

Society News

Late appearance of NZ again this month! Sorry to everyone but I've really only just caught up with myself this month.

Only a week or so before the next one is due. Any articles from members would be very welcome as it seems my normal workload isn't going to reduce anytime soon.

Annual General Meeting

At a rather poorly attended AGM, there have been a couple of changes that need members attention.

1. The position of **Committee Secretary** is now empty and up for grabs. Many thanks to Richard for efforts over the last few years.
2. I need somebody to take on production of this newsletter.

If you can help in either case, please contact any member of the Committee.

Observatory

We have taken a step back from the observatory extension planned over the last few months.

Instead of jumping in both feet first, we have decided to conduct an in depth survey of the existing dome and electrical facilities.

A fully repair plan will then be created and we can use that to make better and maybe more appropriate decisions.

Garlic Festival and Wolverton Manor

We were lucky with good weather at both events so thanks to all members who helped out.

We didn't have a VAS stand at the Garlic Festival this year but did provide marshalling across the weekend.

Our stand at Wolverton attracted a good turnout and interest from both local and tourist visitors.

Brian Curd

VAS Website: wightastronomy.org

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

The Editor, New Zenith
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Material for the next issue by the 6th of the month please.

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

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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

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2022 Monthly Meetings

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

Date	Subject	Speaker
23 Sep	Kristian Birkeland - The story of the father of Northern Lights knowledge	Jonathan Clough
21 Oct	Outreach Event	
25 Nov	The UK National Space Strategy	Adam Amara

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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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**.

September 2022 - Night Sky

Autumnal Equinox

The Autumnal Equinox, the time at which the Sun crosses the equator on its way south, and day and night are of equal length is on September 23 at 01:04 UTC.

Moon Phases

New	First Qtr	Full	Last Qtr
25th	3rd	10th	17th
			

Planets

Mercury

This month's evening apparition of Mercury is very poor with the planet setting very shortly after the Sun. The sky will still be quite bright when the planet sets making any observation very difficult. Experienced observers may be able to view the planet during the day using a telescope or binoculars if the sky is very clear. If attempting daylight observation, ensure that there is no chance of accidentally pointing any optical aid at the Sun.

Venus

For the first half of the month Venus can be found low in the east just before sunrise. The sky will be quite bright making more difficult to spot, but Venus itself is very bright and should be visible.

Mars

Mars can be seen from when it rises at about midnight until dawn. It is currently crossing the constellation of Taurus and during the first week of the month together with the bright star Aldebaran gives the bull two red eyes. Mars is now getting quite bright outshining all nearby stars. A telescope will show some surface markings if the seeing is good enough.

Jupiter

On the 26th Jupiter is at opposition, opposite the Sun in the sky, meaning that it rises at sunset, sets at sunrise, and is highest in the sky at midnight GMT. At this time the planet is closest to the Earth and is best placed for observation. Look for it low in the south east as the sky darkens after sunset, it is brighter than any star making it easy to identify. A small pair of binoculars will easily show the Galilean moons and a telescope will show the cloud belts. With patience and good seeing a surprising amount of detail can be seen in the cloud formations. It does take patience; the seeing may only be good enough for fleeting glimpses through the turbulence.

Saturn

Saturn was at opposition last month, although it is now past its best it is still a good target for viewing. By 10pm it will have risen high enough the clear of the worst of the haze close to the horizon. It is significantly fainter than Jupiter, but is still brighter than any other star in the south eastern sky. Find Jupiter and look to the west at about the same altitude and the next bright object you will find is Saturn. It has a more yellowish hue than Jupiter. A telescope will be needed to show the rings.

Uranus

Uranus is in the constellation of Ares, but although it is a bright binocular object it can be a challenge to locate for the first time because there are no nearby bright stars, and there are a number of stars close by that have a similar brightness that can be mistaken for the planet. It is approximately 3 & 4 degrees respectively from the 4th magnitude stars Botein and Epsilon Arietis. The finder chart shows Uranus' position until March 2023.

Neptune

Neptune can be found below the circlet of Pisces just into the constellation of Aquarius. It is fairly well placed for observation, but it quite a faint object that needs at least a pair of binoculars to be observed visually. With no bright stars nearby, initially finding it can be a challenge. Use a planetarium program or the finder chart in the August New Zenith,

Deep Sky

M39 Open Cluster

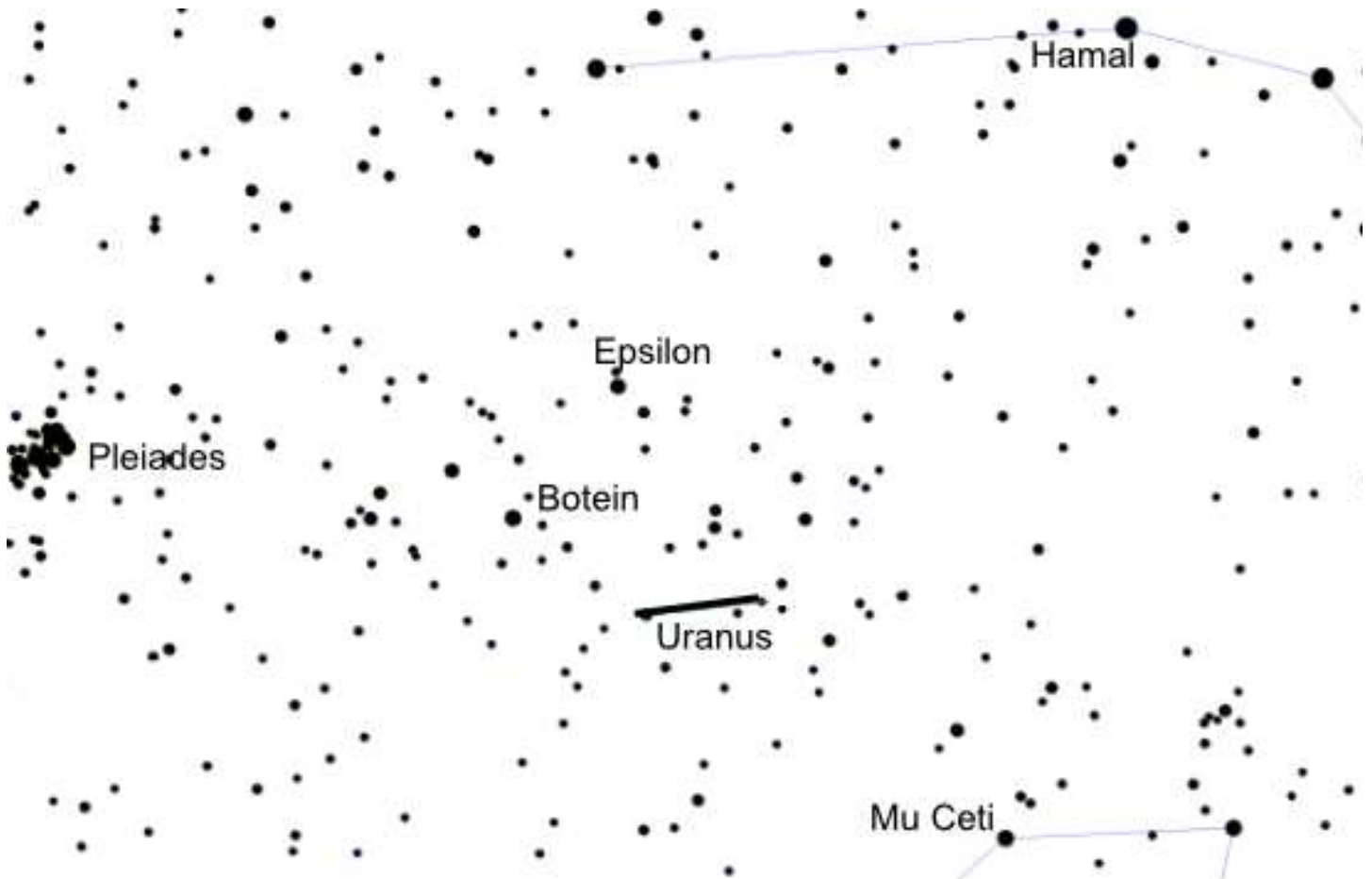
RA 21h 32, Dec 48° 32' mag 4.5

The Milky Way is full of star clusters, many are dimmed by intervening dusts or are so surrounded by other stars that it can be difficult to identify them. M39 can be spotted with the naked eye under good conditions, it is large, about the size of the full moon, so binoculars or a rich field telescope are the best instruments to use to observe this triangular shaped cluster.

M72 Globular Cluster

RA 20h 54m, Dec -12° 31' mag 10.0

Visually a rather small globular but it can be forgiven its apparent size when you consider that it is on the other side of the galaxy from us. It can be just seen in binoculars and a small to medium sized telescope with some magnification is needed to resolve any of the stars. It is not as tightly packed in the core as many globulars.



Finder chart for Uranus from September 2022 until March 2023

M15 Globular Cluster
RA 21h 30m, Dec 12° 10' mag 7.5

This impressive globular is quite bright and very easily found in binoculars. Follow the line from Baham to Enif, about 4 degrees beyond the horse's nose to find this rather large fuzzy looking star. Through a telescope it reveals itself as a bright core surrounded by a halo of much fainter stars. As with all globulars the view becomes more impressive with increasing aperture. This is one of only a few globular clusters to contain a planetary nebula, it is however about 14th magnitude and for visual observation beyond all but those with the largest telescopes and best eyes.

Peter Burgess

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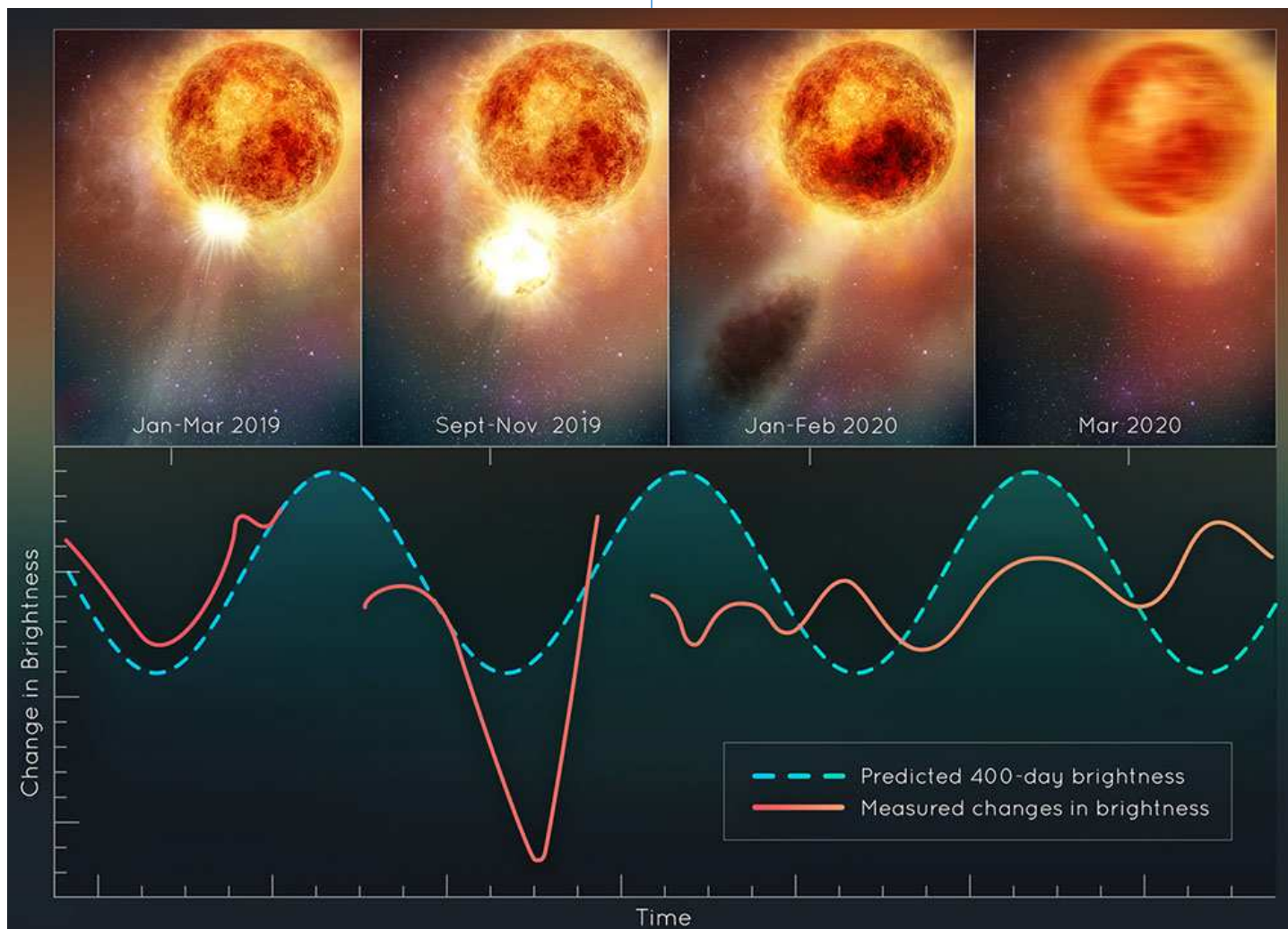


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Betelgeuse's Great Dimming: The Aftermath



This comparison image shows dramatic changes as Betelgeuse underwent unprecedented dimming. The observations, taken with the SPHERE instrument on ESO's Very Large Telescope in January and December 2019, reveal that the bottom half of the star had dimmed. Credit: ESO / M. Montargès et al.

An international team of astronomers has revealed why the star Betelgeuse famously dimmed back in 2019. The dying star coughed out a huge chunk of material weighing several times more the Moon, which then blocked out some of its light.

Betelgeuse is the 10th brightest star in the night sky and marks Orion's right shoulder (his left shoulder from our point of view). It is a red supergiant, an engorged monster that would stretch out to the orbit of Jupiter if it replaced the Sun in our solar system. Betelgeuse is well on its way to ending its life by detonating as a cataclysmic supernova; meanwhile, astronomers get unprecedented insight into a giant star's final stages.

The situation became more intriguing in late 2019 when Betelgeuse mysteriously dropped in brightness, an

event that came to be known as The Great Dimming. The fading was pronounced enough, more than a magnitude, to notice even with the unaided eye. Lots of possible explanations have been mooted, but now a team led by Andrea Dupree (Center for Astrophysics, Harvard & Smithsonian) thinks they know what happened.

By piecing together data from a slew of telescopes, including the Hubble Space Telescope, Dupree is pointing the finger at an event called a Surface Mass Ejection (SME). Our own Sun regularly burps material from its corona, ejecting a billion tonnes of solar material — about the mass of Mount Everest. But Betelgeuse's SME spit out 400 billion times more material, equivalent to several times more mass than the Moon. As the ejected material cooled, it formed a cloud of dust that partially blocked, and thus dimmed, our view of Betelgeuse.

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“We've never before seen a huge mass ejection of the surface of a star,” Dupree says. “We are left with something going on that we don't completely understand.”

The likely cause of the upheaval was a giant plume inside the star that measured a million miles across — four times the distance between Earth and the Moon. It bubbled up to the surface, causing shocks and pulsations that threw material into space. Betelgeuse's bloated size made the effects more pronounced; its surface gravity is 10,000 times weaker than the Sun's.

The event seems to have had a profound effect on Betelgeuse's more regular pulsations. Astronomers have observed the star for centuries and noticed that it goes through cycles of brightness variations with a period of 400 days. This pattern seems to have completely disappeared since The Great Dimming, perhaps as result of a reshuffling of material in the star's interior. “Betelgeuse continues doing some very unusual things right now,” Dupree says.

“These observations allow us to watch . . . as a giant star re-adjusts and settles down after a huge disturbance,” says Thomas Baumgarte (Bowdoin College), who was not involved in the research. “This is truly a unique opportunity, with lots of potential to advance our understanding of these stars.”

Emily Cannon (KU Leuven, Belgium), also not involved in the work, says the process must be put into context. “Red supergiants exhibit powerful mass loss, expelling the entire mass of our Sun into the interstellar environment over a timespan of 10,000 to 1 million years,” she says. “While still contributing to the overall mass loss, this single event ejecting approximately 0.000001 solar masses is not a lot for these type of stars.”

We have never witnessed an event like this before, but that doesn't mean it's uncommon. After all, as Dupree says, we're now “watching stellar evolution in real-time.”

Link: <https://skyandtelescope.org/astronomy-news/betelgeuses-great-dimming-the-aftermath/>

Who is/was James Webb?



James Webb in 1966 © Getty

You might be thinking, who gets the honour of having such a historic telescope named after them? Well, that title goes to James Edwin Webb, the second administrator of NASA, best known for heading up Apollo – the first space programme to send humans to the Moon.

He was also instrumental in the two crewed space programmes that followed on from Apollo: Mercury and Gemini. While Webb did eventually die in 1992, aged 85, he left a massive legacy behind, deserving of a telescope named after him.

“It is fitting that Hubble's successor be named in honour of James Webb. Thanks to his efforts, we got our first glimpses at the dramatic landscape of outer space,” said former NASA administrator Sean O'Keefe about the observatory's name. “He took our nation on its first voyages of exploration, turning our imagination into reality.”

The telescope hasn't always been named after Webb. It started its life being known as the Next Generation Space Telescope which, realistically, isn't the most imaginative name we've ever heard!

From: <https://www.sciencefocus.com/space/james-webb-space-telescope/>

What Is Stellar Wind?



This Hubble Space Telescope image of the Veil Nebula reveals the fine details of the nebula's delicate threads and filaments of ionized gas.

Credit: ESA/Hubble & NASA, Z. Levay

Stellar winds are fast-flowing streams of particles that are emitted from a star.

Even though stars may appear to be stable and static, they are in fact extremely hot, active, and dynamic. Particles, including protons, electrons, and atoms, can be emitted from a star, resulting from either the outward pressure of internal fusion reactions or the star's magnetic field. Stellar winds in low- to intermediate-mass stars, such as the Sun, tend to be driven by the stellar magnetic fields.

Particles in the outermost layers of a star acquire sufficient energy from magnetic field interactions to escape its gravity. This process generates stellar winds that only cause stars to lose a very small percentage of their mass during the stable period of their lifetime (prior to their evolution into red giants). In contrast, some more massive stars cast off their own mass in very powerful stellar winds, which are driven directly by outward pressure from the stars' own radiation. This type of stellar wind can cause a star to lose up to half of its own mass during the course of its lifetime.

Hubble's imagery has captured the effects and presence of stellar wind, as seen in the Veil Nebula (pictured above). Astronomers suspect that the Nebula's source star had a strong stellar wind before it exploded. This wind blew a large cavity into the surrounding interstellar gas. As the shock wave from the supernova expanded outwards, it encountered the walls of this cavity - and formed the nebula's distinctive structures. Bright filaments are produced as the shock wave interacts with a relatively dense cavity wall, while fainter structures are generated by regions nearly devoid of material.

The Veil Nebula's colourful appearance is due to variations in the temperature and density of the gas present. By applying new processing techniques to Hubble's data in 2021, the fine details of the Veil nebula's delicate threads and filaments of ionized gas have brought out new details, particularly enhanced details of emissions from doubly ionized oxygen, ionized hydrogen, and ionized nitrogen (compared to its previous images in 2015 and 2007).

Link and Video: <https://scitechdaily.com/astronomy-astrophysics-101-stellar-wind>

An Extrasolar World Covered In Water?

An international team of researchers led by Charles Cadieux, a Ph.D. student at the Université de Montréal and member of the Institute for Research on Exoplanets (iREx), has announced the discovery of TOI-1452 b, an exoplanet orbiting one of two small stars in a binary system located in the Draco constellation about 100 light-years from Earth.

The exoplanet is slightly greater in size and mass than Earth and is located at a distance from its star where its temperature would be neither too hot nor too cold for liquid water to exist on its surface. The astronomers believe it could be an "ocean planet," a planet completely covered by a thick layer of water, similar to some of Jupiter's and Saturn's moons.

In an article published today in *The Astronomical Journal*, Cadieux and his team describe the observations that elucidated the nature and characteristics of this unique exoplanet.

"I'm extremely proud of this discovery because it shows the high calibre of our researchers and instrumentation," said René Doyon, Université de Montréal Professor and Director of iREx and of the Observatoire du Mont-Mégantic (OMM). "It is thanks to the OMM, a special instrument designed in our labs called SPIrou, and an innovative analytic method developed by our research team that we were able to detect this one-of-a-kind exoplanet."

It was NASA's space telescope TESS, which surveys the entire sky in search of planetary systems close to our own, that put the researchers on the trail of this exoplanet. Based on the TESS signal, which showed a slight decrease in brightness every 11 days, astronomers predicted a planet about 70% larger than Earth.

Charles Cadieux belongs to a group of astronomers that does ground follow-up observations of candidates

identified by TESS in order to confirm their planet type and characteristics. He uses PESTO, a camera installed on the OMM's telescope that was developed by Université de Montréal Professor David Lafrenière and his Ph.D. student François-René Lachapelle.

“The OMM played a crucial role in confirming the nature of this signal and estimating the planet's radius,” explained Cadieux. “This was no routine check. We had to make sure the signal detected by TESS was really caused by an exoplanet circling TOI-1452, the largest of the two stars in that binary system.”

The host star TOI-1452 is much smaller than our Sun and is one of two stars of similar size in the binary system. The two stars orbit each other and are separated by such a small distance -- 97 astronomical units, or about two and a half times the distance between the Sun and Pluto -- that the TESS telescope sees them as a single point of light. But PESTO's resolution is high enough to distinguish the two objects, and the images showed that the exoplanet does orbit TOI-1452, which was confirmed through subsequent observations by a Japanese team.

Ingenuity at work

To determine the planet's mass, the researchers then observed the system with SPIRou, an instrument installed on the Canada-France-Hawaii Telescope in Hawai'i. Designed in large part in Canada, SPIRou is ideal for studying low-mass stars such as TOI-1452 because it operates in the infrared spectrum, where these stars are brightest. Even then, it took more than 50 hours of observation to estimate the planet's mass, which is believed to be nearly five times that of Earth.

Researchers Étienne Artigau and Neil Cook, also with iREx at the Université de Montréal, played a key role in analysing the data. They developed a powerful analytic method capable of detecting the planet in the data collected with SPIRou. “The LBL method [for line-by-line] allows us to clean the data obtained with SPIRou of many parasite signals and to reveal the weak signature of planets such as the one discovered by our team,” explained Artigau.

The team also includes Quebec researchers Farbod Jahandar and Thomas Vandal, two Ph.D. students at the Université de Montréal. Jahandar analysed the host star's composition, which is useful for constraining the planet's internal structure, while Vandal was involved in analysing the data collected with SPIRou.

A watery world

The exoplanet TOI-1452 b is probably rocky like Earth, but its radius, mass, and density suggest a world very different from our own. Earth is essentially a very dry planet; even though we sometimes call it the Blue Planet

because about 70% of its surface is covered by ocean, water actually only makes up a negligible fraction of its mass -- less than 1%.

Water may be much more abundant on some exoplanets. In recent years, astronomers have identified and determined the radius and mass of many exoplanets with a size between that of Earth and Neptune (about 3.8 times larger than Earth). Some of these planets have a density that can only be explained if a large fraction of their mass is made up of lighter materials than those that make up the internal structure of the Earth such as water. These hypothetical worlds have been dubbed “ocean planets.”

“TOI-1452 b is one of the best candidates for an ocean planet that we have found to date,” said Cadieux. “Its radius and mass suggest a much lower density than what one would expect for a planet that is basically made up of metal and rock, like Earth.”

The University of Toronto's Mikado Plotnykov and Diana Valencia are specialists in exoplanet interior modeling. Their analysis of TOI-1452 b shows that water may make up as much as 30% of its mass, a proportion similar to that of some natural satellites in our Solar System, such as Jupiter's moons Ganymede and Callisto, and Saturn's moons Titan and Enceladus.

To be continued...

An exoplanet such as TOI-1452 b is a perfect candidate for further observation with the James Webb Space Telescope, or Webb for short. It is one of the few known temperate planets that exhibit characteristics consistent with an ocean planet. It is close enough to Earth that researchers can hope to study its atmosphere and test this hypothesis. And, in a stroke of good fortune, it is located in a region of the sky that the telescope can observe year round.

“Our observations with the Webb Telescope will be essential to better understanding TOI-1452 b,” said Doyon who overviewed the conception of James Webb's component NIRISS. “As soon as we can, we will book time on Webb to observe this strange and wonderful world.”

Link with video: <https://www.sciencedaily.com/releases/2022/08/220824103051.htm>

An Especially Sneaky Black Hole

In 1922, Albert Einstein first published his book explaining the theory of general relativity – which postulated black holes. Now, one hundred years later, astronomers captured actual images of the black hole at the center of the Milky Way. In a recent paper, a team of astronomers describes another exciting new discovery: the first “dormant” black hole observed outside of the galaxy.

What exactly is VFTS 243?

VFTS 243 is a binary system, which means it is composed of two objects that orbit a common center of mass. The first object is a very hot, blue star with 25 times the mass of the Sun, and the second is a black hole nine times more massive than the Sun. VFTS 243 is located in the Tarantula Nebula within the Large Magellanic Cloud, a satellite galaxy of the Milky Way located about 163,000 light-years from Earth.

The black hole in VFTS 243 is considered dormant because it is not emitting any detectable radiation. This is in stark contrast to other binary systems in which strong X-rays are detected from the black hole.

The black hole has a diameter of around 33 miles (54 kilometers) and is dwarfed by the energetic star, which is some 200,000 times larger. Both rapidly rotate around a common center of mass. Even with the most powerful telescopes, the system visually appears to be a single blue dot.

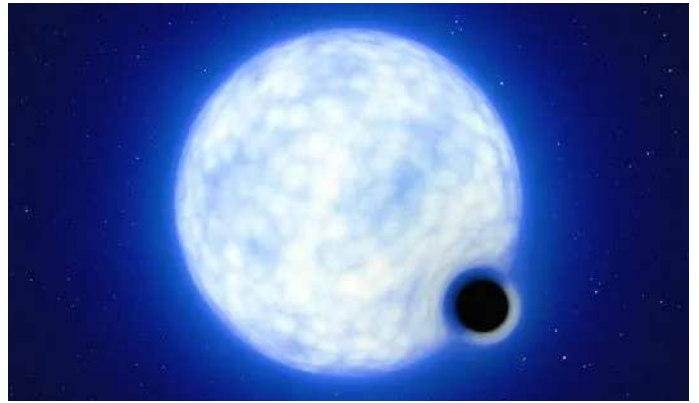
Finding dormant black holes

Astronomers suspect there are hundreds of such binary systems with black holes that do not emit X-rays hiding in the Milky Way and the Large Magellanic Cloud. Black holes are most easily visible when they are stripping matter from a companion star, a process known as “feeding.”

Feeding produces a disk of gas and dust that surrounds the black hole. When the material in the disk falls inward toward the black hole, friction heats the accretion disk to millions of degrees. These hot disks of matter emit a tremendous amount of X-rays. The first black hole to be detected in this manner is the famed Cygnus X-1 system.

For years astronomers have known that VFTS 243 is a binary system, but whether the system is a pair of stars or a dance between a single star and a black hole was unclear. To determine which was true, the research team studying the binary used a technique called spectral disentangling.

This technique separates the light from VFTS 243 into its constituent wavelengths, which is similar to what happens when white light enters a prism and the different colors are produced.



This artist's impression shows what the binary system VFTS 243 might look like if we were observing it up close. The system, which is located in the Tarantula Nebula in the Large Magellanic Cloud, is composed of a hot, blue star with 25 times the Sun's mass and a black hole, which is at least nine times the mass of the Sun.

This analysis revealed that the light from VFTS 243 was from a single source, not two separate stars. With no detectable radiation emanating from the star's companion, the only possible conclusion was that the second body within the binary is a black hole and thus the first dormant black hole found outside of the Milky Way galaxy.

Why is VFTS 243 important?

Most black holes with a mass of less than 100 Suns are formed from the collapse of a massive star. When this happens, often there is a tremendous explosion known as a supernova.

The fact that the black hole in VFTS 243 system is in a circular orbit with the star is strong evidence that there was no supernova explosion, which otherwise might have kicked the black hole out of the system – or at the very least disrupted the orbit. Instead, it appears that the progenitor star collapsed directly to form the black hole sans explosion.

The massive star in the VFTS 243 system will live for only another 5 million years – a blink of an eye in astronomical timescales. The death of the star should result in the formation of another black hole, transforming the VFTS 243 system into a black hole binary.

To date, astronomers have detected nearly 100 events where binary black holes merge and produced ripples in space-time. But how these binary black hole systems form is still unknown, which is why VFTS 243 and similar yet-to-be-discovered systems are so vital to future research. Perhaps nature has a sense of humor – for black holes are the darkest objects in existence and emit no light, yet they illuminate our fundamental understanding of the universe.

Link and Video: <https://scitechdaily.com/>

Artemis I Launch Plans Slip Again

Days after NASA proposed to make its next attempt to launch the Artemis 1 mission on Sept. 23, the agency changed course and pushed back the launch.

At a Sept. 8 briefing, NASA said it was tentatively planning to fly the Space Launch System and Orion spacecraft as soon as Sept. 23, with Sept. 27 as a backup launch date. That schedule depended on completing and testing repairs to seals in liquid hydrogen lines that attach to the rocket's core stage, as well as getting approval from the Eastern Range to extend the certification of the flight termination system (FTS) on SLS.

In an update late Sept. 12, however, NASA said it dropped plans for a Sept. 23 launch. The agency said that date was no longer feasible after delaying a tanking test to confirm the new seals are working properly from Sept. 17 to Sept. 21.

"The updated dates represent careful consideration of multiple logistical topics, including the additional value of having more time to prepare for the cryogenic demonstration test, and subsequently more time to prepare for the launch," NASA said in a statement. It also allows more time to replenish supplies of liquid hydrogen and liquid oxygen at the pad and give launch teams enough rest.

The earliest launch opportunity is Sept. 27, NASA said, with a potential backup launch date of Oct. 2. That backup date remains under review as the agency continues to plan to launch a new crew to the International Space Station on SpaceX's Crew-5 commercial crew mission on Oct. 3 from Launch Complex 39A, next to the SLS at Launch Complex 39B at the Kennedy Space Center.

The Sept. 27 launch window opens at 11:37 a.m. Eastern and lasts for 70 minutes; a launch that day would set up a splashdown of the Orion spacecraft in the Pacific Ocean Nov. 5. The Oct. 2 launch would take place during a 109-minute window that opens at 2:52 p.m. Eastern, setting up a splashdown Nov. 11.

In its statement, NASA said technicians completed replacement of seals on the two liquid hydrogen lines and reconnected them to the core stage. The seals will be tested at ambient temperatures this week before the rescheduled cryogenic tanking test next week.

Even if the tanking test is successful, NASA will not be able to proceed with a launch without rolling back to the Vehicle Assembly Building to recertify the FTS unless the Eastern Range grants a waiver to its certified lifetime, which expired Sept. 6.

NASA said that the Eastern Range is still evaluating NASA's request for a waiver. "NASA is continuing to respect the Eastern Range's process for review of the agency's request for an extension of the current testing requirement for the flight termination system and is providing additional information and data as needed."



NASA said it would no longer pursue an SLS launch on Sept. 23 after concluding it needed more time for a tanking test. Credit: NASA/Joel Kowsky

From: <https://spacenews.com/artemis-1-launch-plans-slip-again/>

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

Latest James Webb Telescope Images



In this mosaic image stretching 340 light-years across, Webb's Near-Infrared Camera (NIRCam) displays the Tarantula Nebula star-forming region in a new light, including tens of thousands of never-before-seen young stars that were previously shrouded in cosmic dust. The most active region appears to sparkle with massive young stars, appearing pale blue.



This image shows the heart of M74 (the Phantom Galaxy). Webb's sharp vision has revealed delicate filaments of gas and dust in the grandiose spiral arms which wind outwards from the centre of this image. A lack of gas in the nuclear region also provides an unobscured view of the nuclear star cluster at the galaxy's centre

Pictures from <https://jwst.nasa.gov/content/multimedia/images.html>

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

We have fully mapped 100% of the surface of Mars and Earth's Moon, whereas we have only been able to map about 5% of the ocean floor.

Although there is no official solid boundary for where space begins, the Kármán line sits at 62 miles above sea-level and is conventionally used as the start of outer space in space treaties or for aerospace records keeping.

There is enough matter in the Orion Nebula to produce over 10,000 stars.

The gas cloud surrounding the stars in the constellation Aquila contains enough alcohol to make 400 trillion pints of beer.

At any given moment, there are 1,800 thunderstorms happening somewhere on Earth. This amounts to 16 million storms each year! We know the cloud conditions that produce lightning, but we cannot forecast the location or time of a lightning strike.

"Albert Einstein" is an anagram for "ten elite brains"