



Igniting passion for science through the lens of astronomy!



THE OBSERVER

February 2024, Vol. 33

KiDiMu Fam Jam, March 23!

BPAA will be at the Kid's Discovery Museum's (KiDiMu) Fam Jam! Come on out and join in the fun on March 23, 10am to 3pm. We'll have space stuff on display and will interact with kids and their parents. We might even be setting up the Portable Planetarium! Check it out! Better yet, volunteer to help out by sending an email to Frank at info@bpastro.org.

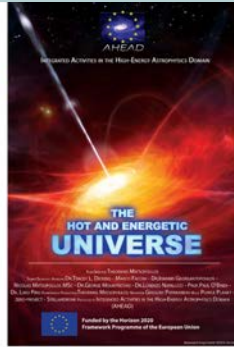
Movies at the Planetarium

Did you miss one of our movies in January? Don't worry, they're back again! These Core Four movies will be the backbone of our movie programs for February and March, though things might change in April. If you have a favorite you want to keep around, let us know! Please spread the word and let your friends and family know about Movies at the Planetarium, Wednesdays at 5pm and 6pm. Use the QR codes in the image or the links below to reserve your place!



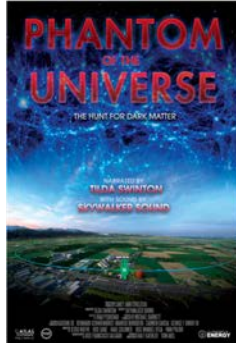
MOVIES AT THE PLANETARIUM

FEBRUARY 7TH
RUDOLPH PLANETARIUM
BATTLE POINT PARK



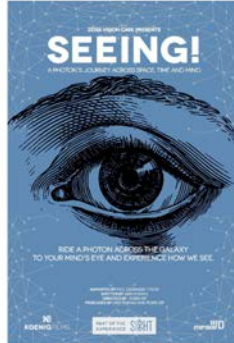
MOVIES AT THE PLANETARIUM

FEBRUARY 14TH
RUDOLPH PLANETARIUM
BATTLE POINT PARK



MOVIES AT THE PLANETARIUM

FEBRUARY 21ST
RUDOLPH PLANETARIUM
BATTLE POINT PARK



MOVIES AT THE PLANETARIUM

FEBRUARY 28TH
RUDOLPH PLANETARIUM
BATTLE POINT PARK



Wednesday 2/7: From Earth to the Universe
5pm show: <https://givebutter.com/Wf0gvu>
6pm show: <https://givebutter.com/zt6Fzf>

Wednesday 2/14: The Hot and Energetic Universe
5pm show: <https://givebutter.com/tWYmve>
6pm show: <https://givebutter.com/dD4Cdi>

Wednesday 2/21: Phantom of the Universe
5pm show: <https://givebutter.com/EKtHpw>
6pm show: <https://givebutter.com/v9W1Ew>

Wednesday 2/28: Seeing! A Photon's Journey
Across Space, Time, and Mind
5pm show: <https://givebutter.com/19g8k9>
6pm show: <https://givebutter.com/P2O81i>

What's a Docent at the Dome?

Would you like to come hang out at the Observatory and learn a little bit about how stuff works and what we do? If so, in no time you'll become qualified to tell others all about it! You can become a Docent at the Dome! If you're curious about what goes on at the observatory and would like to check out opportunities to learn and become involved, this is a great way to start without making a big commitment. Contact Frank at info@bpastro.org, or better yet give him a call or text at 206-409-7578 to find out more!

We Are Looking for Planeteers!

We are still looking to train new Planeteers! The primary method of communication for the Planeteers is 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>. Confused about Discord? Join us at our next training session on February 10th from 4pm to 5:30pm (before the Second Saturday science talk!) and we'll get you up to speed.

**Upcoming Event: 2nd Saturday Program
February 10, 6:00pm**



Photo credit: Erin Leigh Howard

An Insider's Guide to the Vera C. Rubin Observatory

Erin Leigh Howard, BPAA and University of Washington

Did you know that our very own education officer and planetarium manager, Erin Howard, is a research scientist/engineer on the Vera Rubin Observatory project? The Vera C. Rubin Observatory (formerly known as the Large Synoptic Survey Telescope) is currently under construction in Chile and is quickly approaching first light. Rubin's Simonyi Survey Telescope boasts an 8.4-meter mirror and the world's largest digital camera and will survey the southern hemisphere skies for ten years with the Legacy Survey of Space and Time. This survey will deliver an unprecedented 500 petabytes of data when it's all finished. For this Second Saturday science talk, Erin will share an insider's guide to all things Rubin...and how you can participate, too!

Tickets: <https://givebutter.com/vYXHkA>

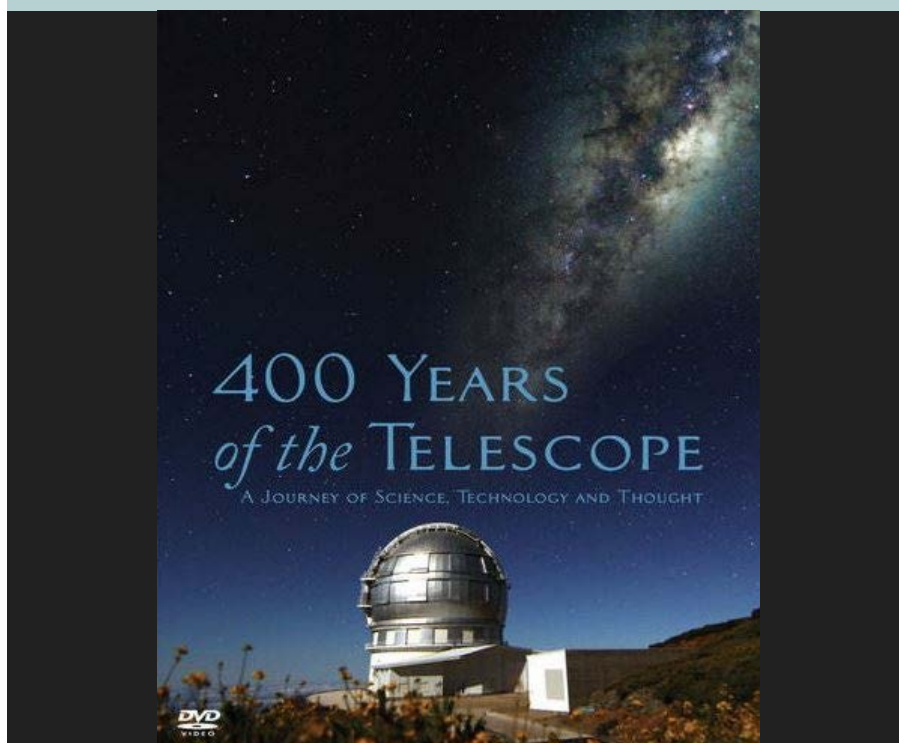
**Upcoming Event(s): Telescope Tuesdays
Every Tuesday, 10:00am - 2:00pm**

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!

**Upcoming Event: Cosmic Conversations
February 20, 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.

**Upcoming Event: Fourth Saturday Community Hour
February 24, 12:00pm**



BPAA welcomes you to our free, Fourth Saturday Community Hour where we'll show a thought provoking and informative science video followed by a rousing discussion. This month's discussion will center around PBS's "400 Years of the Telescope" with a runtime of 55 minutes.

"Beautifully photographed in 4K digital cinematography, this film is a visually stunning chronicle of the history of the telescope from the time of Galileo, its profound impact upon the science of astronomy, and how both shape the way we view ourselves in the midst of an infinite universe."

After the talk and discussion, Dan Schlesener will lead visitors on a tour of the Ritchie Observatory and, time permitting, round out the hour with a planetarium show.

Sign up at <https://givebutter.com/tcHndQ>.

**Upcoming Event: First Friday
March 1, 5:00pm**

First Fridays of every month will introduce you to the night sky as well as the Ritchie Observatory from 5pm to 7pm. We will have 15-20 minute "What's up in the sky this month?" planetarium shows on the hour, and a 15-20 minute tour of Ritchie telescope on the half hour. Planetarium shows are \$3 for non-members and free for members, tours are free for everyone! (Psst if you're a member, email planetarium@bpaastro.org for your discount code!)

Reserve your spot with these links:

5pm show and 5:30pm tour: <https://givebutter.com/olkTBQ>

6pm show and 6:30pm tour: <https://givebutter.com/GPmPw6>

**Modified Event: Kalamazoo Astronomical Society's
Introduction to Amateur Astronomy**

We will not be hosting further viewing sessions of Kalamazoo Astronomical Society's Introduction to Amateur Astronomy series at the Observatory. Folks can go to the KAS website (<https://www.kasonline.org/amastro.html>), register and watch remaining sessions, Parts 3, 4 & 5, on their own via Zoom. Sorry for any inconvenience.

Are You Ready for the April Eclipse?

While our area is not in the path of totality for the total solar eclipse coming on April 8, the Sun will be eclipsed to a maximum of ~20%. BPAA has approximately 30 pairs of eclipse glasses available for \$3. So, whether you're traveling to somewhere in the path of totality or staying locally, make sure you're safe to observe this spectacular event. Come out to the Observatory during any of the events listed above and get yours while supplies last!

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](https://www.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](https://www.in-the-sky.org/), Dominic Ford, Editor. The links provide details for each event including a scale on how difficult they are to observe.

Feb 9 – New Moon

Feb 15 – [Conjunction of the Moon and Jupiter](#)

Feb 16 – [Close approach of the Moon and M45](#)

Feb 19 – [Messier 81 is well placed](#)

Feb 24 – Full Moon

Mar 1 – [Comet C/2021 S3 \(PANSTARRS\) reaches peak brightness](#)

Mar 3 – [Asteroid 3 Juno at opposition](#)

Mar 10 – New Moon

Mar 11 – [Asteroid 23 Thalia at opposition](#)

Mar 14 – [Comet C/2021 S3 \(PANSTARRS\) passes perigee](#)

Mar 19 – [March equinox](#)

Mar 24 – [Penumbral lunar eclipse](#)

Mar 25 – Full Moon

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

Mar 30 – [136472 Makemake at opposition](#)

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](#)

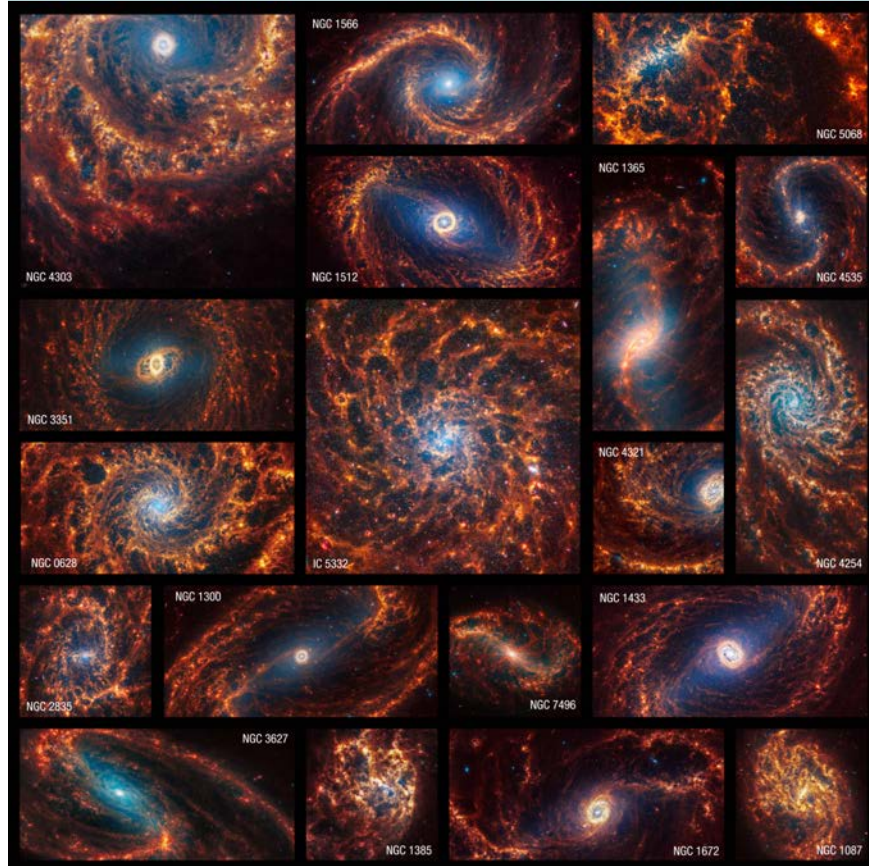
Apr 22 – [Lyrid meteor shower 2024 peak](#)

Apr 23 – Full Moon

– [Messier 101 is well placed](#)

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!

NASA's Webb Depicts Staggering Structure in 19 Nearby Spiral Galaxies



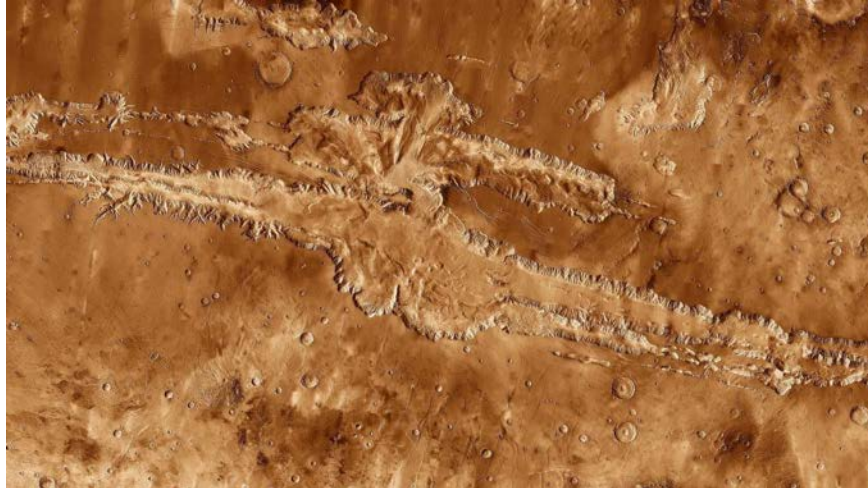
The James Webb Space Telescope observed 19 nearby face-on spiral galaxies in near- and mid-infrared light as part of its contributions to the Physics at High Angular resolution in Nearby GalaxieS (PHANGS) program. PHANGS also includes images and data from NASA's Hubble Space Telescope, the Very Large Telescope's Multi-Unit Spectroscopic Explorer, and the Atacama Large Millimeter/submillimeter Array, which included observations taken in ultraviolet, visible, and radio light. Credit: NASA, ESA, CSA, STScI, Janice Lee (STScI), Thomas Williams (Oxford), PHANGS Team, Elizabeth Wheatley (STScI)

It's oh-so-easy to be absolutely mesmerized by these spiral galaxies. Follow their clearly defined arms, which are brimming with stars, to their centers, where there may be old star clusters and – sometimes – active supermassive black holes. Only NASA's James Webb Space Telescope can deliver highly detailed scenes of nearby galaxies in a combination of near- and mid-infrared light – and a set of these images was publicly on 1/29/2024.

These Webb images are part of a large, long-standing project, the Physics at High Angular resolution in Nearby GalaxieS (PHANGS) program, which is supported by more than 150 astronomers worldwide. Before Webb took these images, PHANGS was already brimming with data from NASA's Hubble Space Telescope, the Very Large Telescope's Multi-Unit Spectroscopic Explorer, and the Atacama Large Millimeter/submillimeter Array, including observations in ultraviolet, visible, and radio light. Webb's near- and mid-infrared contributions have provided several new puzzle pieces.

(Source: [NASA](#))

Why Is There A Grand Canyon On Mars?



Imaged by the THEMIS camera on the Mars Odyssey mission, this photograph shows Valles Marineris, or Mariner Valley, discovered in 1972 by the Mariner 9 mission. It is the largest, grandest canyon known in the Solar System, but was formed in a very different fashion from Earth's Grand Canyon. Credit: NASA / JPL-Caltech / Arizona State University

Valles Marineris is the Solar System's grandest canyon, many times longer, wider, and deeper than the Grand Canyon. What scarred Mars so?

Here on Earth, there are a variety of ways that our planet winds up with giant cracks, rifts, or valleys within it, but none compare to Mars's Valles Marineris: the grandest canyon of them all.

Spanning some 4000 kilometers (2500 miles) long and up to 7 kilometers (4 miles) deep at its deepest, Valles Marineris has carved out dozens of times the volume of Earth's Grand Canyon.

How did this planet-wide scar form on Mars? Where did it come from, and why is it Mars, and not any other world, that has the grandest canyon of them all? Science closes in on the answer.

(Source: [Big Think](#))

Clashing Cosmic Numbers Challenge

Our Best Theory of the Universe



Atop Hawai'i's Maunakea, the Subaru Telescope (far left) recently completed a five-year survey of millions of galaxies. Credit: Alamy Stock Photo

In the early 2000s, it seemed that cosmologists had solved the largest and most complex puzzle of all: how the universe works.

“There was this amazing moment when all of a sudden, all the pieces in cosmology snapped together,” said J. Colin Hill, a theoretical cosmologist at Columbia University.

All the ways of studying the universe — mapping galaxies and their larger structures, catching catastrophic stellar explosions called supernovas, calculating distances to variable stars, measuring the residual cosmic glow from the early universe — told stories that “seemed to overlap,” Hill said.

But that moment of tranquility was only a brief respite between times of struggle. As astronomers made more precise observations of the universe across the sweep of cosmic time, cracks began to appear in the standard model. Some of the first signs of trouble came from measurements of variable stars and supernovas in a handful of nearby galaxies — observations that, when compared with the residual cosmic glow, suggested that our universe plays by different rules than we thought, and that a crucial cosmological parameter that defines how fast the universe is flying apart changes when you measure it with different yardsticks.

Cosmologists had a problem — something they called a tension, or, in their more dramatic moments, a crisis.

Those discordant measurements have only become more distinct in the decade or so since the first cracks emerged. And this discrepancy isn't the only challenge to cosmology's standard model. Observations of galaxies suggest that the way in which cosmic structures have clumped together over time may differ from our best understanding of how today's universe should have grown from seeds embedded in the early cosmos. And even more subtle mismatches come from detailed studies of the universe's earliest light.

(Source: [Quanta Magazine](#))

The Japanese Moon Lander Gets Back to Work After the Sun Reaches Its Solar Panels



This image provided by the Japan Aerospace Exploration Agency shows an image taken by a Lunar Excursion Vehicle of a robotic moon rover called Smart Lander for Investigating Moon, or SLIM, on the moon. Credit: AP

A Japanese moon explorer is up and running on Monday, Jan. 29, 2024, after several tense days without the sunlight it needs to generate power.

Japan's first lunar mission hit its target in a precision touchdown on Jan. 20, but landed the wrong way up, leaving its solar panels unable to see the sun.

But with the dawn of the lunar day, it appears that the probe has power.

The Japan Aerospace Exploration Agency, or JAXA, said that it successfully established communication with the probe Sunday night, and the craft has resumed its mission, taking pictures of the Moon's surface and transmitting them to the Earth.

After a last-minute engine failure caused the Smart Lander for Investigating Moon, or SLIM, to make a rougher-than-planned landing, JAXA used battery power to gather as much data as possible about the touchdown and the probe's surroundings. The craft was then turned off to wait the sun to rise higher in the lunar sky in late January.

(Source: [NPR.org](https://www.npr.org))

NASA Ends Mars Ingenuity Helicopter Mission



'Ginny,' on the surface of Mars before its 54th flight, imaged by Perseverance's Mastcam-Z camera. Credit: NASA / JPL

It has been a fun ride. NASA [announced recently](#) that after almost three years in operation, the Ingenuity helicopter has made its final flight on Mars.

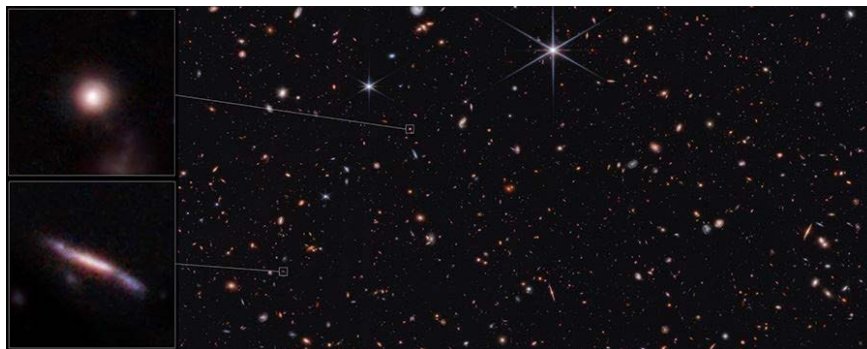
This news comes after 72 flights — starting with the [first one](#) on April 19, 2021, when the four-bladed 'copter lifted off from the Wright Brothers Field site. The experimental addition to the Perseverance mission has far exceeded the original expectations that it would make five flights over 30 days. The helicopter (sometimes nicknamed "Ginny") logged over two hours flying time and traveled more than 10.5 miles (17 kilometers) in all — more than 14 times farther than initially planned. (Check out the full [flight log!](#))

"Ingenuity is an exemplar of the way we push the boundaries of what's possible every day," says Laurie Leshin (NASA-JPL) in a recent [press release](#). "I'm incredibly proud of our team behind this historic technological achievement and eager to see what they'll do next."

The decision to terminate Ingenuity came after the helicopter sent home an image on Sol 1035 (January 18th), indicating that one of its rotor blades had sustained damage during what is now its final landing. Ingenuity had made an emergency landing on its previous flight.

(Source: [skyandtelescope.org](https://www.skyandtelescope.org))

The Milky Way Might Have Started Out Shaped Like a Pickle



Researchers analyzing distant galaxies in a James Webb Space Telescope survey, called Cosmic Evolution Early Release Science (CEERS), found an array of galactic shapes when the universe was only 600 million to 6 billion years old. The inset at the top left shows a rare galaxy that looks more like a sphere. At bottom left is a more common example, a galaxy that appears as an edge-on disk but may be better classified as elongated. (Note that while the study finds most early galaxies are indeed elongated, that is a statistical finding rather than a claim about any given galaxy.) Credit: NASA / ESA / CSA / Steve Finkelstein (UT Austin) / Micaela Bagley (UT Austin) / Rebecca Larson (UT Austin)

Faraway dwarf galaxies in the universe's distant past — which will become modern Milky Ways — have an unexpectedly stretched-out appearance.

What did the Milky Way look like shortly after it was born? Decidedly different than it does now, according to a new study.

The study, [to appear in the *Astrophysical Journal*](#), reveals that early galaxies often had surprisingly elongated shapes, some long and round like pickles, others long and flat like surfboards. And it's these small, faraway galaxies that have become the Milky Way-like galaxies of today.

"My first reaction to the paper was déjà vu!" says Lennox Cowie (University of Hawai'i, Manoa), who conducted a seminal study on galactic shapes using Hubble data but wasn't involved in the new work. "These observations look so like our 1995 [Hubble Space Telescope observations of high-redshift galaxies](#)."

Studies such as Cowie's probed galactic shapes in a universe already 2 billion years old. Yet even at this relatively mature cosmic age, some galaxies were decidedly unlike today's full-formed galaxies, appearing elongated rather than spherical or disk-like in shape. Astronomers thought we might be viewing early disk galaxies edge-on, like frisbees seen from the side.

Now, thanks to the longer wavelengths detected by JWST, which probe farther in space and thus further back in time, images are revealing stretched-out shapes for galaxies in a much younger universe — as young as 650 million years after the Big Bang. What's more, it appears that the galaxies it's finding are not edge-on disks after all: These galaxies truly are elongated.

(Source: skyandtelescope.org)

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