

# THE OBSERVER

BATTLE POINT ASTRONOMICAL ASSOCIATION

[WWW.BPASTRO.ORG](http://WWW.BPASTRO.ORG) BAINBRIDGE ISLAND, WA



## 25<sup>th</sup> Anniversary of a Major BPAA Milestone



(Image credit: F. Petrie, BPAA)

This month marks the 25th anniversary of the casting of the concrete pedestal that supports the Ritchie Telescope on the roof of the Helix House. This photo shows the date scratched into the wet concrete, probably by club founder John Rudolph, on May 19, 1996. The pedestal, actually a rectangular slab, sits atop the two-story concrete-block tower that supports the telescope and isolates it from random vibrations from the surrounding building.

## Are Soccer Field Lights Coming to Battle Point Park?

The Bainbridge Football Club has floated a proposal to the Parks District to install stadium lighting at the artificial turf fields in the Park, approximately 500 feet north of the Ritchie Observatory. Such lights will severely impact BPAA's ability to do astronomy, not to mention all the attendant issues of traffic and infrastructure impacts that will affect the neighborhood. When the turf fields were first installed around 15 years ago, promises to never install lights were made to BPAA and the neighborhood. BPAA and the newly-formed "Battle Point Night Skies Alliance" neighborhood group have joined forces to advocate for protecting the dark skies at Battle Point Park. The Parks Board will be considering the lighting proposal over the next several months. We anticipate this matter to be next taken up by the Parks Board at its June 3rd meeting, but this may change. We will post announcements via email and Facebook as we learn more. In the meantime, it's important that you show your support for dark skies in the park by emailing the Parks Commissioners (<https://biparks.org/board/>) and attending the Parks Board meetings (<https://biparks.org/meetings-notices/>), which are held via Zoom on the first and third Thursdays each month.

## Happy 31<sup>st</sup> Birthday to Hubble!



A Hubble Space Telescope image shows a giant star called AG Carinae, which is surrounded by a vast nebula of gas and dust about 5 light-years wide. (Image credit: NASA, ESA and STScI)

Scientists using the [Hubble Space Telescope](#) unveiled a stunning new image of a fast-burning star to celebrate the iconic observatory's 31st anniversary.

The [star](#) itself, dubbed AG Carinae, is of a class called Luminous Blue Variables and appears surrounded by a huge shell of material that the star blew into space thousands of years ago. That shell, called a [nebula](#), is 5 light-years wide, about the distance from Earth to the nearest star beyond our sun, Alpha Centauri, [according to the European Space Agency](#), which helps operate Hubble.

"I like studying these kinds of stars because I am fascinated by their instability," Kerstin Weis, who studies luminous blue variable stars at Ruhr University in Bochum, Germany, [said in a NASA statement](#). "They are doing something weird."

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

## Perseverance Extracts First Oxygen

The growing list of "firsts" for Perseverance, NASA's newest six-wheeled robot on the Martian surface, includes converting some of the Red Planet's thin, carbon dioxide-rich atmosphere into oxygen. A toaster-size, experimental instrument aboard Perseverance called the Mars Oxygen In-Situ Resource Utilization Experiment ([MOXIE](#)) accomplished the task. The test took place April 20, the 60th Martian day, or sol, since the mission landed Feb. 18.

While the technology demonstration is just getting started, it could pave the way for science fiction to become science fact – isolating and storing oxygen on Mars to help power rockets that could lift astronauts off the planet's surface. Such devices also might one day provide breathable air for astronauts themselves. MOXIE is an exploration technology investigation – as is the Mars Environmental Dynamics Analyzer ([MEDA](#)) weather station – and is sponsored by NASA's Space Technology Mission Directorate (STMD) and Human Exploration and Operations Mission Directorate.

"This is a critical first step at converting carbon dioxide to oxygen on Mars," said Jim Reuter, associate administrator for STMD. "MOXIE has more work to do, but the results from this technology demonstration are full of promise as we move toward our goal of one day seeing humans on Mars. Oxygen isn't just the stuff we breathe. Rocket propellant depends on oxygen, and future explorers will depend on producing propellant on Mars to make the trip home."

(Source: [nasa.gov](#))

## Satellite skyglow may make it impossible to avoid light pollution

In the past few years, astronomers have raised concerns about the growing number of satellites being launched — especially the [megaconstellations](#) launched by companies like SpaceX. When satellites streak overhead, they can disrupt naked-eye observing and astrophotography, as well as observations [by professional telescopes](#).

Now, a [paper published online](#) March 29 in the Monthly Notices of the Royal Astronomical Society highlights another concern: Even when satellites and other objects in orbit are too dim to be resolved by the naked eye, they collectively scatter enough light back into the atmosphere that it produces a diffuse glow similar to light pollution from cities.

As any astronomer knows, amateur or professional, the key to seeing much of the cosmos is dark skies. That's why modern ground-based observatories are built in remote locations — like the Vera C. Rubin Observatory atop the peak of Cerro Pachón in Chile. And it's also why many backyard observers travel far from city lights to get the best views of the sky possible. But if artificial skyglow really brightens the atmosphere as much as this new research suggests, it could be impossible to avoid, even far from any standard sources of light pollution like streetlights.

SpaceX has responded to some of these concerns by attempting to reduce the reflectivity of its Starlink satellites. Observations by Rubin researchers [published last year](#) found the darker satellite model is dimmer than its predecessors by about one full magnitude — down to magnitude 6.1, right at the threshold of naked-eye observation. Still, this new research shows that even when satellites are invisible to the naked eye, they can significantly brighten the background sky.

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

## Ingenuity takes flight!



NASA's Ingenuity Mars Helicopter (above center to the right) is viewed by one of the hazard cameras aboard the Perseverance rover during the helicopter's fourth flight on April 30, 2021. Credit: NASA/JPL-Caltech

Ingenuity successfully completed **four flights on Mars**, making history in being the first helicopter to fly on another planet.

The space chopper will now move on to helping [NASA's Perseverance Rover](#) hunt for signs of life on Mars.

This new 'operational phase' will last for another 30 Martian days, but Nasa said it is hopeful Ingenuity's quest could be extended further.

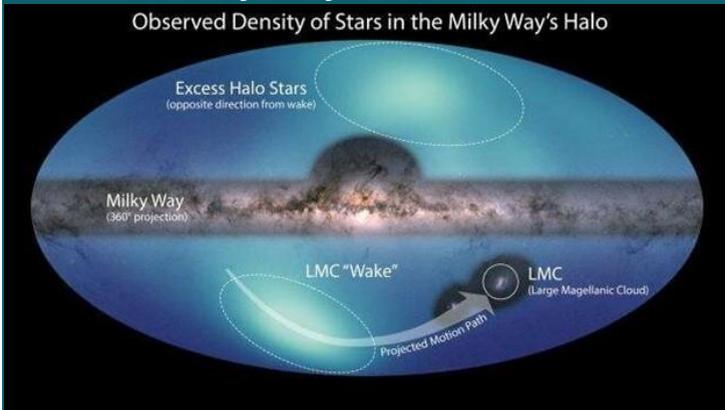
Nasa's original plan was to then carry out a total of five flights, before grounding Ingenuity permanently.

But Nasa's latest announcement is a change of heart. The US space agency said it was so pleased with the helicopter's performance, it wanted to find out how much Ingenuity is capable of.

Bob Balaram, Ingenuity's chief engineer, said: "It's been riding the winds, it's been taking off great, all the engineering systems, the solar panel, the battery, the radio have all been working very well - everything has just been fantastic."

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

## Astronomers release new all-sky map of the Milky Way's outer reaches



Credit: NASA/ESA/JPL-Caltech/Conroy et. al. 2021

Astronomers using data from NASA and the ESA (European Space Agency) telescopes have released a new all-sky map of the outermost region of our galaxy. Known as the galactic halo, this area lies outside the swirling spiral arms that form the Milky Way's recognizable central disk and is sparsely populated with stars. Though the halo may appear mostly empty, it is also predicted to contain a massive reservoir of dark matter, a mysterious and invisible substance thought to make up the bulk of all the mass in the universe.

The data for the new map comes from ESA's Gaia mission and NASA's Near Earth Object Wide Field Infrared Survey Explorer, or NEOWISE, which operated from 2009 to 2013 under the moniker WISE. The study, led by astronomers at the Center for Astrophysics | Harvard & Smithsonian and published today in *Nature*, makes use of data collected by the spacecraft between 2009 and 2018.

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

### BPAA Monthly Virtual Program and Star Party

We hold a virtual (at least for now) program and star party (weather permitting) at 7:30pm on the second Saturday of each month.

Please join us on May 8<sup>th</sup> when our chief scientist, Steve Ruhl, will present a talk on the "Origins of the Moon." Over the years there have been many theories of how the earth has such an unusual moon, the largest as compared to planet mass. We will look at some of the origin theories and specifically "the great impactor". We will add in some astronomical forensics to discuss how the impactor could have been formed.

### 2021 Officers

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Please send comments, suggestions, or questions regarding the newsletter to [newsletter@bpaastro.org](mailto:newsletter@bpaastro.org)

## Mars has right ingredients for present-day microbial life beneath its surface

As NASA's Perseverance rover begins its search for ancient life on the surface of Mars, a new study suggests that the Martian subsurface might be a good place to look for possible present-day life on the Red Planet.

The study, published in the journal *Astrobiology*, looked at the chemical composition of Martian meteorites -- rocks blasted off of the surface of Mars that eventually landed on Earth. The analysis determined that those rocks, if in consistent contact with water, would produce the chemical energy needed to support microbial communities similar to those that survive in the unlit depths of the Earth. Because these meteorites may be representative of vast swaths of the Martian crust, the findings suggest that much of the Mars subsurface could be habitable.

"The subsurface is one of the frontiers in Mars exploration," Mustard said. "We've investigated the atmosphere, mapped the surface with different wavelengths of light and landed on the surface in half-a-dozen places, and that work continues to tell us so much about the planet's past. But if we want to think about the possibility of present-day life, the subsurface is absolutely going to be where the action is."

"The big implication here for subsurface exploration science is that wherever you have groundwater on Mars, there's a good chance that you have enough chemical energy to support subsurface microbial life," said Jesse Tarnas, a postdoctoral researcher at NASA's Jet Propulsion Laboratory who led the study while completing his Ph.D. at Brown University. "We don't know whether life ever got started beneath the surface of Mars, but if it did, we think there would be ample energy there to sustain it right up to today."

In recent decades, scientists have discovered that Earth's depths are home to a vast biome that exists largely separated from the world above. Lacking sunlight, these creatures survive using the byproducts of chemical reactions produced when rocks come into contact with water.

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

## WHAT'S UP(COMING)!

May 6 –  $\eta$ -Aquariid meteor shower peak

May 8 –  $\eta$ -Lyrid meteor shower peak

May 11 – New Moon

May 13 – Saturn enters retrograde motion

May 26 – Full Moon

– Total lunar eclipse

Jun 10 – New Moon

– Annular solar eclipse (not visible locally)

– Daytime Arietid shower peak

Jun 20 – Jupiter enters retrograde motion

– June solstice

Jun 24 – Full Moon

Jun 26 – Neptune enters retrograde motion

Jun 27 – June Bootid shower peak

Jul 9 – New Moon

Jul 13 – Conjunction of Venus and Mars

Jul 17 – 134340 Pluto at opposition

Jul 28 – Piscis Austrinid shower peak

Jul 30 – Southern  $\delta$ -Aquariid shower peak

–  $\alpha$ -Capricornid shower peak