

Igniting passion for science through the lens of astronomy!



Ritchie Dome Replacement Update



We can report that the aluminum shutter replacement for the Ritchie Telescope Dome, based on a design by Peter Moseley with help and review by many, is now well under way. The arches were formed by Albinico in Tualatin, OR and transported from there to BARN with a U-haul truck piloted by Frank Petrie with Peter riding herd. Bob Mathisrud and Peter Moseley cut the cross ribs and end beams and Patrick Clanton has been doing the welding. The basic welding should be done this week if the weather holds.

There will be a lot more to do including moving the assembly to BPAA, priming and painting, installing the drive chain on the spine, and finishing the spring-loaded support mechanisms. After it is ready, we will have to engage a crane and riggers to remove the existing shutter and, fingers crossed, put the new one in place.

Upcoming Event: Partial Solar Eclipse Viewing



Saturday, October 14, 7:30 am - An annular solar eclipse will be visible along a southeasterly path starting in western Oregon and passing through parts of Northern California, Nevada, Utah, Arizona, Colorado, New Mexico, and Texas.

Here in western Washington, if clouds don't get in the way, we will see an 80% partial eclipse commencing around 8 am on October 14.

Join us Saturday morning at the Ritchie Observatory to safely view this unique event! (Registration is not required.)

Upcoming Event: 2nd Saturday Program

Saturday evening, October 14 - Program Canceled

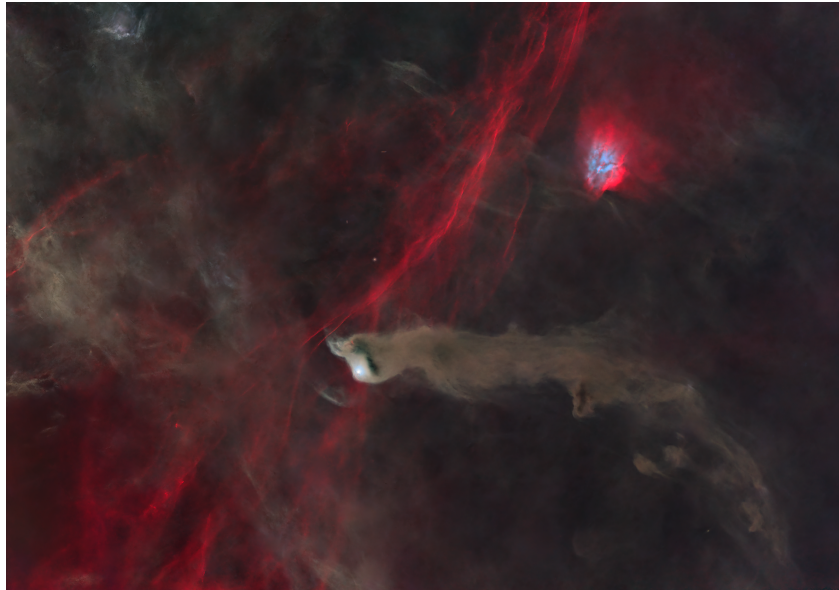
Thanks to community support, BPAA has acquired a new planetarium dome. We are now in the process of removing the old dome and installing the new dome, so the planetarium room is not usable.

We will resume regular programming in November. Stay tuned!

Thank You! to everyone who contributed to the purchase of the new dome.

Member Contributed Images

Wolf's Cave Nebula



Credit: Brian Puhl

Wolf's Cave is a beautiful target in itself, but it frames even better when the SNR shell in the background provides some depth to the image. Utilizing LRGBHO, this is another project completed using [@Charles Hagen](#)'s narrowband combination and continuum subtraction methods. They're very hard to beat for a composition such as this. Feel free to check out the guide on his website: <https://www.nightphotons.com/guides/advanced-narrowband-combination>

For additional information, use this [link](#).

Abell 39 Planetary Nebula



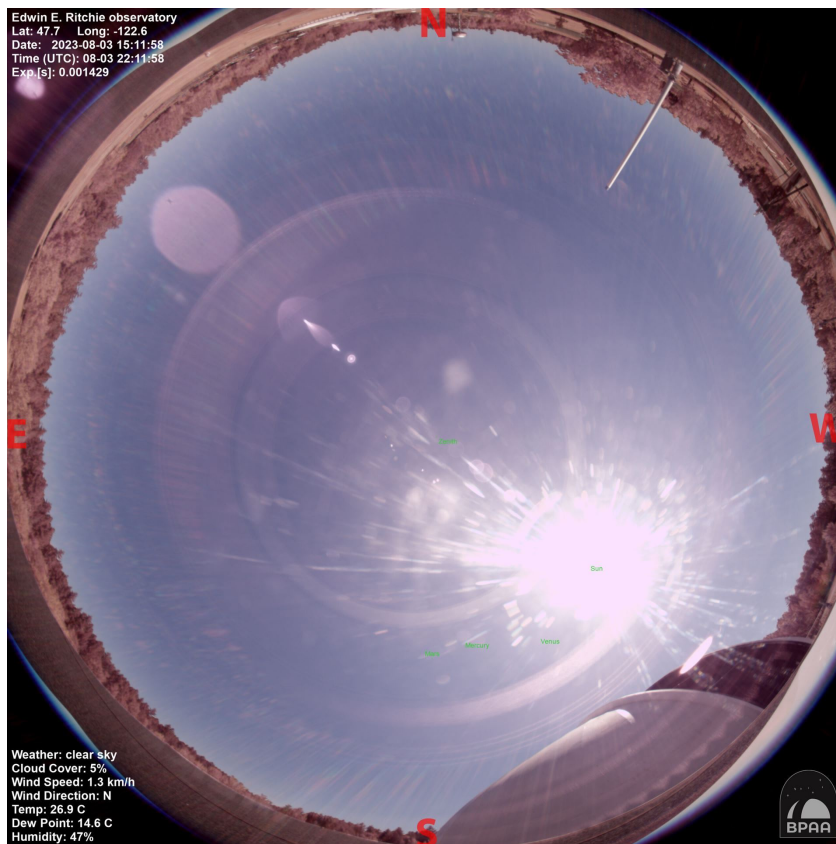
Credit: Mario Alejandro Torres

From Member Mario Alejandro Torres:

"A big shout-out to Battle Point Astronomical Association and their chief astronomer, Cole Rees, for their incredible work on making the 27-inch-mirror telescope (Edwin Ritchie Telescope) fully operational from a remote location. I had the honor of having my first go at operating the telescope (located in Washington State) all the way from Tennessee. I have chosen a planetary nebula in the constellation of Hercules cataloged as "Abell 39" as my first project. Having a finished picture will probably take me a month or two (depending on weather conditions). Here is just a small capture (around 20 min) in the Narrowband signal of OIII, a picture of what I see on my screen (at home) when operating the telescope, and one of the Ritchie Telescope. Clear Skies!"

This image was actually updated after Mario's initial description to include about an hour of OIII and RGB combined.

All-Sky Camera Image from the Ritchie Observatory



Credit: Menno Van Leeuwen

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.

- Oct 1 – [Asteroid 29 Amphitrite at opposition](#)
- Oct 2 – [The Andromeda Galaxy is well placed](#)
 - [Close approach of the Moon and M45](#)
- Oct 3 – [October Camelopardalid meteor shower peak](#)
- Oct 9 – [Draconid meteor shower peak](#)
- Oct 10 – [Southern Taurid meteor shower peak](#)
- Oct 11 – [\$\delta\$ -Aurigid meteor shower peak](#)
- Oct 14 – New Moon
 - [Annular solar eclipse](#)
- Oct 15 – [The Triangulum Galaxy is well placed](#)
- Oct 18 – [Venus at highest altitude in morning sky](#)
 - [136199 Eris at opposition](#)
- Oct 22 – [Orionid meteor shower peak](#)
 - [Venus at dichotomy](#)
- Oct 25 – [Leonis Minorid meteor shower peak](#)
- Oct 27 – [The Perseus Double Cluster is well placed](#)
- Oct 28 – Full Moon
- Oct 30 – [Close approach of the Moon and M45](#)
- Nov 2 – [Jupiter at opposition](#)
- Nov 5 – [Asteroid 18 Melpomene at opposition](#)
- Nov 12 – [Northern Taurid meteor shower peak](#)
- Nov 13 – New Moon
 - [Uranus at opposition](#)
- Nov 18 – [Leonid meteor shower peak](#)
 - [The Pleiades cluster is well placed](#)
- Nov 22 – [\$\alpha\$ -Monocerotid meteor shower peak](#)
- Nov 27 – Full Moon
- Nov 28 – [November Orionid meteor shower peak](#)
 - [The Hyades cluster is well placed](#)
- Dec 6 – [December \$\phi\$ -Cassiopeid meteor shower peak](#)
- Dec 9 – [Monocerotid meteor shower peak](#)
- Dec 12 – New Moon
 - [Comet 144P/Kushida passes perigee](#)
 - [\$\sigma\$ -Hydrid meteor shower peak](#)
- Dec 14 – [Geminid meteor shower peak](#)
- Dec 15 – [The Running Man cluster is well placed](#)
- Dec 16 – [Comae Berenicid meteor shower peak](#)
- Dec 20 – [December Leonis Minorid meteor shower peak](#)

[Dec 21 – Asteroid 4 Vesta at opposition](#)

[Dec 22 – Asteroid 9 Metis at opposition](#)

[Dec 23 – Ursid meteor shower peak](#)

[Dec 25 – Comet 62P/Tsuchinshan passes perihelion](#)

[Dec 26 – Full Moon](#)

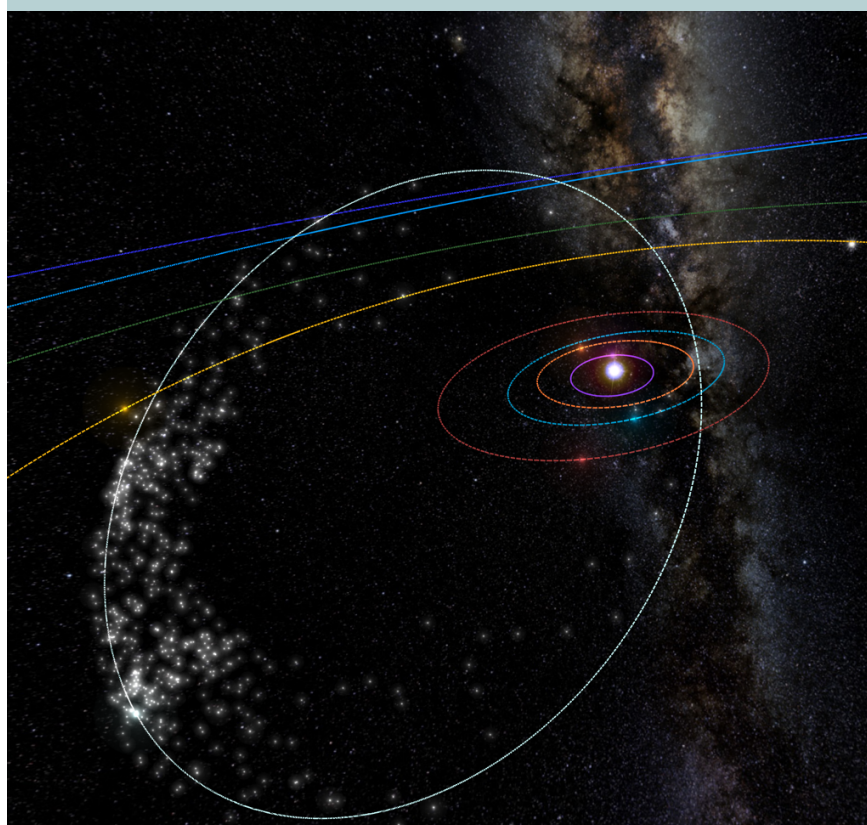
[Dec 27 – Asteroid 5 Astraea at opposition](#)

[Dec 29 – The cluster NGC 2232 is well placed](#)

[Dec 30 – The Rosette Nebula 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!

Meteor Showers from Space



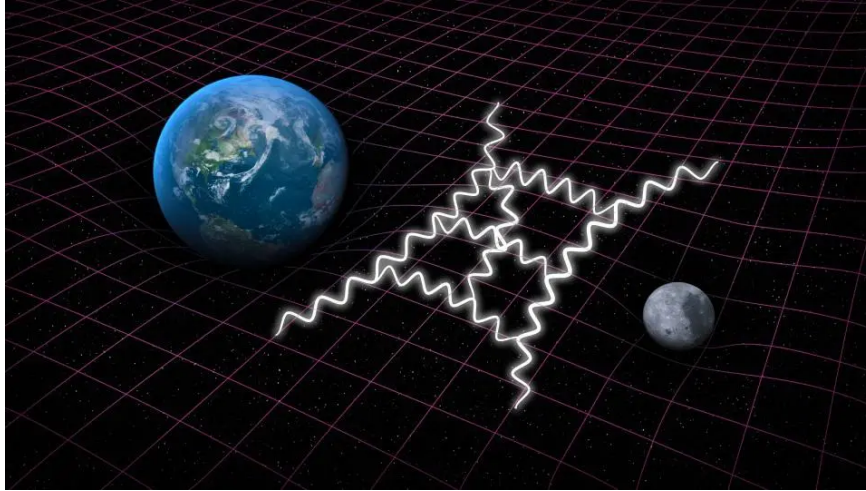
This visualization is developed and hosted by [Ian Webster](#).

Meteor showers on Earth are caused by streams of meteoroids hitting our atmosphere. These meteoroids are sand- and pebble-sized bits of rock that were once released from their parent comet. Some comets are no longer active and are now called asteroids.

This visualization shows these meteoroid streams orbiting the Sun, some stretching to the outer regions of the solar system. Select the meteor shower in the menu to see the corresponding meteoroid stream in space. Their meteoroid orbits are based on those measured by NASA's [CAMS video camera surveillance network](#), and were calculated by meteor astronomer [Peter Jenniskens](#) of the SETI Institute and NASA Ames Research Center.

Click [here](#) or on the image above to visit the site.

Could Dark Matter Be Made of Gravitons?



Quantum gravity attempts to combine Einstein's General theory of Relativity with quantum mechanics. Quantum corrections to classical gravity are visualized as loop diagrams, as the one shown here in white. If you extend the Standard Model to include gravity, many new possibilities arise, including the tantalizing hope that gravitons may in fact be massive, rather than massless (like gravitational waves in General Relativity), quanta. Credit: SLAC National Accelerator Laboratory

Dark matter hasn't been directly detected, but some form of invisible matter is clearly gravitating. Could the graviton hold the answer?

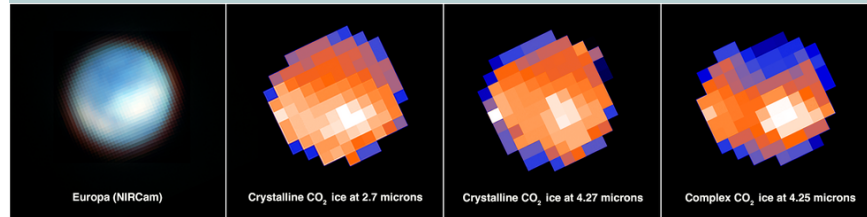
Dark matter, astrophysically, is the gravitational "glue" that holds the overwhelming majority of large structures in the Universe together.

However, despite the fact that every massive galaxy and group/cluster of galaxies is embedded in a dark matter halo, the particle(s) responsible for it have never been directly detected.

Could the graviton, the hypothetical particle that mediates the gravitational force, be the ultimate culprit behind this mystery? It's a fascinating possibility.

(Source: [Big Think](#))

NASA's Webb Finds Carbon Source on Surface of Jupiter's Moon Europa



This graphic shows a map of Europa's surface with NIRCam (Near Infrared Camera) on NASA's James Webb Space Telescope in the first panel and compositional maps derived from Webb's NIRSpec/IFU (Near Infrared Spectrograph's Integral Field Unit) data in the following three panels. In the compositional maps, the white pixels correspond to carbon dioxide in the large-scale region of disrupted chaos terrain known as Tara Regio (center and right), with additional concentrations within portions of the chaos region Powys Regio (left). The second and third panels show evidence of crystalline carbon dioxide, while the fourth panel indicates a complexed and amorphous form of carbon dioxide. Science Credit: Geronimo Villanueva (NASA/GSFC), Samantha Trumbo (Cornell Univ.), NASA, ESA, CSA. Image Processing Credit: Geronimo Villanueva (NASA/GSFC), Alyssa Pagan (STScI)

Astronomers using data from NASA's James Webb Space Telescope have identified carbon dioxide in a specific region on the icy surface of Jupiter's moon Europa.

Jupiter's moon Europa is one of a handful of worlds in our solar system that could potentially harbor conditions suitable for life. Previous research has shown that beneath its water-ice crust lies a salty ocean of liquid water with a rocky seafloor. However, planetary scientists had not confirmed if that ocean contained the chemicals needed for life, particularly carbon.

Astronomers using data from NASA's James Webb Space Telescope have identified carbon dioxide in a specific region on the icy surface of Europa. Analysis indicates that this carbon likely originated in the subsurface ocean and was not delivered by meteorites or other external sources. Moreover, it was deposited on a geologically recent timescale. This discovery has important implications for the potential habitability of Europa's ocean.

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

'Einstein Ring' Snapped by James Webb Space Telescope Is Most Distant Gravitationally Lensed Object Ever Seen



In the field of one of JWST's largest-area surveys, COSMOS-Web, an Einstein ring was discovered around a compact, distant galaxy. It turns out to be the most distant gravitational lens ever discovered by a few billion light-years. (Image credit: P. van Dokkum et al., Nature Astronomy accepted, 2023)

The James Webb Space Telescope has taken a stunning image of a perfectly formed Einstein ring, which is also the most distant gravitationally lensed object ever detected.

Photos snapped by the [James Webb Space Telescope](#) (JWST) have revealed the farthest-ever example of an "Einstein ring." The record-breaking halo of warped light, which is a whopping 21 billion light-years away, is unusually perfect and surrounds a mysteriously dense galaxy.

An Einstein ring is an extremely rare type of gravitationally lensed object that was first predicted by [Albert Einstein's theory of relativity](#). [Gravitational lensing](#) occurs when the immense [gravity](#) of a massive foreground object, such as a galaxy cluster or a [black hole](#), warps space-time around itself; light emitted by more distant objects, such as galaxies or supernovas, that passes through this warped space-time also appears curved and warped from our perspective on [Earth](#).

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

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

The first supernova ever discovered through its X-rays has an enormously powerful engine at its core. It's unlike anything ever seen.

In 2018, a breakout supernova was discovered by an automated facility, AT2018cow, and was the first in a new class of superluminous transient events. Since, only a few others have been seen. But AT2020mrf is unique, hundreds of times more luminous than the others. A central engine, like a magnetar or an actively accreting black hole, is required to power this explosion, which shows unique X-ray features.

(Source: [Big Think](#))

Osiris-Rex Capsule Returns Samples of Asteroid Bennu to Earth



A capsule with a sample of asteroid Bennu inside, delivered to Earth on Sept. 24, 2023, by NASA's OSIRIS-REx mission, is seen shortly after touching down on the Department of Defense's Utah Test and Training Range. NASA / Keegan Barber

It's been a long time coming, but after a journey of seven years and 4.4 billion-miles (7.1 billion kilometers), NASA's Origins, Spectral Interpretation, Resource Identification, Security-Regolith Explorer (Osiris-REx) spacecraft has accomplished its primary mission: It has returned its sample capsule to Earth, containing material grabbed from asteroid 101955 Bennu.

The return happened over the U.S. Department of Defense's Utah Test and Training Range. The 101-pound (46-kilogram), table-size capsule separated from the spacecraft four hours prior to touchdown on Sunday, September 24th, while it was still 63,000 miles (about a quarter of the Earth Moon distance) away. The capsule came in hot this morning over the California Pacific coast and by 10:52 a.m. EDT / 14:52 UT, the capsule was on the ground. The Osiris-REx mission dispatched helicopter search teams to search the 58-by-14 kilometer reentry area, and the team retrieved the sample shortly afterward.

(Source: skyandtelescope.org)

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