on 01274 672570. johnbards@blueyonder.co.uk

BRANNEL ASTRONOMY
www.brannelastronomy.com
1st & 3rd Fri at Brannel School, St Stephens, Cornwall.
Frank Johns, 01637-878020
e-mail: frank@laplage.demon.co.uk

BRECKLAND AA www.brecklandastro.org.uk/
2nd Fri at Recreation Centre, B1077 Watton Road, Great Ellingham
Rod Crockford. Email: rod_crockford@yahoo.co.uk

BRIDGEND AS
www.bridgendastronomicalsociety.co.uk
2nd Fri (Sept-May) Parc Slip Nature Reserve, Aberkenfig.
Email: clivedown@btinternet.com

BRISTOL AS www.bristolastro.org.uk
Every Fri at Bristol Grammar School, University Road
Simon Smith, email: secretary@bristolastro.org.uk

CALLINGTON CAG www.callington-astro.org.uk
1st & 3rd Sat (exc Aug). at Space Centre, Callington Community College.
Becky Watson; callintonastro@kimwatson99.fsn.net

Jan 3: A History of the Speed of Light Tony Broxton
Feb 7: Star & Planet Formation Prof Tim Naylor
Mar 7: Double Bill Nick Tonkin/Frank Johns

CARDIFF AS www.cardiff-astronomical-society.org
Alt Thurs, Sep-Jul, at Dept Physics & Astronomy, Univ. of Wales, 5 The Parade.
David Powell, 029 2055 1704.

Email: CAS@lldat.demon.co.uk
CAROLIAN AS www.carolianaastro.org.uk
Contact: Chris Ashman 01562 743758.

Email: info@carolianaastro.org.uk
CASTLE POINT AC www.cpac.org.uk
Every Weds at St Michaels Church, St Michaels Rd, Daws Heath, Hadleigh.
01702 434449. Email: secretary@cpac.org.uk

CHESTER AS www.cpac.org.uk
Last Weds (no meeting Aug & Dec) at Burley Memorial Hall, Waverton, Chester
Tim Colegate. Email: tjcsmith@btinternet.com

CHIPPING NORTON AAG www.cnaag.com/
3rd Mon Robin Smitten 07900-858690.
Email: robin@chippingnortontheatre.com

CLACTON AS www.clactonastro.org.uk
1st Thurs (exc Aug) at Quakers House, Granville Road, Clacton-on-Sea. CO15 6BX
David Pugh 01255 429849 e-mail dpugh@sky.com

CLEETHORPES AS
www.cleethorpesastronomy.co.uk
Meetings held at the Beacon Hill Observatory, Cleethorpes, start at 7.30pm.
Paul Thompson 01472 233552
e-mail paul@cleethorpesastronomy.co.uk.

CLYDESDALE AS www.clydesdaleastro.org.uk
2nd Mon at Dunglass House, Ayr Road, ML11 9TU
Contact: Lyn Smith 07725 347711. e-mail: clydesdaleastro@hotmail.co.uk

CORNWALL AS www.CornwallAS.org.uk
2nd Tues & 4th Thurs at WI Hall, Mabe, Penryn..
Robert Beeman (01326-341164)
Email: info@CornwallAS.org.uk

COTSWOLD AS www.cotswoldas.org.uk
2nd Sat at Millenium Hall, Bishop Road, Shurdington, Cheltenham.
Duncan Willoughby (01452-416405)

COVENTRY & WARWICK AS <http://uk.geocities.com/covwaras/>
2nd Fri at Earlsdon Methodist Church Hall, Earlsdon Ave South, Earlsdon
email: cov_wark_as@yahoo.co.uk

May 9: Pluto & Outer Solar System Dr Mike Leggett
CRAWLEY AS <http://uk.geocities.com/crawleyas/>
3rd Fri (exc July & Aug) at Ifield Community Centre. 7.30 pm.

Jim Swift 01293-882560
E-mail: cytron@btinternet.com

CROYDON AS www.croydonastro.org.uk
2nd Fri during term time at Royal Russell School, Coombe Lane
Paul Harper email: chairman07@croydonastro.org.uk

DERBY & DISTRICT AS www.derbyastronomy.org
1st Fri (exc July) at 7.30 at Friends Meeting House, St Helen's St, Derby
Dave Selfe email: secretary@derbyastronomy.org/

Jan 9: Jupiter—Friend or Foe Dr Jonti Horner
Mar 6: Music of the Heavens Chris Newsome
Apr 3: Photographing the Night Sky Nik Szymanek
May 5: Apollo: Tranquility & Beyond Anthony Southwell

DONCASTER AS www.donastro.org.uk
2nd & 4th Thurs at Church House—behind St George Minster, Doncaster.
Mrs Lesley Hardware on 01302-743352
email: secretary@donastro.org.uk

DUMFRIES AS Society web-site
www.astronomers.uksciencist.com
Monthly meetings at the St. George's Churchhall, George Street, Dumfries
Email: lesley.burrell@btinternet.com or 01387 269762

EASTBOURNE AS www.EastbourneAS.org.uk
Saturdays at the Willingdon Memorial Hall, Church Street, Willingdon p.m.

Bob Cripps, tel. 01323 732067
email bobcripps@btinternet.com

EAST RIDING ASTRONOMERS
www.eastridingastronomers.org.uk
3rd Mon at the Friends Meeting House, Quaker Lane, Beverley.

Tony Scaife, email astrogen@astrogen.karoo.co.uk
FALKIRK ASTRONOMERS www.astronomy-falkirk.co.uk
2nd Weds (exc June/July) at Old Peoples Welfare Hall, Laurieston, Falkirk.

email: malcolm@astronomy-falkirk.co.uk
FARNHAM AS www.farnham-as.co.uk
Meet 2nd Tues at Willis Hall, Sandy Lane, Church Cookham, Fleet
Barry Bellinger, tel. 07748766610
barry.bellinger@nokia.com

FLAMSTEED AS www.flamsteed.info
1st Mon at Royal Observatory & National Maritime Museum, Greenwich.
Friends Office, tel. 020 8312 6678
E-mail: jjbendall@btinternet.com

FURNESS & SOUTH LAKELAND AS
www.furness-astrosociety.org.uk
1st Fri (exc Jul/Aug) at Trinity Church Centre, Warwick St. Barrow-in-Furness
Richard Alldridge, 01229 826864
Email: Richard@alldridge.worldonline.co.uk

GUERNSEY AS www.astronomy.org.gg
Every Tues at the Observatory, Rue Lorier, St. Peters, Guernsey.
Debby Quertier. 01481 725760
Email: quertiers@thomasml.com

GUILDFORD AS www.guildfordas.org
1st Thurs at Guildford Institute, Ward Street, Guildford
John Axtell. 01932 341036 johnaxtell42@aol.com

HAMPSTEAD GARDEN SUBURB AS
Last Wed at Free Church Hall, Northway, London NW11.
Dianne Fishman 020 8458 4038

email: hgsas@dfish.demon.co.uk
HANTS ASTRO.ORG www.hantsastro.org
David Woods 023 9261 7092
email: subscribe@hantsastro.org

HARROGATE AS
Last Fri at The Green Hut, Harlow Community Centre, Harlow Ave.
Email: patsyorio@tiscali.co.uk

HAVERING AS <http://homepages.tesco.net/~nik.szzymanek/havering.htm>
3rd Wed at Cranham Community Centre, Marlborough Gardens, Cranham. Contact: Frances Ridgley 01708 227397

HEART OF ENGLAND AS www.hoeas.co.uk
Last Thurs Furnace End Meeting Site, The Old Exchange, Shustoke, Warwickshire
email: hoeas@tiscali.co.uk

May 29: How to Build a Galaxy Prof M Merrifield
HEBDEN BRIDGE AS
Meetings at Hope Baptist Church Rooms at approx 4 week intervals.
Len Entwistle (01422-378368) or visit FAS webpage.

HEREFORD AS
Meet 1st Thurs at Kindle Centre, Hereford.
Contact: Paul Olver (01432-761693)
email: info@hsastro.org.uk

HERSCHEL AS www.herschel-astro.org.uk
Email: hasadmin@gmail.com

HIGHLANDS AS www.spacegazer.com
1st Tues at The Green House, Beechwood Business Park North, Inverness.
Eric Walker, Tel: 01349 863821
email: pat.williams@ndirect.co.uk

Jan 6: Mars—how did they get it so wrong? Bill Leslie
Feb 3: Powering Satellites & Spaceships Arthur Milnes
Apr 7: AGM
May 5: Aurora Jim Wild

HORSHAM AS www.horshamastronomy.co.uk
1st Wed at Christs Hospital School, Horsham, West Sussex.
Richard Griffith
email: secretary@horshamastronomy.co.uk

HULL & EAST RIDING AS www.heras.org.uk
2nd Mon at Room S25, Wilberforce Bldg, Uni of Hull,
Cottingham Road, Hull
Mark Evans, Secretary.
E-mail: mark.Heras@merrydowncontrolware.co.uk

HUDDERSFIELD A & P SOCIETY
www.huddersfieldastronomy.org.uk
Every Fri at 4A Railway Street.
Email: marcus.armitage@ntworld.com
Jan 9: Our Magical Cosmos Prof John Brown

ILKESTON & DISTRICT AS
2nd Tuesdays at Hayloft Erewash Museum, Ilkeston,
Derbyshire
Mary McMulty, tel. 01298 78234
email: mintaca@msn.com

ISLE OF MAN AS www.iomastronomy.org
1st Thurs at the IOM Observatory, Foxdale.
James Martin e-mail: ballaterson@manx.net

JERSEY AC www.jerseyastronomyclub.org.je
Meets 2nd Mon at Sir Patrick Moore Astronomy
Centre, Les Creux, St Brelade.
Eileen Besnard. 01534-860802
e-mail: hakmat@jerseymail.co.uk

KIELDER OBSERVATORY AS
www.kielderobservatory.org
Lyn Henderson. Tel: 0191-4261708
e-mail: lynhenderson@blueyonder.co.uk

KNOWLE AS www.knowleastro.org.uk
1st Mon (exc Aug) at St George & St Theresa's Parish
Centre, Dorrige, Solihull.
Nigel Foster. Tel: 01676-535941
e-mail: nftest00@hotmail.com

LEEDS AS www.leedsastronomy.org.uk
2nd & 4th Wed at The Friends Meeting House, Carl-
ton Hill, 188 Woodhouse Lane, Leeds LS2 9DX-19.30
Mailto: xavier@leedsastronomy.org.uk or
xvermeren@gmail.com
Feb 11: Cauldron in the Cosmos Dr David Jenkins
Mar 11: The LHC at CERN Dr Joe Foster
Apr 8: The AMASE Project Dr Lianne Benning

LEICESTER AS www.leicester-astronomical.co.uk
Meets 2nd and 4th Tues 19.30. National Space Centre,
Exploration Drive, Leicester
Chris Gutteridge 0116 270 0596
email: chris@gutteridge.co.uk

LETCHEWORTH & DISTRICT AS
Meets last Wednesday of the month at Plinston Hall,
Letchworth: 7:45pm
Nick Ellis e-mail: ellis.nick@virgin.net

LIVERPOOL AS www.liverpoolas.org
3rd Fri at The Gibberd Room, The RC Metropolitan
Cathedral, Liverpool L3 5QW
email: clarklunar@aol.com

LOUGHTON AS www.las-astro.org.uk
Every Thurs in the Scout Hall, Loughton Lane, They-
don Bois, Essex.
Jerry Workman (0208-507-7568)

LOWESTOFT & GT YARMOUTH RA (LYRA)
2nd Tues at Waveney Gymnastics Centre (access Not-
ley Rd).
Richard Chilvers: 01502 57401
email: good.goat@tiscali.co.uk

LUTON AS www.lutonastronomy.org.uk
Last Thurs at Putteridge Bury Campus, University of
Bedfordshire
Geoff Mitchell. Email: user998491@aol.com

MACCLESFIELD AS www.maccastro.com
1st Tues (exc Jan) at Jodrell Bank Observatory & 3rd
Tues at Goostrey Village Hall.
email: secretary@maccastro.com
Mar 17: Lights in the Sky Dr Jim Wild
Apr 21: My Astronomy Ken Irving
May 19: Jodrell Bank-Tenerife, Lagrange 2 & Big Bang
Prof Rod Davies

MANCHESTER AS www.manastro.co.uk/
3rd Thurs Godlee Observatory, Sackville Building,
University of Manchester,
Email: massecretary@manastro.co.uk

MAIDENHEAD AS www.maidenhead-astro.net
1st Fri (exc July & Aug) at Stubbings Church hall,
Maidenhead SL6 6QZ
Tim Haymes 07796-164010

MANSFIELD & SUTTON AS www.sherwood-observatory.org.uk/
Sherwood Observatory, Coxmoor Rd, Sutton-in-
Ashfield. NG17 5LF
Cathy Beaumont 01623 552276
Email: secretary@sherwood-observatory.org.uk/

MARCHES A G www.spaceguarduk.com/mag
2nd Fri at Spaceguard Centre, Knighton, Powys. LD7
1LW.
Michael Birch 01597 850010 zakdorn@hotmail.com

MELTON & DISTRICT AS
Meets: Monthly at Village Hall, Main Street, Gaddesby,
Leics. At 8.00pm
Tomy Pacey (Secretary)
email: james.pacey@ntworld.com

MEBOROUGH & SWINTON AS
www.msas.org.uk
Every Thurs at Swinton Working Mens Club, 4 Station
Rd, Swinton. S64 8AU
Shaun O'dell (Secretary) 01709-579529

MID KENT AS www.mkas-site.co.uk/
2nd and last Fri at The Bredhurst Village Hall,
Hurstwood Road, Bredhurst, Kent
email pparish54@yahoo.co.uk

MILTON KEYNES AS www.mkas.org.uk
Alt Fri at Rectory Cottages, Church Green Road,
Bletchley, Milton Keynes
Mike Leggett Tel: 01908 503692
Email: mike.leggett@fsmail.net
Jan 23: Rare Stars, Cosmic Mayhem Prof M Merrifield
Mar 6: Images of the Universe Paul Money
Apr 17: The Wing Dynasty Dr Mike Leggett
May 15: Historical Observations at Cambridge
Mark Hurn

MORAY AC, SIGMA www.sigma-astro.co.uk
1st Fri at Birnie Village Hall, Thomshill, Elgin, Moray.
Ian Brantingham 01466 771371
Email: ian@branters.freereserve.co.uk

NEWBURY AS www.newburyas.org.uk
1st Fri (Sept-June) United Reformed Church Hall,
Cromwell Place, Newbury.
email: rfleet@clara.co.uk
Jan 9: The Ultimate Timeline Dr Francisco Diego
Feb 6: Shield for Starship Enterprise Dr Ruth Bamford
May 6: Microquasars Sebastian Perez
Jun 5: Mmmagma Dr Alison Rust

NORMAN LOCKYER OBS SOC [http://](http://www.ex.ac.uk/nlo/welcome.htm)
www.ex.ac.uk/nlo/welcome.htm
Fris & 2nd Mon at Norman Lockyer Obs, Sidmouth
Devon. EX10 0YQ
e-mail: enquiries@normanlockyer.org
Tel: 01395 512096

NORTH ESSEX AS <http://www.neas.me.uk>
3rd Thurs (exc Aug & Dec) at Henry Dixon Hall,
Rivenhall End, Witham.
Neil Short e-mail: njs.int@btinternet.com

NORTH NORFOLK AS <http://www.nnas.org>
At General Townend Club (Royal British Legion),
Cattle Market St, Fakenham.
Email: japrocker@aol.com Kevin Kilburn
Jan 16: James Naysmyth

NORTH WALES & LLANDRILLO COLLEGE AS
www.manastro.co.uk/nwgas/llandrillo
2nd Tues at Lecture Hall, Llandrillo College
Jean Smith e-mail: jsmith2859@aol.com

NORTHANTS AA www.naastronomy.com
1st Tues at Church House, St Bodolphs Rd, Barton,
Seagrave, Kettering and on 3rd Tues at Newton Field
Centre nr Geddington.
Steve Williams 01933 650331.

NORWICH AA
www.norwich.astronomicalsociety.org.uk/
3rd Fri at The Seething Observatory, Toad Lane,
Thwaite St Mary
David Balcombe 01953 602624.
email: nassec@tiscali.co.uk

NOTTINGHAM AS [http://](http://beehive.thisisnottingham.co.uk/nottinghamastro)
beehive.thisisnottingham.co.uk/nottinghamastro
1st Thurs British Geological Survey, Nicker Hill, Key-
worth, Notts. NG12 5GG.
Paul Stocks. email: nottinghamastro@yahoo.co.uk

ORWELL AS www.oasi.org.uk/
Weds at Orwell Park Observatory, Nacton, Ipswich
IP10 0ER
Roy Gooding (Secretary) 01473-462977
email ipswich@ast.cam.ac.uk

PAPWORTH ASTRONOMY CLUB
1st Wed at Vinter Room, Vinter Close (off Elm Way),
Papworth Everard
Peter Sandford 01480 830729
email peter@cheere.demon.co.uk

PLYMOUTH AS
2nd Friday at GK Centre, Alfred Street (off Lockyer St),
Plymouth
Alan Penman (Chair) 01752-338491
email: oakmount12@aol.com -

PETERBOROUGH AS www.pas-stargazer.co.uk
1st Tues at St Kingburgh Church Hall, Castor, Peter-
borough.
Gerry Holland 01733 769639
Email: gerry_comrep@yahoo.com

PORT TALBOT AS
1st Tues-7.45pm at Mozart Drive Community Centre,
Sandfields, Port Talbot.
John Minopoli (secretary) - phone 01792 850919.
email: john@jminopoli.freereserve.co.uk

RENFREWSHIRE AS
www.renfrewshireastro.co.uk
Meets every Fri 7.30pm at The Coats Observatory
Ian Anderson Tel: 0141 580 9852
email: ianander2000@yahoo.co.uk

RUGBY & DISTRICT AS www.rugbyastro.co.uk
3rd Sun in Three Horseshoes Hotel, Sheep Street,
Rugby. CV21 3BX
Julian Lecki Tel: 01788-572152
email: julianleck@aol.com

SALFORD AS www.salfordastro.org.uk
1st Wed at The Observatory, Chaseley Road, Salford:
John Pond

SCARBOROUGH & RYDALE AS
www.scarborough-as.org.uk
3rd Fri (exc Aug & Dec) at East Ayton Village Hall,
Willson Lane, East Ayton
01723 500389
email: gwenfrangwernan@btinternet.com

SEKAS (SOUTH EAST KENT) www.sekas.co.uk
Tony Bennet 01843-831079
email: Secretary@sekas.co.uk
Jan 14: The latest observations Prof Michael D Smith

SHETLAND AS
Monthly, South Mainland, Shetland
Peter Kelly Tel: 01957 733242
Email: theglebe@zetnet.co.uk

SHANNONSIDE AC <http://go/to/sac>
1st Wed at 8.00pm, Room 206, Mary Immaculate
College, Limerick
Tony O'Hanlon. 00353-65-6892221
e-mail: tylazy@yahoo.ie

SHROPSHIRE AS www.shropshire-astro.com
1st Sat at Rodington Village Hall
Contact: Mark Wiggin.
e-mail: mark.wiggin@blueyonder.co.uk

SOCIETY FOR THE HISTORY OF ASTRONOMY
www.shastro.org.uk
Stuart Williams, secretary@shastro.org.uk

SOLENT AMATEUR ASTRONOMERS
www.delscope.demon.co.uk
3rd Tues. Room 8, Oaklands Centre, Fairisle Road,
Lordshill, Southampton
Ken Medway. 02380-582204
email: ken@medway1875.freereserve.co.uk

SOUTHAMPTON AS www.southampton-astronomical-society.org.uk
2nd Thurs at Edmund Kell Unitarian Church Hall,
Bellevue Road
Email: secretary@southampton-astronomical-
society.org.uk

SOUTH LINES A & G S www.solags.co.uk
3rd Frid (exc Jul/Aug) at St Mary's Church Hall,
Pinchbeck, Spalding.
Martin Anderson 01406-380003
email: secretary@solags.co.uk

SOUTH WEST HERTS AS www.swhas.org.uk
Shirley@atwhitelands.freereserve.co.uk

STAFFORD & DISTRICT AS [www.freewebs.com/](http://www.freewebs.com/philiphall/)
philiphall/
3rd Thurs at Weston Road High School, Stafford.
ST18 0YG
Joe Jaworski, 0543 686043

ST NEOTS AS
Meets 1st Mon 19.00hrs in the Citizenship Block, St
Neots Community College, Barford Road, Eynesbury.
David Roberts 01480-212960
email: davidr.astro@btinternet.com

STRATFORD UPON AVON AS www.astro.org.uk
Home Guard Club, Tiddington, Stratford upon Avon.
Mike Whitecross 01789 731784

SUNDERLAND AS www.sunderlandastro.com
2nd & 3rd Sunday Wildfowl & Wetlands Trust, Wash-
ington
Graham Darke 0191 415 2625 darke@bun.com

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SWANSEA AS www.swanastro.co.uk

2nd & 4th Thur at Lecture Theatre C, Science Block,
Uni of Wales, Swansea
01792-299311

TAVISTOCK AS

The Physics Laboratory, Kelly College.
Email: jewels on 07877-448117

THE LEWES ASTRONOMERS

www.lewesastro.org.uk

1st Wed at Southover Grange, Southover High St.
Lewes. BN7 1TP.

Alice Smol 01273-477441 email: alice.smol@tesco.net

THURROCK AS www.thurrockastronomy.com

First Wed (exc Aug) at Methodist Hall, High Street,
Horndon-on-the-Hill SS17 8LN

Roy Hookway Tele:01375 676602

email: roy.hookway1@btinternet.com

May 7: Supernovae Tony Sizer

TIVERTON AS www.tivas.org.uk

Fri at St Aubyn's School, Blundells Road, Tiverton.
Neil Purves 01884-277425

TORBAY AS www.torbayastro.org

1st & 3rd Thurs - Sep to Apr at Torquay Boys
Grammar School.

Dennis Humphreys on 01626 367280

UNIVERSITY OF BIRMINGHAM AS

www.astrosoc.org.uk

We are a University society but all are welcome.

Kym Goss, email: kjg494@googlemail.com

USK AS www.uskastronomicalociety.org.uk

Email: jbprince9@yahoo.co.uk

VECTIS AS (IoW) www.vectis-astro.org.uk

4th Fri of month (exc Dec) at Parish Hall, Town Lane,
Newport.

Sue Curd email: secretary@vectis-astro.org

WADHURST AS www.wadhurst.org.uk/was/

Third Wed at the Methodist Church Upper Room,
High Street, Wadhurst.

G G Rathbone, 13 Brookfield, Kemsing, Sevenoaks,
Kent. TN15 6SQ

WALSALL AS www.wallsallastro.co.uk

Every Thurs at the Rushall Olympic Football Club,
Dales Lane, Walsall.

Alan Ledbury 01922 632624 email:

email: g.ledbury@blueyonder.co.uk

WESSEX AS www.wessex-astro-
society.freeserve.co.uk

First Tues - Allendale Centre, Wimborne, Dorset.
Alan Jefferis, e-mail alan@ajefferis.freeserve.co.uk

WEST CORNWALL AS

www.westcornwallastro.org

First Wed at St Michaels Hotel, Falmouth, and Third
Thur at the CPR Learning Centre, Camborne.

Robin Wadding

email: robinwadding@westcornwallastro.org

WEST DIDSBURY AS

2nd Mon (exc Aug) at William Hulme Grammar
School, Springbridge Rd, Whalley Range. M16 8PR

Susie Metcalfe email: susiemetcalfe@yahoo.com

Feb 9: Astronomy in Flatland Colin Steele

Apr 13: Large Scope making The Liverpool Trio

May 11: New Advances in Digital Astrophotography

David Ratledge

WEST OF LONDON AS www.wolas.org.uk

Second Mon (exc Aug) at: Christ Church Chapel,
Redford Way, Uxbridge AND at St John's Ambulance
Hall, North Harrow (odd months)

Duncan J Radbourne.

Email: duncan.radbourne@gmail.com

WEST YORKSHIRE AS www.wyas.fsnet.co.uk

Every Tues (exc Aug/BH's) at 'Rosse Observatory',
Carleton Rd, Carleton, Pontefract. James Boulton

0924-379376. Email: jcandcboulton@btinternet.com

WEST NORFOLK AS www.wyas.fsnet.co.uk

James Boulton 0924-379376.

Email: l.peters@homecall.co.uk

Feb 23: Galileo

Dr Mick Weston

Mar 23: The Virgo Cluster & Some Gems

Apr 27: In Search of the Winged Messenger

WEYMOUTH AC www.weymouthastronomy.co.uk

Fourth Fri at The Old School Rooms, Upwey, DT3

5QE (opposite Wishing Well)

Nigel Dalley 07968-115002

Email: webmaster@weymouthastronomy.co.uk

WILTSHIRE AS www.wasnet.co.uk/

Andrew Burns Email: anglesburns@hotmail.com

WIGTOWNSHIRE AS www.wigtownshire-

astro.org.uk

Second Wed Glenamour, Newton Stewart.

Robin Bellerby 01671-404387 / 07966-413679

Email: robin@glenamour.com

(THE) WEBB SOCIETY

www.webbsociety.freeserve.co.uk/

Stephen Rayner Tel: 01189 817616

e-mail: stephen.rayner@tesco.net

WHITE PEAK ASTRO OBS GROUP

www.wpaog.co.uk/

Hopton Cottage, Hopton, Top Hopton, Derbyshire,
DE4 4DF

Robin Spencer. Tel: 01332-881912

Email: robin108@tiscali.co.uk

WOLVERHAMPTON AS www.wolvas.org.uk

Alt Mon, between Sep & Apr Beckminster Methodist
Church Hall, Birches.

Sydney Crump (tel 01299 871606)

email secretary@wolvas.org.uk

WORCESTER AS www.worcesteras.freeserve.co.uk

Meetings held 2nd Thurs 8-10pm at University College,
Oldbury Rd, Worcester

Michael Morris. Email: michaelmorris@hotmail.com

Jan 8: OJ+287-A Black Hole 'tec Story Gary Poyner

Feb 12: Geology of Mars Dr John Bridges

Mar 12: The Centre of our Galaxy

Prof Michael Merrifield

Apr 9: Apollo-40 years Jerry Workman

May 14: Dark Matter & Boubly Project

Prof Tim Summer

WORTHING AS

Meet 3rd Mon (exc Aug) 7.30pm at Emmanuel United

Reform Church, corner Heene Rd/St Michaels Rd.

Graham Boots

Email: meeting_secretary@was.org.uk 01903 505346

101 Ardingley Drive, Goring, Worthing West Sussex

BN12 4TW

WYCOMBE AS www.wycombeastro.org.uk

Third Weds at Woodrow High House, between High

Wycombe and Amersham.

Jackie Harris. Email: www.wycombeastro.org.uk

YORK AS www.yorkastro.co.uk

Denham Room, The Priory Street Centre, York,

Martin Whillock on 01347 821849

email: martin@whillock.me.uk

NOTICES

CCD Imaging Course. December 20th 2008

Venue: Earlsdon Methodist Church Hall - Coventry

Time: 10.30am to 5pm

Course Tutors: Ian King, Nik Szymanek

The course will comprise a series of 45 minute to 1 hour talks and demonstrations on the above topics, as well as provide an opportunity for course tutors to break off into smaller groups and address more specific areas driven by course members.

A buffet lunch will be served and is included in the price. Hot and cold drinks will be available throughout the course.

Price £35 per head.

Please call us on 01892 834004 or email at info@iankingimaging.com for further information or to book.

Deadlines for submission for the next newsletter:

Spring 2009 — 27 March 2009

Please remember to send ALL items to the Editor, Frank Johns.
Regrettably material can only be returned if supplied with a SAE.

Note! to Society Secretary/ Treasurer

Within your pack of Newsletters you should find the following inserts:

1. advertisement flyer for telescope/camera insurance
2. order form for astronomical image posters (up to 5 sets free per society)

Please contact Eric Hutton if you cannot locate them.

LIST OF OFFICERS 2007/2008

President, Secretary, Treasurer & Newsletter Editor - See cover

Vice President: Callum Potter: vicepresident@fedastro.org.uk

PLI & Distribution: Eric Hutton: plisecretary@fedastro.org.uk

Membership Sec: John Axtell: membership@fedastro.org.uk

Minutes Sec: Sam George

Webmaster: Gary Gawthrop

Details of meetings mentioned in the Society Roundup should be confirmed before travelling. All programmes may be subject to change with no notice. The FAS can accept no responsibility for any inaccuracies. However if the details of your society are incorrect, or indeed if you aren't included, please send details to the Editor.

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