

I have to start 2013 with sad news I'm afraid:

John Smith MBE

Sadly, John died on Sunday 30th December 2012, John Langley kindly submitted an obituary - see page 5.

Sir Patrick Moore

Sir Patrick, an honorary member of the Vectis Astronomical Society for many years, died on 9th December 2012 and will be sadly missed by astronomers everywhere. Anyone with even a passing knowledge or interest in astronomy will surely know the important contribution Sir Patrick made during his life - His [Wikipedia entry](#) tells the story far better than I ever will.

Society News

It's been a hectic start to the year what with StarGazing Live! and a sudden increase in public interest. It seems that Astronomy is the new black and everyone wants a slice.

We have already got 6 groups of Cubs/Scouts/Brownies/Guides and schools with dates for observatory visits for Feb and March. We also have a couple more diary dates for other groups later in the year.

Junior Members

Whilst we have lots of observatory visits from Scouts, Guides and schools, we don't see much of our own younger members. We'd very much like to correct that and are inviting Junior Members and their parents to a **special meeting at 19.30 on Friday 15th February**.

The idea is to discuss what you'd like from VAS and hopefully start the ball rolling towards a regular meeting each month.

Please let me know if you can attend.

Diary Date

Early I know, but we have reserved **Thursday 16th May as a Barbecue Night** at the observatory. VAS will provide cooking facilities, soft drinks and rolls etc. Just bring your own meat/veggie option.

Clear Skies!
Brian Curd

Observatory Director

VAS Website: www.wightastronomy.org

Submissions or letters to New Zenith are always welcome and should be sent to:

The Editor New Zenith
35 Forest Road
Winford
Sandown PO36 0JY

Tel: 01983 864303 or email: editor@wightastronomy.org

Material for the next issue by the 6th of the month please.

VAS Registered Office

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Observatory Diary

Monday, 19.30hrs	Members Only by arrangement Telescope and night sky training. Contact Barry Bates 01983 872979
Thursday, 19.30hrs	Members and Public. Informal meeting and observing.

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Monthly Meeting Calendar 2013

Check the website for up to the minute information.

Travel for our monthly speakers is sponsored by:		
		
Date	Subject	Speaker
25 Jan	Mapping the Universe	Dr Rita Tojeiro
22 Feb	Galaxy and Mass Assembly	Dr Jon Loveday
22 Mar	Active Galaxies	Nick Hewitt
Apr		
May		
Jun		
Jul		
Aug		
27Sep	History of the Dark Sky	Alan Dowdell
Oct		
Nov		

All details correct at time of publication.

Do You Know a Speaker?

As you can probably see, we are have some spaces at the moment.

If you know anyone who can help, or perhaps you would be prepared to have a go, please contact Elaine Spear at progorg@wightastronomy.org

Subscription Changes

Please read "A Cost Saving Simplification" on page 8 for details regarding a change to our Subscription collection. VAS will save a considerable sum each year once this is implemented.

VAS Contacts 2013

Chairman	Bryn Davis chairman@wightastronomy.org
Secretary	Rebecca Mitchelmore secretary@wightastronomy.org
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NZ Editor	Brian Curd editor@wightastronomy.org
Membership Secretary	Norman Osborn members@wightastronomy.org
NZ Distribution	Brian Bond distribution@wightastronomy.org
Others	Barry Bates Mark Williams

On Line Forum

Dear members, we have made exciting changes to VAS on Facebook. We now have a VAS forum where you can ask for help share ideas your photos, or generally discuss and find out information regarding astronomy.

Invitations have been sent to join our new Facebook "Group" to those of you who already "liked" our old page. If this has not got through to you then to find it please follow the link:

http://www.facebook.com/groups/242279475901520/268339489962185/?notif_t=group_comment#!/groups/242279475901520/?fref=ts

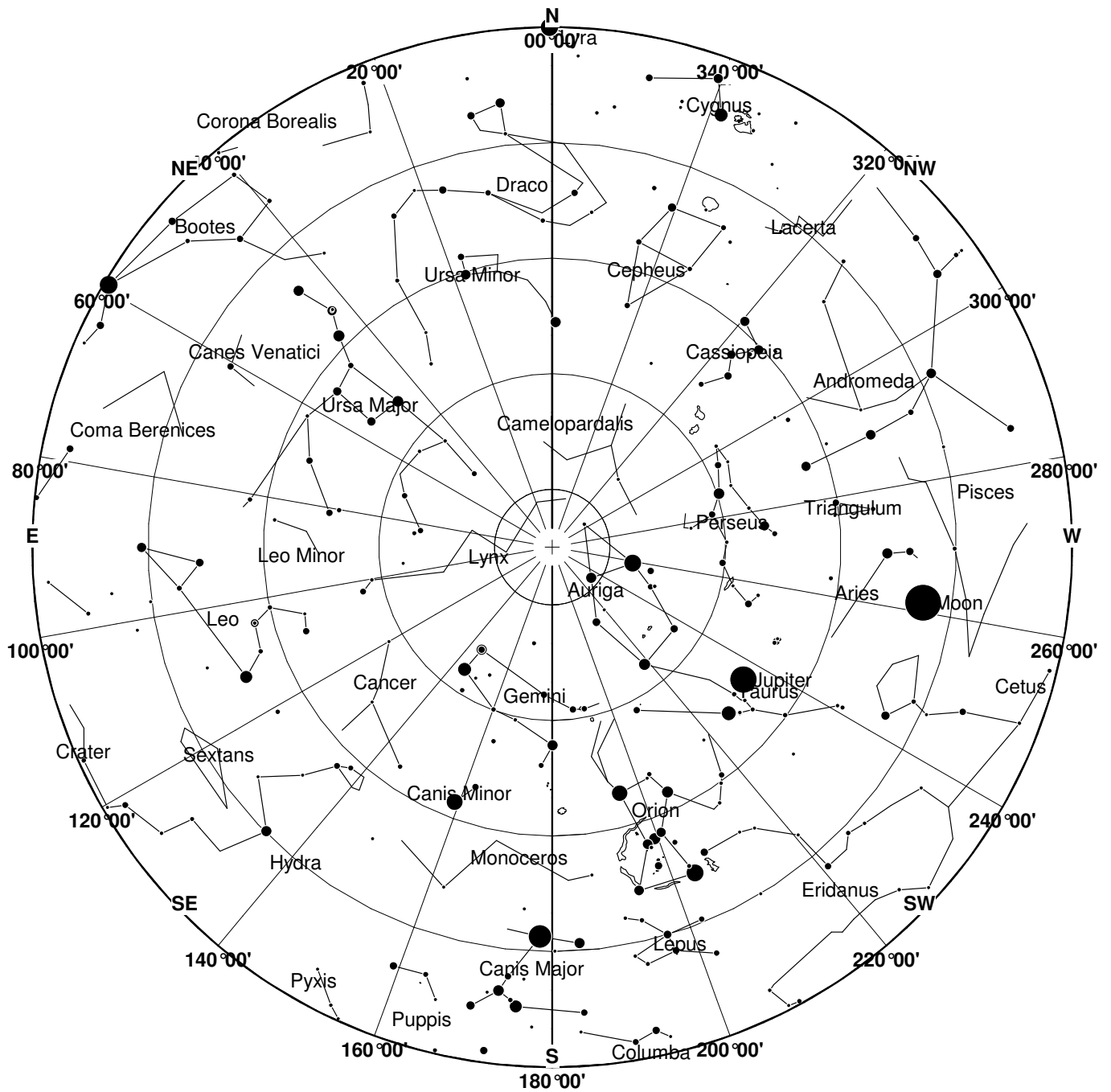
or search for Vectis Astronomy Society - Group. It is possible to set yourself up on Facebook just to enjoy the astronomy forum, and not partake in "normal" facebook use, it will be worth it!

The more of you that join the better it will be! Any questions or assistance on what to do, please speak to Simon Plumley or Elaine Spear.

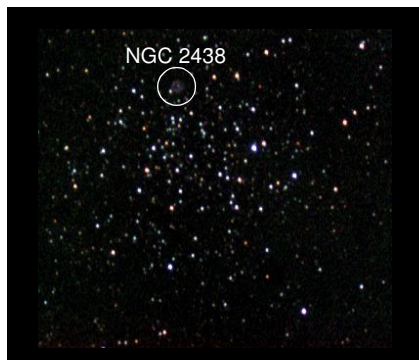
My email address is splumley69@gmail.com and I would be happy to hear from you.

Simon Plumley

February 2013 Sky Map



View from Newchurch Isle of Wight UK - 2100hrs - 15 February 2013



Messier 46 (also known as NGC 2437) is an open cluster in the constellation of Puppis. Discovered by Charles Messier in 1771. Dreyer described it as “very bright, very rich, very large.” M46 is about 5,500 light-years away with an estimated age of several 100 million years.

Planetary nebula NGC 2438 appears to lie within the cluster near its northern edge, but it is most likely unrelated since it does not share the cluster’s radial velocity. The case is yet another example of a superposed pair, joining the famed case of NGC 2818.

M46 is about a degree east of M47 in the sky, so the two fit well in a binocular or wide-angle telescope field.

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It uses material from the Wikipedia article “Messier 46”

February 2013 Night Sky

Moon Phases

New	1 st Qtr	Full	Last Qtr
10th	17th	25th	3rd

Planets

Mercury

Mercury makes a rather unfavourable appearance in the evening sky during the first fortnight of the month. Mercury can be quite bright but it will be low down in a bright sky. Its greatest separation from the Sun is only some 18 degrees and by the time this is achieved its brightness is already fading fast.

Altitude and Azimuth for Mercury at sunset during February					
Date	Alt	Az	Date	Alt	Az
1	6°	236°	12	14°	239°
4	8°	236°	16	15°	243°
8	11°	238°	20	15°	247°

Venus

As Venus passes behind the Sun it will not be visible for a few months reappearing as the evening star in early May.

Mars

Mars is too close to the Sun in the evening sky to be easily visible. For those who enjoy a challenge and have a good western horizon Mars and Mercury are in close conjunction, just 15 arc seconds apart on the 8th.

Jupiter

Jupiter is well placed for observation in the evening sky. It is so bright that as darkness falls it can not be missed high in the southern sky in the constellation of Taurus, between the bright star Aldebaran and the Pleiades cluster.

Saturn

Early risers and insomniacs will find Saturn low down in the south. It lies in the constellation of Libra about half way between the bright stars Antares and Spica, the brightest stars in Scorpius and Virgo. Compare the colours of these three objects, the distinct red of Antares, the bright blue of Spica and the yellow hue of the brighter Saturn.

Uranus & Neptune

Both outer planets are too close to the Sun to be observed until late summer.

Deep Sky Objects

M46 Open Cluster RA 7h 42m Dec -14° 51' mag 6.5

Visible through binoculars as a misty smudge against the winter Milky Way in the same field of view as M47, M46 is a cluster of some 500 stars spread over an area equivalent to the full Moon. For observers with larger telescopes there is an 11th magnitude planetary nebular located towards the northern edge of the cluster. This nebula is a foreground object and appears to be within the cluster boundary purely by chance.

M47 Open Cluster RA 7h 37m Dec -14° 31' mag 4.5

In a clear sky M47 may be seen with the naked eye, but optical aid is required to show the full splendour of this cluster. The cluster stars have a wide range of brightness from about magnitude 6 and beyond. This together with a few bright foreground stars allows the imagination to run free with all the different star patterns.

M48 Open Cluster RA 8h 14m Dec -5° 49' mag 5.5

M48 is one of the 'lost' Messier objects, at the original coordinates there is no object to be found. It is believed that the great comet hunter made an error in either his records or calculations and that this is the object he actually observed. Under dark skies it can be seen with the naked eye and several stars can be resolved even in binoculars. A telescope shows what has been described as an arrowhead or boomerang shaped collection of stars.

M42 Orion Nebula RA 5h 35m Dec -5° 25' mag 4

Visible to the naked eye as the sword of Orion the light we see is a glimpse into a large, relatively nearby star forming region. We are looking into a hollowed out shell of gas that is glowing from the intense radiation emitted by the newly formed stars. Four of these bright stars are closely grouped near the centre of the nebula forming an asterism known as the Trapezium. There is detail to be seen in all sizes of telescope and binoculars making this probably the most observed object in the night sky.

Peter Burgess

ISLE OF WIGHT STAR PARTY

7th - 11th March 2013

Come and Enjoy Some of the
Darkest Skies in the South

<http://www.iowstarparty.org/> for more details

John Wilson Smith, MBE



John had been one of the leading figures in the Vectis Astronomical Society (VAS) in Newchurch and the establishing of what is now considered to be one of the finest observatories in the south of England. It was John's energy and drive, together with other Society members, that got the funding flowing even though he had to take considerable personal financial risk in keeping ahead of the many large bills that arose during the construction and fitting-out of the facility. To John's great delight and relief, the Observatory was opened in September 1998 on time and within budget.

Equipment at that time was scarce so John loaned his prized Celestron telescope to the Observatory and oversaw its installation and operation. He alone gave many training sessions on it to ensure that maximum usage was obtained.

One of the principal reasons that Newchurch was chosen as the Observatory location (dark skies being taken as granted) was the willingness of the Newchurch Parish Sports & Community Association (NPS&CA) to assist with funding of the project and provision of the ground it stands on. Again, that was thanks to John Smith for exercising his skills in making a solid financial case for Newchurch to benefit in the long run. The benefits were more intangible than monetary: VAS is proud to have such a prominent position on the Isle of Wight and is well known for provision of hearty welcomes to local schools, youth groups (such as Scouts, Guides, Cubs, Beavers and Brownies all eager to be astounded with facts of the Universe), and adult organisations such as WIs, Towns-Women's Guild groups, and various other interest groups throughout the Island who want to discover what goes on in that 'strange' building.

All of the above would have been enough for one person to cope with but not John. Besides astronomy matters, he kept the Apse Heath Over 60s Club running; he was a very active member of the Poetry Group; was a keen member of the Newchurch Horticultural Society and, until the NPS&CA withdrew from the running of the Island's famous Garlic Festival, was a leading voice in the Festival administration. John had the amazing ability of being able to concentrate fully on all of his interests. VAS members saw John as 'their John' but they suspected that he was 'our John' to each of the other interests and organisations he interacted with. He had been awarded a 'Local Hero' appreciation for his community activities, a recognition that gave him much pleasure. Typically of this worthy gentleman, he did not trumpet the honour at the time – the information had to be winkled out from other sources!

Later on, in 2007 he was to be nominated for a National Honours award, which is an honour in itself as recognition of his deep involvement with his local community. To actually discover that he had been granted the award was something that John had not even contemplated in his long and busy lifetime. He was awarded his MBE in Newchurch Pavilion in 2008, being invested by the Lord Lieutenant Major General Martin White (both shown here in the picture). John had been offered the opportunity of receiving his Award at Buckingham Palace itself but chose instead to have the event on the Island so that as many of his family and friends could share in his delight. A very modest man to the end, John always thought of others first and himself last.

Somewhere, let us hope that he is now enjoying chatting to that other recently departed astronomer, his old friend, Sir Patrick Moore.

John Langley

Weird Stars

Lecture report 23 November 2012

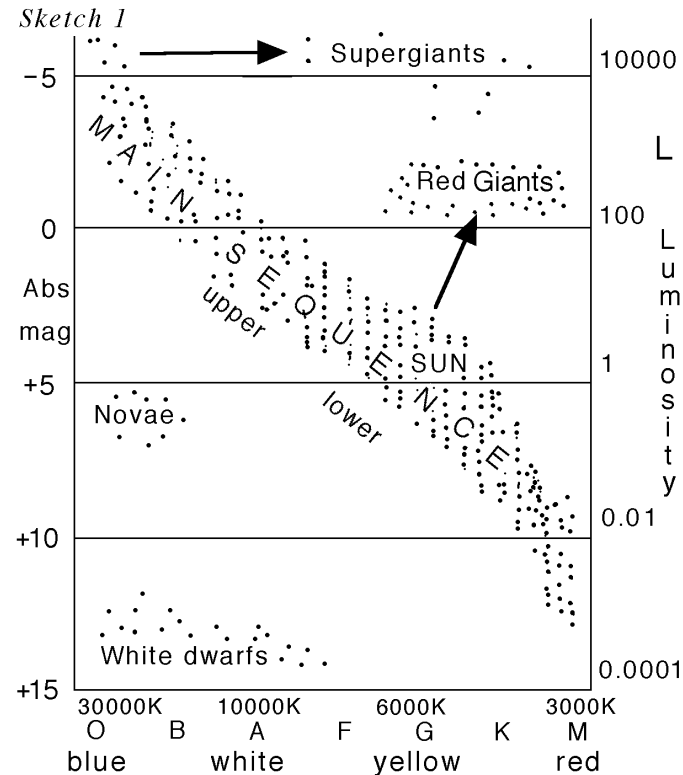
Dr. Tom Maccarone

Universities of Southampton and Amsterdam

This lecture travelled fast, not least because since the previous lecture, "Stellar Collisions" in Feb 2007, the subject has developed rapidly. This includes papers by the lecturer (accessible via Google Scholar), specializing in X-ray binaries, microquasars, transient outbursts, gamma-ray emission, and jet mechanisms with x-rays coupled to radio emission, interacting with the interstellar medium. Some phenomena are too bright for professional telescopes, giving opportunities for amateurs to become involved and contribute to cutting-edge science. Much exciting new information in this field was explained for the benefit and entertainment of a full house of members.

Read '<' as 'less than' and '>' as 'greater than'.

The lecture started with history - Eddington in the 1900s realized that stars must be powered by something other than chemical energy, or they would expire within thousands of years - then moving to an explanation of the H-R diagram. It's worth spending time on this diagram as it provides essential background to 'weird stars'.



The Hertzsprung-Russell diagram - Sketch 1. This diagram relates stellar temperature and colour to absolute magnitude - this is the magnitude of a star if observed from 10 parsec away. The terms 'dim' and 'bright' don't apply,

because very luminous stars can be dim if far away, and so on. Colour also affects our sensation of brightness. Early on it was recognized that visual and photographic magnitude differences were due to temperature effects and different colour sensitivities. The embers of a log fire emitting kilowatts, keeping us warm on a frosty night, don't appear nearly as bright as fraction-of-a-watt torch-bulbs. That places red-giant stars ('hot logs') with huge emission surfaces, to the top right in the H-R diagram, and the very small, difficult to observe, very high temperature white dwarfs with small surface areas ('torch-bulbs') on the bottom left. Luminosity L relative to the Sun is plotted on the right in *Sketch 1*. A one-hundredfold **increase** in luminosity is equivalent to a **decrease** of 5 (upwards) on the magnitude scale on the left. Red giants and blue giants have negative or near zero absolute magnitudes.

Sometimes H-R diagrams include background colours, (see bottom of *Sketch 1*), but these are not pure spectral colours. When an object is heated, it turns from dull red, to red, to yellow, to white and then bluish. (A book in the VAS library has green instead of white.) Any star on the H-R chart gives a full visible spectrum, containing absorption lines, yielding data on the star's composition, photosphere properties, speed towards or away from the observer, rotation rate and magnetic fields (from Zeeman line splitting and polarization).

Spectral categories, approximate descriptions:

- type **O** >25,000 K, rare, contain ionized helium, eg. Alnitak.
- type **B** neutral helium, ionized oxygen and nitrogen, hydrogen is too hot to give a strong spectrum (the hydrogen nuclei are free protons with no excitable electrons.) eg. Bellatrix.
- type **A** strong hydrogen lines, ionized calcium, iron, chromium, titanium. eg. Altair and Sirius A (Sirius B is a white dwarf).
- type **F** "ionized calcium stars" weak hydrogen, neutral and ionized metals 6500 K, eg. Canopus.
- type **G** Solar type, hydrogen, ionized calcium and neutral metals, including iron. eg. Capella.
- type **K** molecular bands appear, neutral metals dominate, eg. Arcturus.
- type **M** 2000-4000 K, titanium oxide, neutral metals and molecules, eg. Betelgeux.

These categories are further subdivided, our Sun is type **G2V**, a 'main sequence dwarf', the last Roman number gives star type, **I** supergiants; **II** and **III** giants; **IV** subgiants; **VI** subdwarfs; **VII** white dwarfs.

Main Sequence Stars in a diagonal band, contain hydrogen fusing into helium, which mostly stays in their cores, the stars expand over billions of years until they run out of hydrogen. Then they evolve away from main sequence. <0.23 solar mass stars become white dwarfs, <10 solar masses pass through a red giant stage. More massive stars, where heavy elements are made by nucleosynthesis, can explode as supernovae. Higher up the main sequence, masses are greater and lifetimes less as burning rate is faster for cores under greater compression. Starting mass and composition depend on the primordial cloud from which the stars were born. If supernovae have already blown heavy metals into the cloud, new generation stars contain more metals than older stars formed in purer older clouds. Typical starting composition is H 74%, He 24%, O 1%, C 0.5%, metals 0.5%.

Lower Main Sequence stars up to 1.5 solar masses include the Sun, now 40% brighter than at birth 4.5 billion years ago. These stars burn hydrogen directly into helium, gravity gets less, and they expand. In the Sun convection only occurs towards the surface, giving sunspots and magnetic loops. Only the lowest mass stars of this group have mixing by convection in their cores.

Upper main sequence stars, >1.5 solar masses, contain hydrogen fusing into helium via the intermediate formation of carbon, nitrogen and oxygen, making the CNO cycle. Reaction rate is more sensitive to temperature, favouring core mixing by convection. These stars burn fast, making strong outward winds.

Wolf Rayet stars with temperatures from 30,000 K to 200,000 K, rich in nitrogen or carbon and oxygen, have continuous spectra plus **emission** bands. Most radiation is ultraviolet and x-ray, so they're not very visible.

Red giants are formed when >0.4 solar mass stars run out of hydrogen at their cores, their outer layers expand because of reduced gravity. The Sun will increase to 1 AU radius and lose one-third of its mass. In stars up to 2.25 solar masses, hydrogen fusion continues in a shell around the core, initiating helium fusion, eventually leaving behind a core of carbon and oxygen.

Red supergiants: If >9 solar masses, carbon in the core fuses, making - in this sequence - oxygen, neon, magnesium, silicon, and iron. Iron is very stable, but it absorbs neutrons, emits beta rays and forms the still heavier elements which are much less common in nature. The dense core can collapse, ejecting outer layers as a supernova leaving the core as a white dwarf.

White dwarfs: typically have 0.6 solar mass, but are squashed to the size of the Earth. A matchbox-full of this compressed carbon, oxygen and high pressure electron gas, would weigh several tons. Difficult to observe amongst all the much brighter stars, the HST has resolved them in the M4 cluster. They are simple stars, where

nuclear burning has finished but the cores remain at ten million Kelvin. Well insulated by the opaque surface at 100,000 K, they will take hundreds of billions of years to cool and eventually make 'black dwarfs'. Some years ago, simple equations describing the cooling were used to estimate the ages of clusters - they appeared to be 16 billion years old, but these were over-estimates. White dwarfs can collide, more often inside elliptical galaxies. Helium white dwarfs are thought to originate from mass loss in binary systems. Some contain neon and magnesium too. They can have hydrogen or helium atmospheres, spin and possess magnetic fields. One type pulsates over hundreds to thousands of seconds, non-radially, giving seismic data on core structure. High gravitation compresses their atmospheres giving diffuse spectral lines, redshifted by their powerful gravitation. If they accrete mass beyond the Chandrasekhar limit of 1.4 solar masses, they explode as Type 1a supernovae, leaving remnant neutron stars or black holes.

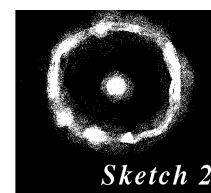
Binary star evolution is a big subject, involving transfers of mass across Roche lobes, widening the evolutionary possibilities compared to single stars. **Algol** changes in brightness and colour over days, it's an eclipsing binary containing a pink and a blue star, the more massive is a main sequence star, the less massive is a subgiant. The more massive star should have been the first to leave the main sequence, but this '**Algol paradox**' is explained by the transfer of mass between them. For an instructive movie, see "binary stars" on Wikipedia.

Cataclysmic variables: a variety of phenomena can happen, involving hot spots, magnetic fields, changes in viscosity, and explosions caused by gas falling into the intense gravitational fields of white dwarfs. Always featuring in the discussion is a very familiar diagram (like a pancake blowing a bugle attached to a balloon - *see report on James Fradgely's talk, NZ Nov 2010*).

Classical and recurrent novae can be caused by surface explosions or nuclear fusion suddenly starting on the surfaces of white dwarfs.

Dwarf Novae are caused by instability and viscosity changes in the accretion disc of a binary, one member is a white dwarf, x-rays are stronger when the emitted light is feeble and *vice versa*. They have potential to be used as standard candles since their luminosity increases with recurrence period, from days to decades. Amateurs are a strong resource for obtaining data.

Nova Cygni 1992 was the brightest explosion in recent history, caused by the accretion disk in this binary system dumping a lot of gas onto the white dwarf, giving thermonuclear detonation and an expanding shell and photographed two years later by the HST, *Sketch 2*.



Blue stragglers. In dense clusters, multiple star interactions widen the evolutionary possibilities yet further, including the puzzling appearance of blue stragglers. They seem ‘too young’ but were probably not formed later than everything else. Sandage in 1953, found in the globular cluster M3, main sequence stars more luminous and bluer than the rest, with stellar masses two or three times bigger than normal. They might be the result of collisions, or merging binary stars, and are more common in the very crowded stellar regions. Some rotate in hours, consistent with collision formation. They lack carbon and oxygen, so might be made from stellar interiors. Later they will cool to form yellow and red stragglers.

R Corona Borealis Stars. At irregular intervals these F and G supergiants fade by several magnitudes, such as from 6 to 14. Hence they are called “fade out stars” or “reverse novae”. They were known to the Greeks who could see to magnitude 6, but a 10" telescope is needed to see down to magnitude 15. They are caused by a build up of carbon dust (soot) in the star’s atmosphere, blocking the light and then the dust is eruptively dispersed by radiation. In infrared, these stars don’t fade. Their spectra lack hydrogen, but their helium is difficult to see.

Conclusions.

- The most exotic stars in the Universe are made in binary evolution processes.
- Many extreme variable stars give opportunities for amateurs to contribute to cutting edge science.

Discussion compared exoplanet dips with variable and eclipsing stars. A newly observed phenomenon is named after the first star where it is seen, hence ‘R Coronae Borealis stars’ (R means it’s the first identification.). One member mentioned that M74 and M92 appear to be breaking up, being especially interested in dark lanes in clusters. Another found difficulty visualizing how soot particles can be emitted by stars which are so very hot.

This report was prepared from notes several weeks later, assisted by Wikipedia, so differences from the lecture can be expected, apologies for any errors.

For those wishing to participate in research contacting ‘The Astronomer’ is obviously a good idea.

Puzzles: Here on Earth, an iron bar glows red at 800 K to 900 K. Steel ingots (below melting point) glow whitish yellow. So shouldn’t red giants, at 2000 K to 4000 K, well above the melting point of steel, appear white? (There’s a Letters column if you have ideas on this.) Also, why does the material blasted from Nova Cygni 1992, *Sketch 2*, appear as a ring, and not as a shell? - see <http://apod.nasa.gov/apod/ap951227.html>

Dr. Guy Moore

A Cost Saving Simplification

Following the discussions at the AGM your Committee has decided that to reduce administration costs and time the subscription process will be changed.

Currently we have all been due to pay our membership renewals on the anniversary of our joining date. To operate this process the membership database is overly complex and therefore error prone. It consumes a great deal of time each month, especially as about half our members do not pay until they receive a reminder. Just the stationary and stamps costs the society over £80 per year. A cost which is rising sharply. Also, as most pay by submitting cheques by post it is costing our members over £60 per year.

As some will have seen, I have attempted, without too much success, to make more use of email to reduce both costs and time but the database was not established to support that form of communication.

In future therefore all membership renewals will become due on 1 October each year.

To save members the costs and effort in having to send cheques they are now asked to set up a Standing Order with their bank. This will also save a great deal of the time and effort put in by Dave Kitchen, our Treasurer, and myself.

Until October this year I will continue sending subscription reminders as they become due under the old system. Members will however be asked to pay only for the number of months up to October. For those members due to pay after October 2013 I will send them a modified reminder requesting them to pay only for the appropriate number of months from their current renewal date up to October 2014,

No one will therefore be asked to pay more than their annual subscription.

Enclosed with the above reminders will be a customized Standing Order Mandate. All members will be requested to do is fill in their bank details and take or send the completed mandate to their bank. The society will have no visibility of the mandate or the members banking details.

New members will be asked to pay the appropriate amount based on the number of months up to October. This change will ease the costs and time for us all leaving more time and money to enjoy star gazing. Thanks in anticipation for your cooperation.

*Norman Osborn, Membership Secretary.
(members@wightastronomy.org)*

Dark Sky Status on the Island

The planning group, formed last year to look into the future of the Society, have started a project to accurately map the sky quality across the IW. The aim being to achieve Dark Sky Status for the Island. This is quite an ambitious project and it will take time. We hope to raise funding/support for this initiative and have some potential sponsors in mind.

As members probably know we have a Sky Quality Meter and thanks to sterling work by Mark Williams we now have a map and database on which to enter the readings. The intention is to start collecting data for the known darkest/best areas first and then, hopefully, increase the spread to get readings for the majority of the Island.

Of course to ensure we can complete the exercise fairly quickly we need assistance (you knew that was coming didn't you!). If you think you can help with this please contact any member of the committee.

Open Street Map Project

As well as our own survey, the Open Street Map Project (<http://www.openstreetmap.org/>) has an overlay for its maps which shows the lighting status of many roads in the UK and around the world.

Lighting is recorded in the following ways:

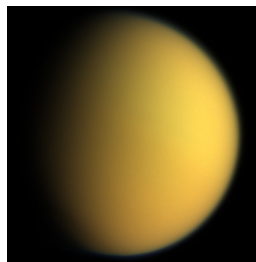
TAG	Description
lit=24/7	Both night and day; e.g. in tunnels.
lit=yes	At night (unknown time schedule or daylight detection)
lit=automatic	When someone enters the way the lights are turned on.
lit=no	There are no lights installed
lit=operating times	Use the schema of opening_hours to document when the light is ON, when the lighting is solely or primarily time dependent. For example lit=Mo-Fr 05:00-07:45 for a way lit for working days' morning rush hour only.

We can do our bit for this too - if you have a few minutes to spare, please email your road name, town and postcode along with one of the tags above, so we can add it to their maps. No personal data will be recorded.

Please send your information to:

streetlights@wightastronomy.org

Saturn's Largest Moon Titan Gets a Dune 'Makeover'



Titan's siblings must be jealous. While most of Saturn's moons display their ancient faces pockmarked by thousands of craters, Titan - Saturn's largest moon - may look much younger than it really is because its craters are getting erased. Dunes of exotic, hydrocarbon sand are slowly but steadily filling in its craters, according to new research using observations from NASA's Cassini spacecraft.

"Most of the Saturnian satellites - Titan's siblings - have thousands and thousands of craters on their surface. So far on Titan, of the 50 percent of the surface that we've seen in high resolution, we've only found about 60 craters," said Catherine Neish, a Cassini radar team associate based at NASA's Goddard Space Flight Center, Greenbelt, Md. "It's possible that there are many more craters on Titan, but they are not visible from space because they are so eroded. We typically estimate the age of a planet's surface by counting the number of craters on it (more craters means an older surface). But if processes like stream erosion or drifting sand dunes are filling them in, it's possible that the surface is much older that it appears."

"This research is the first quantitative estimate of how much the weather on Titan has modified its surface," adds Neish.

Titan is the only moon in the solar system with a thick atmosphere, and the only world besides Earth known to have lakes and seas on its surface. However, with a frigid surface temperature of around minus 290° Fahrenheit (94k), the rain that falls from Titan's skies is not water but instead liquid methane and ethane, compounds that are normally gases on Earth.

Neish and her team made the discovery by comparing craters on Titan to craters on Jupiter's moon Ganymede. Ganymede is a giant moon with a water ice crust, similar to Titan, so craters on the two moons should have similar shapes. However, Ganymede has almost no atmosphere and thus no wind or rain to erode its surface.

"We found that craters on Titan were on average hundreds of yards (meters) shallower than similarly sized craters on Ganymede, suggesting that some process on Titan is filling its craters," says Neish, who is lead author of a paper about this research published online in the journal *Icarus* Dec. 3, 2012.

Read more at: <http://www.sciencedaily.com>

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS



Stargazing Live 2013 12th Jan 2013

In conjunction with recent BBC2's Stargazing Live 2013 series, we once again hosted an event open to the public. The observatory was open and we hired the pavilion next door to accommodate visitors.

The sky was full of cloud and it rained during the entire evening. Nevertheless, about 40 people turned up, and appeared to be in no hurry to leave.

Brian gave talk on 'How we fit in to the Universe' and around 15 members were on hand to chat and give advice. Several telescopes were out on display and tours of the dome were given.

The whole evening was really enjoyable for visitors and members and there was a real buzz in the air from the enthusiasm.

We raised around £100 on the night, £70 of that from the raffle. We envisage about 6 new members from the event. So, all in all a successful night, regardless of the weather. *A very big thank you to all involved.*

Elaine Spear



Christmas Tree

VAS provided a an entry to the Brighstone Christmas Tree Festival.

Bigger and better than ever, the 2012 Festival had five venues in this, its 16th year, with the addition of the Social Club, and over 130 decorated trees on show.

St Mary's Church in Brighstone always has the greatest number and this year there were 52 trees filling the pews and every available spare space. Brighstone Methodist Church has 17 trees inside and five outside including the Parish Council Tree and the Hospice Tree. While just up the road the Wilberforce Hall had 26 trees lining the walls.

Brighstone Social Club and Reading Rooms had 16 trees and the lovely little church at Mottistone hosted a further 17 trees.

Many thanks to all who helped.

Rebecca Mitchelmore

The Construction of The International Space Station

Watch the pieces come together as they are sent up from Earth. This is the International Space Station (ISS) Assembly diagram, piece by piece. I had no idea the Space Station had grown to this size. Watch the left hand corner for dates.....

http://i.usatoday.net/tech/graphics/iss_timeline/flash.htm

Observatory

For your own safety, when visiting the VAS observatory, please bring a torch. Also, please make sure you close and lock the car park gate if you are the last to leave - if you need the combination to the lock, please contact a member of the committee.

Articles Needed

New Zenith welcomes letters, articles or pictures related to all aspects of astronomy. Contributions to the Editor at the email or postal address on the front page.

*“At my age I do what
Mark Twain did.
I get my daily paper,
look at the
obituaries page and
if I'm not there
I carry on as usual”*
Sir Patrick Moore

Quotations

“I'm only a four-dimensional creature. Haven't got a clue how to visualise infinity. Even Einstein hadn't. I know because I asked him”

“There is absolutely nothing to be said in favour of growing old. There ought to be legislation against it”
Sir Patrick Moore