New Zenith

The Monthly Newsletter of the Vectis Astronomical Society

Vol 25 Issue 6 — July 2017 *When Printed, this Newsletter costs VAS at least £1*

Society News

AGM - Committee Nominations etc

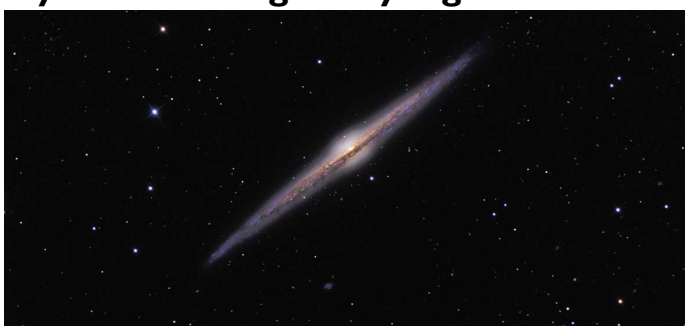
Again, Page 11 of this newsletter carries a nomination form for Committee positions.

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.

My 100 Best Night Sky Sights



Almost 20 years ago (1998), VAS member Bert Paice produced a whole series of articles for NZ titled "*My 100 best night sky sights*".

After several member's requests this series will be repeated, starting this month with an introduction to the subject (See page 9).

The articles refer to the "100 best..." and are not matched to the month the articles appear. Collect the set and you'll have a very useful resource for the whole year.

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.

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		
23 Jun	"It's not all rocket science" - progression of The Needles 'Black Knight Rocket' site	Mike Kelleway
28 Jul	Pseudoastronomy: Planet X, Zetans, and Lost Civilisations	Stephen Tonkin
25 Aug	Annual General Meeting and Citizen Science	Chris Lintott
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
Chairman	Bryn Davis chairman@wightastronomy.org
Secretary	Richard Flux secretary@wightastronomy.org
Treasurer	Simon Plumley treasurer@wightastronomy.org
Observatory Director	Brian Curd director@wightastronomy.org
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NZ Editor	Brian Curd editor@wightastronomy.org
Membership Secretary	Norman Osborn members@wightastronomy.org
NZ Distribution	Graham Osborne
Others	Mark Williams, Nigel Lee & Stewart Chambers

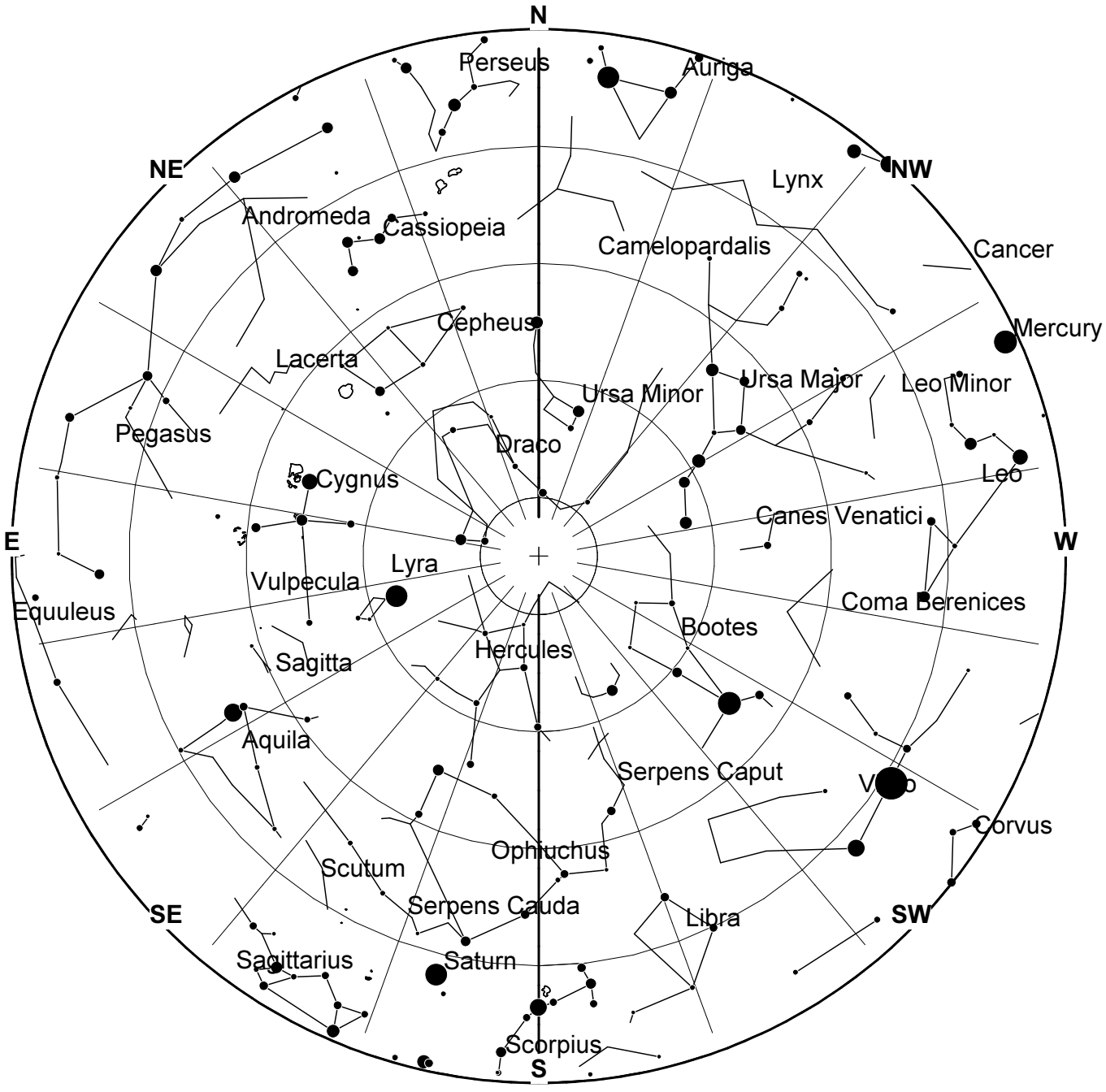
Important

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.

July 2017 Sky Map



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

Jupiter's Galilean moons: Io, Europa, Ganymede and Callisto. They are some of the largest objects in the Solar System outside the Sun and the 8 planets in terms of mass and are larger than any known dwarf planet. Ganymede exceeds even Mercury in diameter. They are respectively the 4th-, 6th-, 1st-, and 3rd-largest natural satellites in the Solar System, containing approximately 99.997% of the total mass in orbit around Jupiter, while Jupiter is almost 5,000 times more massive than the Galilean moons. The inner moons are in a 1:2:4 orbital resonance. Models suggest that they formed by slow accretion in the low-density Jovian subnebula—a disc of the gas and dust that existed around Jupiter after its formation—which lasted up to 10 million years in the case of Callisto. Several are suspected of having subsurface oceans.

July 2017 Night Sky

Moon Phases

New	First Qtr	Full	Last Qtr
			
23rd	1st	9th	16th

Planets

Mercury

Another poor apparition of Mercury. This month Mercury is only about 5° above the horizon at sunset and will be a very difficult target for observation.

Venus

In the early morning, at around 4am Venus, the brightest of the planets and outshining all stars, can be found low down in the eastern sky. On the 27th it is quite close to M1, the Crab nebula, the remnants of a star that was seen to explode as a supernova in 1054AD. This is perhaps something like what was seen at that time.

Mars

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

Jupiter

As the sky darkens after sunset, Jupiter is the brightest object to be found in the south western sky, here it can be observed until it drops into the horizon haze.

Saturn

At sunset Saturn can be found in the south eastern sky. It is not as bright as Jupiter, but is still brighter than any star in that part of the sky.

Uranus

Uranus is still too close to the horizon to be easily observable this month.

Neptune

Neptune can be found in the constellation of Aquarius between the stars Lambda and Phi Aquarii. It is closer to Lambda and as the year progresses it moves closer still. The finder chart (*Page 5*)shows the path of Neptune over the remainder of the year with stars to magnitude 9. Neptune is almost magnitude 8, easily within reach using a pair of 10x50 binoculars.

There are no bright guide stars in the area Aquarius can be found between the great square of Pegasus and the bright star Fomalhaut, close to the southern horizon.

Deep Sky

M14 Globular Cluster R.A 17h 38m Dec -3° 15' mag 7.6

Despite its magnitude this is quite a difficult binocular object, it is quite large but does not have a particularly well condensed core. This means that the available light is spread out rather thinly. Larger aperture telescopes are needed to resolve some of the cluster stars.

IC4665 Open Cluster RA 17h 47m Dec 5° 42' mag 4.2

This is a large cluster slightly more than a degree in diameter. It is best viewed in a rich field telescope or large binoculars. The brighter members form right angled triangular patterns around the cluster's centre. Under a dark sky it is visible to the naked eye using averted vision. Look for fuzzy smudge about a degree north of the magnitude 2.7 star Cebalrai in Ophiuchus.

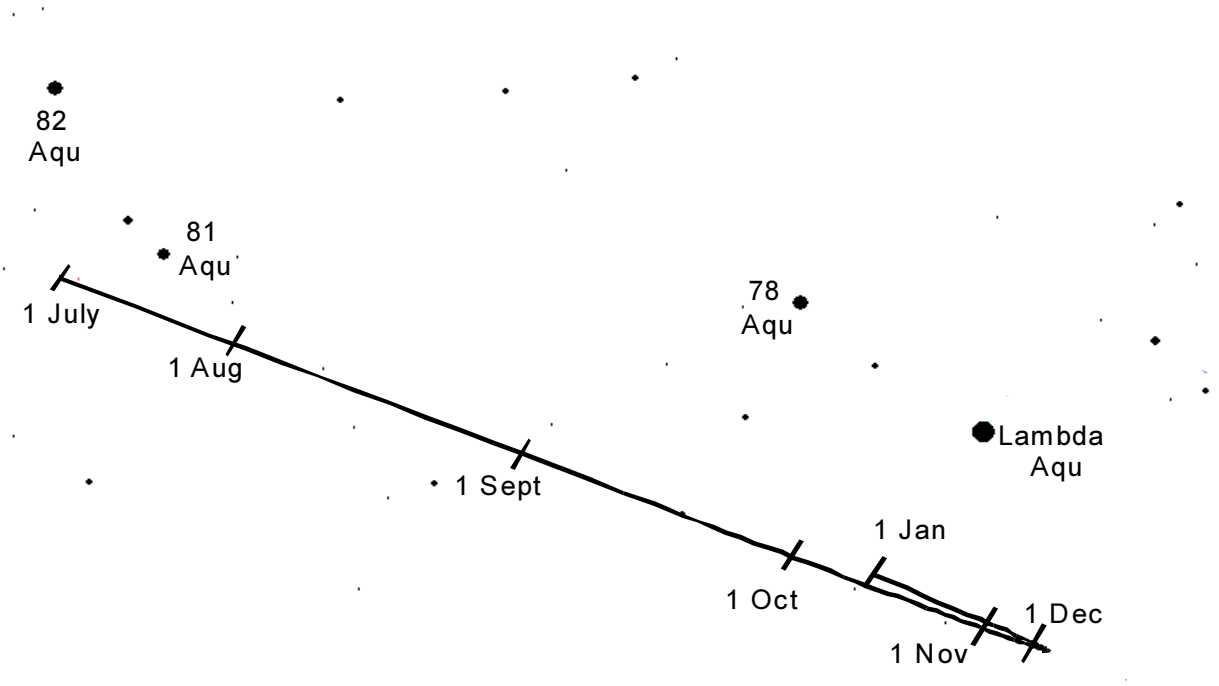
NGC6633 Open Cluster RA 18h 28m Dec 6° 34' mag 4.5

Although it is clearly visible in binoculars it is best viewed through a rich field telescope where the brighter members of this cluster form a rather wavy looking wedge of stars. If viewed before the sky darkens too much restricting the number of visible stars the scene is reminiscent of a miniature Leo, the backward question mark is a little indistinct, but the back and haunches are easily distinguishable.

Melotte 186 Open Cluster RA 18h 38m Dec 2° 56' mag 4

This is a large cluster about 3 degrees in diameter centred on the magnitude 4 star 67 Ophiuchi. It is visible to the unaided eye but best appreciated using binoculars. Its brightest members form a tick mark and with stars that do not form part of the cluster form an equilateral triangle. Look for it about 5 degrees to the east of the star Cebalrai.

Peter Burgess



Finder chart for Neptune during 2017

Voyager 1 passes another milestone: It's now 138AU from home

Tape drive due to shut down in 2018 as 1.4 kbps link becomes too skinny

Voyager 1 has just ticked off another milestone: on Tuesday it reached 138 astronomical units from Earth, or about 20,600,000,000km from the planet on which (presumably!) you're reading this story.

It's not an achievement that will be widely noticed or celebrated, because every km it travels sets a new record for the most-travelled artefact humans have ever created. Passing an entirely notional milestone makes little difference, but we noticed the "Miles Since Left Planet" counter tick over and so here we are!

It now takes 38h 15m for a radio signal to make it to Voyager and back to Earth, a period of time that is both remarkable and terrifying: we think that the Universe is about 27 billion light years across, but we're just 19 light hours into it. Both Voyagers stopped sending pictures decades back and in 2015 NASA stopped publishing even weekly mission updates because so few people bothered to read them and it was decided to save the mission team the time it took to compile them.

NASA has, however, recently updated the Spacecraft Lifetime page for both Voyagers, confirming that both craft's Radioisotope Thermoelectric Generators continue to produce less power, but are also achieving "better performance than the pre-launch predictions". But before long NASA will have to decide which instruments it has to shut down to allow the probes to operate with reduced power budgets.

One tool already scheduled to shut down in 2018 is Voyager 1's data tape recorder, as NASA says it's "Limited by ability to capture 1.4 kbps data using a 70m/34m antenna array." We think that means the tape spools out data at a faster rate, but that Voyager 1 is now so distant that even a big antenna can't make a sufficiently fast connection to receive its output.

It's hoped that four instruments – the detector of Low-Energy Charged Particles, Cosmic Ray Subsystem, Magnetometer and Plasma Wave Subsystem – will operate on both craft after 2020.

But the space agency's advice is that "no earlier than 2025", neither Voyager will produce enough power to allow operation of a single on-board instrument. Once Voyager 1 runs out of power, it'll head towards planet AC +79 3888, aka Gliese 445, 17.6 light years from home.

More, with Reader's Comments at: ***https://www.theregister.co.uk/***

Jupiter has two new moons

And five lost ones have been found

A montage of images taken by Voyager of Jupiter and four of its moons: Io, Europa, Ganymede, and Callisto. Credit: NASA/JPL

As if the gas giant wasn't impressive enough, Jupiter's already long list of moons has just grown by two.

While on the hunt for Planet X, DTM staff scientist Scott Sheppard, along with David Tholen from the University of Hawaii and Chadwick Trujillo from Northern Arizona University, decided to point their telescopes toward Jupiter. From there, the team could study Jupiter in the foreground while continuing their search for Planet X in the background.

While making those observations, they discovered many "lost" moons in addition to two new, mile-wide moons they're calling S/2016 J 1 and S/2017 J 1. The new moons lie about 13 million miles (21 million km) and 15 million miles (24 million km) from Jupiter.

Several of the moons Sheppard's team found qualify as lost moons - despite their discovery back in 2003, there was not enough information to define their exact orbits, so astronomers lost track of them as they circled Jupiter. Some moons have been found since that time, but at the beginning of 2016, 14 were still considered lost.

While observing, Sheppard and his team added their data from 2016-2017 to data from 2003 and found five of those lost moons. They will continue observing for another year to see if they can identify the rest of the lost moons; they may find more new moons, too.

Meantime, after checking their 2016-2017 data against images taken in 2003, the team confirmed that S/2016 J 1 and S/2017 J 1 are previously undiscovered moons, bringing the number of Jupiter's moons up to 69.

From: ***http://www.astronomy.com/news/***

10 new Earth-sized planet candidates discovered

The Kepler space telescope continues to monitor the skies in search of exoplanets, which are planets orbiting a star other than the Sun. Its latest data is helping astronomers piece together a catalogue of the different kinds of planets that exist in our Galaxy.

An artist's impression of three exoplanets orbiting their host star. Credit: NASA/JPL-Caltech

10 Earth-sized planets orbiting their stars in the 'habitable zone' are part of a new catalogue of candidate exoplanets released by NASA.

The catalogue released by the Kepler space telescope team contains 219 new candidates for exoplanets, bringing the total number to 4,034, of which 2,335 have been verified.

The Kepler space telescope searches for exoplanets by looking for transits.

This is the name given to the phenomenon of a planet crossing in front of a star, which causes a dip in brightness that Kepler can detect.

"The Kepler data set is unique, as it is the only one containing a population of these near Earth-analogs - planets with roughly the same size and orbit as Earth," says Mario Perez, Kepler programme scientist. "Understanding their frequency in the Galaxy will help inform the design of future NASA missions to directly image another Earth."

A second study using the same data has established two distinct size groupings for small planets: rocky, Earth-size planets and gaseous planets smaller than Neptune. Few planets appear to exist between these groupings.

More at: ***http://www.skyatnightmagazine.com/***

Turquoise Swirls in the Black Sea

Image and references: NASA's Earth Observatory Credit: Norman Kuring, NASA's Ocean Biology Processing Group.

Most summers, jewel-toned hues appear in the Black Sea. The turquoise swirls are not the brushstrokes of a painting; they indicate the presence of phytoplankton, which trace the flow of water currents and eddies.

On May 29, 2017, the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Aqua satellite captured the data for this image of an ongoing phytoplankton bloom in the Black Sea. The image is a mosaic, composed from multiple satellite passes over the region.

Phytoplankton are floating, microscopic organisms that make their own food from sunlight and dissolved nutrients. Here, ample water flow from rivers like the Danube and Dnieper carries nutrients to the Black Sea. In general, phytoplankton support fish, shellfish, and other marine organisms. But large, frequent blooms can lead to eutrophication—the loss of oxygen from the water—and end up suffocating marine life.

One type of phytoplankton commonly found in the Black Sea are coccolithophores—microscopic plankton that are plated with white calcium carbonate. When aggregated in large numbers, these reflective plates are easily visible from space as bright, milky water.

"The May ramp-up in reflectivity in the Black Sea, with peak brightness in June, seems consistent with results from other years," said Norman Kuring, an ocean scientist at NASA's Goddard Space Flight Center. Although Kuring does not study this region, the bloom this year is one of the brightest to catch his eye since 2012.

Other types of phytoplankton can look much different in satellite imagery. "It's important to remember that not all phytoplankton blooms make the water brighter," Kuring said. "Diatoms, which also bloom in the Black Sea, tend to darken water more than they brighten it."

Nasa's Aqua Satellite

Aqua is a multi-national NASA scientific research satellite in orbit around the Earth, studying the precipitation, evaporation, and cycling of water.

- Launch date: 4 May 2002
- Period: 1.6 hours
- Power: 4.444 kW
- Inclination: 98.1987°
- Manufacturer: TRW Inc.

More at: ***https://en.wikipedia.org/***

Distance Measurement in Astronomy

"Space is big. You just won't believe how vastly, hugely, mind- bogglingly big it is.
I mean, you may think it's a long way down the road to the chemist's,
but that's just peanuts to space"

Douglas Adams, The Hitchhiker's Guide to the Galaxy

Dealing with the numbers involved with the distances to the stars or even with those found in the solar system can be hard going. Astronomers make their lives easier by using a number of rulers (units of distance) for the distances and although they have some strange names they can be very useful for comparing the distances to stars, other galaxies and even the planets in our solar system.

AU (astronomical units)

One AU is the distance that the average distance that the Earth orbits the Sun at. The AU is most commonly used for the distances to objects with in our solar system. Pluto, the last planet in the solar system is found at an average distance of 39.47 AU from the Sun. Sedna, nearly as large as a planet, found beyond Pluto is never nearer to the Sun than 76AU and then goes to 880AU from the Sun in its giant elliptical orbit.

Light Years

One of the most common rulers is the light year. The light year is the distance that light travel in one year (365.25 days). It is most commonly used for the distances to stars and other galaxies.

The nearest star is 4.2 light years away from our sun. We are 8.3 light minutes away from the Sun. The distance to the outer most planet Pluto is about 13 light hours.

The table on the right shows some other distances in light years:

Object	Approx. Distance in light years
Next Nearest Star (Proxima Centuri)	4.2
Sirius	8.6
Centre of the galaxy	30,000
Andromeda Galaxy	2 million
Betelgeuse and Rigel	1,400

Parsec (pc)

Astronomers started measuring distances from the amount that a star moves as the Earth goes from one side of the Sun to the other. Try moving your head and you will see that the position of everything around you changes. One parsec is derived from the smallest angle measurement of 1/3,600th of a degree or an arc second that is the angle that a star at this distance would appear to move in 6 months as the Earth journeys around the Sun. A parsec is 3.2616 light years or 30,857,000,000,000 km. Two parsecs is 6.5532 light years or twice the distance, it is not a measure of change in angles of the stars. Due to the massive distance in the universe astronomers often use multiples of parsec commonly found are kiloparsec (kpc) a 1000 parsecs or a megaparsec (Mpc) 1,000,000 parsecs.

Below is a conversion table for some useful astronomical distance units:

	Kilometres (km)	Astronomical units (AU)	Light Years (l.y.)	Parsec (pc)
Kilometres (km)	1	149.6 million	9,460,000,000,000	30,857,000,000,000
Astronomical units (AU)	0.0000000067	1	63,240	206,263
Light Years (l.y.)	0.00000000000011	0.000016	1	3.2616
Parsec (pc)	0.000000000000033	0.0000048	0.3066	1

A new (old!) regular column!

The article which follows has appeared in NZ before, back in February 1998 to be precise and was supplied by Bert Paice. Over the last few months, several members have requested a repeat of the whole series titled '*My 100 best night sky sights*'. This is an introduction to that series of 25 articles. These will start again next month.

The articles are "as were" apart from minor formatting issues caused by more modern software.

Night Skies

During the last two years in my monthly articles I've described over 200 different deep sky objects on view for those months. These have been derived from a combination of sources - books, magazine articles and, in many instances, my own observations. Most published sources seem to assume the observer is nicely sited in the middle of a desert with clean, clear skies and a total absence of any form of light pollution, using a perfectly collimated telescope with diffraction-limited optics. The real world is different so, where these sources were relied upon exclusively, I tried to tune the view described to that more likely to be obtained from typical Isle of Wight locations.

However, when in November 1996 I obtained my new telescope, it gave me the facility to locate deep sky objects rapidly so enabling the study of many more in a given period than previously possible. I set myself the target of studying over 400 of the supposedly finest spectacles the night sky has to offer and this has been completed so I'm now setting out on the next 500!

In the last issue of the New Zenith I said the format of these articles would change in the new year and I now propose to present what I consider to be the very best deep sky objects to be seen from our locations in typical I.o.W. skies - those which everyone should have in their list of sights not to be missed. The articles will therefore describe only what I have seen through the eyepiece and what you can see if you attend any observing sessions. I don't of course have access to every kind and size of instrument used on the Island - my observing sessions have been undertaken mostly with a 10" SCT and 10 x 50 binoculars - but I'll try to indicate what the view will look like through other telescopes.

There may be some surprises. For example, many (not just some, but many) Messier objects are downright disappointing to casual observers using small and medium sized telescopes but, in compensation, a large number of NGC objects not logged by Messier are a positive delight.

Items will be grouped according to their nature and I have used nine categories:

1. **Open or Galactic Clusters** - groups of associated stars from 10s to 100s, generally loose associations easily resolved into individual members in the smallest telescopes.

2. **Globular Clusters** - tight associations of many 1000s of stars inhabiting the halo around our Milky Way Galaxy usually requiring quite high powers to resolve even the outer stars.

3. **Galaxies** - spiral galaxies like our own Milky Way and elliptical, lenticular irregular (or peculiar) galaxies which are variations on the same theme.

4. **Nebulae** - emission nebulae which shine by their own light and reflection nebulae visible only because they reflect the light of nearby or embedded stars.

5. **Planetary Nebulae** - not nebulae at all but material puffed out by some stars in later evolutionary stages, often forming an apparent gaseous ring around a dim central star.

6. **Double Stars** - pairs of stars which may be related (binaries) or not (line-of-sight), frequently displaying gorgeous contrasts of colour and brilliance.

7. **Multiple Stars** - three or more stars in association but sometimes including line-of-sight stars adding to the pleasing aspect of the view. At around nine or ten members these become Open Clusters but the crossover point is blurred.

8. **Supernovae Remnants** - remains of stars in our own galaxy which have suffered cataclysmic explosion. Few in this group are readily seen through amateur telescopes but they are a unique category and can be fascinating to observe.

9. **Miscellaneous** - anything that doesn't fit one of the other categories, including such things as Dark Nebulae (obscuring dust clouds), Star Clouds (myriads of closely packed stars covering relatively large areas of sky), asterisms (stars usually not associated with each other but forming shapes or patterns) and coloured individual stars.

As a preamble let me offer you a couple of disappointing Messier items (in this article only) and two good NGC objects by way of illustration.

M26 Scutum. An open cluster 30° above the southern horizon well placed in summer late evenings and described in one reference book as 'a tightly packed group of stars in a rich field - a worthwhile object in small telescopes'. This contrasts with the view through my 10" on a night of good seeing of a rather sparse cluster of dim stars (brightest only mag11) and through a 6" telescope you'd be lucky to see more than four. My observation notes are succinctly brief: 'Very few stars, none bright and needing a power of 250x to see at all well - category 2 on a scale of 0 to 10'.

M109 Ursa Major. A barred spiral galaxy adjacent to the bottom left star of the bowl of the Plough purporting to show in a 6" telescope 'a small sharp nucleus surrounded by mottled nebulosity'. On a night of fairly good seeing my note reads simply 'Very disappointing - a large, grey smudge only just glimpsed using averted vision - needs a BIG instrument!'.

Now for the better news.

NGC2244 Monoceros. A galactic cluster 40° above the southern horizon in mid-winter about which, in only moderate seeing I noted: 'A very open cluster with six very bright stars interspersed among 8 fairly bright ones and other fainter members. With the Oxygen lll filter fitted there is a strong hint of the emission nebula NGC2237 - the Rosette Nebula. This is a must for a night of better seeing'.

NGC4565 Coma Berenices. A spiral galaxy high in the spring sky. My notes read 'Faint but surprisingly 'bright' for such an extended object. Very large and clearly edge-on with a large and significantly brighter central core. Obscuring dust band not noted needs better seeing than tonight'.

That's it for this month. From the next issue I'll start on 'My 100 best night sky sights' - there's much more up there to see than meets the (casual) eye.

Bert Paice

Meteoroid Facts for Children

Enjoy these great meteoroid, meteor and meteorite facts for children.

- A meteoroid is a small rock or particle of debris in our solar system. They range in size from dust to around 10 metres in diameter (larger objects are usually referred to as asteroids).
- A meteoroid that burns up as it passes through the Earth's atmosphere is known as a meteor. If you've ever looked up at the sky at night and seen a streak of light or 'shooting star' what you are actually seeing is a meteor.
- A meteoroid that survives falling through the Earth's atmosphere and colliding with the Earth's surface is known as a meteorite.
- The fastest meteoroids travel through the solar system at a speed of around 42 kilometres per second (26 miles per second).
- The Earth's atmosphere experiences millions of meteors every day.
- Meteors are easier to see during the lower light conditions of night.
- A small percentage of meteoroids fly on a path that goes into the Earth's atmosphere and then back out again, they are known as Earth grazing fireballs.
- When many meteors occur in a close time frame in the same part of the sky it is called a meteor shower.
- Around 500 meteorites reach the Earth's surface every year but of those only around 5 ever make it to scientists for study.
- Meteorites that are observed as they fall through the Earth's atmosphere and later recovered are called 'falls', all others are called 'finds'. To this date there have been around 1000 collected 'falls' and 40000 'finds'.
- Unsure why a meteoroid is different to meteor, comet or asteroid? Learn the difference between a comet, asteroid, meteoroid, meteor & meteorite.

Learn more at: ***http://www.sciencekids.co.nz/***

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

Meteotux PI

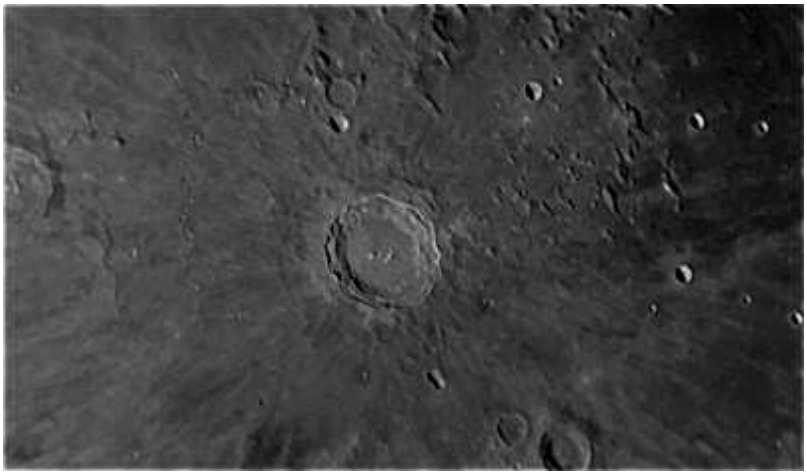
I came across an interesting, though rather sparse website the other day - ***https://sites.google.com/site/meteotuxpi/*** .

Meteotux PI is a program to record continuous high resolution images of night time fireballs, aeroplanes, satellite flashes etc. The equipment needed is:

- Raspberry PI + USB-power supply.
- Raspberry Pi Camera Module (IR filter removed) or Raspberry Pi NoIR
- SD-card Raspbian installed on it (others may work too, not tested).
- The program Meteotux PI itself (free download on the site).

If anyone has a go at this project, please let NZ know how you get on.

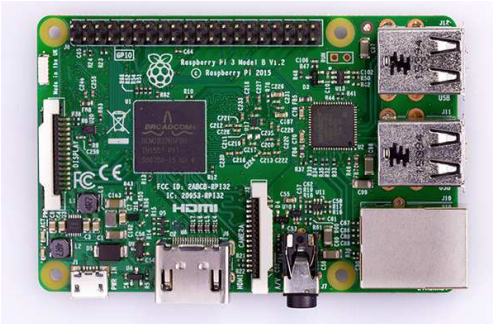
General Astrophotography with a Pi



Another stumbled on website introduces itself as "*Astrophotography with the Raspberry Pi Camera - **A Cheapskate's Guide to Solar System Photography***"

The site is at: ***https://shortcircuitsandinfiniteloops.blogspot.co.uk/2017/04/astrophotography-with-raspberry-pi.html***

What is a Pi?



A Raspberry Pi is a small low-cost single board computer capable of many tasks but which is particularly suited to those wanting to connect and control external devices.

There are many projects underway as a quick Google search will reveal.

If you jump into the Pi, please drop NZ a line or two about your experience.

Many more details about what is being done along with a heap of free magazines is available at:

https://www.raspberrypi.org/

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.

"If your experiment needs statistics, you ought to have done a better experiment"
Ernest Rutherford

"Understanding the history of matter and searching for its most interesting forms, such as galaxies, stars, planets and life, seems a suitable use for our intelligence"
Robert Kirshner

"An experiment is a question which science poses to Nature, and a measurement is the recording of Nature's answer"
Max Planck