



**BATTLE POINT
ASTRONOMICAL
ASSOCIATION**

Igniting passion for science through the lens of astronomy!



Photo Credit: Frank Petrie

THE OBSERVER

April 2024, Vol. 35

Note from the President: Introducing Liz Walker



I'm thrilled to announce that BPAA has hired our first employee! Please welcome Liz Walker, our new Communications Manager. Liz is handling our social media posts, email announcements, website updates, press releases, and other activities for getting the word out about the great work BPAA does in the community. She will also be onsite at the observatory on Fridays and Saturdays to greet visitors, show them around, and talk about what we do and how they can be involved.

Liz will also be coordinating volunteer opportunities and reaching out to you, our members, to get involved in doing something you enjoy that will benefit our organization.

Liz will be working part time, 20 hours per week. She comes to us from BARN, where she also works part time.

I encourage you to stop in and give Liz a warm welcome to BPAA!

[Frank Petrie, BPAA President](#)

Dome Repair Progress



We are making good progress on the construction of the replacement arch assemblies for the Ritchie dome. There are 4 arch segments being welded up at Barn by Patrick Clanton that will be joined with cross members to make two arch assemblies that will in turn be bolted together to make the complete structure at installation.

The two arch assemblies will be powder coated and then taken to the observatory to await installation while we remove the old shutter and arches and prepare the dome plate for the new structure. We will move the shutter, completed last year, to the site and prepare it and then on a big day we will use a large crane to lift the Ritchie out and then lift the arch assemblies into place and secure them. We will then raise the shutter and place it and then use the crane to raise the components for our new telescope and pier to the roof. It will be quite a job to attach the old dome skin to the new arches. We expect to have professional help for this.

Once the new arches and shutter are in place we will rebuild the already removed floor of the dome and then install the new telescope.



Great Day at KidiMu's FamJam!



Folks from BPAAs supported KidiMu's FamJam on Saturday, March 23. There was a constant flow of people throughout the event with 120 attending planetarium shows in our portable dome. Frank Petrie and Dan Schlesener alternated giving nine of these shows while Cole Rees and Liz Walker helped answer telescope questions. Erin Howard had a hands-on project for kids and tirelessly repeated eclipse facts for everyone who came by. Denise Hidano talked to parents, and we gained two new family memberships and an half dozen people filled out our "for more info" sheet.



March (of Stars) Madness Campaign - Last Call!

NGA TOHUNGA WHAKATERE
The Navigators

80%
FUNDED

MARCH OF STARS MADNESS

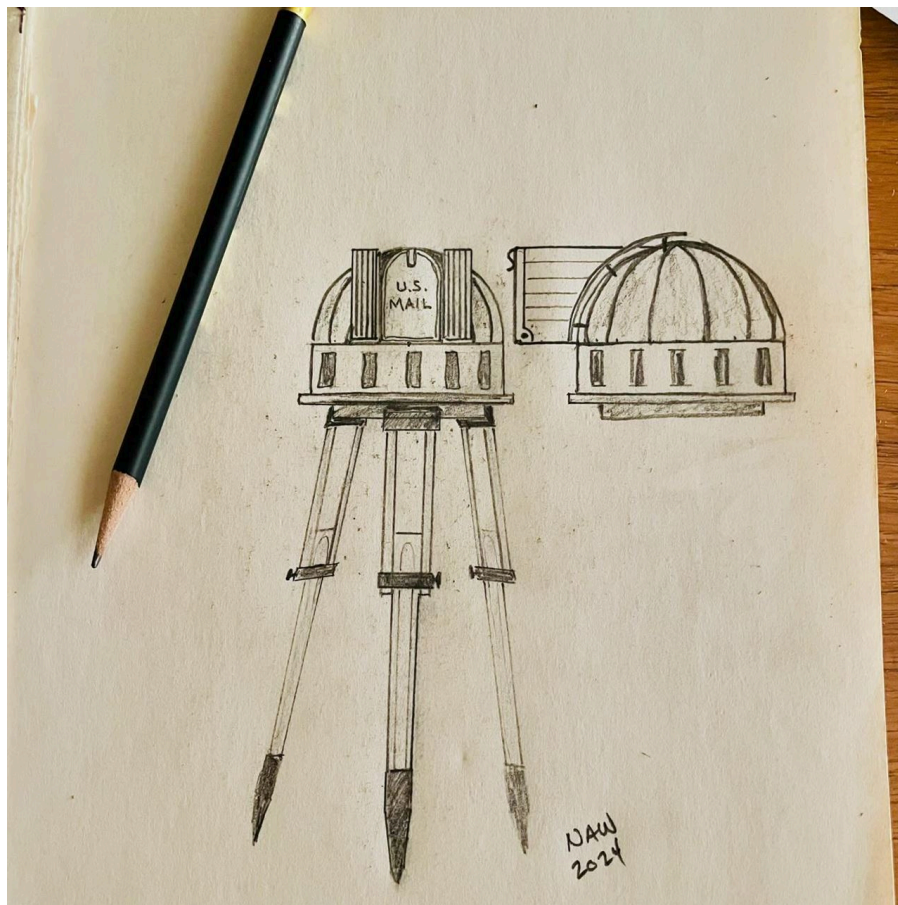
Help BPAA raise funds to secure a license for *The Navigators*, a full-dome movie experience, AND a high-resolution, 3D PNW terrain dataset for our planetarium!

Donate to the March of Stars Madness Fundraising Event:
<https://givebutter.com/NavigateTogether>

There's still time to support us in our March (of Stars) Madness Campaign to raise \$5,000. The campaign will be open until 10am on April 8, just before of the start of the partial solar eclipse locally! As you can see, we're close to our goal. Use the QR code above or this [link](https://givebutter.com/NavigateTogether) to help push us over the line!

The funds will go toward purchasing a five-year license for *The Navigators* full-dome movie, and a new high-resolution Pacific Northwest terrain data set. The movie is a 30-minute, immersive film in which we will "fly through space, follow the stars, traverse the largest ocean on Earth with Moko and her ancestors." The data set will enable Planetarium audiences to fly over our region and explore the landscape in great detail.

Collaborate On a Fun Astronomical Mailbox!



Inspirational Concept Design By: Neil Wright

Calling all artists, tinkerers, and makers! In conjunction with [Arts & Humanities Bainbridge](#), BPAA is looking for volunteers to help ideate and create what is sure to be a Bainbridge Island landmark mailbox. The possibilities for a truly unique and inspired design are as vast as the cosmos! The new mailbox will be located near the west entrance of Battle Point, across from Skinner Road (10800 Battle Point Drive NE.)

If you have any questions, fun ideas, or are interested in collaborating as a volunteer, please reach out to BPAA at president@bpaastro.org.

Planeteers Needed!

We are still looking to train new Planeteers! What is a Planeteer you might ask. It's someone who has been trained to run our new planetarium system and manage presentations in the Rudolph Planetarium! For members that checked off "Operating the Rudolph Planetarium" as a volunteer interest, this is your opportunity to shine! And all Planeteers get a great BPAA-blue shirt!

The first step is to get connected to us on our Discord channel. If you are not already on the Discord, please join here: <https://discord.gg/YSeHM26e59>. After you're on BPAA's Discord, please tag or message Erin (@astronomyftw) so they can add the Planeteer role to your account. When you've joined the Discord and have the Planeteer role, you'll have access to our team channel. All Planeteer information is kept in this channel: <https://discord.gg/BMQsfZ8d2r>.

You can then join us at our next training session on April 13th from 4pm to 5:30pm (before the Second Saturday science talk!) and we'll get you up to speed.

Telescope Tuesdays Every Tuesday, 10:00am - 2:00pm

There's always a lot to do at the Ritchie observatory! Come on out every Tuesday, 10am to 3pm, and get involved. Learn how stuff works. Help make improvements. An enormous amount of progress has been made, but there's always more to do. And we might even have pizza! Come on out and support Telescope Tuesdays!

Here's some of our volunteers in action:



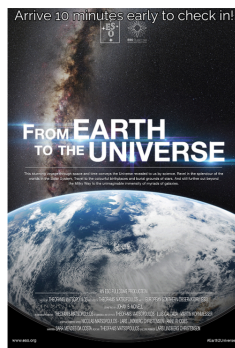
Deborah Milton adding some pizzaz to the Observatory foyer.



Dan Schlesener applying some stain to the woodwork.

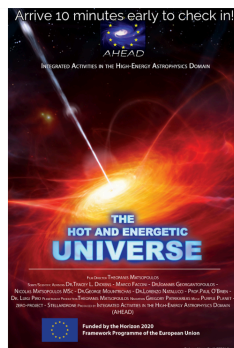
Movies at the Planetarium Every Wednesday

April is the start of our second quarter of Movies at the Planetarium events and we're still looking for reviews of the program! Our core four will change based on your feedback, so if you have attended any of these events, we'd love to hear from you about your experiences. We hope to make MATP as best as it can be and feedback helps us do that. You can find the feedback form here: <https://forms.gle/CA4nE9YbbB2UMHYVA>



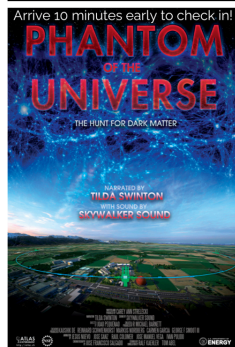
MOVIES AT THE PLANETARIUM

APRIL 3RD
RUDOLPH PLANETARIUM
BATTLE POINT PARK



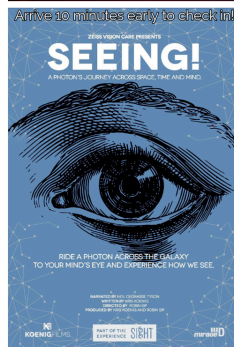
MOVIES AT THE PLANETARIUM

APRIL 10TH
RUDOLPH PLANETARIUM
BATTLE POINT PARK



MOVIES AT THE PLANETARIUM

APRIL 17TH
RUDOLPH PLANETARIUM
BATTLE POINT PARK



MOVIES AT THE PLANETARIUM

APRIL 24TH
RUDOLPH PLANETARIUM
BATTLE POINT PARK



Wednesday 4/3: From Earth to the Universe
5pm show: <https://givebutter.com/N64MQW>
6pm show: <https://givebutter.com/NoOVuT>

Wednesday 4/10: The Hot and Energetic Universe
5pm show: <https://givebutter.com/3njPLs>
6pm show: <https://givebutter.com/Znf567>

Wednesday 4/17: Phantom of the Universe
5pm show: <https://givebutter.com/BaSGsC>
6pm show: <https://givebutter.com/l5jWR5>

Wednesday 4/24: Seeing! A Photon's Journey
Across Space, Time, and Mind
5pm show: <https://givebutter.com/TL9CfO>
6pm show: <https://givebutter.com/HHpxCS>

First Friday, April 5

Our next First Friday is on 4/5! Find out what's going on in the sky for the month of April and then join us for a tour of the Ritchie Observatory. Members: be sure to email planetarium@bpastro.org for your free show discount code!

5pm show and tour: <https://givebutter.com/HZ1TGE>

6pm show and tour: <https://givebutter.com/oYiriG>

**BATTLE POINT
ASTRONOMICAL
ASSOCIATION**

FIRST FRIDAY

WHAT'S UP IN APRIL?

Join us at the Rudolph Planetarium on **April 5th**
and learn all about what's up in the night sky for
the month of March!

After the planetarium show, join us for a free tour
of the Ritchie Observatory and get to know Battle
Point Astronomical Association.

5PM

6PM

Please arrive 10 minutes early to check in!

Second Saturday Program April 13, 6:00pm

Stellar Evolution

Zoe Bozich, San Diego State University of Washington

Did you know that how stars accumulate (or, the more technical term, "accrete") their mass profoundly impacts their size, evolution, and characteristics? Computer simulations of star formation often focus on a steady, constant increase in mass, but other models suggest that accretion rates can be highly variable. The Rudolph Planetarium welcomes San Diego State University master's student (and Education Officer Erin's good friend) Zoe Bozich, who will show us how these two methods—constant versus variable—compare with the Modules for Experiments in Stellar Astrophysics (MESA) stellar evolution code.

Reserve your spot here: <https://givebutter.com/hfb180>

Cosmic Conversations

April 16, 7:00pm

Topic: TBD

On the third Tuesday of each month, we have been engaging in COSMIC CONVERSATIONS at the Ritchie Observatory in Battle Point Park. These are open to members and operate much like a book group, wherein we pick a topic, read some background material and then discuss what we've learned. These are nonmathematical discussions where we hope to learn from each other.

Third Saturday Kids Club

April 20, 12:00pm

It's time for the first Third Saturday Kids Club event ever! We are excited for this program and have high hopes to bring exciting astronomy education geared toward kids. This month's topic is the Solar and Lunar Eclipses! We'll be working in small groups to make a Yardstick Eclipse, then we'll use the planetarium as a rocketship to see how eclipses look from space. After 40 minutes, we'll take a 20 minute wiggle break and then sit down to watch a 20 minute fulldome movie, Sunstruck.

The recommended minimum age for this month's Kids Club is 6! At least one parent or guardian must stay with the kiddo(s). Parents and guardians are free, but kids always get the best seats in the house at Kids Club!

Buy your tickets here: <https://givebutter.com/f75u8Z>

Third Saturday Members Meeting

April 20, 6:00pm

Are you travelling to see the eclipse on April 8th or are you staying put? Well no matter where you went, we'll have a meeting to tell our tales! Submit your pictures (with location!) and stories to planetarium@bpastro.org and Erin will put them all into a slideshow and we'll share everyone's experiences together! This presentation will be in person and on zoom, and we'd love to hear you share your story when we reach your slide! After we share what our wonderful members have been up to, we will do a small planetarium show on eclipse science. See the eclipse from space!

Reserve your spot here: <https://givebutter.com/INWw76>

Earth Expo/Community Hour
April 27, 10:00am to 2:00pm



BPAA will again be participating in this year's Earth Expo at Battle Point Park on Saturday April 27. We're looking for BPAA members to volunteer to staff our booth, talk to folks about BPAA, and sign-up new members.

Similar to our activities at KiDiMu Fam Jam in March, we'll have telescopes on display, and, weather permitting, the solar telescope imaging the sun. In addition, as part of the Earth Day theme of this event, we'll be directing people to head over to the Rudolph Planetarium where we'll be screening the full-dome movie "Dark Side of Light" on the hour and half-hour. The movie looks at "why and how do we humans destroy our surroundings with light pollution, what impact it has not only on us, but on nature as a whole, and also what each of us can do about it."

If you'd like to help out, contact Frank Petrie at president@bpastro.org.

BPAA Will Participate in the 2024 Kitsap Great Give!



BPAA has been approved to participate in the 2024 Kitsap Great Give. The Kitsap Great Give is a 24-hour “give-day” event that unites our community through a special online donation platform to support the many nonprofit organizations that make Kitsap a great place to live – for all of us.

There are multiple ways you can make a gift to the Kitsap Great Give on Tuesday, April 16, 2024 (or via “Early Giving” that starts April 1 and ends April 15 at midnight):

- Use your credit or debit card to give online on this website (KitsapGreatGive.org) from a computer or mobile device, as this website has been optimized for easy access through mobile giving from a smartphone (iPhone, Android, etc.). Data charges for personal mobile devices may apply and are not reimbursed;
 - Make a gift by check, credit, or debit card by returning our reply envelope included in the KGG direct mail appeal distributed to more than 100,000 households in Kitsap;
 - Make a gift by check, credit, or debit card using our reply device clipped from the special supplement provided by Sound Publishing to the Bainbridge Island Review, North Kitsap Herald, Central Kitsap Reporter, and Port Orchard Independent and mailing it to the Kitsap Community Foundation;
 - Call the Kitsap Community Foundation at (360) 698-3622 to make your gift over the phone.
-

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.

Apr 2 – [The Sombrero Galaxy is well placed](#)

Apr 5 – [Messier 94 is well placed](#)

Apr 8 – [Total solar eclipse](#)

– New Moon

– [Asteroid 532 Herculina at opposition](#)

Apr 15 – [The Whirlpool Galaxy is well placed](#)

Apr 18 – [Messier 3 is well placed](#)

Apr 20 – [136108 Haumea at opposition](#)

Apr 22 – [Lyrid meteor shower 2024 peak](#)

Apr 23 – Full Moon

– [Messier 101 is well placed](#)

May 5 – [\$\eta\$ -Aquariid meteor shower 2024](#)

May 7 – New Moon

May 8 – [\$\eta\$ -Lyrid meteor shower 2024](#)

May 12 – [Messier 5 is well placed](#)

May 14 – [Mercury at dichotomy](#)

May 17 – [Asteroid 2 Pallas at opposition](#)

May 23 – Full Moon

May 29 – [Messier 4 is well placed](#)

May 31 – [Conjunction of the Moon and Saturn](#)

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

Jun 1 – [The Great Globular Cluster in Hercules is well placed](#)

Jun 3 – [Messier 12 is well placed](#)

Jun 5 – [Messier 10 is well placed](#)

Jun 6 – New Moon

Jun 10 – [Daytime Arietid meteor shower 2024 peak](#)

– [Messier 92 is well placed](#)

Jun 18 – [The cluster IC 4665 is well placed](#)

Jun 20 – [June solstice](#)

Jun 21 – Full Moon

Jun 27 – [June Bootid meteor shower 2024 peak](#)

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

Jun 28 – [Close approach of the Moon and Neptune](#)

– [The cluster NGC 6633 is well placed](#)

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!

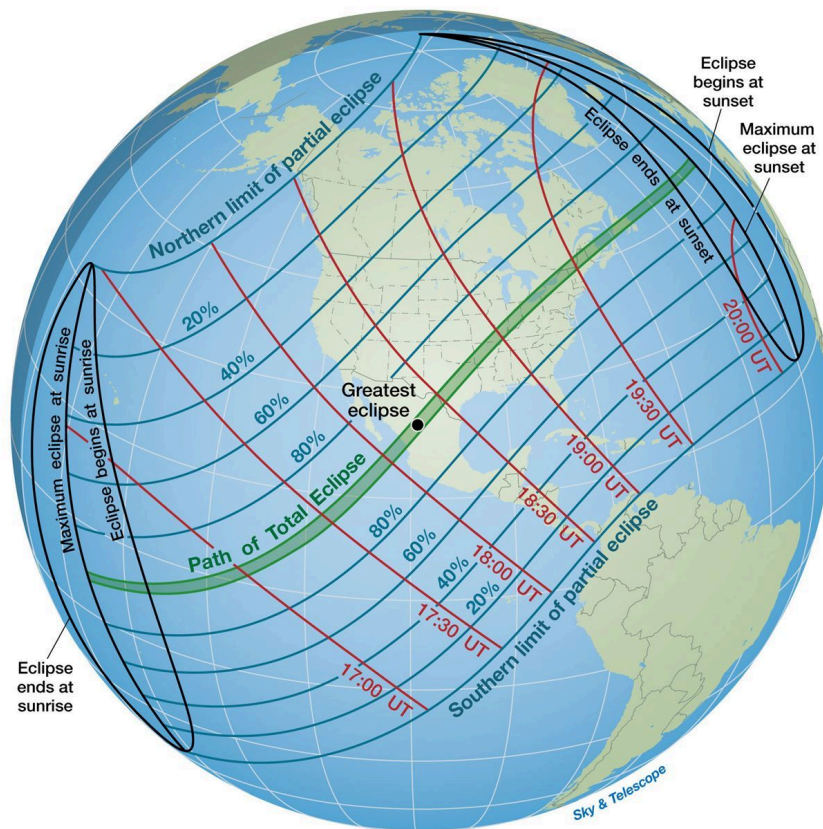
Partial: The Solar Eclipse for The Rest Of Us



The Christmas 2000 eclipse was partial only. At photographer Fred Espenak's location, its maximum "eclipse magnitude" (at middle image) was 43%.

Totality watchers get the best show, but far more people will be in partial-only territory. Here's how to make the most of it.

There's been a lot to say about America's total eclipse of the Sun coming up April 8th. You can visit Sky & Telescope's [eclipse landing page](#), and [get local maps and predictions](#) as detailed as you want (zoom in). But as the globe below shows, for the vast majority of people in North and Central America the eclipse will be only partial.



How partial, and when? If you're anywhere in North or Central America, you will get at least a partial eclipse on April 8th. The red lines give the Universal Time (UT) of mid-eclipse. (Eastern Daylight Time is UT minus 4 hours, CDT is UT minus 5 hours, MDT is UT minus 6 hours, and PDT is UT minus 7 hours.) The blue lines tell the eclipse magnitude — the percent of the Sun's diameter covered — at that time. Mark your spot, and interpolate between the lines. Credit: Sky & Telescope. Source: Fred Espenak

Here are ways to make the most of it — without endangering your eyes.

The blindingly brilliant surface of the Sun can be actually blinding, perhaps permanently, if you stare at it for any length of time. That also goes for the bright part of a partially eclipsed Sun.

You have two basic ways to watch safely: directly through a safe solar filter, or indirectly by projection.

Go to [Partial: The Solar Eclipse for the Rest of Us - Sky & Telescope - Sky & Telescope](#) for more details.

(Source: [skyandtelescope.org](#))

This [link](#) from the What's Up section above will provide approximate times of eclipse visibility locally.

Protect Against Eye Damage from April 8's Solar Eclipse, Doctors Say



A woman watches an annular solar eclipse on October 14, 2023 using special solar filter glasses at the National Autonomous University of Mexico. Credit: Carlos Tischler/ Eyepix Group/Future Publishing via Getty Images

On April 8, as millions of people try to watch a solar eclipse sweep over North America, eye doctors across the United States will be on high alert.

That's because, while a solar eclipse is a stunning celestial event, it can also be dangerous. Looking at any part of the exposed sun without the right kind of protection can permanently injure the eye's light-sensitive retina.

And if past eclipses are prologue, it's likely that some eclipse-gazers will show up at doctors' offices with significant eye damage.

In 2017, during the solar eclipse seen across the United States, that happened to multiple people despite abundant media coverage about the danger of looking at the sun when it is anything less than fully and completely covered by the moon.

Ophthalmologist Avnish Deobhakta notes that there are ways to enjoy the eclipse without looking up at all; everyday household objects like colanders allow you to create [pinhole projectors](#) that let you watch an image of the sun becoming more and more crescent-shaped.

"My advice is to not look at the sun, because you may not realize that it is affecting your retina. It does not hurt. It doesn't burn at the time. It's not as if you feel it," says Deobhakta.

If you do choose to look up at the sun when it is partially eclipsed, says Deobhakta, "make sure you really are sure that you have the standard glasses that have the right filters."

The American Astronomical Society has a [list of vetted suppliers](#).

(Source: [NPR](#))

What Are the True Colors of Images From the James Webb Space Telescope?



NASA's James Webb Space Telescope has captured a tightly bound pair of actively forming stars, known as Herbig-Haro 46/47, in high-resolution near-infrared light. Look for them at the center of the red diffraction spikes, appearing as an orange-white splotch. (Image credit: NASA, ESA, CSA. Image Processing: Joseph DePasquale (STScI))

NASA's [James Webb Space Telescope](#) (JWST) is known for capturing our universe with unprecedented precision and sensitivity. Its images aren't only scientifically useful but also beautiful. From the blue and gold of the [Southern Ring Nebula](#) to the pink, orange and purple of [Cassiopeia A](#), JWST images render the universe in brilliant color.

The images are so stunning, you might wonder, —do these cosmic objects really look that colorful? What would they look like if we could see them with our own eyes, instead of through a telescope?

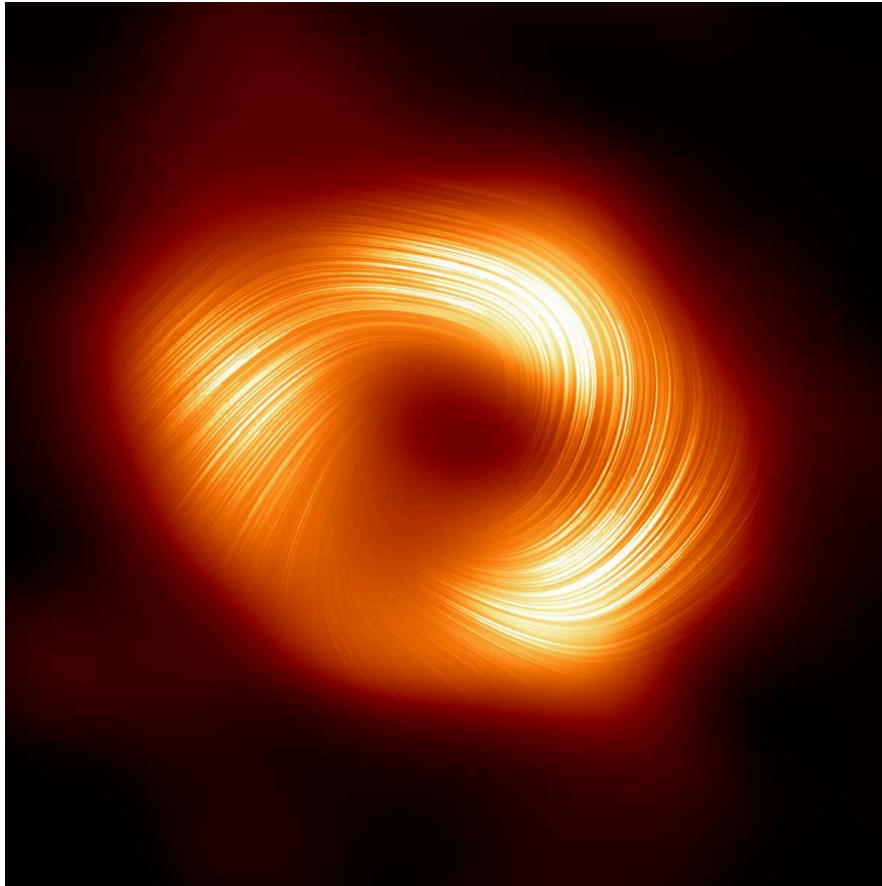
"The quickest answer is, we don't know," said Alyssa Pagan, a science visuals developer at the Space Telescope Science Institute (STScI) and part of the team that works to bring color to the JWST images. But one thing is for sure: You wouldn't see the universe like this.

JWST is an infrared telescope, meaning it "looks" at the universe in wavelengths of light that are longer than that of red light, which has the longest wavelength we can detect with our eyes.

So how are the colors for these spectacular images chosen, then? JWST targets are viewed through several filters attached to the telescope, which "see" in a certain range of wavelengths of infrared light. JWST's Near Infrared Camera, the telescope's main camera, has six filters, all of which capture slightly different images. Combining these images into a composite allows Pagan and Joe DePasquale, another science visual developer at the STScI for JWST, to create the full-color images.

(Source: [Space.com](#))

Strong Magnetic Fields Swirl Near Milky Way's Black Hole



This new image from the Event Horizon Telescope collaboration shows the silhouette of the supermassive black hole in the Milky Way's center, with lines overlaid that trace the light's polarization. The polarization reveals details about the strength and structure of magnetic fields close to the event horizon. This is the first time astronomers have been able to measure polarization in detail around our black hole, called Sagittarius A*. Credit: EHT Collaboration

Astronomers have detected twisted, orderly magnetic fields near the event horizon of Sagittarius A*.

The Event Horizon Telescope collaboration has released another image of our galaxy's central black hole, Sagittarius A* — this time revealing the behavior of the magnetic fields that thread the surrounding gas. The results appear today in two papers in *Astrophysical Journal Letters*.

The images that the EHT produces are reconstructions of the black hole's silhouette, a dark shadow framed by the glow of light that's evaded the event horizon. The team has so far imaged both Sgr A* and M87*, the behemoth squatting at the center of the elliptical galaxy M87 in Virgo. Both the new image and the previous ones are based on observations taken in 2017 by the EHT's worldwide network of radio telescopes, the data scrupulously spliced to reveal glimmers of what a planet-size telescope would see.

The radio emission that the EHT observes is called synchrotron radiation. It's emitted by electrons corkscrewing along magnetic field lines — think of it like the particles' scream of glee as they whiz along.

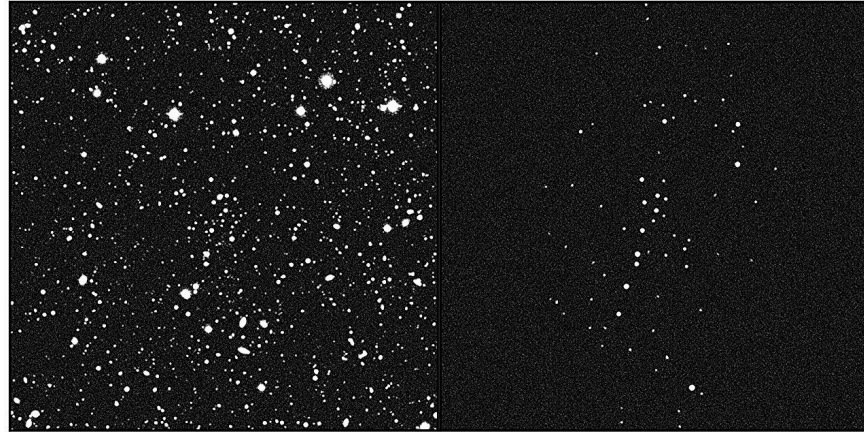
By nature, this light is polarized. Light is an electromagnetic wave, and it oscillates perpendicularly to the direction of motion. Usually, the oscillation's orientation fluctuates randomly with time. But when light is polarized, the orientation is fixed, whether in a single plane or rotating in a predictable way.

As electrons spiral around magnetic field lines, the particles emit photons in directions perpendicular to the field. Thus the amount and pattern of polarization in the emission provides key information about the magnetic fields, enabling astronomers to map the fields' structure and strength. That matters because magnetic fields are powerful players in the environment around an accreting black

hole — more so than astronomers had appreciated, the new results confirm.

(Source: skyandtelescope.org)

Faintest Known Star System Orbiting the Milky Way Discovered



Hidden in this deep sky image (left) is Uma3/U1, a minuscule group of stars (right) bound together by their own gravity (and possibly even dark matter!) in orbit around the Milky Way. Credit: CFHT/S. Gwyn (right) / S. Smith (left). *The Astrophysical Journal* (2024). DOI: 10.3847/1538-4357/ad0d9f

A team of astronomers led by the University of Victoria and Yale University has detected an ancient star system traveling around our galaxy named Ursa Major III / UNIONS 1 (UMa3/U1)—the faintest and lowest-mass Milky Way satellite ever discovered, and possibly one of the most dark matter-dominated systems known.

The team conducted the study from Hawai'i using two Maunakea Observatories on Hawai'i Island—W. M. Keck Observatory and Canada-France-Hawai'i Telescope (CFHT)—as well as the University of Hawai'i Institute for Astronomy Pan-STARRS (Panoramic Survey Telescope and Rapid Response System) on Haleakalā, Maui; the findings are published in a recent edition of *The Astrophysical Journal*.

Observations reveal the stellar system is tiny, with only about 60 stars that are over 10 billion years old, spanning just 10 light-years across. UMa3/U1 has an extremely low mass—at 16 times the mass of the sun, it is 15 times less massive than the faintest suspected dwarf galaxy.

(Source: phys.org)

Is The Moon Shrinking?



Fault scarps near a region of the Moon called Mare Frigoris, imaged by NASA's Lunar Reconnaissance Orbiter. Image: NASA

The Moon as we see it is always changing. Throughout the month, our planet's natural satellite goes through phases as its orientation relative to Earth and the Sun changes. The phases are predictable and cyclical, giving [the Moon](#) a constancy in spite of its variability. But the Moon is also changing in other, more permanent ways.

The Moon is shrinking. Both its actual volume and its apparent size from Earth's perspective are getting smaller. Although both of these phenomena are happening extremely slowly, they are actually measurable.

The change in the Moon's actual size is caused by the cooling of its interior. The Moon was [formed from a great collision](#) between early Earth and another protoplanet about 4.5 billion years ago. This collision created an enormous amount of heat, and the Moon has been cooling off ever since. Although its exterior today is cold and solid, the Moon's interior is still cooling down, causing it to contract. This contraction affects the entire Moon, causing its surface area to decrease and its [solid crust to wrinkle](#).

We know this is happening in large part because of imagery and data from spacecraft like NASA's [Lunar Reconnaissance Orbiter](#). This mission, which has been in orbit around the Moon since 2009, and past missions have captured images showing a particular kind of cliff on the lunar surface. Known as fault scarps, these cliffs are caused by two parts of the Moon's crust being pushed together and forced upward. Fault scarps are [found across the lunar surface](#), giving strong evidence of ongoing contraction deep inside its interior.

(Source: [The Planetary Society](#))

2024 Officers

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