

Igniting a passion for science through the lens of astronomy!



Join us at the Grand Old 4th Celebration!

We'll be right outside the Post Office in the Town & Country parking lot from 9 am until 5 pm with telescopes, including the solar scope (lots of sunspots up there right now) and other fun stuff. Volunteer for an hour or two (or all day!) to meet folks, answer questions about astronomy (or ask your own), and get to know other BPAA members. Or just stop by for a chat. See you there!

Planetarium Dome Fundraiser a Success!

Our recent fundraiser through Bainbridge Community Foundation's Community Grant Cycle for the purchase of a new dome for the new planetarium has been a resounding success - we raised \$11,500! Thank you to everyone who donated. We need just a few thousand more to complete the purchase and installation. If you haven't already made your gift, or want to give a little more, you can do so here: [Planetarium Fundraiser](#).

Please Join Our Next Cosmic Conversation!

Cosmic Conversations is a new monthly activity hosted by Peter Moseley at the Ritchie Observatory on the 3rd Tuesday of the month from 7:00 to 8:30pm.

We envision that it will work much like a book group. Topics are pre-selected by the group and become the basis for the evenings conversation. References will be given for the selected topic, e.g. Wiki articles, news pieces, magazine articles etc. so that everyone has some background on the subject. These will be non-mathematical discussions designed to "ignite passion for science through the lens of astronomy"

Next meeting July 18 , 2023 7:00 PM

The topic for the next meeting will be "Stellar Structure and Stellar Evolution."

References: https://en.wikipedia.org/wiki/Stellar_structure; https://en.wikipedia.org/wiki/Stellar_evolution.

RSVP: pmose268@gmail.com

Save These Dates!

Here are some opportunities to get involved with BPAA outreach. Contact BPAA President Frank Petrie to volunteer: President@BPAAstro.org.

Friday June 30 thru Friday July 7 — Rotary Auction setup; and Saturday July 8 — Rotary Auction — BPAA supports the Bainbridge Island Rotary Club with volunteers to help set up for the Rotary Auction, and run the event on Auction Day. Volunteer to lend a hand on one or more days! It's the least we can do to show our appreciation for Rotary's recent Huney Grant support of our new planetarium projector, telescope upgrades, and dome repair. Volunteers are needed 6/30, 7/1, 7/2, 7/3, 7/5 8am-8pm. Show up to the volunteer welcome table at Woodward Middle School to sign up on paper or go to the website for detailed info and electronic sign up. <https://www.bainbridgerotaryauction.org/volunteer> MAKE SURE TO IDENTIFY YOUR HOURS AS BEING CONTRIBUTED BY BPAA.

Tuesday July 4th — Bainbridge Island's Grand Old 4th Street Fair — Just like last year, BPAA will have a booth at the street fair. Come join us for the whole day, or just an hour, whatever amount of time you can spend to hang out with other BPAA members, talk to the public about astronomy, and have a grand old time! The event runs from 9am to 5pm. Volunteers are needed that day both before and after the event time as well for set up and take down. Contact Frank Petrie. Schedule of events website is <https://bainbridgechamber.com/bainbridge-island-grand-old-4th/>.

Week of July 24-28, 10am-2pm: Bainbridge Performing Arts Theatre School Summer Program at the Observatory — Theatre students will get a brief intro to astronomy, and then write, produce and perform their own cosmically-inspired explorations of the intersection of astronomy and performance arts.

Every Tuesday 10am-3pm is Telescope Tuesday! Come to the Observatory and participate in work parties to make upgrades and repairs. Get a front row seat to the work we're doing to upgrade the capabilities of the Ritchie Telescope. Special thanks to all who have volunteered so far: Chuck Wraith, Allen Lang, Dan Schlesener, Elliott and Erik Schweitzer, Bob Mathisrud, Peter Moseley, and Cole Rees.

Cosmic Conversations are on the third Tuesday of each month from 7-8:30pm
We meet to discuss interesting developments in astronomy.

Docents at the Dome — On **weekends through the summer**, we intend to be open from 10am-2pm with a couple of volunteer members to greet passersby curious about what goes on in the observatory. Please come out and support this activity.

Last summer the park commissioners asked us to open up for the **concerts and movies in the park**. We complied and it was hugely popular - a lot of people came through and were excited to see what goes on in our building. We're planning to repeat this year. We'll be open on **Wednesday afternoons in July and August**, and **Friday evenings in August**. The August Friday events, being after dusk, will feature telescope viewing if the sky is clear.

WHAT'S UP(COMING)!

Source for events and links are In-The-Sky.org, Dominic Ford, Editor. The links provide details for each event including a scale on how difficult they are to observe.

Jul 1 – [Close approach of Venus and Mars](#)

Jul 2 – [The cluster IC 4756 is well placed](#)

Jul 3 – Full Moon

Jul 9 – [Venus at greatest brightness](#)

Jul 17 – New Moon

Jul 25 – [Mercury at highest altitude in evening sky](#)

Jul 29 – [Piscis Austrinid meteor shower 2023](#)

Jul 30 – [Southern \$\delta\$ -Aquariid meteor shower 2023](#)

– [\$\alpha\$ -Capricornid meteor shower 2023](#)

Aug 1 – Full Moon

Aug 9 – [Mercury at dichotomy](#)

– [Close approach of the Moon and M45](#)

Aug 10 – [Asteroid 10 Hygiea at opposition](#)

Aug 13 – [Perseid meteor shower 2023 peak](#)

Aug 14 – [Messier 15 is well placed](#)

Aug 15 – [Messier 2 is well placed](#)

Aug 16 – New Moon

Aug 18 – [\$\kappa\$ -Cygnid meteor shower 2023 peak](#)

Aug 26 – [Asteroid 8 Flora at opposition](#)

Aug 27 – [Saturn at opposition](#)

Aug 28 – [Uranus enters retrograde motion](#)

Aug 30 – [Blue Moon](#)

– Full Moon

Sep 1 – [Aurigid meteor shower 2023 peak](#)

Sep 4 – [Conjunction of the Moon and Jupiter](#)

Sep 9 – [September \$\epsilon\$ -Perseid meteor shower 2023 peak](#)

Sep 14 – New Moon

Sep 18 – [Venus at greatest brightness](#)

Sep 19 – [Neptune at opposition](#)

Sep 22 – [September equinox](#)

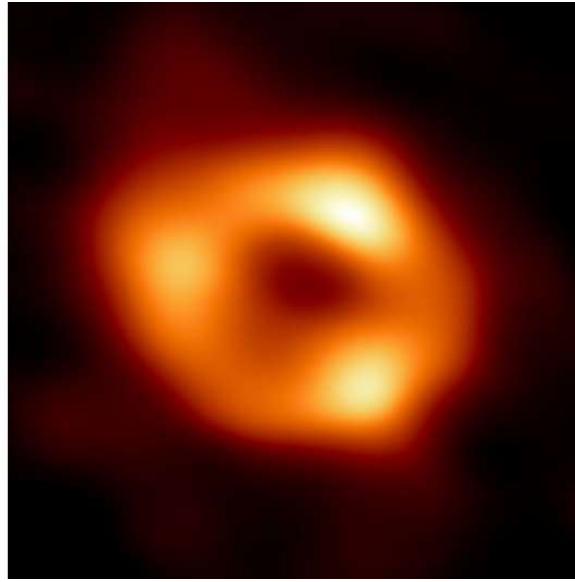
Sep 23 – [Mercury at highest altitude in morning sky](#)

Sep 28 – [Daytime Sextantid meteor shower 2023](#)

Sep 29 – Full Moon

Here are some interesting things going on in Astronomy. If they pique your curiosity, please follow the link at the bottom of each for the full article!

Our Galaxy's Black Hole Not As Sleepy As Thought



First image of Sagittarius A*, the black hole at the center of the Milky Way galaxy. Credit: EHT Collaboration

The supermassive black hole lurking at the center of our Milky Way galaxy is not as dormant as had been thought, a new study shows.

The slumbering giant woke up around 200 years ago to gobble up some nearby cosmic objects before going back to sleep, according to the study published in the journal *Nature* on Wednesday.

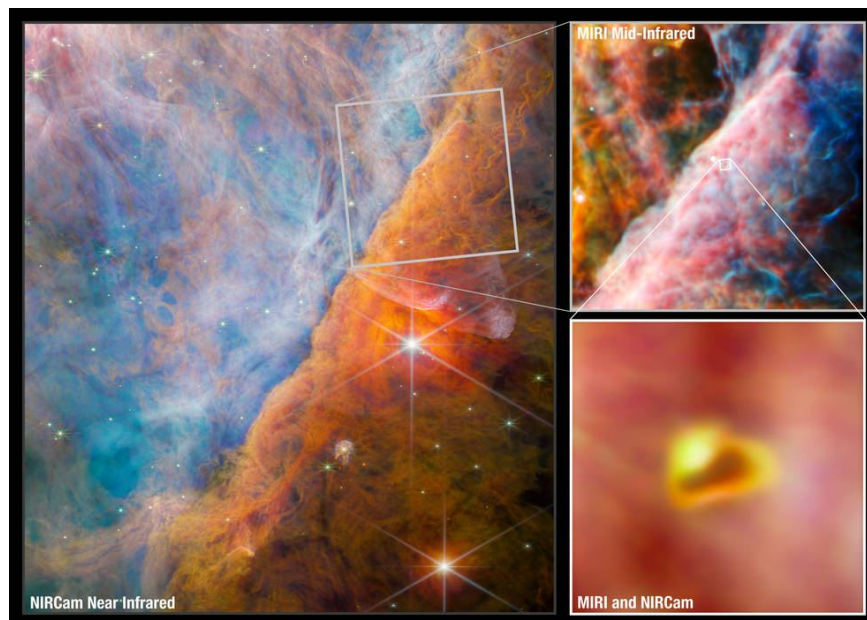
NASA's IXPE space observatory spotted an X-ray echo of this powerful resurgence of activity, the researchers said.

The supermassive black hole Sagittarius A*—abbreviated to Sgr A*—is four million times more massive than the Sun. It sits 27,000 light years from Earth at the center of the Milky Way's spiral.

Last year astronomers revealed the first-ever image of the black hole—or rather, the glowing ring of gas that surrounds its blackness.

(Source: phys.org)

Webb Makes First Detection of Crucial Carbon Molecule



These Webb images show a part of the Orion Nebula known as the Orion Bar. The largest image, on the left, is from Webb's NIRCam (Near-Infrared Camera) instrument. At upper right, the telescope is focused on a smaller area using Webb's MIRI (Mid-Infrared Instrument). At the very center of the MIRI area is a young star system with a protoplanetary disk named d203-506. The pullout at the bottom right displays a combined NIRCam and MIRI image of this young system. Credits: ESA/Webb, NASA, CSA, M. Zamani (ESA/Webb), and the PDRs4All ERS Team

A team of international scientists has used NASA's James Webb Space Telescope to detect a new carbon compound in space for the first time. Known as methyl cation (pronounced cat-eye-on) (CH_3^+), the molecule is important because it aids the formation of more complex carbon-based molecules. Methyl cation was detected in a young star system, with a protoplanetary disk, known as d203-506, which is located about 1,350 light-years away in the Orion Nebula.

Carbon compounds form the foundations of all known life, and as such are particularly interesting to scientists working to understand both how life developed on Earth, and how it could potentially develop elsewhere in our universe. The study of interstellar organic (carbon-containing) chemistry, which Webb is opening in new ways, is an area of keen fascination to many astronomers.

The unique capabilities of Webb made it an ideal observatory to search for this crucial molecule. Webb's exquisite spatial and spectral resolution, as well as its sensitivity, all contributed to the team's success. In particular, Webb's detection of a series of key emission lines from CH_3^+ cemented the discovery.

(Source: [nasa.gov](https://www.nasa.gov))

Indonesia's Oldest Observatory Losing Its Shine as Tourism Brings Light Pollution



The Bosscha Observatory in Lembang, West Java, is Indonesia's oldest astronomical observatory. (Photo: CNA/Wisnu Agung Prasetyo)

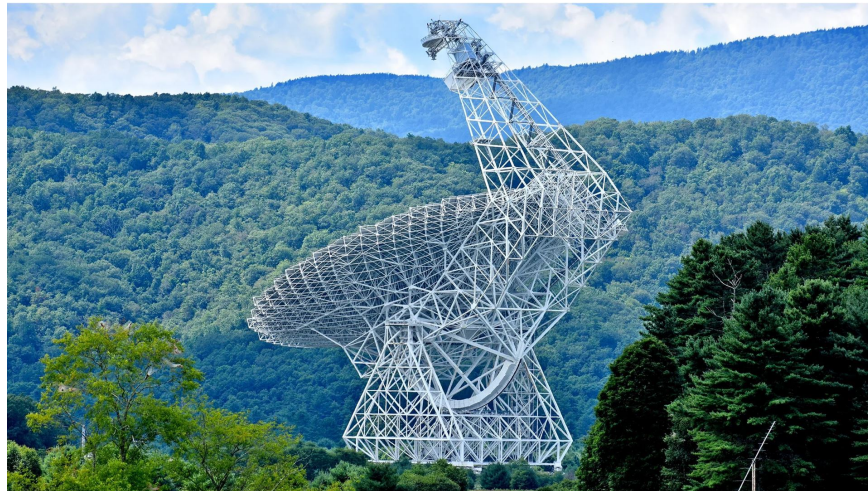
Since it was opened in 1923, the Bosscha Observatory has been drawing astronomers from around the globe, looking to unravel the mysteries of the universe.

But Indonesia's oldest astronomical observatory may be on its last legs.

The stars and other celestial objects over the century-old structure are getting dimmer, struggling to compete with the lights emitted from surrounding hotels, restaurants and theme parks as the once tranquil hills of Lembang are turned into a burgeoning resort area.

(Source: channelnewsasia.com)

An Enormous Gravity 'Hum' Moves Through the Universe



The 100-meter Green Bank Telescope has precisely measured the timing of dozens of pulsars over the course of 15 years. Credit: Jim Hoover

Astronomers have found an extra-low hum rumbling through the universe.

The discovery shows that extra-large ripples in space-time are constantly squashing and changing the shape of space. These gravitational waves are cousins to the echoes from black hole collisions first picked up by the Laser Interferometer Gravitational-Wave Observatory (LIGO) experiment in 2015. But whereas LIGO's waves might vibrate a few hundred times a second, it might take years or decades for a single one of these gravitational waves to pass by at the speed of light.

The finding has opened a wholly new window on the universe, one that promises to reveal previously hidden phenomena such as the cosmic whirling of black holes that have the mass of billions of suns, or possibly even more exotic (and still hypothetical) celestial specters.

(Source: [Quanta Magazine](#))

Gravity And Dark Matter, A Bond Beyond Distances



Dwarf galaxy. Credit: NASA's Goddard Space Flight Center/Jenny Hottle

Isaac Newton formulated his theory of gravity as an action at a distance: a planet instantly feels the influence of another celestial body, no matter the distance between them. This characteristic motivated Albert Einstein to develop the famous theory of general relativity, where gravity becomes a local deformation of spacetime. The principle of locality states that an object is directly influenced only by its surrounding environment: Distant objects cannot communicate instantaneously; only what is here right now matters.

However, in the past century, with the birth and development of quantum mechanics, physicists have discovered that non-local phenomena not only exist, but are fundamental to understanding the nature of reality. Now, a new study from SISSA—Scuola Internazionale Superiore di Studi Avanzati—recently published in *The Astrophysical Journal*, suggests that dark matter, one of the most mysterious components of the universe, interacts with gravity in a non-local way. According to the authors, Ph.D. students Francesco Benetti and Giovanni Gandolfi, along with their supervisor Andrea Lapi, this discovery could provide a fresh perspective on the still unclear nature of dark matter.

(Source: phys.org)

Reconstructing an Alien Astronomer's View of Our Home Galaxy's Chemistry



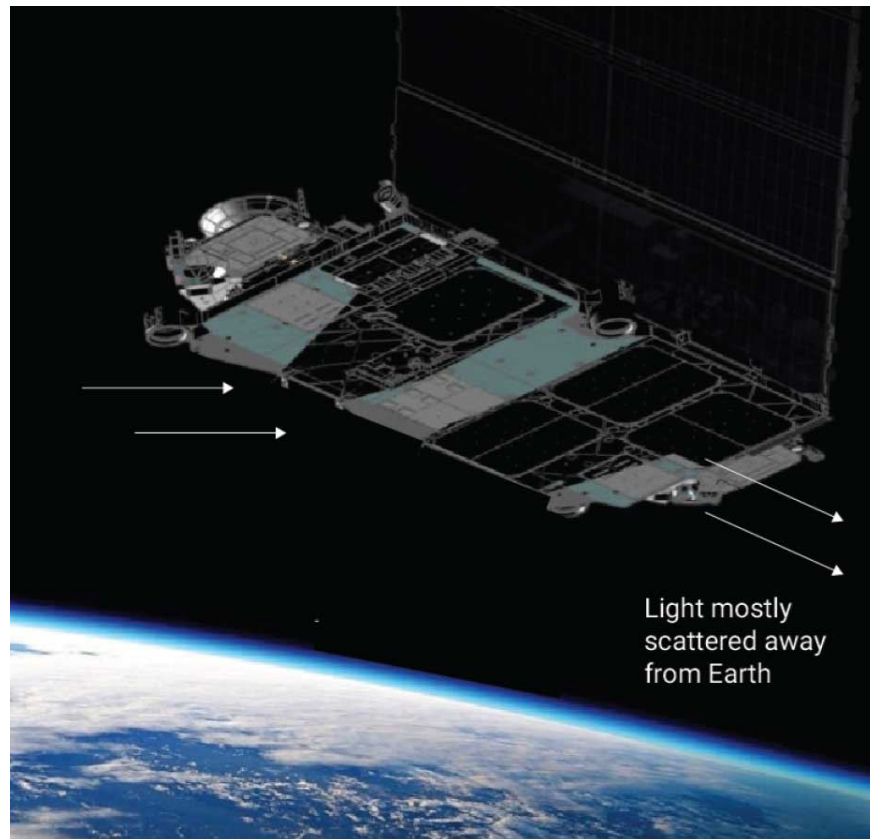
Artist's impression of the Milky Way, as seen from the outside. The study described here goes one step further, showing what results extragalactic astronomers would obtain if they studied our Milky Way from afar. Credit: Stefan Payne-Wardenaar

Researchers have reconstructed what alien astronomers observing our Milky Way galaxy from afar would find if they analyzed our home galaxy's chemical composition. The study, which is led by researchers from the Max Planck Institute for Astronomy, is relevant for our own understanding of the cosmos: It allows for a new kind of comparison between our home galaxy and the many distant galaxies that we observe from the outside. The results provide part of the answer to the old question whether our home galaxy is special: at least when it comes to chemical composition, the Milky Way is unusual, but not unique.

We see distant galaxies from the outside: Telescope observations show us a galaxy's shape and its spectrum (the rainbow-like decomposition of a galaxy's light). So how would our own galaxy look from that perspective, to a distant, alien astronomer? That is a deceptively simple question. After all, astronomers here on Earth have devised quite ingenious ways of deducing a galaxy's properties from what we observe, and alien astronomers will likely have a similarly sophisticated view of the Milky Way.

For the more sophisticated methods of analysis, it is not at all easy to tell what alien astronomers would find, were they to apply those methods to our home galaxy. But the pay-off can be considerable. Jianhui Lian (Max Planck Institute for Astronomy and Yunnan University), the lead author of the study that has now been published in *Nature Astronomy*, says, "Finding ways to compare our home galaxy with more distant galaxies is what we need if we want to know whether the Milky Way is special or not. This has been an open question since astronomers realized a hundred years ago that the Milky Way is not the only galaxy in the universe."

The Newest and Largest Starlink Satellites Are Also The Faintest



Sunlight coming from the left is reflected into space by dielectric mirror surfaces on the bottom of the spacecraft body. Illustration from SpaceX

SpaceX launched their first batch of second-generation Starlink satellites on February 27th. These spacecraft are called “Mini,” but they are only small in comparison to the full-size satellites that will come later. The 116 square meters of surface area make them more than four times the size of the first-generation spacecraft.

The Minis’ large dimensions were an immediate concern for professional and amateur astronomers alike because area usually translates to brightness. However, SpaceX changed their physical design and concept of operations (conops) in order to mitigate their brightness. The company developed a highly reflective dielectric layer, which is applied to the bottom of the spacecraft body. This mirror-like surface reflects sunlight into space instead of scattering it toward observers on the ground. In addition, the solar panels are oriented so that observers do not see their sunlit sides.

(Source: skyandtelescope.org)

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