FEDERATION OF ASTRONOMICAL SOCIETIES

http://www.fedastro.org.uk

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

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 (email 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.

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 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 policymakers about the broader value of their work, and they must be coherent about the consequences of lower funding levels.

Courtesy: Nature 9 July 2008
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 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, URBIIS, 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

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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 Gorge has to reluctantly stand down.

The FAS Secretary is the first port of call 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 are picked up as 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 Gorge 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?

Callum Potter
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.

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.

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.

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.
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 10²⁵ cu. metre, thus the 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 pregalactic 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), HC₃N, HC₅N……HC₁₁N (a cyanopolyne 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 rekindled my interest in the chemistry of the cosmos.

Allan Whatling

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 geometries 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
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 who are interested in the question of life beyond our 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 mankind are enormous.

Read and enjoy. I doubt you will regret it!

Julia Johnson

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David Levy’s Guide to Observing Meteor Showers
David H Levy

Perhaps it is because David Levy’s first academic qualifications were in English Literature (BA in 1972 and an MA in 1979) 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 U L3) 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
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 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 nearer the finished model will be, but the tolerances are quite large so there is plenty of room for minor inaccuracies.

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.
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 detecting galaxies at high redshifts through deep multicolour imaging. This, however, is not the spectroscopic redshift that high redshift astronomers are so often looking for. It is always the case that low-luminosity radio galaxies have a high redshift, but the reverse is not always true, so they are not as useful for identifying high redshift galaxies out to redshifts 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 optical imaging. 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 α < -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 infrared wavelengths. Next observations in optical and infrared 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!
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 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 Intergovernmental 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 rocketsthe 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 reorbit 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 reorbiting 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.

## What are the dangers from debris?

When 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 35,000km/h (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.

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Summer 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!

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!

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
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 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.

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Changing Perceptions

Colin Knappit

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 fascinating 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.)

(Continued from page 10)

Tucanae on its edge. Both clouds were easy to find using the stars as a guide. Making the Andromeda galaxy seem a mere dim fleck.

Every phenomenon described by the fifty cards was new, intensely fascinating 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.)

During the day, clouds at night and the Earth's bulk throughout mask the blackness of space but the atmosphere during the day, clouds at night and the Earth's bulk throughout mask the blackness of space. (He free-fell to the ground for sixteen miles before landing by parachute.)

As for extraterrestrial 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 me 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 extraterrestrial 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 hand. 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

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 M 36, M 37 and M 38 in Auriga, but better. Similarly M 47 and M 93 in Puppis, that I had painstakingly tracked down in a telescope two weeks earlier from home, were obvious and easy to find. 

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.

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 C rux 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 Shopshire AS
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 predictably 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.

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.

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 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.

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.

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.

Well watch this space!
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.

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@vectisastro.org.uk
Freelance Science Writer
lucy@lucyrogers.com


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 led 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 Comer: The Triangle Trio’

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 constellations. 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,” Tri 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 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 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 longperiod Mira-type variable that starts at 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 stage 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, M 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.

(Continued on page 15)
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 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.

"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."


ScienceDaily (July 17, 2008)

(Continued from page 14)

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 Sirius in Canis Major. These include 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 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, T Z 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
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 Llandrillo 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
Binnie Village Hall & Field, Thomshill
Comet Making, Rocket Launching, Planeterium Dome, Talks & Observing

For further information email: ian@branters.freeserve.co.uk

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

LIST OF OFFICERS 2007/2008

President, Secretary, Treasurer & Newsletter Editor - See cover
Vice President: Richard Sargent vicepresident@fedastro.org.uk
P.A. & Distribution: Eric Hutton pside@fedastro.org.uk
Membership Sec.: Shaun O’Dell membership@fedastro.org.uk
Minutes Sec.: Richard Sargent
Webmaster: Gary Gawthrope webmaster@fedastro.org.uk

Chilems Group: Steve Williams
North West Group: Richard Sargent
West Midlands: Dave Evets
SAGAS: Keith Brackenborough
Yorkshire Group: Paul Harper

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

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