BATTLE POINT ASTRONOMICAL ASSOCIATION

Igniting passion for science through the lens of astronomy!

THE OBSERVER

March 2025, Vol. 46

Kitsap Great Give Starts today, March 1st!

Today marks the start of early giving for the 2025 Kitsap Great Give! I hope you'll support our STEAM initiative to offer hands-on programs at the Observatory to introduce Kitsap students to the wonders of the night sky through both technical and creative exploration. Your gifts will help provide these experiences to Kitsap kids for little or no cost.

Kitsap Great Give Early Giving is the lead-up to the Kitsap Great Give on March 11, a 24-hour "give-day" that unites our community to support the many nonprofit organizations that make Kitsap a great place to live - for all of us.

Thank you so much for your support!

Dome Repair Progress

The new stairs are in place. At the moment they rest on wooden blocks, but these will go away when we finish making the extension straps that will support the stairs.

We have found that the new gear box is so efficient that it allows the shutter to move under its own weight even after the drive motor turns off. Here you see Will Popendorf installing bumpers that will hold the shutter in the proper position when it is closed. Similar bumpers are being installed on the “south” end to support the shutter when it is fully open.

The inside of the shutter cools down at night and condensation forms. We are going to install some insulation on the inside of the shutter to help prevent this. Once this is done, the scaffolding will come down and we can start on the floor replacement.

What Is a Blood Moon?
from Betsy Daniels

A Blood Moon refers to the phenomenon during a total lunar eclipse when the Moon acquires a reddish hue. This occurs as the Earth aligns directly between the Sun and the Moon, casting Earth's shadow over the lunar surface.

Why Does the Moon Turn Red?

The reddish coloration during a total lunar eclipse results from Rayleigh scattering. As sunlight passes through Earth's atmosphere, shorter wavelengths (blue and violet) scatter, while longer wavelengths (red and orange) bend toward the Moon, illuminating it with a coppery glow.

Upcoming Blood Moons in 2025

In 2025, two total lunar eclipses will offer opportunities to observe a Blood Moon:

1. March 13–14, 2025: This eclipse will be visible across North and South America, Europe, and parts of Africa. For observers in Kitsap County, Washington:

• Penumbral Eclipse Begins: March 13 at 8:57 PM PST

• Totality Begins: March 13 at 11:58 PM PST

• Totality Ends: March 14 at 1:01 AM PST

• Penumbral Eclipse Ends: March 14 at 3:00 AM PST

2. September 7–8, 2025: This eclipse will be visible in parts of Asia and Western Australia.

Where to Look in the Night Sky

During a total lunar eclipse, the Moon is visible in the opposite direction of the Sun. In Kitsap County, Washington, on March 13–14, 2025:

• Direction: The Moon will be in the eastern sky as the eclipse begins and will move toward the western horizon during the event.

• Elevation: The Moon's altitude will vary throughout the night; starting higher in the sky and descending as the night progresses.

For optimal viewing:

• Find an open area free from obstructions like tall buildings or trees.

• Check local weather forecasts to ensure clear skies.

• Allow your eyes to adjust to the darkness for better visibility.

No special equipment is needed to observe a lunar eclipse, but binoculars or a telescope can enhance the experience.

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How Climate Change May Affect Astronomy
from Betsy Daniels

Climate change is reshaping many aspects of life on Earth, and astronomy is no exception. While it may seem that the study of the universe is beyond the reach of environmental changes, rising global temperatures, increasing atmospheric instability, and pollution are making astronomical observations more challenging.

1. Atmospheric Turbulence and Reduced Visibility

As global temperatures rise, the atmosphere becomes more turbulent due to increased convection and shifting weather patterns. This turbulence distorts light from celestial objects, reducing the clarity of images captured by ground-based telescopes. Astronomers call this effect “seeing,” and poor seeing conditions limit the ability to observe fine details in astronomical objects.

2. More Cloud Cover and Extreme Weather

Many of the world’s leading observatories are located in high-altitude, dry locations, such as the Atacama Desert in Chile and Mauna Kea in Hawaii. However, climate change is altering cloud patterns and increasing precipitation in some of these regions, leading to more nights lost to bad weather. Extreme weather events, such as hurricanes and wildfires, also threaten observatories and their infrastructure.

3. Light and Air Pollution

Climate change is often linked to urban expansion and industrial activity, both of which contribute to light pollution. Increased artificial lighting reduces the darkness needed for clear astronomical observations. Additionally, wildfires—exacerbated by rising temperatures—produce smoke and aerosols that further degrade visibility.

4. Impact on Space Observations

While space telescopes avoid many Earth-based atmospheric issues, climate change can still impact them indirectly. For example, warming temperatures threaten the stability of launch sites, as rising sea levels and storms can damage critical infrastructure. Additionally, shifts in global economies and priorities may divert funding away from astronomy toward climate-related emergencies.

Adapting to the Challenges

To counter these effects, astronomers are advocating for more sustainable observatory practices, better regulation of light pollution, and increased investment in space-based telescopes. Advances in adaptive optics also help compensate for atmospheric turbulence, allowing ground-based telescopes to produce sharper images.

While climate change presents new challenges for astronomy, scientific innovation and global cooperation can help mitigate its impact. Protecting the dark skies and stable conditions needed for astronomical research is essential—not just for scientists, but for humanity’s continued exploration of the cosmos.

References

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KiDiMu Fam Jam is Saturday, March 15, 10am - 2pm

Fam Jam is an outdoor family celebration to kick off Spring! Come join the fun as we share astronomy with kids (and their adults) at KiDiMu! Spend an hour or two, or four, talking to young astronomers about space, planets, and how telescopes work. Weather permitting, we'll have the solar scope set up for live views of the active sun. Kids love it! And you will too!

BPAA volunteers needed Friday evening 4-6 pm to help take our stuff from the Observatory to KiDiMu, and on Saturday from 8:30 am to 3 pm for set up, staffing our booth, and takedown/return to Observatory. To volunteer, send an email to Liz at info@bpastro.org.

Second Saturday

March 8, 6:00pm

Topic: Saturday Night Lights

Speaker: John Black

General Admission $10 | Members $5 | Zoom: Free

Lasers have become ubiquitous in modern life, from check-out scanners to DVD players to contemporary fiber-optic communications. We'll shine a light on what a laser is, what it can do, and how lasers are being applied in astronomy, autonomous vehicles and medicine.

Our speaker, John is a PhD chemist who came over from the Dark Side after seeing the amazing ways lasers impact people's lives. He escaped from Silicon Valley and moved to Bainbridge Island which reminds him of the Lake District in England where he grew up. At BPAA he got to drive a really big masonry drill but secretly aims to put a laser and adaptive optics on the Takahashi.

In-person attendance is limited to 30; advance registration is required for admittance, so please register today. After the planetarium show, we'll have a star party if the weather allows.

Registration links:

In person:

BPAA - Second Saturday Science Talk

bpaa.wildapricot.org

Zoom:

Welcome! You are invited to join a meeting: Saturday Night Lights. After registering, you will receive a confirmation email about joining the meeting.

us06web.zoom.us

Planeteer Training

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.

Training sessions will be held:

March 8, 3:00-5:00pm

March 22, 3:00-5:00pm

Cosmic Conversations

March 18, 7:00pm

Topic: TBA

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.

Telescope Tuesdays

Every Tuesday, 10:00am - 3:00pm

There's always a lot to do at the Ritchie observatory! As you can see from the progress report above, we're working on getting our new CDK telescope and its supporting infrastructure ready.

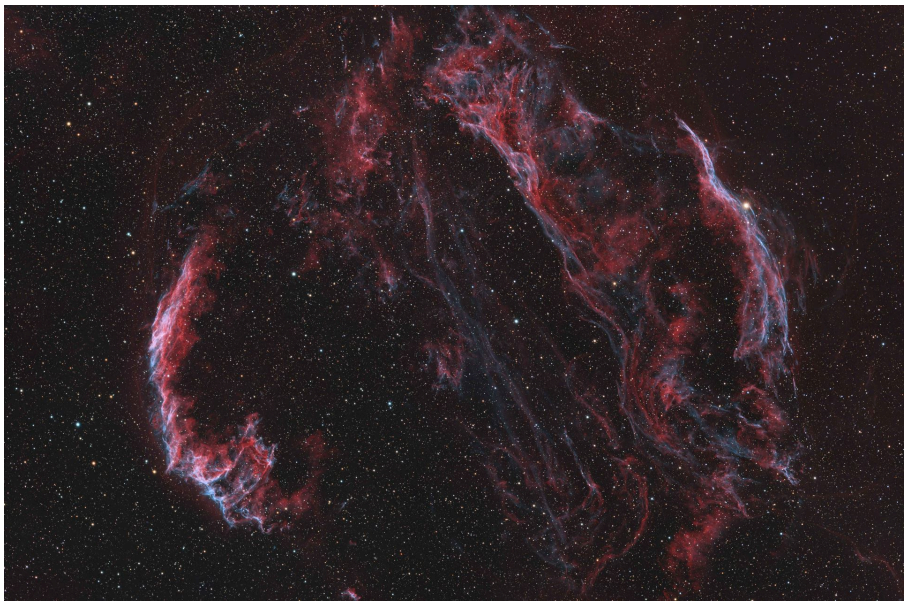
Come on out every Tuesday, 10am to 3pm, and get involved. Learn how stuff works. Help make improvements. An enormous amount of progress has been made, but there's always more to do. And we might even have pizza! Come on out and support Telescope Tuesdays!

Save the Date! Earth Expo 2025 at Battle Point Park

BPAA is hosting a booth for Earth Expo 2025 on Saturday April 26 from 10am - 2pm. Details to follow in next month's Observer. To volunteer to help represent BPAA, send an email to Liz at info@bpastro.org.

Member Contributed Image

Veil Nebula - Caldwell 33



Credit: Dustin Kadrmas; For additional information, follow this link.

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.

Mar 1 – Conjunction of the Moon and Venus

Mar 5 – Close approach of the Moon and M45

Mar 6 – Conjunction of the Moon and Jupiter

Mar 8 – Mercury at highest altitude in evening sky

– Conjunction of the Moon and Mars

Mar 9 – Conjunction of Venus and Mercury

Mar 12 – Asteroid 8 Flora at opposition

Mar 13 – Total lunar eclipse

– Full Moon

Mar 20 – March equinox

Mar 23 – Saturn ring plane crossing

Mar 29 – New Moon

Mar 30 – 136472 Makemake at opposition

Apr 2 – The Sombrero Galaxy is well placed

– Conjunction of the Moon and Jupiter

Apr 5 – Messier 94 is well placed

– Conjunction of the Moon and Mars

Apr 11 – Mercury at highest altitude in morning sky

Apr 12 – Full Moon

Apr 15 – The Whirlpool Galaxy is well placed

Apr 18 – Messier 3 is well placed

Apr 21 – 136108 Haumea at opposition

Apr 22 – Lyrid meteor shower 2025 peak

Apr 23 – Venus at greatest brightness

– Messier 101 is well placed

Apr 24 – Conjunction of the Moon and Venus

Apr 27 – New Moon

Apr 30 – Conjunction of the Moon and Jupiter

May 2 – Asteroid 4 Vesta at opposition

May 3 – Conjunction of the Moon and Mars

May 5 – Close approach of Mars and M44

– Equinox on Saturn

May 6 – η-Aquariid meteor shower 2025 peak

May 8 – η-Lyrid meteor shower 2025 peak

May 9 – Asteroid 9 Metis at opposition

May 12 – Full Moon

– Messier 5 is well placed

May 22 – Conjunction of the Moon and Saturn

May 23 – Conjunction of the Moon and Venus

May 26 – New Moon

May 28 – Conjunction of the Moon and Jupiter

May 31 – Venus at greatest elongation west

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!

Asteroid Won't Hit Earth, But Might Hit Moon — a Potential Science Bonanza

An artist's illustration of an asteroid. Credit: N. Bartmann / ESA / Webb / ESO / M. Kornmesser and S. Brunier / N. Risinger

“We are all rooting for the Moon!” Richard Binzel (MIT) is referring to the asteroid 2024 YR4, which for a few weeks had remained at the second-highest-rated probability of potential Earth impact of any asteroid discovered. Now, although its impact probability has fallen to virtually zero for Earth, it still has a slight chance of impacting the Moon on December 22, 2032.

An Earth impact by an object of this size — estimated at anywhere from 40 to 90 meters across — could have been serious for a local region, if populated, and astronomers around the world have scrambled for weeks to obtain observations in order to refine the object’s orbit, using the Canada France Hawaii telescope in Hawai‘i, the Magdalena Ridge Observatory in New Mexico, and even the European Southern Observatory’s Very Large Telescope in Chile..

The effort paid off, as its odds of hitting us shrank from a high of 3.1% to a less than 1 in a million chance. At the same time, the odds of it hitting the Moon have risen from a small fraction of a percent to somewhere between 1% and 2% .

Unlike an Earth impact, a hit on the Moon would not only be not a threat but could actually be an opportunity for science. A lunar impact could reveal details of the asteroid’s composition and structure — as it’s pulverized by the impact and spewed back out in a rain of debris — as well as the lunar subsurface, as viewed in ejected material. Understanding the dynamics of the impact could also help aid future asteroid redirection.

(Source: skyandtelescope.org)

Webb Maps Full Picture of How Phoenix Galaxy Cluster Forms Stars

New observations from NASA's James Webb Space Telescope trace the cooling gas that enables the Phoenix cluster to form stars at such a high rate. Previous studies of the Phoenix cluster using the Hubble Space Telescope, Chandra X-ray Observatory, and the Very Large Array radio telescope showed how the supermassive black hole at the center was feeding an unusually high rate of star formation. This is not typical – in other observed galaxy clusters, a supermassive black hole usually sends out energetic particles and radiation that prevents gas from cooling enough to form stars.
Chandra detects the hottest gas, which is seen in purple in this image. Jets, represented in red, are sent out from the center of the cluster, inflating cavities or bubbles in the hot gas, outlined here in purple dashes. Filaments of cooler gas where stars are forming, observed by Hubble, appear in blue.
Until Webb's powerful spectroscopic instruments that probe the infrared, the cooling gas remained undetected. In this image, contours tracing the gas, from spectroscopic data collected by Webb, are overlaid. This intermediary warm gas was found between the cavities tracing the very hot gas, a searing 18 million degrees Fahrenheit, and the already cooled gas around 18,000 degrees Fahrenheit.
Credits: Image - NASA, CXC, NRAO, ESA, Michael McDonald (MIT), Michael Reefe (MIT); Illustration - Joseph Olmsted (STScI)

Researchers using NASA's James Webb Space Telescope have finally solved the mystery of how a massive galaxy cluster is forming stars at such a high rate. The confirmation from Webb builds on more than a decade of studies using NASA's Chandra X-ray Observatory and Hubble Space Telescope, as well as several ground-based observatories.

The Phoenix cluster, a grouping of galaxies bound together by gravity 5.8 billion light-years from Earth, has been a target of interest for astronomers due to a few unique properties. In particular, ones that are surprising: a suspected extreme cooling of gas and a furious star formation rate despite a roughly 10 billion solar mass supermassive black hole at its core. In other observed galaxy clusters, the central supermassive black hole sends out energetic particles and radiation that prevents gas from cooling enough to form stars. Researchers have been studying gas flows within this cluster to try to understand how it is driving such extreme star formation.

"We can compare our previous studies of the Phoenix cluster, which found differing cooling rates at different temperatures, to a ski slope," said Michael McDonald of the Massachusetts Institute of Technology in Cambridge, principal investigator of the program. "The Phoenix cluster has the largest reservoir of hot, cooling gas of any galaxy cluster — analogous to having the busiest chair lift, bringing the most skiers to the top of the mountain. However, not all of those skiers were making it down the mountain, meaning not all the gas was cooling to low temperatures. If you had a ski slope where there were significantly more people getting off the ski lift at the top than were arriving at the bottom, that would be a problem!"

To date, in the Phoenix cluster, the numbers weren't adding up, and researchers were missing a piece of the process. Webb has now found those proverbial skiers at the middle of the mountain, in that it has tracked and mapped the missing cooling gas that will ultimately feed star formation. Most importantly, this intermediary warm gas was found within cavities tracing the very hot gas, a searing 18 million degrees Fahrenheit, and the already cooled gas around 18,000 degrees Fahrenheit.

(Source: webbtelescope.org)

Hubble Completes the Largest Galactic Mosaic of All-Time

This selection of the Andromeda galaxy comes courtesy of the largest photomosaic ever assembled with Hubble Space Telescope data. There's an enormous wealth of astronomical data found within the image: far more than is readily visible to the human eye. Credit: NASA, ESA, Benjamin F. Williams (UWashington), Zhuo Chen (UWashington), L. Clifton Johnson (Northwestern); Processing: Joseph DePasquale (STScI)

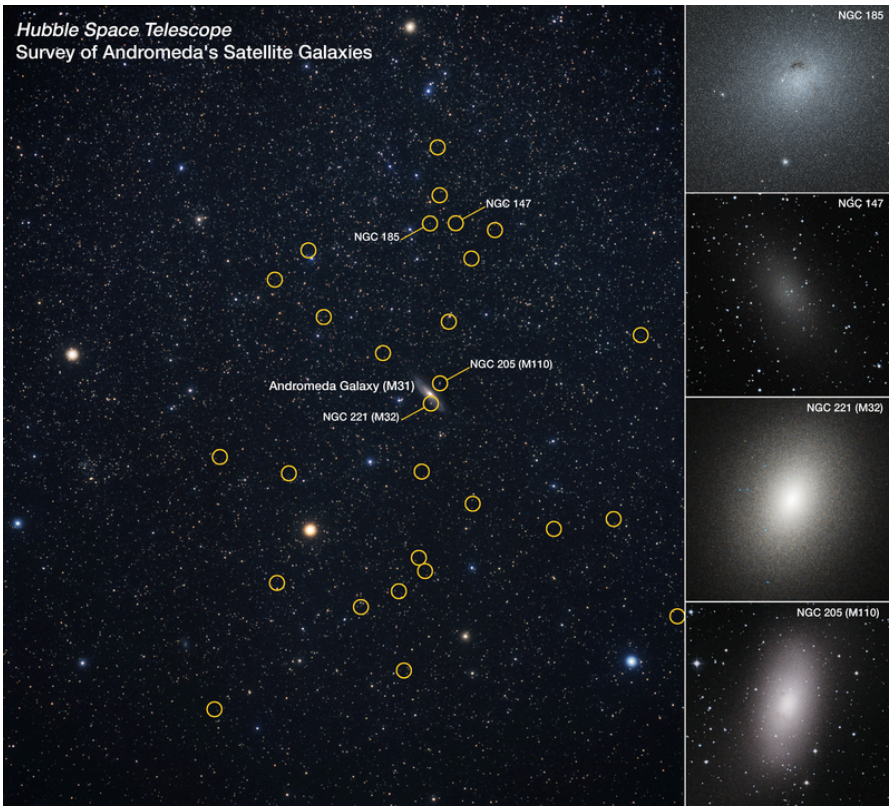
Ten years ago, Hubble released their results from PHAT: the Panchromatic Hubble Andromeda Treasury, stitching together 394 hours worth of observations, containing over 100 million stars, into one glorious mosaic.

Now, here in 2025, they've extended that survey to the southern half of Andromeda and completed our largest galactic mosaic ever: with more than 600 overlapping snapshots, in a 2.5+ billion pixel image.

An extraordinary number of astronomical lessons have been learned, and many more are awaiting us after future analysis by astronomers. Hit this link to see where we are so far.

(Source: Big Think)

NASA's Hubble Provides Bird's-Eye View of Andromeda Galaxy's Ecosystem



This is a wide-angle view of the distribution of known satellite galaxies orbiting the large Andromeda galaxy (M31), located 2.5 million light-years away. The Hubble Space Telescope was used to study the entire population of 36 mini-galaxies circled in yellow. Andromeda is the bright spindle-shaped object at image center. All the dwarf galaxies seem to be confined to a plane, all orbiting in the same direction. The wide view is from ground-based photography. Hubble's optical stability, clarity, and efficiency made this ambitious survey possible. Hubble close up snapshots of four dwarf galaxies are on image right. The most prominent dwarf galaxy is M32 (NGC 221), a compact ellipsoidal galaxy that might be the remnant core of a larger galaxy that collided with Andromeda a few billion years ago. Credits: NASA, ESA, Alessandro Savino (UC Berkeley), Joseph DePasquale (STScI), Akira Fujii DSS2

You can think of our Milky Way galaxy and the neighboring Andromeda galaxy as two giant aircraft carriers accompanied by a flotilla of smaller warships. Those ships in this imaginary battle fleet are dwarf galaxies, a fraction the size and mass of the giant spiral galaxies. Our Milky Way has about 70 known dwarf galaxies, and Andromeda appears to have three times as many. The dwarf galaxies provide clues as to how the Milky Way and Andromeda evolved over billions of years. The satellites tell a markedly different story for each system. Our Milky Way has led a relatively placid life, while it's been a game of bumper cars around Andromeda—including a major collision several billion years ago. In an ambitious observing program, the Hubble Space Telescope was used to inventory all of the known dwarf galaxies surrounding Andromeda.

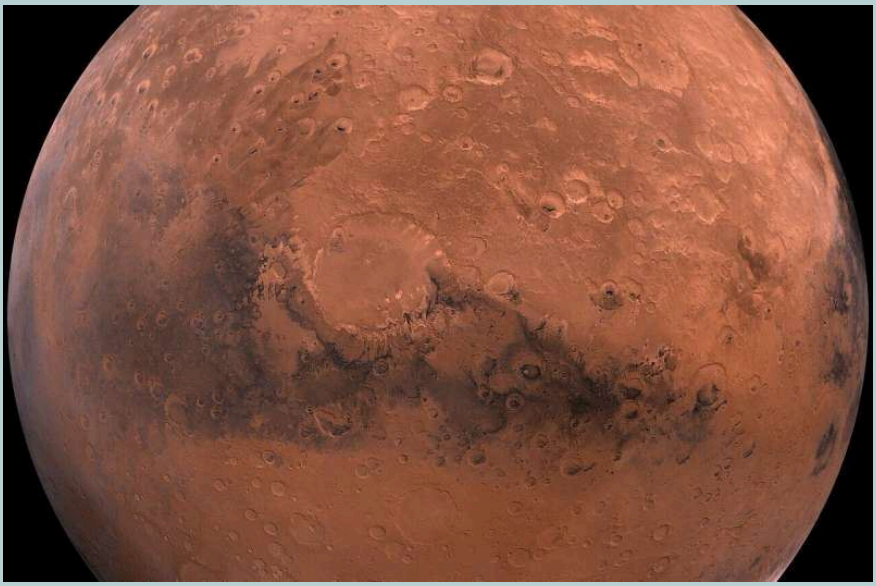
Located 2.5 million light-years away, the majestic Andromeda galaxy appears to the naked eye as a faint, spindle-shaped object roughly the angular size of the full Moon. What backyard observers don't see is a swarm of nearly three dozen small satellite galaxies circling the Andromeda galaxy, like bees around a hive.

These satellite galaxies represent a rambunctious galactic "ecosystem" that NASA's Hubble Space Telescope is studying in unprecedented detail. This ambitious Hubble Treasury Program used observations from more than a whopping 1,000 Hubble orbits (see previous article). Hubble's optical stability, clarity, and efficiency made this ambitious survey possible. This work included building a precise 3D mapping of all the dwarf galaxies buzzing around Andromeda and reconstructing how efficiently they formed new stars over the nearly 14 billion years of the universe's lifetime.

In the study published in The Astrophysical Journal, Hubble reveals a markedly different ecosystem from the smaller number of satellite galaxies that circle our Milky Way. This offers forensic clues as to how our Milky Way galaxy and Andromeda have evolved differently over billions of years. Our Milky Way has been relatively placid. But it looks like Andromeda has had a more dynamic history, which was probably affected by a major merger with another big galaxy a few billion years ago. This encounter, and the fact that Andromeda is as much as twice as massive as our Milky Way, could explain its plentiful and diverse dwarf galaxy population.

(Source: stsci.edu)

Mars Time Machine: Researchers Create Virtual Model to Decode Red Planet's Climate Evolution



Credit: CC0 Public Domain

Researchers are creating advanced simulations that will provide a deeper understanding of Mars's climatic history and help to determine whether it was once able to sustain life.

An international team of researchers is developing a model of Mars's evolution that could unlock some of its long-held secrets, including whether it once harbored life.

François Forget, a space scientist from the Pierre Simon Laplace Institute in France, is the man looking for those answers. He is not a time traveler, but is hoping to do the next best thing.

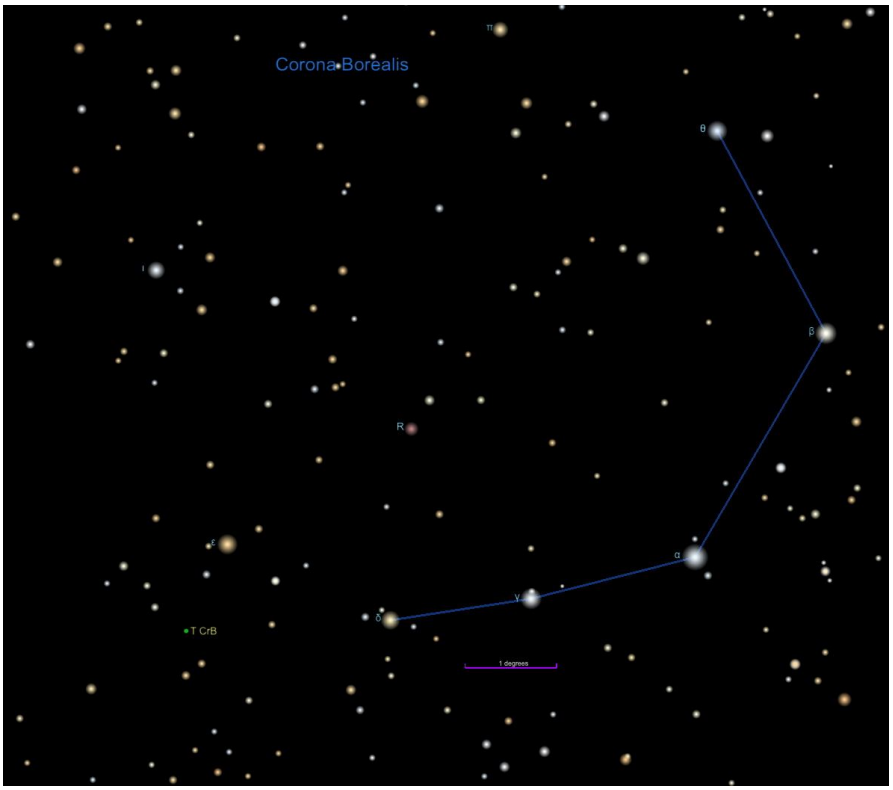
His team of researchers, gathered under the name "Mars through time," is trying to piece together different periods of the planet's history. The aim is to answer the question that has long perplexed scientists: was Mars once habitable?

"Mars was a place where life could have emerged, so it's very fascinating," said Forget, the principal investigator of Mars through time.

The work of his team is being coordinated at the French National Centre for Scientific Research in Paris. The six-year initiative, ending in November 2025, aims to shed light on the possible timeframes during which Mars might have been warm and wet, covered in glaciers, and maybe even suitable for life.

(Source: phys.org)

When Is T Coronae Borealis Going to Explode?



This closeup of Corona Borealis shows the location of T CrB with a green dot. In this view, North is up and East is left. Credit: Alison Klesman (via TheSkyX)

T Coronae Borealis (T CrB) is classified as a recurrent nova — a star that blows its top over and over. Such objects are rare; fewer than a dozen have been identified in our galaxy. And despite predictions that it would explode last year, we're still waiting.

T CrB is part of a binary system where a white dwarf and a red giant orbit one another. The red giant, near the end of its stellar life, is continually shedding hydrogen, some of which falls on the white dwarf. As the smaller star collects this gas, the pressure and temperature on its surface increase until the hydrogen ignites and, BOOM!

That boom happens roughly every 80 years. In fact, the last time an earthling saw T CrB with just their eyes was in 1946, the year of its most recent outburst. Normally, it hovers around 10th magnitude, some 40 times too faint for even seasoned sky observers to detect. (Also, in case you're curious, the first time it was seen — or, at least, recorded — was way back in 1217.)

When the star does have its outburst, it will rise in brightness to 2nd magnitude, equal to that of the North Star, also known as Polaris. How long will it stay that bright? Less than one day. Yep, that's it. As soon as you read about it exploding, start making plans to head out that night. It might remain visible to naked eyes for a few days, but there are no guarantees about that.

(Source: astronomy.com)

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