New Zenith

The Monthly Newsletter of the Vectis Astronomical Society

Vol 30 Issue 2 — March 2022

When Printed, this Newsletter costs VAS at least £1

Society News

Everything is pretty much back to normal now the previous COVID restrictions have all been lifted.

The Observatory is open to both members and visitors and everyone seems to be aware of sensible precautions when attending.

The Dome

There are plans to refurbish the dome area at the observatory. This will include redecoration and some updating of the electrical systems.

The dome itself is not in great condition and we are hoping to replace it and its associated controls at some point. I have sent emails to the dome manufacturer but have so far not received any replies.

Replacement will involve a lot of work and considerable expense (*hopefully grant funded*).

If you can commit to helping with this effort, please contact any member of the Committee (list on page 2).

All members should be aware that the dome may not be available for "normal" use over the next few months but we will be making efforts to work around the usage patterns we have usually seen.

If you want to use the dome and it's facilities, please let us know beforehand and we will do our best to make sure things are as operational as we can make them.

This is a long term project and no doubt will involve some inconvenience. It is however essential that we attend to this and we are working on the plans now.

SpaceCamps

Members will be aware of our efforts to involve the children of the Islands schools via "SpaceCamps", these are again being planned for 2022 with a number already set. If you'd like to be involved in this valuable work, please let us know. *Every extra hand is very welcome!*

Brian Curd

VAS Website: wightastronomy.org

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

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Tel: 07594 339950 or email: **editor@wightastronomy.org**

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

Observatory Diary

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

VAS Website: wightastronomy.org

Contents this Month

2022 Monthly Meetings

Check *http://www.wightastronomy.org/meetings/* for the latest information

Date	Subject	Speaker
25 Mar	Rebel Star: The Sun's Greatest Mysteries ***(ZOOM Meeting)***	Colin Stuart
22 Apr	Arrokoth and the Sentinels	Greg Smye-Rumsby
27 May	Orbital Oddities	James Fradgley
24 Jun	TBA	
22 Jul	TBA	
26 Aug	AGM	No Speaker
23 Sep	TBA	Jonathan Clough
21 Oct	Outreach Event	
25 Nov	TBA	

Observatory Visits Booked

No bookings so far

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.

IMPORTANT

Could all VAS members please ensure they notify the Membership Secretary of any change of address.

To ensure our compliance with GDPR rules, we must maintain accurate membership records.

VAS Contacts 2022

President	Barry Bates president@wightastronomy.org
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Others	Dudley Johnson

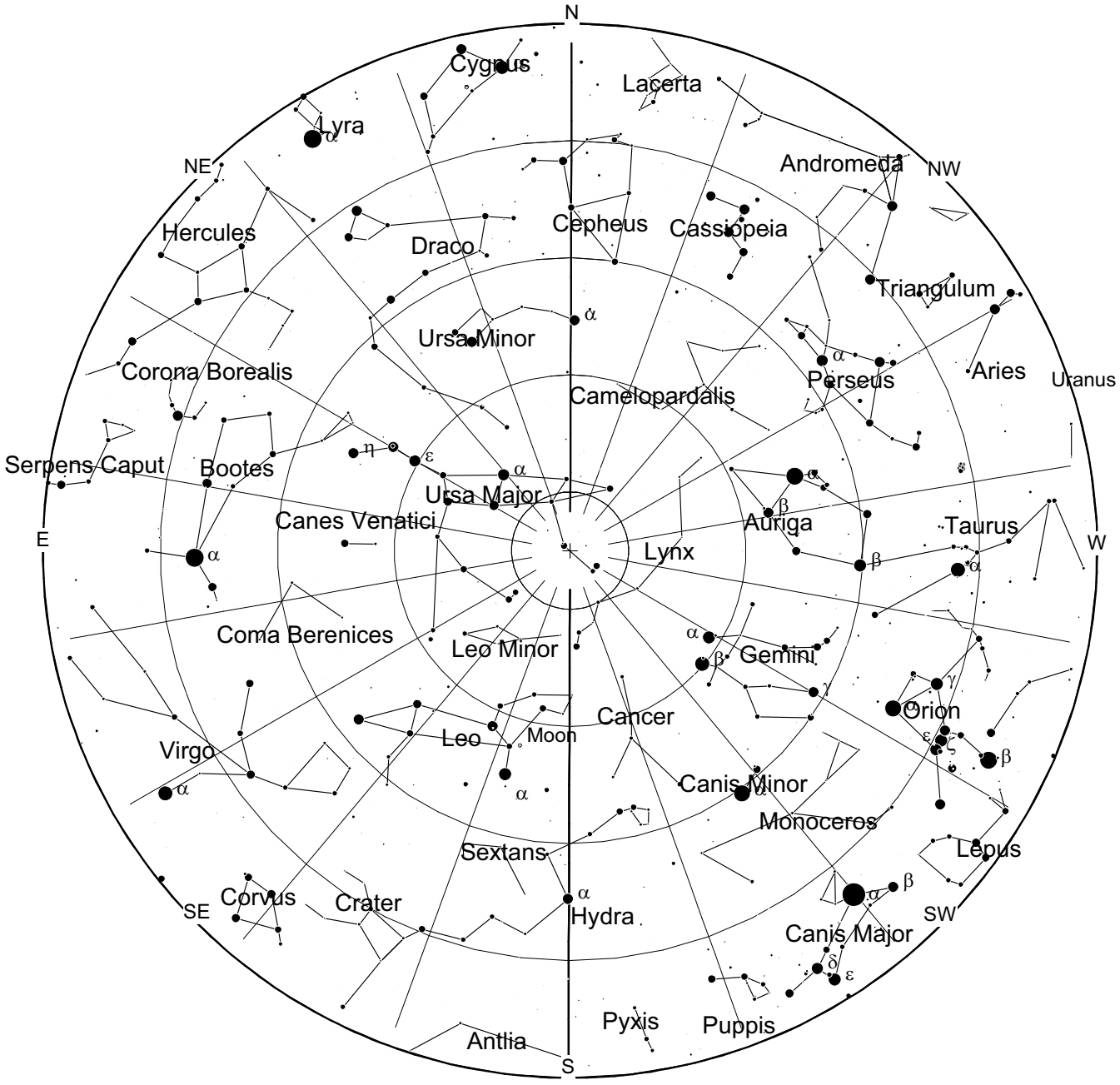
Important

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.

March 2022 - Sky Map



View from Newchurch Isle of Wight UK - 2200hrs - 15 March 2022

The Leo Triplet (also known as the M66 Group) is a small group of galaxies about 35 million light-years away[5] in the constellation Leo. This galaxy group consists of the spiral galaxies M65, M66, and NGC 3628.

The M66 Group is located in the eastern part of Leo constellation, along the line from the bright star Denebola to Regulus. The galaxies are located between the stars Chertan, Theta Leonis, and Iota Leonis.

A medium to large telescope should be capable of showing all three galaxies in one view. Of course you'll need a clear dark sky with no light pollution or moon glow.

March 2022 - Night Sky

Moon Phases Dec 2021

New	First Qtr	Full	Last Qtr
2nd	10th	18th	25th
			

Vernal Equinox

The spring, or Vernal Equinox, the time at which the Sun crosses the equator on its way north, and day and night are of equal length is on March 20 at 15:33 UTC.

Planets

Mercury

As viewed from our latitude Mercury rises only a short time before the Sun so is not suitably placed for observation. Be patient and wait for next month when it makes the best evening apparition of the year.

Venus

From about an hour before sunrise Venus, as the Morning Star can be seen rising in the south east. It is very bright and will be visible even against the brightening pre-dawn sky.

Mars

For the next few months Mars will be too close to the horizon before sunrise to be visible against the dawn sky.

Jupiter

Jupiter is in conjunction with the Sun on the 5th of the month and so is currently not visible.

Saturn

Saturn is unfavourably placed in the sky this month, it is very low close to the horizon before the Sun rises and is unlikely to be seen against the brightening sky. During the last few days of the month it passes about 2 degrees below Venus, but this event very unlikely to be visible from here as Saturn is only just above the horizon at sunrise.

Uranus & Neptune

Both the outer planets are unsuitably placed for observation this month.

Deep Sky

M82 Cigar Galaxy
RA 9h 56m Dec 69° 41' mag 9.5

Buy one, get one free! In the same field of view as M81 this is an edge on spiral, or maybe irregular galaxy that has suffering the effects of galactic interaction. The new star birth can easily be seen even in smaller telescopes as bright knots all along its length. The contrast between these two galaxies is quite striking, and made all the more so for being seen together. This galaxy pair is a sight not to be missed.

NGC2392 The Eskimo Nebula
RA 7h 29m Dec 20° 54' mag 9.9

First discovered over 200 years ago by William Herschell and made into a spectacular image by the Hubble space telescope, a large telescope and dark skies are needed to see any detail in this planetary nebula.

M35 Open Cluster
RA 6h 9m Dec 24° 20' mag 5.5

A large bright cluster in which Lord Ross counted three hundred stars. Some of the brighter members form a V shape pointing almost to the centre of the cluster and snaking up the other side is a long curved chain like a very shallow S. A little to the south west in the same low power telescopic field is NGC2158, a small triangular shaped cluster.

Peter Burgess

Ultraprecise atomic clock poised for new physics discoveries

University of Wisconsin-Madison physicists have made one of the highest performance atomic clocks ever. Their instrument, known as an optical lattice atomic clock, can measure differences in time to a precision equivalent to losing just one second every 300 billion years and is the first example of a "multiplexed" optical clock, where six separate clocks can exist in the same environment. Its design allows the team to test ways to search for gravitational waves, attempt to detect dark matter, and discover new physics with clocks.

"Optical lattice clocks are already the best clocks in the world, and here we get this level of performance that no one has seen before," says Shimon Kolkowitz, a UW-Madison physics professor and senior author of the study. "We're working to both improve their performance and to develop emerging applications that are enabled by this improved performance."

Atomic clocks are so precise because they take advantage of a fundamental property of atoms: when an electron changes energy levels, it absorbs or emits light with a frequency that is identical for all atoms of a particular element. Optical atomic clocks keep time by using a laser that is tuned to precisely match this frequency, and they require some of the world's most sophisticated lasers to keep accurate time.

By comparison, Kolkowitz's group has "a relatively lousy laser," he says, so they knew that any clock they built would not be the most accurate or precise on its own. But they also knew that many downstream applications of optical clocks will require portable, commercially available lasers like theirs. Designing a clock that could use average lasers would be a boon.

In their new study, they created a multiplexed clock, where strontium atoms can be separated into multiple clocks arranged in a line in the same vacuum chamber. Using just one atomic clock, the team found that their laser was only reliably able to excite electrons in the same number of atoms for one-tenth of a second.

However, when they shined the laser on two clocks in the chamber at the same time and compared them, the number of atoms with excited electrons stayed the same between the two clocks for up to 26 seconds. Their results meant they could run meaningful experiments for much longer than their laser would allow in a normal optical clock.

"Normally, our laser would limit the performance of these clocks," Kolkowitz says. "But because the clocks are in the same environment and experience the exact same laser light, the effect of the laser drops out completely."

The group next asked how precisely they could measure differences between the clocks. Two groups of atoms that are in slightly different environments will tick at slightly different rates, depending on gravity, magnetic fields, or other conditions.

They ran their experiment over a thousand times, measuring the difference in the ticking frequency of their two clocks for a total of around three hours. As expected, because the clocks were in two slightly different locations, the ticking was slightly different. The team demonstrated that as they took more and more measurements, they were better able to measure those differences.

Ultimately, researchers could detect a difference in ticking rate between the two clocks that would correspond to them disagreeing with each other by only one second every 300 billion years - a measurement of precision timekeeping that sets a world record for two spatially separated clocks.

It would have also been a world record for the overall most precise frequency difference if not for another paper, published in the same issue of Nature. That study was led by a group at JILA, a research institute in Colorado. The JILA group detected a frequency difference between the top and bottom of a dispersed cloud of atoms about 10 times better than the UW-Madison group.

Their results, at one millimeter separation, also represent the shortest distance to date at which Einstein's theory of general relativity has been tested with clocks. Kolkowitz's group expects to perform a similar test soon.

"The amazing thing is that we demonstrated similar performance as the JILA group despite the fact that we're using an orders of magnitude worse laser," Kolkowitz says. "That's really significant for a lot of real-world applications, where our laser looks a lot more like what you would take out into the field."

To demonstrate the potential applications of their clocks, Kolkowitz's team compared the frequency changes between each pair of six multiplexed clocks in a loop. They found that the differences add up to zero when they return to the first clock in the loop, confirming the consistency of their measurements and setting up the possibility that they could detect tiny frequency changes within that network.

"Imagine a cloud of dark matter passes through a network of clocks -- are there ways that I can see that dark matter in these comparisons?" Kolkowitz asks. "That's an experiment we can do now that you just couldn't do in any previous experimental system."

From: https://www.sciencedaily.com/

How Many Stars are There in the Milky Way? In the Universe?

Look up at the sky on a clear night, and you'll see thousands of stars – about 6,000 or so.

But that's only a tiny fraction of all the stars out there. The rest are too far away for us to see them.

The universe, galaxies, stars

Yet astronomers like me have figured out how to estimate the total number of stars in the universe, which is everything that exists.

Scattered throughout the universe are galaxies – clusters of stars, planets, gas and dust bunched together.

Like people, galaxies are diverse. They come in different sizes and shapes.

Earth is in the Milky Way, a spiral galaxy; its stars cluster in spiral arms that swirl around the galaxy's center.

Other galaxies are elliptical – kind of egg-shaped – and some are irregular, with a variety of shapes.

Counting the galaxies

Before calculating the number of stars in the universe, astronomers first have to estimate the number of galaxies.

To do that, they take very detailed pictures of small parts of the sky and count all the galaxies they see in those pictures.

That number is then multiplied by the number of pictures needed to photograph the whole sky.

The answer: There are approximately 2,000,000,000,000 galaxies in the universe – that's 2 trillion.

Counting the stars

Astronomers don't know exactly how many stars are in each of those 2 trillion galaxies. Most are so distant, there's no way to tell precisely.

But we can make a good guess at the number of stars in our own Milky Way. Those stars are diverse, too, and come in a wide variety of sizes and colors.

Our Sun, a white star, is medium-size, medium-weight and medium-hot: 27 million degrees Fahrenheit at its center (15 million degrees Celsius).

Bigger, heavier and hotter stars tend to be blue, like Vega in the constellation Lyra. Smaller, lighter and dimmer stars are usually red, like Proxima Centauri. Except for the Sun, it's the closest star to us.

An incredible number

Red, white and blue stars give off different amounts of light. By measuring that starlight – specifically, its color and brightness – astronomers can estimate how many stars our galaxy holds.

With that method, they discovered the Milky Way has about 100 billion stars – 100,000,000,000.

Now the next step. Using the Milky Way as our model, we can multiply the number of stars in a typical galaxy (100 billion) by the number of galaxies in the universe (2 trillion).

The answer is an absolutely astounding number. There are approximately 200 billion trillion stars in the universe. Or, to put it another way, 200 sextillion.

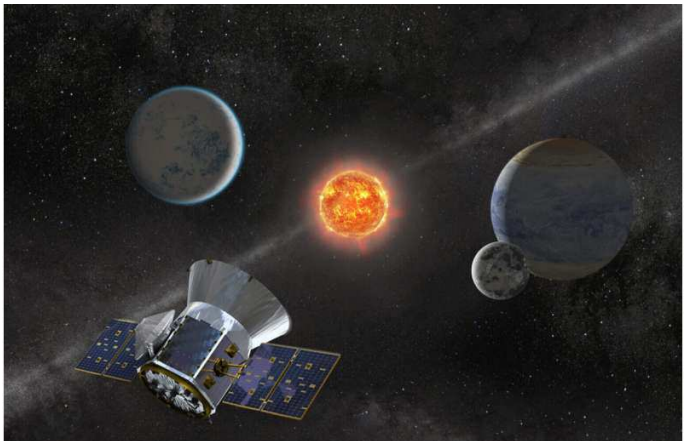
That's 200,000,000,000,000,000,000,000!

The number is so big, it's hard to imagine. But try this: It's about 10 times the number of cups of water in all the oceans of Earth.

Think about that the next time you're looking at the night sky – and then wonder about what might be happening on the trillions of worlds orbiting all those stars.

More at: https://scitechdaily.com/

Discovery of Exceedingly Rare Magnetic Hybrid Pulsating Star



Artist concept of TESS observing an M dwarf star with orbiting planets.
Credit: NASA's Goddard Space Flight Center

A team of astronomers have made the discovery of a lifetime that will help answer burning questions on the evolution of stars. The group is led by Evolutionary Studies Initiative member and Stevenson Professor of Physics and Astronomy, Keivan Stassun.

Stassun's team generated a new model that greatly improved the way stars are measured in 2017.

"Being able to combine all of the different types of measurements into one coherent analysis was certainly key to being able to decipher the various unusual characteristics of this star system," Stassun said.

The model helps predict the types of planets orbiting distant stars - called exoplanets. It has been used to identify the characteristics of more than 100 stars found by the TESS space telescope and 1,000s of others. But nothing prepared the team for what this new binary star system - which is actually two stars orbiting each other - could tell them about our universe.

According to Stassun, "This type of star is so extremely unusual that, frankly, we would not have thought to go looking for it - nobody has seen one before!"

Stassun explained how several key ingredients make this binary star system incredibly rare. Binary star systems are not uncommon among the cosmos, but one uncommon trait of this one is its orientation. When viewed from Earth, the stars eclipse each other. This allows researchers to calculate important qualities of the two stars more easily, like their mass and luminosity.

Also, stars can change size and luminosity in a process known as pulsating, and studies of these pulsations allow astronomers to probe the inner workings of stars, akin to Earth scientists using earthquake vibrations to study the Earth's internal structure. Two rare types of stellar pulsating exist, each of which provides a different, complementary view of stellar interiors. One of the stars in this binary star system that Stassun's team found exhibits a hybrid of both.

"Stars exhibiting either of those pulsating behaviors are quite rare; a star exhibiting hybrid pulsating behavior is even more so," Stassun said.

Next, this unique star has a strong magnetic field, which is decidedly uncommon for a hybrid pulsating star, and which could be a key missing ingredient in current theories for understanding the earliest stages of stellar evolution.

Finally, according to Stassun, "this is the first time that one of these rare magnetic hybrid pulsating stars has been found that is part of a star cluster and that is moreover a part of an eclipsing binary system. It seems quite unlikely that TESS will discover another star that has all of these attributes together."

Graduate student Dax Feliz, also played a major role in this project. He joined the lab as a fellow through the Fisk-Vanderbilt Masters-to-Ph.D. Bridge Program.

According to Feliz, "the discovery of this rare eclipsing binary star system provides a fantastic test bed for understanding how stellar binaries evolve over time. As the TESS mission continues observing large patches of sky, star systems like HD 149834 which are located in star clusters can help us further our understanding of stellar evolution."

The team received plenty of help from the Frist Center for Autism and Innovation. The center, founded by Stassun in 2018, works to understand and promote neurodiverse talents.

When asked about the center's contribution, Stassun said, "we have students and interns who have expertise with data visualization, and that process is becoming increasingly important for detecting rare patterns in data, such as extreme - and extremely interesting - 'outliers' such as the system we discovered in this study."

From: https://phys.org/

Galaxy Collision Creates 'Space Triangle' in New Hubble Image

A head-on collision between two galaxies fueled the unusual triangular-shaped star-birthing frenzy, as captured in a new image from NASA's Hubble Space Telescope. The interacting galaxy duo is collectively called Arp 143. The pair contains the glittery, distorted, star-forming spiral galaxy NGC 2445 at right, along with its less flashy companion, NGC 2444 at left.

Astronomers suggest that the galaxies passed through each other, igniting the uniquely shaped star-formation firestorm in NGC 2445, where thousands of stars are bursting to life on the right-hand side of the image. This galaxy is awash in starbirth because it is rich in gas, the fuel that makes stars. However, it hasn't yet escaped the gravitational clutches of its partner NGC 2444, shown on the left side of the image. The pair is waging a cosmic tug-of-war, which NGC 2444 appears to be winning. The galaxy has pulled gas from NGC 2445, forming the oddball triangle of newly minted stars.

"Simulations show that head-on collisions between two galaxies is one way of making rings of new stars," said astronomer Julianne Dalcanton of the Flatiron Institute's Center for Computational Astrophysics in New York and the University of Washington in Seattle. "Therefore, rings of star formation are not uncommon. However, what's weird about this system is that it's a triangle of star formation. Part of the reason for that shape is that these galaxies are still so close to each other and NGC 2444 is still holding on to the other galaxy gravitationally. NGC 2444 may also have an invisible hot halo of gas that could help to pull NGC 2445's gas away from its nucleus. So they're not completely free of each other yet, and their unusual interaction is distorting the ring into this triangle."

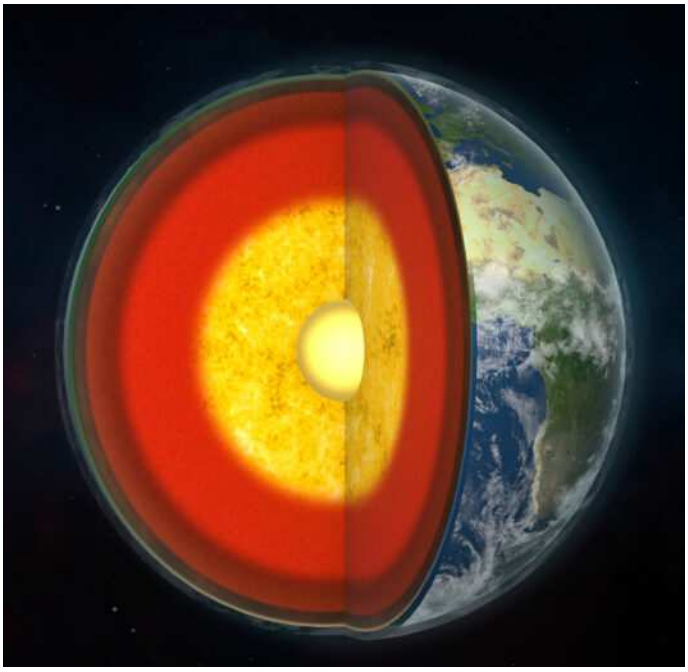
NGC 2444 is also yanking strands of gas from its partner, stoking the streamers of young, blue stars that appear to form a bridge between the two galaxies. These streamers are among the first in what appears to be a wave of star formation that started on NGC 2445's outskirts and continued inward. Researchers estimate the streamer stars were born between about 50 million and 100 million years ago. But these infant stars are being left behind as NGC 2445 continues to pull slowly away from NGC 2444.

Stars no older than 1 million to 2 million years are forming closer to the center of NGC 2445. They are the brightest and most massive in the galaxy. Most of the brilliant blue clumps are groupings of stars. The pink blobs are giant, young, star clusters still enshrouded in dust and gas.

Although most of the action is happening in NGC 2445, it doesn't mean the other half of the interacting pair has escaped unscathed. The gravitational tussle has stretched NGC 2444 into an odd shape. The galaxy contains old stars and no new starbirth because it lost its gas long ago, well before this galactic encounter.

From: https://www.nasa.gov/

Weird "superionic" matter could make up Earth's inner core



A quirky material that behaves like a mishmash of liquid and solid could be hidden deep in the Earth.

Computer simulations described in two studies suggest that the material in Earth's inner core, which includes iron and other, lighter elements, may be in a "superionic" state. That means that while the iron stays put, as in a solid, the lighter elements flow like a liquid.

The research gives a potential peek at the inner workings of an enigmatic, inaccessible realm of the planet. According to conventional scientific wisdom, Earth's core consists of a liquid outer core surrounding a solid inner core. But beyond knowing that the inner core is rich in iron, scientists don't know exactly which other elements are present, and in what quantities.

Seismic waves stirred up by earthquakes can plow through the inner core, providing clues to what's inside. But measurements of these waves have left researchers puzzled. The velocity of one type of wave, called a shear wave, is lower than expected for solid iron or for many types of iron alloys - mixtures of iron with other materials. "That is a mystery about the inner core," says geophysicist Yu He of the Chinese Academy of Sciences in Guiyang.

In one new study, He and colleagues simulated a group of 64 iron atoms, along with various types of lighter elements - hydrogen, carbon and oxygen - under pressures and temperatures expected for the inner core. In a normal solid, atoms arrange themselves in an orderly grid, holding fast to their positions. In a superionic material, some of the atoms arrange neatly, as in a solid, while others are liquid-like free spirits that slip right through the solid lattice. In the simulation, the researchers found, the lighter elements moved about while the iron stayed in place.

That superionic status slowed shear waves, suggesting the weird phase of matter could explain the unexpected shear wave velocity measured in the inner core.

Shear waves, also known as secondary or S waves, jiggle the Earth perpendicular to their direction of travel, like the undulations that move along a jump rope that's wiggled up and down. Other waves, called primary or P waves, compress and expand the Earth in a direction parallel to their travel, like an accordion being squeezed.

To really explain the inner core, scientists must find a combination of elements that keeps with everything scientists know about the inner core, including its S wave velocity, P wave velocity and its density. "You have to match all three things, otherwise it doesn't work," says mineral physicist John Brodholt of University College London.

Another puzzle of Earth's heart is the fact that the inner core's structure seems to change over time. This has previously been interpreted as evidence that the inner core rotates at a different rate than the rest of the Earth. But He and colleagues suggest that it could instead result from the motions of liquid-like light elements swirling inside the inner core and changing the distribution of elements over time. "This paper sort of offers an explanation for both of these phenomena" — the slow shear wave velocity and the shifting structure — says Tkalcic, who was not involved with either new study.

One thing missing is laboratory experiments showing how these combinations of elements behave under inner core conditions, says geophysicist Daniele Antonangeli of Sorbonne University in Paris, who was not involved with the new research. Such tests could help confirm whether the simulations are correct.

Previous experiments have found evidence that water ice can go superionic, perhaps under conditions found inside Uranus or Neptune (SN: 2/5/18). But researchers can't yet probe the behavior of superionic materials under the conditions thought to exist inside Earth's core. So scientists will have to keep pushing the tests to further extremes, Antonangeli says. "The experimentalist that is within me craves seeing experimental validation of this."

From: https://www.sciencenews.org/

Lava Flows On Mars

Lava that Once Flowed

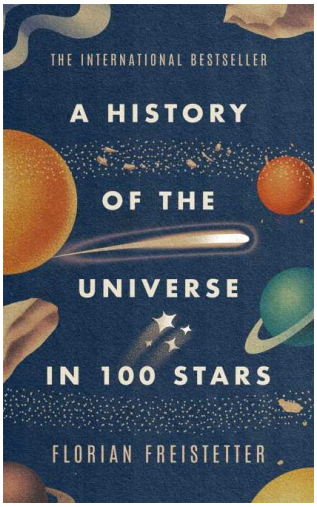
This image shows some beautiful lava flows in Amazonis Planitia. Lava isn't moving around on Mars today, but it certainly once did, and images like this one are evidence of that.

A thick lava flow came in from the west, and you can see the cooled flow lobes and wrinkled upper surface. East of the flow margin, this most recent flow also coursed over an older lava surface which shows some long, north-south breaks, and in the southeast corner, an arrowhead-shaped set of ridges. These textures are most likely from rafted slabs of lava. Under certain conditions, a large piece of lava can cool, but then detach and move like an iceberg over a cushion of still-molten lava.

The long, narrow north-south smooth areas are probably where two of these plates rafted away from one another exposing the lava below. The arrowhead-shaped ridges are probably from when one of these plates pushed up against another one and caused a pile-up before cooling.

From: https://www.uahirise.org/hipod/ESP_047071_2065

A History of the Universe in 100 Stars



By Florian Freistetter

(Quercus 2021 - English Translation; 2019 - Original German edition)

This title is surely a winner, and indeed this book is acclaimed an International Bestseller. What could be better than a comprehensible history of the universe, told in bite-sized chapters each based on a single star? The format is familiar to anyone who came across BBC Radio 4's History of the World in 100 Objects by Neil MacGregor which was a brilliant radio series and later beautiful book.

Can Freistetter's History of the Universe in 100 Stars do for astronomy what MacGregor's did for history? I am not sure the 100 Stars quite matches up.

There is certainly plenty of variety and interest here: stories from antiquity and recent research, tales of discovery, observation and mystery. And all of the expected characters from the history of astronomy make an appearance together with plenty of others from the European perspective (the book was originally written in German). We find the ancient Greeks estimating the distance to the sun, Galileo and Kepler moving the Earth out of the centre of the universe, Caroline and William Herschel, Eddington and Hubble, each expanding and enriching our concepts of the Universe, through to the hunters of exoplanets and other exotic objects like quasars, pulsars and suspected “black dwarfs”.

Not all of the hundred chapters are actually about stars: the chapter on “Hairy Stars” is about comets (the word comet is from the Greek for “hair”!) looks at how they were portents and signs through different times and cultures. Another section is “Sidera Medicea” which is the name originally given by Galileo to the moons of Jupiter, in honour of the powerful Medici family. And “Star 23" is actually a bronze age archaeological find - part of the oldest known physical representation of the sky. These are scattered amongst chapters about Algol - the winking “Daemon's Eye” which hints that the early Arab astronomers knew it was a variable star; Polaris - one of many “North stars” as the earth's axis of rotation precesses through the sky; Deneb - which was central to the brilliant work of Cecilia Payne who in the 1920s identified the absorption spectra in starlight and proved what stars are made of.

Dr Freistetter is an Austrian author who worked as an astronomer at the University in Heidelberg in Germany, so he has bags of practical experience and he provides no end of nuggets and factoids: 70 millennia ago, Scholtz's Star made the closest ever fly-by by a star approaching our sun; huge Gamma Ray Bursts from distant exploding stars have been strong enough to trigger the Nuclear Early Warning satellites in the 1960s; or Antares, the bright red giant in Scorpio which lived fast and died young. So many stories.

This book is good to dip into, but I am not sure it does really tell the “History of the Universe” in a coherent way. I guess we will always have more sober textbooks for that. But it really would have benefitted from some pictures or diagrams or star charts - just something to give a little visual stimulus. Nevertheless, it is a book to intrigue and entertain and should draw in any interested reader to ask more questions.

Simon Gardner

Just A Reminder!

The Watery Lane Observatory is now open again on Thursday evenings (*Hooray!*)

Whilst COVID isn’t over, the restrictions we have got used to over the last months have been lifted and we have re-opened

Please remember though, the Observatory is a confined space so be aware of others who may be in there

All visitors are being asked to let us know when they are coming to visit and how many are in their group

Please have a face covering available when you visit - *you may need it if visitors come pouring through the doors!*

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

Important News

The March meeting will be the last planned Virtual Monthly Meeting (via Zoom) for now. However, we have decided to keep our options open for this kind of meeting as it does mean we can access a whole range of extra speakers.

Names of the Days of the Week

In many languages, the names given to the seven days of the week are derived from the names of the classical planets in Hellenistic astronomy, which were in turn named after contemporary deities, a system introduced by the Roman Empire during Late Antiquity.

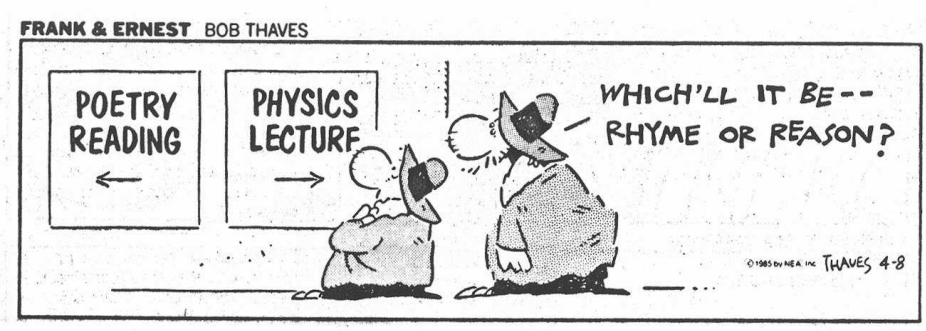
In some other languages, the days are named after corresponding deities of the regional culture, beginning either with Sunday or with Monday. The seven-day week was adopted in early Christianity from the Hebrew calendar, and gradually replaced the Roman nundinal cycle as the new religion spread. Sunday remained the first day of the week, being considered the Lord's Day, while the Jewish sabbath remained the seventh. Emperor Constantine adopted the seven-day week for official use in CE 321, making the Day of the Sun (dies Solis) a legal holiday.

In the international standard ISO 8601, Monday is treated as the first day of the week.

The results:

Sunday	***Sol or Helios***	**Sun**
Monday	***Luna or Selene***	**Moon**
Tuesday	***Mars or Ares***	**Mars**
Wednesday	***Mercurius or Hermes***	**Mercury**
Thursday	***Jove or Zeus***	**Jupiter**
Friday	***Venus or Aphrodite***	**Venus**
Saturday	***Saturnus or Kronos***	**Saturn**

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



At The Observatory

1. **Please bring a torch.**
2. **Make sure you close and lock the car park gate if you are the last to leave.**

Articles Needed

NZ needs relevant content. Contact details on page 1.

Strange Facts

You can't burp in space

When you burp on Earth, gravity keeps down the solids and liquids from the food you just ate, so only the gas escapes from your mouth. In the absence of gravity, the gas cannot separate from the liquids and solids, so burping essentially turns into puking.

Water can exist in three states at once

The triple point is a specific temperature and pressure where materials exist as a gas, a liquid, and a solid simultaneously. It is also the only situation where all three states of matter can coexist, is different for every material. Water reaches its triple point at just above freezing (0.1 degree Celsius) and at a pressure of 0.006 atm.

Bananas are radioactive

Bananas contain potassium, and since potassium decays, that makes the yellow fruit slightly radioactive. You'd need to eat ten million bananas in one sitting to die of banana-induced radiation poisoning