

General Data Protection Regulation

Last month's NZ contained information about the new data protection regulations. Response to the request for each member to return a completed form has been disappointing.

It is essential that we get a completed form for each member in order for VAS to comply with the General Data Protection Regulation.

Please use the form on **page 11** of this edition of NZ and either return it to the Membership Secretary or drop it in to the observatory.

If you haven't completed the form, please do it now!

Observatory Maintenance

Well it's spring and the observatory needs a good clean.

I'm hoping to get some help with this and have chosen the weekend of the 2nd and 3rd June to have a go at it.

The main aim is to get the outside of the dome cleaned and repainted, the external UPVC facias and guttering tidied up.

If you can spare a few hours over that weekend please let me know.

BBQ

Instead of our normal meeting on **Fri 27th July**, we propose a members' BBQ instead.

Probably the easiest arrangement, is for VAS to provide soft drinks, sauces, salads and rolls etc and members bring along other drinks and whatever they would like cooked.

If anyone has a large BBQ we can borrow for the night, please get in touch otherwise we'll hire one.

*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.

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

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PLEASE NOTE

Monthly meetings are now held at the Newchurch Pavilion next to the Observatory. All meetings start at 19.30 unless stated.

2018 Monthly Meetings

Date	Subject	Speaker
Check http://www.wightastronomy.org/meetings/ for the latest information		
27 Apr	An Overview of the Development of the Universe to date	John Currigan
25 May	The Rise and Fall of the Herstmonceux Observatory	Keith Brakenborough
22 Jun		
27 Jul	Members BBQ	-
24 Aug	AGM from 19.00hrs The European Extremely Large Telescope	Dr Aprajita Verma
28 Sep		
26 Oct	Dark Skies Stargazing Night	
23 Nov	Noise Effects in Astronomical Processes	Dudley Johnson

Observatory Visits Booked

No current bookings
<i>Please phone me for the current situation (number on the front page)</i>
It would be appreciated if members could avoid using the observatory at these times.

VAS Contacts 2017/18

President	Barry Bates president@wightastronomy.org
Chairman	Bryn Davis chairman@wightastronomy.org
Secretary	Richard Flux secretary@wightastronomy.org
Treasurer	Simon Plumley treasurer@wightastronomy.org
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Astro Photography	Simon Plumley ap@wightastronomy.org
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

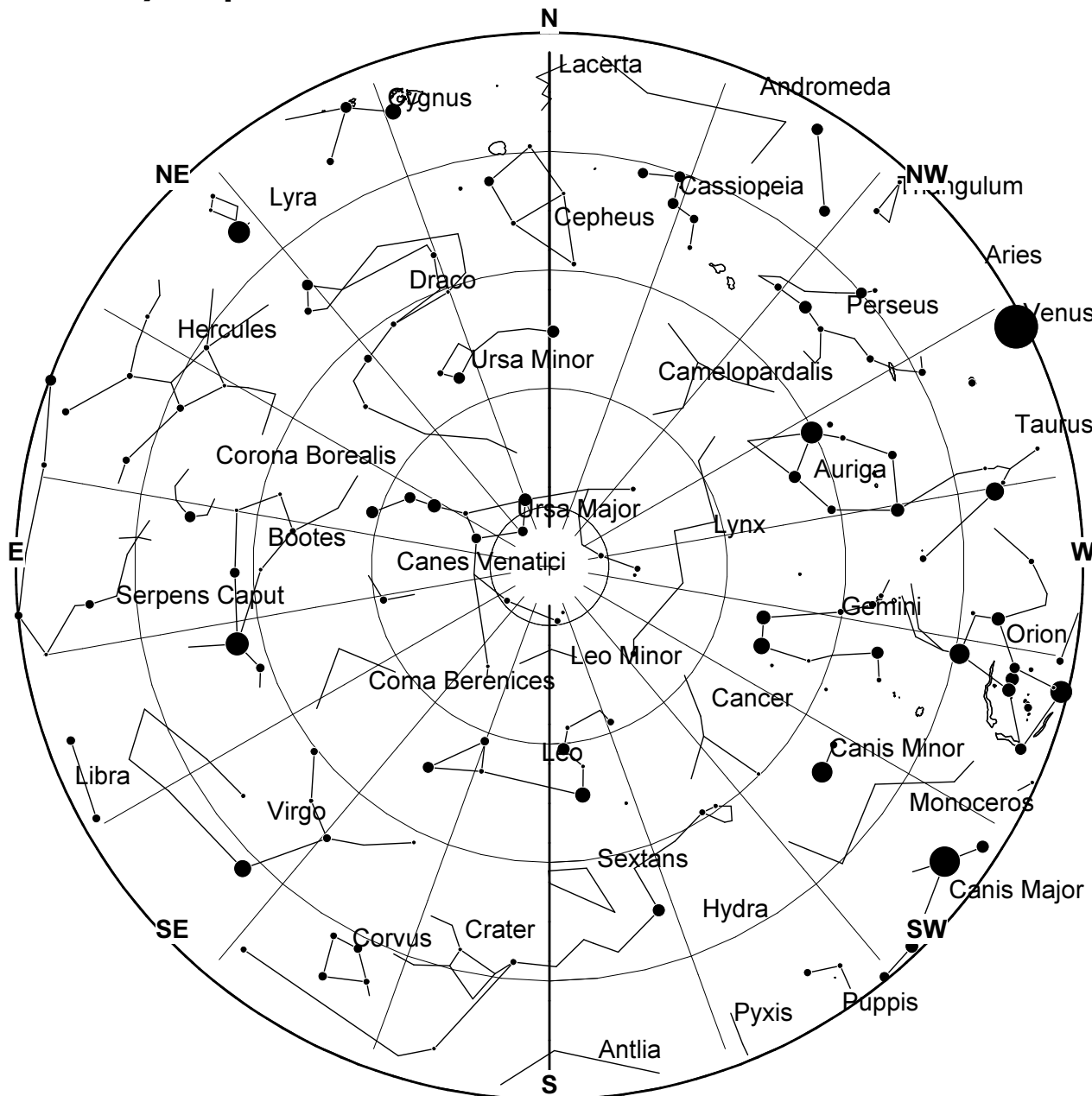
Important

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

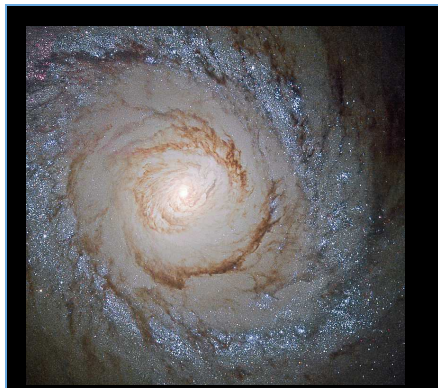
On several occasions, lights, heaters and the Meade LX200 have been left on!

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

May 2018 Sky Map



View from Newchurch Isle of Wight UK - 2200hrs - 15 May 2018







Messier 94 (also known as NGC 4736) is a spiral galaxy in the constellation Canes Venatici. It was discovered by Pierre Méchain in 1781, and catalogued by Charles Messier two days later. Although some references describe M94 as a barred spiral galaxy, the “bar” structure appears to be more oval-shaped. The galaxy has two ring structures. A 2009 study revealed that the outer ring of M94 is not a closed stellar ring, but a complex structure of spiral arms when viewed in mid-IR and UV. The study found that the outer disk of this galaxy is active. It contains approximately 23% of the galaxy’s total stellar mass and contributes about 10% of the galaxy’s new stars. In fact, the star formation rate of the outer disk is approximately twice the inner disk as it is more efficient per unit of stellar mass.

This article is licensed under the [GNU Free Documentation License](https://www.gnu.org/licenses/old-licenses/fdl-1.0.html). It uses material from the Simple Wikipedia article “Messier 94”.

May 2018 Night Sky

Moon Phases

New	First Qtr	Full	Last Qtr
			
15th	22nd	29th	8th

Planets

Mercury

Mercury continues its poor morning apparition getting closer to the Sun before passing behind it at the beginning of next month. It rises just before sunrise into an already bright sky and can be seen only with a telescope. Observations can be made during the day **if precautions are taken to avoid pointing the instrument at the Sun.**

Venus

For about 2 hours after sunset Venus can be seen in the west-north-west as the brilliant evening star. A telescope shows that it has a distinctly gibbous phase.

Mars

Mars is still an early morning object rising just before 3am. It is steadily brightening and increasing in size. A small telescope will show surface markings, which will become easier to distinguish over the coming weeks as Mars reaches opposition and it makes its frantic rush to the evening sky with a rapid diminution in size and brightness.

Jupiter

Jupiter is at opposition this month and can be observed all night, it can be found low in the south at about 1am. Apart from the Moon it is the brightest object in the southern sky.

Saturn

Although it rises at about 1 am Saturn is best placed for observation in the south-south-east just before the sky starts brighten, at this time of year this is from about 3am.

Uranus & Neptune

Both the outer planets remain lost to the morning twilight.

Deep Sky

M63 Sunflower Galaxy

RA 13 16m Dec 41° 58' mag 8.5



This is a barred spiral galaxy 37 million light years away. It was originally discovered by Pierre Mechain, a friend of Charles Messier and who went on to discover over 25 more objects that were subsequently added to Messier's catalogue.

Through a small telescope it is visible as an elongated smudge, but with larger apertures and a dark sky some hint of detail in the spiral arms may be seen.

M64 Black Eye Galaxy

RA 12 57m Dec 21° 38' mag 9



The black eye galaxy gets its name from the dark dust lane that crosses its centre. It will need a dark sky and high magnification to spot the 'eye'.

M94 Cat's Eye Galaxy

RA 12 51m Dec 41° 4' mag 8.1



This is a face on spiral galaxy with tightly wrapped arms ringed by bright new stars. This indicates that this galaxy may have been in a collision in the astronomically recent past. The visual appearance is of a bright core surrounded by a faint evenly illuminated oval halo.

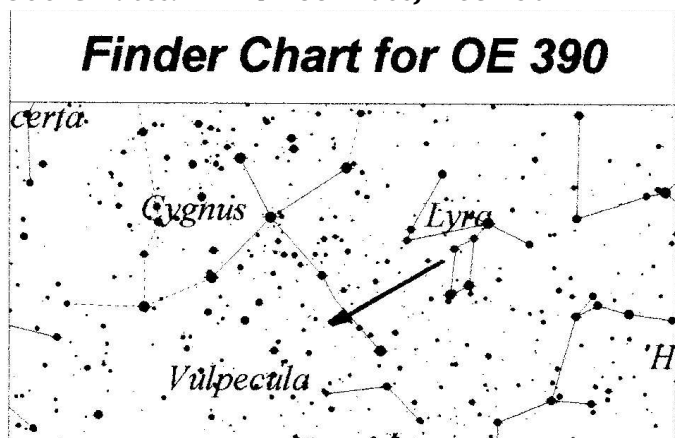
The spiral arms are too tightly wound to show any detail in all but the very largest amateur telescopes.

Peter Burgess

My 100 Best Night Sky Sights

Multiple Star

Coordinates: RA 19h 55m 06s, Dec +30° 12"



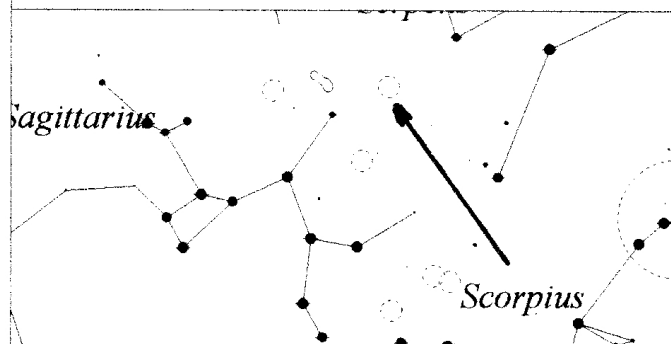
High in mid to late summer skies is the lovely constellation of the Swan, so replete with celestial goodies that double and multiple star systems hardly get a glance on the Cygnus Tour (except for one, about which more sometime next year). Here's one of the better multiples - **OΣ390 Cygni** (OΣ = Otto Struve, a noted double star specialist astronomer, son of Friedrich Struve, an even more notable d.s.s.a.). This is a triple star system, a bright mag 6.6 blue primary closely accompanied by a mag 8.9 yellowish secondary just 10" away NE and a dimmer blue star mag 9.7 twice this distance SE. The three are a pleasing sight through any telescope and at any magnification but at low powers, say 100x or less, the view is significantly enhanced by inclusion in the field of several other unrelated stars of varying brightness, in particular three mag 8 and 9 stars close by forming an irregular polygon with OΣ390, just like the 'bowl' of the Plough.

Galactic Cluster

Coordinates: RA 17h 56m 48s, Dec -19' 01"

With even more delights to savour than Cygnus it's a shame **Sagittarius** is so far south seen from the UK but, whilst we may not have dress circle seats, our position in the stalls still allows us great views of many of its attractions. This is certainly so for **M23**, an excellent open cluster with many dozen stars in an area less than that of the Moon. On a clear night binoculars will show it as a grainy patch somewhat similar to one of the more loose globular clusters seen through a small telescope. With any telescope M23 is a grand sight at all magnifications. With low powers (40x to 60x) the whole group can be contained in the field with many of its members seen to be arranged in curving chains. With successively higher powers more and more stars are excluded but the view takes on different

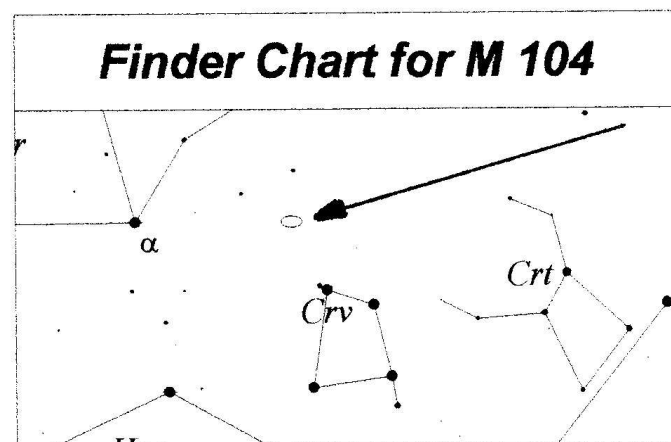
Finder Chart for M 23



though equally fine aspects as stars brighten and the background darkens until, at 250x or more, great pleasure can be had panning in all directions across the cluster, now displaying brilliant beacons against an inky black sky. M23 contains anything from 100 to 140 stars depending on the information source and I've tried to pin this down to a more accurate figure but come up with a different number each time! It should be simple but try counting them yourself and you'll discover how frustratingly difficult it can be. Summer viewing again.

Spiral Galaxy

Coordinates: RA 12h 40m 00s, Dec -11' 37"

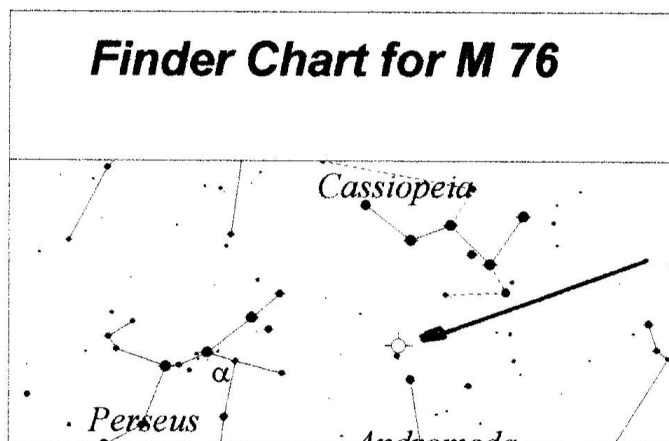


Astronomical atlases abound in pictures of **M104** in **Virgo**, the **Sombrero Hat galaxy**, so called because of its similarity to the headpiece. Alas, this is only so in photographs, which can cause disappointment to first time viewers - a pity because M104 is one of the better spiral galaxies to observe. From our skies it requires a dark, clean night and a 10" telescope to see clearly the dark dust band which bisects the bright bulge of the edge-on galaxy, producing its characteristic appearance in CCD images and long exposure photographs, although an 8" may do so in exceptional conditions. A 6" should easily see the bright galactic core which shines at a respectable mag 8.3 but the dust band, if glimpsed at all, will seem more like a slightly less bright area around the centre. M104 is a

Springtime galaxy and at its greatest altitude in April. Although in Virgo it's not a member of the great Virgo Cluster of galaxies and lies significantly nearer to us in the south west of the constellation, right on the border with Corvus. Strangely, the Webb Society's Deep-Sky Observers Handbook - Volume 4 - Galaxies makes no mention of M104, at least I can't find it. Can anyone account for this surprising omission?

Planetary Nebula

Coordinates: RA 01h 42m 24s, Dec +51' 34"



Just as the Great Bear has a small cousin in the Little Bear, so the Dumbbell Nebula has a diminutive relation in the **Little Dumbbell in Perseus**, which looks even more like its name suggests than the more celebrated planetary nebula in Vulpecula. **M76** is however very dim at mag 11.5 and really needs a 6" telescope to see at all, but don't let that put you off - Messier saw it in his 3"! Between October and January this little planetary can be found directly overhead depending on the time - 7 to 8 pm in January, 1 to 2 am in October- and what it lacks in brightness it makes up for in shapeliness. Through an 8" or larger telescope on a good night the distinctive outline of this double planetary is visible, the two 'spheres' appearing to be touching (each has its own NGC number) - no central 'bar' in this dumbbell.

Using the technique of averted vision makes it easier to see the shape; even better is to fit an OIII filter to your eyepiece which really makes the image stand out. M76 takes magnification well and looks good at anything from 60x to 180x through my 10" f10 telescope, however I find that 100x gives a crisp, if small image which I prefer.

Bert Paice

Originally published in NZ - November 1998

EasyFundRaising for VAS?

Whenever you buy anything online - from a weekly shop to an annual holiday - you could be collecting free donations for Vectis Astronomical Society?

3,000+ retailers are ready to make a donation, including Amazon, John Lewis, Aviva and Sainsbury's - and it doesn't cost you a penny!

It's as easy as 1, 2, 3...

1. Head to <https://www.easyfundraising.org.uk/causes/vectisastromicalsociety/> and join for free.
2. Every time you shop online, go to easyfundraising first to find the site you want and start shopping.
3. Check out and the retailer will make a donation to VAS at no cost to you!

No catches or hidden charges and VAS will be really grateful for your donations

IAU Light Pollution Brochure



This publication is a compilation of important findings of experts worldwide in the area of light pollution. The information was gathered under the umbrella of the Cosmic Light programme, organized by IAU during the International Year of Light 2015. The goal of this brochure is to raise the profile of recent advancements in our understanding of light pollution, in particular regarding the use of LEDs, to support the astronomy community and increase public awareness of light pollution research.

<https://www.iau.org/>

When the Invisible Goes Missing – An Exception Proves the Rule?

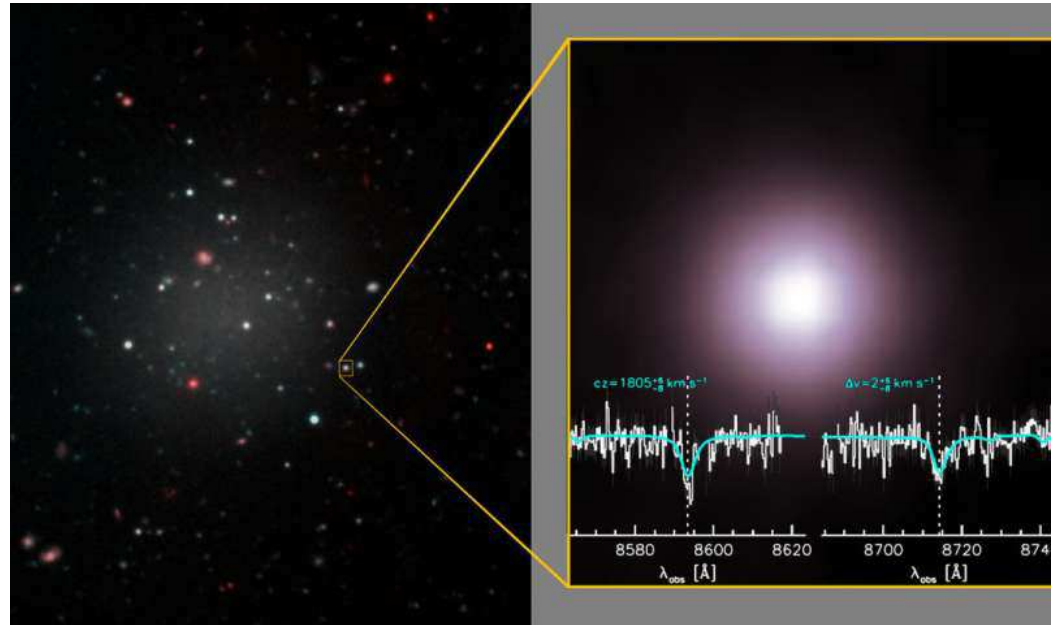
At the end of March, a friend asked if I'd seen the news story about a galaxy that didn't have any dark matter. I was intrigued. She added "it may prove that dark matter really exists". "Err... pardon? Run that past me again." The headline in The Guardian was "*Galaxy without any dark matter baffles astronomers*" and included the line "*its absence strengthens case for its existence*"^[1]. So the dark matter that no-one has yet been able to identify – someone

has found a place where it isn't, which may prove that it's real?! This needed a closer look...

Where is this odd galaxy? It is called NGC1052-DF2 and is an Ultra Diffuse Galaxy (UDG) which is a type first observed in the 1980s. It is about the size of our own Milky Way Galaxy, but has only 1% of the stars. NGC1052-DF2 is associated with a giant elliptical galaxy (NGC1052) about 8 degrees declination away from M77 in the constellation of Cetus, the sea monster. It's about 63 million light years away from us.^[2]

Figure 1 – Left: galaxy NGC1052-DF2; Right: one globular cluster and spectrographic results.

Credit: Gemini Observatory / NSF / AURA / W.M. Keck Observatory / Jen Miller / Joy Pollard (Source: phys.org)^[3]



How did they make the measurements? The main data were collected by the W. M. Keck Observatory on Mauna Kea in Hawaii. In Figure 1, the picture of the galaxy (on the left) is a composite colour photo, which highlights the prominent globular clusters within it. One of these is shown on the right, and overlaid on it are results from the Gemini Multi Object Spectrograph (GMOS) instrument. The dips in the blue lines show positions of absorption lines in the spectrum of the globular cluster which allows velocities to be estimated. And the Doppler width of these dips gives a measure of the spread of velocities (the "velocity dispersion"). Ten such clusters were studied in this way.

What does it mean? It's the velocity dispersion measurements that are crucial: they are combined to derive a structural parameter $M_{\text{halo}}/M_{\text{stars}}$ (the ratio of dark matter to ordinary stuff). The galactic "halo" is a hypothetical structure which is bigger than the visible parts of a galaxy. The evidence for it is seen in the characteristic rotation curves of most galaxies – the patterns of how the velocity of stars changes with distance from the galactic centre requires there to be more stuff out there than we can see. This is the main evidence for the existence of "dark

matter". The $M_{\text{halo}}/M_{\text{stars}}$ ratio has been measured for many galaxies, and it appears to vary smoothly with the total mass with a minimum value of about 30. However, in NGC1052-DF2 the value is about 400 times smaller than has been seen before and – given measurement errors – could be zero.

Why does it matter? The implications for cosmology may be huge. The current standard model of galaxy formation is the "Lambda Cold Dark Matter" theory in which clouds of gas & dust gather around dark matter to form the nebulae from which stars and galaxies form. At the very least this result means that there was something unusual about how NGC1052-DF2 formed, or that something happened to "strip out" the dark matter from the visible, although there is no evidence of interaction between nearby galaxies to account for it.

Who did it? The results were published in Nature^[4], by a group of 12 researchers from the USA, Canada and Germany. The lead author, Pieter van Dokkum, professor of Astronomy and Physics at Yale University, is quoted in a very readable report on phys.org: "This discovery shows that dark matter is real – it has its own separate existence

apart from other components of galaxies,” he said^[3]. The team's results demonstrate that dark matter is separable from galaxies, and could rule out some alternative theories to dark matter, for example that dark matter is an illusion because gravity behaves differently than we think.

So for once the journalists seem to have got this one right – the scientists are indeed “baffled” at an unexpected result. Some people tend to scoff at such things and think that science is wrong. But we all know that when something odd crops up that doesn't fit the theory, that's exactly where the exciting science is! “NGC1052-DF2” is hard to remember, so I would propose we name it after a cat. The original news reports reminded me of T S Elliot's *Old Possum's Book of Practical Cats*^[5]:

“Macavity, Macavity, there's no-one like Macavity,

He's broken every human law, he breaks the law of gravity.”

It's not some fictional feline master-criminal who is absent from the scene of this crime, but – an extraordinary finding for astronomy – the dark matter that we've never yet identified appears to have gone missing, which may just prove that it is real after all:

“You may seek him in the basement, you may look up in the air—

But I tell you once and once again, Macavity's not there!”

Links:

1. The story in The Guardian: <http://www.theguardian.com/science/2018/mar/28/galaxy-without-any-dark-matter-baffles-astronomers>
2. Here's a nice video that shows the location of NGC1052-DF2: <http://www.spacetelescope.org/videos/heic1806a/>
3. The article on phys.org (Science X): <http://phys.org/news/2018-03-dark-galaxy.html>
4. The paper (abstract) in Nature: <http://www.nature.com/articles/nature25767>
5. *Macavity: The Mystery Cat*: <http://allpoetry.com/Macavity:-The-Mystery-Cat>

Simon Gardner

FOR SALE

18" f/4.3 David Lukehurst classic wooden Dobsonian (black) with 2" rack and pinion focuser, wheelbarrow handles, finder, wooden primary mirror cover and Telegizmos scope cover, the latter purchased separately but I've included it with the scope. This is a perfect scope for visual deep sky observing.

It has aluminium truss poles, a light wooden upper tube assembly and can be disassembled into a cube for storage and transport. The wheelbarrow handles attach to the side of the rocker box, making it easy to move around.

I bought the scope new from David Lukehurst in 2011 but, since 2014, circumstances have meant I am not able to use it as much as I'd like. The mirror may require re-coating.

I'd like £2500 for the telescope, but I'd consider any reasonable offer.

If interested please email wightskies@gmail.com or phone/text 07557 331500



**Don't Forget
The best telescope is the
one that gets used**

Hubble Space Telescope

25 years on April 24, 2015



During its 25-year mission the NASA/ESA Hubble Space Telescope has changed our view of the Universe significantly. Some of the most ground-breaking discoveries made in astronomy in the 20th century were made by Hubble, which allows astronomers to better understand the world we live in and investigate its mysteries even further.

The Hubble Deep Fields: How Hubble has observed the furthest away galaxies and the most ancient starlight ever seen by humankind

One of the main scientific justifications for building Hubble was to measure the size and age of the Universe and test theories about its origin. Images of faint galaxies give “fossil” clues as to how the Universe looked in the remote past and how it may have evolved with time. The Deep Fields gave astronomers the first really clear look back to the time when galaxies were forming. The first deep fields - Hubble Deep Field North and South - gave astronomers a peephole to the ancient Universe for the first time, and caused a real revolution in modern astronomy.

Subsequent deep imagery from Hubble, including the Hubble Ultra Deep Field, has revealed the most distant galaxies ever observed. Because of the time it has taken their light to reach us, we see some of these galaxies as they were just half a billion years after the Big Bang.

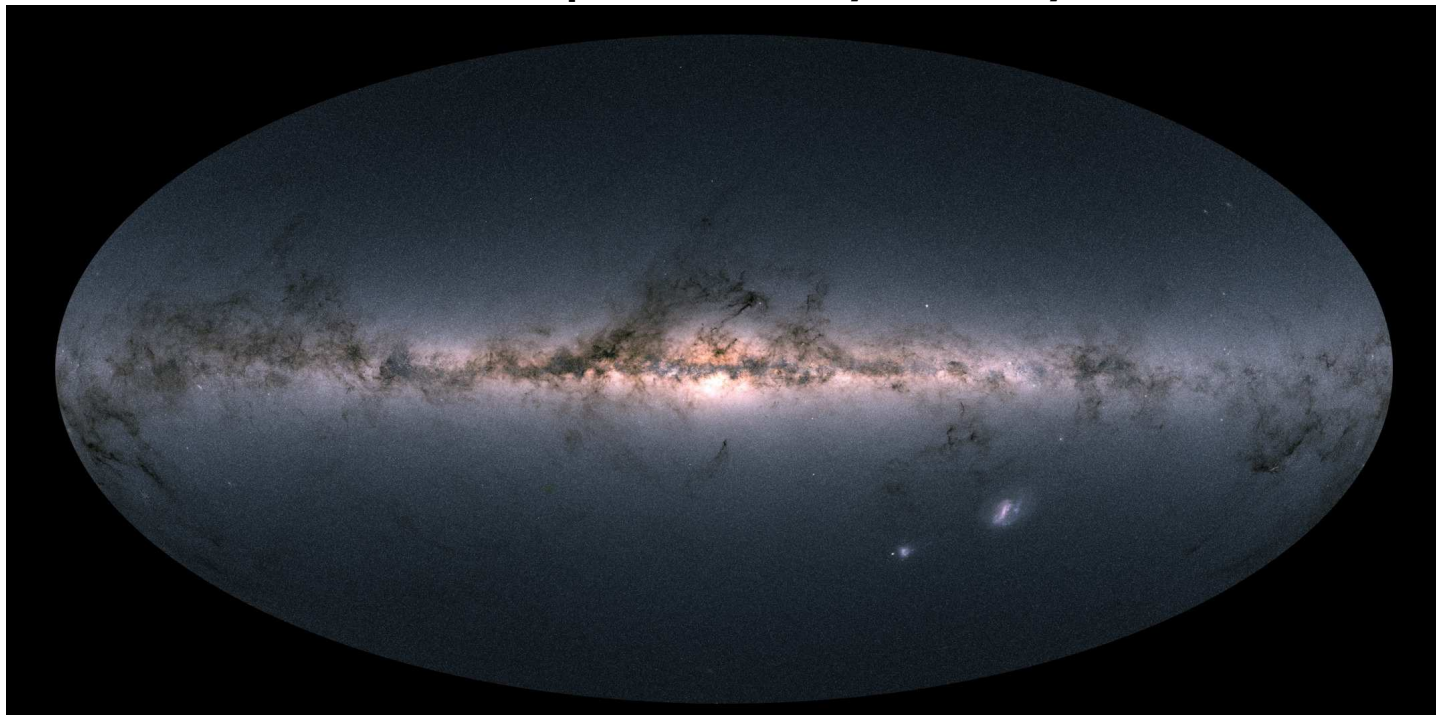
Deep field observations are long-lasting observations of a particular region of the sky intended to reveal faint objects by collecting the light from them for an appropriately long time. The 'deeper' the observation is (i.e. longer exposure time), the fainter are the objects that become visible on the images. Astronomical objects can either look faint because their natural brightness is low, or because of their distance. In the case of the Hubble Deep and Ultra Deep Fields, it is the extreme distances involved which make them faint, and hence make observations challenging.

Using the different Hubble Deep fields astronomers were able to study young galaxies in the early Universe and the most distant primeval galaxies. The different deep fields are also a good gathering grounds to find the most distant objects ever observed.

Within 2012 and 2014 Hubble created two new deep fields: The Hubble eXtreme Deep Field is so far the deepest image ever taken of the sky so far and combines the light of one million seconds of observation. The last Hubble Ultra Deep Field released in 2014 was observed in ultraviolet. This image allowed astronomers to study star formation in a region 5 - 10 light-years away from us.

Much more at: <http://hubble25th.org/>

Gaia creates richest star map of our Galaxy – and beyond



The European Space Agency's Gaia mission has produced the richest star catalogue to date, including high-precision measurements of nearly 1.7 billion stars and revealing previously unseen details of our home Galaxy.

A multitude of discoveries are on the horizon after today's much-awaited release, which is based on 22 months of charting the sky, as part of Gaia's mission to produce the largest, most precise three-dimensional map of our Galaxy ever created. The new data includes positions, distance indicators and motions of more than one billion stars, along with high-precision measurements of asteroids within our Solar System and stars beyond our own Milky Way Galaxy.

Preliminary analysis of this phenomenal data reveals fine details about the makeup of the Milky Way's stellar population and about how stars move, essential information for investigating the formation and evolution of our home Galaxy.

"The observations collected by Gaia are redefining the foundations of astronomy," said Günther Hasinger, ESA Director of Science. "Gaia is an ambitious mission that relies on a huge human collaboration to make sense of a large volume of highly complex data. It demonstrates the need for long-term projects to guarantee progress in space science and technology and to implement even more daring scientific missions of the coming decades."

This unique mission is reliant on the work of Cambridge researchers who collect the vast quantities of data transmitted by Gaia to a data processing centre at the University, overseen by a team at the Institute of Astronomy.

"There is hardly a branch of astrophysics which will not be revolutionised by Gaia data," said Cambridge's Professor Gerry Gilmore, Principal Investigator for the UK participation in the Gaia Data Processing and Analysis Consortium, and one of the original proposers of the mission to ESA. "The global community will advance our understanding of what we see, where it came from, what it is made from, how it is changing. All this is made freely available to everyone, based on the dedicated efforts of hundreds of people."

Gaia was launched in December 2013 and started science operations the following year. The new data release, which covers the period between 25 July 2014 and 23 May 2016, pins down the positions of nearly 1.7 billion stars, and with a much greater precision. For some of the brightest stars in the survey, **the level of precision equates to Earth-bound observers being able to spot a Euro coin lying on the surface of the Moon.**

Gaia also observes objects in our Solar System: the second data release comprises the positions of more than 14,000 known asteroids, which allows precise determination of their orbits. A much larger asteroid sample will be compiled in Gaia's future releases.

Much more at: <http://sci.esa.int/gaia/>

General Data Protection Regulation

To comply with the new Regulation, which comes into force in May 2018, the Society is required to obtain your explicit consent to use your personal data. Fines for a Breach of Compliance have been increased to 20m Euro.

1. Data is held to enable the Society to communicate with our members and maintain membership information.
The data held on each member is:
 - Name
 - Postal Address
 - Telephone Number (Landline and mobile)
 - Email address
 - Month and year of joining.
 - Date and method of renewing subscription
 - Class of membership
 - How New Zenith is received
2. The data is held on the computer of the Membership Secretary. It is backed up on local hard storage.
3. The data is not shared with, or available to, any organisation or individual.
4. An extract containing name and email address is shared with the member responsible for distributing New Zenith by email for those members wishing to receive New Zenith by email.
A further extract containing name and postal address is shared with the member responsible for distributing New Zenith by post for those members wishing to receive New Zenith by post.
5. Data is deleted two years after a member leaves the Society.
6. A member may request a copy of the data held on him/her.

Please print off, date and sign the form below and return to:

Membership Secretary
 9 Woodside Avenue
 Alverstone Garden Village
 Isle of Wight
 PO36 0JD

As the database is being updated, please also enter your mobile phone number to the form.

General Data Protection Regulation – Consent Form

I hereby give my consent for my personal data to be held by the Vectis Astronomical Society.

Full Name

.....

Mobile Phone Number

.....

Signed

.....

Date

This marks an important change in the laws VAS works to and we must comply. Please complete and return the form as soon as you can.

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

The Robert Hooke Trail

*as part of
The Isle of Wight Walking Festival
on
Friday 4th May 2018
and again on
Friday 11th May 2018*

*Starting at 11.00am from by All Saints Church and Red Lion Pub,
Freshwater, PO40 9BB
Grid Reference: SZ 346873*

Bus route: 7 Closest bus stop: Hooke Hill/Copse Lane junction

Circular walk Length: 3 - 4 miles Duration: 2 hours

*The Robert Hooke Trail booklet £2 is available from your walk
guide and also on sale at local stationery outlets*

*Robert Hooke, 18th July 1635 - 3rd March 1703
Freshwater's official 'Local Hero'*

Free Online Magazines

Magpi

The MagPi was created – like most great Raspberry Pi projects – by a group of like-minded enthusiasts from the Raspberry Pi.org forum. Their goal was to make a Raspberry Pi magazine for the whole community could enjoy (and they succeeded!). The magazine is now published by Raspberry Pi as the official Raspberry Pi magazine.

Click the heading “Catalogue” to see all the pdf files available.

<https://www.raspberrypi.org/magpi/>

HackSpace

HackSpace magazine is the new monthly magazine for people who love to make things and those who want to learn. Grab some duct tape, fire up a microcontroller, ready a 3D printer and hack the world around you!

Click the heading “Issues” to see all the pdf files available.

<https://hackspace.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.

*“I have yet to see any
problem, however
complicated, which, when
you looked at it in the right
way, did not become still
more complicated”
Poul Anderson*

*“The wireless telegraph
is not difficult to
understand. The ordinary
telegraph is like a very
long cat. You pull the tail
in New York, and it
meows in Los Angeles.
The wireless is the same,
only without the cat”
Albert Einstein*

*“The most powerful force
in the universe is
compound interest”
Albert Einstein*