Stargazey Pie!

A slice of Highlands astronomical life!

Tues 5th July 2011

INTRODUCTION

July's meeting started with a number of worried looking committee members stalking the corridors of the church building looking for more attendees. It's traditionally a month of people going off on holiday (traitors!) so there was a bit of anxiety in the air. Would Paul really only be talking to an audience of eight people? As it turned out, he needn't have worried. The members appeared mostly at the last minute and there was a decent turnout for a summer month. As well as a fine talk, there are some interesting notices this month too…

- **HAS Subscriptions.** After the July Meeting 2010-11 members, who have not yet paid their subscriptions, no longer have the privileges of membership. You are welcome to re-join by paying your annual subscription or to attend meetings as a visitor at a cost of £2.50 per meeting. Paul and Pat W. will give a courtesy phone call to remind you.

- **2011-12 Programme Update.** The following events have been announced for our participation through the coming season:

  Culloden Academy Games Evening Tuesday 21st June at the school. Many thanks to Samantha, James Hitchmough and Pat Escott. who nobly braved the rain. Thank you too to Culloden Academy for allowing us to take part.

  SOAKE Friday 1st July. There will be an update on how this went in the August Notices.

  HAS exhibition at the Highland Archive Centre. Thank you to Pat Escott, Pauline Macrae and James Hitchmough who contributed and set this up. Opening hours 10:00 – 17:00 Mon – Thurs with closing at 19:30 on Wed. This is well worth a visit.

  Astronomy Fun Day for youngsters aged 8-12, Saturday 30th July 10:00 to 13.00 at The Highland Archive Centre. Please contact Pat Escott for details.

  Open Doors Day Saturday 3rd September at the Observatory from 14:00 to 20:00.

  Proposed Glasgow Science Centre HAS Visit Sat. 17th September. Pat Escott will give details at the July Meeting. Another chance for fish'n'chips – who can resist?

  Caroline Smith of the Natural History Museum will talk to the public and schools in Caithness about meteorites/cosmo-chemistry, during the week commencing 14 November 2011. She will probably be bringing meteorite samples with her and has kindly agreed to give a presentation to HAS in relation to this visit. Please watch this space for further details of date and venue.

  The HAS Christmas Dinner will be held on Sat. 3rd December. Pat Escott would welcome suggestions for a venue. Because of the snow last December the committee are recommending that we choose somewhere central in Inverness; ideally a room where we have sole occupancy.

HAS Out Reach Day at the Eastgate Centre Jan. 21st January, 10:00 - 16:00 with viewing at the observatory in the evening.

Volunteers will be needed for most of these events. Please contact Pat Escott.

Also, Dr Lyndsay Fletcher from Glasgow University has kindly agreed to speak to us in October. She is always a stimulating and memorable speaker, having a particular flare. (Solar Flare – geddit?) Michael will now give his talk Naming Astronomical Objects in December.

- **Observing Sessions – JSL Solar Observing.** Solar Saturdays have been back for a while now, allowing observing in the warm with toes unchilled. The Observatory will be open, weather permitting, on Saturdays 14:00 – 16:00 when a supervisor is available. Please check the website for the most up to date information. If you are interested in training as a solar Squaddie please contact Rhona or myself. See Highland Skies below for some insight into the Solar Sessions.

- **HAS Subscriptions.** Thank you to all members who have paid their membership fees. You should have received a receipt from Paul, a letter from the Chairman, a copy of the amended constitution and will retain your voting rights. If you have not yet paid your subscription please do so as membership lapses after the July meeting and you will be cast into a Black Hole as soon as one passes by.

- **Break-Out!** Volunteers are needed to organise the breakout groups please.

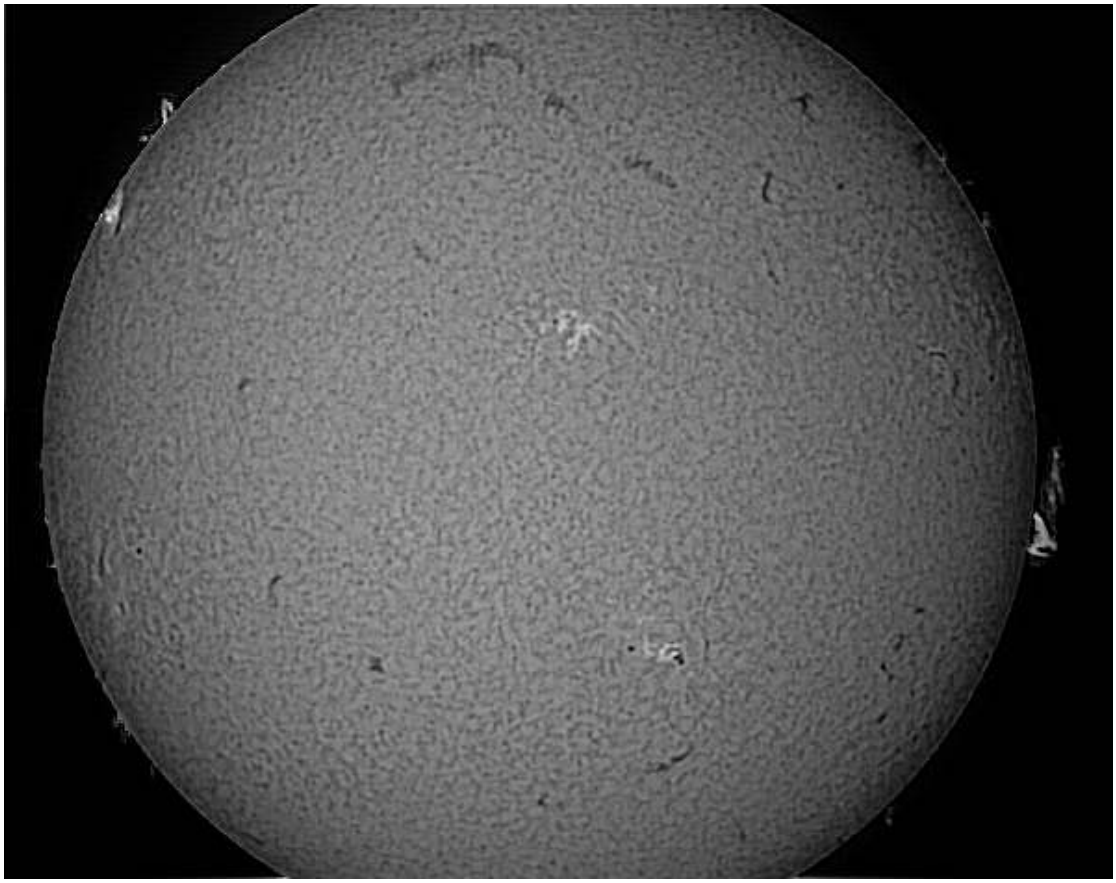
- **June meeting.** 57 people attended the June Meeting to hear Ken Kennedy give his excellent talk on *The Aurora Borealis*. The raffle raised £55.00, so many thanks to Arthur and Lorna who organised it and to Samantha who sold the tickets.

- **Technology Team.** Volunteers needed for the Tech Team, which I presume is to help with the knob-twiddling during the club meetings. Any experienced knob-twiddlers with a desire to help out, please contact a committee member to volunteer.

Shooting Stars: Other Important Club News!

Paul gave us a brief but very exciting account of the goings-on up at the JSL observatory. The Solar Sessions are going very well, and particularly impressive is the progress being made with attaching a webcam to the Lunt solar telescope and feeding the signal to the computer in the observing station. From there it can be displayed on the monitors in real time. I've always wondered what "real time" is – is it any better than "unreal time"? I must try it "sometime". Anyway, the image can be manipulated to bring out the best detail by using freely available software and the results are almost exactly what you would see if looking through the telescope using an eyepiece – except bigger! It makes it a lot easier for large groups of people to view at the same time, and the session hosts can point out features on the disc more easily.

The same technology is used to capture video runs of the Sun, and the individual frames can then be stacked and processed to reveal excellent "stills" of the solar disc. One of my own attempts at this is shown here and Bill Leslie of Sigma is famous for his hydrogen-alpha solar images.



Moving on from the Sun, Paul mentioned that a recent topic for discussion had been whether or not to restore the LX200R telescope to its original equatorial mode, which was very unsatisfactory and made for a lot of apologising and looking embarrassed on observing nights. The main advantage for mounting the telescope equatorially is for long-exposure astrophotography. These days, however, it is more common to capture larger numbers of shorter exposure images, and use the methods detailed above to combine and process them. It has therefore been decided to leave the telescope in its current, working alt-azimuth-mounted mode.

A rather lovely image of noctilucent clouds, taken by distant member Eric Walker, was shown, resulting in comments being passed by several members showing that they too had seen the phenomenon on the night the picture was taken. A discussion was then instigated about why the telephone contact list had not been used. However, considering that the photograph was taken in the early hours of the morning (approximately 01:30) there was reluctance to start making phone-calls to people who would not want to be bothered, even though they are on the contact list. Will a special "Early Hours" contact list be created? Watch this space.

Eric Walker's photograph of noctilucent clouds (NLC's)

The Main Event:
'The Going of Dawn' by Paul Jenkins

Paul Jenkins is well known to you all as the man who takes your money from you when you join the club. In his past life he has also worked in Fuel Sciences, the Royal Air Force, Airport Management, and most recently the Highland Council! Through it all he had a passion for astronomy and cosmology, and then one day, walking through the Eastgate Shopping Centre, he happened across a stand being run by the Highlands Astronomical Society… and the rest is history!

Paul's recent talks have all dealt with the subject of space travel, though mostly theoretical in nature. This talk was also about space travel, but the vehicle that is the subject of the talk is out there right now fulfilling its mission. Why DAWN? Perhaps because of he content of the mission parameters. The following text is from NASA's homepage for the DAWN mission:

"Dawn, as a mission belonging to NASA's Discovery Program, delves into the unknown, drives new technology innovations, and achieves what's never been attempted before. In Dawn's case, it is orbiting one member of the main asteroid belt, Vesta, before heading to gather yet more data at a second, Ceres.

Dawn's goal is to characterize the conditions and processes of the solar system's earliest epoch by investigating in detail two of the largest protoplanets remaining intact since their formations. Ceres and Vesta reside in the extensive zone between Mars and Jupiter together with many other smaller bodies, called the asteroid belt. Each has followed a very different evolutionary path constrained by the diversity of processes that operated during the first few million years of solar system evolution. "

Ever driven by the wonder of the technology involved, Paul showed a video of the launch of the Titan V rocket that carried DAWN on its journey into space on 27th Sept 2007. These launch videos are always amazing but even more so when you think that the launch is only the beginning. Once in orbit, DAWN had to set off on its journey to Mars.

Although Mars was not the mission goal, in order to reach Vesta the probe would need to execute a "slingshot" maneuver around the planet, before shooting off on course to Vesta, having increased its speed by 5800mph! The speed increase is given by the orbital angular momentum of the gravitating body as it pulls on the spacecraft. The vehicle uses a new system of propulsion known as an Ion Engine. Using Xenon fuel and the power generated by its 65-inch solar panels, the Xenon is ionised and then accelerated using an electric field. Electrons are injected into the field after the acceleration, which results in thrust being developed out of the engine that pushes the vehicle on its way.

Although the thrust generated is low to start with, the engine can be left firing for a very long time (up to 50,000 hours is estimated for the duration of the mission) and so builds up very high speeds using very little actual fuel.

DAWN is now using its Hydrazine-fuelled thrusters to brake in its approach to Vesta, which is thought to be a protoplanet with a diameter of about 530km. It is probably the second largest object in the asteroid belt (though Pallas is similar in size), with the only definitely larger one being Ceres, also on DAWN's tour list. Incidentally, Vesta was the fourth asteroid to be discovered, in 1807 by German astronomer Heinrich Wilhelm Olbers. It is observable from Earth using small telescopes, as is Ceres, and finder charts for them both are published in the pages of Astronomy Now magazine every month.

The two bodies are very different, with Vesta having evidence of basaltic lava flows and a large impact crater, while Ceres has a dusty surface and evidence of water ice. The mission hopes to gather data using the many instruments described by Paul and transmit it back to Earth, allowing scientists to compare the two minor planets and try to unravel the mysteries of their journeys through the protoplanetary period.

DAWN should reach Vesta on or around July 16th, and be captured by its gravity at a distance of about 16,000km. Once in closer orbit the probe will begin to gather information on this fascinating artefact of cosmological history and pass it back to us on Earth. The news from the mission is constantly being updated on its homepage http://dawn.jpl.nasa.gov/mission and will be in all the astronomical press over the coming months and years. Keep an eye open for it, and perhaps for the asteroid itself, as it will be visible again to us in the coming months too!

Thanks once again to Paul for taking us on another journey out into space – a real current one this time – and showing us what makes DAWN tick and the importance of its mission. We look forward to hearing more about it, and to Paul handing out our spacesuits for his next venture: my money's on a combined talk and HAS daytrip entitled, "Come With Me to Mars in Maarten's Homebuilt Capsule"…

Highland Skies – July 2011

I'm writing this ahead of the meeting on Tuesday 5th, obviously, but I'm assuming that on your way in to the church, before you picked up this piece of paper, you were offered the opportunity to look through a very special telescope standing outside the entrance. Possibly there were two 'scopes for you to look through. Their target: The Sun. (In the event there was no Sun and so no telescopes – Ant)

Summer is a great time for solar observing. Well, duh – that's obvious isn't it? Solar observing is a nice relaxed comfortable part of the hobby of astronomy. It takes place in daylight, under the Sun – so it's going to be warmer than nighttime observing in the winter. It tends to happen in daylight too, which is a bonus, as you can generally find where you put everything and are much less likely to crash into the tripod, upsetting the alignment of the mount. You're less likely to sit on your glasses too – a valuable consideration for anyone who's done it…

However, summer 2011 is an extra special opportunity as the Sun is a lot more active now than it has been in recent years – meaning that there's more to see!

The club's Lunt LS60THaC1200 hydrogen alpha solar telescope is a very specialised piece of equipment, that even ten years ago would have been virtually unreachable for the average amateur astronomer; even for the average astronomy club. Thankfully the production and development of these telescopes has improved and they have become more attainable for the average person with an interest in the Sun, and for clubs who are willing to make the still considerable investment on their members' behalf. They can still not be considered "cheap" though.

The Lunt was purchased by HAS so that our members could make use of the solar observing opportunities at "Solar Saturday" events through the summer, and get a chance to see for themselves the incredible dynamic features that our star's chromosphere has to offer. That's not just one or two events through the year, that's EVERY Saturday as long as it's clear and sunny, and some Sundays too, depending on the availability of the Solar Squad hosts!

If you took the opportunity to "have a look" as you passed into the church tonight, perhaps you made a comment along the lines of "that's impressive," or simply "Wow!" - I do every time I look at the Sun through one of these modern marvels. Unfortunately when I've attended or hosted a Solar Saturday event I have noticed that not many club members come along, and I wondered why? Is it because you think that having looked at the Sun once on a Tuesday evening it will be the same for the next month? Not so. The Sun's chromosphere is active and changes every second. You can notice real changes in the view in as little as 15-20 minutes.

Is it because you think it will be "difficult" and uncomfortable? See second paragraph and consider that you will be among friends at the observatory for these events, with chat and banter between looks at the Sun, and even the possibility of a biscuit or two! You even get to have a seat while enjoying the view, and we are also mastering the video uplink to the indoor screens with impressive results.

Is it because you think it will be expensive? Don't worry, it's all paid for already. Your Solar Saturday observing sessions are free, gratis and for nothing. The telescope that a decade ago would have been completely out of reach has been put in front of you and is there for YOU to use: one of the included benefits of you annual membership fee.

So now that you know a bit more about the Solar Saturdays, why not make the effort of coming along to have a look, and give the Solar Squad hosts a reason for being there? Bring the family and friends too: it's open to everyone after all – in fact we currently get far more non-member visitors than members!

Solar observing at a Solar Saturday event is dead easy – come along and have some fun in the Sun!

Next Time

The next meeting takes place on Tuesday 2nd August at Smithton-Culloden Free Church and will start at 19:30. The talk will be "Getting Close to an Exo-Earth" and will be given by James McTaggart. The Youngstars (8-14 year olds) will meet before the main meeting, at 19:00 with Pauline and Triona. The usual club perks of tea, coffee, biscuits and chat will all be on offer too. What fun! And there may be a telescope or two to have a look at or through as well.

In the meantime, watch out for those midgies!

Antony McEwan