

Stargazey Pie!

A slice of Highlands astronomical life!

Tues 7th Dec 2010

Introduction

A surprising number of people turned up to the meeting after braving sub-freezing conditions, snow and ice. They received a warm welcome with tea, coffee and Christmas biscuits, and were treated to a cosmological mystery By Paul Jenkins. Unfortunately Antony was unable to make it leaving this month's newsletter in my frosty hands. (*Cold hands, warm heart – Antony ☺*)

- **HAS Secretary Roles (Membership Secretary and Organising Secretary)**

- The HAS Secretary role is being divided into two manageable parts:
 - **Membership Secretary:** act as Charity Officer, record and monitor committee meetings and membership of the Society
 - **Organising Secretary:** compile and manage the programme of meetings, organise social events, outings, etc.

The Committee are making a passionate plea to the membership for volunteers to recruit to these posts. We are a large Society and, for too long the running of it has been supported by too small a team of enthusiastic individuals. The Society desperately needs its membership to rise to the challenge and play an active part to ensure its survival and development.

- **HAS Discussion Forum (Messageboard)** – this facility is now operational for all members to take part. Put <http://spacegazer.freebb3.com/> into your web browser and follow the easy instructions to register. We look forward to many interesting discussions, debates, observing opportunities, buying and selling and anything else which stimulates our members to regularly use this online resource.
- **Night-time Observing Sessions: JSL Observatory** – sessions open at 8.00pm with last admission at 10.00pm. Finish time is around 11.00pm. (*except * which are 6.30pm finishing at 8.00pm – these are the holiday times.*) Please check the website for the most up to date information.

Fri	10th	Dec	-	public & members	supervisor: Paul
Sat	11th	Dec	-	members & guests only	supervisor: Gerry
Mon	27th	Dec*	-	public & members	supervisor: Pauline
Tues	28th	Dec*	-	public & members	supervisor: Paul
Wed	29th	Dec*	-	public & members	supervisor: Rhona
Thur	30th	Dec*	-	public & members	supervisor: Gerry
Fri	7th	Jan	-	public & members	supervisor: Pauline
Sat	8th	Jan	-	public & members	supervisor: Paul

- **HAS Communications with Members** – there has been considerable discussion at Committee meetings as how best to routinely keep members up-to-date with current and forthcoming events. Various options are the website, group texting (SMS), emailing, MFR, Inverness Courier, Society mobile 'phone, carrier pigeon, smoke signals, astral projection, etc. Suggestions from the membership are welcome for consideration.

- **HAS Seeing Stars article** will be published in last Friday's Inverness Courier and will shortly find its way onto our website. The article is entitled 'Lunar Landscapes in Focus' and was written by Antony McEwan.
- **Please note, the next HAS meeting is on Tuesday 11th January 2011.**
Our last meeting was attended by 47 people (39 members, 5 Visitors and 3 YoungStars).
- **Astrofest 2011** – will be held in Kensington Town Hall on Friday 4th and Saturday 5th February 2011. If anyone is planning to go would they please contact Pat Williams.
- **Astronomical Events & Highlights** – an easy to read and use guide is provided by Manchester University and can be found at www.jodrellbank.manchester.ac.uk/astronomy/nightsky/.
- **BBC Two: Stargazing LIVE** – 3rd–5th Jan 2011, hosted by Prof. Brian Cox and Dara O'Brian.



BBC Two are running a series hosted by Brian Cox starting early in the New Year (3-5 Jan 2011). The theme is based upon local astronomical events. The BBC contacted HAS through our website enquiry page. The BBC will feature our events and provide marketing material such as posters, star guides and activity packs.

The timing keys in with our planned events over that period, and we will participate without too much extra effort.

Date of event	Friday 7 th January
Time of event	2000h – 2300h
Location of event	JSL Observatory (nr. Culloden Battlefield NTS Visitor Centre, IV2 5EU)
Event name / title	Public Observing Session

Date of event	Saturday 8 th January
Time of event	11030h – 1530h
Location of event if different from above (inc postcode)	Eastgate Shopping Centre, Inverness, IV2 3PP
Event name / title	Highlands Astronomical Society – Open Day

Date of event	Saturday 8 th January
Time of event	2000h – 2300h
Location of event if different from above	JSL Observatory (nr. Culloden Battlefield NTS Visitor Centre, IV2 5EU)

(inc postcode)	
Event name / title	Public Observing Session

Date of event	Tuesday 11 th January
Time of event	1930h – 2200h
Location of event if different from above (inc postcode)	Smithton Primary School, IV2 7PD
Event name / title	Monthly Meeting

HAS would welcome additional volunteers for the Public Observation Sessions.

Beyond Infinity

The talk this month was given by Paul Jenkins, our current Treasurer and former Observatory Manager. Paul has a degree in fuel sciences but ended up as an engineer in the RAF where he gained a degree in thermodynamics and aero-engine design and became a Chartered Mechanical Engineer. After retiring from the RAF he worked as General Manager of Highlands and Islands airports and as an Internal Consultant with the Highland Council. Now retired, he enjoys indulging in his passion of astronomy and cosmology.

Paul begins with the question: “what is life, the universe and everything” to which the answer is of course 42. Or is it? This talk sets out to try to find answers to this central question.

Starting with the ‘standard model’, Paul explains that this is generally thought to be the most probable explanation of how the Universe came to be. However, not all cosmologists agree. In order to make the Big Bang work as a theory some of the ideas have been made to fit rather than finding the actual evidence – Paul calls these ‘fudges’.

The universe started as a primeval atom, very small and very hot, containing all the mass and energy present today. It began to expand very quickly but not sufficiently to account for the expansion we see now leading to the first major ‘fudge’: inflation. A different type of physics has to be invoked during the first fraction of a second when inflation occurs and which then becomes the physics we understand.

A degree of turbulence occurred during inflation creating the clumps of energy and matter that can be seen in the COBE and Planck Satellite pictures. These show the seeds of galaxies, some as young as 600 million years after the Big Bang. Since then galaxies have evolved into the different types we see today. The proto galaxies were much closer together when light left them to travel to Earth.

The Observable Universe is defined as the sphere whose radius is the distance light can travel in the 13.7 billion years since the Big Bang. We are unable to see beyond the surface of that sphere so should only be able to see 13.7 billion years backwards where we find that the proto-galaxies were only about half way out towards the edge of the Observable Universe. Paul wants to know what is beyond the Observable Universe.

Paul also asks the nature of the space into which the universe was born and what was there before the Big Bang.

The second major 'fudge' is dark matter. This has been invoked to explain why stars move almost as fast around the edge of a galaxy as the stars close to the centre of a galaxy when they should be moving very much more slowly. No one knows what dark matter is or what it is made of and its nature is yet to be discovered; this makes Paul skeptical.

The third major 'fudge' is known as dark energy, which is supposed to explain the apparent lack of energy in the universe. After inflation the universe expanded further but then slowed under the effect of gravity, which eventually became the weaker force as dark energy took over and the rate of expansion began to increase once again. Again, no one knows what dark energy is or what it consists of.

It is thought by some that inflation may have been a sudden phase change and thus expanded beyond the distance that light can travel which means we cannot see beyond the distance that light has travelled, the whole universe extends beyond the observable universe – beyond infinity says Paul.

Some cosmologists are now asking whether the Big Bang really was the start of the universe.

Penrose suggests that there must have been an endless cycle of creation and death to ensure that entropy (disorder) remains low at the birth of the universe since entropy increases with time.

Steinhardt and Turok suggest that the universe cycles through an endless sequence of big crunches and big bangs. The homogeneity and flatness that has been observed were from events occurring before the most recent big bang and the seeds of galaxies formed during the big crunch.

Others suggest we have multiverses or interconnected bubble universes. In M-theory, there are 'branes' in which our four spatial dimensions are contained in a brane that can have 11 dimensions.

However none of these ideas tell Paul what is outside the observable universe, what was outside the primeval atom just as the universe was born, what was there just before the universe was born and what caused the birth of the universe?

If you know please tell Paul as he really wants to find out!

Highland Skies – December 2010

Antony McEwan

Wow – it's nearly the end of the year again! Here we are in December, traditionally one of the most exciting observing months in the calendar. Ideally we would all be out now with our telescopes under a clear frosty sky, hopefully in not too cold a temperature, with excellent seeing... but looking at what?

There are so many choices! Gemini is up, with the great clusters M35 and NGC2158; a combination of easy and not so easy open clusters in the same moderate field of view. How about nearby but neglected open clusters NGC 2129 and NGC 2175? Both 7th magnitude so within easy reach of small telescopes, but both so often overlooked in favour of their more well-known neighbours.

Perhaps it's time for a tour of the famous open clusters in Auriga: M36, M37 and M38 – and their 'poor neighbour', NGC 1907, often visible in the same field of view as M38 if you know where to look.

I think it's been a while since I mentioned M45, the Pleiades, hasn't it? The most beautiful open cluster in the northern sky is now high up in the southeast and presents the most gorgeous sight in binoculars or a small refractor with a wide-angle eyepiece. Or even a large refractor with a wide-angle eyepiece – let's not be biased! See if you can spot the patches of nebulosity within the clusters borders, particularly around the brighter central stars. A dark observing site helps with this.

On an even larger scale, but perhaps not so obvious, are the Hyades, which form part of the torso and head of Taurus and surround the bright red Bull's eye: Aldebaran. The cluster is visually vast, covering

about 8 to 10 degrees, so is best swept with big binoculars for the ultimate "Wow" factor. It is also one of the closest star clusters to the Earth at only 151 light years away.

Oh yes, and then there's that great big constellation that covers a huge swathe of sky and has more bright stars in it than any other. What's his name again... Orion! Well, Orion is just chock full of everything. Think of it as a complete observing season in one constellation. Double and multiple stars, emission nebulae, reflection nebulae, dark nebulae, HII regions and star-formation regions are all there. You can literally spend every night of the month looking at Orion and never grow tired of it. Especially if you rise to the challenge of hunting down the elusive Horsehead Nebula visually...

Jupiter is getting exciting. A 'spot' has been, well, "spotted" in the area of the vanished Southern Equatorial Belt, which means in all likelihood that a new SEB will soon be forming. When it does, every single chance to observe the planet should be taken, to see the new belt being dynamically formed before our eyes. A series of further spots will probably appear at similar latitudes, and gradually "bleed" into each other until a distinct new belt is formed. Exciting stuff! Catch it now, as the SEB can last for several years (over a decade, even) before disappearing and reforming again.

I'm not going to list target after target for you to hunt down this month. Just wrap up warm and take yourselves out into the dark and enjoy the view. If you take binoculars or telescopes, then enjoy using them and treat them with care so that they can return the favour and reward you with stunning views of the treasures of the winter sky. If not, then just use your eyes to soak up the grandeur of it all.

Next Time

As the first Tuesday of the month falls on a public holiday, the next HAS meeting will take place on Tuesday 11th January when Maarten de Vries of HAS will be giving us a talk on 'Seeing the Quantum World Through a Telescope'. The YoungStars session for children (8-14 years old) will be held before the main meeting, running from 19:00 until 19:30.

Have a good Christmas and happy New year!

Pauline Macrae