New Zenith

The Monthly Newsletter of the Vectis Astronomical Society

Vol 25 Issue 7 — August 2017

When Printed, this Newsletter costs VAS at least £1

Society News

AGM - Committee Nominations etc

Last chance! Page 11 of this newsletter carries a nomination form for Committee positions.

VAS is your Society and you have the opportunity to help keep it going into the future. We do have a solid core at the moment but there is room for more volunteers either on the Committee or helping out with other jobs.

For example, in August, I need to stand down from my job as New Zenith Editor as I really don't have time to handle that and the Observatory Director position. The Dark Skies application is also going through a bit of a renewal and that also takes a chunk of my time. Even if you could spare some time to help gather articles for the newsletter each month it would help.

Please consider helping out, without willing volunteers VAS will struggle, with them we can easily grow and thrive - it really is that simple. Join in, help make 2017/18 the best year so far.

Observatory Face Lift

We plan to have a working party on the weekend of **9/10 September** 10am start with an aim to be done by 4pm. The work may spill over into Sunday, as it's a little weather dependent.

Plans

- Clean guttering and facia boards
- Scrub and re-paint the dome
- Tidy and clean the inside of the observatory
- Possibly re-paint the walls inside
- Clear out some 'stuff' under the dome with possible trips to the dump

Contact, Brian - details top right

Brian Curd
Editor New Zenith.

VAS Website: wightastronomy.org

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

The Editor, New Zenith
Carpenter's Cottage
Dennett Road
Bembridge
Isle of Wight PO35 5XF

Tel: **01983 872875** or email: **editor@wightastronomy.org**

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

Registered Charity No 1046091

Observatory Diary

Monday, 19.30hrs	Members Only and by arrangement Telescope and night sky training. Please contact Martyn Weaver 07855 116490
Thursday	Members (19.30hrs) and Public (20.00hrs). Informal meeting and observing

VAS Website: wightastronomy.org

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PLEASE NOTE:
All monthly meetings are now held at the Newchurch Pavilion next to the Observatory

2017 Monthly Meetings

Date	Subject	Speaker
Please check **wightastronomy.org/meetings/** for the latest information		
28 Jul	Pseudoastronomy: Planet X, Zetans, and Lost Civilisations	Stephen Tonkin
25 Aug	Annual General Meeting and TBA	TBA
22 Sep	TBA	Graham Bryant
27 Oct	VAS - AONB -CPRE Public Open Evening	
24 Nov	TBA	TBA

Observatory Visits Booked

No bookings for June so far but I have other interested parties choosing dates at the moment.

I am restricting visits to Mon and Tues wherever possible.

Please phone me for the current situation (number on the front page)

It would be appreciated if members could avoid using the observatory at these times.

VAS Contacts 2016/17

President	Barry Bates president@wightastronomy.org
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Membership Secretary	Norman Osborn members@wightastronomy.org
NZ Distribution	Graham Osborne
Others	Mark Williams, Nigel Lee & Stewart Chambers

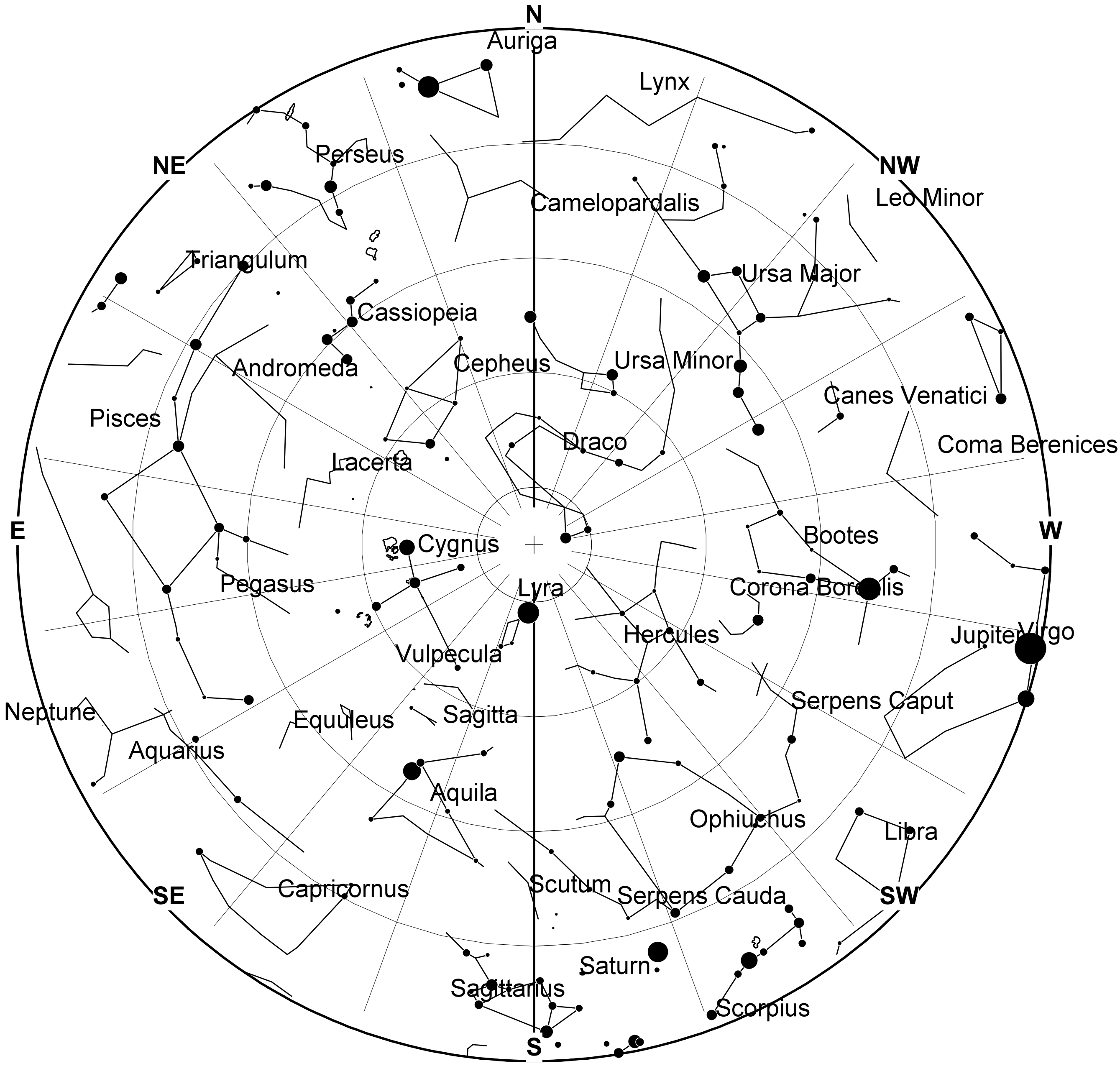
Important

Members using the observatory MUST enter a line or two in the Observatory Log Book.

On several occasions, lights, heaters and the Meade LX200 have been left on!

When leaving, please ensure all is secure and all lights, heaters and telescopes are TURNED OFF.

August 2017 Sky Map



View from Newchurch Isle of Wight UK - 2200hrs - 15 August 2017

A **meteoroid** is a small rocky or metallic body in outer space. Meteoroids range in size from small grains to 1m wide - objects smaller than this are classified as micrometeoroids or space dust. Most are fragments from comets or asteroids, whereas others are collision impact debris ejected from bodies such as the Moon or Mars.

When a meteoroid enters Earth's atmosphere at a speed typically in excess of 20 km/s (45,000 mph), aerodynamic heating of that object produces a streak of light, both from the glowing object and the trail of glowing particles in its wake. This phenomenon is called a meteor or "shooting star". A series of many meteors appearing seconds or minutes apart and appearing to originate from the same fixed point in the sky is called a meteor shower.

An estimated 15,000 tonnes of meteoroids, micrometeoroids and different forms of space dust enter Earth's atmosphere each year

August 2017 Night Sky

Moon Phases

New	First Qtr	Full	Last Qtr
21st	29th	7th	15th

Planets

Mercury - is between us and the Sun this month and is not visible.

Venus - From about 2 hours before sunrise Venus can be seen low in the eastern sky. Apart from the Moon there is no other object in this area of the sky that comes close in brightness to Venus.

Mars - is on the far side of the Sun and lost in its glare.

Jupiter - is now well past its best for observation. It can be found low in the south west after sunset.

Saturn - As Jupiter sets Saturn becomes visible low in the south. It is not as bright as Jupiter, but is still noticeably brighter than any star in that part of the sky.

Uranus - can be found in the constellation of Pisces close to the star Omicron Piscium. At around mid month this is placed well up in the south eastern sky at about 4AM. There are no bright guide stars in the area Omicron is only magnitude 4.5 a relatively faint but under reasonable skies easily seen star. Uranus is about magnitude 5.8, very easily seen using a small pair of binoculars, and just about visible under good skies to someone with very good eyesight without optical aid.

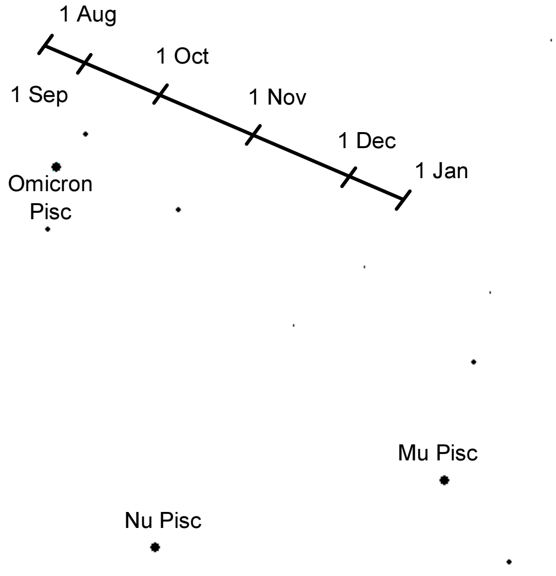
The finder chart shows the path of Uranus for the rest of the year. Stars are shown to magnitude 7.

Neptune

Neptune can be found in the constellation of Aquarius a little less than 2° to the east of the star Lambda Aquarii. By the end of the month it is a little over a degree away. The finder chart in last months New Zenith shows the path of Neptune for the remainder of the year.

Perseids Meteor Shower

The Perseids meteor shower peaks on the 12th. This is a dependable shower with a zenith hourly rate of between 100 and 200. This does not mean that this number of meteors can be seen, it relates to the number that could be visible under ideal skies if all the meteors were directly overhead. This year's shower will be diminished somewhat by the presence of the waning gibbous moon. Moonrise is about 2300 narrowing the opportunity to see meteors without bright moonlight interfering.



Finder Chart for Uranus 2017

Deep Sky

M27 The Dumbbell Nebula RA 19h 59m Dec 22° 44' mag 7.5

The summer sky's show piece planetary nebula can easily be seen as a rectangular patch of light bluish grey nebulosity with 10x50 binoculars. It is quite a large object; almost half the diameter of the full moon. A small telescope will show some detail, and some users of large telescopes even claim to be able to see traces of colour. The nebula consists of multiple gas shells moving away from the central star some moving at speeds of 30km/s.

M11 The Wild Duck Cluster RA18h 51m Dec -6° 16' mag 7.0

Easily seen in binoculars as a fuzzy patch in the Scutum Star clouds, this cluster gets its name from the V shape formed by two long chains of stars on its northern edge. They are supposed to represent the V formation of a flock of wild ducks flying across the Milky Way.

Stock 1 Open Cluster RA 19h 36m Dec 25° 13' mag 5.3

A little over a fingers width east of Alpha Vulpeculae lays a large misty patch of the Milky Way. This is Stock 1, a rich open cluster where the brighter stars are rather spread out floating over a misty haze of the dimmer cluster members and background Milky Way. Although this cluster is a nice sight in binoculars it does not give its best; a small telescope using magnification up to about 60 gives a much better view. The brighter stars tend to form angular patterns rather than the more 'normal' curved chains.

Peter Burgess

Monitoring Climate from Space Part 5

This article looks at monitoring the coastal zones and major climate events such as El Niño and hurricanes from Earth observation satellites.

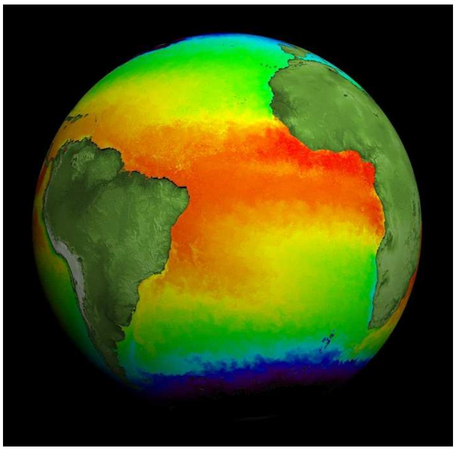
Monitoring Coastal Zones

Coastal zones are highly vulnerable to impacts from climate change. Rising sea levels, alterations in the frequency of storm surges, and changes in precipitation, ocean temperatures and ocean acidification can all serve to affect coastal activities in a variety of ways.

Earth Observation satellites deliver, at a global scale, a variety of highly relevant oceanographic data products, such as ocean surface wind speeds, sea level heights and ocean colours.

Through a programme from ESA, the study of storm surges has been devised through a programme called eSurge. This brings together a range of different remote sensing data sets for particular storm surge events. We can get wind data from scatterometers, which measure how strong the storm was pushed up against the coast, coastal altimetry, which measures the height the surge reached at the coastline, inundation mapping products, which measure how far the water extended onto the land areas that have been flooded. Ocean colour shows longer term effect of the biology of the ocean caused by a storm, surge, and the sediment that's lifted and redistributed.

This goes towards improving forecasts for storm surges we may have in the future.



The red shows where the ocean is warmer than normal and the blue shows where the ocean is coolest.

Monitoring Hurricanes, El Niño

One of the dramatic changes that happens in the oceans from year to year is the El Niño phenomenon. This represents the huge movement of heat from one part of the ocean to another. The oceans do many things in the climate system. First of all they are a great sink for heat. So, essentially if you heat up the Earth, you would essentially be heating up the oceans. The oceans also move heat around. The oceans are also a sink for greenhouse gasses that humankind emits into the atmosphere.

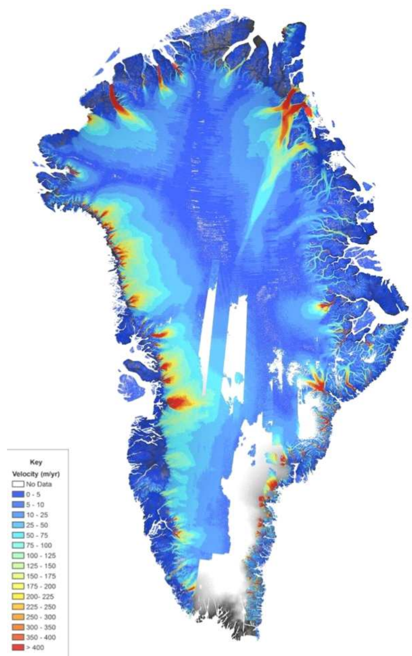
The benefit of satellites is that they can take enormous amounts of measurements each day.

Satellites from Europe have combined with satellites from USA to blend together data from different sensors and therefore give global data on sea surface temperature and height. This data can show how the warm water moves into the southern hemisphere summer, and then into the northern hemisphere summer.

The satellites can also monitor the extent and direction of the currents and see where the heat transference is most concentrated.

Another feature which can be included is the wave motions along the equatorial regions, and these regions can become warmer and cooler than average.

Predicting Sea Level Rises



Greenland Ice Sheet Melt

Areas of high velocity indicate melting ice

So one of the most important things that we've been able to do with satellite measurements from space is to measure the rate of sea level rise. The rate as it's happening right now, is rising by about 3mm per year. Estimates are based used four different techniques, satellite gravimetry, satellite radar altimetry, satellite interferometry, and satellite laser altimetry. Each technique has its own strength and weakness.

Sea level rise is due partly to expansion of oceans as they are getting warmer and expand a bit. There is no change in mass, but they occupy a larger volume. Ice melt is another factor in sea level rise. That is, glacier melt, Greenland, Arctic and Antarctic ice sheet melt. Sea levels could rise 70cm over next century from ice sheet melt. If Greenland melted sea level would rise by 5m, If Antarctica melted sea levels would rise by 50m. Although no one expects this to happen anytime soon.

Monitoring Emissions From Fires

Earth observations from satellites can see, for example, fires in Africa migrating from north to south and back again during the different seasons of the year. This is the only way we can get information on this sort of scale regularly updated.

Information on fires like this are very useful, for example, for atmospheric scientists who want to know the role of biomass burning in placing material into the atmosphere-- be it carbon dioxide, other gases like carbon monoxide, or aerosols.

A LIDAR laser system is used to scan a plot of vegetation and create a three dimensional model of the area. The same area is scanned the next day after a fire to create another model of the area with less vegetation. Subtract the second model from the first, and we can get an impression of the biomass consumed in the fire. That will be compared to data from a thermal imaging system that's being carried by helicopter.

Satellites are extremely important for our monitoring of the climate and state of the atmosphere, because we can get information about any variations in, for example, atmospheric constituents, or specific humidity, or the temperature of the planet. And before the satellite era, this was not possible, because we couldn't get an instantaneous global view of all these different components of the Earth's atmosphere. So it's very important for several aspects, including weather forecasting, because we can get real-time observations.

Also, having a long-term series of satellite observation is really enabling us to say something about the state of the climate, and possible, where the climate is going. And looking back, we see how it has evolved over the years.

The single location where we can learn the most about our planet is found nowhere on Earth but high up above it. The ability to fly satellites into space has changed all our lives in many ways, including providing new ways of seeing the world.

Future Learn

https://www.futurelearn.com/courses/climate-from-space

Glossary of terms

Gravimetry - Measurements of Earths Gravitational field. It's an accelerometer measuring different speeds of signal aimed at objects of different density

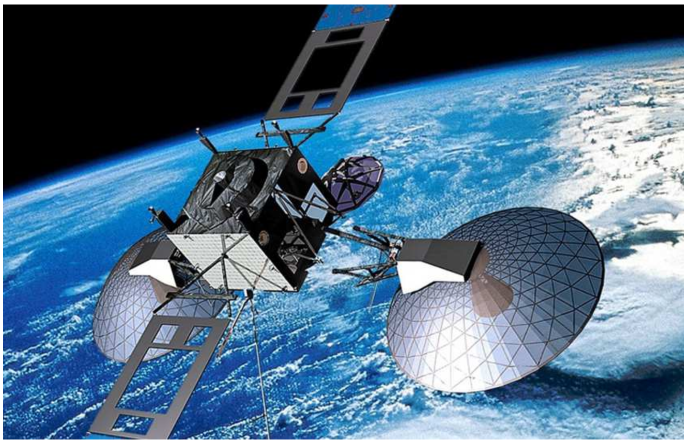
Radar altimetry - Uses radio waves to measure the altitude from the top of a terrain to a satellite

Interferometry - A technique using electromagnetic waves (radar microwaves) to measure distance and surface irregularities on the Earth to provide mapping.

Laser altimetry - Short flashes of laser light from the Earth to the satellite measure the topography or shape of the surface.

The was to be the final article in this series, however and additional article will discuss the future trends in Earth Observation satellites and how they evolving.

Elaine Spear



Booze in Space: How the Universe is Absolutely Drowning in the Hard Stuff

Mine's a Star-opramen. Credit: Studioloks

A cold beer on a hot day or a whisky nightcap beside a coal fire. A well earned glass can loosen your thinking until you feel able to pierce the mysteries of life, death, love and identity. In moments like these, alcohol and the cosmic can seem intimately entwined.

So perhaps it should come as no surprise that the universe is awash with alcohol. In the gas that occupies the space between the stars, the hard stuff is almost all-pervasive. What is it doing there? Is it time to send out some big rockets to start collecting it?

The chemical elements around us reflect the history of the universe and the stars within it. Shortly after the Big Bang, protons were formed throughout the expanding, cooling universe. Protons are the nuclei of hydrogen atoms and building blocks for the nuclei of all the other elements.

These have mostly been manufactured since the Big Bang through nuclear reactions in the hot dense cores of stars. Heavier elements such as lead or gold are only fabricated in rare massive stars or incredibly explosive events.

Lighter ones such as carbon and oxygen are synthesised in the life cycles of very many ordinary stars – including our own sun eventually. Like hydrogen, they are among the most common in the universe. In the vast spaces between the stars, typically 88% of atoms are hydrogen, 10% are helium and the remaining 2% are chiefly carbon and oxygen.

Which is great news for booze enthusiasts. Each molecule of ethanol, the alcohol that gives us so much pleasure, includes nine atoms: two carbon, one oxygen and six hydrogen. Hence the chemical symbol C2H6O. It's as if the universe turned itself into a monumental distillery on purpose.

Interstellar Intoxication

The spaces between stars are known as the interstellar medium. The famous Orion Nebula is perhaps the best known example. It is the closest region of star formation to Earth and visible to the naked eye – albeit still more than 1,300 light years away.

Yet while we tend to focus on the colourful parts of nebulae like Orion where stars are emerging, this is not where the alcohol is coming from. Emerging stars produce intense ultraviolet radiation, which destroys nearby molecules and makes it harder for new substances to form.

Instead you need to look to the parts of the interstellar medium that appear to astronomers as dark and cloudy, and only dimly illuminated by distant stars. The gas in these spaces is extremely cold, slightly less than -260?, or about 10? above absolute zero. This makes it very sluggish.

It is also fantastically widely dispersed. At sea level on Earth, by my calculations there are roughly 3x1025 molecules per cubic metre of air – that's a three followed by 25 zeros, an enormously huge number. At passenger jet altitude, circa 36,000ft, the density of molecules is about a third of this value – say 1x1025. We would struggle to breathe outside the aircraft, but that's still quite a lot of gas in absolute terms.

Now compare this to the dark parts of the interstellar medium, where there are typically 100,000,000,000 particles per cubic metre, or 1x1011, and often much less than even that. These atoms seldom come close enough to interact. Yet when they do, they can form molecules less prone to being blown apart by further high-speed collisions than when the same thing happens on Earth.

If an atom of carbon meets an atom of hydrogen, for instance, they can stick together as a molecule called methylidyne (chemical symbol CH). Methylidyne is highly reactive and so is quickly destroyed on Earth, but it is common in the interstellar medium.

Simple molecules like these are more free to encounter other molecules and atoms and slowly build up more complex substances. Sometimes molecules will be destroyed by ultraviolet light from distant stars, but this light can also turn particles into slightly different versions of themselves called ions, thereby slowly expanding the range of molecules that can form

Read more at: ***https://phys.org/news/***

My 100 Best Night Sky Sights

This article first appeared in NZ back in March 1998 as part of a series called 'My 100 best night sky sights' supplied by Bert Paice. The articles are "as were" apart from minor formatting issues caused by more modern software.

With my hope that you've had a great Christmas and a good start to the New Year I'll launch straight in to my new Night Sky series of top objects to view through that magnificent telescope that Father Christmas left in your stocking. If he passed you by don't fret too much - just come along to one of the viewing sessions to be held this year whenever conditions permit. Not that these have been too good just lately. At the time of writing (mid January) not one observing opportunity has presented itself for the last eight weeks - the longest barren period I can remember. The bright side is that good old 'Law of Averages' will see to it that many good observing nights will inevitably happen in due course. So clean up the optics and out we go.

Open Clusters

M7 Scorpius - Although very low in the sky from the Isle of Wight, this cluster of stars is so large and bright that it can be seen easily as a fuzzy patch on any good night. It actually contains well over 100 stars in an area nearly 1° across - nearly twice that of the Moon - about half theoretically visible in binoculars, although the extinction effect of the thick layer of atmosphere through which we view them reduces this number significantly.

In the finder or binoculars it can be found to the NE of the Scorpion's sting in the same field and will show a few of the brightest stars in the group seemingly against a misty background - the other cluster members. Placing M7 at the bottom left of the field will reveal another cluster to the NW. This is M6 about which more in another article.

On most nights any telescope will show at least a dozen brightish stars half of which huddle together in the centre, the rest spread around the periphery at varying distances. With my 10" I like to use a power of around 100 to zoom in to this central region when the field of view sparkles with 12 brilliant jewels interspersed with 10 or so other stars and, dead centre, a fine, bright double. This to me is the magic of galactic clusters - low powers show the structure as a whole, but higher powers can be employed to reveal more members and show details of different parts of the group. Thus a single cluster can provide enjoyable viewing for more than just a few moments.

M25 Sagittarius - This is a nice, loose cluster of around 50 stars between mags 6 & 10 which just spill out of the 32° field of my 26mm eyepiece. At its northern extremity half a dozen moderately bright members form a very neat figure like a 'V' on its side and, just as with M7, there's a close double at the centre.

The cluster also contains the Cepheid variable U Sgr which varies between mags 6.3 & 7.1 in just under 7 days. As M25 contains many comparison stars, this makes following the variations much simpler. Find the cluster 6° due N of the 'Teapot' lid.

Both clusters make fine summer night viewing through any telescope.

Globular Cluster

M53 Coma Berenices - As with most globulars the view of M53 improves with increasing aperture but, given reasonable skies a 6" telescope will show it as a globular and resolve some outer stars using a moderately high power - say x150. However this is one object which demonstrates exceedingly well the difference that a really clean sky can make, as extracts from my observing notes under different conditions make clear:

- *Moderate seeing* - 'somewhat dim, seen only as a grainy patch at x65. Slightly better at x95 but only a few peripheral stars resolved'
- *Good seeing* - 'excellent at all powers. Small and grainy at x65 but nicely framed by foreground stars. Edge well resolved at x180 - very bright, condensed centre'

Look for M53 in the spring 1° NE of Alpha Comae in the SE corner of the constellation.

Spiral Galaxy

M106 Canes Venatici - Of all wonders of the heavens spiral galaxies are arguably both most spectacular and the most disappointing to people observing them for the first time. For generations we've been treated to pictures of these gigantic systems of stars and gas taken with the Mounts Wilson and Palomar telescopes and, more recently in glorious Technicolor by modern large instruments. Eagerly we train our newly-acquired 6" Newtonian on (say) the giant galaxy M101 in Ursa Major and what do we see - a large, faint, hazy patch with not even a suggestion of spiral form. The answer is to forget the glamour photos and recognise the limitations of your equipment. Then the mere fact of spotting one of these massive systems at such incredible distances can be a thrill in itself.

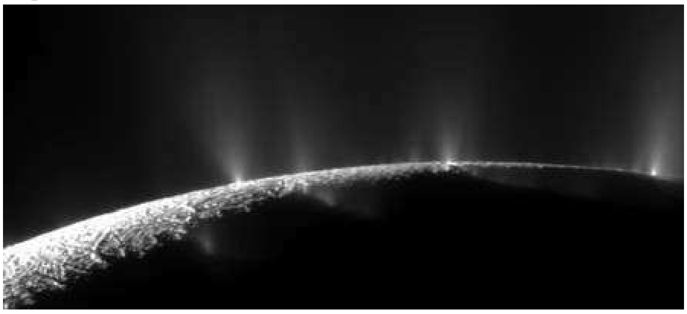
Fortunately there are several galaxies which offer rather more than just a dim fuzz to the amateur astronomer and M106 is one of these. It's a large system yet with a high surface brightness which means it's more readily seen than most and, when I last studied it (April 97) on a night of indifferent seeing the central core was star-like in appearance, not bright but distinct, and the conditions made the system appear more edge-on than it really is. Using averted vision (strongly recommended for observing galaxies) the faint spiral arms were extensive, giving M106 the classic appearance of an edge-on galaxy (which it is not). I was using my 10" at x95 but you can expect to see the galaxy at least as well as this with an 8" or even a 6" on a night of good seeing.

To find M106 follow a line left along the two stars forming the bottom of the 'bowl' of the Plough (Merak and Phecda) for half their distance, then move the same distance due south to a point half way between Phecda and Beta CanV.

More from my Top 100 next month.

Bert Paice

Holographic Imaging Could be Used to Detect Signs of Life in Space



Plumes water ice and vapour spray from many locations near the south pole of Saturn's moon Enceladus, as documented by the Cassini-Huygens mission. Credit: NASA/JPL/Space Science Institute

We may be capable of finding microbes in space - but if we did, could we tell what they were, and that they were alive?

This month the journal Astrobiology is publishing a special issue dedicated to the search for signs of life on Saturn's icy moon Enceladus. Included is a paper from Caltech's Jay Nadeau and colleagues offering evidence that a technique called digital holographic microscopy, which uses lasers to record 3-D images, may be our best bet for spotting extraterrestrial microbes.

No probe since NASA's Viking program in the late 1970s has explicitly searched for extraterrestrial life - that is, for actual living organisms. Rather, the focus has been on finding water. Enceladus has a lot of water - an ocean's worth, hidden beneath an icy shell that coats the entire surface. But even if life does exist there in some microbial fashion, the difficulty for scientists on Earth is identifying those microbes from 790 million miles away.

"It's harder to distinguish between a microbe and a speck of dust than you'd think," says Nadeau, research professor of medical engineering and aerospace in the Division of Engineering and Applied Science. "You have to differentiate between Brownian motion, which is the random motion of matter, and the intentional, self-directed motion of a living organism."

Enceladus is the sixth-largest moon of Saturn, and is 100,000 times less massive than Earth. As such, Enceladus has an escape velocity - the minimum speed needed for an object on the moon to escape its surface - of just 239 meters per second. That is a fraction of Earth's, which is a little over 11,000 meters per second.

Enceladus's minuscule escape velocity allows for an unusual phenomenon: enormous geysers, venting water vapour through cracks in the moon's icy shell, regularly jet out into space. When the Saturn probe Cassini flew by Enceladus in 2005, it spotted water vapour plumes in the south polar region blasting icy particles at nearly 2,000 kilometers per hour to an altitude of nearly 500 kilometers above the surface. Scientists calculated that as much as 250 kilograms of water vapour were released every second in each plume. Since those first observations, more than a hundred geysers have been spotted. This water is thought to replenish Saturn's diaphanous E ring, which would otherwise dissipate quickly, and was the subject of a recent announcement by NASA describing Enceladus as an "ocean world" that is the closest NASA has come to finding a place with the necessary ingredients for habitability.

Water blasting out into space offers a rare opportunity, says Nadeau. While landing on a foreign body is difficult and costly, a cheaper and easier option might be to send a probe to Enceladus and pass it through the jets, where it would collect water samples that could possibly contain microbes.

Assuming a probe were to do so, it would open up a few questions for engineers like Nadeau, who studies microbes in extreme environments. Could microbes survive a journey in one of those jets? If so, how could a probe collect samples without destroying those microbes? And if samples are collected, how could they be identified as living cells?

Read more at: ***https://phys.org/news/***

Spiral Arms Allow School Children to Weigh Black Holes

This is an artistic rendering of a black hole accumulating matter at the center of a galaxy. Credit: James Josephides

Astronomers from Swinburne University of Technology, Australia, and the University of Minnesota Duluth, USA, have provided a way for armchair astronomers, and even primary school children, to merely look at a spiral galaxy and estimate the mass of its hidden, central black hole. The research was supported by the Australian Research Council and has been published in the journal Monthly Notices of the Royal Astronomical Society.

Given that black holes emit no discernible light, they have traditionally been studied via highly technical observations of the stars and gas orbiting around them, which in turn provide a measurement of how massive they must be.

Now, new research based on these pre-existing measurements has shown that a black hole's mass can be accurately estimated by simply looking at the spiral arms of its host galaxy.

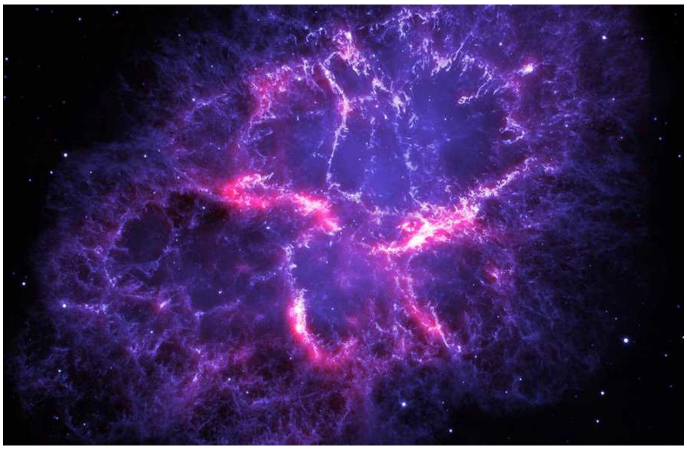
Nearly a century ago, Sir James Jeans and Edwin Hubble noted how spiral galaxies with large central bulges possess tightly wound spiral arms, while spiral galaxies with small bulges display wide open spiral arms. Since then, hundreds of thousands, if not millions, of spiral galaxies have been classified as type Sa, Sb, Sc, Sd, depending on their spiral arms.

Prof Marc Seigar, Associate Dean of the Swenson College of Science and Engineering at the University of Minnesota Duluth, and co-author of the study, discovered a relationship between central black hole mass and the tightness of a galaxy's spiral arms nearly a decade ago.

Dr Benjamin Davis and Prof Alister Graham, from Swinburne's Centre for Astrophysics and Supercomputing, led the new research revising this connection between black hole mass and spiral arm geometry.

More at: ***https://www.sciencedaily.com/***

Scientists Discover the "Angel Particle" That is Both Matter and Anti-matter



A composite view of the Crab nebula viewed by the Herschel Space Observatory and the Hubble Space Telescope (Image: NASA)

A team of scientists found first evidence for the existence of a Majorana fermion, a hypothetical particle proposed 80 years ago that is its own antiparticle.

In 1928, physicist Paul Dirac predicted that every fundamental particle has an antiparticle - a twin that has an opposite charge. If a particle and antiparticle were to meet, they would be annihilated while releasing a burst of energy. But in 1937, physicist Ettore Majorana added the prediction that a class of particles exists known as fermions, which would include particles that are their own antiparticles.

Now the researchers from Stanford University and University of California found the Majorana fermion in a series of lab experiments on exotic materials. They were led by UC-Irvine Associate Professor Jing Xia and UCLA Professor Kang Wang, and followed a plan proposed by the Stanford physics professor Shoucheng Zhang.

Professor Zhang, one of the senior authors of the paper, put their finding in perspective:

"Our team predicted exactly where to find the Majorana fermion and what to look for as its 'smoking gun' experimental signature," said Zhang. "This discovery concludes one of the most intensive searches in fundamental physics, which spanned exactly 80 years."

The complexity of the experiments necessary to find the Majorana fermion makes this work a "landmark in the field," said Tom Devereaux, director of the Stanford Institute for Materials and Energy Sciences.

More at: ***http://bigthink.com/***

VAS Officers and Committee Nominations 2017/18

For those wishing to stand for election at the AGM of the Society to be held on Friday 25th August 2017 at 7.00pm.

Name and Address of Nominee:

Standing for

- Chairman .... ❑
- Treasurer .... ❑
- Secretary .... ❑
- Observatory Director .... ❑
- Membership Secretary .... ❑
- Programme Organiser .... ❑
- Committee .... ❑

Proposed by: ....

Seconded by: ....

Signature of Nominee: ....

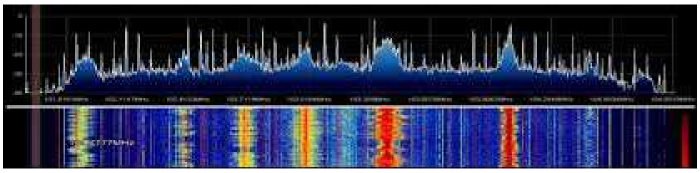
Notes

- The Committee meets once each month usually on a Thursday evening before the usual club night.
- No person can be elected to more than one position.
- Only adult fully paid-up members may stand for election (or propose or second).
- All completed nomination forms to be received by the Secretary at least 7 days before the AGM.

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

Radio Astronomy



Thanks to member Dudley Johnson, we now have a working SDR (Software Defined Radio) which can monitor the GRAVES radar system in France. The equipment is being boxed as I write this and should be available for members' use very soon.

For further details:

- On GRAVES, take a look ***here***,
- on SDR ***here***.

Fund Raising

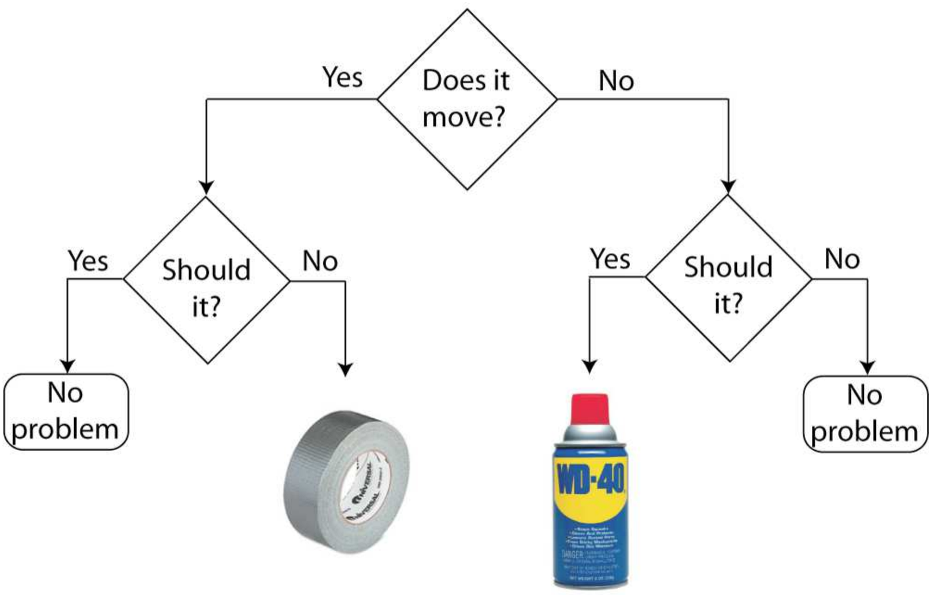
Your committee are continually thinking of ways to grow the astronomy society and you'll hear about some of our thoughts and suggestions for the direction of VAS at the AGM. In order to see development we need to raise funds, so we are going to be writing bids for funding from the likes of the Lottery Fund and Awards for All.

If there is a skilled bid writer amongst you, we urge you to get involved, and perhaps join a Fund raising Sub-committee.

This could have a team leader who takes on the role of Fund raising Officer.

*Contact secretary, Richard Flux - **secretary@wightastronomy.org***

Troubleshooting for Beginners



Observatory

When visiting the VAS observatory, for your own safety, 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

NZ needs letters, articles, reviews or pictures related to astronomy.
Send to the Editor, contact details on the front page.

"Time is a drug. Too much of it kills you"
Terry Pratchett

"The good thing about science is that it's true whether or not you believe in it"
Neil deGrasse Tyson

"We can only see a short distance ahead, but we can see plenty there that needs to be done"
Alan Turing

"Not only is the Universe stranger than we think, it is stranger than we can think"
Werner Heisenberg