BATTLE POINT ASTRONOMICAL ASSOCIATION

Igniting passion for science through the lens of astronomy!

THE OBSERVER

July 2024, Vol. 38

Upcoming Volunteer Opportunities!

We've got some very near-term volunteer opportunities that we would love to see folks step up to support.

1. Grand Old 4th Street Fair

Come visit us at BPAA's booth on July 4th during the Grand Old 4th Street Fair. Or better yet, volunteer to spend a few hours with fellow members and interacting with curious visitors! There's still time to volunteer for a shift or two, or to help with setup and takedown. Simply fill out this form:

Volunteer Sign-up: Grand Old 4th

2. Rotary Auction, July 6

BPAA has in the past received funding from the Rotary Club. Help us say "Thank You" to Rotary by volunteering to help with the Auction. You can help during the auction itself, or during setup which is already underway this week. No prior experience necessary!

Volunteer here: Rotary Auction Volunteer Sign-up. When you sign up, be sure to select "Battle Point Astronomical Assoc" in the "non-profit team" drop-down menu.

Grants Awarded

We've recently received notification of two successful grant applications.

1. BCF Community Grant

Thank you to everyone who supported BPAA's Community Grant request through the Bainbridge Community Foundation! Thanks to your support we will be receiving $13,350 for further improvements to the Rudolph Planetarium.

2. Archibald Grant

We've also been granted $7,500 from the Archibald Foundation toward the purchase of electronic equipment for the new telescope, specifically to enhance our ability to capture images in near-real time for display on the big screen TV downstairs and to viewers at home. This equipment improves accessibility for viewers who are unable to climb the spiral stairway to the roof.

Pardon Our Dust!

We're in the thick of the action with the new telescope and the dome repair!

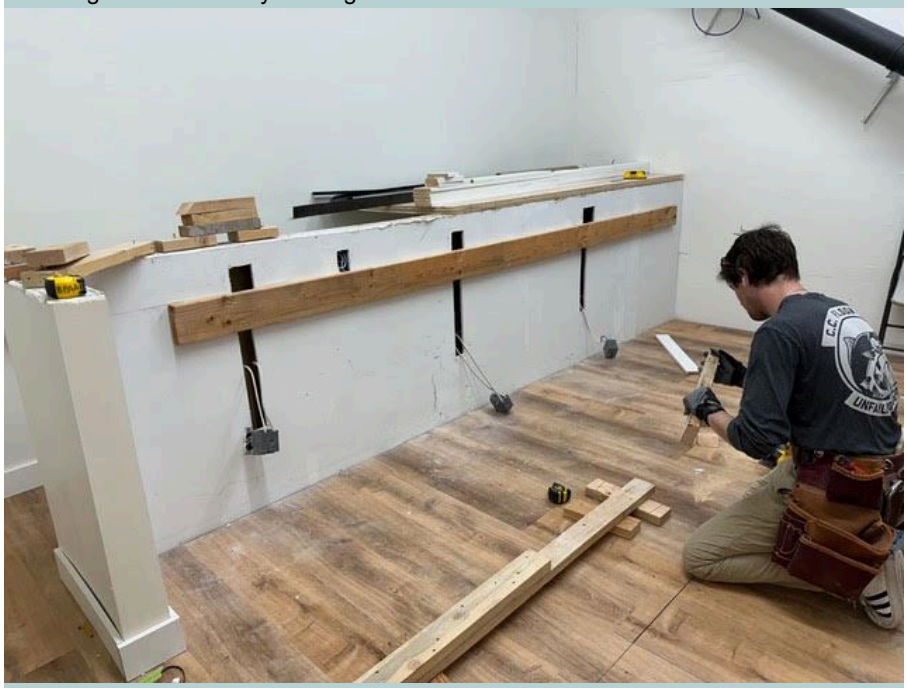
To focus our volunteer efforts and ease the foot traffic through the observatory (an active construction zone), we've cancelled the majority of our events at the Rudolph Planetarium for the summer. This includes private shows and the travel planetarium. We're sorry for the inconvenience, but Battle Point Park has loads of summer events to keep your busy and entertained!

We'll see you at our regularly scheduled events again in the fall!

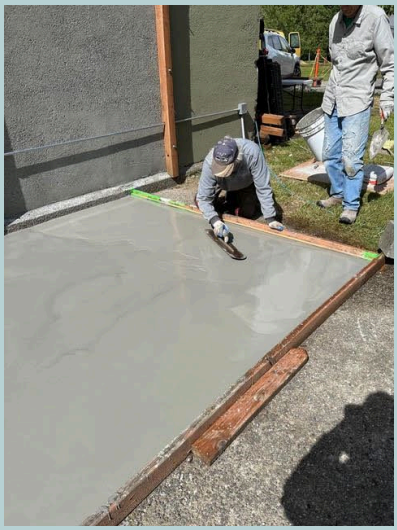
Observatory Upgrades Progress
from Peter Mosely

And since you're wondering about our ongoing projects, here are updates on all that work!

Cole began the month by starting the construction of our workbench:



Frank, Dan and Chuck then prepared the pad for the new shed with expert trowel work by Allen Lang. We then partially assembled the shed, as we need to remove the roof when the Ritchie telescope is placed there.



Meanwhile Steve McGlothlen had volunteered to paint the arches. A lot of prep work was done by Chuck, Dan, Peter, Dave and Frank. Steve then epoxy primed for the white surface and then painted that side white.

After some cure time, the arches were turned over and masked for the black paint. Here they are in their two tone:

Meanwhile the scaffolding was completed, and the shutter removed:

A big tarp was dragged into place to protect the dome and telescope:

The pedestal for the new CDK telescope arrived.

Our new mailbox was installed by Frank and Dave.

And finally, a 55” OLED TV was donated, and Cole installed it in the Library.

Call for Volunteers for Rooftop Dome Reconstruction
from Frank Petrie

As you just read, the new arches for the rooftop dome have been painted, and the temporary internal scaffolding has been built. We are still in need volunteers to help make this project successful. No experience necessary, just a willingness to get involved and make a difference! Contact Frank at president@bpastro.org to learn more and join the crew.

Planeteers Needed!

We are also 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.

And here are links to sign up for upcoming Planeteer training sessions:

07/20: https://givebutter.com/r7e2i5

07/27: https://givebutter.com/ZWd9lL

08/17: https://givebutter.com/WasidE

08/24: https://givebutter.com/vI8ObQ

Another Volunteer Opportunity!

We are starting a new volunteer role for members here at the Observatory. It is for individuals who would like to learn how to use basic visual telescopes AND help operate them at our public Star parties, pointing out different objects to the guests. We are calling these volunteer positions "Astro Ambassadors".

If anyone is interested in getting involved, they can email astronomer@bpastro.org or get in touch with Cole on discord. We have a dedicated chat on the discord for astro-ambassadors as well.

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!

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 – Conjunction of the Moon and Mars

– The cluster IC 4756 is well placed

Jul 5 – New Moon

Jul 15 – Close approach of Mars and Uranus

Jul 21 – Full Moon

Jul 23 – 134340 Pluto at opposition

Jul 24 – Conjunction of the Moon and Saturn

Jul 25 – Close approach of the Moon and Neptune

Jul 28 – Piscis Austrinid meteor shower 2024 peak

Jul 29 – Close approach of the Moon and M45

Jul 30 – Southern δ-Aquariid meteor shower 2024 peak

– α-Capricornid meteor shower 2024 peak

– Conjunction of the Moon and Mars

– Conjunction of the Moon and Jupiter

Aug 4 – New Moon

Aug 6 – Asteroid 16 Psyche at opposition

– Asteroid 7 Iris at opposition

Aug 12 – Perseid meteor shower 2024 peak

Aug 13 – Messier 15 is well placed

Aug 14 – Conjunction of Jupiter and Mars

– Messier 2 is well placed

Aug 17 – κ-Cygnid meteor shower 2024 peak

Aug 19 – Full Moon

Aug 20 – Conjunction of the Moon and Saturn

Aug 25 – Close approach of the Moon and M45

Aug 27 – Conjunction of the Moon and Jupiter

– Conjunction of the Moon and Mars

Aug 31 – Aurigid meteor shower 2024 peak

Sep 2 – Asteroid 194 Prokne at opposition

– New Moon

Sep 6 – Mercury at highest altitude in morning sky

Sep 7 – Saturn at opposition

Sep 9 – September ε-Perseid meteor shower 2024 peak

Sep 17 – Full Moon

– Partial lunar eclipse

– Lunar occultation of Saturn

– Lunar occultation of Neptune

Sep 20 – Neptune at opposition

Sep 22 – September equinox

– Close approach of the Moon and M45

Sep 23 – Conjunction of the Moon and Jupiter

Sep 25 – Conjunction of the Moon and Mars

Sep 27 – Daytime Sextantid meteor shower 2024 peak

Sep 29 – Asteroid 20 Massalia at opposition

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!

The Pillars of Creation and the Interplay of Stars and Dust

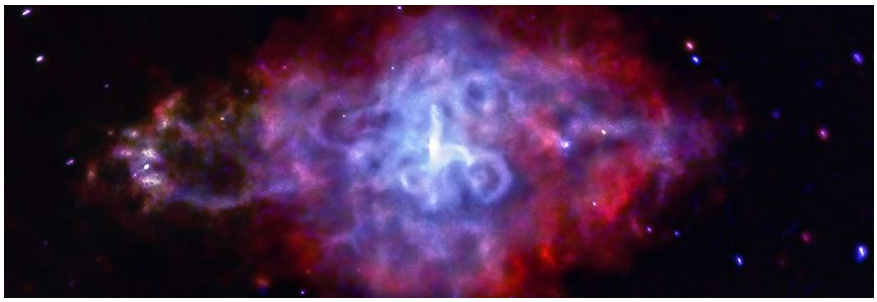
A mosaic of visible-light (Hubble) and infrared-light (Webb) views of the same frame from the Pillars of Creation visualization. The visualization sequence fades back and forth between these two models as the camera flies past and amongst the pillars. These contrasting views illustrate how observations from the two telescopes complement each other. Credit: Greg Bacon, Ralf Crawford, Joseph DePasquale, Leah Hustak, Christian Nieves, Joseph Olmsted, Alyssa Pagan, and Frank Summers (STScI), NASA's Universe of Learning

This scientific visualization explores the iconic Pillars of Creation in the Eagle Nebula (Messier 16 or M16) and the various ways that stars and dust are intertwined in the process of star formation. In developing the contextual story and the three-dimensional model, the video uses data from science papers, the Hubble Space Telescope, the Webb Space Telescope, the Spitzer Space Telescope, and the Chandra X-ray Observatory. Click on the image above or here to see the video.

The Pillars of Creation get their nickname from the fact that stars are forming within these dust clouds. The visual tour highlights various stages of star formation, including an embedded protostar at the top of the central pillar, bipolar jets from a hidden star in the process of forming in the upper part of the left pillar, and a newborn star in the middle of the left pillar.

(Sources: webbtelescope.org; NASA Science)

Three Neutron Stars Reveal Inside Secrets



This image of the supernova remnant 3C 58 contains a white-hot neutron star at its center (white). That neutron star, however, is cooler than expected compared to its siblings elsewhere in the galaxy. Around it in the center is a torus filled with speedy charged particles and a jet. The image is colorized by the energy of the X-rays (low-energy X-rays are red, medium-energy are green, and high-energy are blue). X-ray: NASA / CXC / ICE-CSIC / A. Marino et al.; Optical: SDSS; Image Processing: NASA / CXC / SAO / J. Major

Astronomers using the XMM-Newton and Chandra space telescopes have revisited a trio of young neutron stars that are particularly cool for their age. Explaining their existence requires ruling out 75% of all neutron star models — bringing astronomers closer to identifying the correct one.

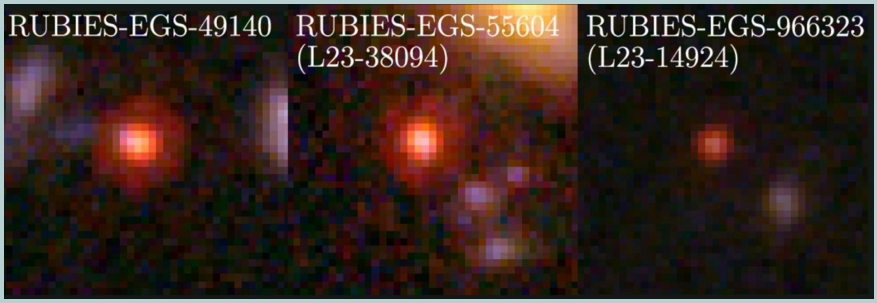
A neutron star is among the universe's most exotic objects, forged in the fury of a massive star's death. The star's core buckles under its own weight, crashing down so hard that electrons and protons are forced to merge into neutrons. The resulting neutron star material is so dense that a single spoonful would weigh more than every human on Earth put together.

Yet astronomers still don't know the exact structure of a neutron star, which probably includes electrons and protons in its crust and maybe quarks in its core. The key to finding out what's really inside neutron stars is identifying the correct equation of state that describes the temperature and pressure of all neutron star interiors. There are hundreds of possibilities.

Now, finally, astronomers have been able to narrow that field. The team, led by Alessio Marino (Institute of Space Sciences, Spain), studied a collection of 70 isolated neutron stars. Using XMM-Newton's and Chandra's measurements of the stars' X-rays, they estimated their temperatures. Crucially, some were still surrounded by supernova remnants, meaning the team could estimate their ages. All of those with age estimates were between 800 and 8,000 years old — astronomical infants. The team's findings are published in Nature Astronomy.

(Source: skyandtelescope.org)

Tiny Bright Objects Discovered at Dawn of Universe Baffle Scientists



Researchers investigated three mysterious objects in the early universe. Shown here are their color images, composited from three NIRCam filter bands onboard the James Webb Space Telescope. They are remarkably compact at red wavelengths (earning them the term "little red dots"), with some evidence for spatial structure at blue wavelengths. Credit: Bingjie Wang/Penn State; JWST/NIRSpec.

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A recent discovery by NASA's James Webb Space Telescope (JWST) confirmed that luminous, very red objects previously detected in the early universe upend conventional thinking about the origins and evolution of galaxies and their supermassive black holes.

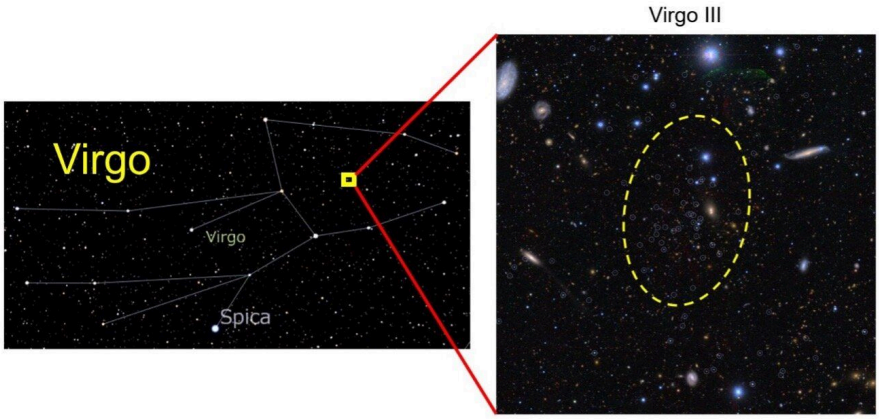
An international team, led by Penn State researchers, using the NIRSpec instrument aboard JWST as part of the RUBIES survey identified three mysterious objects in the early universe, about 600–800 million years after the Big Bang, when the universe was only 5% of its current age. They announced the discovery today June 27 in Astrophysical Journal Letters.

The team studied spectral measurements, or intensity of different wavelengths of light emitted from the objects. Their analysis found signatures of "old" stars, hundreds of millions of years old, far older than expected in a young universe.

The researchers said they were also surprised to discover signatures of huge supermassive black holes in the same objects, estimating that they are 100 to 1,000 times more massive than the supermassive black hole in our own Milky Way. Neither of these are expected in current models of galaxy growth and supermassive black hole formation, which expect galaxies and their black holes to grow together over billions of years of cosmic history.

(Source: phys.org)

Astronomers Discover Two New Milky Way Satellite Galaxy Candidates



The position of a newly found dwarf galaxy (Virgo III) in the constellation Virgo (left) and its member stars (right; those circled in white). The member stars are concentrated inside the dashed line in the right panel. Credit: NAOJ/Tohoku University

For years, astronomers have worried about how to explain why the Milky Way has fewer satellite galaxies than the standard dark matter model predicts. This is called the "missing satellites problem."

In order to bring us closer to solving this problem, an international team of researchers used data from the Hyper Suprime-Cam (HSC) Subaru Strategic Program (SSP) to discover two completely new satellite galaxies.

These results were published in the Publications of the Astronomical Society of Japan on June 8, 2024 by a team of researchers from Japan, Taiwan, and America.

The research team recognized the possibility that there are likely many undiscovered, small satellite galaxies (dwarf galaxies) which are far away and difficult to detect. The powerful ability of the Subaru telescope—which sits atop an isolated mountain above the clouds in Hawaii—is well-suited to find these galaxies. In fact, this research team previously found three new dwarf galaxies using the Subaru telescope.

Now, the team has discovered an additional two new dwarf galaxies (Virgo III and Sextans II). With this discovery, a total of nine satellite galaxies have been found by different research teams. This is still much fewer than the 220 satellite galaxies predicted by the standard theory of dark matter.

(Source: phys.org)

China’s Chang’e 6 Mission Has Brought Back Material from the Farside of The Moon

The recovery of the Chang'e 6 sample return capsule. Credit: CGTN

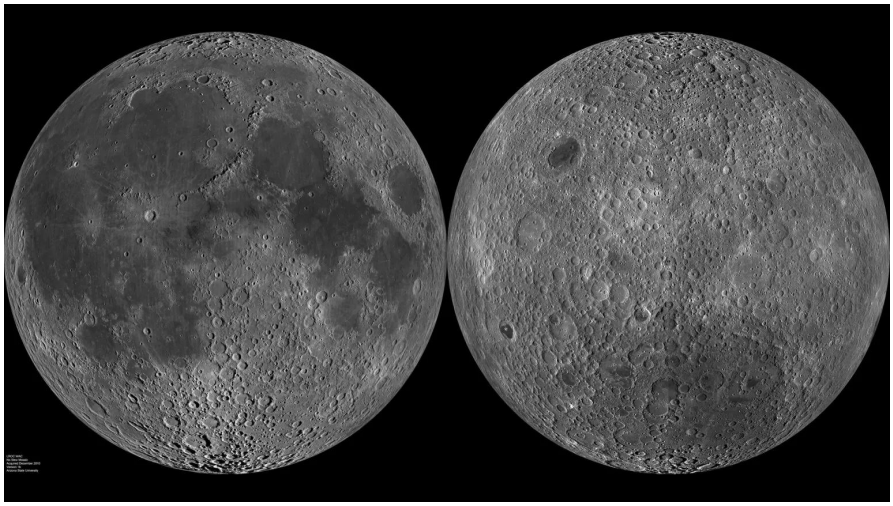
In a whirlwind, 53-day mission, China’s Chang’e 6 sample-return capsule reentered Earth’s atmosphere over the Siziwang Banner site in Inner Mongolia early Tuesday, carrying precious cargo: an estimated 2 kilograms (4.4 pounds) of material from the farside of the Moon.

"The Chang'e 6 returner landed accurately in the designated area . . . and operated normally, marking the complete success of the Chang'e 6 mission of the lunar exploration project and the world's first return of samples from the back of the Moon," the China National Space Agency announced in a recent press statement.

The bell-shape capsule touched down at around 6:07 Universal Time (2:07 p.m. China Standard Time) on June 25th, marking a new pinnacle in China's lunar sample-return missions. In 2019, Chang’e 4 landed on the farside landing and in late 2020, Chang’e 5 returned more than 1.7 kilograms (61 ounces) of material from the Mons Rümker site on the lunar nearside. Of that return, 77.7 grams have been distributed to 114 research teams worldwide.

(Source: skyandtelescope.org)

The Mystery of the Moon's Two Faces Could Soon Be Solved



This two-faced mosaic from NASA's Lunar Reconnaissance Orbiter shows the near side (L) and the far side (R) of the Moon with modern technology. By looking at the ratios and sizes of craters found on the Moon with respect to the age of that portion of the Moon, Mars, Mercury, and Earth, we can learn how cratering rates have varied over the Solar System's history. Now, with our first samples from the lunar far side having been returned to Earth, we might finally learn more about the Moon's ultimate origins. Credit: NASA/GSFC/Arizona State University

Long ago, something odd must have happened way back when the Moon first formed. We aren't sure exactly what it was or how it happened, but the aftermath of those events led to a tremendous set of differences between the Moon's near side — the side that always faces us — and the far side, which can only be accessed via spacecraft. The near side is full of familiar and recognizable features, including:

- heavily cratered white areas, representing old lunar highlands,
- sparsely cratered dark areas, representing lowlands known as lunar maria,
- bright rays emerging from many of the deep lunar craters, but only in the dark maria areas,
- and many craters of different sizes superimposed atop one another but found almost exclusively in the light highland areas.

But the far side, which was only glimpsed for the first time with a 1959 space mission, is very different. It's almost exclusively comprised of heavily cratered highlands, and the few dark, low-lying maria that are present are very small in comparison to the near side. The simplest explanation for this effect is already known to be wrong, but a wild-yet-compelling theory is about to be put to the test. Now that China's Chang'e-6 mission has successfully returned lunar samples taken from the Moon's far side to Earth for the first time in human history, we can at last analyze them and compare them to near side samples that have been around since the Apollo era. After all these years, the mystery of the Moon's two hemispheres could finally be solved.

(Source: Big Think)

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