New Zenith

The Monthly Newsletter of the Vectis Astronomical Society

Vol 30 Issue 3 — April 2022

When Printed, this Newsletter costs VAS at least £1

Society News

Last Thursday night's meeting was one of the busiest for a couple of years! We had about 12 visitors and, thank goodness, a pretty clear night.

Everyone had a chance to look through some of our telescopes and they were all keen to learn much more about the night sky and its importance to life on the Island.

Let's hope we see visitors every week from now on!

Outreach

Three of our members went to a Space Camp event at St Helen's school in March.

We entertained about 12 young students with a slide show, telescopes and binoculars. Again it was quite a clear night and it seemed that everyone enjoyed both their special Space themed lessons during the day and the chance to do some stargazing later in the evening.

Thanks to all who helped.

Brian Curd

April Asteroid

On April 1, 2022, asteroid 2007 FF1 will pay the Earth a close call. It is a very small asteroid whose orbit crosses the orbit of Earth.

NASA JPL has classified 2007 FF1 as a "Potentially Hazardous Asteroid" due to its predicted close pass(es) with Earth.

This year it will pass us travelling at 12.832 km/s and it will only be some 7,423,318 km away

2007 FF1 orbits the sun every 684 days (1.87 years), coming as close as 0.79 AU and reaching as far as 2.25 AU from the sun. Based on its brightness and the way it reflects light, 2007 FF1 is probably between 0.116 to 0.259 kilometers in diameter, making it a small to average asteroid, very roughly comparable in size to a school bus or smaller.

VAS Website: wightastronomy.org

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

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St John's Crescent
Sandown
Isle of Wight
PO36 8EE

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.
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
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

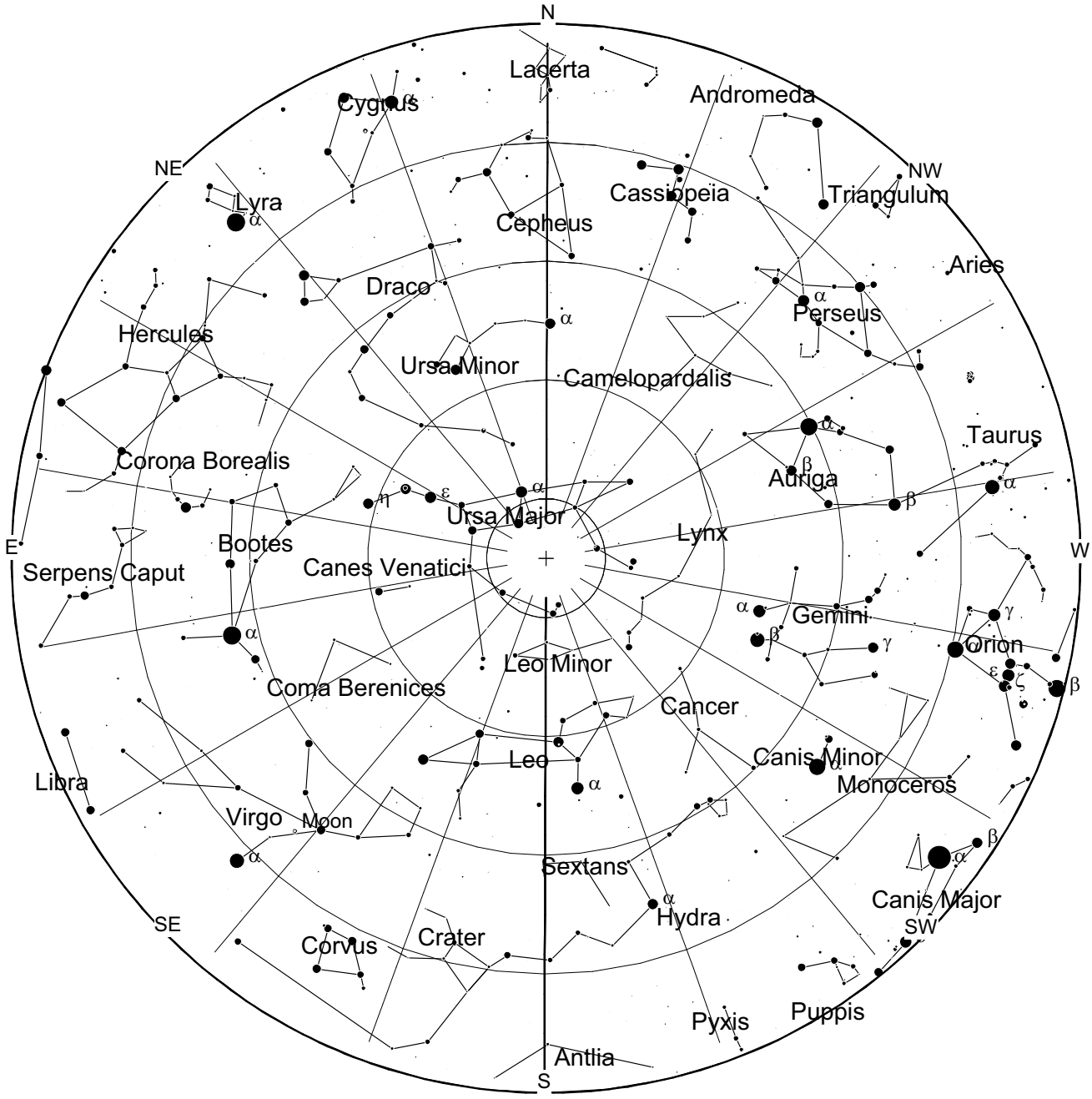
Important

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.

April 2022 - Sky Map



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

The April **Lyrids** are a meteor shower lasting from April 16 to April 25 each year. The radiant of the meteor shower is located in the constellation Lyra, near its brightest star, Vega. The peak of the shower is typically around April 22 each year.

The source of the meteor shower are particles of dust shed by the long-period Comet C/1861 G1 Thatcher. The April Lyrids are the strongest annual shower of meteors from debris of a long-period comet, mainly because as far as other intermediate long-period comets go (200–10,000 years), this one has a relatively short orbital period of about 415 years. The Lyrids have been observed and reported since 687 BC; no other modern shower has been recorded as far back in time

April 2022 - Night Sky

Moon Phases Dec 2021

New	First Qtr	Full	Last Qtr
1st and 30th	9th	16th	23rd
			

Planets

Mercury

After conjunction with the Sun on the 2nd, Mercury makes its best evening apparition of the year. Found low down on the west just after sunset, and although relatively bright, it can be quite a challenge to spot against the still bright sky. A pair of binoculars makes finding it easier. The table below shows the alt and az at 20:30 BST, It should be possible to see the planet from about the 9th or 10th from about 20:00, but it will be close to the horizon and the sky will be much brighter. Seeing Mercury is always a compromise between the apparent brightness of the planet that decreases as it moves further from the Sun and as it gets closer to the horizon against the darkening sky, and waiting for the sky to darken.

Azimuth & Altitude of Mercury at 20:30 BST during April 2022

Date	Az	Alt		Date	Az	Alt
13	287	4		22	286	13
14	287	5		23	286	13
15	287	6		24	286	14
16	287	8		25	286	15
17	286	9		26	286	16
18	286	9		27	286	15
19	286	10		28	286	16
20	286	11		29	286	16
21	286	12		30	286	16

Venus

Rising at about 04:30 Venus can be seen very low down in the east-southeast just before sunrise. It is very bright so can be readily seen against the fast brightening dawn sky.

Mars

Mars may be visible low down in the east-southeast before sunrise, but it is still not very bright and may not be visible even with a telescope. As the year progresses it will rise earlier in the morning and become more visible.

Jupiter

During the last week of the month Jupiter may be bright enough to be visible against the bright pre-dawn sky, look a few degrees to the left of the much brighter Venus which is fast closing in on Jupiter and is in very close conjunction on the May 1st.

Saturn

At the start of the month Saturn is close to Mars low down in the east-southeast before dawn, and will also be a difficult target. On the 5th it is about 7° to the right of Venus and in close conjunction with Mars. As the month progresses it moves further to the west, but remains challenging to see against the bright pre dawn sky.

Uranus & Neptune

Both the outer ice giant planets are not visible until later in the year.

Meteor Showers

The Lyrid meteor shower that is associated with Comet Thatcher marks the end of the spring lull in meteors and peaks during the night of the 22nd/23rd. It produces fast bright meteors with an hourly rate of about 18. This year will be somewhat hampered in the early morning by the last quarter moon.

Deep Sky

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

M51 together 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.

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.

Peter Burgess

Satellite Streak Watcher Project

About this project

As more satellites are placed into orbit, they will become an increasing problem to astronomers on the ground. This long term project will photographically track the population growth of these satellites over time. (Logo credit Victoria Girgis - Lowell Observatory)

Project goal

Photographically record satellite streaks across the night sky to monitor this form of sky pollution.

What participants do:

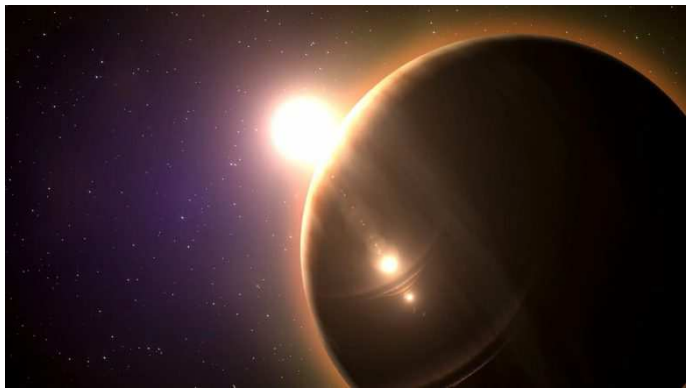
Use your smartphone camera to record satellite streaks through the night sky to monitor this problem over time.

In the coming years, thousands of satellites will be deployed into low Earth orbit as part of the new internet mega-constellations. In the three hours after sunset and before sunrise, these bright streaks from reflected sunlight will crisscross the night sky and wreak havoc with astronomers trying to photograph astronomical objects from the ground. It will also be a problem for amateur astronomers for the same reasons. This project will record for posterity the growth of this problem over many years as participants use their smartphones to photograph the increase in these streaks over time from locations around the world. These satellites will be bright enough due to sun glint to appear with magnitudes between +2 and +6m, and so can be readily photographed using most smartphone cameras.

Join the Project here:

https://www.anecdata.org/projects/view/687

How Do We Find Exoplanets?



How can we detect planets around other stars? Planets are very faint and small compared to the stars they orbit. To overcome this challenge, scientists use a variety of techniques to find and characterize them.

Since planets are close to much brighter stars, how do we actually find them?

Some planets are found by a technique that uses Einstein's theory of general relativity, observing the bending effect of gravity from a hidden planet as it warps the light around its host star.

The most common method is to look for an eclipse or transit as a planet passes in front of its host star. This is how the Kepler observatory found planets, by staring at a large region of the sky and waiting for planets to pass in front of their stars, taking snapshots every second.

The Transiting Exoplanet Survey Satellite uses the same technique on our nearest neighbor stars.

Another technique observes very small changes in the star's position in the sky - the wobble that occurs when an unseen planet's gravity tugs on its host star.

If the planet and star are oriented so that the star is moving toward or away from us, instead of side to side, we can detect the planet as a shift in the star's light.

As far as getting pictures of the actual exoplanets themselves, it's possible, but very difficult. The telescope has to block the bright star's light to reveal the faint planet nearby.

More at: https://scitechdaily.com/

Happy Birthday, Winchcombe Meteorite!

(Based on a Royal Astronomical Society lecture by Áine O'Brian, The Winchcombe Meteorite - The Lowdown on the Lockdown Rock, 22nd February 2022)

Figure 1 A piece of the Winchcombe meteorite on display in the Natural History Museum, London

About 10pm on 28th February 2021, when most of us were huddled under lockdown, a fireball streaked at 14 km per second across the sky over England. Did anyone notice? Yes, they did: it was captured on so many cameras and other sensors that it was the most well-recorded fireball in history. This was a case where track and trace really did work, because the path of the fireball and predicted impact point(s) of the surviving meteorites were pinpointed by a group called the UK Fireball Alliance comprising about 30 universities and other organisations led by the Natural History Museum. The track was so well established that this is the first meteorite with some certainty where it originated in the outer asteroid belt.

Figure 2 Áine O'Brian - planetary science & astrobiology student and meteorite hunter

Áine O'Brian is a Planetary Science PhD student in Scotland who is one of the team of academics who were mobilised from all over the country to descend on the village of Winchcombe in Gloucestershire to search for the remains. It was a logistical challenge to get permissions to travel in the middle of lockdowns, work to all the health and safety guidelines and while keeping the details out of the mainstream media, for fear of large numbers of people gathering. She tells the story of the race to gather any pieces of meteorite as an exciting, once in a lifetime race - this was the first meteorite to land in Britain for over 30 years! There were days of patiently scanning the ground in fields, looking for black rock, often frustratingly indistinguishable from sheep poo!

Figure 3 Fireball and piece of the Winchcombe meteorite

Then there was the Wilcock family who not only noticed black rock and dust on their driveway, but carefully preserved it, later even donating a section of their driveway for analysis. It can now be viewed on display in the Natural History Museum. Their quick actions and the successful searches for other pieces of the meteorite resulted in over half a kilogram of material available for scientific analysis. The lack of contamination for much of what was gathered is reckoned to be as good as the sample return missions where spacecraft have brought back materials from asteroids. Where it had been plucked out of the sheep fields, the team carefully collected environmental samples around each site so that contaminants could be accounted for.

This was a Carboniferous Chondrite (CC) meteorite - a rare type that is thought to be material unchanged for 4.6 billion years - and the first CC meteorite to land in the UK. Áine was tasked with carrying out some of the first analysis back in the lab in Glasgow. She described it as daunting to be entrusted with this precious stuff: 0.1g of the meteorite can fetch many £100s at auction! Despite working in a very cold lab (which had been moth-balled throughout lockdown and had no operational heating) she established important results. There is 2-3% carbon by weight and less than about 15% water content trapped in mineral components, but the organic analysis was not yet published at the time of her lecture. There are some exciting findings still to come which are likely to refine our understanding of how our solar system formed.

Áine O'Brian should now be completing her PhD thesis, which has been extended to include some of the Winchcombe analysis. She is a dynamic and engaging speaker and another of the superb crop of young Astro-physicists and Planetary Scientists who can not only carry out fine science, but have the charisma and communication skills to enthuse us all with brilliant science.

Simon Gardner

Links to related material:

A fireball, a driveway and a priceless meteorite

Wikipedia (Carboniferous chondrite meteorites)

Meet our students - Áine O'Brien

Farmer Finds 2lb Meteorite that Landed in Field 18 Months Ago

Tony Whilding searched 18 months for the 2lb 4oz meteorite

A DAD has found a 2lb 4oz meteorite worth up to £100,000 in a farmer's field after searching for it for 18 months.

Tony Whilding, 38, of Wrexham, North Wales, began his hunt after a ball of flames shot over his home and went out.

Tony is hoping to get the rock certified to find how much it is worth.

He said: "I was in my back garden having a midnight cigarette when I noticed the sky lighting up above my head.

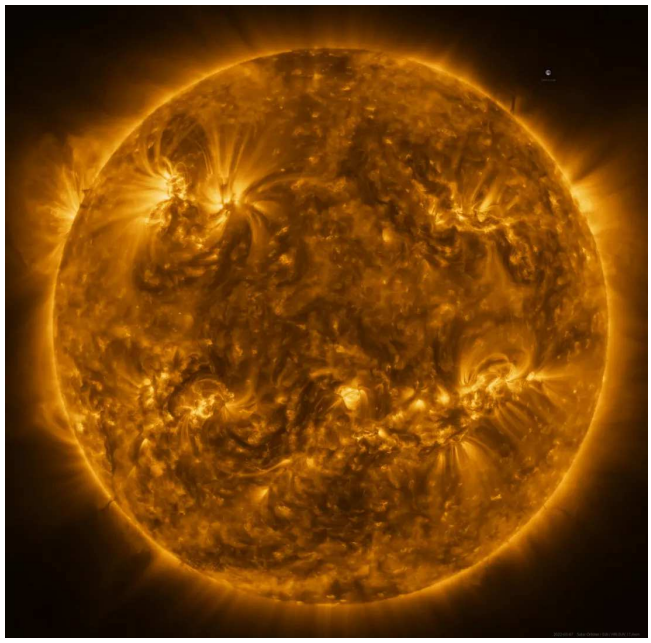
"I looked up to see a low-flying ball of fire with two swirling trails of smoke.

"It got brighter as it approached my house at about twice its height. It was so low you could have kicked a football in the air and it would have reached it.

"As it crossed over, it extinguished within a few seconds. There was no noise, it just disappeared, leaving only the trials of smoke."

More at: https://www.sott.net/

European probe captures the highest resolution image of the Sun's corona ever taken



The European Space Agency has shared what it claims is the highest resolution image ever taken of the Sun's full disc and outer atmosphere, the corona. The Solar Orbiter had to snap 25 individual images to fit the entire star into a single frame. The process took more than four hours as each image needed about 10 minutes of exposure, plus extra time for the craft to adjust between shots.

A series of images were captured on March 7. The crown jewel of the set was photographed using the Extreme Ultraviolet Imager (EUI) at a distance of roughly 46.6 million miles from the Sun, or about halfway between the Earth and the Sun.

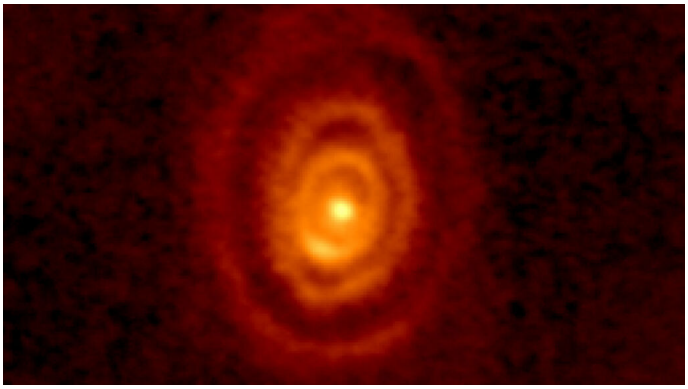
The corona has a temperature of around one million degrees Celsius.

The full-size image can be downloaded from the ESA's website. It weighs in at more than 56MB and at a resolution of 9,148 x 9,112, contains more than 83 million pixels. The ESA even included a scale image of the Earth in the top-right corner for comparison.

The Solar Orbiter launched on February 10, 2020, as a joint operation between the ESA and NASA. The US space agency also operates its own probe, known as the Parker Solar Probe. Late last year, it became the first spacecraft to fly through the Sun's atmosphere. Future missions will see the Parker Solar Probe fly even closer to the Sun - within 3.83 million miles of its surface.

From: https://www.techspot.com/

New Image Captures Enormous Gas Rings of an Aging Red Star



Three rings of ejected gas sail from an aging star named V Hydrae, seen in this false-color radio image from the Atacama Large Millimeter/submillimeter Array in Chile Credit: R. Sahai, P-S. Huang, S. Scibelli, M.R. Morris, K. Hinkle, C-F. Lee

Huge rings of gas surround a large red star named V Hydrae, new images show, signaling its eventual transformation into a much smaller and bluer star.

"It's definitely going through its metamorphosis," says Raghvendra Sahai, an astronomer at NASA's Jet Propulsion Laboratory in Pasadena, Calif. "Such ringlike structures have never been seen in any object like this before."

Observations of the three concentric rings, all ejected from the star during the last 800 years, could help astronomers understand how giant stars lose mass toward the end of their lives and seed the cosmos with planet- and life-building elements.

Born roughly twice as massive as the sun and lying about 1,300 light-years from Earth, V Hydrae is what's known as an asymptotic giant branch star. It once fused hydrogen in its core, as the sun does. But now it is a cool, brilliant, puffed-up star that alternately burns hydrogen and helium in shells around a carbon-oxygen core. Such stars cast lots of material into space.

"The processes by which this happens are not well-understood," says Sahai, who has studied V Hydrae since the 1980s.

His team used the Atacama Large Millimeter/submillimeter Array of radio telescopes in Chile, also known as ALMA, to detect the three rings of gas. Beyond them lie three additional rings, which are fainter and seen only partially, Sahai and colleagues report in a paper submitted February 18 at arXiv.org.

The outermost complete ring now sits about 260 billion kilometers from the star, or 1,740 times as far as Earth is from the sun - more than 40 times Pluto's distance from Earth. By measuring the speed at which the three complete rings are moving outward and their current distances from the star, the astronomers calculate that it cast them off about 270, 485 and 780 years ago.

It's thought that another star orbits the main one every few hundred years on an elliptical orbit. When the companion dives in, it can trigger the giant star to cast more material into space, the team says.

The new image is striking and unusual, and it illustrates how a companion star enhances a giant star's loss of mass, says Joel Kastner, an astronomer at the Rochester Institute of Technology in New York who was not part of the study. "Mass loss is very important because it's how the elements of life get distributed from stars into the universe."

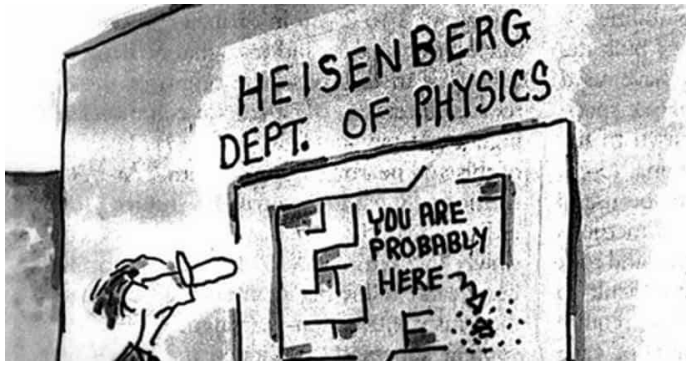
Stars like V Hydrae forged most of the nitrogen in Earth's air as well as much of our planet's carbon, the basis for all terrestrial life V Hydrae has so many carbon compounds in its atmosphere that it's classified as a carbon star. It's also one of the reddest stars known because those compounds as well as dust particles absorb its blue and violet light.

Sahai expects the star's ejection of material to continue, but, he says, "it's anybody's guess as to how many more rings will be produced."

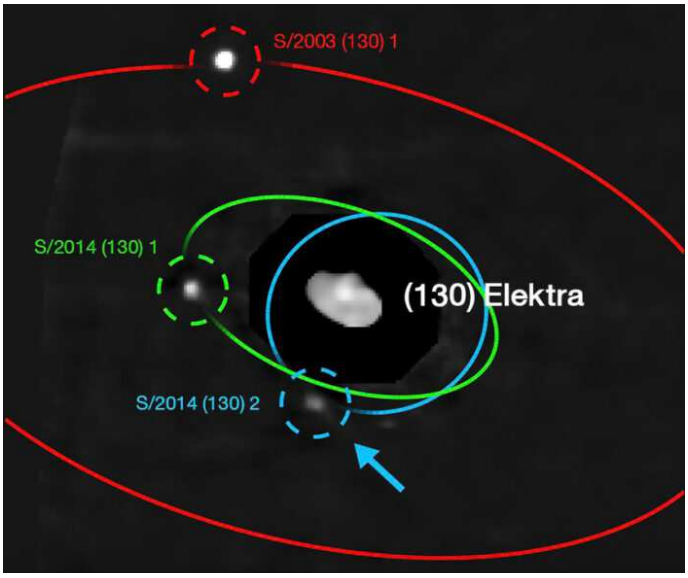
When the star loses all of its atmosphere, probably many thousands of years from now, it will expose its hot core, whose ultraviolet light will set the cast-off material aglow, creating a beautiful bubble of gas known as a planetary nebula.

When the nebula dissipates, all that will remain of the magnificent red star will be a tiny blue one - a white dwarf - a little larger than Earth, plus innumerable life-giving elements floating through the Milky Way.

See: https://www.sciencenews.org/



How Many Moons Can an Asteroid Have?



The best estimate of the moons' orbits is shown here, with the newest discovery, S/2014 (130) S2, shown in blue. Credit: NARIT / A. Berdeu

Recently, astronomers found a third moon orbiting the asteroid 130 Elektra, breaking the record for moons among asteroid systems. The discovery of the first quadruple asteroid raises the question, *just how many moons can an asteroid have?* And *where do these moons come from?*

Anthony Berdeu (National Astronomical Research Institute of Thailand) and colleagues set out looking for asteroid moons when they delved into old observations taken by the Spectropolarimetric high-contrast exoplanet research facility (SPHERE), a set of instruments on the Very Large Telescope in Chile. Though primarily intended for picking out exoplanet fireflies next to their beacon-bright stars, SPHERE also shines when it comes to faint solar system objects. And researchers have previously used SPHERE to observe a second moon around Elektra, a main-belt asteroid with a composition similar to Ceres.

It was these observations that Berdeu's team returned to in order to find the asteroid's third moon, reported in Astronomy & Astrophysics. Hiding in the asteroid's bright "halo," the third object, designated S/2014 (130) 2, is the smallest of the bunch at 1.6 kilometres across (the other two are 6 km and 2 km, respectively).

Unfortunately, the moon appears on the same side of the asteroid in all the archival observations, which makes its orbit difficult to pin down. More observations would help with this. Additional data could also help astronomers narrow down the moon's composition.

Berdeu chose Elektra to test a new image-processing software he had developed, because he knew the asteroid already had two detected moons. The newest find thus happened by sheer luck and suggests that many-mooned asteroids might be a common phenomenon.

But unlike Earth's Moon, most asteroidal moons probably formed recently in the solar system's history. Three main scenarios could happen in any given system: In gravitational capture, a passing rock passes too close to an asteroid and becomes part of its system. Or, if the asteroid spins quickly, it might fling off some rocks, which might either escape its weak surface gravity or ultimately remain part of the system as moons. Finally, moons might arise from debris ejected during an impact.

Because the newest moon appears to have an elongated orbit that's inclined to the asteroid's spin, the authors favor an impact scenario. But they really need to pin down the moon's orbit and composition to make a solid case.

In theory, impacts could create quite a few moons, including much smaller ones than those we've detected so far. "Knowing that astronomers already discovered a satellite with rings, I would say that there is no fundamental limits of the number of moons you may find," Berdeu says. "It is just that the more they are and the closer they are, and the less stable will be the system."

More: https://skyandtelescope.org/

Just A Reminder!

The Watery Lane Observatory is now open again on Thursday evenings

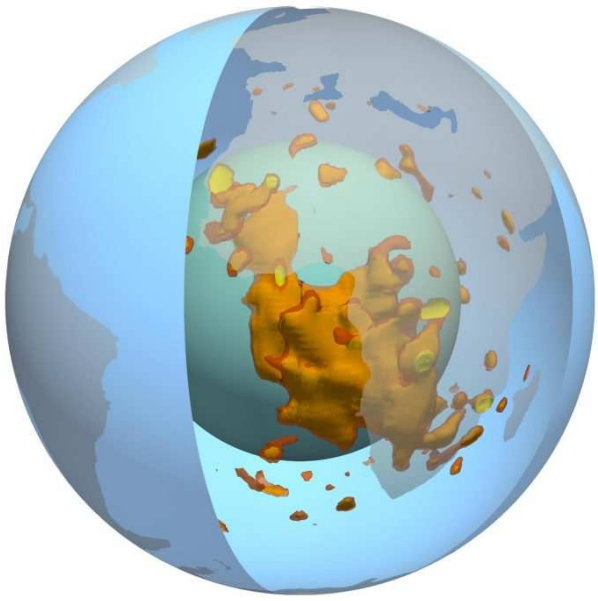
COVID isn't over, but the restrictions we have got used to over the last months have been lifted and we have re-opened

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!*

Two Massive Blobs in Earth's Mantle Baffle Scientists With Their Surprising Properties



A 3D view of the blob in Earth's mantle beneath Africa, shown by the red-yellow-orange colors. The cyan color represents the core-mantle boundary, blue signifies the surface, and the transparent gray signifies continents. Credit: Mingming Li/ASU

Earth is layered like an onion, with a thin outer crust, a thick viscous mantle, a fluid outer core, and a solid inner core. Within the mantle, there are two massive blob-like structures, roughly on opposite sides of the planet. The blobs, more formally referred to as Large Low-Shear-Velocity Provinces (LLSVPs), are each the size of a continent and 100 times taller than Mt. Everest. One is under the African continent, while the other is under the Pacific Ocean.

Using instruments that measure seismic waves, scientists know that these two blobs have complicated shapes and structures, but despite their prominent features, little is known about why the blobs exist or what led to their odd shapes.

Arizona State University scientists Qian Yuan and Mingming Li of the School of Earth and Space Exploration set out to learn more about these two blobs using geodynamic modeling and analyses of published seismic studies. Through their research, they were able to determine the maximum heights that the blobs reach and how the volume and density of the blobs, as well as the surrounding viscosity in the mantle, might control their height. Their research was recently published in Nature Geoscience.

The results of their seismic analysis led to a surprising discovery that the blob under the African continent is about 621 miles (1,000 km) higher than the blob under the Pacific Ocean. According to Yuan and Li, the best explanation for the vast height difference between the two is that the blob under the African continent is less dense (and therefore less stable) than the one under the Pacific Ocean.

To conduct their research, Yuan and Li designed and ran hundreds of mantle convection models simulations. They exhaustively tested the effects of key factors that may affect the height of the blobs, including the volume of the blobs and the contrasts of density and viscosity of the blobs compared with their surroundings. They found that to explain the large differences of height between the two blobs, the one under the African continent must be of a lower density than that of the blob under the Pacific Ocean, indicating that the two may have different composition and evolution.

"Our calculations found that the initial volume of the blobs does not affect their height," lead author Yuan said. "The height of the blobs is mostly controlled by how dense they are and the viscosity of the surrounding mantle."

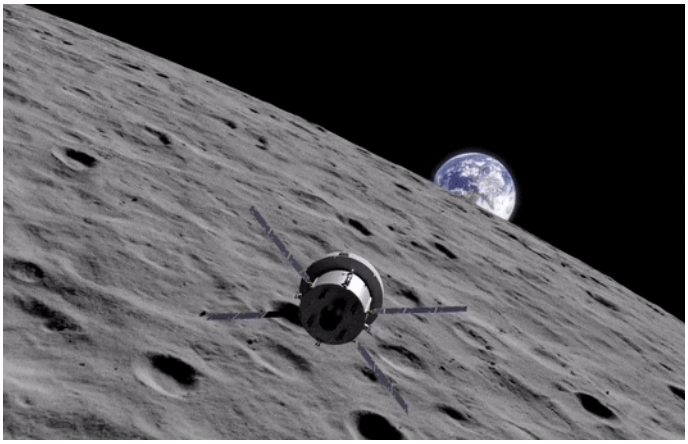
"The Africa LLVP may have been rising in recent geological time," co-author Li added. "This may explain the elevating surface topography and intense volcanism in eastern Africa."

These findings may fundamentally change the way scientists think about the deep mantle processes and how they can affect the surface of the Earth. The unstable nature of the blob under the African continent, for example, may be related to continental changes in topography, gravity, surface volcanism and plate motion.

"Our combination of the analysis of seismic results and the geodynamic modeling provides new insights on the nature of the Earth's largest structures in the deep interior and their interaction with the surrounding mantle," Yuan said. "This work has far-reaching implications for scientists trying to understand the present-day status and the evolution of the deep mantle structure, and the nature of mantle convection."

See: https://scitechdaily.com/

Fly Your Name Around the Moon on NASA's Artemis I



Here's your chance to participate in NASA's return to the Moon with the Artemis program!

NASA is inviting people to submit their names to be included on a flash drive that will be sent along with Artemis I, an uncrewed test flight that kicks off the space agency's plans to land the first woman and first person of color on the Moon.

The flight, should take place in the coming next few months, perhaps late May, June, or July 2022.

The sign-up process is easy: *go to this link on NASA's website*, and click on the "Get boarding pass." Users will be directed to fill in their first and last name, along with a 4-7 digit pin code. A "boarding pass" will be displayed with your name, which you can save, or you can access it again later by remembering your pin. After submitting, NASA will send a QR code to allow those who sign up to join future NASA launches by watching online.

Artemis 1 will launch from the historic Launch Complex 39B at Kennedy Space Center, using the Space Launch System for the first time. NASA says the Orion spacecraft "will demonstrate our commitment and capability to extend human existence to the Moon and beyond."

The plan is for the uncrewed Orion to orbit the Moon for approximately a week and spend about a month in space. This will allow engineers to test out all the systems on board the spacecraft and rocket and enable the first future crews to travel beyond Earth orbit since 1972, the final Apollo mission.

See: https://scitechdaily.com/

Spiral Galaxies

A spiral galaxy typically has a rotating disc with spiral 'arms' that curve out from a dense central region. The Milky Way is a spiral galaxy.

Four classes are used to classify galaxies: **spiral; barred spiral; elliptical and irregular.** Spiral galaxies have a complex structure: a dense central bulge lies at the center of a rotating disc, which features a spiral structure that originates at the bulge. Spiral galaxies are surrounded by sparsely populated halos - roughly spherical regions above and below the plane of the discs. Barred spirals differ from normal spiral galaxies in that the arms of the galaxy do not lead all the way into the center, but are connected to the two ends of a straight bar of stars which contains the nucleus at its center. Approximately two-thirds of all spiral galaxies are thought to be barred spiral galaxies.

Classifying spiral galaxies is not always straightforward, as their appearance varies considerably depending on their orientation relative to Earth. The most visually spectacular spiral galaxies are 'face-on', meaning that their bulge and all their spiral arms are clearly visible. The most challenging to identify are fully 'side-on', meaning that only the outer edge of one side of the galaxy's arms is visible.

The Milky Way is thought to be a barred spiral galaxy. Approximately 60% of all galaxies are thought to be spiral galaxies, making spiral galaxies the home of the majority of the stars in the Universe. Spiral galaxies are populated by stars that are on average much younger than those that populate elliptical galaxies, and current thinking suggests that spiral galaxies may evolve into elliptical galaxies. Spiral galaxies rotate, and their spiral shape is not stable. A puzzle of modern astronomy is how spiral galaxies maintain their spiral arms.

Hubble has captured beautiful images of the distinctive arms and spiral features of spiral galaxies throughout its more than 30-year history. Particularly popular is the Andromeda Galaxy — a large spiral galaxy — which Hubble has observed in unprecedented detail, capturing over 100 million stars and representing a new benchmark for precision studies of this galaxy type.

Most spiral galaxies in the Universe have a bar structure in their center, and Hubble's images of NGC 1073 and NGC 1300 offer particularly clear views of these.

See: https://scitechdaily.com/

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

Important News

Please don't forget: The April Monthly Meeting will be the first "***in person***" meeting of 2022.

We may still use ZOOM from time to time as it does open our options and it does mean we can access a whole range of extra speakers.

Obviously news of any changes will be in NZ, on our website and by email.

The European Space Agency outlines plan for Jupiter moon tour

The European Space Agency has outlined its plans and goals for an upcoming mission to Jupiter. With any luck, Juice - short for the Jupiter Icy Moons Explorer - will bring us a step closer to better understanding the mysteries of these moons.

Juice will leave Earth on an Ariane 5 rocket from Europe's Spaceport in Kourou in April 2023. The spacecraft will leverage four gravity assist maneuvers over the next several years to help propel it towards our solar system's largest planet while conserving as much propellant as possible.

Once on its way, the craft will take a little more than two years to reach its target. Should everything go according to plan, Juice will conduct its first flyby of Jovian moon Ganymede in July 2031. Flybys of Europa and Callisto are also in the cards.

https://www.techspot.com/news/93971-european-space-agency-outlines-plan-jupiter-moon-tour.html

A Few Extra Links I've Enjoyed Reading

To Catch a Falling Satellite

https://spectrum.ieee.org/space-junk-astrobee

Some of the Sun's iconic coronal loops may be illusions

https://www.sciencenews.org/article/sun-coronal-loop-illusion-atmosphere-plasma-astronomy

Look! Up in the sky! Is it a planet? Nope, just a star

https://www.sciencedaily.com/releases/2022/03/220315150113.htm

Using the Moon's Orbit as a New Gravitational Wave Detector

https://scitechdaily.com/using-the-moons-orbit-as-a-powerful-new-gravitational-wave-detector/

Astronomy & Astrophysics 101: Gravitational Lensing

https://scitechdaily.com/astronomy-astrophysics-101-gravitational-lensing/

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

The hottest planet in our solar system is Venus

Most people think that this would be Mercury, as it is the closest planet to the sun. However, Venus has a lot of gasses in its atmosphere which creates a "Greenhouse Effect" that causes a constant temperature of 462° Celsius everywhere on the plant's surface.

The Milky Way galaxy is 105,700 light-years wide

It would take a modern spacecraft 450,000,000 years to travel to the center of our galaxy!

The Sun makes a full rotation once every 25 - 35 days

On Earth, one full rotation equals one full day. However, our sun takes 25-35 Earth days to make one full rotation

Neptune's moon, Triton, orbits the planet backwards

Triton is the only large moon of any of the planets that does this.
This is known as a retrograde orbit and astronomers are unsure as to why Triton orbits Neptune this way.