

Stargazey Pie!

A slice of Highlands astronomical life!

Tues 2nd June 2009

Introduction

June's meeting was the stage for an excellent talk, some handy advice, and some slightly disappointing news – but there is still hope! As you can see from the notices below, there is quite a lot to look forward to, despite the shock news in the first item...

- **Monthly Meeting Venue.** Due to a change of ownership of The Green House we can no longer afford to hold our meetings here. Our lease expires after this meeting. The Committee is working hard to find a permanent solution. There will be an open discussion on this issue immediately before the tea break. See further down for more information on this topic.
- **Observing Sessions.** Regular sessions are no more, due to the thoughtless intrusion of "daylight" into our evenings and nights. However, although there are none officially planned at this stage, this will be reviewed in light of the Lunar 100 observing challenge mentioned at the last meeting. Updates on Summer Sessions will be announced on the website front page. The next season's opening night is planned to be an open night on Sat 19th Sept.
- **Membership Application Forms.** It is very important that the Taxpayer box is completed and the form signed. This ensures the Society is able to recoup Gift Aid. Also, if the Telephone Alert box is not ticked the member will not be included in the alert system.
- **Membership Subscriptions.** Subscriptions are due now. Again, it is very important that the Society receives prompt payment in order to fund its ongoing operational commitments. Lapsed members will need to pay the £2.50 visitor fee from the August meeting onwards.
- **Raffle Prizes.** Our very successful raffle continues to generate useful income for the running of the Society. Any prizes donated by the members would be gratefully received.
- **Event Volunteers Needed!** Volunteers are required to help man the stands at the forthcoming Inverness Highland Games (Sat 18th July) and Black Isle Show (Thu 6th August). Please contact Pat Williams.
- **Moon Magic.** Moonwatching For All – The Science and Beauty of the Moon, featuring Prof. John Brown and Dr. Gill Russell. Two events will be held to coincide with the Royal Astronomical Society's IYS2009 National Astronomy Autumn Moonwatch Week (phew) which takes place in late October / early November this year, as close to Full Moon and First Quarter as possible. Activities will include Binocular observing, Recording Phase and Position, the Effect of Moonlight on Stars and Landscapes, Halos and Moonbows, etc. The Highlands Astronomical Society is looking for volunteers to help develop this project. If you are interested, please contact Pat Williams. As a special bonus, Prof. Brown may do some magic tricks just for you...
- **IYA Webcasts.** Eric is broadcasting from his home observatory throughout the year. Visit <http://www.ustream.tv/channel/the-cosmos-cam> to see when the next programme is planned, or email him to be automatically notified of webcasts as they happen.

- **Seeing Stars.** June's Seeing Stars article in the Inverness Courier is by Rhona Fraser. She has written about "The Upside-down World of the Southern Hemisphere" and it will soon be available to read on this website.
- **More Moon.** The Lunar 100 is being revisited. Improve your lunar observing skills this summer and take up the Lunar 100 challenge. 100 lunar features are listed and marked on a Moon map for you to find and tick. All you have to do is look for them – what could be more fun and challenging? The information sheet and special Moon map are downloadable from the Astronomy Projects section on the "Documentation" page of the Society website.
- **Scope Calculator Update.** Maarten has updated the Telescope Calculator on our website so that you can now specify the size and resolution of a CCD chip or DSLR. Useful indeed for all the budding astro-photographers in the Society. You can access it here:
<http://www.spacegazer.com/index.asp?pageid=74737>
- **Scope For Sale.** Lynn Robinson is selling her Meade GoTo LX telescope. It has 8" aperture and is a Schmidt Cassegrain design – a good all-rounder. Enquiries to, and more information from, Lynn herself, or contact a committee member to be put in touch.

The Main Event

'Blinking Stars' by Melvyn Taylor

This month Melvyn Taylor talked on the subject of observing variable stars. Melvyn became Secretary of the British Astronomical Association in 1978, won the BA Merlin Medal for Advancement of Astronomy in 2005, and is currently vice president of the Leeds Astronomical Society. Melvyn is a very accomplished observer of variable stars.

Stars burst into existence and go out in style, but in between their lives can be surprising and interesting. Beginning with a list of several types of variable stars, Melvyn brought some order to a seemingly confusing array of star types that regularly undergo changes in brightness, magnitude and actual size or colour. His main classifications included eruptive, pulsating, rotating and cataclysmic variables, eclipsing binaries, and X-ray sources. He then went on to describe each of these categories in more detail, illustrating his descriptions with some famous and easy-to-find examples. Melvyn was keen to point out that advanced instruments and large apertures are not always necessary, and the heartbeats of many stars can be observed using binoculars or even with the naked eye.

The first group mentioned was the 'Eruptive Variables'. The brightest of these is Gamma Cassiopeiae, the middle star in the W of Cassiopeia. Spinning rapidly, it periodically sheds matter which settles into rings or shells around the star. As R Corona Borealis busily burns helium into carbon, it dims at irregular intervals due to clouds of carbon dust travelling into its chromosphere. This smoking star quickly dims from magnitude 5.5 to magnitude 15, remaining obscure for months. CH Cygni also changes dramatically, confounding scientists by ejecting mysterious jets of gas. All of these stars can be observed through binoculars.

The 'Pulsating Variables' contract and expand due to the outward pressure of the star's fusion exceeding the inward pull of gravity. These rhythmic pulses occur over long, short and irregular time spans. The southern constellation of Cetus has the prototype long-period variable, Mira. A cool red giant, Mira's apparent magnitude drops from 3.0 to 10.0 over a period of about 330 days. The oscillations of Mira type stars take place over 100 – 1000 days. On the other hand, 'Short Period Variables', or Cepheids, have cycles of 1-100 days. Delta Cephei is a yellow supergiant with a period of 5 days and 8 hours, and is seen from the Northern Hemisphere. 'Semi-Regular Variables' include mu Cephei, (the Garnet Star), Zeta Geminorum, Alpha Herculis, and Alpha Orionis (Betelgeuse).

Perhaps not so visible in binoculars or small telescopes are 'Rotating Variables' which alter during rotation due to features on the star's surface which sometimes turn out to be binary stars.

There followed the 'Eclipsing Variables', where two stars move around in an orbital plane periodically blotting each other out. Beta Persei, or Algol, is a binary, a hot blue star closely orbited by a cool red supergiant. One component moves in front of the other, dimming Algol to only 30% of its maximum brightness, in a 2.87-day cycle.

Then there are the 'Cataclysmic Variables'. One of the most notable stars in this category is the dwarf novae SS Cygni, observable in an 8 inch telescope. Every few weeks it goes nova, brightening quickly from around magnitude 12 to perhaps as bright as magnitude 8, then slowly dimming again. RS Ophiuchus, is a recurrent nova, where mass is exchanged between a red giant and a white dwarf, leading to periodic thermonuclear explosions about every 10 or 20 years. The last one occurred in 2006.

We heard about two 18th century astronomers who made the first modern discoveries of variable stars. Until then, astronomers only knew of a small number of variable stars. Edward Pigott began searching for more, and in 1784 discovered Eta Aquilae, and measured its period. He worked together with his companion, the young John Goodricke, who, although deaf and mute, made significant discoveries including the variability of Beta Lyrae and Delta Cephei.

It's often said that observation of variable stars is one area of astronomy where the amateur can make a valuable contribution to science. Many long cold hours are spent by dedicated amateurs - watching and waiting in the night. Their aim: to measure slight changes and collect data to be plotted on charts. Developments in digital photography, CCD photography, and in computer shareware have helped revolutionise this branch of astronomy in recent years.

Warm applause was given for Melvyn's talk which appealed to all regardless of experience, from the more advanced and knowledgeable to those who may have felt encouraged to begin to trace the changes in the stars, to learn more about them, and perhaps attempt to make some observations.

John Burns – Strathspey Binoculars

Tonight we also had a display of binoculars, and a few helpful explanations and tips on the subject from John Burns. Many people like to use binoculars to watch the night sky, as they are uncomplicated, easy to use, and give upright images as opposed to the inverted visions seen through some telescopes. For anyone looking for some optical aids for stargazing, binoculars are a very good place to start.

John's binoculars range from small birding binoculars to colossal 100mm aperture ones, which need a very sturdy tripod.

John explained some of the terminology and numbers that apply to lens size and magnification, field of view and exit pupil. This last figure, he simply explained as the diameter of each beam of light going from the eyepieces to your eyes. This may be larger or smaller than the size of your fully dilated pupil as you look through binoculars at night. A good explanation is given on the website.

Another factor is the quality and type of prism. John advises that porro prisms used in most binoculars come in varying densities, namely bak-7 and bak-4. Bak-4 prisms are the type John prefers, as they are denser and give brighter, better quality images. Then there are the coatings, that range from a single coat of magnesium fluoride for general purpose binoculars (keeping costs down), through to multiple coats of magnesium fluoride on every air to glass surface. Binoculars with this, more effective type of coating, are referred to as being fully multi-coated. These are best for astronomy, as they provide images with maximum sharpness and without the fringing or shimmering associated with lesser coating types.

The standard handy size is 10x50 and the Strathspeys start at around £30. Some come with special eyepieces, providing longer eye relief for wearers of spectacles. For around £80 you can buy marine binoculars, which are heavier but are fully multi-coated. These won the prize for best 10x50s in Sky At Night magazine in 2008!

The larger binoculars for astronomy range from fairly casual hand held 15x70's at £74.99(exc. vat), which can fit (and are best used) on a tripod with an adapting bracket which can be bought separately, to rather serious 100mm binoculars costing all of £949.99 (exc. vat). Some tripods are also available for sale. It should be noted that using a tripod steadies the view through binoculars enormously, and is recommended for "larger" astronomical binoculars.

The Strathspey website is very informative and offers detailed descriptions of every item on sale. If you are interested, it can be found at www.strathspey.co.uk

The Greenhouse

After next month, we will no longer be able to hold our monthly meetings in our familiar venue, The Greenhouse.

New Park Management have formally bought the venue, and only 3 weeks ago raised our rent by £100 per month. Prior to that Highlands and Islands Enterprise owned it, and our contract with them allowed us to use the venue for £65 per night plus VAT. As we have one month's grace, we will be meeting in the Greenhouse next month. Meanwhile, board members are engaged in an effort to change the minds of the new owners.

Although the Greenhouse offers excellent facilities, it's generally agreed that the new rent would put unacceptable pressure on HAS, and alternative premises are being sought. We are looking for somewhere centrally located around Inverness, which has car parking and facilities for tea and coffee. Tiered seating and room for breakout sessions would be preferred. We may also need to consider moving our meetings from Tuesday to another evening in the week.

Any ideas regarding an alternative venue would be appreciated – please contact a committee member if you think of anything!

Outside Storage Box

When the previous observatory telescope was being used, It was decided that we should keep the HAS Dobsonian telescope in a storage box on site. Now that the Dobs has been re-housed inside the JSL observatory, the box is no longer of use to HAS, so if anyone would like to buy it, offers would be welcome. It has a wooden base and would be a useful garden tidy. Bill Leslie has adapted his own version for storing a telescope. It is very light and might even be transportable. Delivery could be arranged.

Next Time

The next meeting will take place on Tuesday 7th July at the Green House – possibly for the last time - starting at 19:30. The Youngstars group will again run from 19:00 to 19:30. The speaker at the main meeting will be Des Loughney of Edinburgh Astronomical Society and his subject will be the Eclipse from China, 2008, and the ancient Beijing observatory. There will be breakout groups, including one featuring Eric's "throw it in the back of the car" 4.5" reflector. Members are encouraged to bring along their own 'scopes for this meeting too!

Refreshments and the usual chance to get together with the other members will also be available as usual!

See you on July 7th!