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PRESIDENT **Callum Potter**, The Cottage, Bredon's Hardwick, Tewkesbury, Glos., GL20 7EE
Tel: 01684 773256 E-mail: president@fedastro.org.uk

TREASURER **Peter Cooke**, Haven Cottage, Frithville, Boston, Lincs, PE22 7DS
Tel: 01205 750868 E-mail: treasurer@fedastro.org.uk

SECRETARY **Sam George**, 10 Dovedale Road, Perry Common, Birmingham. B23 5BG
Tel: 0121 288 4373 E-mail secretary@fedastro.org.uk

EDITOR **Frank Johns**, 38 Chester Road, Newquay, Cornwall. TR7 2RH
Tel: 01637 878020 E-mail newsletter@fedastro.org.uk Fax: 08700 558463

FEDERATION OF ASTRONOMICAL SOCIETIES

http://www.fedastro.org.uk

STFC budget cuts; UK physicist hear the worst

Last week, an official opened a meeting between scientists and the UK Science and Technology Facilities Council (STFC) by asking that those present leave their weapons at the front desk - a joke which shows how bad things have been between the STFC, whose responsibilities include high-energy physics and astronomy, and the scientists it serves.

In December 2007, STFC announced an £80-million spending shortfall in its latest budget, which runs until 2011, and laid out preliminary plans to withdraw from such key projects as the International Linear Collider, a next generation particle accelerator, and the Gemini Observatory, a pair of 8-metre telescopes located in Hawaii and Chile. Many were furious over the cuts, which came with no consultation.

However, last week's meeting showed that the STFC has gone some considerable way towards repairing its relationship with the community.

Whilst resentment remains, by and large, the researchers who depend on the STFC to back their work seem ready to accept a programme that includes some cuts. This change is thanks to the formation of ten specialist advisory committees to help inform the final version of the STFC's budget.

Although the plan looks similar to the original package, important concessions have been made and priorities shifted in a way that has ameliorated the community's initial rage. The final plan sets aside around £1 million for 'advanced detector work', similar to that being done in preparation for the linear collider. It also continues participation in the Gemini telescopes, although it will seek to sell half of Britain's observing time in the project. The plan also promises support to projects in other fields, such as nuclear and neutrino physics.

The truce between community and council comes just in time. The UK government is gearing up for its next budget review, and the STFC and its constituent physicists must be able to work in concert if they are to win a bigger slice of the cake in the next round. They must speak with a single voice to policy-makers about the broader value of their work, and they must be coherent about the consequences of lower funding levels.

Courtesy: Nature 9 July 2008

FAS Regional Group Funding

As you are all aware the regional groups are of great importance to the FAS. We are also aware that these groups always find it very hard to support their activities without relying on individual societies.

The FAS is pleased to announce that we are, for the International Year of Astronomy, able to offer small funding opportunities for regional activities.

Applications should be received by October 20th (e-mail only) and all awards will be decided on at the November council meeting.

Please see our online form for more information. If you require further guidance please contact the FAS Secretary.

FAS Convention and AGM
Saturday 20th September
at the Institute of Astronomy, Cambridge

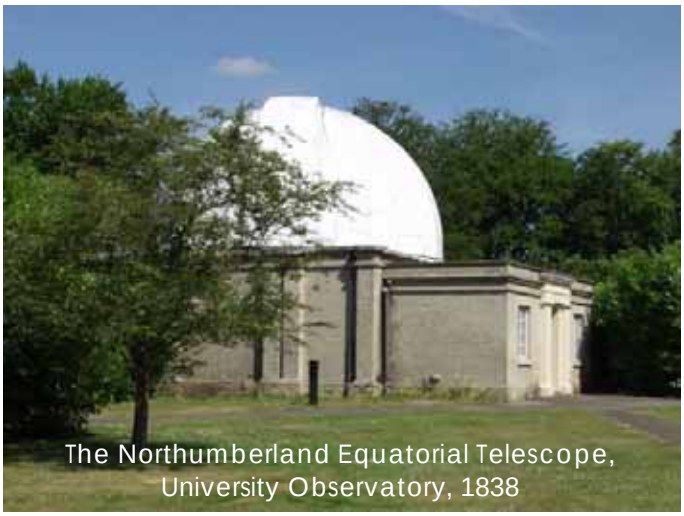
The FAS have again lined up an impressive list of speakers for the Annual Convention which this year will be held at the Institute of Astronomy, Madingley Road, Cambridge.

In addition to the speaker programme, the FAS Annual General Meeting will take place. This should not take up much time, but it enables the required business to be carried out and also give members a chance to air their views.

For many people one of the more enjoyable aspects of visiting the IoA, is the chance to see the various historically important telescopes, including the Northumberland. The tour of the telescope will be undertaken during the luncheon period.

The technical programme is as follows:

- Professor Andy Fabian *(University of Cambridge)*: The Power of Black Holes
- Dr Barry Jones *(Open University)* : The Search for Extraterrestrial Life
- Dr Somak Raychaudhury *(University of Birmingham)* : Einstein's Outrageous Legacy–Black Holes, Cosmic Illusions and Dark Energy
- Nik Szymanek *(Open University)* : Photographing the Night Sky



The Northumberland Equatorial Telescope, University Observatory, 1838

There will also be trade stands, including: *Aurora Books, Jack Martin, AWR, LDAS, Sky's the Limit, Greenwitch, Widescreen Centre, Cambridge University press, Society for the History of Astronomy, SPA, Science Replicas*– with more to be announced.

- and once again there will be a raffle for a wide range of astronomy based goodies.

Make sure all your members are aware of this excellent event.– Tickets will be £8 on the door, with the first lecture due to get underway at 09.30.

Printed for the FAS by: P&J Print, Newquay, Cornwall

Presidents Spot

It was a couple of years ago when we received notification that plans were afoot for the UN to declare 2009 as the International Year of Astronomy, and now 2009 is almost upon us. I know that many societies are already well advanced with plans for events in 2009, and if so, please send us details for registering on our events page. If you have yet to start planning your events, then now is a good time to start !

What sort of events might you run ? Nationally there are planned to be two observing weeks, the Moonwatch Weeks, in March and October. These would be ideal opportunities for your Society to take advantage of expected national publicity, but you should also generate your own local publicity too, of course. The IYA is very much about public engagement, so while it will be nice to celebrate the year amongst the astronomical community, the year is more about running events for the general public – observing, talks, displays, etc.

Rather than running events, the FAS role will be principally as a facilitator to help you run your events. So if you need resources, partners to collaborate with, publicity, help or other assistance, please get in touch – this is why we are here!

For example, one suggestion was for the provision of some large scale posters or prints for display or exhibition purposes. One-off costs are often prohibitive, but when purchasing a large number (50 or more), the unit-price would be more affordable. But maybe you would like such posters as high resolution PDF's so you can print these yourself.

Or, perhaps you might like an automatic PowerPoint slide-show to display at events. If you don't have the skills to do this, the FAS can help.

However, we need to know what you want – if you don't tell us, we will never know.

A topic that has been much in the press and raised by societies is Child Protection. We are producing a short note on this, which I hope will help de-bunk some of the myths that surround this subject. Really, it is not difficult, and the application of common-sense will in most cases see you through. For those that think the legislation is bureaucracy gone mad – spend a few minutes thinking about those poor children who have had their childhood taken away, or worse still. Whilst the risks in our context may be low, they are certainly not negligible, so we must be vigilant.

The note will be available on the FAS Website, and we will circulate this to member societies by email too. If you don't have any web or email, please get in touch with the Secretary who will be able to provide you with a hard-copy when it becomes available.

Finally, I would like to recommend the new FAS booklets "Buying your Telescope" and "Observing the Night Sky". Both these are excellent introductory publications for beginners or the general public. I would hope all societies might take a few copies of these for sale during IYA. There are further titles planned, and if you are a budding author and would like to contribute, please get in touch.

Callum Potter

Volunteers Wanted for FAS Council

There are vacancies on the FAS Council for volunteers to undertake the duties of Honorary Secretary, PR/Marketing for the FAS and Publications. Of these the most pressing is that of Secretary, as pressure of work over the next year means that Sam George has to reluctantly stand down.

The FAS Secretary is the first port of all for all societies with the FAS and as such he/she is responsible for delegating these items to Council. The use of email is essential in this role, though the older communication methods still apply. The Secretary is also responsible for arranging the council meetings and communicating with other external organisations. Like the rest of the council members other tasks as picked up and when they are needed, and the ability to be flexible is a must. The chore of minute taking however is undertaken by a separate Minute Secretary.

Full details of what is involved can be obtained from Sam George or Callum Potter (contact details on the Page 1)

The FAS relies on volunteers for its continued operation to provide a service to your society.

Why not volunteer to do your bit?

LETTERS

Dear Frank.

NEW TELESCOPE OWNERS & POOR EQUIPMENT ?

The York Astronomical Society invites anyone to bring their own telescopes to our Talks Evenings and Star Parties if they want advice on how to use them. There are usually a few beginners with their scopes at most of our meetings, and they are very pleased to be helped. We are meeting a real need. The age range of enquirers is wide and there are often a few parents with 'scopes bought for children.

Often very cheap Tasco type 'scopes are brought along - these are a menace because they are difficult for any one to use, let alone a beginner or an child. The very poor mounts and tripods are the worst aspect. Many must be put off enjoying the night sky by rubbish 'scopes. Perhaps we should have a campaign to persuade retailers not to sell them ?

Martin Whillock York AS

Dear Sir

The members of Doncaster Astronomical Society are an active group of amateur astronomers, and have a wide interest in visual astronomy and astrophotography.

We are in partnership with the Austerfield Study Centre, and our observatory is located on their premises, beside the main road through the village, and street lighting is our particular Bette Noir, restricting both visual and photographic work for our members. Additionally, society members take an active role in supporting the staff of the Study Centre who accommodate several thousand children annually, from the borough and from surrounding counties, for field studies and evening stargazing sessions.

An email to the highways lighting department of our local Doncaster MBC, brought forward a willingness to listen to our problem. Not only did they listen but they came down to see too. And as the current lamps were nearing the end of their useful lifespan, they talked the lantern supplier, URBIS, into making a donation of 9 new full cut off lamps, and replaced the old ones with the newly donated lanterns.

The replacement took but a few minutes, but the improvement for star gazers is nothing short of dramatic, and for road users it's equally so, as the new lanterns direct all their light down onto the road and don't waste it upwards into the sky or sideways into windows.

In this we feel that Doncaster MBC has made a significant contribution to light pollution control, and should be applauded as leaders in this important field.

Dave Adshead. Doncaster AS

Hello Frank

Many societies / clubs etc may find themselves with a planned speaker evening where the speaker has cancelled at the last minute. In such circumstances it is a relatively easy option to offer an exhibition of a video or DVD in place of the speaker. However, it is most important to establish that your society and/or the venue is licensed to show that item and permission has been obtained from the distributor. Failure to do so can attract crippling penalties. With the Olympic games sucking money away from the arts , sciences etc - and set to get even worse - the last thing the amateur astronomy movement needs is any adverse publicity or damaging fines.

Details on licensing can be found by googling 'Filmbank' and working through their web site or contacting them direct. Often a direct phone call to the distributor can get permission but not always.

There are also implications regarding advertising outside of the venue and commercial/non-commercial exhibitions . With 'In The Shadow Of The Moon' still on the cinema circuit be very aware of licensing requirements.

Could the FAS include this in its advice to clubs etc to check the licensing before any exhibition - it is not worth taking the risk.

I am in the cinema business and well aware that the penalties for non-compliance can be severe.

Regards to all.

Robin Smitten. Chipping Norton AAG

Isle of Wight Star Party Report
Thursday 6th to Monday 10th March, 2008

The dark skies on the south coast of the Isle of Wight provided a brilliant backdrop for the inaugural Isle of Wight Star Party. About forty five astronomers travelled from as far as Devon and Cambridge for the event, which was held at the Brighstone Holiday Centre, between Thursday 6th March and Monday 11th March, 2008.

Delegates at Needles Rocket Testing Site

The location offered almost 180-degree southerly views across the Channel, and many astronomers commented on seeing stars, such as the lower half of Canis Major, that were so near the horizon that they are not normally visible from other sites. Unfortunately, the worst storms of the winter made imaging all but the brightest objects very difficult, but visual observing was good on the Friday and Sunday evenings. M42 and M43 were obvious early targets, but later Sirius Pup was seen, as was NGC 3242 in Hydra - one of the deep south objects visible from the site. M65 and M66 were clear in an 80 mm refractor which was pleasing for at least one attendee, as these are normally swamped by light pollution even in bigger scopes. The equipment used during the event ranged from small binoculars, refractors and Schmidt Cassegrains, to a 14 inch Celestron on a modified mount and a 20 inch Dobsonian.

Delegates at Needles Rocket Testing Site 2

Daytime activities included visits to Vectis AS s Isle of Wight Observatory, and the National Trust s Needles New Battery (Ex-rocket testing site), with a talk by someone who used to work on the secret rocket testing programme there.

The Saturday evening was completely clouded out, but with a very high level of audience participation, John Murrell, Owen Brazell, Richie Jarvis and David Rayner, kindly gave fascinating talks which between them covered rocket testing, deep sky objects, digital image manipulation and eclipse photos.

The holiday centre provided some excellent camping facilities, and there were also heated en-suite chalets for those who didn't want to brave the elements. A kitchen/tea/coffee room allowed for free hot drinks to be available all night long and lockable rooms were available for the safe storage of equipment and the trade stands. A large dining area provided accommodation, not only for a wonderful cooked breakfast, but also doubled up as a wet weather location and meeting/ reception room.

Owen Brazell setting up

Richie Jarvis with his scope

Ian Melville

There was a great raffle - with a star prize of a Lanthanum eyepiece donated by Orion Optics. (Thanks also to Springer books, Astronomy Now, David Hinds and BC&F for providing other raffle prizes). Thanks are also due to the ferry company Wightlink, who provided a very good deal on the ferries.

The event was run by the island's Vectis Astronomical Society (VAS) in association with the Southern Area Group of Astronomical Societies (SAGAS). Information about next year's Isle of Wight Star Party (around 26th March 2009 [New Moon] tbc) is available on www.iowstarparty.org. If you would like to be contacted about future events, please email info@iowstarparty.org.

Scopes and tents

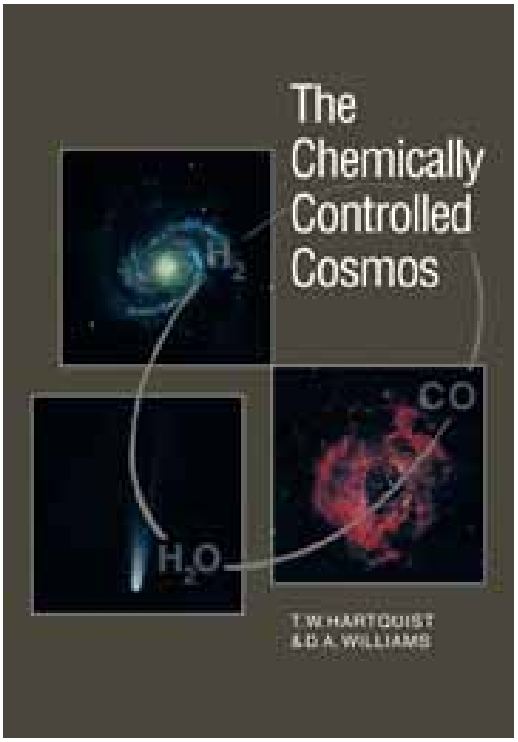
John Murrel looking through Celestron 14 inch. Photo: Lucy Rogers

REVIEWS

The Chemically Controlled Cosmos

by T. W. Hartquist (Max-Planck Institute, Germany) and **D. A. Williams** (University College, London)

Cambridge University Press. ISBN: 13-978056373 Paperback. 170pp. £18.99



It is advertised as "an introduction to the role of cosmic chemistry in the Universe and suitable for non-science students taking a non-mathematical course in Astronomy"

I would suggest that 'non-science' students might find it rather hard going. This is a book not merely to be read, but a book that is meant to be studied. Nevertheless, it is a story of the fascinating chemical journey that the universe has taken from the Big Bang to the present day. After the Big Bang, the chemistry of the Early Universe was essentially that of hydrogen. The gas was mainly *atomic* hydrogen (H) with some helium (about 10%). The production of *molecular hydrogen* (H2) was the next step and essential as the first stage in producing heavier molecules and compounds, ionisation (the removal of a negatively charged electron to leave the atom with a residual positive charge) was the key. Once the hydrogen ion (H^) was achieved, the speed of molecule production accelerated. Timescales were important; for atoms or molecules to react together they need to come into close contact. In the Earth's atmosphere the number densities of oxygen and nitrogen molecules are around 10^{25} cu. metre, thus time between collisions is short (around a billionth of a second). However, in the Universe at large the number density of hydrogen atoms can be as low as 1000/cu. metre. At this level, collisions between hydrogen atoms occur once in a million years, even then they rarely stick together to form a molecule. Some of this matter accumulated into pre-galactic gas clouds through the cooling effect of H2. Within these regions the first generation of massive, short-lived stars formed burning hydrogen to make the heavier elements of carbon, nitrogen and oxygen. When they exploded they seeded the Early Universe with trace amounts of these elements. The cloud of gas eventually spawned a variety of stars, gas clouds and dust. The importance of dust grains in providing sites for the efficient combination of atoms is examined. Dust comprises about 1% by mass of the interstellar medium and has several fundamental properties that play a crucial role in the making of our galaxy.

Stars are the producers of the heavier elements and also organic compounds. Large stars up to six solar masses can produce some exotic molecules. In IRC+10216, HCN (hydrogen cyanide), HC_3N, HC_5N.....$HC_{11}N$ (a cyanopolyyne series) were detected.

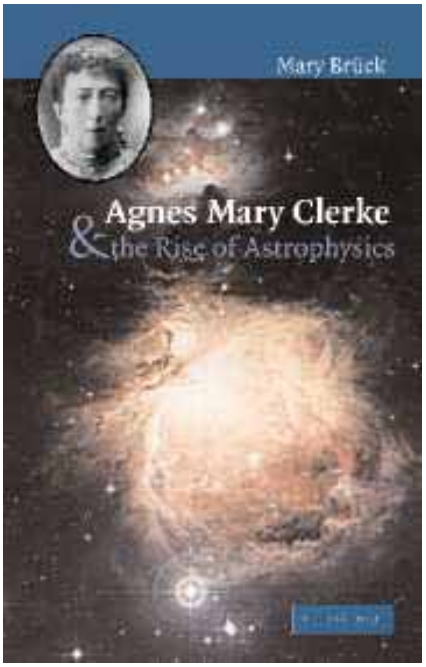
Some compounds were detected in space before they were synthesised in the laboratory. Stars of around eight solar masses and above, which eventually become supernovae, create the heavier elements iron and silica and even elements such as radioactive cobalt. These explosions seed the galaxies with carbon, oxygen, nitrogen, silica and iron, which are constantly being recycled to this day.

This is a complex and rewarding book that has certainly re-kindled my interest in the chemistry of the cosmos.

Allan Whatling

Agnes Mary Clerke & the Rise of Astrophysics
By Mary Bruck

Cambridge University Press. 270 pages.£17.00
ISBN-13:9780521055796



Agnes was born in Ireland in 1842 and died in London in 1907. She was not an astronomer in the accepted sense however she possessed a remarkable ability to précis the work of others and made it understandable to a wider audience. Her most enduring work concerns her studies of the history of astronomy.

Her most important work arguably was “A popular history of Astronomy during the 19th century” published in 1885. This was followed by “The system of the stars” in 1890 and “The Herschels and modern astronomy” in 1895. She was also a contributor to the Encyclopaedia Britannica. In 1903 she was elected an Honorary Fellow of the Royal Astronomical Society.

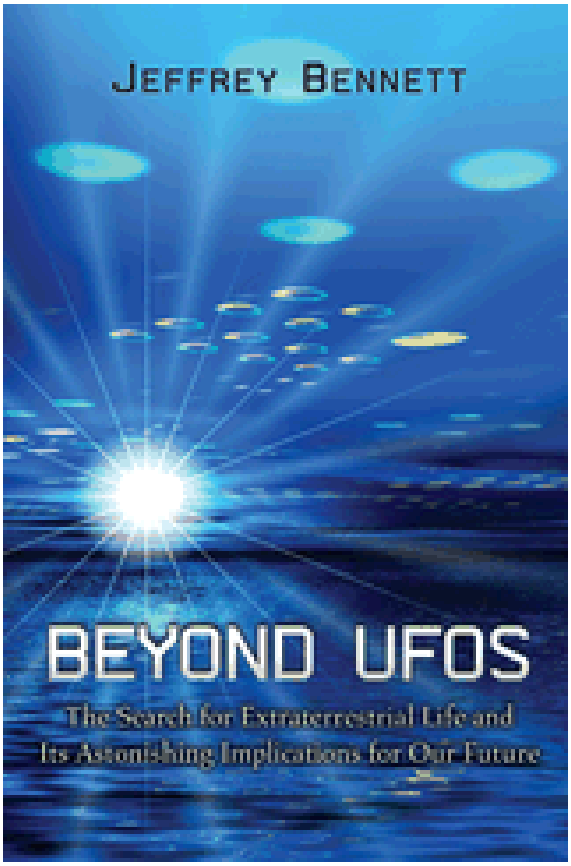
Her life spanned that important period between the geometers of the first half of the 19th century including George Bidell Airy and the physicists of the second half e.g. William Huggins, a pioneer in the use of the spectrometer, Agnes was very friendly with his wife Margaret.

Mary Bruck’s book covers the rise and rise of Agnes from her birth in remote Ireland to be an important figure in British Astronomy. She covers in detail the early family life and her connections with senior astronomers of the day. She spent time in South Africa with David Gill working with him. Historians of astronomy perform an important role gelling and cross linking the various developments of the time.

The book makes a valuable contribution to our knowledge of Victorian astronomy – to be sure it covers an area not well understood by many - but very much valued by those that do. They were indeed exciting times in the development of our science.

Brian Sheen

Beyond UFO's—The search for Extraterrestrial Life and Its Astonishing Implications for Our Future
By Jeffrey Bennett
Princeton University Press. ISBN-13: 9780691135496. £15.95



'... in modern science we turn every answer into the next question.'
Jeffrey Bennett

Jeffrey Bennett certainly answered a lot of questions for me in this very readable book, 'Beyond UFOS' and opened up a whole lot more. For any of you are interested in the question of life beyond are own planet, it's a must. For those of you who feel that the existence of life beyond our planet is improbable, it's a must.

Jeffrey Bennett makes a clear distinction between 'life' and 'intelligent life'. In fact, the difficult question of defining life itself is addressed, along with a fascinating discussion on the origins of life and evolution.

What makes a planet habitable? What is life likely to be like on other worlds?

In looking at these questions and many others, Bennett draws from astronomy, biology, geology, philosophy, touches on religion and global warming. We are treated to a basic and clear explanation of genetics; hear about Kepler's Law's; Hubble's law; Aristotle; Einstein; the Big Bang and much more.

This really is a book with something for everybody and of course the question 'Is there life out there?' as Bennett so accurately suggests, is a question which profoundly affects all of us.

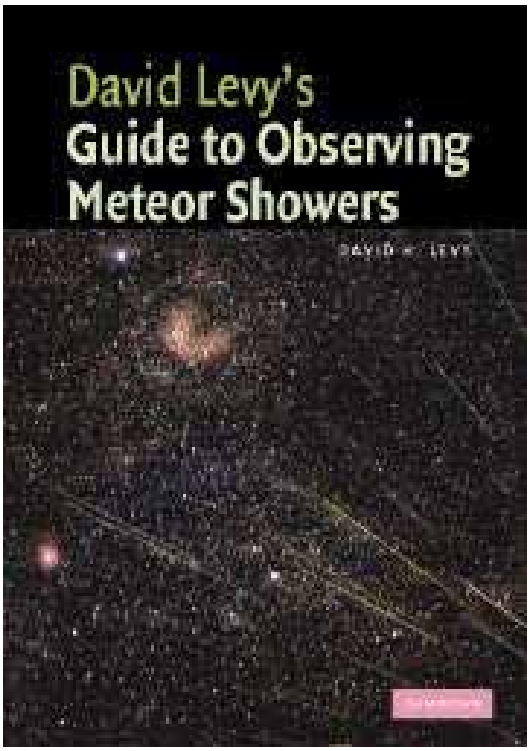
Whether we are alone or the Universe is teaming with life, either way, the implications for man kind are enormous.

Read and enjoy. I doubt you will regret it!

Julia Johnson

David Levy's Guide to Observing Meteor Showers
David H Levy
Cambridge University Press ISBN: 978-0-521-69691-3 £18.99

Perhaps it is because David Levy's first academic qualifications were in English Literature (BA in 1972 and an MA in1979) that he is able to write clearly and entertainingly about his astronomical passion. In this fascinating book he explains that, in common with many of us, his interest in astronomy was triggered at a very young age when observing the impressive flight of a meteor across the night sky. In his case it was at the age of 8 when he was on a summer camp in New York State.



His amateur passion for observing the sky during his youth must have been a stimulus for writing this latest book because it contains clear and well described methods for observing and recording meteor activity with the use of only our eyes, pen and paper.

In the first chapters he describes what meteors are and why they appear more frequently on some nights. What we now know as meteorites and meteors were recorded in ancient times –Diogenes mentions "stones falling from the sky" in the fifth century BC.

His description of how small rocks and dust particles are classified is interesting – the arguments that led to Pluto being declassified as a planet are indicators of the difficulties in categorizing small objects in the solar system. He and Shoemaker discovered an asteroid (1990 UL3) in 1990 using an 18 inch telescope but within a few weeks it was reclassified as a comet (Shoemaker-Levy 2) when a faint coma was observed using a 61 inch telescope.

Levy describes simple techniques for individuals and groups to observe and record meteor activity. His straightforward description forms the basis of a potentially interesting night of observations with a group of friends or fellow amateurs.

The final eleven chapters in the book are each dedicated to some of the most impressive meteor showers. These include the Lyrids, the Geminids, the Orionids, the Leonids and the Perseids. The history and origins of each meteor shower are described and good advice on how to observe each one is given.

His final chapter includes a catalogue of over 120 meteor showers throughout the year. Each shower is dated and information on rates and velocities is given. A plan for observations can easily be created using this data.

David Levy has been instrumental in discovering 22 comets and over 40 asteroids – many using his own personal telescopes. The passion that was initiated by observing a meteor over 50 years ago has given rise to a book which can easily be read by enthusiasts of any age. It is written simply and clearly and hence would make an ideal gift for a young person who looks into the night sky and asks about a flash of light. It is also suitable for amateur astronomers who want a concise source of information in order to plan observations of these startling and fascinating natural wonders.

Mike Thompson

Historical Eclipses and Earth's Rotation (2008)
F. Richard Stephenson

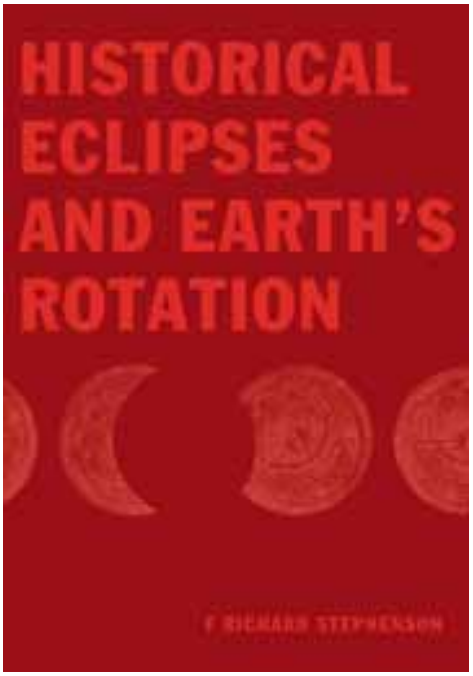
Cambridge University Press ISBN-13: 9780521056335 557 pages Price £31.99
This is a paperback re-issue of a work originally published in 1997

If the Earth's rate of rotation had remained constant throughout history, then eclipses would not have been visible at the times and places recorded. Richard Stephenson's book investigates and quantifies the fluctuating variations in the Earth's length of day (rate of rotation) by examining over 400 records of solar and lunar eclipses, made using different techniques, from a wide variety of ancient and medieval cultures (700BC to 1600AD).

The history of discovering and measuring the variation in day length is explained in full. For centuries the assumed constancy of the Earth's diurnal rotation had been used as the standard for measuring all other motions - how do you measure a variation in the passage of time in your chosen timepiece?

Nearly 80% of the book consists of the various observations along with comments regarding their value in the determination of the increase in the Earth's length of day, about one quarter of the records were in fact deemed unsuitable and reasons for this are given in each case. For each observation there is a translation of the original record and many are illustrated with copies of the originals - including photographs of clay tablets from Babylon, an ox bone from China and even an inscription carved on a stone pillar in an Italian village.

For those who are interested, full details are given of how each observation is transformed to a calculation (of the time difference between observed time and computed time) but, even if the mathematics is beyond you, this book still deserves to be read for its wealth of other interesting information. You will, for example, learn about calendars, clocks, time systems, Chinese hour names, Chinese dynasties. Islamic months and the very sad tale that Babylonian clay tablets suffered severely because 19th century dealers were prepared to pay more for several small pieces than for one large piece!



In conclusion. Professor Stephenson observes that there is a mean rate of increase in Earth's length of day (measured in milliseconds per century), largely due to tidal friction but with a non-tidal decrease working in opposition to this. The non-tidal causes are suggested as including: post-glacial uplift, electro-magnetic coupling between the Earth's core and mantle and sea level changes. Geophysicists are here encouraged to investigate these factors further.

This is an academic reference book that represents many years of research by the author; it is liberally illustrated in black and white with photographs, tables, maps and graphs. I agree with the publisher's blurb, where it states that it will appeal particularly to geophysicists and astronomers interested in history (and historians interested in astronomy!). Personally, I found it to be both interesting and educational although I am none of the aforementioned and believe that it could easily be read at many different levels.

Louise Auty

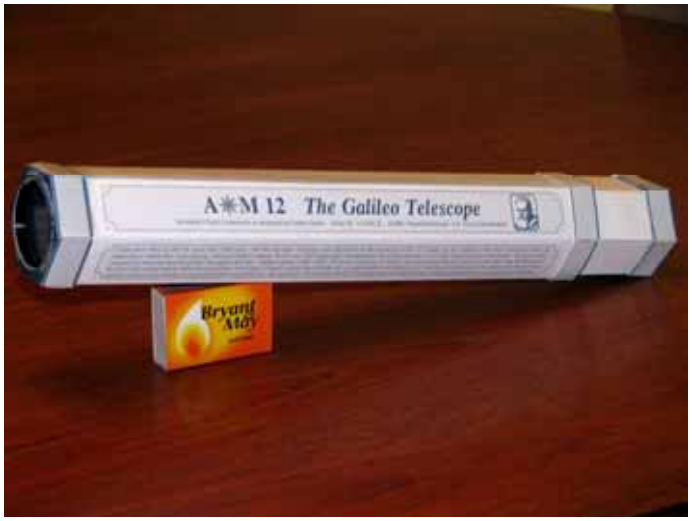
AstroMedia Telescope

Marketed by Science Replicas
RRP: £5.00 with Trade discount for FAS Member Societies

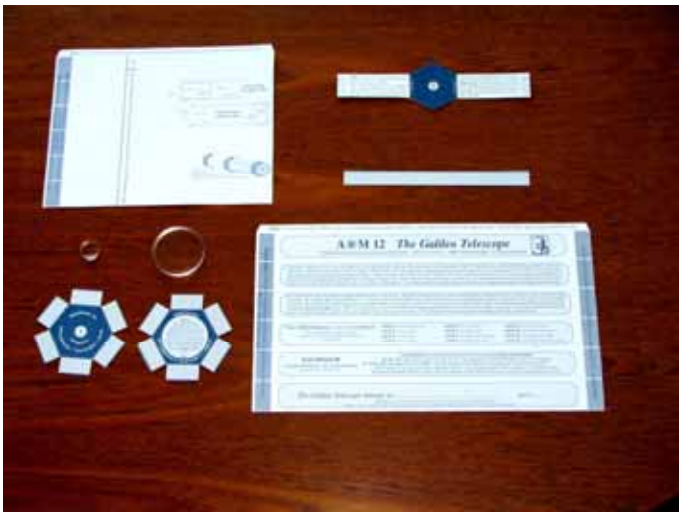
The A*M 12 Galileo Telescope kit is part of a range of simple astronomical models designed for schools or other clubs/groups.

The kit is comprised of a single A3 sheet of card (folded to A4) and two plastic lenses. The cardboard has all the telescope components printed on one side, with corresponding black printing on the reverse to reduce light reflections in the interior of the assembled telescope. All assembly instructions are printed on or beside the various components, along with a brief history of the telescope and the principle design features of both the Galilean telescope and that produced by Johannes Kepler.

Assembly of the telescope is a simple matter of cutting out the components and folding and gluing to produce an eye-piece tube and an objective tube, and then pushing one inside the other. With the instructions being printed on or about the pieces, there is no need to keep referring to other sheets or leaflets and the simple steps could easily be followed by anyone from about the age of 10 years upwards. As with any model making, the more care and attention to detail that is taken, the neater the finished model will be, but the tolerances are quite large so there is plenty of room for minor inaccuracies.



The finished telescope.



The cut out components.

The finished telescope produces a small but quite acceptable image when used for terrestrial viewing, but, obviously, the plastic lenses produce too much chromatic aberration and distortion for astronomical use. The sliding eyepiece tube design demonstrates quite clearly the principle of changing the distance between objective and eyepiece in order to obtain focus.

All in all, this kit is easily constructed to produce a simple model of what was, after all, a simple telescope and would, therefore, be a useful teaching aid for introducing any group or individuals to the principles of astronomy.

Phil Brotherwood

Hunting for the highest redshift galaxies

by Samuel George

We now see many galaxies as they were only 800 million years after the Big Bang (something that I find very mind blowing!), and that limit may soon be exceeded when wide-field infra-red detectors are widely available. Some groups have claimed to have detected galaxies out to redshift of > 7! In recent years, the technique of Lyman break imaging has proven very effective at identifying large numbers of galaxies at high redshifts through deep multicolour imaging. This, however, is not the spectroscopic redshift that high redshift astronomers dream about at night, still its a good proxy. But how to come up with the targets for these observations and not just hope in some serendipitous manner...? Well there are a few different ways but I'm going to concentrate on one particular way, a method that I think has been very much under utilised.

Radio surveys provide a crucial role in the study of active galactic nuclei (AGN) and they have several good reasons why they are useful for hunting for high redshift galaxies. The emission tends to be much more powerful and can be detected to very high redshifts ($z > 4$). Also, the most powerful sources at highest redshifts pin point the most massive and luminous galaxies at such redshifts and crucially they are not affected by dust. In the local universe, high-power radio galaxies are found in lower-density environments than low-luminosity radio galaxies. This means that powerful radio galaxies could serve as efficient probes of moderate redshift galaxy groups and poor clusters. The actual link between these two parameters is not well understood. We know that the faint radio population is a mixture of several types of objects (including faint AGN, normal spirals and ellipticals, and starburst galaxies) though little is known about their redshift distribution and luminosity properties. In general very little is understood about the relative importance of the different classes of source. Reasons for this include that the faint radio samples are small, and the optical follow up is incomplete (only 20% of sources have spectroscopic follow-up). A very successful method for finding high redshift radio galaxies (HzRGs) is to construct a filtered survey and this can easily be achieved by picking sources which have ultra-steep spectra (USS), say $\alpha < -1.25$ where S is proportional to ν^{α} (S being the radio flux density at a given frequency, ν). This is largely an empirical result. All the highest radio galaxies, $z > 4$, have been detected by using USS criteria. Once objects are selected based on their α we discard bright, nearby sources, by comparing positions with wide-field shallow surveys at optical and infra-red wavebands. Next observations in optical and infra-red wavelengths are needed to make identifications of these faint sources. Once successful detection are made follow up spectroscopic observations are undertaken, allowing redshifts to be calculated from emission lines.

Over the past decade, the availability of a new generation of ground- and space-based instruments has transformed our understanding of early galaxies. The quest for the detection of the highest redshift galaxies is in short a bit of stamp collecting, but by trying to detect these objects you end up having to push observation techniques, develop new technology and in the end learn some rather wonderful physics!

Fourth Dwarf Planet Named For Polynesian God

A dwarf planet circling the sun out beyond the orbit of Neptune has been rechristened Makemake after a Polynesian god and designated the third of the solar system's new class of plutoids, the International Astronomical Union (IAU) announced Saturday. Makemake is a small, red-tinged world that ranks among the largest objects in the outer solar system. But it is still smaller and dimmer than the already demoted dwarf planet Pluto, which astronomers reclassified as a plutoid last month.

Astronomers discovered Makemake (pronounced MAH-keh MAH-keh), the fourth dwarf planet so far, in 2005 and believe its surface is covered by a layer of frozen methane. It is bright enough to be seen by a high-end amateur telescope, the IAU said.

"The orbit is not particularly strange, but the object itself is big," said astronomer Mike Brown of the California Institute of Technology in Pasadena, Calif., who led the team that discovered Makemake. "Probably about two-thirds the size of Pluto."

Pluto, Makemake and a third object - dubbed Eris - are all classified as plutoids, as well as dwarf planets. The solar system's largest asteroid Ceres is also a dwarf planet, but not in the plutoid class because its orbit, which falls in the belt of asteroids between Mars and Jupiter, is smaller than that of the more distant Neptune.

Originally designated 2005 FY9, the object was nicknamed "Easterbunny" by its discoverers before officially being named Makemake after the Polynesian creator of humanity and the god of fertility, the IAU said.

"We consider the naming of objects in the solar system very carefully," said Brown.

Makemake's methane ice-rich surface, while fascinating, did not easily relate to Earthly mythology, he added. But the small dwarf planet, like Eris and the object 2003 EL61 also spotted by Brown and his team, was found while his wife was pregnant with their daughter. It was the discovery of those three objects that led to Pluto's drop from full planet to dwarf planet in 2006.

Brown was researching the mythology of Rapa Nui, or Easter Island, in the South Pacific for prospective names when he learned of the creator and fertility god Makemake.

"I am partial to fertility gods," Brown said, recalling the discovery of Makemake, Eris and 2003 EL61. "I have the distinct memory of feeling this fertile abundance pouring out of the entire Universe. Makemake was part of that."

Courtesy: www.space.com

FAILURE IS NOT AN OPTION!

FRED HAISE (APOLLO XIII LUNAR MODULE PILOT.)

Friday October 10th @ 19:30 at Carleton Community High School, Green Lane, Carleton, Pontefract. WF8 3NW.

Fred W. Haise Jr. was a member of the Apollo 13 crew that struggled for more than 3 days to return to Earth after an oxygen tank explosion aboard the spacecraft aborted the mission as it approached the Moon in 1970.

Fred Wallace Haise, Jr. is a former NASA astronaut. He is one of only 24 men to have flown to the Moon. He completed Naval flight training in 1954 and served as a United States Marine Corps fighter pilot.

His NASA career began as an Aeronautical Research Pilot at Lewis Research Center in 1959. Further assignments were held as a Research Pilot at the NASA's Dryden Flight Research Center in 1963 and as an astronaut at the Johnson Space Center in 1966. Haise was the first of the 1966 group to be assigned to Apollo duties - ahead of some group 3 members. He served on the back-up crew for the Apollo 8, Apollo 11, and Apollo 16 moon missions. He flew as the Lunar Module Pilot on the aborted Apollo 13 lunar mission in 1970. He was also scheduled as commander for the cancelled Apollo 19 mission. He later flew five flights as the Commander of the space shuttle Enterprise, in 1977, for the Approach and Landing Tests Program at Edwards Air Force Base, and was selected to command the original STS-2 mission to rescue the Skylab space station in 1979, but was cancelled due to the long delays in the Shuttle's development as well as the break-up of the Skylab in mid-1979.

In 1995, Haise was portrayed by Bill Paxton in the movie Apollo 13. He was also portrayed by Adam Baldwin in the mini-series From The Earth To The Moon.

Tickets £20 each. Dinner with Fred on Thursday night-£50.

SAE to: Ken Willoughby, 11 Hardistry Drive, Pontefract WF8 4BU. 01977 795535. e-mail: ken.willoughby@btinternet.com

China Says Work Under Way to Mitigate Space Junk

The Chinese government is implementing a wide series of measures to reduce the amount of debris left in orbit by Chinese rockets and satellites, and to develop a space-surveillance tool to determine what is in orbit, Chinese space-debris experts said.

The measures, some of which already have been put into place, include techniques already adopted by some other space powers to re-orbit retired satellites out of the geostationary orbital arc and to render Chinese rocket upper stages passive in orbit by emptying their fuel tanks to prevent the threat of explosion and debris propagation.

The Chinese government has been a member of the 11-member Inter-Agency Space Debris Coordination Committee (IADC) since the mid-1990s. But Chinese officials concede they have been slow in adopting debris-prevention or debris-mitigation measures.

China's seriousness about space debris has been thrown into question since the January test of a mobile ground-based Chinese missile that was used to intentionally destroy a retired Chinese meteorological satellite, creating thousands of pieces of orbital debris in a heavily used region of low Earth orbit.

The negative global reaction to that event led China to cancel a scheduled April IADC meeting in Beijing. The meeting was switched to July in Toulouse, France. China sent a full delegation to the meeting, which featured at least one blunt exchange between U.S. and Chinese delegates regarding January's test of the anti-satellite missile.

Li Ming, who headed the Chinese delegation to IADC, declined to outline China's space-debris policy immediately after the Toulouse meeting. But in August he emailed a summary of China's space-debris policies in reports written by him and by other Chinese space-debris experts.

"China has made a relatively late start in space debris research," Li said in a preface to the summary of the debris research. "There is still an obvious gap between China and other advanced countries in space debris-related technologies."

China's space-debris research is based at the Purple Mountain Astronomical Observatory, a Chinese Academy of Sciences facility located in Nanjing and home to the Centre for Space Debris Observation and Research.

Li said the centre and related institutes, working under China's 11th Five-Year Plan from 2006-2010, are working on four debris-related aspects:

- Space debris surveillance.
- Collision avoidance.
- Satellite debris protection.
- Debris mitigation.

Two optical telescopes, one a 25-inch (65-centimeter) fixed facility and the other a 10-inch (25-centimeter) car-mounted telescope, have been developed as space-surveillance tools and have been used to time the launch of China's astronaut-carrying capsules to avoid heavier concentrations of debris in low-Earth orbit, Li said.

A Hypervelocity Impact Centre created by Harbin Institute of Technology has been created and tasked with developing technologies to shield spacecraft from debris.

Debris mitigation has been the focus of much IADC work to persuade space powers to take measures to reduce the debris-creating potential of their rocket upper stages and their satellites.

Li and Zhang Wenxiang, a research fellow at the Xi'an Satellite Control Centre, said Chinese Long March rockets-specifically the Long March (LM) 2C, LM 2D, LM 3, LM 4B and LM 4C vehicles-either already have been fitted with propellant-venting systems or soon will be.

Li said the China Academy of Launch Vehicle Technology has adopted propellant venting for the LM-3A vehicle. Zhang said the propellant-venting design for the cryogenic upper stage of the LM-3 series, which carries heavy satellites into geostationary transfer orbit, has been completed. "We believe that in the near future we may perform the post-mission passivation" for the upper stage, Zhang said.

Zhang also said recent research has been focusing on ways to better estimate the amount of fuel remaining in satellites so that they can be removed from their operational orbits at the latest possible time, but early enough to be placed into so-called graveyard orbits out of the main orbital traffic lanes.

Zhang said this kind of re-orbit manoeuvre was performed for the first time on a geostationary-orbit Chinese satellite in September 2006, on the FY-2B meteorological satellite.

In a separate presentation, Zhang Ke, senior engineer at the Xi'an Satellite Control Centre, said the FY-2B manoeuvre, which placed the now-retired satellite about 25 miles (40 kilometres) above geostationary position, "was not enough. ... It indicates that we had developed the re-orbiting technology successfully. In the future, we will improve the estimation process and leave [sufficient] propellant to perform the operation."

Li said work also has begun on using the remaining fuel in Chinese rocket upper stages to send the stages back into the atmosphere to burn up.

Computer-generated image of trackable objects currently in orbit around the Earth

Zhao Changyin, a research fellow at the Purple Mountain Observatory, said China's space activities as of December 2006 had produced "more than 300" pieces of orbital debris.

The U.S. Space Command's Space Surveillance Network, in a catalogue dated July 4, said China-created debris numbered 2,296, behind the 4,281 pieces from Russia and other nations of the former Soviet Union, and 4,189 pieces for which U.S. launches are responsible. Space Command's public catalogue lists only pieces of debris about four inches (10 centimetres) or larger.

Peter B de Selding -Space News

What are the dangers from debris?

Whilst much of this space debris is tiny, it is travelling extremely fast. Below about 2,000 km altitude, the average relative impact speed is over 35,000kmph (20,000 mph).

At this speed, collision can be dramatic:

- A 1mm metal piece or chip could do as much damage as a .22 bullet
- A pea-sized ball of debris this large probably would penetrate a spacecraft, and if it struck a critical item then it could prove fatal.
- A piece of metal the size of a cricket ball would seriously damage a spacecraft.

Worthing AS Visit to Patrick Moore

15 March 2008

A large group of WAS and their family members met at Patrick's on the evening of Saturday 15th March 2008. The intention was to observe Saturn amongst other things, but unfortunately the weather, true to form when any astronomical event is planned in advance, decided otherwise and provided us with torrents of rain!

WAS Members in Patrick's study, taken by Brian Halls

Graham, who arranged this visit, started the evening off by presenting Patrick with a framed photograph that he and Keith Peters had taken on a former visit.

All members present signed the back and Patrick was absolutely delighted with the gesture. Everyone attending had brought along some liquid refreshment as a thank you to Patrick for opening up his home to us all and I am sure that he will be enjoying his gifts for quite some time to come!

We were shown the observatory housing the 15th inch reflector with which Patrick had done so much of his observing, a simple Newtonian, as modern as the day when it was first put in place. In these days when computerised equipment is the norm, it was a pleasure to see a dome housing just a good basic telescope, some steps and nothing else!

Patrick's Telescope, taken by Jan Young

G Boots and Patrick Moore, taken by Jan Young

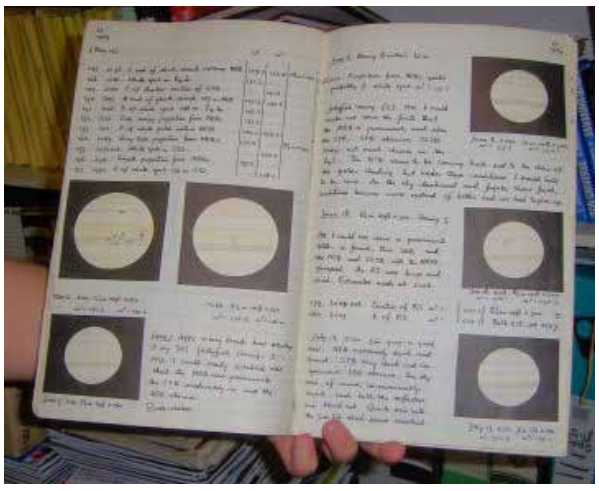
We were all made welcome with the provision of drinks and biscuits and Patrick was more than happy for us all to walk around his home. For myself, the highlight of the evening was being able to hold one of his famed observation books.

5inch Cooke refractor, taken by Jan Young

It was wonderful seeing for real that famous study, so often seen on TV, crammed from floor to ceiling with such wonderful books, also Patrick's famous 5inch Cooke refractor that was on view in the house and there were several members who wanted to take it home!

My thanks go to Graham for arranging the visit, to Trevor and Ed for acting as guides and most of all to Patrick and his two cats (Jeannie and Ptolemy) who opened up their home to us all.

Jan Young



Patrick's Jupiter Observing Book, taken by Jan

Grant Privett visits Australia

It's 40 years now since I became an amateur astronomer and so, unsurprisingly, the northern sky is pretty familiar territory. Star patterns like Lyra, Cygnus and Gemini are not abstract forms, but old friends, and it's a long time since I got lost finding a star or tracing out a constellation. So, when work told me I had to go to Australia for a week, I was keen to relive the experience of learning new constellations, hunting down some of the brighter deep sky objects with binoculars and seeing what the other half of the world sees when the lights go down.

So, armed with a battered pair of 10x50 binoculars, Ridpath's 'Collins Guide' and a small tripod/digital camera amounting to more than 1/6th of my baggage allowance, I took the 24 hours of flight each way in my stride. It's true I felt like an obese kangaroo had sat on me by the time I got there – perhaps one had, I was too jetlagged to care.

Adelaide, like most cities, has too much lighting. From the streets near the town centre you are doing well to spot a 3rd magnitude star even with the prevalent low humidity and blue daytime skies there. Despite that, long before dark, while walking through a park watching the pelicans on the river, the southern sky gave me its three big – though related – shocks and all in quick succession.

Firstly I noticed, at sunset, that the Sun had moved the wrong way across the sky during the afternoon. If, in England, you face the direction of the Sun at noon, you notice that it moves from left to right during the day. In the southern hemisphere it's the other way round. Intellectually I understood immediately, but during the visit I came to notice that my normally good sense of direction was on the blink. This definitely gave me pause for thought and was the real culture shock of the trip.

A few minutes later I noticed the Moon. It was the wrong way up! Gone was the friendly face I had seen shining down as long as I could remember, to be replaced by an interloper.

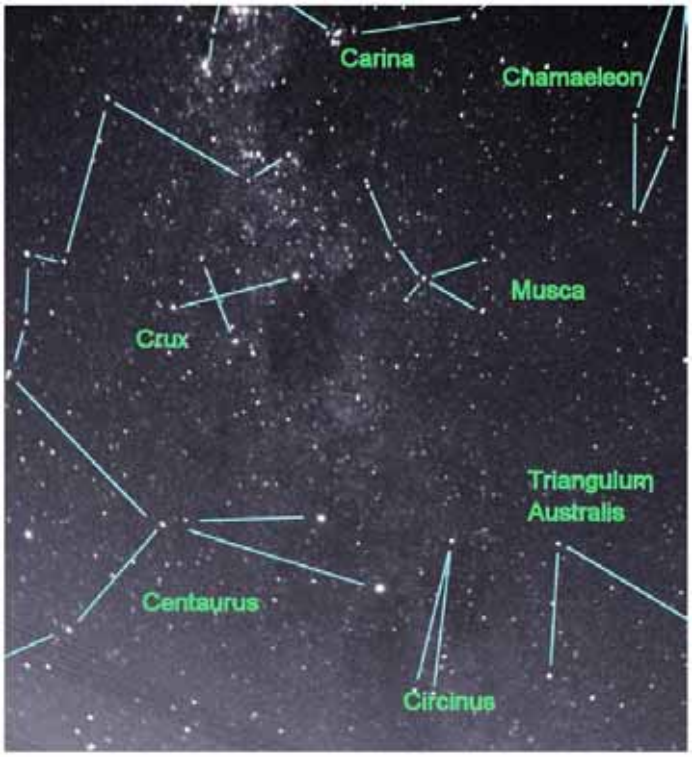
And then, immediately, the final shock. It was in the wrong place. I knew the Moon was at a gibbous waxing phase. But the Moon was to the right of the sunset, which to my northern mindset meant that it must be a sunrise I was watching. That took some getting used to as it meant also that the stars wheeled clockwise around the southern celestial pole.

Backward Moon—A waxing gibbous moon. Honest!

Perhaps I'm making too much of this, but together they did more to reinforce the fact I was 10,000 miles from home than all the wallabies, accents and sun-tans around me had done.

After that, astronomy had to wait until I spent a weekend in Tasmania on the way home. There, in surroundings that could have been a cross between Devon and the Lake District, but with eucalyptus trees thrown in, I managed to spend an hour outside on a clear, though moonlit night. Apparently, Tasmania has some of the best air quality in the world – and it showed.

The daytime skies there are of the deepest blue with transparency that let us see 50 miles. After dark the sky was fantastic. The near full Moon couldn't hide the Milky Way, and the stars seemed to twinkle less than they do at home. Better still was the southern Milky Way and the constellations through which it passes.



The southern sky winding clockwise round the pole

I had been very worried about finding my way around and had assumed I would move south from the constellations I knew, such as Orion (who was doing a handstand), Canis Major which was directly overhead and Gemini and Leo near the horizon. But oddly, with the Sirius, Canopus and alpha and beta Centauri pointing the way, the small Southern Cross was immediately obvious. In binoculars it fitted snugly within the 5-degree field of the 10x50s and with three of the stars strongly coloured was very pretty. Also apparent in the same field was the partially resolved and compact Jewel Box cluster and the edge of the Coal Sack dark nebula was just detectable. And this with the Moon up.

Inspired by this, I used stars in the Cross to point the way and went 'cross country' through rich, star-strewn fields – looking for Omega Centauri, the sky's brightest globular cluster. It was an easy find as it's both enormous and bright, with my humble binoculars starting to resolve its components.

(Continued on page 11)

Changing Perceptions

Colin Knappitt

Perhaps the dawning was going on for a long time in the subconscious but the end of the evolution in my world view of astronomy, space, the Universe took centre stage in my consciousness two or three years back.

The journey began more than fifty years ago with the 'Out in Space' Brook Bond tea card album that I have described in a previous article. This was a couple of years before the launch of the Space Age, when the world was still big, largely unspoiled and relatively unpopulated. Before US Air Force Capt. Joseph Kittinger (later Col.) had ascended nearly twenty miles above the Earth's surface by balloon and seen the curve of the world and the blackness of space. (He free-fell to the ground for sixteen miles before landing by parachute). Every phenomenon described by the fifty cards was new, intensely remote: 'A jet aircraft travelling at 500mph would take ninety years to reach Jupiter'. Everything had its appointed place in the heavens and all was well with the world.

Time moved on and my knowledge and excitement grew with the first views through a 4" reflector of the Moon, Jupiter's satellites, Saturn's rings and Vega. The first data came from the probes to the Moon, Mars, Venus; and, Earth was still big (though not quite so big) and the contents of space remained way out there, remote and unthreatening.

Then came the thrilling prospect of extra-terrestrial intelligence. A radio telescope in the United States in the early 1960's was listening for artificial signals from the stars Tau Ceti and Epsilon Eridani. Other, more advanced civilisations might be out there; strange and fabulous galactic empires as brought to us by such science ficton novels, television series and feature films as 'A for Andromeda', 'The Black Cloud', 'Lost in Space', 'Star Trek' and '2001: A Space Odyssey'. You felt- at least I did- that contact was imminent. The caption at the start of the (somewhat later) film 'Close Encounters of the Third Kind': THE NEAR FUTURE, still gives me a thrill.

But, as the gigabytes and terabytes of data have poured in over the decades from probes, telescopes on Earth and telescopes in orbit; as theories have been refined; as the Earth has become increasingly plundered, polluted and over-populated, things look very different. Nothing underlines more for me what the Americans would call this paradigm shift than the rise of the phrase "on the planet" which, like the invading grey squirrels out- competing the native red, is displacing the traditional "on Earth" and "in the world". The three words "on the planet" draw our attention each time they are uttered to the status of the Earth in a way that the predecessor phrases did not. The Earth is a planet, and a not very big planet; as much a part of the "out there" as Jupiter and Saturn. When I look up at the daytime sky now, I am much more easily able in my mind's eye to see the blackness of space such a short distance beyond. And when I look down to the ground after gazing at a clear night sky, I see in my mind's eye through the eight thousand miles of solid to New Zealand and out once more into the blackness of space beyond. The stars are down there beneath your feet just as much as they are above your head. We forget that the blackness of space surrounds us all the time but the atmosphere during the day, clouds at night and the Earth's bulk throughout mask this reality.

Just as satellites and jet airliners have shrunk the Earth, probes have shrunk the Solar System. Craft can almost routinely travel to Mars and Venus in a few months and, under the right circumstances, can voyage to Jupiter in about eighteen months rather than the ninety years mentioned earlier. Even distant Pluto will be getting a visit in a few years. But, at the same time, the environment beyond the Earth has increasingly appeared much less benign than it did once. Ignorance was bliss. It does not boost confidence to know that changes of circumstance can fry a planet or freeze it; blast it with sterilising radiation; blow its atmosphere away; devastatingly change its orbit through gravitational perturbation; pulverise its surface with ferocious bombardment; in extremis, split it asunder in a gargantuan collision. Everything does not have its appointed place in the heavens and all is not necessarily well with the world. We live on a knife edge; but perhaps the Earth can escape a hammer blow from space for a while yet!

As for extra-terrestrial life, I suspect that very low life, perhaps at the level of viruses (if viruses are to be counted as life) might be widespread in space. The panspermia hypothesis strikes be as plausible. But intelligent life, that is another matter. Life at the level of human beings, arguably not particularly intelligent, might be vanishingly rare. Far from feeling that contact with extra-terrestrial intelligence is imminent, I now take the pessimistic view that, in the Galaxy the emergences of high technology civilisation might be counted on the thumb of one thumb. I should not be surprised if all the listening and searching to the end of human society detects nothing. . On Earth Human Kind is plentiful to the point of endangering its own continuation and the existence of countless other species. Outside the Earth, it looks to me as if we have little more than fire and ice and rock and radiation and vacuum - particularly vacuum. So I find it curious, to put it at its lowest, that so many people can be casual in so many ways when it comes to looking after the only piece of vanishingly small paradise* of which we know.

*From a Persian word for garden.

Article courtesy of the Worthing AS Newsletter

(Continued from page 10)

After that it was a bit like being a kid in a sweet factory. Just idly wandering up and down the Milky Way brought me to Eta Carinae which, like Omega Centauri, was a naked-eye object with three obvious deep sky objects in the same field of view – a bit like the field of view that holds M36, M37 and M38 in Auriga, but better. Similarly M47 and M93 in Puppis, that I had painstakingly tracked down in a telescope two weeks earlier from home, were obvious and easy-to-find objects.

Becoming more ambitious, I thought I should look for the Magellanic clouds while I took some undriven photos of the Milky Way as a memento. That was fun. I had expected something small. Perhaps subtle. But the Large Magellanic Cloud is anything but, as it proved to be bigger than the field of view of the binoculars and bright, making the Andromeda galaxy seem a mere dim fleck.

Even the Tarantula nebula on the edge of the LMC was bright and distinct, having the alternative name of the star 30 Doradus. The Small Magellanic Cloud was not as well placed and a more subdued affair, apart that is from the bright but compact globular cluster 47 Tucanae on its edge. Both clouds were easy to find using the stars Canopus and Archenar to track them down.

With tiredness advancing and the Moon now high in the sky, I rushed through some of the rest, promising myself another view the next night, but alas the sky was hazy and it will have to wait until I pluck up sufficient courage to endure another 48 hours stuck in a tin box hurtling through the air at 38,000ft. I went to bed making the comparisons M31 versus LMC, Omega Centauri versus M13 and M42 versus Eta Carinae. No contest.

A lot is said about how glorious The Plough, Cassiopeia and Auriga are, but for my money you can keep them. I have seen the Milky Way as it runs down past Orion, into Puppis through Carinae, Centaurus and Crux and onward and I have my wife's permission to tell you I am in love. It's true the Plough would never rise and Lyra would at best scrape the horizon, but with Scorpius and Sagittarius riding overhead later in the year there really is no contest. The southern sky is truly beautiful.

Australia really is the lucky country.

Grant Privett—March 2008

Courtesy of Hermes—The Newsletter of Shropshire AS

Liverpool Star Party, Croxteth Park & Hall
Weekend March 15th-16th 2008.

Yet another star party weekend for members of Liverpool Astronomical Society, and their telescopes. Now in its 23rd year, the weekend of telescope observing, astronomy talks, and much more inside the historical hall, still attracts a respectful number of members of the public. Even in predicable bad weather, forty five members of the public attend events inside the hall the first night, and talks from Steve Southern, and David Forshaw kept them entertained, and in from the cold, cloudy rain splashed night outside. Dave Whittle kept them all supplied with hot and cold drinks, and very light snacks.

LAS Member Steve Southern (far left) prepares to givea general public guide of 'What's Up' over the weekend

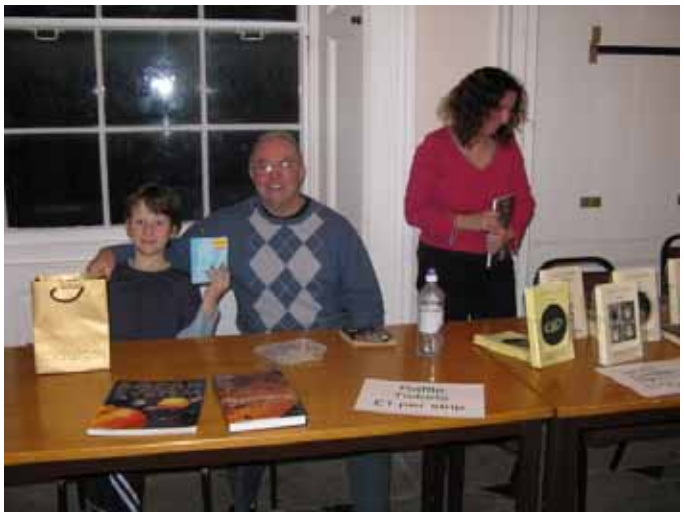
Ken Clark was on hand manning the membership and information desk, and Geoff Regan also did demonstrations of astronomy computer programs, while several telescope owners, kept vigil outside, shelled from the rain, waiting, and above hoping for a clear spell, but alas it never happened. Tricia and Iain Banks did great work with the that nights raffle, and Gerard plus Sarah Gilligan sold the Society newsletter. The "Younger" astronomers present, where provided with an activity corner, with colouring and quiz sheets provided, all with an astronomical theme. Displays of Society member's observational work and research also provide a welcome distraction from the bad weather outside.

Dave Bentley (in red) shows young and old the wonders of the Night Sky

However the following night, Sunday, was much better, with regard the weather, very cold, but with welcome long duration clear skies. The events inside where repeated, but Clouds did caused some problems with views later in the evening. Telescopes, ranging from the TROK 30, to 6 inch Dobsonians where pressed into use for most of the night. Views of the Moon, including society member Rob Johnson proving live views of the lunar Appennine Mountain chain, the site of the 1971 manned Apollo 15 landing.

All future astronomers were made welcome!

Solar System members Saturn, and Mars where also viewed, plus many other star clusters, and galaxies. A bright meteor was also seen by many. Young and old where able to see details of deep sky objects, planets, and places on the Moon for the very first time. Some long queues form along side telescopes, and more so at the large 30 inch TROK Dobsonian, manned by Dave Thomson, and Dave Owen. Over both nights, more than 100 members of the public braved the good and bad weather to learn a little about the Universe around them.



Young astronomer Iain Banks helps with the Astronomical Raffle, with his mum and John Knott.

We would like to thank all those members of the public who supported our weekend, and to those thirty members of the Society who gave up their own personal weekend time to help organise and run the event. Special thanks goes to all the Croxteth Park Hall attendant and security staff who gave grateful help during both nights – See next year during International Astronomy Year 2009?

Well watch this space!

Rob Johnson shows live images of the Moon, via his laptop

Reaching for the skies with TROK 30" Dobs, with the help of Dave Thompson (far right)

More pictures taken at the Liverpool Star Party

Amateur Astronomer Gets MBE

Hi Fellow Astronomers,

I am delighted to be able to inform you that an amateur astronomer has been awarded an MBE in the Queen's Birthday Honours.

John Smith, who lives on the Isle of Wight and is a member of Vectis Astronomical Society, has been given the honour for services to Newchurch Parish, which included the founding of the Isle of Wight Observatory.

Johns Smith MBE - Vectis AS - Photo: John Langley.

John Smith has many friends throughout the amateur astronomical community, and you may like to use the report in your publication.

Kind Regards *Lucy*

Dr Lucy Rogers
Chairman Vectis Astronomical Society chairman@vectis-astro.org.uk
Freelance Science Writer lucy@lucyrogers.com

Leeds Astronomical Society on the move.

From September 2008 the monthly meetings of the Leeds AS will be held at The Friends Meeting House, Carlton Hill, 188 Woodhouse Lane, Leeds LS2 9DX. Centenary House has served the society well for several years now but the increasing numbers at meetings have lead us to find a rather more comfortable venue

The Leeds Astronomical Society hosts a full and varied programme of speakers at the monthly meetings. We also hold observing evenings at Rodley Nature Reserve and other public outreach activities. Our members have a wide range of astronomical interests and are always on hand to give advice and encouragement to those new to astronomy.

Meetings are held on the 2nd and 4th Wednesdays of each month. Doors open at 19.00, the meeting begins at 19.30.

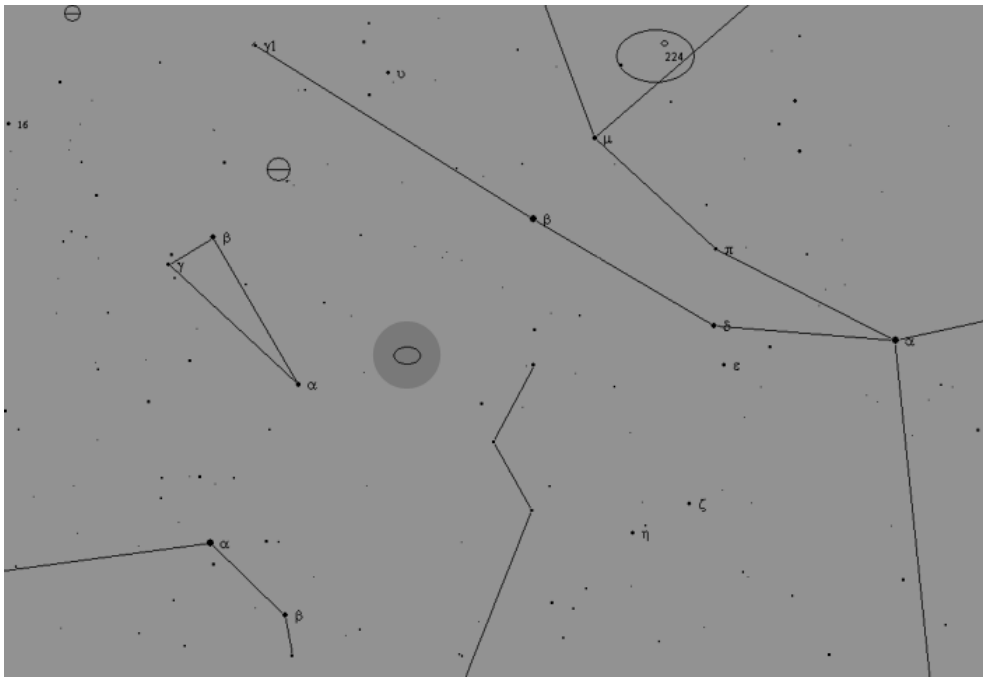
As well as being the International year of Astronomy, 2009 is also the 150th anniversary of our founding. Please come and help us celebrate in this milestone year.

www.leedastronomy.org.uk

Jim's Stellar Corner: 'The Triangle Trio'

By Jim Kaler (Honorary president Lyra)

Mixed into the birds, beasts, and mythical figures of the classical ancient constellations is a decidedly practical figure, Triangulum, the eponymous Triangle that Hipparchus -- the possible inventor of trigonometry -- perhaps found inspiring. Look for the pretty pattern in northern autumn evenings between Aries the Ram and the graceful curves of stars that represent Andromeda, the focus of the Perseus myth. While Triangulum is wholly visible in the southern hemisphere down to a latitude of 55 degrees south -- which takes in all but the southern tip of South America and Antarctica -- southerners have their own they can admire, Triangulum Australe, the Southern Triangle. Southern sky-watchers rather keep their version to themselves, as "TrA" (as opposed to "Tri") can be seen fully only below 20 degrees north latitude. One of the 38 accepted "modern constellations," TrA was invented (discovered?) by a pair of southern explorers and navigators, Pieter Keyser and Frederick de Houtman around 1600, placed on the globe of the northern astronomer Petrus Plancius, and finally cast into permanent celestial memory by Johannes Bayer in his famed Uranometria. On nearly opposite sides of the sky, the two triangles -- other than each being three-sided -- have a couple things in common. Both are small, near the bottom of the size list (Tri ranking 78th, TrA 83rd), and each figure's Alpha star has a proper name, Alpha Tri called "Mothallah" (meaning "the triangle"), while Alpha TrA is the obviously manufactured "Atria." Then the resemblance rather skids to a halt. Triangulum is rather isosceles, while TrA is close to equilateral. Triangulum's stars range from 64 light years away for Alpha to 124 for Beta, while TrA's span from closer (40 for Beta) to farther, a hefty 415 for Atria. More obviously, the southern Triangle is much the brighter of the two with respective visual magnitudes of 1.92, 2.85, and 2.89, Alpha, Beta, and Gamma (in proper order) all make the top 150 brightest-stars list (coming in at 42nd, 138th, and 149th). Tri's stars, on the other hand, are out of order, third magnitude Beta (which at 3.00 closely defines third magnitude) the brightest, followed by Mothallah at 3.41 and Gamma at 4.01, allowing one to see the effect of a full magnitude at one glance.



Five of the sextet are common white class A or F dwarfs or giants. Odd man out is Atria, an orange class K2 giant that is also the sky's brightest "barium star." Such stars are all evolving giants that are believed to have been contaminated by heavy elements when a more-massive companion was itself dying as a giant and transferring matter to the star we now see.

Unfortunately, the companion -- which should now be a white dwarf -- is nowhere to be seen. Atria also is distinguished as a "hybrid" star that has both a cool wind and a hot corona at the same time (which may belong to yet another companion; we don't know). The northern triangle responds to this sort of fame with a couple very close binaries. Mothallah has a companion that orbits in a mere 1.7 days, while Beta Tri has a sun like neighbor that takes just 32 days to make a turn. Of more interest is that both constellations have good naked-eye (providing you have dark skies and good eyes) variables. Up north, eastern Triangulum hosts R Trianguli (the first variable to be found in the figure), a long-period Mira-type variable that starts at bright sixth magnitude (5.7 or so) and then plunges to a miserable 12.5, when it is visible only in a decently sized telescope, returning to maximum visibility every 266 days. Though a luminous class M giant, its relative apparent faintness comes from its great distance of about 1300 light years the distance having a large uncertainty). Like all Miras, R Tri is entering its final death throes. Nearly the size of Earth's orbit, several thousand times more luminous than the Sun, unstable, and brightening with a dead core made of carbon and oxygen, the star will shortly turn itself into a planetary nebula and then a white dwarf. If you can catch it, you might admire the color of as it goes from class M4 at its brightest to a deeply cool M8 at the bottom. Triangulum Australe responds with "X." Far redder than R Tri, X TrA is an irregularly-variable class C5 carbon star some 1500 or so light years off that wobbles between sixth and seventh magnitude. Carbon stars have lofted to their surfaces fresh carbon made in the fusion of helium atoms in their nuclear-burning cores. Carbon molecules and metal atoms depress the stars' short-wave light, leaving little but red to come through, such stars often startling to see against the blackness of night. They are a major contributor to the carbon in the Universe. TrA also boasts not one, but a pair of naked eye Cepheid variables. R and S TrA vary between sixth and seventh magnitude over respective periods of 3.39 and 6.32 days. Cepheids are class F and G evolving super giants that, like Mira are in an unstable state that causes them to pulsate, to change their dimensions and luminosities (which also range into the thousands of Suns). Smaller than Miras, they are much more regular. Of supreme importance, the visual luminosities of Cepheids are tightly correlated with their periods making them wonderful "standard candles" for measuring distances to other galaxies. Too far away for parallax, the period-luminosity relation tells of respective distances for R and S of 2000 and 2700 light years.

The Crown Jewel, though, belongs to the northern Triangle, as it is home to one of the nearest galaxies to the Earth, the strikingly beautiful Triangulum Spiral, Messier 33, one of only four galaxies visible to the naked eye (the others being the two Magellanic Clouds of the southern hemisphere and the famed Andromeda spiral, M 31). While M 31, at a distance of 2.5 million light years, is usually taken as the farthest thing you can see with the naked eye, M 33 -- which is a much more difficult naked-eye object -- is actually a bit farther, 2.7 million light years. Third ranked in size in our Local Group of galaxies after M 31 and our own, it is still huge, a full degree in the sky, some 50,000 light years, across. Buried within it, to the northeast of center, is one of the most magnificent of diffuse nebulae, NGC 604. Lit by 200 hot young stars, 1300 light years across, this giant, if placed at the Orion Nebula, would not just overfill the constellation Orion, but would extend into Lepus and Taurus. At center is a huge bubble blown out by the winds and supernova explosions of the massive stars within.

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New Way To Weigh Giant Black Holes

How do you weigh the biggest black holes in the universe? One answer now comes from a completely new and independent technique that astronomers have developed using data from NASA's Chandra X-ray Observatory.

By measuring a peak in the temperature of hot gas in the centre of the giant elliptical galaxy NGC 4649, scientists have determined the mass of the galaxy's supermassive black hole. The method, applied for the first time, gives results that are consistent with a traditional technique.

Astronomers have been seeking out different, independent ways of precisely weighing the largest supermassive black holes, that is, those that are billions of times more massive than the Sun. Until now, methods based on observations of the motions of stars or of gas in a disk near such large black holes had been used.

"This is tremendously important work since black holes can be elusive, and there are only a couple of ways to weigh them accurately," said Philip Humphrey of the University of California at Irvine, who led the study. "It's reassuring that two very different ways to measure the mass of a big black hole give such similar answers."

NGC 4649 is now one of only a handful of galaxies for which the mass of a supermassive black hole has been measured with two different methods. In addition, this new X-ray technique confirms that the supermassive black hole in NGC 4649 is one of the largest in the local universe with a mass about 3.4 billion times that of the Sun, about a thousand times bigger than the black hole at the center of our galaxy.

The new technique takes advantage of the gravitational influence the black hole has on the hot gas near the centre of the galaxy. As gas slowly settles towards the black hole, it gets compressed and heated. This causes a peak in the temperature of the gas right near the centre of the galaxy. The more massive the black hole, the bigger the temperature peak detected by Chandra.

This effect was predicted by two of the co-authors -- Fabrizio Brighenti from the University of Bologna, Italy, and William Mathews from the University of California at Santa Cruz -- almost 10 years ago, but this is the first time it has been seen and used.

"It was wonderful to finally see convincing evidence of the effects of the huge black hole that we expected," said Brighenti. "We were thrilled that our new technique worked just as well as the more traditional approach for weighing the black hole."

The black hole in NGC 4649 is in a state where it does not appear to be rapidly pulling in material towards its event horizon, nor generating copious amounts of light as it grows. So, the presence and mass of the central black hole has to be studied more indirectly by tracking its effects on stars and gas surrounding it. This technique is well suited to black holes in this condition.

A composite image from NASA's Chandra X-ray Observatory (shown in purple) and Hubble Space Telescope (blue) shows the giant elliptical galaxy NGC 4649. By applying a new technique, scientists used Chandra data to measure the black hole at its centre to be about 3.4 billion times more massive than the Sun. The value from this X-ray technique is consistent with a more traditional method using the motions of stars near the black hole. NGC 4649 is now one of only a handful of galaxies for which the mass of a supermassive black hole has been measured with two different methods. (Credit: X-ray (NASA/CXC/Univ. of California Irvine/P.Humphrey et al.); Optical (NASA/STScI))

"Monster black holes like this one power spectacular light shows in the distant, early universe, but not in the local universe," said Humphrey. "So, we can't wait to apply our new method to other nearby galaxies harbouring such inconspicuous black holes."

These results will appear in an upcoming issue of The Astrophysical Journal. NASA's Marshall Space Flight Centre, Huntsville, Ala., manages the Chandra program for the agency's Science Mission Directorate. The Smithsonian Astrophysical Observatory controls science and flight operations from the Chandra X-ray Centre in Cambridge, Mass.

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But wait!!!. The title of this column is a TRIO of Triangles. What happened to the third one? In the late seventeenth century, Johannes Hevel (Hevelius) filled in many of the blank areas of sky seen from the north with another set of modern constellations. To him we owe Canes Venatici, Lacerta, Leo Minor, and four others. Another quartet, however, never made it. Among the rejected were Musca, the Fly, which unsurprisingly perches on the back of Aries the Ram, and Triangulum Minus, the "Smaller Triangle," which lies just southeast of classical Triangulum and was made of 6, 10, and 12 Trianguli before the numbers were assigned to John Flamsteed's stars. The brightest of them, fifth magnitude (4.94) 6 Tri, is an outstanding quadruple star.

Through the telescope one sees it as a visual double made of a fifth magnitude mid-class G evolving giant coupled to a seventh magnitude mid-class F ordinary dwarf and separated by 3.9 seconds of arc (an easy split), which at a distance of 305 light years corresponds to a true separation of at least 360 Astronomical Units. Though the stars actually are both about the same nearly-white color, juxtaposition coupled with brightness difference makes the eye see color that is not there, Admiral Smythe referring to them as "topaz-yellow" and "green."

While there is nothing special about such doubles, each is also a spectroscopic binary with a very tight orbit. The brighter, 6 Tri A, has a companion that goes around in just 14.7 days, while 6 Tri B's mate takes a mere 2.2 days. The brighter pair has a measured separation of just 0.2 Astronomical Units. The rapid orbital motion has spun up the rotation of the giant, which in turn produces stellar activity, including includes spots, which makes the star slightly variable and a fine example of an "RS Canum Venaticorum" star (the prototype of such binaries).As a result, 6 Tri A is also known by its variable name, TZ Tri. The other double just sits there watching the whole thing, knowing that once one of its own components evolves; it may follow the lead of 6 Tri A and become an RS CVn star itself.

The eye loves patterns, evident in this trio of triangles. We might also add the two big ones that span constellation boundaries, the Winter Triangle (made of Betelgeuse in Orion, Procyon in Canis Minor, and Sirius in Canis Major) and the Summer Triangle (formed from Vega in Lyra, Deneb in Cygnus, and Altair in Aquila).

Article courtesy of the LYRA Newsletter

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.astroadas.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 Thurs (exc Aug) at Grateley Village Hall.
e-mail: secretary@andoverastronomy.org.uk

AYLESBURY AS www.aylesbury-astronomy.org.uk
1st Mon at the Observatory, Upper Wichendon, Aylesbury.
Email: sandymac@waitrose.com

AYRSHIRE AS http://ayrastro.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
Contact: Andrew Patten email: andrew_patton@talk21.com

BATLEY & SPENDBOROUGH AS
Every Thurs at Milner K Ford Observatory, Wilton Park, Batley
Contact: I Newsome 01924-443860 email: bevian11@hotmail.com

BECKINGTON AS www.basnet.org.uk
3rd Fri (exc Jul, Aug & Dec) at Beckington Baptist Church Hall, Beckington,
Contact: 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. (Library, ATM, workshop, etc). Last Tues–lecture
Email: john@jspittle38.freeserve.co.uk

BLACKPOOL & DISTRICT AS www.blackpoolastronomy.org.uk
1st Wed of month at St Kentigern's Church Hall, Newton Drive, Blackpool
Contact: 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)
Secretary: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 or ring Hilary on 01274 6725710. johnbards@blueyonder.co.uk

BRANNEL ASTRONOMY www.brannelastronomy.com
1st & 3rd Fri at Brannel School, St Stephens, Cornwall .
Contact: 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
Contact: Rod Crockford. Email: rod_crockford@yahoo.co.uk

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

BRISTOL AS www.bristolastrosoc.org.uk
Every Fri at Bristol Grammar School, University Road
Contact: Simon Smith (Secretary), email: secretary@bristolastrosoc.org.uk

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

CARDIFF AS www.cardiff-astronomical-society.org
Alt Thurs, Sep-Jul, at Dept Physics & Astronomy, Univ. of Wales, 5 The Parade.
David Powell (secretary), 029 2055 1704. Email CAS@ilddat.demon.co.uk

CAROLIAN AS www.carolianastro.org.uk
Contact: Chris Ashman 01562 743758. Email: info@carolianastro.org.uk

CASTLE POINT AC www.cpac.org.uk
Every Weds at St Michaels Church, St Michaels Rd, Daws Heath, Hadleigh.
Contact: 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
Contact: 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.clactonastronomy.co.uk
1st Thurs (exc Aug) at Quakers House, Granvile Road, Clacton-on-Sea. CO15 6BX
Contact 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 or 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.
Contact 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 and the Outer Solar System Dr Mike Leggett
Jun 13: AGM
Jul 11: Introduction to Image Processing Nik Szymanek
Aug 8: Galaxies and Largest Structures in Universe Samuel George

CRAWLEY AS http://uk.geocities.com/crawleyas/
3rd Fri (exc July & Aug) at Ifield Community Centre. 7.30 pm.
Sec: Jim Swift 01293-882560 E-mail: cytron@btinternet.com
16 May: Russian Cosmonaut Training Nick Quinn
20 Jun: Astrophotography Nik Szymanek

CROYDON AS www.croydonastro.org.uk
2nd Fri during term time at Royal Russell School, Coombe Lane
Contact 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
Contact: Dave Selfe email: secretary@derbyastronomy.org/
Sep 5: The Apollo Moon Missions Dave Eagles
Oct 3: Observatories of the World Martin Lunn
Nov 11: Astronomy in Flatland Dr Colin Steele
Dec 5: A Complete History of the Universe Dr Chris Lintott
Jan 9: Jupiter–Friend or Foe Dr Jonti Horner

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

DUMFRIES AS Society web-site www.astronomers.ukscientist.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. Contact Bob Cripps, tel. 01323 732067, email bobwcripps@btinternet.com

EAST RIDING ASTRONOMERS www.eastridingastronomers.org.uk
3rd Mon at the Friends Meeting House, Quaker Lane, Beverley.
Contact 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
Secretary; Barry Bellinger, tel. 07748766610 barry.bellinger@nokia.com

FLAMSTEED AS www.flamsteed.info
1st Mon at Royal Observatory & National Maritime Museum, Greenwich.
Contact: Friends Office. tel. 020 8312 6678 - 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
Contact: Richard Alldridge, 01229 826864 Richard@alldridge.worldonline.co.uk

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

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

HAMPSTEAD GARDEN SUBURB AS
Last Wed at Free Church Hall, Northway, London NW11.
Contact: Dianne Fishman 020 8458 4038 hgsas@dfish.demon.co.uk

HANTS ASTRO.ORG www.hantsastro.org
Contact: David Woods 023 9261 7092 email: subscribe@hantsastro.org

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

HAVERING AS http://homepages.tesco.net/~nik.szymanek/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 Michael Merrifield

HEBDEN BRIDGE AS
Meetings at Hope Baptist Church Rooms at approx 4 week intervals.
Contact: Len Entwhistle (01422-378368) or visit FAS Diary on FAS webpage.

HERSCHEL AS www.herschel-astrosoc.co.uk
Email: hasadmin@gmail.com

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

HORSHAM AS www.horshamastronomy.co.uk
1st Wed at Christs Hospital School, Horsham, West Sussex.
Contact: 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
Contact: 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

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

Sep 9:	Star Trekking	Dennis Ashton
Oct 14:	Exoplanets	Dr Frazer Pearce

ISLE OF MAN AS www.iomastronomy.org
1st Thurs at the IOM Observatory, Foxdale.
Contact: 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.
Contact: 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, Dorridge, Solihull.
Contact: Nigel Foster. Tel: 01676-535941 e-mail: nftest00@hotmail.com

LEEDS AS
2nd & 4th Wed at Centenary House, North St, Leeds LS2 8AY
Mailto: xavier@leedsastronomy.org.uk or xvermeren@gmail.com

LEICESTER AS www.leicester-astronomical.co.uk
Meets 2nd and 4th Tues 19:30. National Space Centre, Exploration Drive, Leicester
Contact: Chris Gutteridge 0116 270 0596 chris@gutteridge.co.uk

LETCHWORTH & DISTRICT AS
Meets last Wednesday of the month at Plinston Hall, Letchworth: 7:45pm
Contact: 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, Theydon Bois, Essex.
Contact Jerry Workman (0208-507-7568)

LOWESTOFT & GT YARMOUTH RA (LYRA)
2nd Tues at Waveney Gymnastics Centre (access Notley Rd).
Richard Chilvers: 01502 57401 email: good.goat@tiscali.co.uk

LUTON AS www.lutonastrosoc.org.uk
Last Thurs at Putteridge Bury Campus, University of Bedfordshire
Contact: 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

Sep 16:	tba	Prof Phil Diamond

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

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

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

MELTON & DISTRICT AS
Meets: Monthly at Village Hall, Main Street, Gaddesby, Leics. At 8.00pm
Contact: 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
Contact: Shaun O'dell (Secretary) 01709-579529

Oct 10:	Dark matter	Dr Ed Daw
Oct 23:	More Astronomy for Beginners	Mark Benton
Nov 13:	Scanning Astronomy	Phil Muffett
Dec 12:	Astronomical Nativity	Phil Muffett

MID KENT AS www.mkas-site.co.uk/
2nd and last Fri at The Bredhurst Village Hall, Hurstwood Road, Bredhurst, Kent
email pwparish54@yahoo.co.uk

MILTON KEYNES AS www.mkas.org.uk
Alt Fri at Rectory Cottages, Church Green Road, Bletchley, Milton Keynes
Contact: Mike Leggett Tel: 01908 503692 Email: mike.leggett@fsmail.net

Oct 24:	Cassini-Huygens Mission	Prof John Zarnecki
Nov 21:	Mythology of the Constellations	Zoe Ball
Jan 23:	Rare Stars and Cosmic Mayhem	Prof Michael Merrifield

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

Sep 5:	Comets, A Strange Tail to Tel	Ian Brantingham
Oct 3:	Introduction to Image Processing	Alan Tough
Nov 7:	Video Astronomy	Andrew Elliot
Dec 5:	Signa Quiz	

NEWBURY AS www.newburyas.org.uk
1st Fri (Sept-June) United Reformed Church Hall, Cromwell Place, Newbury.
email: monjohn.balstone@virgin.net

May 2:	Observing the Sky in H Alpha	Prof Janet Drew

NORTH ESSEX AS http://www.neas.me.uk
3rd Thurs (exc Aug & Dec) at Henry Dixon Hall, Rivenhall End, Witham.
Contact 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: japrockter@aol.com

NORTH WALES & LLANDRILLO COLLEGE AS
www.manastro.co.uk/nwgas/llandrillo
2nd Tues at Lecture Hall, Llandrillo College
Contact: 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.
Contact: 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

NOTTINHAM AS http://beehive.thisisnottingham.co.uk/nottinghamastro
1st Thurs British Geological Survey, Nicker Hill, Keyworth, Notts. NG12 5GG.
Contact: 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
2nf 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, Peterborough.
Gerry Holland 01733 772236 Email: gerry@comrep.freeserve.co.uk

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

RENFREWSHIRE AS www.renfrewshireastro.co.uk
Meets every Fri 7.30pm at The Coats Observatory
Contact: 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
Contact: Julian Lecki Tel: 01788-572152 email: julianleck@aol.com

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

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

SEKAS (SOUTH EAST KENT) www.sekas.co.uk
Tony Bennet 01843-831079 Secretary@sekas.co.uk

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

SHANNONSIDE AC http://go/to/sac
1st Wed at 8.00pm, Room 206, Mary Immaculate College, Limerick
Contact: 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
Contact: 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 ken@medway1875.freeserve.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

May 8:	So you want to be an astronomer?	R F Turner
Jun 12:	Jets and stuff coming out of black holes	Christian Kaiser

SOUTH LINCS 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.freeserve.co.uk

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STAFFORD & DISTRICT AS www.freewebs.com/philiphall/
3rd Thurs at Weston Road High School, Stafford. ST18 0YG
Contact Joe Jaworski, 0543 686043

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

Oct 6:	Observation Techniques	Lee Sproat
Nov 3:	Galaxy Clusters	Carolin Crawford

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

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

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. jewels on 07877-448117

THE LEWES ASTRONOMERS www.lewesastro.org.uk
1st Wed at Southover Grange, Southover High St. Lewes. BN7 1TP.
Contact: 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 ww.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.
Contact Kym Goss, email: kjg494@googlemail.com

USK AS www.uskastronomicalsociety.org.uk
Contact: jbprince9@yahoo.co.uk

VECTIS AS (Isle of Wight) www.wightskies.fsnet.co.uk
Parish Hall, Town Lane, Newport.
rosemarypears@aol.com

WADHURST AS www.wadhurst.org.uk/was/
Third Wed at the Methodist Church Upper Room, High Street, Wadhurst.
Contact: G G Rathbone, 13 Brookfield, Kemsing, Sevenoaks, Kent. TN15 6SQ

WALSALL AS www.walsallastro.co.uk
Every Thurs at the Rushall Olympic Football Club, Dales Lane, Walsall.
Alan Ledbury 01922 632624 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.westcornwallastrosoc.org
First Wed at St Michaels Hotel, Falmouth, and Third Thur at the CPR Learning Centre, Camborne
Robin Wadding email: robinwaddling@westcornwallastrosoc.org

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

Oct 10:	Hubble–not just a pretty picture	Will Gator
Nov 11:	The Herschel Dynasty	Andy Burns
Dec 8:	How to Discover a Comet	Roger Wesson

WEST YORKSHIRE AS www.wyas.fsnet.co.uk
Every Tues (exc Aug or BH's) at 'Rosse Observatory', Carleton Rd, Carleton, Pontefract.
James Boulton 0924-379376. Email: jcandcboulton@btinternet.com

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/
Contact: 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/
Contact: 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
Contact: Robin Spencer. Email: thespencers@care4free.net

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

WORTHING AS
Graham Boots meeting_secretary@was.org.uk 01903 505346

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

Re: Name of the Society

Because some members are having difficulty finding us when they come from a distance, we wish to change the name of our society from Llandrillo College and Coastal AS to North Wales and Landrillo College AS *Tony Shone - Treasurer*

Moray Astronomy Club Sigma Astronomy Weekend

open to the public for free
Friday 24th-25th October - 7 to 10 pm
Saturday 25th October - 2 to 4..30pm & 7 to 10pm
Birnie Village Hall & Field, Thomshill
Comet Making, Rocket Launching, Planaterium Dome, Talks & Observing
For further information email: ian@branters.freeserve.co.uk

LIST OF OFFICERS 2007/2008

President, Secretary, Treasurer & Newsletter Editor - See cover

Vice President:	**Richard Sargent :vicepresident@fedastro.org.uk**
PLI & Distribution:	**Eric Hutton plisecretary@fedastro.org.uk**
Membership Sec:	**Shaun O'Dell membership@fedastro.org.uk**
Minutes Sec:	**Richard Sargent**
Webmaster:	**Gary Gawthrope**
	webmaster@fedastro.org.uk
Chilterns Group :	**Steve Williams**
North West Group :	**Richard Sargent**
West Midlands :	**Dave Evetts**
SAGAS:	**Keith Brackenborough**
Yorkshire Group :	**Paul Harper**

Deadlines for submission for the next newsletter:
Winter 2008/9 — 7 November 2008
Please remember to send ALL items to the Editor, Frank Johns.
Regrettably material can only be returned if supplied with a SAE.

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.