New Zenith

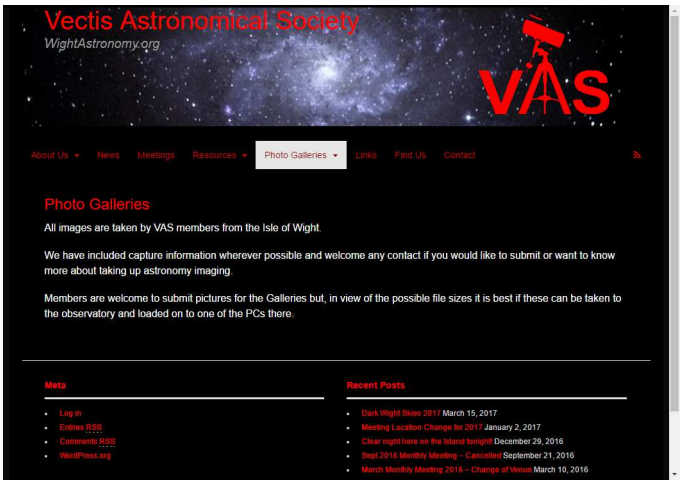
The Monthly Newsletter of the Vectis Astronomical Society

Vol 25 Issue 3 — April 2017

When Printed, this Newsletter costs VAS at least £1

Society News

Photography galleries on the website



As mentioned last month Simon Plumley and I have managed to get a gallery up an running on the VAS website, ***wightastronomy.org*** just look under the "Photo Galleries" Menu item.

It's an ongoing project, and it's off to a great start with around 170 images and videos, so please take a look and contribute more if you can.

Some of the files are quite large so please be patient if you have a slower net connection.

Dark Skies/Stargazing Event

VAS, AONB and CPRE are holding an open stargazing event on Thursday 30th March at the Observatory and Pavilion. *See advert on page 9.*

If you can help with General site safety, Refreshments, Telescope supervision, Car Park marshals, Observatory information guides, etc etc. please contact a committee member.

We've held similar events previously and this time we are overdue a clear, calm night. Please come along if you can - the more the merrier!

Brian Curd
Editor New Zenith.

VAS Website: wightastronomy.org

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

The Editor, New Zenith
Carpenter's Cottage
Dennett Road
Bembridge
Isle of Wight PO35 5XF
Tel: **01983 872875** or email: **editor@wightastronomy.org**

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

Registered Charity No 1046091

Observatory Diary

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

VAS Website: wightastronomy.org

Contents this Month

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

2017 Monthly Meetings

Date	Subject	Speaker
Please check **wightastronomy.org/meetings/** for the latest information		
24 Mar	Astro-Photography	Simon Plumley
28 Apr	Radiation protection in space (for manned missions)	Dr Elizabeth Cunningham
26 May	Mapping orbits around black holes and neutron stars	Dr Diego Altamirano
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	TBA	TBA
24 Nov	TBA	TBA

Observatory Visits Booked

Wed 19th April	Cowes WI

Just one booking for April so far but I have other interested parties choosing dates at the moment.

I am restricting visits to Mon, Tues and Wed wherever possible.

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

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

VAS Contacts 2016/17

President	Barry Bates president@wightastronomy.org
Chairman	Bryn Davis chairman@wightastronomy.org
Secretary	Richard Flux secretary@wightastronomy.org
Treasurer	Simon Plumley treasurer@wightastronomy.org
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NZ Editor	Brian Curd editor@wightastronomy.org
Membership Secretary	Norman Osborn members@wightastronomy.org
NZ Distribution	Graham Osborne
Others	Mark Williams, Nigel Lee & Stewart Chambers

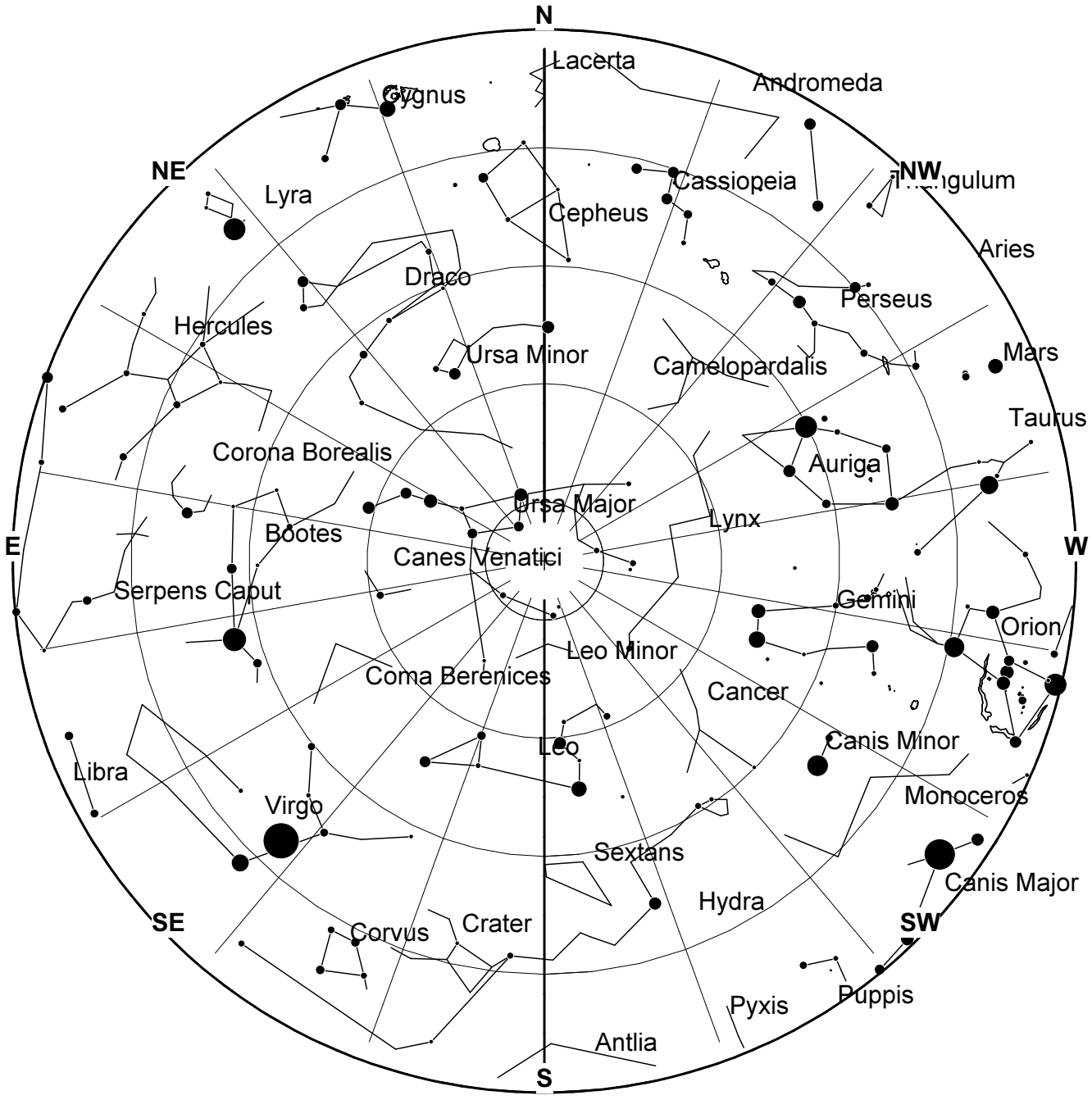
Important

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

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

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

April 2017 Sky Map



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

***The Whirlpool Galaxy**, also known as Messier 51a, M51a, or NGC 5194, is an interacting grand-design spiral galaxy with a Seyfert 2 active galactic nucleus in the constellation Canes Venatici. It was the first galaxy to be classified as a spiral galaxy. Recently it was estimated to be 23 ± 4 million light-years from the Milky Way, but different methods yield distances between 15 and 35 million light-years. Messier 51 is one of the best known galaxies in the sky. The galaxy and its companion, NGC 5195, are easily observed by amateur astronomers, and the two galaxies may even be seen with binoculars. The Whirlpool Galaxy is also a popular target for professional astronomers, who study it to further understand galaxy structure (particularly structure associated with the spiral arms) and galaxy interactions.*

April 2017 Night Sky

Moon Phases

New	First Qtr	Full	Last Qtr
			
26th	3rd	11th	19th

Lunar Occultation

On the 28th the crescent moon passes in front of the bright star Aldeberan. The star is occulted at 19:11 re-appears from behind the sunlit side of the Moon at 20:07. The occultation occurs before sunset making this a difficult event to observe.

Planets

Mercury

During the first few days of the month it may be possible to spot Mercury very low in the western sky just after sunset as it completes its evening apparition. It will then be in conjunction with the Sun and is not be visible until well into next month when it makes a reappearance in the morning sky.

Venus

Venus starts its morning star apparition - look low in the east just before sunrise. The ecliptic on spring mornings lies close to the horizon making the planets that are close to the Sun more difficult to observe. Being very bright will help to make Venus easier to spot, but a good eastern horizon and clear skies will be needed.

Mars

As the sky darkens look low down in the west to find Mars. It is now not very bright; at magnitude 1.5 it is much fainter than Aldebaran, the red eye of Taurus, which at the end of the month is about a hand width left of Mars.

Jupiter

Jupiter reaches opposition this month on the 7th putting it at its best position for observation this year. Look for it, brighter than any star, in the east at sunset and south at midnight.

Saturn

Saturn is an early morning object rising at 3AM at the start and 1AM at the end of the month. It is to be found low down in the constellation of Sagittarius. There are no stars of comparable brightness anywhere nearby; the brightest yellowish coloured object in the south south-eastern sky is Saturn.

Uranus & Neptune

Both outer planets are lost in the glare of the Sun this month.

Deep Sky

NGC5866/M102 Spindle Galaxy RA 15h 7m Dec 55° 44' mag 10.5

Is this really M102? Did Messier ever see this galaxy or was it all a great mistake, and just a duplicate observation of M101, perhaps we will never know. An almost perfectly edge on galaxy, visually it lives up to its name, small telescopes show it as a silvery spindle of light against a hopefully dark background. Larger 'scopes may, if the seeing is good enough show a thin dust lane cutting through the central bulge.

NGC2903 Galaxy RA 9h 32m Dec 21° 28' mag 9.6.

When comet hunting Charles Messier did not find all the fuzzy objects that could be mistaken for these elusive visitors to our skies. There are many relatively bright galaxies that he could have put into his catalogue if his telescope had happened upon them. NGC2903 is one of these; commonly regarded as one of the best NGC objects for small telescopes it is a large almost face on barred spiral galaxy. This is a young galaxy with a much higher rate of star formation than our own Milky Way. In larger telescopes this activity can be glimpsed in the spiral arms which have a mottled appearance when viewed with averted vision

M51 Whirlpool Galaxy RA 13h 30m Dec 47° 10' mag 8.0

M51 with its companion NGC5195 are one of the most famous galaxy pairs in the sky. The spiral nature of nebulae was first observed in this galaxy by Lord Rosse with his Leviathon telescope. The pair are easily seen today in small telescopes, and thanks to the intense star formation a medium sized telescope easily shows that spiral structure.

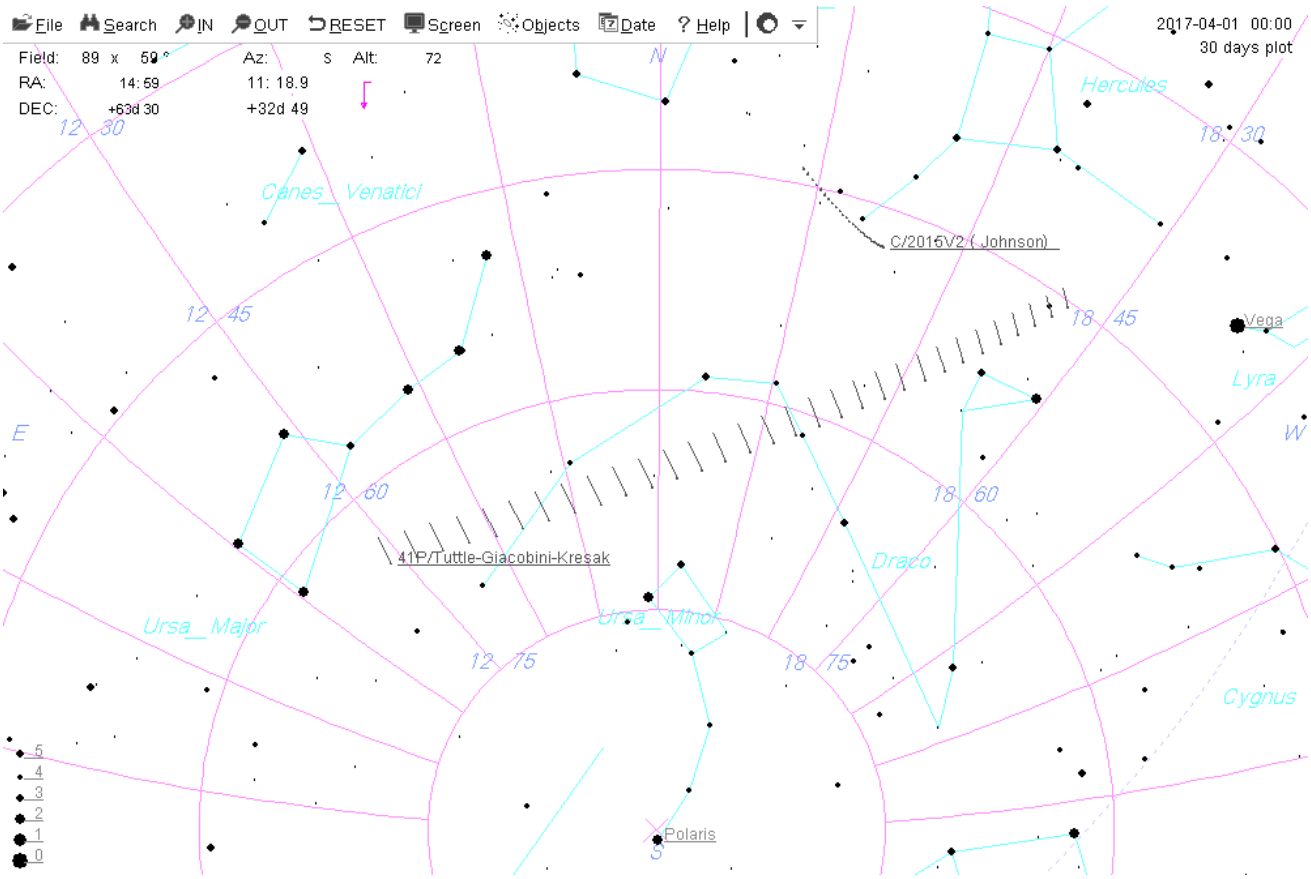
Comet 41P/Tuttle-Giacobini-Kresák

Comet 41P is a short period comet with an orbit of 5.4 years. During April it passes about 14 million miles from the Earth and is predicted to become bright enough to be seen in binoculars. It is possible if there is an outburst that it may become a faint naked eye object.

On the 17th it passes close to the magnitude 2.7 star Aldhiban and on the 25th close to the magnitude 2.8 star Rastaban.

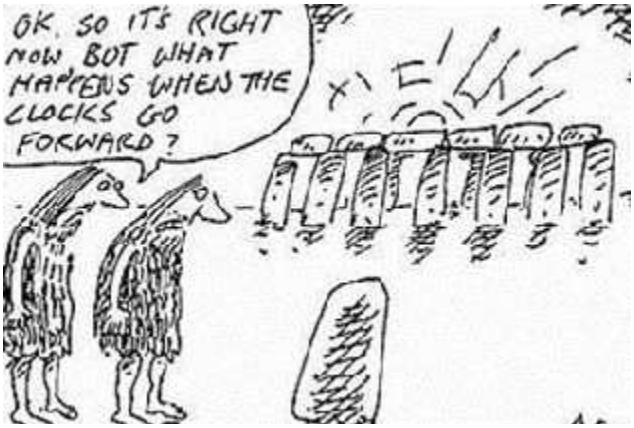
The finder chart shows the comets position every day from April 1st to 30th.

There is a second comet C/2015 V2 Johnson, passing through the constellation of Hercules. This comet is predicted to reach magnitude 7.4 at the start of the month. This will be quite faint in a pair of small binoculars.

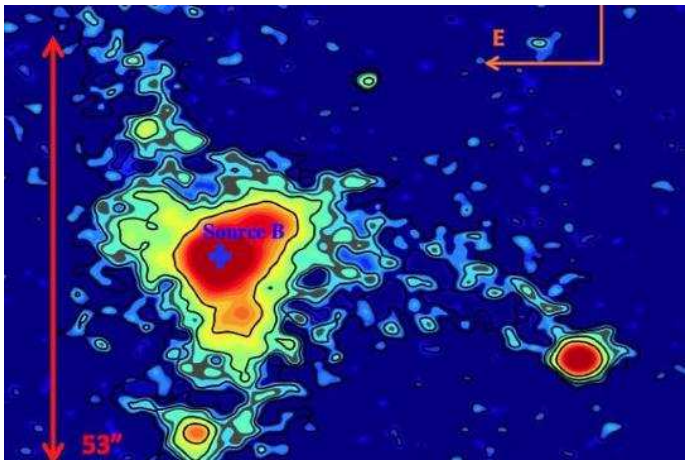


Finder chart for Comet 41P and C/2015 V2 for April

Peter Burgess



There is enormous glowing blob in universe. But what's lighting it up?



Astronomers have found an enormous, glowing blob of gas in the distant universe, with no obvious source of power for the light it is emitting.

Called an "enormous Lyman-alpha nebula" (ELAN), it is the brightest and among the largest of these rare objects, only a handful of which have been observed.

ELANs are huge blobs of gas surrounding and extending between galaxies in the intergalactic medium.

They are thought to be parts of the network of filaments connecting galaxies in a vast cosmic web.

Previously discovered ELANs are likely illuminated by the intense radiation from quasars, but it's not clear what is causing the hydrogen gas in the newly discovered nebula to emit Lyman-alpha radiation (a characteristic wavelength of light absorbed and emitted by hydrogen atoms).

The newly discovered nebula was found at a distance of 10 billion light years in the middle of a region with an extraordinary concentration of galaxies.

Researchers found this massive overdensity of early galaxies, called a "protocluster," through a novel survey project led by Zheng Cai, a Hubble Postdoctoral Fellow at UC Santa Cruz.

"Our survey was not trying to find nebulae. We're looking for the most overdense environments in the early universe, the big cities where there are lots of galaxies," said Cai. "We found this enormous nebula in the middle of the protocluster, near the peak density."

Cai is first author of a paper on the discovery accepted for publication in the Astrophysical Journal.

His survey project is called Mapping the Most Massive Overdensities Through Hydrogen (MAMMOTH), and the newly discovered ELAN is known as MAMMOTH-1.

Coauthor J. Xavier Prochaska, professor of astronomy and astrophysics at UC Santa Cruz, said previously discovered ELANs have been detected in quasar surveys.

In those cases, the intense radiation from a quasar illuminated hydrogen gas in the nebula, causing it to emit Lyman-alpha radiation. Prochaska's team discovered the first ELAN, dubbed the "Slug Nebula," in 2014. MAMMOTH-1 is the first one not associated with a visible quasar, he said.

"It's extremely bright, and it's probably larger than the Slug Nebula, but there's nothing else visible except the faint smudge of a galaxy. So it's a terrifically energetic phenomenon without an obvious power source," Prochaska said.

Equally impressive is the enormous protocluster in which it resides, he said. Protoclusters are the precursors to galaxy clusters, which consist of hundreds to thousands of galaxies bound together by gravity.

Because protoclusters are spread out over a much larger area of the sky, they are much harder to find than galaxy clusters.

The protocluster hosting the MAMMOTH-1 nebula is massive, with an unusually high concentration of galaxies in an area about 50 million light years across.

Because it is so far away (10 billion light years), astronomers are in effect looking back in time to see the protocluster as it was 10 billion years ago, or about 3 billion years after the big bang, during the peak epoch of galaxy formation.

After evolving for 10 billion more years, this protocluster would today be a mature galaxy cluster perhaps only one million light years across, having collapsed down to a much smaller area, Prochaska said.

The standard cosmological model of structure formation in the universe predicts that galaxies are embedded in a cosmic web of matter, most of which is invisible dark matter.

The gas that collapses to form galaxies and stars traces the distribution of dark matter and extends beyond the galaxies along the filaments of the cosmic web.

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

First Solar Images from NOAA's GOES-16 Satellite

The first images from the Solar Ultraviolet Imager or SUVI instrument aboard NOAA's GOES-16 satellite have been successful, capturing a large coronal hole on Jan. 29, 2017.

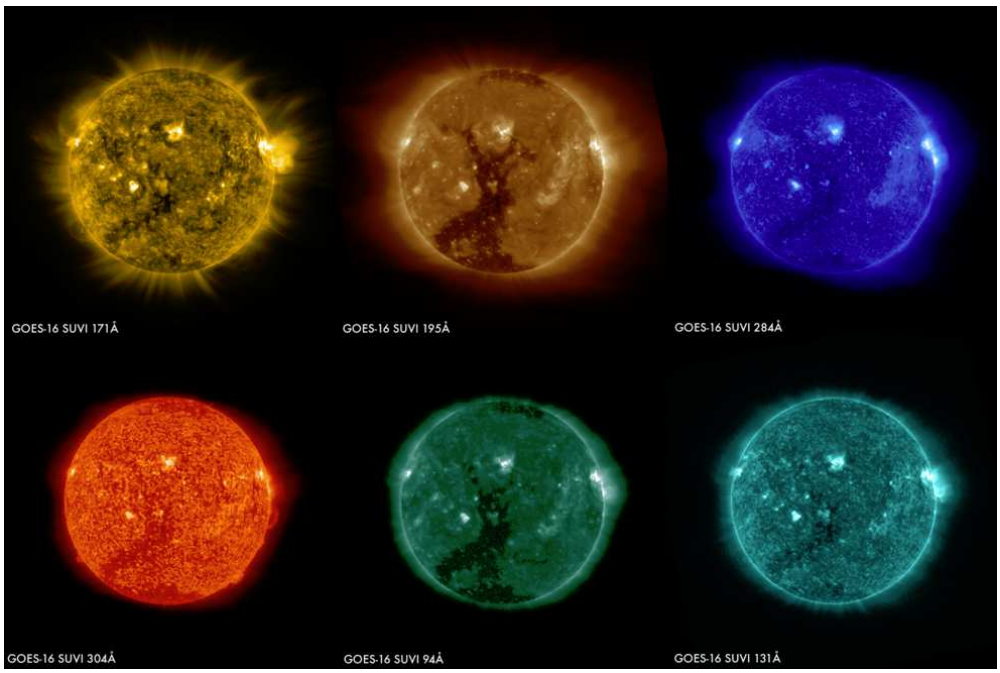
The sun's 11-year activity cycle is currently approaching solar minimum, and during this time powerful solar flares become scarce and coronal holes become the primary space weather phenomena – this one in particular initiated aurora throughout the polar regions. Coronal holes are areas where the sun's corona appears darker because the plasma has high-speed streams open to interplanetary space, resulting in a cooler and lower-density area as compared to its surroundings.

SUVI is a telescope that monitors the sun in the extreme ultraviolet wavelength range. SUVI will capture full-disk solar images around-the-clock and will be able to see more of the environment around the sun than earlier NOAA geostationary satellites.

The sun's upper atmosphere, or solar corona, consists of extremely hot plasma, an ionized gas. This plasma interacts with the sun's powerful magnetic field, generating bright loops of material that can be heated to millions of degrees. Outside hot coronal loops, there are cool, dark regions called filaments, which can erupt and become a key source of space weather when the sun is active. Other dark regions are called coronal holes, which occur where the sun's magnetic field allows plasma to stream away from the sun at high speed. The effects linked to coronal holes are generally milder than those of coronal mass ejections, but when the outflow of solar particles is intense – can pose risks to satellites in Earth orbit.

The solar corona is so hot that it is best observed with X-ray and extreme-ultraviolet (EUV) cameras. Various elements emit light at specific EUV and X-ray wavelengths depending on their temperature, so by observing in several different wavelengths, a picture of the complete temperature structure of the corona can be made. The GOES-16 SUVI observes the sun in six EUV channels.

Data from SUVI will provide an estimation of coronal plasma temperatures and emission measurements which are important to space weather forecasting. SUVI is essential to understanding active areas on the sun, solar flares and eruptions that may lead to coronal mass ejections which may impact Earth. Depending on the magnitude of a particular eruption, a geomagnetic storm can result that is powerful enough to disturb Earth's magnetic field. Such an event may impact power grids by tripping circuit breakers, disrupt communication and satellite data collection by causing short-wave radio interference and damage orbiting satellites and their electronics. SUVI will allow the NOAA Space Weather Prediction Center to provide early space weather warnings to electric power companies, telecommunication providers and satellite operators.



These images of the sun were captured at the same time on January 29, 2017 by the six channels on the SUVI instrument on board GOES-16 and show a large coronal hole in the sun's southern hemisphere. Each channel observes the sun at a different wavelength, allowing scientists to detect a wide range of solar phenomena important for space weather forecasting.
Credits: NOAA

More at: ***https://www.nasa.gov/***

Breaks Observed in Rover Wheel Treads

A routine check of the aluminium wheels on NASA's Curiosity Mars rover has found two small breaks on the rover's left middle wheel—the latest sign of wear and tear as the rover continues its journey, now approaching the 10-mile (16 kilometre) mark.

The mission's first and second breaks in raised treads, called grousers, appeared in a March 19 image check of the wheels, documenting that these breaks occurred after the last check, on Jan. 27.

"All six wheels have more than enough working lifespan remaining to get the vehicle to all destinations planned for the mission," said Curiosity Project Manager Jim Erickson at NASA's Jet Propulsion Laboratory, Pasadena, California. "While not unexpected, this damage is the first sign that the left middle wheel is nearing a wheel-wear milestone,"

The monitoring of wheel damage on Curiosity, plus a program of wheel-longevity testing on Earth, was initiated after dents and holes in the wheels were seen to be accumulating faster than anticipated in 2013. Testing showed that at the point when three grousers on a wheel have broken, that wheel has reached about 60 percent of its useful life. Curiosity already has driven well over that fraction of the total distance needed for reaching the key regions of scientific interest on Mars' Mount Sharp.

Curiosity Project Scientist Ashwin Vasavada, also at JPL, said, "This is an expected part of the life cycle of the wheels and at this point does not change our current science plans or diminish our chances of studying key transitions in mineralogy higher on Mount Sharp."

Curiosity is currently examining sand dunes partway up a geological unit called the Murray formation. Planned destinations ahead include the hematite-containing "Vera Rubin Ridge," a clay-containing geological unit above that ridge, and a sulfate-containing unit above the clay unit.

The rover is climbing to sequentially higher and younger layers of lower Mount Sharp to investigate how the region's ancient climate changed billions of years ago. Clues about environmental conditions are recorded in the rock layers. During its first year on Mars, the mission succeeded at its main goal by finding that the region once offered environmental conditions favorable for microbial life, if Mars has ever hosted life. The conditions in long-lived ancient freshwater Martian lake environments included all of the key chemical elements needed for life as we know it, plus a chemical source of energy that is used by many microbes on Earth.

Through March 20, Curiosity has driven 9.9 miles (16.0 kilometers) since the mission's August 2012 landing on Mars. Studying the transition to the sulfate unit, the farthest-uphill destination, will require about 3.7 miles (6 kilometers) or less of additional driving. For the past four years, rover drive planners have used enhanced methods of mapping potentially hazardous terrains to reduce the pace of damage from sharp, embedded rocks along the rover's route.

Each of Curiosity's six wheels is about 20 inches (50 centimeters) in diameter and 16 inches (40 centimeters) wide, milled out of solid aluminium. The wheels contact ground with a skin that's about half as thick as a U.S. dime, except at thicker treads. The grousers are 19 zigzag-shaped treads that extend about a quarter inch (three-fourths of a centimetre) outward from the skin of each wheel. The grousers bear much of the rover's weight and provide most of the traction and ability to traverse over uneven terrain.

https://www.nasa.gov/feature/jpl/breaks-observed-in-rover-wheel-treads


FREE!
Dark Wight Skies
2017
Observatory, Watery Lane, Newchurch
Thursday 30 March 2017
7pm to 10pm
Learn about the value of dark skies
Use telescopes
Talks and activities
Star gazing*
*weather dependant
pinkeyegraphics.cco.uk
Suitable for all ages * Bring a torch and wear warm clothing
VAS
CPRE Campaign to Protect Rural England
Standing up for your countryside
wightaonb.org
darkwightskies.com
Landscapes for life .org.uk
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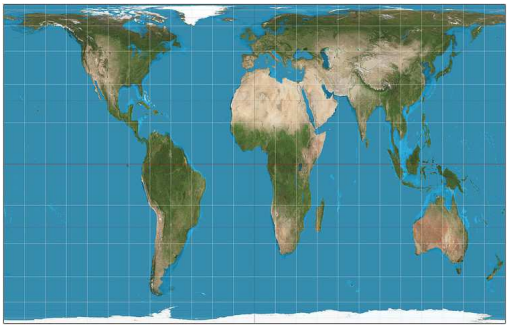
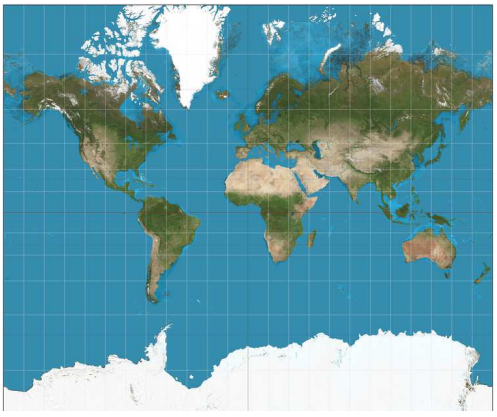
Five maps that will change how you see the world

Boston public schools recently announced that they will shift to using world maps based on the Peters projection, reportedly the first time a US public school district has done so. Why? Because the Peters projection accurately shows different countries' relative sizes. Although it distorts countries' shapes, this way of drawing a world map avoids exaggerating the size of developed nations in Europe and North America and reducing the size of less developed countries in Asia, Africa and South America.



Peters projection. Daniel R. Strebe, CC BY-SA

This is what happens with the more commonly used Mercator projection, which exaggerates the size of the Earth around the poles and shrinks it around the equator. So the developed "global North" appears bigger than reality, and equatorial regions, which tend to be less developed, appear smaller. It's especially problematic given that the first world maps based on the Mercator projection were produced by European colonialists.

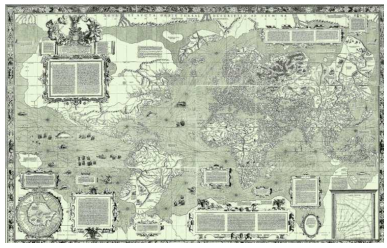


Mercator projection. Daniel R. Strebe, CC BY-SA

Why does this problem occur? Simply put, the world is round and a map is flat. Imagine drawing a world map on an orange, peeling the skin to leave a single piece and then flattening it. It would, of course, rip. But imagine you could stretch it. As you did so, the map drawn on its surface would distort.

The distortions this introduces are massive. And different projections distort maps in different ways. The Mercator projection depicts Greenland as larger than Africa. But, in reality, Africa is 14 times the size of Greenland. It alters the way you see the size – and, some people argue, the way you see the importance – of different parts of the world. So this isn't just a cartographer's dilemma – it's a political problem.

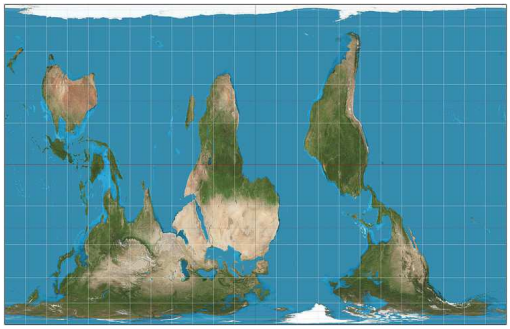
The Renaissance cartographer Gerardus Mercator did this to preserve the shapes of countries, so the map could be used to accurately calculate compass bearings. Accurate compass bearings are very important if you are a 16th century seafarer. But if you want a better idea of the relative size of the world's landmasses, you need a map that distorts shape but preserves area, like the Peters projection does.



Mercator's original 1569 map. Gerardus Mercator

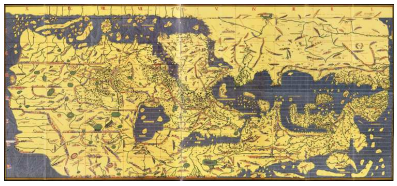
The difference between the Peters and Mercator projections shows how significant changing the way a map is drawn can be. Here are four other map styles that each come with their own political implications.

South-up



South-up Peters projection. Daniel R. Strebe, CC BY-SA

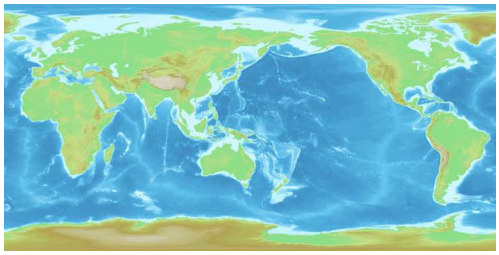
North is up, right? Only by convention. There's no scientific reason why north is any more up than south. Equally, we could do east-up, west-up or any other compass bearing. Purposefully reversing the typical way world maps are drawn has a similar political effect to using the Peters projection, putting more developing countries in the generally poorer southern hemisphere at the top of the map and so giving them greater significance.But some of the first known world maps put south at the top as a matter of course. For example, in 1154 Arab geographer Muhammad al-Idrisi drew a south-up map of Europe, Asia and northern Africa for his book the Tabula Rogeriana. The Arabian Peninsula can be seen in the centre of the map but, of course, pointing upwards rather than the more familiar downwards.



1927 recreation of the Tabula Rogeriana. Muhammad al-Idrisi/ Konrad Miller

Pacific-centred

Another convention of world maps is that they are centred on the prime meridian, or zero degrees longitude (east-west). But this is scientifically arbitrary, deriving from the location of the Royal Observatory in Greenwich, London. The result is that Europe (although also Africa) is in the centre of the conventional world map – a rather colonial perspective.

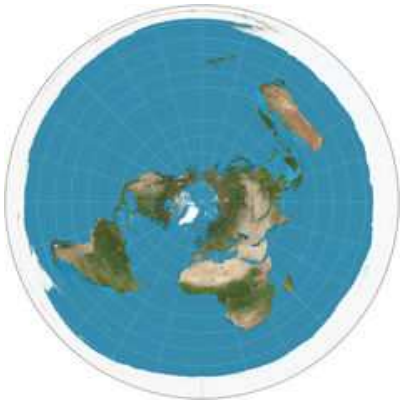


Pacific-centred map. DEMIS Mapserver/ Wikimedia

The familiar meridian-centred map conveniently places the map edges down the middle of the Pacific Ocean so no continent is chopped in two. But maps centred on the Pacific Ocean also work well because the edges of the map conveniently run down the middle of the Atlantic. This places east Asia in a more prominent position and pushes Europe to the edge. Much of Oceania and Asia uses Pacific-centred maps. (American-centred maps are also in use, but these have the unfortunate consequence of partitioning Asia to either side of the map.)

Our meridian-centred view of the world shapes how we refer to world regions. "Far East", for example, implies far from Greenwich, London. Seeing Europe on the left of a map and the Americas on the right can seem counter-intuitive, but it is just as correct as any other arbitrary chop point. The world is, after all, round.

Azimuthal polar projection



Azimuthal equidistant projection. Daniel R. Strebe, CC BY-SA

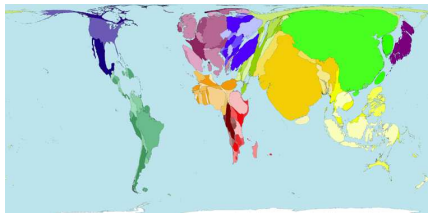
All the projections we've discussed so far tend to put one continent in the middle of the map, giving it greater prominence over the others. An alternative is to place the North Pole in the centre. It is strangely disorienting to gaze on the world from a polar perspective. The lower hemisphere should be hidden from view by the curve of the Earth because you can only see half a sphere at a time.

But on the azimuthal polar projection from the north, the southern hemisphere has been pulled into view on the page, with the consequence that Antarctica centrifuges into a doughnut around the edge of the circular map. This highlights the disadvantage of the projection as it distorts both the area and shape of landmasses, but distances from the North Pole are accurate in all directions, with those further from the centre becoming more enlarged on their east-west axis.

UN logo. United Nations

This "azimuthal" polar projection is depicted on the United Nations flag. North America was prominent on the initial 1945 UN flag (which had the longitude line 90 degrees west pointing upwards). The following year, the map on the flag was reoriented to be more neutral by having the international date line (180 degrees east, lying in the middle of the Pacific Ocean) pointing upwards. The map stops at latitude 60 degrees south, meaning Antarctica does not appear.

Cartograms



Voter turnout cartogram. Worldmapper.org / Sasi Group (University of Sheffield) and Mark Newman (University

Another way of representing the world is to display countries' sizes in proportion to key indicators of interest to geographers today, such as population, environment and development. Predictably, the world map of GDP is dominated by North America and Europe, while Africa almost disappears. The population cartogram gives greater prominence to India and China, and makes Indonesia far bigger than neighbouring Australia. But perhaps more surprising is the map of voter turnout, where emerging economies are bigger – and North America smaller – than many people might suppose.

Now more than ever, we need to be able to see the world from different perspectives. Any one perspective is not any more correct than another – just different.

Author

Donald Houston
Head of Geography, University of Portsmouth

From: ***https://theconversation.com/***

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

Religious countries likely to perform worse in science and maths, study finds

Research also finds women generally more religious than men

Students in religious countries are likely to perform worse in science and maths than their more agnostic or atheist counterparts, new research has found.

"Countries that are more religious score lower in educational performance," the study's co-author, Professor Gijsbert Stoet, told The Independent.

As a result he advised that "governments that might be able to raise educational standards and so standards of living by keeping religion out of schools and out of educational policy-making."

Read More at: ***https://www.independent.co.uk/***

Rocks suggest there's chaos in the solar system

What could be more dependable than the daily cycles of the Sun, Moon and the other planets in our solar system? Not much, you might think, but strictly speaking you'd be wrong. Since the 1980s scientists have suspected that the motion of the solar system is chaotic. Now they have found evidence that this is really the case — not in the sky, but in a North American rock formation.

The idea of a chaotic solar system sounds quite shocking at first. Naively, you might think that something as seemingly eternal as the solar system would be reasonably robust. If one of the planets received a tiny little push, for example, you might expect a small variation in its orbit, but nothing more. In a chaotic system, however, even the tiniest variations can snowball over time, leading to drastic changes. A pushed planet, even if knocked only ever so slightly, could end up leaving its orbit completely and eventually exit the system or crash into another planet.

Read More at: ***https://plus.maths.org/***

Latest Zooniverse project - Astronomy Rewind

Thousands of astronomy photos are mostly dead to science, and we aim to bring them fully back to life! Astronomy Rewind will take these "zombie images" - which have been scanned from the pages of dusty old journals - and make them searchable via digital sky atlases and catalogs. Anyone will then be able to find them online and compare them with electronic data from modern telescopes, making possible new studies of short- and long-term changes in the cosmos.

Your first task will be to identify what figure type(s) each journal page contains: photos of celestial objects with (or without) labelled axes? maps of planetary surfaces with (or without) coordinate grids? Later you'll view the figures in their celestial context within WorldWide Telescope.

Please help us now at ***www.astronomyrewind.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

New Zenith needs letters, articles, reviews or pictures related to astronomy. Contributions to the Editor at the email or postal address on the front page.

"Space is for everybody. It's not just for a few people in science or maths, or for a select group of astronauts. That's our new frontier out there, and it's everybody's business to know about space"
Christa McAuliffe, Challenger Astronaut

"Astronomers, like burglars and jazz musicians, operate best at night"
Miles Kington

"Do not look at stars as bright spots only. Try to take in the vastness of the universe"
Maria Mitchell