

*Passion for science through the lens of astronomy!*



## We Need You!



BPAA Chief Astronomer Cole Rees helping a young attendee try out a refracting telescope at the recent Earth Day Expo at Battle Point Park. Image credit: Denise Hidano

Battle Point Astronomical Association (BPAA) invites all ages to experience the awe and wonder of our skies. With solar and lunar telescopes available, BPAA will be getting out this summer to the Saturday Farmers' Market, July 4th celebration, evening events at Battle Point Park and KiDiMu. BPAA's purpose is to inspire scientific curiosity while getting people interested in joining the Association. We're looking for folks to help out at the events mentioned above, as well as those in the "Save These Dates" section below. BPAA will offer instruction in the use of telescopes for those who volunteer. If you have questions or want to participate, please respond to [publicity@bpastro.org](mailto:publicity@bpastro.org).

## Replacing the Cloth Planetarium Dome

THANK YOU!!! to everyone who has contributed so far! We've made a great start: \$3,175 has been donated as of May 30th, toward the \$16,000 we'll need for the new dome. If you haven't already, please click here: [BainbridgeGives.org](http://BainbridgeGives.org) and make your gift by June 15th -- every little bit helps!

In case you're wondering, yes the \$11,000 we're requesting from BCF is less than the total budget for the dome. That's because BCF set \$11k as the maximum limit on all requests. But that doesn't mean we can't exceed that amount if there's enough enthusiasm and support for the project. So let's blow the doors off that \$11k and fully fund the project at \$16,000!! BPAA will receive every dollar you give, and everyone who comes to a planetarium show will have a great experience!

Thank YOU for YOUR support!

## Save These Dates!

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

**Saturday June 3, 10am-2pm — Bainbridge Library Summer Learning Kick-off Party.** BPAA will be in the Haiku Garden at the Library with our solar telescope to show visitors views of the very active Sun. Meet and talk with members of the public about why BPAA is a great community resource.

**Ordway Elementary 3rd Grade field trips to the Observatory:** On **Friday June 9** from 11-1 we will have 20 students, and on **Thursday June 15** from 10-2 we will have two groups of 25 students. Each visit will include a tour of the Observatory, a planetarium show, and an astronomy Q&A discussion. Come help introduce kids to astronomy. Events like these are a lot of fun.

**June 10, 7pm, Second Saturday program — "Exoplanets: Finding Life in the Galaxy"** presented by Dr. Rob Zellem, an astronomer at Nasa's Jet Propulsion Laboratory in Pasadena, California. His research is focused on the atmospheres of planets outside of our solar system. Dr. Zellem is a team member and team lead for a number of initiatives which use advanced tools, both earth and space based, to study exoplanets. He is also the charismatic and colorful leader of Exoplanet Watch, a citizen science group, which allows everyday people to reduce exoplanet transit datasets and contribute to real science. Preregistration required to attend in person or on Zoom; details at <https://bpaastro.org/events/>

**Friday June 30 - 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.

**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!

**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 a work party to make upgrades and repairs. Especially interesting is the work we're doing to upgrade the capabilities of the Ritchie Telescope.

**"Cosmic Conversations" are on the third Tuesday of each month from 6-9pm.** Join other BPAA members 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.

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## **WHAT'S UP(COMING)!**

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

Jun 2 – [The Great Globular Cluster in Hercules is well placed](#)

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

– Full Moon

Jun 4 – [Venus at greatest elongation east](#)

Jun 6 – [Asteroid 11 Parthenope at opposition](#)

– [Messier 10 is well placed](#)

Jun 11 – [Daytime Arietid meteor shower 2023](#)

– [Messier 92 is well placed](#)

Jun 17 – New Moon

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

Jun 27 – [June Bootid meteor shower 2023](#)

Jun 29 – [The cluster NGC 6633 is well placed](#)

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

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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!

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## Stars Could Be Invisible Within 20 Years As Light Pollution Brightens Night Skies



The Milky Way photographed over the Philippines. It may soon be lost to view. Photograph: Gilbert Rondilla Photography/Getty Images

The increased use of light-emitting diodes (LED) and other forms of lighting are now brightening the night sky at a dramatic rate, scientists have found. Indiscriminate use of external lighting, street illumination, advertising, and illuminated sporting venues is now blinding our view of the stars.

In 2016, astronomers reported that the Milky Way was no longer visible to a third of humanity and light pollution has worsened considerably since then. At its current rate most of the major constellations will be indecipherable in 20 years, it is estimated. The loss, culturally and scientifically, will be intense.

(Source: [theguardian.com](http://theguardian.com))

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## Red Galaxies At Night, Astronomers' Delight: A Look At The "Hubble-Dark" Universe



The Cartwheel Galaxy, right, dazzles in this composite near- and mid-infrared image from JWST. NASA / ESA / CSA / STScI

JWST has given us a new look at galaxies as they were in the first few billion years of the universe. Among the newly discovered galaxies is a population of flat, red, extended disks that may have been entirely missed by previous surveys.

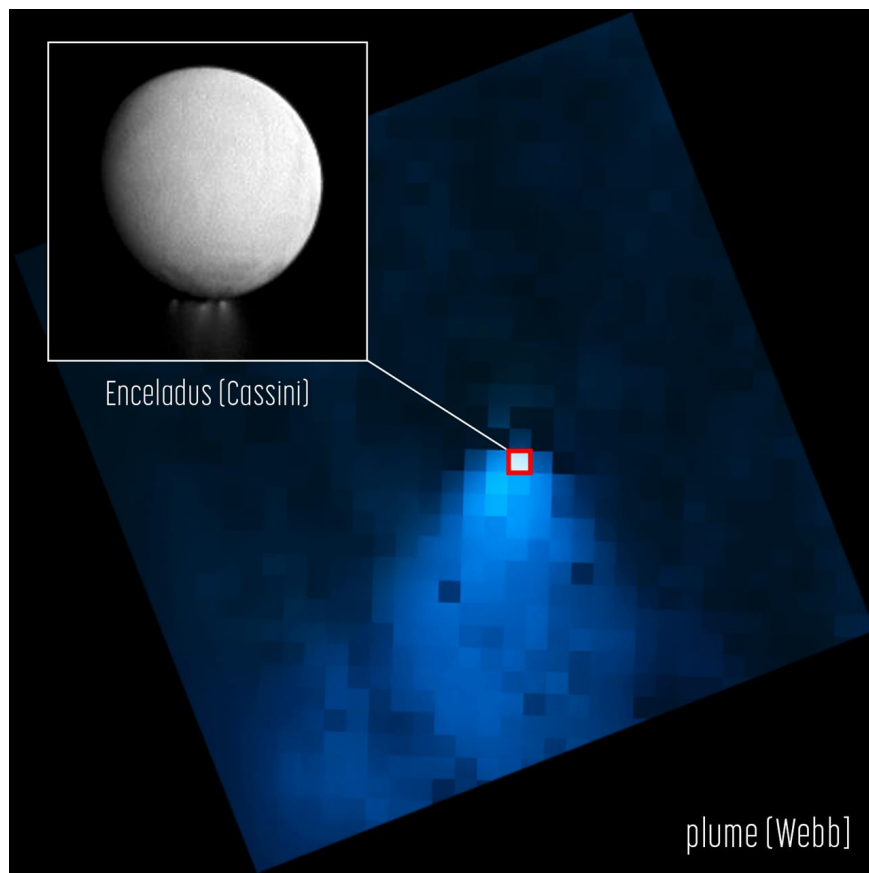
In a recently published article, a team led by Erica Nelson (University of Colorado) has reported on their analysis of JWST observations from the Cosmic Evolution Early Release Science (CEERS) Survey. This survey was conducted at infrared wavelengths of a few microns (1 micron =  $10^{-6}$  meter). The same field of view surveyed by CEERS was also visited by the Hubble Space Telescope during the Cosmic Assembly Near-infrared Deep Extragalactic Legacy Survey (CANDELS), though Hubble viewed the area at shorter wavelengths.

Nelson and collaborators noticed that the new JWST images contained galaxies that were absent in the Hubble images of the same region. By selecting for galaxies with certain color characteristics, the team picked out 26 galaxies that were bright in the JWST images but missing in the Hubble images. Among these newfound galaxies are a dozen that are remarkably extended rather than compact — a potentially unexplored population of galaxies present 1–3 billion years after the Big Bang.

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

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## Webb Maps Surprisingly Large Plume Jetting From Saturn's Moon Enceladus



In this image, NASA's James Webb Space Telescope shows a water vapor plume jetting from the southern pole of Saturn's moon Enceladus, extending out 20 times the size of the moon itself. The inset, an image from the Cassini orbiter, emphasizes how small Enceladus appears in the Webb image compared to the water plume. Credits: NASA, ESA, CSA, STScI, and G. Villanueva (NASA's Goddard Space Flight Center). Image Processing: A. Pagan (STScI).

A water vapor plume from Saturn's moon Enceladus spanning more than 6,000 miles – nearly the distance from Los Angeles, California to Buenos Aires, Argentina – has been detected by researchers using NASA's James Webb Space Telescope. Not only is this the first time such a water emission has been seen over such an expansive distance, but Webb is also giving scientists a direct look, for the first time, at how this emission feeds the water supply for the entire system of Saturn and its rings.

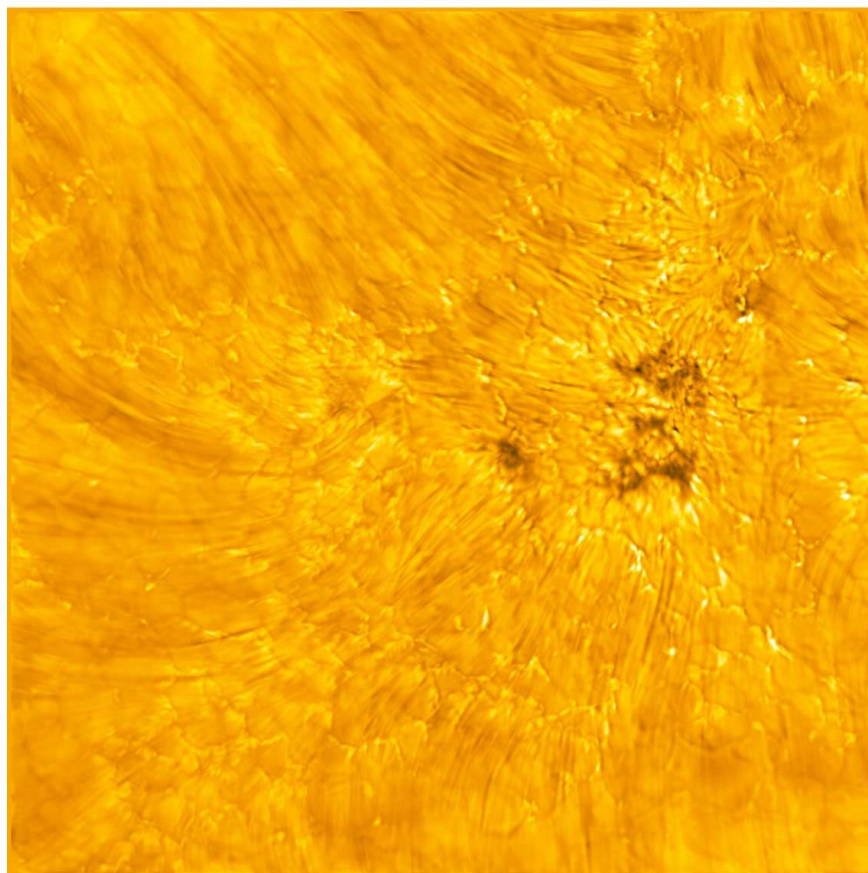
Enceladus, an ocean world about four percent the size of Earth, just 313 miles across, is one of the most exciting scientific targets in our solar system in the search for life beyond Earth. Sandwiched between the moon's icy outer crust and its rocky core is a global reservoir of salty water. Geyser-like volcanos spew jets of ice particles, water vapor, and organic chemicals out of crevices in the moon's surface informally called 'tiger stripes.'

Previously, observatories have [mapped jets hundreds of miles](#) from the moon's surface, but Webb's exquisite sensitivity reveals a new story.

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

## The Sun Gets Its Close-Up: Images From New Solar Telescope

2022-04-15T19:50:10.146 WVL = 486.136 nm



This image shows fine, dark threads known as fibrils in the chromosphere. The magnetic fields for the fibrils come from further down, in the photosphere, especially from the dark pores and umbral fragments. NSF / AURA / NSO; Image Processing: Friedrich Wöger(NSO), Catherine Fischer (NSO) Science Credit: Juan Martínez-Sykora (Bay Area Environmental Research Institute)

The Daniel K. Inouye Solar Telescope shows some stunning detail on the Sun, including sunspots, fibrils, granules, and other solar textures.

The Inouye solar telescope, part of Haleakalā Observatory on Maui, Hawai'i, just completed its first year of commissioning science observations in February. During this period, scientists test out and calibrate the instruments while also conducting valuable science. It was operating with only three of its five instruments, though; the fourth was only recently installed, and the fifth should be integrated next year.

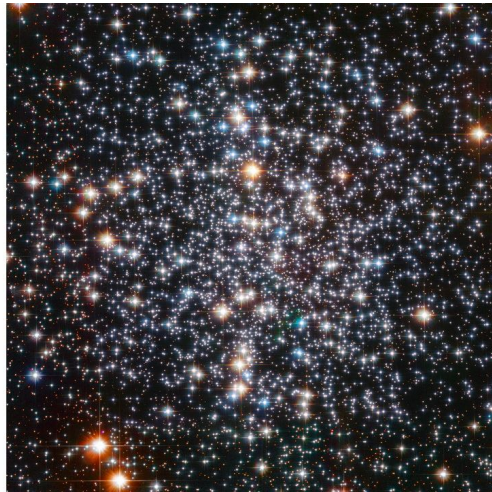
(Source: [skyandtelescope.org](https://skyandtelescope.org))

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## NASA's Hubble Hunts for Intermediate-Sized Black Hole Close to Home



A Hubble Space Telescope image of the globular star cluster, Messier 4. The cluster is a dense collection of several hundred thousand stars. Astronomers suspect that an intermediate-mass black hole, weighing as much as 800 times the mass of our Sun, is lurking, unseen, at its core. Credits: Image - ESA/Hubble, NASA; Science - NASA, ESA, Eduardo Vitral (STScI)

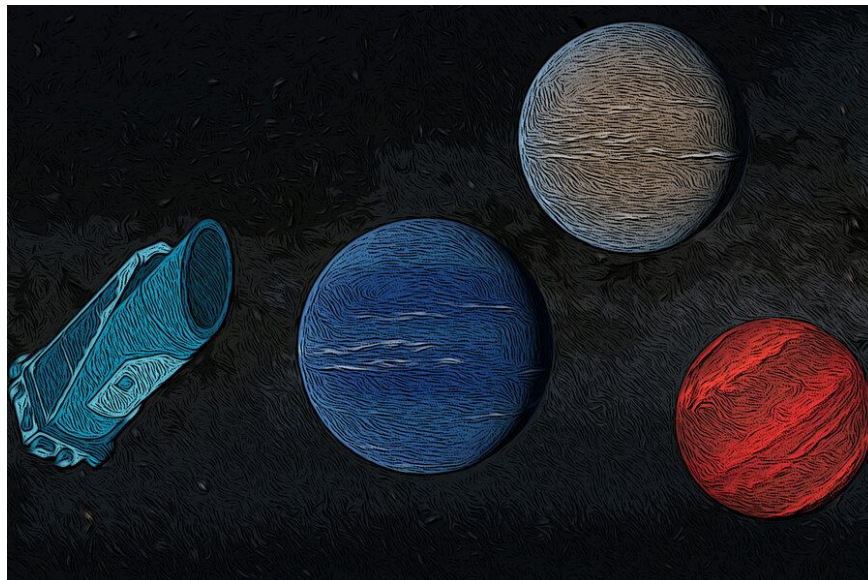
The cores of globular star clusters are hunting grounds for intermediate-mass black holes. They are smaller than galaxies and should have correspondingly smaller black holes. Over 150 of these snow-globe-shaped collections of hundreds of thousands of stars orbit our Milky Way galaxy, like artificial satellites whirling around Earth. Searches for intermediate-mass black holes in these clusters have been elusive. The suspected central black hole can't be directly observed, of course. Astronomers gather circumstantial evidence by watching stars swarming around the black hole, like bees around a hive. Based on their speeds, the invisible central mass can be calculated using straightforward Newtonian laws of physics.

Tracking the stars is meticulous work that's cut out for the Hubble Space Telescope's sharp resolution and longevity. Astronomers looking through over a decade of Hubble observations of the nearby globular star cluster Messier 4 calculated there is a very dense central object of about 800 solar masses. It is so compact, the observations tend to rule out alternative theories as to what's happening in the heart of the cluster.

(Source: [hubblesite.org](http://hubblesite.org))

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## Astronomers Discover the Last Three Planets the Kepler Telescope Observed Before Going Dark



With the help of citizen scientists, astronomers discovered what may be the last three planets that the Kepler Space Telescope saw before it was retired. This illustration depicts NASA's Kepler Space Telescope, which retired in October 2018, and three planets discovered in its final days of data. Credit: NASA's Jet Propulsion Laboratory

More than 5,000 planets are confirmed to exist beyond our solar system. Over half were discovered by NASA's Kepler Space Telescope, a resilient observatory that far outlasted its original planned mission. Over nine and a half years, the spacecraft trailed the Earth, scanning the skies for periodic dips in starlight that could signal the presence of a planet crossing in front of its star.

In its last days, the telescope kept recording the brightness of stars as it was running out of fuel. On Oct. 30, 2018, its fuel tanks depleted, the spacecraft was officially retired.

Now, astronomers at MIT and the University of Wisconsin at Madison, with the help of citizen scientists, have discovered what may be the last planets that Kepler gazed upon before going dark.

(Source: [phys.org](http://phys.org))

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