

Stargazey Pie!

A slice of Highlands astronomical life!

Tues 7th Sept 2010

Introduction

Welcome back to Stargazey Pie, the newsletter of the Highlands Astronomical Society! After a year off the Pie returns full of the activities that have taken place at the latest HAS meeting, to educate members who were not present and to refresh the memories of members who were! The September meeting took place at Smithton Primary School, location #74 in the Society's ongoing tour of presentation venues in the Western Hemisphere, and was attended by a goodly number of members, including some new faces.

- **Magical Mystery Tour.** If you have any further recommendations for the temporary replacement venue for HAS meetings, please let a committee member know. In the meantime, the pros and cons of the last three venues used are being discussed.
- **Message Board Active!** This fantastic facility is now operational and open to all members. Put <http://spacegazer.freebb3.com/> into your web browser and follow the easy instructions to register or enter. We look forward to many interesting discussions, debates, observing reports and opportunities to buy used kit on the classifieds section.
- **Solar Saturdays.** The Saturday solar observing sessions at JSL observatory are continuing through September, each Saturday, and will run from 14:00 to 16:00 weather permitting. Please check the website for details of each session and the session status.
- **Fettle That Scope!** See below for details of the forthcoming Equipment Fetting day on Saturday 11th! (Update: this has now taken place and was quite successful, particularly for one 'scope-owner!)
- **Moonshine.** HAS is considering participating in the first ever International Observe the Moon Night on Sat 18th Sept, in which case we will make it a public event. See <http://obvservethemoonnight.org/> for details and our website for further updates. If it goes ahead you can be sure of a superb sight of the Moon being swiftly covered up by clouds, possibly closely followed by being rained on. Joy!
- **Seeing Stars.** "The Challenge of Finding Ophiuchus" was published in Sept 3rd's edition of the Inverness Courier. Written by Pat Williams, the piece will be uploaded to our website shortly. Remember folks, this is Pat's first ever Seeing Stars article, so if you want signed copies you had better be quick in contacting the author before she gets too famous and relocates to Muana Kea!
- **Doors Open – and so do wallets!** Details of the Doors Open Day follow below, and add to them the fact that we received about £23 of donations in the collection box from our many and varied visitors!
- **Adventure! Exploration! Excitement!** Glasgow Science Centre, including the Planetarium, has been proposed as a destination for a HAS outing. Pat Williams is currently finding out about costs, discounts, the need to book in advance, toilets, chip shops en route, etc. If you are interested please let a

committee member know NOW! We also need a volunteer (that means YOU, up at the back) to organise the trip once Pat has finished her initial fact-finding.

- **Stuffing.** Suggestions, preferably with an example menu and an idea of cost, are being sought for the HAS Christmas Dinner #3. Restaurants (and therefore gastronomes) tend to start planning for these in early September, which is where we are now! Please contact a committee member with any ideas or to make your interest known.
- **Astronomical Events & Highlights.** Manchester University provides this easy to read and use guide: www.jodrellbank.manchester.ac.uk/astronomy/nightsky/
- **Pat Steps Down.** In a shock announcement Pat Williams declared her immediate departure from the post of Secretary and from the committee. She initially declared her intention many months ago, in the hope that a suitable candidate would step forward to take her place, but with no candidates stepping forward (suitable or unsuitable) she has decided to shock the Society membership into action and remove herself from active duty. Pat will still remain an active member of the Society and curiously, intends to actually "do some astronomy" in her free time. We would like to extend our deepest thanks to Pat for all the work she has done for the club on our behalf and for her organisational expertise.

The Main Event

'LIGO & LISA' by Stuart Reid

Stuart Reid holds a BSc in Physics and Astronomy and a PHD in Physics (experimental, gravity waves). Since 2008 he has been Co-investigator in the institute for gravitational research, based at the University of Glasgow. Having recently turned 30, Stuart decided to view this night at HAS as the last gasp of his celebrations.

The subject of Stuart's talk, and indeed his work, was, and is, the detection of Gravity Waves. To prepare us for this, Stuart introduced us to the concept of gravity itself. There are four main forces in space and gravity is the weakest! If gravity had a relative strength of 1, then the force generated by an electromagnetic field could be 10^{37} relative to it! Gravity makes up for this shortfall in actual strength though as it acts on every single atom in existence whereas the other larger forces may act only on particular parts of atoms.

Having demonstrated what a gravity wave might look like, Stuart showed how one might be detected using a principle based on a standard laser beam splitter. He then discussed the various detectors in existence and their limitations. To detect a gravity wave, the detector has to be sensitive to fluctuations to the order of 10^{-17} , using a detector that would be 1km long. The European GEO600 detector is 600m long, and the team collaborates with the GW groups in the USA (LIGO). GEO is up and running, but has not detected anything significant yet.

Stuart described some of the technical difficulties that have to be overcome in designing such an intricate device, including 'shot noise' and 'thermal noise' within the glass parts of the detector. To try and alleviate these problems, the mirrors are hung using thin strands of extruded glass, just 0.4mm in diameter, which are strong enough to take an 80kg load! He had brought a couple of these strands in with him to show us and they're mighty impressive.

The future of gravity wave detection involves making the detectors ever more sensitive in the hope of finally detecting the evidence of one of these elusive waves, which would prove the validity of Albert Einstein's theory of Special Relativity. The next generation of detector could be LISA – a gravity wave detector in Space! Consisting of three mirrors and a sophisticated array of on-board navigational, alignment and detection equipment, the LISA vehicle would orbit the Sun in a fixed position behind the Earth's orbit and would be free from Earth-based effects that might prevent successful detection.

LISA would also be more sensitive, and would hopefully be used to detect waves emanating from more distant phenomena, such as galactic binary systems and areas of black hole formation.

We would like to thank Stuart for an excellent presentation and discussion. He really did seem to have all the answers – except of course when a wave will actually be detected! Once one is, we look forward to having Stuart back to tell us all about it. In the meantime search for “Einstein at home” on the Internet for a program you can run on your own PC that will help disseminate the data being captured by the detectors currently in operation.

Observatory Report!

Paul Jenkins took to the floor to give us the latest report on events that have taken place, or are going to take place, at the JSL Observatory. First on the list was to draw peoples attention to the fact that the new observing season is upon us, with the first official session of the season being on Friday 10th of this month. It will start at 9pm and is open to members and to the public. Let's hope for clear skies to start us off.

Over the last weeks and months, much attention has been paid to the 14" telescope and its systems in the observatory dome. The telescope is now pointing very accurately at its intended targets and tracking them well. A dehumidifying device is now installed to keep the optics and interior of the scope dry while it is not being used, which will help prevent dewing up and condensation forming during and after observing sessions.

Maarten and Gerry have been very enthusiastic with experimenting with the video cameras, for through-the-telescope video astronomy, which will allow us to show what the telescope is 'seeing' on the video screen inside the nice warm Observing Station. Eventually it may well be possible to upload this video link onto the Internet for true remote viewing. To help with this, a 'Dongle' has been invested in – a device which will allow the users of the telescope to connect to the Internet using a laptop, netbook or observatory-based desktop PC.

To help our members prepare their own equipment for the coming season, Paul and myself will be holding an Equipment Fettle day on Saturday 11th Sept, from 11am onwards. We will have plenty of time, patience and tools with us to bring your telescopes or mounts up to optimum performance levels (fingers crossed) and will be able to look at focuser motion, mount smoothness, optical cleanliness, collimation issues, etc. We will also be happy to answer questions about equipment too.

The observing sessions for the next few weeks are as follows:

Date	Type	Host
Fri 10 th Sept	Public & members	Pauline
Sat 11 th Sept	Members & guests only	Paul
Fri 17 th Sept	Public & members	Gerry
Sat 18 th Sept	Members & guests only	Rhona
Fri 1 st Oct	Public & members	Pauline
Sat 2 nd Oct	Members & guests only	Paul

The Supervisors team consists of Pauline, Rhona, Gerry, Pat Williams and Paul. Assistants are still sought, so if you would like to become part of this prestigious team, with continuing support and training included in the non-existent financial reward package, please contact one of the supervisors!

Jodrell Spank

A brief mention was made of the proposed visit to Jodrell Bank radio observatory. Paul recently made his way there with his daughter to sample what was currently on offer at the UK's most famous astronomical

institution. The actual dish and telescope structure is astounding, as I remember well from my two visits there, but it sounds like the presentation material has not moved on at all since I last visited about a decade ago.

Paul felt that the material on display was basic and outdated – simplistic even, and that the bar needs to be raised quite a few notches to bring it in line with what we as a society would expect from a tour of the site.

Basically, the recommendation was that we wait until the proposed redevelopment of the observatory is completed, though of course the funds reserved for that purpose may well be revoked as part of the current government's solution to our economic situation...

Regardless of all that, the pictures in Paul's little exposition were certainly impressive!

Phone Alert

What is a Lert and why should we phone one? Well, Pat Williams has reorganised the nighttime Phone Alert sheet. It is now completely revamped as the next evolutionary model of the long-running list of phone numbers and contacts for people to call when interesting things happen in the sky. Noctilucent clouds and aurorae are the phenomena that most frequently activate this 'waterfall' phone call effect. The list of contacts is now available, so ask Eric if you'd like to have a copy sent to you. It will also be available at the next meeting and probably uploaded onto the website at some point too.

Rhona's Twins

Rhona Fraser, international globetrotter that she is, has discovered that Dunedin Astronomical Society in New Zealand might be of interest to us as a potential 'twinning' partner. The club has a fine observatory and telescope, and the locality is heavily populated by people of Scottish ancestry, with 'Mac's of all sorts filling the phone book.

By twinning the two Societies, nothing much would be expected of us, and not a lot would actually happen – except that it would be an interesting long-distance association, perhaps with information exchanges taking place. Another possibility might be remote access to each other's telescopes in the future – they are in the Southern Hemisphere after all, so our seasons are opposite. A show of hands was asked for and there seemed to be no objectors to the idea, so it looks like it might well go ahead. If Rhona disappears off there again in the near future, we can only suspect that somehow an undisclosed free trip was part of the deal...

Open Day Report

Saturday 4th Sept saw the latest Doors Open Day take place at the JSL observatory! Pat was on hand to help with the organisation, meet and greet the many visitors, and take some terribly embarrassing photo's of those that attended. Open to the public as a "what we're all about" event, the Doors Open day works very well to introduce people to the club's members and explain what we do, when we do it, and why.

The Lunt 60mm H-alpha solar scope was set up and proved very popular with the visitors, as did several privately owned telescopes brought along by our more enthusiastic hosts. The Sun played it very coy though, only peeping through the hazy cloud long enough to catch brief hazy glimpses of the nice Sunspot that was (technically) on display.

Special thanks were extended to Arthur and Lorna Milnes for being part of the team that put the event together. At one point Lorna was seen trailing from the gazebo-glider as the gale force wind swept them along in the direction of Nairn beach.

In total, more than 70 people turned up to see what HAS is about, and some of them came along to our meeting at Smithton Primary School too; two of them as newly signed members! Several telescope enquiries were answered, and only one telescope was lightly mauled by an inquisitive small boy's fingers,

though even then the damage was easily repaired. (Though if Pat Escott hadn't been quick enough to catch my focuser and Herschel Wedge before it hit the dirt there could well have been tears and gnashing of teeth – thanks Pat!)

Highland Skies – September 2010

Welcome to the new night sky observing season! Have you all made sure your lenses and mirrors are clean and well aligned? That your eyepieces are too and are up to the task? Tweaked your mounts for optimal smoothness and reliability? Then you're all set to explore September's night sky. If not, you may have heard by now about the Equipment Session coming up this month at the observatory. If you don't know by now, you will by the end of the meeting...

So, let's start off with the easiest target first: Jupiter. The king of the planets is rising earlier now, being 20 degrees above the horizon by 22:30 in the middle of the month. By midnight it's about 30 degrees high, and previous early morning observing sessions have shown that the planet is easily observable at medium to high magnification at this elevation. For example, I had very good experiences using 209x a few weeks ago at 02:30, when disc detail was very easy to resolve.

When you do have a look, you may see that something doesn't look right. The Southern Equatorial Belt has faded away, leaving a blank portion on the disc. If you've observed Jupiter before and are used to seeing the distinctive northern and southern equatorial belts, it will instantly strike you as odd! In fact, the SEB fades semi-regularly every 3-15 years. If we are lucky, over the next few months we might see a spot arrive, which will gradually extend out to form the new SEB. The SEB is dead – long live the new SEB.

Beside Jupiter is Uranus. There is not much to see on Uranus visually, but simply tracking it down and seeing it for the first time will be reward in itself. Jupiter can be used as a good stepping-stone for this, as Uranus will be seen in the same low power field of view as Jupiter – if you know where to look. To this end, Sky & Telescope magazine have printable findercharts for Uranus on their website, which will make the task easier. They also include charts for Neptune, which is in between Aquarius and Capricornus at the moment.

Away from the planets, the constellations of Auriga, Perseus and Cassiopeia bring a horde of open clusters with them for us to train our small scopes on (old and new!) this month. Along with them The Pleiades, M45, will be creeping above the horizon too, so reach for the wide angle eyepieces and head to the darkest site possible to enjoy this most wonderful of clusters. A view from a dark site will reveal the delicate strands and wisps of nebulosity between the bright white stars, and if you can frame the view in a good 4-inch or 5-inch refractor you'll have a view you will never forget.

Two other standout objects in September (and for many more months to come) which are best seen on Moonless nights, are the two galaxies M31 and M33. M31, the Andromeda galaxy, is visible to the naked eye from a dark sky site. And needs a wide field of view to take in completely, so large is the extent of the halo which spreads out about three degrees or more. Despite its brightness, a large telescope is required to resolve structure within the halo itself, though many people are quite happy with the low power views through small refractors or large binoculars.

M33, another spiral galaxy within the local group, and known as the Pinwheel Galaxy, is a much more difficult object to see. It is large but faint, so a dark sky site is essential for this one. Once you have found it, about a third of the way between Mithras in Triangulum and Mirach in Andromeda, you *might* then be able to spot it from less ideal skies later on. I first spotted it from a pitch-black site, when it was just barely detectable by eye (magnitude 5.7). Now that I know where to look, I can just about get it on very good nights from beside my house (when the streetlights are blocked off or broken).

With all those fantastic objects to observe, and many more of course, September promises to be an excellent month for visual observing. The observatory opens again for nighttime viewing on Friday 10th and you can bet that most of them will be on the list for that night and many more.

Next Time

The next meeting will take place on Tuesday 5th October at a top-secret venue that is yet to be revealed! Keep an eye on the website and check your emails regularly, as the location will be shared using those media. It will start at 19:30, with the Youngstars children's group starting at 19:00. The main presentation will be by John Rosenfield and will be about the Moons of Uranus.

Until then, get your scopes out, people and enjoy the skies we have in September!

See you in October,

Antony