Stargazey Pie

A slice of Highlands astronomical life!

HAS Meeting Notices January 2012

Get ahead, get a hat or three.
Arthur, at the December meeting, challenged us with his annual Christmas quiz. Team marks reflected well on the knowledge of the society and on the information imparted by speakers throughout the year. Here are three members of Pauline's winning team wearing the hats kindly donated by Rhona, following her trip to Antarctica and New Zealand. The other members of the team were Pauline, Pat E. and Kieran.

Sarah, Lewis & Samantha Winners of the New Zealand Hats.

1. 2011-12 Programme Update With Dates For Your Diary.

Michael's talk *Naming Astronomical Objects* *is* rescheduled for February with Arthur's *Elements of Surprise* in April.

BBC Stargazing Live Programmes are on BBC2 on Mon. 16th; Tues. 17th and Wed. 18th of January 2012.

Saturday 21st January from 10:00 to 16:00 - **Outreach Day** at the Eastgate Centre, Inverness. This has been arranged to coincide with the BBC Stargazing Live Programmes.

The **Observatory** will be open for public viewing on the same evening from 20:00 to 23:00 and also on Thursday 19th and Friday 20th January in a change to the schedule. Members competent to show the public objects in the night sky through their own telescopes should contact Gerry Gaitens on 07761 866778 or gerrygaitens@aol.com or Pat Escott as above.

Astrofest 2012 takes place in Kensington Town Hall on Friday 10th and Saturday 11th of February. For details see http://www.astronomynow.com/astrofest/. Ten or more HAS members will be there. If you are planning to go and wish to join us then please contact Pat Williams on 0793 0183 999 or e-mail pat@spacegazer.com
A HAS social programme for the evenings is almost finalised. Tickets will be bought and tables booked so do not delay.

2. Observing Sessions - JSL Observatory, NTS Visitor Centre Car Park, Culloden Moor.

Thanks to the generosity of a benefactor we have a SkyWatcher 90 Maksutov telescope and an EQ-1 mount available for loan to members. This would be a good opportunity to try out such a telescope, and to get into observing, before committing to a telescope purchase. If you would like to borrow it for a while please contact:
Gerry (*01349 863563 or 07761 866 778*) or
Paul (*01667 456789 or 07776 262 865)*

SkyWatcher 90 available for loan.

2 (continued). Observing Sessions - JSL Observatory, NTS Visitor Centre Car Park, Culloden Moor.
Please check www.spacegazer.com before setting out. We now have internet access and can also view the live telescope sightings from the warm room, so if the cold was putting you off, come and try our latest facilities.

Date	For Whom	Time	Supervisor
Thu. 19th Jan.	Public and members	20:00 – 22:00	Pauline
Fri. 20th Jan.	public and members	20:00 – 23:00	Rhona, PJ, GG
Sat. 21st Jan.	public and members	20:00 – 23:00	Pauline
Fri. 27th Jan.	public and members	20:00 – 23:00	Pat W
Sat. 28th Jan.	members and guests only	20:00 – 23:00	Paul J
Fri. 17th Feb.	public and members	20:00 – 23:00	Pauline
Sat. 18th Feb.	members and guests only	20:00 – 23:00	Paul J

We apologise for the absence of January's *Highland Skies.*

3. The Next Meeting will be Tuesday 7th February 2012.
Our speaker then will be Michael Marett-Crosby with a talk entitled "*Naming Astronomical Objects*". The **"Youngstars"** session for 8-14 year olds before the main meeting, will run from 19:00 until 19:30 led by Pauline and Triona.

4. Would you like to become more involved with the club? This applies to all members both new and old.
Help is needed with; break-out groups, technology at the meetings, the tea-team, the observatory (training will be given), giving a talk, becoming a committee member or simply giving us your suggestions. All talents can be utilised. Speak to a committee member at the meeting or contact Pat Williams on 0793 0183 999 or e-mail pat@spacegazer.com

5. December Meeting and Stargazey Pie.
Despite the weather 34 people attended the December Meeting. The raffle raised £17.00
The *Pie,* in Antony's absence, was written by Pauline and subsequently sent to all members who were unable to attend the meeting.

6. Membership.
We currently have 94 members.

7. Keeping the Secretary Up to Date.
A heartfelt plea! Please let me know if your contact details change. As to mine, an error in last month's notices, my e-mail addresses are pat@spacegazer.com or pat.williams@ndirect.co.uk .

8. Orkney Astronomical Society.
A new society is being formed there. Arthur and Pat E. took part in a video of our observatory to let the people in Orkney see what we had achieved. http://www.oisf.org/

9. Satellite 3.
This two day science fiction convention is taking place in the Grand Central Hotel, Glasgow on the 25th and 26th of February 2012. Theme - Mars and the Chinese Space Programme. More details can be found at www.satellite3.org.uk

10. Lecture at the Rothiemurchus Estate.
We are invited to a guest lecture from Ian Sheffield, now retired, who previously worked at the Royal Observatory Edinburgh and other observatories around the world. The lecture is on Wednesday 18th January at 7.00pm in the Rothiemurchus Tennis Clubhouse. It is free to attend and refreshments are included.

Tea break has been extended to allow more time to chat to other members and savour the tea and biscuits.

Observatory report
Paul gave us the observatory report. The weather had been disappointing over the Christmas period, and few of the extra observing sessions that had been scheduled proved feasible. Nevertheless, a number of objects had been observed, perhaps for the first time for some of those present. There was also the opportunity to try out the 17 mm Nagler eyepiece that had been purchased for the Observatory. (It works very well!).

Members were encouraged to come along and make use of the splendid facilities at the Observatory. There were a number of scheduled sessions coming up in late January, and additional ones had been included on the 19th, 20th and the 21st to link in with this year's BBC Stargazing Live programmes.

The Society had been gifted a Skywatcher MAK90EQ1 telescope, which was now available for loan to Members who would like to try their hand at observing from home. Anyone who wished to borrow it should contact Gerry or Paul. Advice would be given on setting it up and using it.

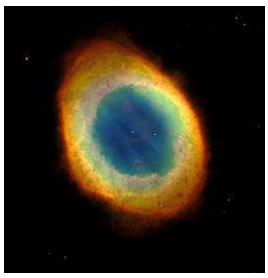
Mercury Messenger update
John Rosenfield briefly told us that BepiColumbo, an ESA mission, will be investigating, in further detail, the results being found at the moment by Mercury Messenger.

Children's Group
Led by Trina this month, who showed us the amazing mathematical pattern of Bodes Law, which predicts the distance of the planets from the Sun. http://www.astro.cornell.edu/academics/courses/astro201/bodes_law.htm

Main Event
Maarten, a long time member of HAS, one time Chairman and a major instigator of our observatory, gave us a superb talk with the strange title of Celestial Oddballs.

In order to help understand how these oddball stars were made, Maarten began his talk with some revision of the double slit experiment showing that very small particles behave like waves as well as particles. He then described how the exclusion principle explains why atoms are mostly empty space but things appear solid and that very small particles can appear anywhere in the universe. Finally a reminder that kinetic energy is heat, which is the movement of atoms. This all helped explain why oddball stars have their strange structure.

Stars are formed by gas collapsing under gravity; potential energy pulls the gas inwards and kinetic energy warms it up. A star shines because it is balanced by the inward pull of gravity and the outward push of radiation energy due to nuclear reactions. Over time, stars fuse their hydrogen to make helium, which is then fused into carbon and so on producing more elements depending on the size of the star. Each reaction requires more heat and goes faster until, in the largest stars, iron is formed in the core. Energy at this point would have to be put into the system so iron cannot be fused.

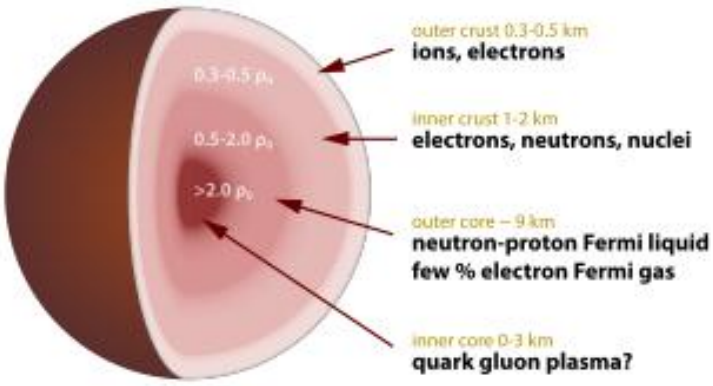


Our Sun, due to its mass, will eventually become a red giant and thence a planetary nebula. The remnant star in the centre collapses under gravity to become a white dwarf star with a mass always less than 1.4 solar masses.
To the left is the ring nebular – a planetary nebula

White dwarfs are composed of hydrogen, helium, carbon and oxygen because stars similar to the mass of the Sun cannot produce more elements than these. Pressure from electrons within these elements jiggle against each other to prevent further collapse. The smaller the white dwarf the more massive it is; a cm cube of white dwarf matter weighs about a ton. The core is crystalline, there is a strong magnetic field and the temperature is constant throughout.

White dwarfs in the sky include 40 Eridani B and Sirius B.

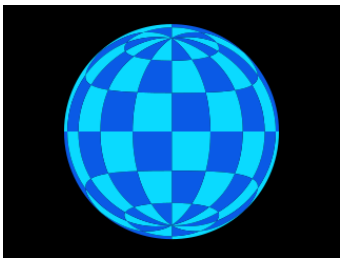
A white dwarf can go supernova if it contains enough carbon and is just under the mass limit of 1.4 solar masses. If the carbon fuses together the white dwarf will explode.



Stars greater than eight times the mass of our Sun will continue burning elements until iron. At this point a supernova explosion occurs and the result is a neutron star that has a mass of between 1.4 and 2.0 solar masses. Electrons can no longer exert a pressure, as they did in white dwarfs, but instead will merge with protons to form neutrons thus forming a neutron star with the release of neutrinos. The neutrons now form a pressure to prevent further collapse.

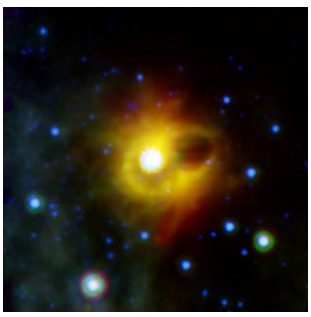
The interior of a neutron star

Neutron stars have very high temperatures, strong magnetic fields and they are extremely dense; a 1cm cube of neutron star weighs 100 million tons but they are not very bright because they are so small – about 15km across.



There are also relativistic effects due to the extreme gravity
e.g. it would be possible to see the north and south pole at the same time.

Pulsars are spinning neutron stars. Due to conservation of angular momentum, as stars collapse into a neutron star, (and thus get smaller) their speed of spin increases. As they spin they beam radiation across the universe like a lighthouse which we can see (hear) if the beam crosses the Earth.
Shown to the right is the crab nebular pulsar.
Maarten let us listen to the noises made by various pulsars.
http://www.jb.man.ac.uk/pulsar/Education/Sounds/sounds.html



Magnetars are even more incredible. These are neutron stars with even more powerful magnetic fields but they spin a little more slowly. Magnetic quakes occur, breaking the crust, which then gives rise to soft gamma ray bursts. This is SGR 1900+14 in infrared light. The magnetar is in the centre although we cannot actually see it.

Thank you Maarten for your fascinating and excellent talk on some very oddball stars out in space.

Break-out Groups
There was a discussion group led by Arthur where Maarten was able to explain his talk in a little more detail and answer any further questions.
Pauline did the constellation of Draco; its myth, its importance as North Pole Star 5000 years ago and the points of interest within it.

Next time (February 7th) Michael will be able to speak to us at last about naming astronomical objects, postponed from October to kindly make way for Lyndsay Fletcher's talk, then from December because of the snow and now brought forward to February as Arthur is unable to give us his talk next month. I'm sure it will be worth waiting for.

Till then, clear skies.