

## Society News

### NZ Tweaks

Well, the only comments I've received regarding the format changes have been positive so it's staying ;)

### Articles Needed

Nice to have some member submitted pieces for this month's edition. I always need articles for NZ so please, if you have taken your first astro-photo or built equipment to solve a particular problem, then please send me the details. Don't worry about file format or spelling, I'll do my best to sort that out!

### Mottistone News

I recently attended a site-survey meeting regarding the event on Wednesday 27th August. We established two sites suitable for telescopes, one in the main grounds and the other at the Long Stone up on the downs above the Manor.

I do hope you can help with this event as the National Trust is expecting up to 200 to attend.

### Secretary Needed

We still need a Secretary for 2014/2015. If you can spare a couple of hours or so each month to take minutes and generally keep VAS in order, the committee would love to hear from you. It's not too onerous, honest....

*Brian Curd*

## VAS Website: [www.wightastronomy.org](http://www.wightastronomy.org)

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

**The Editor New Zenith**

**35 Forest Road**

**Winford**

**Sandown PO36 0JY**

Tel: **01983 864303** or email: [editor@wightastronomy.org](mailto:editor@wightastronomy.org)

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

## VAS Registered Office

35 Forest Road, Winford, Isle of Wight, PO36 0JY

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

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## Observatory Diary

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

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## Events - Help Request

I have received a request for VAS to attend a quite large astronomy events to be held in 2014:

- **National Trust Mottistone**  
Weds 27th Aug - Start time 1930  
VAS will be one of 5 activities around the garden including bats, moths, birds and hedgehogs

**The event is in a dark sky area and should be a good evening so please, if you can help at Mottistone, I'd really like to hear from you.**

## Monthly Meeting Calendar 2014

Check the website for up to the minute information.  
All details correct at time of publication.

Date	Subject	Speaker
25 Jul	Exoplanets and How We Find Them (Live demo)	Jakub Bochinski, Chairman OU Astronomy Club
22 Aug	Photographing the Aurora and <b>AGM</b>	Elizabeth Cunningham
26 Sep	Mysteries of the Solar System	Dr Stuart Eves Astrium
24 Oct	Asteroids, Comets, Impacts. Should we worry?	Robin Catchpole
28 Nov	TBA	David Waltham

### Telescope Training

Any member who would like training on the observatory Meade LX200 should contact **Barry Bates on 872979**

### Observatory Visits Booked

None this month

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

### Important:

Members using the observatory outside normal Thursday meetings **MUST** enter a line or two in the Observatory Log Book.

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

When you leave the observatory please ensure it is secure and all lights, heaters and telescopes are **TURNED OFF**.

## VAS Contacts 2013/14

<b>President</b>	Barry Bates president@wightastronomy.org
<b>Chairman</b>	Bryn Davis chairman@wightastronomy.org
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<b>Membership Secretary</b>	Norman Osborn members@wightastronomy.org
<b>NZ Distribution</b>	Brian Bond distribution@wightastronomy.org
<b>Others</b>	Mark Williams Nigel Lee



**Island Planetarium  
@Fort Victoria**

*The Island's Telescope Professionals*

### **Serious Stuff**

TAL 200mm Newtonian Reflector OTA  
180mm Maksutov Cassegrain OTA  
EQ 5 mount and drives

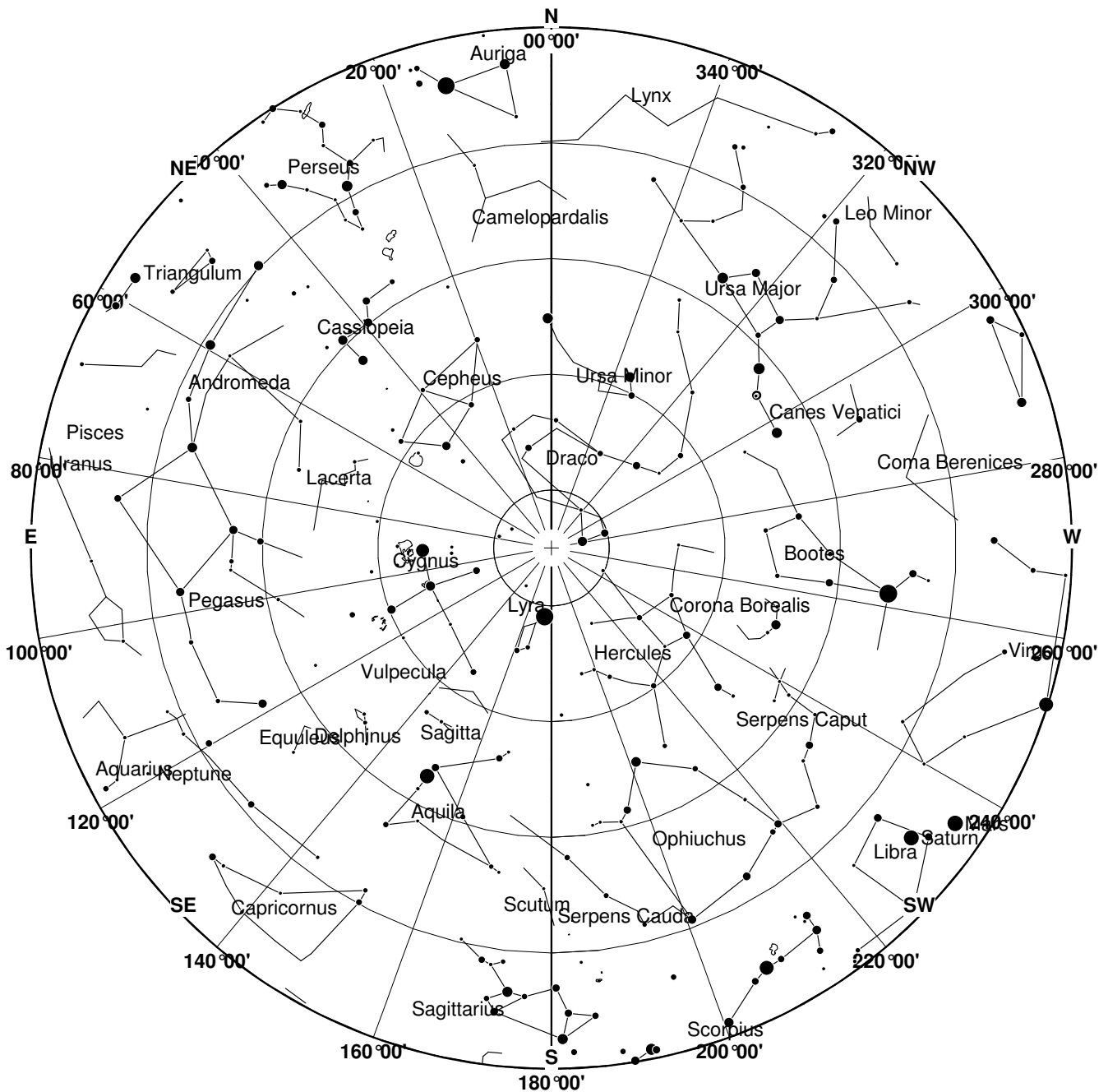
### **Various Used ETX 's**

**Also starter scopes and accessories**

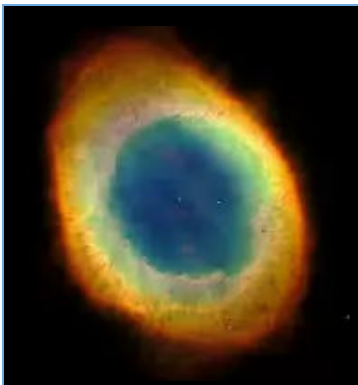
**Discounts and deals for VAS members**

**Call Paul England – VAS Member**  
on 761555 - leave a message if I am not there  
Or - [enquiry@islandastronomy.co.uk](mailto:enquiry@islandastronomy.co.uk)

# August 2014 Sky Map



View from Newchurch Isle of Wight UK - 2200hrs - 15 August 2014







**The Ring Nebula** (also catalogued as Messier 57, M57 or NGC 6720) is a planetary nebula in the northern constellation of Lyra. Such objects are formed when a shell of ionized gas is expelled into the surrounding interstellar medium by a red giant star, which was passing through the last stage in its evolution before becoming a white dwarf.

M57 is an example of the class of planetary nebulae known as bipolar nebulae, whose thick equatorial rings visibly extend the structure through its main axis of symmetry. It appears to be a prolate spheroid with strong concentrations of material along its equator. From Earth, the symmetrical axis is viewed at about 30°. Overall, the observed nebulosity has been currently estimated to be expanding for approximately  $1,610 \pm 240$  years.

*This article is licensed under the [GNU Free Documentation License](http://www.gnu.org/licenses/fdl.html). It uses material from the Wikipedia article "[Ring Nebula](http://en.wikipedia.org/wiki/Ring_Nebula)"*

## August 2014 Night Sky

### Moon Phases

New	First Qtr	Full	Last Qtr
			
25th	4th	10th	17th

### Planets

**Mercury** - During the first week of the month Mercury completes its poor appearance in the eastern sky just before sunrise. On the 3rd it makes a close conjunction with Jupiter, but the pair are only about 5° from the Sun, so will be very difficult to observe from our latitude.

**Venus** - Venus is low down in the eastern sky before sunrise. It is gradually getting closer to the Sun and will be separated by about 15° at the end of the month. On the 18th Venus and Jupiter are in close conjunction separated by about 1/3rd the diameter of the full Moon.

**Mars** - After sunset as the sky gets dark, stretch out your arm to the south west and make a thumb's up sign. The ruddy object close to your thumb nail is Mars. For the next few months it will be low in the south western sky after sunset. It is now getting very small and being so low down detecting any surface features through a telescope will be very difficult.

On the 3rd the first quarter Moon sits between Mars and Saturn and during the last week of the month these two planets slide past one another as Saturn heads towards the Sun.

**Jupiter** - Jupiter climbs up into the pre-dawn sky away from conjunction passing close by Venus on the 3rd, ending the month 25° clear of the horizon at sunrise.

**Saturn** - As the month progresses Saturn drifts further and lower into the southwest making observation more and more difficult. On the 31st the waxing crescent Moon passes just a full moon's width below the planet.

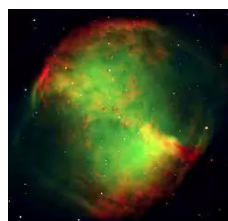
**Uranus** - Uranus is found about 2.5° below the 4th magnitude star Epsilon Piscium. Mid month it is due south at 04:00

**Neptune** - Neptune is in the constellation of Aquarius located in the middle of the stars Ancha, Lambda and Tau Aquarius. It should be high enough for observation from about midnight until twilight.

### Meteors

August is a good month for meteors, the Perseids shower peaks on the night of 12 – 13th, but activity can be quite good a few days either side. This year viewing will be hampered by the bright almost full moon.

### Deep Sky



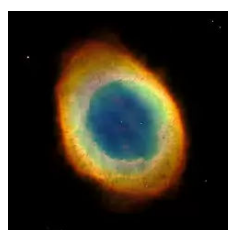
#### **M27 Dumbbell Nebula**

**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.



#### **M57 Ring Nebula**

**RA 18h 54m Dec 33°2' mag 9.5**

This tiny smoke ring in the sky is easily found with a small telescope between Sulafat and Sheliak, the bottom two stars in Lyra.

A planetary nebula is the last display of a star similar in size to our Sun. As the star runs out of fuel the outer layers are blown off and the remaining core shrinks to become a white dwarf.

The intense ultra violet radiation from the white dwarf causes the surrounding gas to glow as it slowly dissipates into space. In stellar life times this is just a fleeting moment. The ring nebula formed approximately 20,000 years ago.



#### **NGC6940 Open Cluster**

**RA 20h 35m Dec 28° 20' mag 6.3**

Surrounded by dark dust lanes the impression is of all the stars in the locality brushed into a small pile leaving the surrounding area relatively empty.

This is a rich cluster with many multicoloured loops, chains and groupings.

*Peter Burgess*

## The Antikythera Mechanism



The Antikythera mechanism is an ancient analog computer designed to predict astronomical positions and eclipses. It was recovered in 1900–01 from the Antikythera wreck, a shipwreck off the Greek island of Antikythera. The instrument has been designed and constructed by Greek scientists and dated between 150 to 100BC. Technological artifacts approaching its complexity and workmanship did not appear again until the 14th century, when mechanical astronomical clocks began to be built in Western Europe.

The mechanism was housed in a wooden box about 340×180×90mm in size and comprised 30 bronze gears (although more could have been lost). The largest gear, clearly visible in fragment A, was about 140 mm in diameter and had 223 teeth. The mechanism's remains were found as 82 separate fragments of which only seven contain any gears or significant inscriptions.

Since their discovery the fragments of the Antikythera mechanism are kept at the National Archaeological Museum of Athens.

### Origins and Discovery

This machine has the oldest known complex gear mechanism and is sometimes called the first known analog computer, although the quality of its manufacture suggests that it had undiscovered predecessors during the Hellenistic Period.

It appears to be constructed upon theories of astronomy and mathematics developed by Greek astronomers and is estimated to have been made around 100 BC. In 1974, British science historian and Yale University professor Derek de Solla Price concluded from gear settings and inscriptions on the mechanism's faces that the mechanism

was made about 87 BC and was lost only a few years later. Jacques Cousteau visited the wreck in 1978 and recovered new dating evidence. It is believed the mechanism was made of a low-tin bronze alloy (95% copper, 5% tin), but the device's advanced state of corrosion has made it impossible to perform an accurate compositional analysis. All of the mechanism's instructions are written in Koine Greek, and the consensus among scholars is that the mechanism was made in the Greek-speaking world.

Recent findings of The Antikythera Mechanism Research Project suggest the concept for the mechanism originated in the colonies of Corinth, since some of the astronomical calculations seem to indicate observations that can be made only in the Corinth area of ancient Greece. Syracuse was a colony of Corinth and the home of Archimedes, which might imply a connection with the school of Archimedes. Another theory states that coins found by Jacques Cousteau in the 1970s at the wreck site and dated to the time of the construction of the device, suggest that its origin may have been from the ancient Greek city of Pergamon. Pergamon was also the site of the famous Library of Pergamum which housed many scrolls of art and science. The Library of Pergamum was only second in importance to the Library of Alexandria during the Hellenistic period.

The ship carrying the device also contained vases that were in the Rhodian style. One hypothesis is that the device was constructed at an academy founded by the Stoic philosopher Posidonius on the Greek island of Rhodes, which at the time was known as a center of astronomy and mechanical engineering; this hypothesis further suggests that the mechanism may have been designed by the astronomer Hipparchus, since it contains a lunar mechanism which uses Hipparchus's theory for the motion of the Moon. Hipparchus was thought to have worked from about 140 BC to 120 BC. Rhodes was a trading port at that time.

The mechanism was discovered in a shipwreck off Point Glyphadia on the Greek island of Antikythera. The wreck had been found in April 1900 by a group of Greek sponge divers. They retrieved numerous artifacts, including bronze and marble statues, pottery, unique glassware, jewelry, coins, and the mechanism itself, which were transferred to the National Museum of Archaeology in Athens for storage and analysis. The mechanism itself went unnoticed for two years: it was a lump of corroded bronze and wood and the museum staff had many other pieces with which to busy themselves. On 17 May 1902, archaeologist Valerios Stais was examining the finds and noticed that one of the pieces of rock had a gear wheel embedded in it. Stais initially believed it was an astronomical clock, but most scholars considered the device to be prochronistic, too complex to have been constructed during the same period as the other pieces that had been discovered. Investigations into the object were

soon dropped until Derek J. de Solla Price became interested in it in 1951. In 1971, both Price and a Greek nuclear physicist named Charalampos Karakalos made X-ray and gamma-ray images of the 82 fragments. Price published an extensive 70-page paper on their findings in 1974. It is not known how it came to be on the cargo ship, but it has been suggested that it was being taken to Rome, together with other treasure looted from the island, to support a triumphal parade being staged by Julius Caesar.



Front panel of a 2007 reproduction.

Cardiff University professor Michael Edmunds, who led a 2006 study of the mechanism, described the device as “just extraordinary, the only thing of its kind”, and said that its astronomy was “exactly right”. He regarded the Antikythera mechanism as “more valuable than the Mona Lisa”.

## Documentaries, exhibitions and popular culture

As of 2012, the Antikythera mechanism was now displayed as part of a temporary exhibition about the Antikythera Shipwreck, accompanied by reconstructions made by Ioannis Theofanidis, Derek de Solla Price, Michael Wright, the Thessaloniki University and Dionysios Kriaris. Other reconstructions are on display at the American Computer Museum in Bozeman, Montana, at the Children’s Museum of Manhattan in New York, at

Astronomisch-Physikalisches Kabinett in Kassel, Germany, and at the Musée des Arts et Métiers in Paris.

A fully functioning Lego reconstruction of the Antikythera mechanism was built in 2010 by hobbyist Andy Carrol, and featured in a short film produced by Small Mammal in 2011.

Several exhibitions have been staged worldwide,[93] leading to the main “Antikythera shipwreck” exhibition at the National Archaeological Museum in Athens, Greece.

*This article is licensed under the **GNU Free Documentation License**. It uses material from the Wikipedia article “**Antikythera mechanism**”*

**Editor’s Note:** *This really is a fascinating device and the (extensive) Wikipedia page, linked above, is well worth a read.*

*I found out about this device from an excellent BBC documentary “The 2000 year old computer” which sadly is no longer available on iPlayer.*

*It is on YouTube though at <http://www.youtube.com/watch?v=nZXjUqLMgxM>*

**VAS Members and families get 2 for 1 entry to the planetarium during July and August.**  
Booking is advised as we do get very busy particularly if it is cold or wet.  
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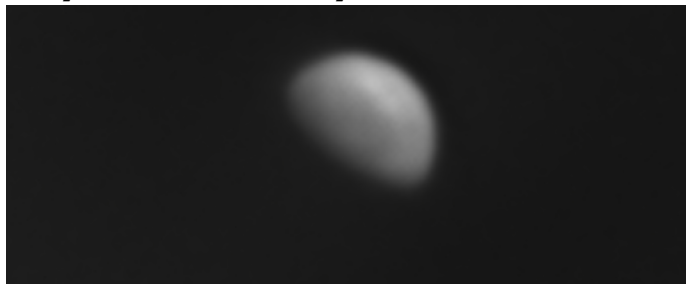


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## Daytime Mercury and Venus



Virtually every article or magazine will point you towards observing Venus and especially Mercury at either sunrise or sunset which for more casual and distant appreciation is the easiest and often a still a visually rewarding thing to do.

However through a telescope this means looking at these planets through a mire of the earth's atmosphere which causes hideous distortion and usually delivers view resembling a discoloured orangey smudge that looks like its on fire in a stormy wind.

There is the additional problem of requiring a low enough field of view to pick these targets in their low altitude westerly setting or an additional inconvenience of an early morning in the easterly direction depending on the time of year.

I like to image what I see so all of the above factors are things to avoid so the solution is to locate them in the daytime. Both planets are bright enough to see with your eyes in a bright blue sky even in the finder scope and that also means you can image it too. The biggest obstacle is finding them and I'm sure you could write a small book on other obstacles if you want to image them. I hope I can encourage you to think of these as good daytime objects to try visually or to image, rather than the traditional evening/morning slot that they always get.

### Plan your planets

Like everything in astronomy there are ideal times to observe/image which for me is dictated to by the highest point the target reaches (transits) in the sky as this has the least atmosphere and so has a better chance of being a clearer image for observing and imaging.

Obviously the weather will be your first influence so make sure on your chosen sunny day that there is no high thin cloud which is often not noticed in the sunny "clear sky". This will hinder your changes of finding them, observing and destroy any quality from imaging.

Distance from the sun - There are numerous astronomy software applications that will help you determine where in the sky Venus and Mercury will be such as Stellarium. I prefer the apple based apps Sky Safari Pro and Luminos

which have a lot of useful data. These will show you how far away the planets will be from the sun on their orbiting path and give you an accurate percentage of illumination, altitude as well as the precise orientation and surface features of Mercury (Luminos). Below is a diagram of the location and paths of Mercury (brown) and Venus (white) (illustration from Star Safari) which you can see has Mercury near the edge of its furthest distance from the sun and therefore the few days before and after are the safest and have the least telescope glare.

Depending on either planets position their appearance will differ dramatically just like the moon and unlike most of the outer planets which have little if any shadow/terminators.

Venus's size decreases dramatically from being a large thin crescent to a smaller more illuminated disc. Roughly this means Venus's size varies from a huge 1 arc minute at 1% illumination to less than 10 arc sec near 100% illumination. Mercury varies approx 12 arc sec size to 5 arc sec. Both have a realistic cut off point where they are too close to the sun to be safe to see or any use due to glare down the telescope. Venus being further out from the sun of course has a lot more opportunities to be enjoyed but Mercury needs the most attention to get the best from it.

Both these planets are predominately white in appearance so some distinct red and blue fringing may be apparent in your view created from your optics, so the better quality the eye piece and imaging train the less of this you will get.

It's worth noting that you should have a long dew shield or sun shade over the end of your telescope for this exercise to stop unwanted reflections. This can be home made from cardboard etc but just make sure it's practical and does not easily fall off.

### How to find them

There are several ways to find these in the day time. The two most straight forward methods would be using setting circles or if your "go to" mount has a last alignment or ability to align without stars.

**Setting circles** - I only know the theory for this but have never done it in practice primarily because my equatorial mount does not have them. I shall not attempt to guide you through this as you will either already know how to use these already or there are numerous articles on the web guiding you through the process a lot better than I. If you haven't used them before it might be worth getting familiar with them at night before you attempt a featureless blue sky. In examples I have seen the Sun is used as a start point but you will need the appropriate safe Sun filters on your set up to use this. It's possible to make use of a day time moon if this happens to be around too.

**Go to mounts** - These differ a lot from model and manufacturer but, if you have a permanent set up, you should be able to use your last alignment to find Venus easily in your finder scope with a fine tune. Simply line up for accuracy and sync your scope. Mercury should then be found more easily by jumping on from Venus.

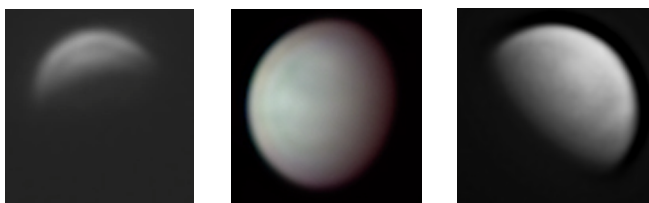
If your mount will not allow alignment from a planet then you could use a very bright star such as Sirius or even Capella and then sync from these. (*Never slew about the sky anywhere near the sun trying to get lucky looking for objects, this is simply too risky for your eyes*).

If you don't have either of these then it's worth setting your scope up at night, polar aligning and then accurately marking your tripod position so that you can re-create this set up in the day time and have the same options as a more permanent set up.

## Imaging

I cannot guide you through every step of this process as this is a topic in itself even before attempting these more awkward targets. However, for those already familiar with imaging and your own equipment it's worth attempting an image of these often avoided planets.

I am still trying to get more detail from these challenging targets. There are expensive specialist UV filters to help this task which I've yet to acquire, but you can still get a starting image without them and I have shared my own initial efforts with this article.



Capturing surface detail will be increased by having more of the surface illuminated (ie a thin crescent does not have much surface to show)

Focus is key in all astro imaging and is particularly difficult on these targets as there are no contrasty bright stars to use a Bahtinov mask on, so you are really left with your best guess as to the overall sharpness determined by the planet's edge.

These are a just a few of the extra Imaging Problems you might like to plan and look out for -

- Schmidt Cassegrain Telescopes - Tube air boils in the suns heat creating impossible distortion.
- Glare reflecting down the sun shade/dew shield
- Glare on lap top screen
- Overheating in make shift sun tent/hood
- Sun burn!

- Dramatic change of focus from eye piece used to line up to attaching camera, barlow etc.
- Trying to fine focus for the image with no details.
- Hot sunny days make my observatory floor hot, so I advise on footwear otherwise you'll end up with that "burning sand on your feet feeling"
- Finding Mercury from Venus
- Clouds! Beware, the cloud gods know when you are trying to get an image, as just when you have finally set up, they roll the clouds in EVERY time.
- Mount flipping on the meridian from Venus to Mercury - sometimes it does - sometimes not, make sure you can disconnect your laptop and any cables fast or the astronomical equivalent of a train crash is going to happen.
- Being able to change filters without disturbing the focus too much or losing your target after its taken so long to find it!
- Having the ability to sync your scope to your target, in case it moves from view for whatever reason.
- The wind gods (I nearly forget them!). Trying to keep Mercury on a tiny 0.4cm x 0.3cm sensor at nearly 8,000 mm focal length is hard enough without the wind; which doesn't affect the mount it upsets the cables and causes terrible wobble.

One thing I've learnt with imaging is that there can always be improvements so you have to keep trying for that perfect set of conditions and who knows, if the cloud gods don't see me, I might get a little more every time.

## Expectations

Overcoming all of these and other day time obstacles will reward you with a virtually featureless image, so why bother? Well, I remember not too long ago, I was delighted when I said "wow I've seen a tiny dot low in the sky with just my eyes and it was the elusive Mercury". The next attempt was better, I was able to have Mercury in the right position low in the sky West and looked through a telescope this time, unfortunately my previous delight was now disappointment due to seeing nothing but the "dancing orangey smudge".

Following this, I recently went in pursuit of seeing/imaging them in the day time. Venus is a lovely pearl like planet to the eyes and has an ever changing soft terminator. It may surprise you just how big and bright it can be. Mercury is a bit trickier but when you locate it you can be rewarded with seeing its planet shape and phases. These neighbourly rocky worlds pass over us virtually unnoticed every day so why not take the time to see something a little different and get a sun tan at the same time?

*NB-Extra care should always be taken when trying to observe object near the sun. Never look through the finder scope or telescope while slewing or simply searching around the sky.*

Simon Plumley



## CfDS and Local Government

The British Astronomical Association's Campaign for Dark Skies (CfDS) was set up by concerned members in 1989, to counter the ever growing tide of sky glow which has tainted the night sky over Britain since the 1950s.

### Sky Glow

Once caused almost exclusively by poorly aimed street lamps and building floodlights emitting light above the horizontal, sky glow is nowadays increasingly the result of overpowered, poorly-mounted household security lights and literally "over-the-top" sports lighting. There is a trend nowadays for obtrusive "light art" to be used for publicity - even Alpine mountains are being illuminated!

The CfDS also works towards solutions for intrusive private and public lighting shining into premises. Local authorities are receiving ever more complaints about this, and about glare, the most safety-related aspect of poorly-aimed lights. CfDS has grown into a network of 141 volunteer local officers, and several hundred committed supporters, working to persuade their councils and other organisations of the benefits of well directed lighting.

With star-quality lighting, money and energy are saved; the night-time environment is more welcoming; and the beauty of the starry night sky, our common heritage, is regained. Everybody wins!

The Campaign's motto: **The right amount of light, and only when and where needed.**

### CfDS at Local Government Conference

I was invited to assist on the CfDS stand all day Tuesday 8th July at Local Government Conference in Bournemouth. These are some summary points:

60% of the stand visits were on the first day.

### Audience

Over the 3 days we talked directly to over 100 people visiting our stand. Many more passed by and took leaflets. Those we spoke to, and were able to identify, included:

- Deputy Mayors - 2
- Leaders - 30 & Deputy Leaders - 9
- Chief Executives - 5 & Councillors - 31
- Listed exhibitors and others - 3
- Not on attendee list, about - 40

Many of the other stands received a visit from us, including political parties, voluntary organisations and potentially interested others. We made contact with two organisations publishing magazines who may accept articles on light pollution.

Few of the delegates were directly concerned with planning.

### Feedback from the delegates

Most of the people we talked to understood and fully supported our cause.

- One visitor said 'best stand seen so far'
- Some had never heard of light pollution.
- Many realised that lights have to be pointed down.
- Practically none were aware of the blue-rich white light issue
- Most understood/accepted our concerns, some complaining about blue LEDs on cars
- Many said their districts had implemented new down-pointing lighting/energy saving installations
- Many districts were dimming or switching off after midnight, some with much controversy, others where the population hardly noticed.
- It is for cost and pollution reasons
- Not many were over concerned with crime issues
- Road traffic safety was much more important, a couple mentioning the bad AA report

Two very good questions were raised by the visitors:

- Do we have a model motion to combat light pollution, that councils could vote on?
- Is there a specification for anti-light polluting lighting?

### What Can Local Government do

Ensure all planning applications comply with the anti-light pollution requirements of:

- Planning Policy Statement (PPS) 1: Delivering Sustainable Development and
- Annex A of PPS 23: Planning and pollution control.
- For all activities within Local Government control, to follow the recommendations from the Royal Commission on Environmental Pollution report on Artificial Light in the Environment, published in 2009. See: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/228832/9780108508547.pdf.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228832/9780108508547.pdf.pdf)
- Insist that all white light be warm white, not blue-rich 'white', with the lowest possible colour temperature - good for night flying insects, good for star gazing.
- Employ professional lighting designers to achieve sympathetic and high quality solutions - insist that developers do the same.
- Influence PPI street lighting plans and activities to ensure that reducing sky pollution, and its impact on nature, is a very high priority.

*Chris Wood*

## DIY Meade Micro-Focuser Hand Controller



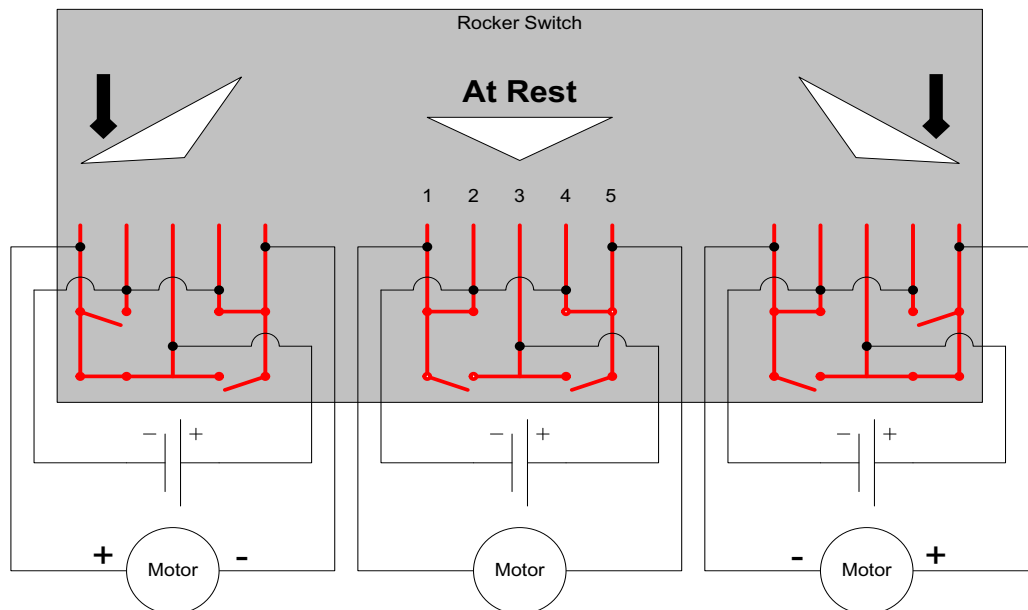
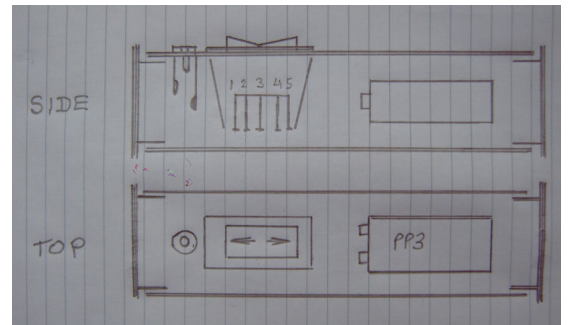
The Meade micro focuser is a must for astro imaging. While the mirror focus knob is good for coarse adjustment, the human touch is way too wobbly for fine control at high magnification on a screen.

As with all astro gear, the micro focuser comes at a price, Telescope House charge £249. Luckily for me, they had an ex-demo one at the International Astronomy Show for £50 but it had no hand controller. This meant putting my thinking cap on because a controller is another £69 and doesn't even have it's own power supply!

The correct voltage is 12v and many handsets offer multiple speeds. I decided a small 9v battery would be lightweight & compact but the speed would be slower. That's a good thing for fine focusing & there's always the mirror knob as mentioned. The motor only draws 40mA so I set about making a handset, with a view to using a rechargeable 600mAh lithium PP3.

My 'ingredients' included a sawn off piece of vacuum cleaner tube, a 3.5mm stereo jack socket, 1 electric car window switch (£1 Ebay), 2 eyepiece dust caps, a bit of bathroom sponge, some wire, a battery (the most expensive item), and a piece of string! The cost of this handset (with no battery) is approximately £3. It measures 150mm x 40mm diameter.

Anyone thinking of trying this, please remember the string. It was an after thought when I realised I couldn't extract the battery for charging!



*Martyn Weaver*

# For Sale



**Meade 152 mm F8 Reflector**  
Complete with, very solid, original mount and  
2 eyepieces

**£300**

With a FREE  
**Bessler Optics Comet 'scope**



Please contact VAS Member Jean-Luc Belon at  
[jean-luc.belon@gknaerospace.com](mailto:jean-luc.belon@gknaerospace.com)

or

07740 322758

## Dwarf Galaxies That Dance?



What is up with these dwarf galaxies? A survey of thousands of galaxies using the Sloan Digital Sky Survey reveals something interesting, which was first revealed by looking at the massive Andromeda Galaxy nearby Earth: dwarf galaxies orbiting larger ones are often in disc-shaped orbits and not distributed randomly, as astronomers expected.

The finding follows on from research in 2013 that showed that 50% of Andromeda's dwarf galaxies are in a single plane about a million light-years in diameter, but only 300,000 light-years thick. Now with the larger discovery, scientists suspect that perhaps there is a yet-to-be found process that is controlling gas flow in the cosmos.

“We were surprised to find that a large proportion of pairs of satellite galaxies have oppositely directed velocities if they are situated on opposite sides of their giant galaxy hosts,” stated lead author Neil Ibatá of Lycée International in France.

“Everywhere we looked, we saw this strangely coherent coordinated motion of dwarf galaxies,” added Geraint Lewis, a University of Sydney physicist. “From this we can extrapolate that these circular planes of dancing dwarfs are universal, seen in about 50 percent of galaxies. This is a big problem that contradicts our standard cosmological models. It challenges our understanding of how the universe works, including the nature of dark matter.”

The astronomers also speculated this could show something unexpected in the laws of physics, such as motion and gravity, but added it would take far more investigation to figure that out.

The findings were published in the journal *Nature*.

More at *Universe Today*

## THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

### Kepler-421b: Astronomers Discover Exoplanet with Longest Known Year

A year on the newly discovered Uranus-sized exoplanet Kepler-421b lasts for 704.2 days, making it the longest orbital period exoplanet yet found. Its parent star, Kepler-421, is a G9/K0 dwarf star located in the constellation Lyra, about 1,000 light-years from Earth.

Kepler-421b orbits the star at a distance of about 177 million km. As a result, the exoplanet is chilled to a temperature of minus 93 degrees Celsius.

Dr David Kipping of the Harvard-Smithsonian Center for Astrophysics and his colleagues discovered the exoplanet by detecting the decrease in brightness of Kepler-421 as the exoplanet passed in front – a transit event.

The planet's long year makes it more than merely a new record-holder, it makes it the first transiting planet discovered near the so-called frost-line – the dividing line between rocky and gas planets.

“When our Solar System was first forming, it was at this special distance that the temperature was cold enough for ice grains to form,” explained Dr Kipping, who is the lead author of a paper accepted for publication in the *Astrophysical Journal*.

*More at [Sci-News.com](http://Sci-News.com)*

### NASA Spacecraft Just One Year Away from Pluto

Less than a year from now, NASA's New Horizons spacecraft will make the first-ever visit to Pluto, potentially revolutionizing scientists' understanding of the dwarf planet.

Because Pluto is so far away — it orbits the sun at an average distance of 3.65 billion miles (5.87 billion kilometers) — many questions about the dwarf planet's composition and activity remain unanswered. Researchers hope New Horizons will lay some of those questions to rest when it flies by Pluto on July 15, 2015.

*More at [Space.com](http://Space.com)*

### Apollo 11 Flight Log, July 22, 1969: Firing Engines for Earth Return

Just two days after landing on the moon, it was time for the Apollo 11 crew to make the journey back to Earth. Their lunar module, Eagle, was now jettisoned and the three men were inside their command module, Columbia, preparing to turn on the engines to head back home.

At 12:56 a.m. EDT, the crew did the “transearth injection burn” to bring them to a speed of roughly 3,600 miles per hour (5,850 km/hr). This maneuver put Neil Armstrong (commander), Michael Collins (command module pilot) and Buzz Aldrin (lunar module pilot) on a path back to Earth.

*More at [Space.com](http://Space.com)*

### Observatory

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

### Articles Needed

**New Zenith needs letters, articles, reviews or pictures related to all aspects of astronomy.**

**Contributions to the Editor please at the email or postal address on the front page.**

*“You will find the key to success under the alarm clock”*

**Benjamin Franklin**

*“The more elaborate our means of communication, the less we communicate”*

**Joseph Priestley**

*“One machine can do the work of fifty ordinary men.*

*No machine can do the work of one extraordinary man”*

**Elbert Hubbard**

*“Nature does not hurry, yet everything is accomplished”*

**Lao Tzu**