

## Society News

### Another Open Night



Following this years stargazing event with AONB and CPRE at the end of March. We are planning another on Friday 27th Oct 2017, at the Watery Lane Pavilion and Observatory.

This event will be in place of our normal Monthly Meeting and will follow the general format of previous open meetings.

Of course volunteers are required to man telescopes, direct traffic and generally help things go smoothly. Please let us know if you can help.

### AGM - Committee Nominations etc

We are rapidly approaching our AGM in August.

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 too 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.

*Brian Curd*  
*Editor New Zenith.*

### VAS Website: [wightastronomy.org](http://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](mailto:editor@wightastronomy.org)

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

The Vectis Astronomical Society and the Editor of the New Zenith accept no responsibility for advice, information or opinion expressed by contributors.

**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](http://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 <a href="http://wightastronomy.org/meetings/">wightastronomy.org/meetings/</a> for the latest information		
26 May	A (Potted) History of the Telescope	Ninian Boyle
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

<b>President</b>	Barry Bates president@wightastronomy.org
<b>Chairman</b>	Bryn Davis chairman@wightastronomy.org
<b>Secretary</b>	Richard Flux secretary@wightastronomy.org
<b>Treasurer</b>	Simon Plumley treasurer@wightastronomy.org
<b>Observatory Director</b>	Brian Curd director@wightastronomy.org
<b>Programme Organisers</b>	Elaine Spear + Paul England progorg@wightastronomy.org
<b>Astro Photography</b>	Simon Plumley ap@wightastronomy.org
<b>NZ Editor</b>	Brian Curd editor@wightastronomy.org
<b>Membership Secretary</b>	Norman Osborn members@wightastronomy.org
<b>NZ Distribution</b>	Graham Osborne
<b>Others</b>	Mark Williams, Nigel Lee & Stewart Chambers

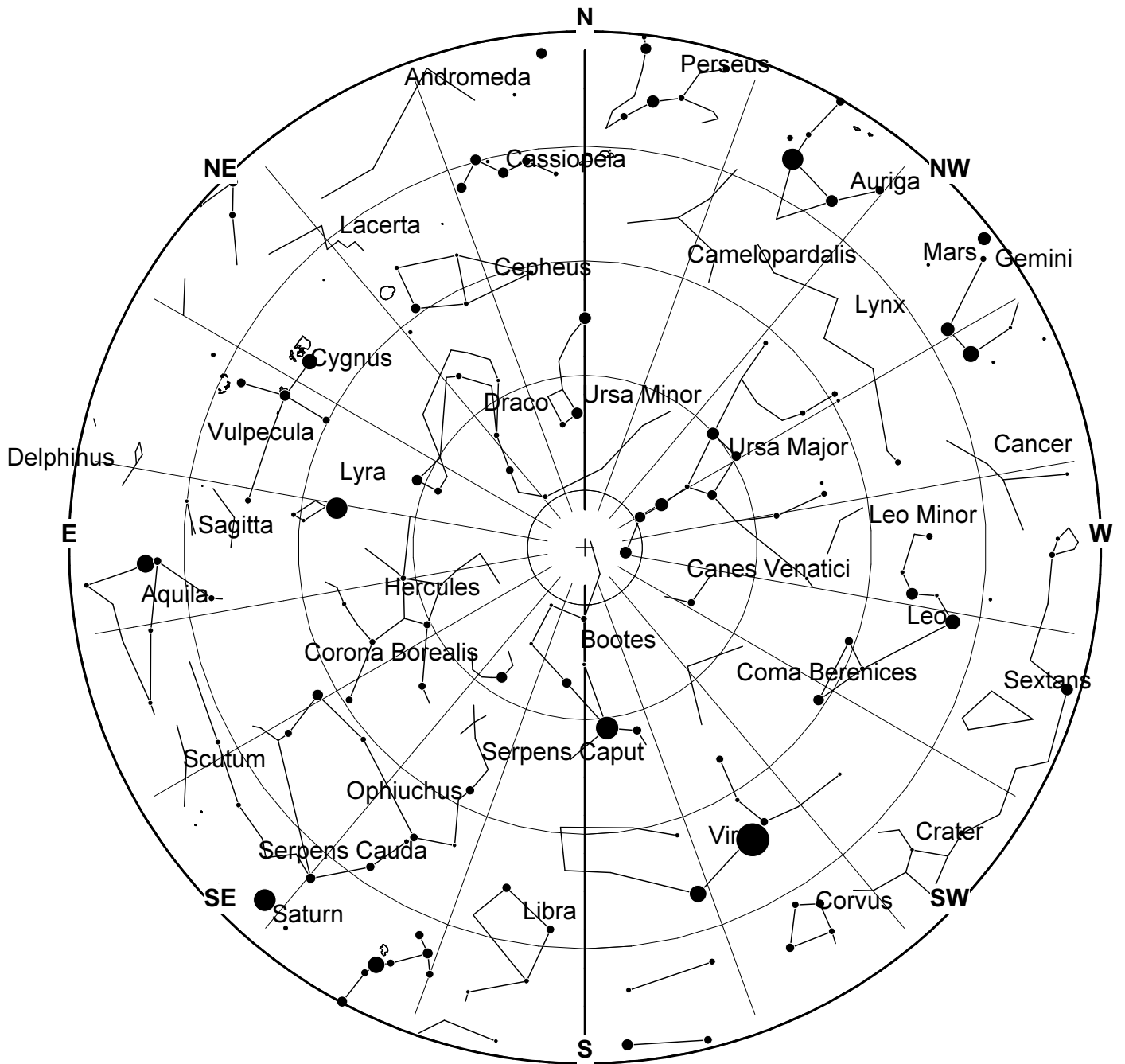
## Important

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**.

# June 2017 Sky Map



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







**Charles Messier** (26 June 1730 – 12 April 1817) was a French astronomer most notable for publishing an astronomical catalogue consisting of nebulae and star clusters that came to be known as the 110 “Messier objects”. The purpose of the catalogue was to help astronomical observers, in particular comet hunters such as himself, distinguish between permanent and transient visually diffuse objects in the sky.

The objects' Messier designations, from M1 to M110, are still used by professional and amateur astronomers today and their relative brightness makes them popular objects in the amateur astronomical community.

*This article is licensed under the [GNU Free Documentation License](#). It uses material from the Wikipedia article “Charles Messier”.*

## June 2017 Night Sky

### Moon Phases

New	First Qtr	Full	Last Qtr
			
24th	1st	9th	17th

### Summer Solstice

The Summer Solstice, the point at which the Sun is at its most northerly declination is on June 21 at 05:22. From now on the Sun is heading south and the nights start to lengthen as we head back towards autumn and winter.

### Planets

#### Mercury

Mercury completes the very poor morning apparition started last month. From our latitude it is lost against the brightness of the sky as it slips behind the Sun.

#### Venus

In the early morning, at around 4AM Venus, the brightest of the planets, can be found low down in the eastern sky.

#### Mars

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

#### Jupiter

Jupiter is to be found in the southern sky and can be observed from when the sky darkens after sunset until it gets too low and disappears in the haze at around midnight.

#### Saturn

This month Saturn is at opposition, rising at sunset and setting at sunrise. It is quite low in the sky, and at this time of year the hours of darkness are short, but being relatively bright means that the planet can be observed for as long as it is clear of the haze.

#### Uranus & Neptune

Both outer planets are lost in the glare of the Sun this month. Although Neptune is above the horizon during the darkest hours of the night it is still too low down to be easily seen.

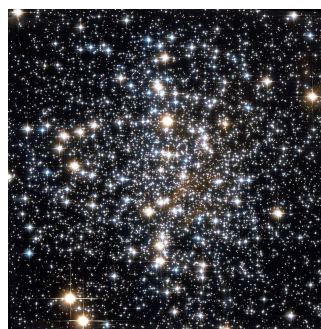
### Comet C/2015 V2 Johnson

This is likely to be the first and last time that Comet Johnson passes close to the Sun. Its current orbit is hyperbolic, meaning that after it passes the Sun it will be ejected from the solar system. It is at its closest to the Earth in June 5th and closest to the Sun on June 12th.

Observation when the comet is close to the Earth will be hampered by the waxing gibbous moon close by.

If predictions are correct then the comet will be between magnitude 6 & 7, a relatively easy target for binocular observing. The finder chart shows its path each day throughout the month as it passes through the constellations of Bootes and Virgo. Finder chart on page 5.

### Deep Sky



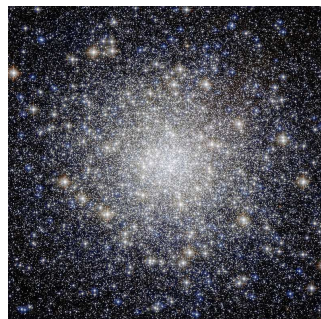
**M4 The Cat's Eye  
Globular Cluster**  
RA 16h 24m Dec -26° 33'  
mag 7.5

At about 7200 light years this 10,000 million year old cluster may be the closest globular cluster to our solar system. This core of this cluster is rather looser than most globulars with a distinct chain of stars running across its centre.



**M13 The Hercules  
Cluster** RA 16h 42' Dec  
36° 26' mag 5.8

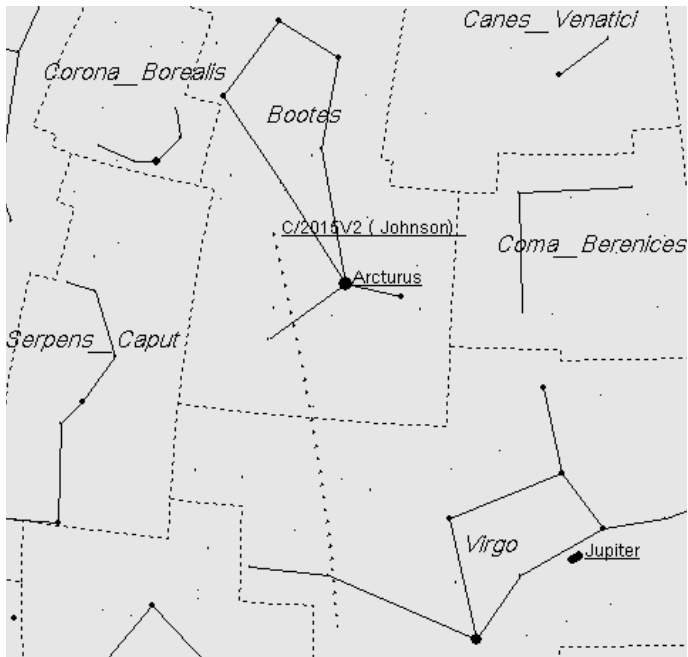
On a dark night the Hercules globular can be seen with the naked eye as a fuzzy star part way down the right hand side of the keystone asterism. This is the brightest and many would argue the best globular visible from the northern hemisphere. It lies some 25,000 light years away from us, relatively close by globular cluster standards. As with all globular clusters the view improves with increasing aperture used to observe it. The view is of a sugar coated ball frozen in time, and surrounded by a flurry of sugar grains.



**M92 Globular Cluster**  
RA 17h 17' Dec 32° 7'  
mag 6.5

Hercules contains two magnificent globular clusters, but for M13, M92 would be the northern hemisphere's showpiece globular. It is overshadowed by its more famous companion. M92 has a slightly smaller, more condensed core surrounded by fewer halo stars, but should be a stop on anyone's tour of the night sky.

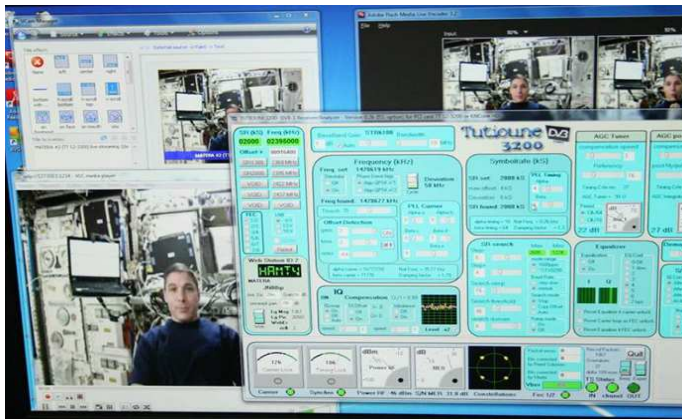
*Peter Burgess*



Finder Chart For Comet C/20152 Johnson

## Ham Video Makes Its Debut On The International Space Station

While amateur radio enthusiasts have been able to communicate with astronauts on the International Space Station since its inauguration in 2000, a new digital amateur television (DATV) transmitter installed in the Columbus laboratory will add a visual element to those conversations, the European Space Agency announced on Monday.



For the past 14 years, people on Earth have been able to communicate with the ISS crew using standard radio equipment, the ESA said. The DATV system was developed by Kayser Italia and arrived at the station last August on board Japan's space freighter. It was then connected to an existing S-band antenna in the Columbus laboratory.

The video signal works like standard TV broadcasts in that the crew members will not be able to see their

audience, but they will be able to hear their questions and comments over the regular amateur radio system. The sessions have to be brief, as the connection requires a direct line of sight. Since the ISS travels at speeds of more than 17,000 mph, it quickly passes through the field of view of Earth-based amateur stations, the agency said.

The crew finished commissioning the set-up for the device on April 12, and NASA astronaut Mike Hopkins was the first member to broadcast over what has been dubbed Ham TV. He took part in a video chat with ground stations in Livorno, Casale Monferrato and Matera, Italy.

The ESA explained that they have contributed five ground antennas and equipment to the Amateur Radio on the International Space Station (ARISS) organization, which can be easily transported and repositioned as needed in order to receive video from the ISS when it flies overhead. When linked together, the agency said that the station is capable of providing up to 20 minutes of contact at any given time.

According to ARISS, the Ham Video transmitted operates with a Canon XF-305 camera. It has download frequencies of 2.422 GHz and 2.437 GHz, contingency frequencies of 2.369 GHz and 2.395 GHz, and a DVB-S like signal. Other characteristics include a DVB-S like signal (without PMT tables), symbol rates of 1.3 Ms/s, 2.0 Ms/s, FEC of 1/2, video PID of 256, audio PID 257 and RF radiated power (approximately 10 W EIRP).

“Ham TV will add to ham radio for space educational purposes, offering schoolchildren the chance to talk and see astronauts in space with simple equipment,” the ESA said. “Anybody can still hail the Station via radio and, if an astronaut floats by the always-on receiver, they might just pick up and answer the call.”

More at: <http://www.redorbit.com/>

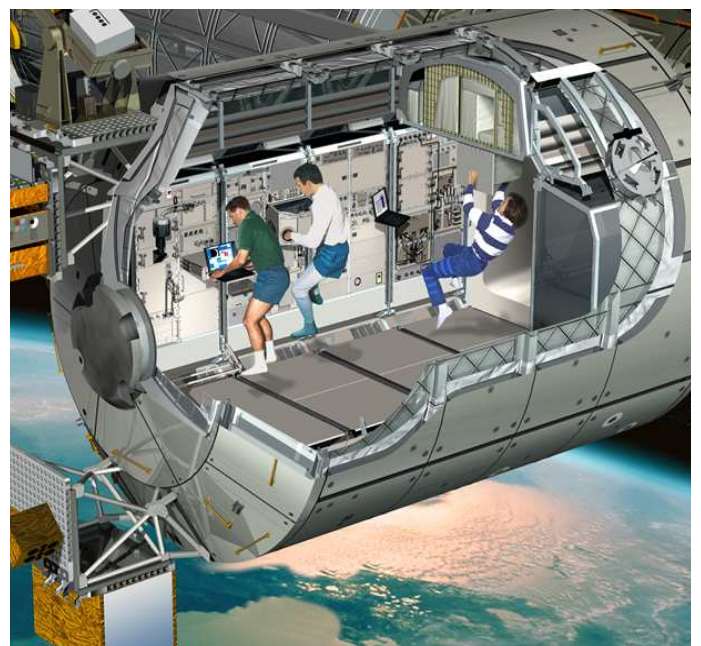
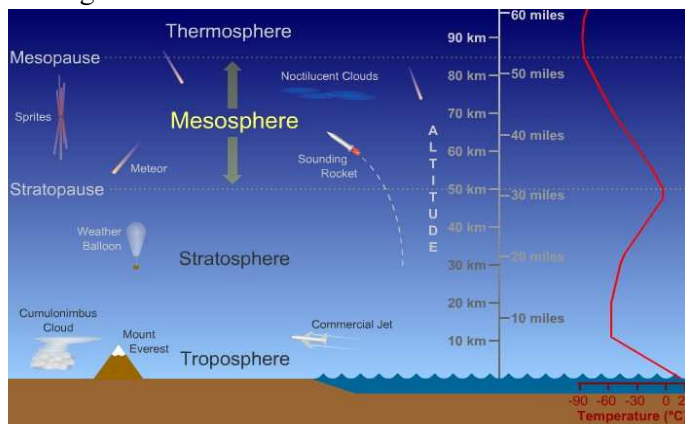




Photo credit: Song Despina - Wakomao Lake, Alberta, Canada

## Noctilucent Clouds

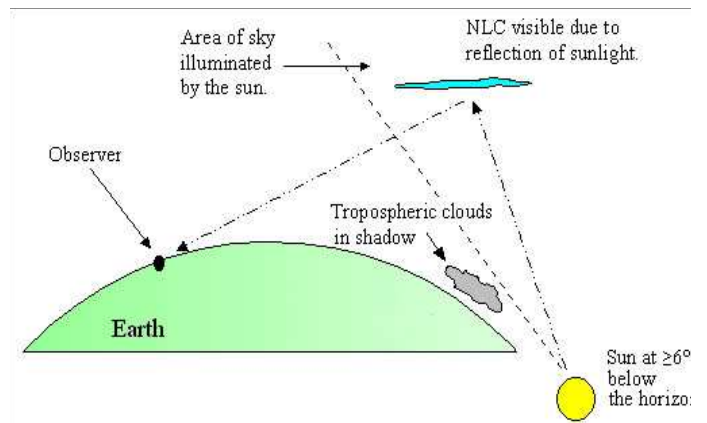
Noctilucent Clouds (NLC) are a cloud-like phenomena in the upper atmosphere. Also known as Space Clouds, they are made of ice crystals and located in the mesosphere at an altitude of about 80km (50miles). Visible only in local summer months. Noctilucent roughly means night shining cloud.



As the mesosphere contains very little moisture and the air is very thin, the ice crystals can only form at temperatures of  $-120^{\circ}\text{C}$ . This means NLC predominantly form in summer months, when, counterintuitive ly, the mesosphere is at its coldest.

NLC are too faint to be seen in daylight, and are only visible when illuminated by the sun when it is about 5 degrees below the horizon; and whilst the lower layers of the atmosphere are in the earth's shadow. So they are best observed about two hours after sunset and two hours before sunrise. You also need a good horizon where the sun sets and rises to see them.

The NLC season typically runs from mid May until mid August in the northern hemisphere and November to



January for the Southern Hemisphere, however sightings outside this window are being recorded with greater frequency. NLC are not fully understood and are a relatively recent discovered meteorological phenomenon; there is no confirmed recordings of their observation before 1885.

Data suggests that NLC require water vapour, dust and very cold temperatures to form. The sources of dust and water are unknown. The dust is believed to be from meteoroids, comets, asteroids and /or volcano dust. The moisture could be lifted through gaps in the tropopause, as well as from gasses from the stratosphere.

The exhaust from Space Shuttles, which was almost entirely water vapour after detachment of the solid rocket booster at a height of around 46km, was found to generate minuscule individual clouds. About half the vapour was released into the thermosphere. As the water migrates northward, it falls from the thermosphere down into the cooler mesosphere, which occupies the region of the atmosphere just below. Although this mechanism is the cause of individual NLC, it is not the major contributor as a whole.



*Photo credit: Kairo Kiitsak - beautiful panorama of NLC over Simuna, Estonia*

NLC are generally colourless or electric blue. The characteristic blue colour comes from absorption by the ozone in the path of the sunlight illuminating the NLC. They frequently show distinctive patterns, such as streaks, wave-like undulations and whirls.

NLC may be seen at a latitude of  $50^{\circ}$  to  $65^{\circ}$ , and seldom occur at lower latitudes, although sightings have been made as far south as Paris, Utah, Italy, Turkey and Spain. Closer to the poles it does not get dark enough for the clouds to become visible.

It has controversially been suggested that recent and increased appearances of NLC may be linked to climate change. Early sightings coincided with the industrial revolution.

Climate models predict that increased greenhouse gas emissions cause a cooling of the mesosphere, which would lead to more frequent and widespread occurrences of NLC. A complementing theory is that larger methane emissions from intensive farming activities produce more water vapour in the upper atmosphere.

## To further your interest:

### Facebook

If you would like to see some amazing images and follow up-to-date sightings, please join my Facebook page Noctilucent Cloud Watch. This is a photograph sharing page I started with my own interest in seeing images of these amazingly beautiful clouds. We have over 200 members now from Canada, Estonia, UK, Denmark, Poland, Germany, New Zealand, Bangladesh, USA and India.

Also on Facebook is Space\_Clouds. They use radio waves data, which return interesting and unique radar echoes

during the summer, to try and predict sightings, which is notoriously different, and not wholly reliable.

### Books

*Space Clouds: A short Guide to Noctilucent Clouds and the Science behind them* - John Rowlands

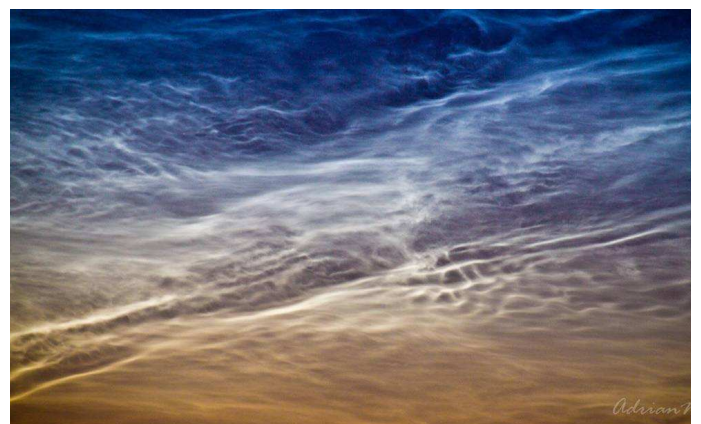
### Websites

<http://www.nightskyhunter.com/Noctilucent%20Clouds.html>

is a really nice illustrated and informative article on how to observe NLC

NASA's AIM (The Aeronomy of Ice in the Mesosphere) satellite mission is exploring NLC, to find out why they form and why they are changing.

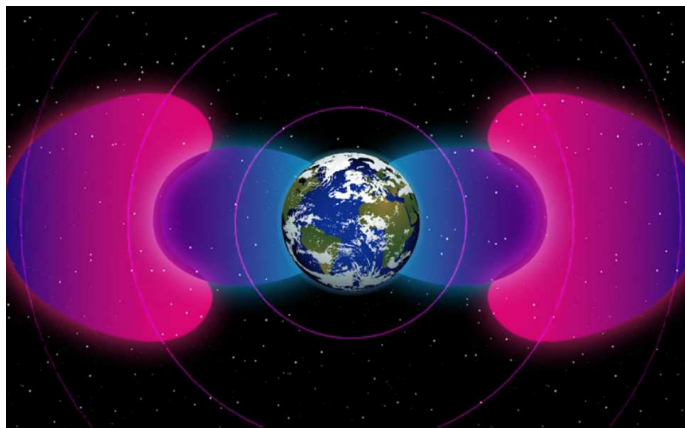
[https://www.nasa.gov/mission\\_pages/aim/index.html](https://www.nasa.gov/mission_pages/aim/index.html)



*Photo credit: Adrian Maricic, Fyfe, Scotland Close up of NLC showing streaks, waves and whirls.*

*Elaine Spear*

## NASA's Van Allen Probes Spot Man-Made Barrier Shrouding Earth



*Credits: NASA's Goddard Space Flight Center/Genna Duberstein*

Humans have long been shaping Earth's landscape, but now scientists know we can shape our near-space environment as well. A certain type of communications — very low frequency, or VLF, radio communications — have been found to interact with particles in space, affecting how and where they move. At times, these interactions can create a barrier around Earth against natural high energy particle radiation in space. These results, part of a comprehensive paper on human-induced space weather, were recently published in *Space Science Reviews*.

“A number of experiments and observations have figured out that, under the right conditions, radio communications signals in the VLF frequency range can in fact affect the properties of the high-energy radiation environment around the Earth,” said Phil Erickson, assistant director at the MIT Haystack Observatory, Westford, Massachusetts.

VLF signals are transmitted from ground stations at huge powers to communicate with submarines deep in the ocean. While these waves are intended for communications below the surface, they also extend out beyond our atmosphere, shrouding Earth in a VLF bubble. This bubble is even seen by spacecraft high above Earth's surface, such as NASA's Van Allen Probes, which study electrons and ions in the near-Earth environment.

The probes have noticed an interesting coincidence — the outward extent of the VLF bubble corresponds almost exactly to the inner edge of the Van Allen radiation belts, a layer of charged particles held in place by Earth's magnetic fields. Dan Baker, director of the University of Colorado's Laboratory for Atmospheric and Space Physics in Boulder, coined this lower limit the “impenetrable barrier” and speculates that if there were no human VLF transmissions, the boundary would likely stretch closer to Earth. Indeed,

comparisons of the modern extent of the radiation belts from Van Allen Probe data show the inner boundary to be much farther away than its recorded position in satellite data from the 1960s, when VLF transmissions were more limited.

With further study, VLF transmissions may serve as a way to remove excess radiation from the near-Earth environment. Plans are already underway to test VLF transmissions in the upper atmosphere to see if they could remove excess charged particles — which can appear during periods of intense space weather, such as when the sun erupts with giant clouds of particles and energy.

*More info and explanatory video available at:*  
<https://www.nasa.gov/>

*Other reports of this discovery include:*  
[https://www.nasa.gov/mission\\_pages/rbsp/mission/index.html](https://www.nasa.gov/mission_pages/rbsp/mission/index.html)  
*and*  
<http://www.sciencealert.com/nasa-space-probes-have-detected-a-human-made-barrier-shrouding-earth?perpetual=yes&limitstart=1>

### VLF

**Very low frequency** or **VLF** is the ITU designation for radio frequencies (RF) in the range of 3 kHz to 30 kHz and corresponding wavelengths from 100 to 10 kilometres, respectively. The band is also known as the *myriametre band* or *myriametre wave* as the wavelengths range from one to ten myriametres (an obsolete metric unit equal to 10 kilometres).

Due to its limited bandwidth, audio (voice) transmission is highly impractical in this band, and therefore only low data rate coded signals are used.

The VLF band is used for a few radio navigation services, government time radio stations (broadcasting time signals to set radio clocks) and for secure military communication. Since VLF waves can penetrate at least 40 metres (120 ft) into saltwater, they are used for military communication with submarines.

*Thanks to Dudley Johnson for alerting me to this.*



## Scientists Discover Possible First Proof of Parallel Universes

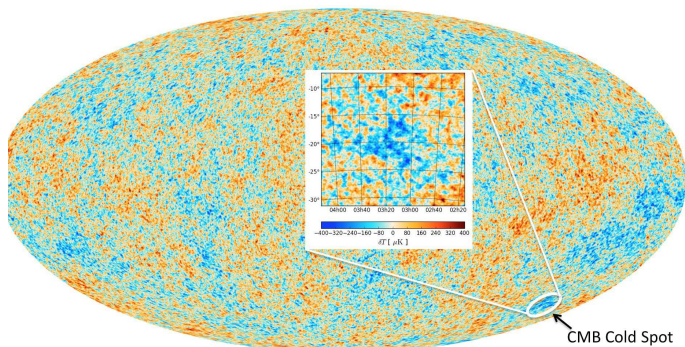


*Tarantula nebula. Credit: Pixabay.*

A new study about one of the most inexplicable places in the cosmos may offer the first proof that we are living in a multiverse.

The idea of a “multiverse” proposes that an infinite amount of universes, including the one we are living in, exist in parallel to each other. These universes differ in a variety of physical properties, featuring multiple Big Bangs, space bubbles and maybe even an alternate version of you who is reading this article in a world run by slugs. The “multiverse” hypothesis has been so far been impossible to test but has supporters among such scientists as Stephen Hawking, Michio Kaku, Neil deGrasse Tyson and Leonard Susskind.

The study by British astronomers focuses on what’s known as the “**Cold Spot**” - an especially cold area of space that has been observed in the microwave background radiation coming from the early Universe 13 billion years ago. Usually temperatures of the radiation vary throughout the universe, but this area of coolness is much larger than others (about 0.00015 degrees Celsius colder than its surroundings).



*The map of the cosmic microwave background (CMB) sky produced by the Planck satellite. Red represents slightly warmer regions, and blue slightly cooler regions. Credit: ESA and Durham University.*

The Cold Spot, first found by NASA in 2004, is a strange place 1.8 billion light years across that doesn’t comfortably gel with existing cosmological models. One explanation is that it simply doesn’t exist, being just an illusion created by the expansion of the universe. Spaces with lower amount of galaxies or “voids” form as the expansion accelerates. With 10,000 fewer galaxies, the Cold Spot would be a “supervoid”.

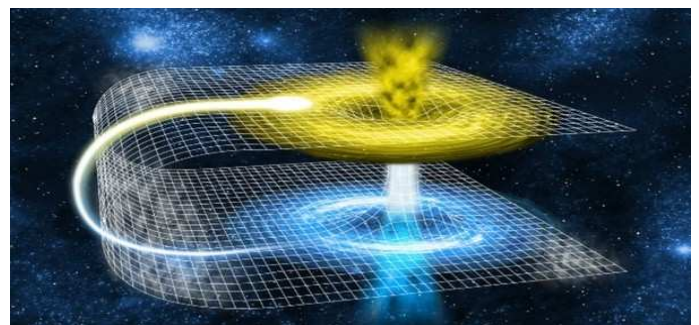
But the study, published in UK’s Royal Astronomical Society, claims to prove that the supervoid is not a valid solution to the Cold Spot’s mystery. The researchers think that instead of one giant emptiness in that area, there are galaxy clusters gathered around smaller bubble-like voids. And, significantly, these would be too small to be responsible for lowering the temperature in the Cold Spot.

In fact, other answers must be sought. The scientists, led by postgraduate student Ruari Mackenzie and Professor Tom Shanks in Durham University’s Centre for Extragalactic Astronomy, think one possible hypothesis is that the Cold Spot resulted from a collision between our universe during its early days and another universe. The energy release of such an impact would have created the Cold Spot.

*“We can’t entirely rule out that the Spot is caused by an unlikely fluctuation explained by the standard model. But if that isn’t the answer, then there are more exotic explanations. Perhaps the most exciting of these is that the Cold Spot was caused by a collision between our universe and another bubble universe. If further, more detailed, analysis of CMB [Cosmic Microwave Background] data proves this to be the case then the Cold Spot might be taken as the first evidence for the multiverse – and billions of other universes may exist like our own,” said Professor Tom Shanks.*

The multiverse, while an exciting idea, has its detractors. Some physicists feel since it’s not something observable or provable, then a discussion of it is pointless or even unscientific. But when more ordinary solutions come up empty, the doors of science open wider.

*Lot’s more & links at: <http://bigthink.com/>*



## A Guide to LED Light Bulbs

Today's most efficient way of illuminating and lighting is undoubtedly LED. When compared with older lighting technologies such as Incandescent, Halogen and CFL bulbs, you will find that LED is by far the most economical and smart solution.

Hopefully this short guide will help you understand how and why you can benefit from making the switch.

### What is an LED?

LEDs (light-emitting diodes) are a type of electronic light source. LEDs are very different from conventional incandescent and halogen lamps

- They last much longer
- They consume far less energy
- Emit very little heat
- They are more durable - no fragile parts or glass tubes and filaments
- They are safer as they do not contain mercury or lead.
- LED bulbs are now available in the most common light fittings.



### How much power do LEDs use?

LED Bulbs use about 90% less energy than an incandescent or halogen bulb of equivalent brightness. LEDs are far more efficient at converting electrical power, measured in Watts, into light, measured in Lumens. A typical 4 Watt LED bulb can easily achieve a light output comparable to a 50 Watt halogen.

### How long do LEDs last?

LEDs do not get as hot as incandescent bulbs. A well-built LED with good thermal management should last up to 50,000 hours. *Though be wary of retailers making exaggerated claims about the life expectancy of their products.*

### How bright are LEDs?

The brightness of a bulb is measured numerically in Lumens (Lm), the higher the number, the brighter the bulb. Despite using very low wattages, LEDs emit the same brightness as traditional light sources. To make things easier, most retailers quote an equivalent incandescent

wattage so consumers can replace their lights and keep the same brightness.

You used to look for wattage when buying new light bulbs, but wattage only measures energy use. Because energy efficient bulbs use considerably fewer Watts, we now use Lumens, which measure brightness, to select new bulbs. The chart below should help you determine how many lumens you'll need from your new bulbs:

You used to look for WATTS (Energy)	Now you look for LUMENS (Brightness)
150 W	2600 Lm
100 W	1600 Lm
75 W	1100 Lm
60 W	800 Lm
40 W	450 Lm
Estimates based on typical incandescent bulbs	

### How can LEDs help me save money?

You buy your electricity in "Units", which are actually kilowatt hours. This means that one Unit = 1000W (a single bar electric fire) for 1 hour. Simply reducing the number of Watts you use each hour means you save.

About 20% of the average household energy consumption is lighting which means you really can save. by switching to LED.

LEDs last far longer so you won't need to replace them often. Once you've switched to LED, you will start saving money in less than a year.

### Do I need a special dimmer for LED dimmable bulbs?

Yes. You must use dimmer switches designed specifically for use with LED bulbs.

### Choosing the LED colour

LED light are usually available in Warm White, Cool White and Daylight.

Warm White is usually used in homes and is the most like standard halogen bulbs making the ideal replacement. Cool White is a cooler white colour often associated with fluorescent tubes in offices or retail outlets. Daylight is a very white light, almost with a tinge of blue to it, and provides the very best colour rendering.

## 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

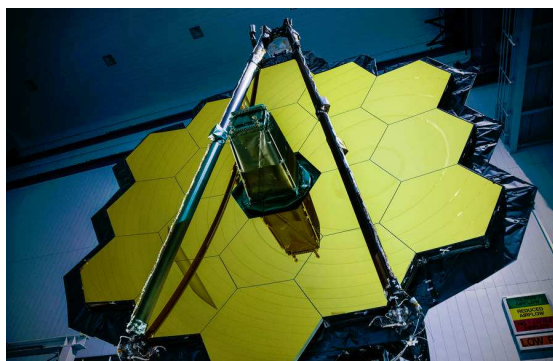
### What's going on at the observatory

Since we completed the building work the observatory is now in pretty good shape. It's now time to get some of the delayed projects up and running:

- Radio Astronomy
- Astro Photography
- Dark Skies
- Public Outreach
- Fund Raising
- Building Maintenance
- etc etc

Yes, it's another appeal for help! No apologies, we need you to join in and keep VAS moving forward. If you are interested in helping with any of the listed items, please get in touch, we need you!

### James Webb Space Telescope shipped to Texas for its biggest test yet



The centrepiece of the James Webb Space Telescope has arrived at NASA's Johnson Space Center in Houston for a three-month test to ensure the observatory's sensors and gold-coated mirrors work in the frigid temperatures of deep space.

While the assembly and initial checks of the telescope's durability have uncovered no major problems, NASA officials

caution that the \$10 billion, multi-national project is on the cusp of some of its most critical tests leading up to a planned launch in October 2018.

Over the next few months, technicians will unpack the telescope and install it inside a thermal vacuum chamber at the space center, then pump air out of the test facility as helium and liquid nitrogen chills the hardware to a temperature colder than minus 370 degrees Fahrenheit, or about 50 Kelvin, a measure above absolute zero.

Parts of the telescope, the largest ever built to fly in space, will be even colder during the 93-day freeze to verify the sensitivity of JWST's infrared detectors, part of an end-to-end test of the observatory's optics to ensure they will function in space.

The mission's four science instruments already went through three cryogenic tests at NASA's Goddard Space Flight Center in Greenbelt, Maryland, but officials had to ship the fully-assembled telescope to Houston to subject the complete structure to the conditions it will encounter in space.

More at: <https://astronomynow.com/>

### 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.

*"We live in a changing universe and few things are changing faster than our conception of it"*

**Timothy Ferris**

*"National boundaries are not evident when we view the Earth from space.*

*Fanatical ethnic or religious or national chauvinisms are a little difficult to maintain when we see our planet as a fragile blue crescent fading to become an inconspicuous point of light against the bastion and citadel of the stars"*

**Carl Sagan**

*"I have never let my schooling interfere with my education"*

**Mark Twain**