BATTLE POINT ASTRONOMICAL ASSOCIATION

Igniting passion for science through the lens of astronomy!

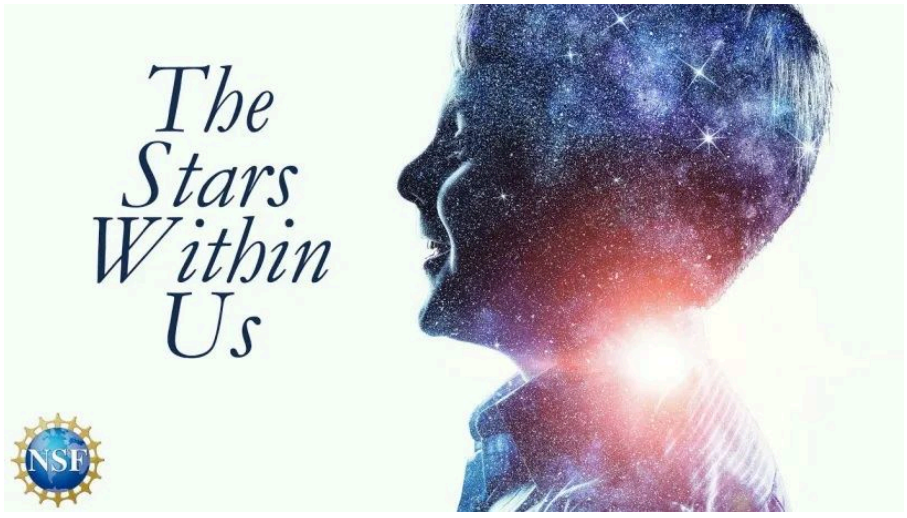

Photo Credit: Frank Petrie

THE OBSERVER

September 2024, Vol. 40

Second Saturday Program
September 14, 7:00pm

Dr. Joe Pesche, National Science Foundation



Please join us in welcoming Dr. Joe Pesche of the National Science Foundation as he shares *The Stars Within Us*, a show all about how the elements inside you, and in everything else, were forged.

Joe is an astrophysicist specializing in supermassive black holes. As a Program Officer at the US National Science Foundation, he oversees major ground-based radio astronomy facilities. Additionally, he is a part-time professor at George Mason University and a visiting professor at the University of Colorado. Wow! Joe will join us over Zoom to share all about *The Stars Within Us*.

Reserve your spot here: https://givebutter.com/iFcKd5

Members Meeting – Equinox Party
September 21, 7:00pm

What better way to celebrate the equinox than an equinox party? Join us as we celebrate equal day and equal night! (Did you know that's what equinox meant?) We will bring the drinks, dishes, utensils, and fun, but we ask that you bring the food. We'll have the potluck portion of our event outside (shelter will be provided if rain is forecasted). Then, we'll take the party inside with space-themed board games and puzzles. We'll also introduce you to our new telescope, which is nearing completion!

Finally, for those who can stay on after the session ends (and if the sky is clear), we'll head outside as it gets dark and put our personal and loaner telescopes to good use! Be sure to dress warm!

Register to join us: https://givebutter.com/o1OAnJ

Cosmic Conversations

September 17, 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.

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.

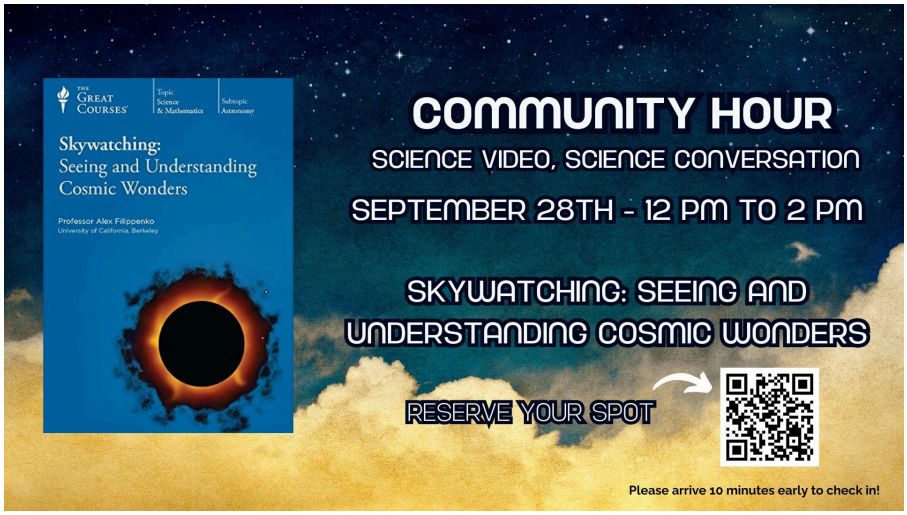
And here are links to sign up for upcoming Planeteer training sessions:

09/14: https://givebutter.com/yKlJpt

09/21: https://givebutter.com/D4zQp9

Fourth Saturday Community Hour

September 28th, 12:00pm to 2:00pm



BPAA welcomes you to our free, Fourth Saturday Community Hour where we'll show excerpts from a thought-provoking and informative science video followed by a rousing discussion. This month's discussion will center around the first two video lectures in the Great Courses series Skywatching: Seeing and Understanding Cosmic Wonders, where each lecture is about 45 minutes long. We will be taking a stretch break after the first video lecture, and occasional pauses for quick discussions as warranted.

Get an unparalleled visual guide to nature's most mysterious and beautiful offerings with Skywatching: Seeing and Understanding Cosmic Wonders. With these twelve 45-minute lectures, award-winning astronomer and Professor Alex Filippenko of the University of California, Berkeley, has crafted a visually stunning tour of the sky's most dazzling displays, most of which you can see even without binoculars. Using the same dynamic and engaging teaching style that has won him praise from countless lifelong learners around the world, he shows you new ways to see your surroundings and appreciate the marvels of both our planet and the entire universe. You'll get up close and personal with nearby phenomena like clouds, sunsets, and rainbows, and then venture far out into space to learn about stars, planets, meteors, and more. Lecture 1 is titled Day and Night Skies across All Distances, and Lecture 2 is titled The Blue Sky, Clouds, and Lightning.

Come join us as we begin our Skywatching adventure to see and understand all types of cosmic wonders!

Sign up with the QR code above or at: https://givebutter.com/fdmmV7

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!

Astro Ambassador Volunteer Opportunity!

We are starting a new volunteer role, Astro Ambassadors, 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.

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.

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.

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

Oct 1 – The Andromeda Galaxy is well placed

Oct 2 –New Moon

Oct 3 – NGC 253 is well placed

Oct 5 – October Camelopardalid meteor shower 2024 peak

Oct 8 – Draconid meteor shower 2024 peak

Oct 10 – Southern Taurid meteor shower 2024 peak

Oct 11 – δ-Aurigid meteor shower 2024 peak

Oct 14 – Conjunction of the Moon and Saturn

– The Triangulum Galaxy is well placed

Oct 17 – Full Moon

– Asteroid 19 Fortuna at opposition

– 136199 Eris at opposition

Oct 18 – ε-Geminid meteor shower 2024 peak

Oct 21 – Conjunction of the Moon and Jupiter

– Orionid meteor shower 2024 peak

Oct 23 – Conjunction of the Moon and Mars

Oct 24 – Leonis Minorid meteor shower 2024 peak

Oct 26 – The Perseus Double Cluster is well placed

Oct 27 – Asteroid 1036 Ganymed at opposition

Nov 1 – New Moon

Nov 10 – Conjunction of the Moon and Saturn

Nov 12 – Northern Taurid meteor shower 2024 peak

Nov 13 – Asteroid 11 Parthenope at opposition

Nov 15 – Full Moon

– Close approach of the Moon and M45

Nov 16 – Uranus at opposition

Nov 17 – Leonid meteor shower 2024 peak

– Conjunction of the Moon and Jupiter

– The Pleiades cluster is well placed

Nov 20 – Conjunction of the Moon and Mars

Nov 21 – α-Monocerotid meteor shower 2024 peak

Nov 22 – Mercury at highest altitude in evening sky

Nov 27 – The Hyades cluster is well placed

Nov 28 – November Orionid meteor shower 2024 peak

Nov 29 – Comet 333P/LINEAR passes perihelion

Nov 30 – New 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!

The Rubin Observatory Will Unleash a Flood of NEO Detections

The Vera Rubin Observatory is poised to begin observations next year. It could detect 130 Near Earth Objects each night. Credit: Rubin Observatory/NSF/AURA/B. Quint

After about 10 years of construction, the Vera Rubin Observatory (VRO) is scheduled to see its first light in January 2025. Once it's up and running, it will begin its Legacy Survey of Space and Time (LSST), a decade-long effort to photograph the entire visible sky every few nights. It'll study dark energy and dark matter, map the Milky Way, and detect transient astronomical events and small solar system objects like Near Earth Objects (NEOs).

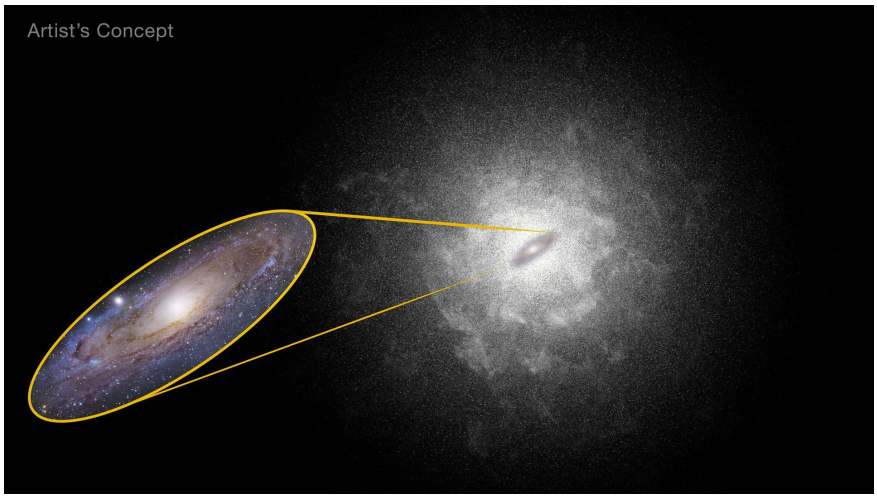
New research shows the LSST will detect about 130 NEOs per night in the first year of observations.

NEOs are small solar system bodies, usually asteroids, that orbit the sun and come within 1.3 astronomical units of the sun. When a NEO crosses Earth's orbit at some point, it's considered a potentially hazardous object (PHO). NASA is currently cataloging NEOs, and while they've made progress, there are many more left to find.

According to new research, the upcoming LSST will detect about 130 NEOs per night. The research is "Expected Impact of Rubin Observatory LSST on NEO Follow-up," and it's still in peer-review but is available on the arXiv preprint server. The lead author is Tom Wagg, a Ph.D. student at the DiRAC Institute and the Department of Astronomy at the University of Washington in Seattle.

(Source: phys.org)

NASA's Roman Space Telescope to Investigate Galactic Fossils



The stellar halo is a common but not well-studied feature of galaxies. This loose collection of stars extends 15 to 20 times beyond the radius of the brightest part of the galaxy, which is what we're used to seeing in telescope images. The stars comprising a halo are some of the oldest in a galaxy. One of the few galaxies with a well-studied stellar halo is our neighbor, Andromeda, depicted here in the graphic. The reason Andromeda's halo can be investigated so thoroughly is simply a matter of distance, both being close enough and bright enough that we can see the full picture with our current class of telescopes.
The stellar halo is illustrated here with exaggerated brightness and density to show how far it extends. In reality, the full stellar halo is too dim and sparse to examine without painstaking hours of observation time on the sharpest resolution telescopes available. When the Nancy Grace Roman Space Telescope launches, it will be able to use its wide field of view to comprehensively image many more stellar halos of more distant galaxies. Credits: NASA, Joseph Olmsted (STScI)

The universe is a dynamic, ever-changing place where galaxies are dancing, merging together, and shifting appearance. Unfortunately, because these changes take millions or billions of years, telescopes can only provide snapshots, squeezed into a human lifetime.

However, galaxies leave behind clues to their history and how they came to be. NASA's upcoming Nancy Grace Roman Space Telescope will have the capacity to look for these fossils of galaxy formation with high-resolution imaging of galaxies in the nearby universe.

Astronomers, through a grant from NASA, are designing a set of possible observations called RINGS (the Roman Infrared Nearby Galaxies Survey) that would collect these remarkable images, and the team is producing publicly available tools that the astronomy community can use once Roman launches and starts taking data. The RINGS survey is a preliminary concept that may or may not be implemented during Roman's science mission.

Roman is uniquely prepared for RINGS due to its resolution akin to NASA's Hubble Space Telescope and its wide field of view – 200 times that of Hubble in the infrared – making it a sky survey telescope that complements Hubble's narrow-field capabilities.

(Source: stsci.edu)

Peeking into Perseus

This stunning new mosaic of images from the NASA/ESA/CSA James Webb Space Telescope showcases the nearby star-forming cluster, NGC 1333. The nebula is in the Perseus molecular cloud, and located approximately 960 light-years away. Credit: ESA/Webb, NASA & CSA, A. Scholz, K. Muzic, A. Langeveld, R. Jayawardhana

Webb's superb sensitivity allows astronomers to investigate young objects with extremely low masses. Some of the faintest 'stars' in the picture are in fact newly born free-floating brown dwarfs with masses comparable to those of giant planets.

The same cluster was featured as the 33rd anniversary image of the NASA/ESA Hubble Space Telescope in April of 2023. Hubble's image just scratched the surface of this region, because clouds of dust obscure much of the star formation process. Observing with a larger aperture and in the infrared part of the spectrum, Webb is capable of peering through the dusty veil to reveal newborn stars, brown dwarfs and planetary mass objects.

The centre of the image presents a deep peek into the heart of the NGC 1333 cloud. Across the image we see large patches of orange, which represent gas glowing in the infrared. These so-called Herbig-Haro objects form when ionised material ejected from young stars collides with the surrounding cloud. They are hallmarks of a very active site of star formation.

Many of the young stars in this image are surrounded by discs of gas and dust, which may eventually produce planetary systems. On the right hand side of the image, we can glimpse the shadow of one of these discs oriented edge-on — two dark cones emanating from opposite sides, seen against a bright background.

(Source: esawebb.org)

Webb Finds Early Galaxies Weren't Too Big for Their Britches After All

This image shows a small portion of the field observed by NASA's James Webb Space Telescope's NIRCam (Near-Infrared Camera) for the Cosmic Evolution Early Release Science (CEERS) survey. It is filled with galaxies. Some galaxies appear to have grown so massive, so quickly, that simulations couldn't account for them. However, a new study finds that some of those early galaxies are in fact much less massive than they first appeared. Black holes in some of those galaxies make them appear much brighter and bigger than they really are. Credits: NASA, ESA, CSA, S. Finkelstein (University of Texas)

It got called the crisis in cosmology. But now astronomers can explain some surprising recent discoveries.

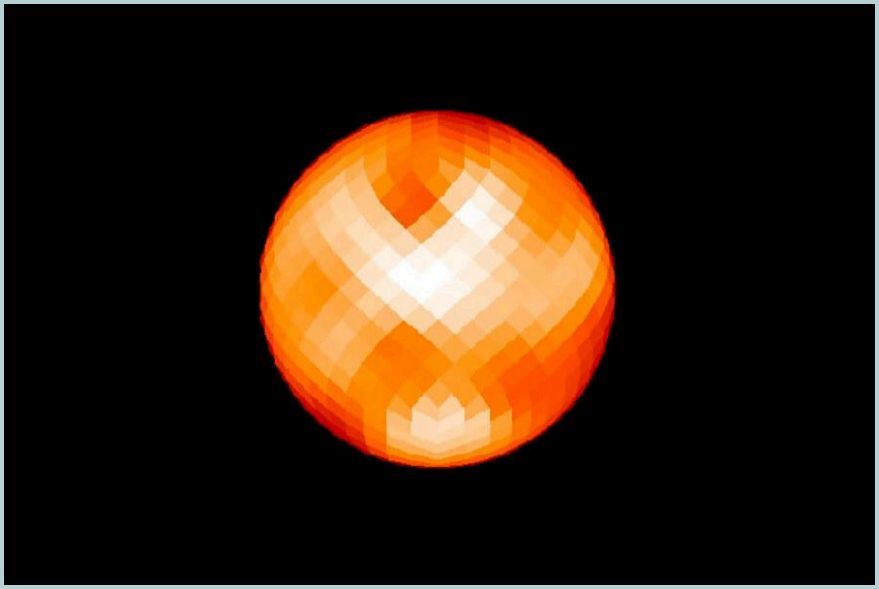
When astronomers got their first glimpses of galaxies in the early universe from NASA's James Webb Space Telescope, they were expecting to find galactic pipsqueaks, but instead they found what appeared to be a bevy of Olympic bodybuilders. Some galaxies appeared to have grown so massive, so quickly, that simulations couldn't account for them. Some researchers suggested this meant that something might be wrong with the theory that explains what the universe is made of and how it has evolved since the big bang, known as the standard model of cosmology.

According to a new study in the Astronomical Journal led by University of Texas at Austin graduate student Katherine Chworowsky, some of those early galaxies are in fact much less massive than they first appeared. Black holes in some of these galaxies make them appear much brighter and bigger than they really are.

"We are still seeing more galaxies than predicted, although none of them are so massive that they 'break' the universe," Chworowsky said.

(Source: NASA Science)

See the Surface of Polaris, the North Star



This visualization shows bright and dark spots on the surface of the North Star, Polaris. Polaris appears about 600,000 times smaller than the Full Moon in the sky. Credit: Evans et al. / Astrophysical Journal 2024

Astronomers have used an array of telescopes to reconstruct images of the surface of Polaris, the North Star. It's the first time that astronomers have glimpsed the surface of a Cepheid variable.

Polaris is one of the most famous stars in the night sky. Sitting almost directly at the celestial north pole, the star's position on the sky barely varies throughout the year. However, Polaris does change in other ways. It is the nearest Cepheid variable star, a type of giant star that brightens and dims in a regular, repeating pattern. What's more, it's a binary, with a companion star on a wide orbit.

To get a closer look at Polaris, a team of astronomers led by Nancy Evans (Smithsonian Astrophysical Observatory) set out to map the orbit of a companion star that swings around Polaris once every 30 years. The results are published in the August 20th *Astrophysical Journal*.

"The small separation and large contrast in brightness between the two stars makes it extremely challenging to resolve the binary system during their closest approach," Evans says. To pull it off, Evans turned to the Center for High Angular Resolution Astronomy (CHARA) array, a set of six 1-meter telescopes on the summit of Mount Wilson in California. The combination of all six instruments acts like a single 330-meter telescope.

(Source: skyandtelescope.org)

Record-Breaking Supernova Manages To “X-Ray” The Entire Universe

An event like AT2018cow, now known as either FBOTs or Cow-like events, is thought to be the result of a breakout shock from a cocooned supernova. With five such events now discovered, the hunt is on to uncover precisely what causes them, as well as what makes them so unique. "New physics," which some had theorized, is entirely unnecessary to explain this class of objects. Credit: Shanghai Astronomical Observatory, China

Every once in a while, a stellar cataclysm occurs in our Universe, bringing the life of a star to an end. The most common type of cataclysm is a core-collapse supernova, where a massive star’s interior implodes, leading to a runaway fusion reaction and a tremendous explosion, where the energy emitted by the star can briefly shine billions of times brighter than a typical star. And yet, it’s the rarer types of stellar cataclysms — superluminous supernovae, hypernovae, tidal disruptions events, and even more exotic explosions — that can shine brighter than anything else we have observed.

In 2018, a new class of explosions was seen for the first time: the “Cow” class. Detected automatically by a facility that monitors the sky for unexpected brightening (or faintening) events, its randomly generated name came out at AT2018cow, where the last three letters happened to spell an actual word. Today, it’s the prototype for a novel class of explosions that occur throughout the Universe. Another event in the same “Cow” class of objects was recently discovered: the first one detected not by its visible light signatures, but by its spectacular X-ray brightening. Known as AT2020mrf, it literally bathed the Universe in X-rays for billions of light-years, including us.

(Source: Big Think)

2024 Officers
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Chief Astronomer - Cole Rees
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Facilities Officer - Denise Hidano
Education Officer - Erin Leigh Howard
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Communications Manager (Non-voting position)
Liz Walker