

Rejections The Newsletter of the Popular Astronomy Club ESTABLISHED 1936

REFLECTIONS from the President



The arrival of September means that the nights are getting longer and cooler, making this a good time of

year for amateur astronomers.

Planetary observing will again become a more important part of our sessions, as Jupiter will be rising in the late evening hours late in the month. Additional public sessions are being planned, so check the PAC website for details as they are posted.

There are some interesting programs planned for monthly meetings this fall. In September, Byron Davies will talk about his use of free Siril image processing software, and his telescopes and cameras, to provide the outstanding, detailed images he has shown us recently.

The annual PAC banquet is on October 14, and we've arranged for an interesting guest speaker. Larry Bartoszek will lead a presentation titled "The Connection between the Periodic Table and Astronomy." This will give us an opportunity to learn about how the use of spectroscopy in astronomy adds to our understanding the chemistry of stars.

More information about the banquet, and the RSVP form, can be found elsewhere in this issue of Reflections. Note that there has been a slight increase in price, reflecting an overall increase in food and service costs. Please make your reservation for the banquet by October 2 so we will know how much food to order.

In November, Val German of the Mid-States Region of the Astronomical League (MSRAL) will present a program about astronomy on the Santa Fe and Oregon Trails. We will finish the year at our December meeting with Roy Gustafson's "Year in Review" presentation.

We're expecting a busy fall, so please keep checking the website for additional public observing programs this fall – and, of course, keep looking up!

September 2023



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'Mount Marilyn' namesake dies

Marilyn Lillie Lovell, the wife of astronaut Jim Lovell, died at the age of 93 at her home in Lake Forest.



MOUNT MARILYN

Illinois, on August 27. She is survived by her husband, four children, 11 grandchildren and seven great-grandchildren.

The late Mrs. Lovell has the distinction of being the namesake of a mountain on the Moon. While in lunar orbit during the Apollo 8 mission in December 1968, Jim Lovell spotted a triangular mountain between the Sea of Tranquility and the Sea of Fertility.

After learning that the lunar mountain, which was later measured at 4,600 feet, had never been spotted before, Lovell reportedly said, "Then I found it, so I'm going to name it. What do you guys think of 'Mount Marilyn'?"

Mount Marilyn served as an landmark for the Apollo 11 astronauts during the first successful landing on the moon. For years, the name was used informally on many NASA technical reports and maps.

The name "Mount Marilyn" became official in July 2017, when the mountain was designated as such by the International Astronomical Union.

ANNOUNCEMENTS / INFO



Seasonal Messier Marathon Program

NCRAL's Seasonal Messier Marathon observing program is NOT designed to qualify observers for the Astronomical League's Messier Observing program; the two programs are unrelated and observing requirements are quite different. In the NCRAL program, the main requirement is to quickly observe and essentially check off items from one of four seasonal lists of Messier objects as noted in the section to follow.

NCRAL recognition will consist a suitable printed certificate and a 3/4inch enameled star pin (a different color for each season). There will be no direct cost to the membership for participating in the award pro-gram; the cost of the program (pins, certificates, mailers, postage) will be borne by the Region as a benefit of affiliation. Relevant program documents are linked below

NCRAL Seasonal Messier Marathon Rules

NCRAL SPRING Seasonal Messier List

NCRAL SUMMER Seasonal Messier List

NCRAL AUTUMN Seasonal Messier List

NCRAL WINTER Seasonal Messier List

HOW'S THE WEATHER?

eteot weather 🌣 close to you



NCRAL

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If you have questions or request, or want more information on PAC, send an e-mail to: popularastronomyclub@gmail.com

September: An interesting month

September will be an interesting month in the night sky.

Although the planets that were in the western evening sky are gone, Saturn will be present all night, and very bright Jupiter will rise at about 10:30 p.m. as September begins and about 8:30 at the end of the month. It will be high in the south by first light.

The other planets will now be in the eastern sky before dawn. Since sunrise will be coming later, it may be worth the effort to see them.

Brilliant Venus will rise first, at least three hours before the Sun, seeming to leap up in the predawn sky during the month. It will be followed by fast-moving Mercury which reaches its highest point on September 22, when it will rise about an hour and a half before the Sun. Only Mars will be too close to the Sun to be seen.

Saturn will be unmistakable in a dim part of the southern sky in the constellation of Aquarius, the Waterbearer. Saturn can be used in a dark sky to find at least some of the stars of this rather dim constellation.



The constellation Aquarius (the Waterbearer), which plays a prominent role in mythology, will be where Saturn can be found in the September night sky.

Aquarius' most prominent feature, the water jug, is formed by a small flattened triangle of stars to Saturn's upper left. (Binoculars will reveal a fourth star above them.) The upper body of the Waterbearer is formed by a line of dim stars to the right of the water jug. His lower body, and water flowing from his jug, are a couple lines of dim stars that pass to the left of Saturn and end near the far southern constellation Piscis Austrinus (the Southern Fish).

The fish's mouth is represented by the bright star Fomalhaut, which will be directly below Saturn when it is well up in the sky. The rest of the fish is formed by a flattened oval of dim stars to the right of Fomalhaut.

Aquarius has represented several mythological characters, including the Greek god Zeus (Roman Jupiter), who was seen as pouring the water of life down from the heavens. It has also been identified with Ganymede, the beautiful young shepherd who was kidnaped by Zeus and taken to Mount Olympus. He was offered immortality in turn for serving as the cupbearer to the gods.

In some representations, Piscis Austrinus was seen as swallowing the water that flowed out of the water jug of Aquarius. According to Greek mythology, the fish was placed in the sky as a reward for saving the daughter of Aphrodite (Roman Venus). For this reason, fish were considered sacred and were not eaten by many Syrians. This fish also was considered to be the parent of the constellation Pisces (the Fish).

Here are some highlights to watch for in September:

September 4: The Moon will be just to the right of very bright Jupiter after they rise at about 10:30 p.m. They will be high in the *Continued on Page 4*

September sky

Continued from Page 3

southern sky by dawn.

September 6: The Moon will be above Aldebaran, the bright eye of Taurus (the Bull), at first light.

September 11: The crescent Moon will be to the upper left of brilliant Venus after they rise at about 4:00 a.m.

September 13: The very thin crescent Moon will be to the upper left of Mercury and to the lower left of Regulus, the brightest star in Leo (the Lion). Look about 30 minutes before sunrise. Binoculars may be needed.

September 20: The Moon will be to the right of Antares, the bright reddish heart of Scorpius (the Scorpion).

September 23: Autumn arrives in the northern hemisphere at about 1:50 a.m. Central Daylight Time, the moment of the fall equinox. On this day the Sun, will rise straight in the east and set straight in the west everywhere, except at the poles, and everyone else will have 12 hours of daylight.

September 26: The bright Moon will be below or to the lower left of Saturn.

September 30: The Moon will again be near bright Jupiter. However, this time it will be to the upper right of the giant planet, and they will rise earlier at about 8:30 p.m. Since the Moon orbits the Earth in 27 and one-third days, it can pass the same star or planet twice in one month.

Moon phases: Last quarter, September 6; New, September 14; First quarter, September 22; Full, September 29.

David Voigts

David Voigts is the Astronomical League Correspondent (ALCOR) for the Black Hawk Astronomy Club in Waterloo, Iowa. The club will host a star party at Prairie Grove Park in Waterloo on Saturday, September 23.

Register now for annual star party

The Quad Cities Astronomical Society will host the annual Eastern Iowa Star Party on weekend of September 15-17. The event will be held at the Menke/QCAS Observatory at the Wapsi River Environmental Education Center in Dixon, Iowa.

The star party will give amateur astronomers a chance to gather, exchange ideas, meet new friends and catch up with old ones, and hopefully enjoy three nights of clear, dark skies for observing. Participants will also receive updates on the project to expand and improve the observatory.

There is no registration fee for the EISP; however, donations for snacks and beverages, and to benefit the observatory project, would be appreciated.

To obtain a registration form, RSVP for this event, and for more information, contact Dr. Robert Mitchell at mailto:<u>rcm1970@msn.com</u>



Alan Sheidler and his wife, Sara, are shown with Black Hawk Astronomy Club members Robert Haack and David Voigts during the club's monthly star party on August 26 at Prairie Grove Park in Waterloo. Al has been visiting clubs the North Central Region of the Astronomical League since being named as NCRAL chair earlier this year.

Banquet features presentation on periodic table

The Popular Astronomy Club will host its annual banquet on Saturday, October 14, at the Riverfront Grille in Rock Island.

The banquet begins with a social hour at 5:30 p.m., followed by a buffet dinner featuring a choice of two meats, side dishes, and dessert. A cash bar will be available. The evening will also feature the presentation of awards and door prizes.

Cost of the banquet is \$28 for adults, and \$18 for children age 12 and under. RSVPs are due by October 2.

Larry Bartoszek will serve as keynote speaker at the banquet, and will give a presentation titled "The Connection between the Periodic Table and Astronomy."



LARRY BARTOSZEK

During his talk, Larry will discuss how studying starlight through spectroscopy reveals the chemical composition of distant stars and how this advances our understanding of the Universe and its origins. He will also show the work he did on the Sloan Digital Sky Survey Telescope, which uses telescopes in both hemispheres to comprehensively map the night sky, examine the history and structure of the universe, and probe the physics of black holes.

A resident of Aurora, Illinois, Larry is the owner of Bartoszek Engineering, a consulting firm specializing in creating mechanical designs for the nuclear and high-energy physics community. Bartoszek Engineering has worked for numerous national laboratories, universities and governts worldwide, and built machines used in research ranging in size from tabletop devices to machines weighing 120 tons standing three stories tall.

Larry worked at Fermi National Accelerator Laboratory from 1983 to 1993; during that time, he was responsible for the design of the \$150 million hadron calorimeter and was involved in other accelerator and detector projects.

Larry is a licensed professional engineer who earned a dual degree in mechanical engineering and physics from the University of Illinois. He is a member of the American Society of Mechanical Engineers, the American Welding Society, the Chicago Society for Space Studies, the National Space Society, and the International Space Elevator Consortium.



To RSVP for the banquet and reserve your spot, see the form on page 14.

'Intense' presentation

Dr. Carl Wenning, the immediate past president of the North Central Region of the Astronomical League, gave a presentation on the use of image intensifiers at the Windmill Restaurant in East Moline on August 7. During the presentation, Carl shared his experiences and recommendations on the use of this technology and showed several examples of how it enabled him to capture better images.



Here are more first-rate images taken by Byron Davies during August, showing (top, from left) the Elephant Trunk Nebula (IC 1396) and Iris Nebula (NGC 7023), and (bottom, from left) the Pleiades(M45) and Dumbbell Nebula (M27). The photos at left were taken at a dark sky location in Little York, Illinois; the M27 photo was taken at Byron's back yard in Davenport, and the Iris Nebula image is a combination of shots taken in Davenport and at Menke Observatory. Byron reports that the Radian Triad Ultra filter does a good job of reducing light pollution, which enables astrophotography in urban settings.



August 15, was a sunny Sunday, so Alan Sheidler set up his telescope and H-Alpha filter to capture these three images of the Sun (top, right). Al also visited former PAC member Mike Mack in Madison, Wisconsin, and came back with the two outstanding solar images shown at bottom.





MEMBER OBSERVATIONS

Alan Sheidler, Rolando Gamino and Rusty Case met at **Castle Observatory** again on August 21 to do both some troubleshooting on the observatory's telescope and to do some observing and astrophotography. The session served as an opportunity capture more "Two in the View" images (at bottom), and also yielded these nice images of the Lagoon Nebula (M8, center top), the Omega Nebula (M17, center bottom) and the M22 star cluster.





The agenda for ALCON 2023, held July 26-29 in Baton Rouge, Louisiana, included a trip to nearly Livingston to tour LIGO - the Laser Interferometer Gravitational Wave Observatory. Here are some photos sent by Alan Sheidler taken during the tour, during which those attending learned how LIGO detects gravitational waves using laser technology in concert with a similar observatory located in Hanford, Washington.





Pleasant weather and pleasant company were both in store at the PAC picnic on August 12. The picnic served as an occasion both to get together to enjoy some food and camaraderie, and to celebrate the 56th wedding anniversary of Wayland and Anne Bauer. After sunset, picnickers had an opportunity to view "shooting stars" brought by the Perseid meteor shower.







September 2023

Meteors scratch the night sky

Despite what you read online, it is possible to think of meteor watching as one of the most boring things you can do with the night sky. No cosmic connection, no postulating about the origins of the Universe, no understanding of what dark matter might entail: When we look for meteors, we are in our own celestial backyard.

We usually do not even use a telescope or binoculars; it's just sitting on a comfortable lawn chair and looking up at the sky. Even if we spot a shooting star as bright as the brightest of stars, it is only a large speck of dust that is probably only a few dozen miles above us.

So why bother with watching meteors at all? Actually, it is because they are so close, so local, that makes this activity unique.

A meteor may be a large speck of cosmic dust, but it strikes the Earth's upper atmosphere at a velocity of 40 miles per second. And that is precisely what I saw, 44 times, on the beautiful night of August 12, 2023.

That night began with the usual thickness of clouds, typical of the Arizona summer monsoon season. But the clouds rapidly dissipated, and stars began to appear.

Well before midnight, I was out with Eureka, my 12-inch telescope with which I would complete two hours of comet hunting before the night ended – one hour before midnight, another before dawn. In between, I counted 44 meteors, one of which is in the accompanying picture.

The Perseids of 2023 were a very good meteor shower, but not the best. In November



2001, Wendee and I were in the Australian Outback during the peak of the Leonid meteor shower.

We gathered on the shore of a dry lake bed and watched carefully as Leo the lion reared its handsome head above the eastern horizon. Then, silently and swiftly, a bright shooting star appeared in the east, made its way across the sky, before slowly vanished in the west.

One watcher said it all: "This trip was worth it!" A few minutes later, a second meteor did almost the same thing.

After that, the meteors came thicker and more often until, at around 3 a.m., they suddenly began pouring out the sky at the rate of about one per second. One observer even saw a meteor after the Sun rose.

What caused this burst of shooting stars? It appears that they originate from a comet. In December 1865 and January 1866, that comet was discovered by the Wilhelm Tempel of Germany and Horace Tuttle of the United States. Because its orbit was identical to the orbits of the meteors, it was subsequently identified as the "parent comet" of the Leonid meteor stream. Moreover, because the comet passes close to Earth every 33 years, it was connected to the great meteor "storms" of 1833 and 1866.

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Explaining the darkness between the stars

Looking up in awe at the night sky, the stars and planets pop out as bright points against a dark background. All of the stars that we see are nearby, within our own Milky Way galaxy. And while the number of stars visible from a dark sky location seems immense, the actual number is "only" in the thousands.

But what lies between the stars, and why can't we see it? Both the Hubble Space Telescope and James Webb Space Telescope have revealed that what appears as a dark background, even in our backyard telescopes, is populated with as many galaxies as there are stars in the Milky Way – at least 100 billion, probably many more.

So, why is the night sky dark and not blazing with the light of all those distant galaxies? Much like looking into a dense forest where every line of sight has a tree, every direction we look in the sky has billions of stars with no vacant spots.

Many philosophers and astronomers have considered this paradox, which has taken the name of Heinrich Wilhelm Olbers, an early 19th century German astronomer. Basically, Olbers Paradox asks why the night sky is dark if the Universe is infinitely old and static – there should be stars everywhere. The observable phenomenon of a dark sky leads us directly into the debate about the very nature of the Universe – is it eternal and static, or is it dynamic and evolving?

It was not until the 1960s, with the discovery of the Cosmic Microwave Background, that the debate was finally settled, though various lines of evidence for an evolving Universe had built up over the previous half century. The equations of Einstein's General Theory of Relativity suggested a dynamic Universe, not one that was eternal and unchanging as previously thought.



This infrared image of a cluster of galaxies taken by the James Webb Space Telescope shows a tiny slice of the Universe that, from our perspective, is equal to a grain of sand held at arm's length.

Edwin Hubble used the cosmic distance ladder discovered by Henrietta Swan Leavitt to show that distant galaxies are moving away from us – and the greater the distance, the faster they're moving away. Along with other evidence, this led to the recognition of an evolving Universe.

The paradox has since been resolved, now that we understand that the Universe has a finite age and size, with the speed of light having a definite value. Here's what's happening – due to the expansion of the Universe, the light from the oldest, most distant galaxies is shifted towards the longer wavelengths of the electromagnetic spectrum. So, the farther an object is from us, the redder it appears.

The Webb Telescope is designed to detect light from distant objects in infrared light, beyond the visible spectrum. Other telescopes detect light at still longer wave-

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This oval sky map, created from images taken by the Planck Space Observatory, shows the



Cosmic Microwave Background, the unseen light between the stars.

Darkness

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lengths, where it is stretched into the radio and microwave portions of the spectrum.

The farther back we look, the more things are shifted out of the visible, past the infrared, and all the way into the microwave wavelengths. If our eyes could see microwaves, we would behold a sky blazing with the light of the hot, young Universe – the Cosmic Microwave Background.

The next time you look up at the stars at night, turn your attention to the darkness between the stars, and ponder how you are seeing is not nothingness, but rather the result of a dynamic, evolving Universe.

Brian Kruse

This article is courtesy of NASA's Night Sky Network program, which supports astronomy clubs and is dedicated to outreach. Visit <u>night-</u> sky.jpl.nasa.gov to learn more.



This image, taken by Al Sheidler on August 24, shows the bright star Antares just before it was occulted by the Moon.

Meteors — Continued from Page 11

In a similar way, Comet Swift-Tuttle, discovered in 1862 by the Americans Louis Swift and Horace Tuttle, was determined to be the parent comet of the Perseids. As I watched them that unforgettable night last month, I was struck by the awe these tiny specks can generate as they race through our at-



An engraving of the meteor 'storm' of 1833.

mosphere. I was struck also by the wonder they generated in my mind; these always welcome visitors from space invariably enchant my soul.

One night in 1833, when Abraham Lincoln was a young lawyer, a deacon friend pounded on his door and woke him. "Arise, Abraham," he yelled. "The day of judgement has come." Lincoln leapt out of bed and strode to a window, and he saw countless shooting stars.

Shortly after he became president, when several states left the Union, Lincoln told this meteor story to some visitors. He said that, as he watched the falling stars in wonder, he also saw that the familiar constellations were still there in the sky.

"The world did not come to an end then," he said wisely. "Nor will the Union now."

A fellow citizen who lived at the same time as Lincoln, and who admired and respected him, was Carl Schurz, who would be elected to the U.S. Senate a decade later. On April 18, 1859, on the eve of the American Civil War, he gave a lecture in Boston's Faneuil Hall.

"Ideals are like stars; you will not succeed in touching them with your hands," Schurz said. "But like the seafaring man on the desert of waters, you choose them as your guides, and following them, you will reach your destiny."

UPCOMING EVENTS

Date: September 11, 2023

Event: Membership meeting @ 7 p.m. Location: Butterworth Center / Zoom Program: Byron Davies on free Siril software All these events, dates and times are tentative and subject to change! Please check your emails for any updates and changes!

UPCOMING EVENTS

- September 11: PAC meeting, Butterworth Center; presentation by Byron Davies
- September 12: Riverdale Astronomy Night, Riverdale Middle School, Port Byron
- September 15-17: Eastern Iowa Stary Party, Menke Observatory
- September 16: Public observing at Niabi Zoo (September 23 rain date)
- September 17: 'Porch Party' at Butterworth Center; PAC info table, activities
- October 14: Annual PAC Banquet, Riverfront Grille, Rock Island
- October 21: Public observing at Niabi Zoo (October 28 rain date)
- October 30: Public observing at Runners Park, East Moline (November 3 rain date)
- November 13: PAC meeting, Butterworth Center; Oregon / Santa Fe trail astronomy
- November 18: Public observing at Niabi Zoo (no rain date; last of season)
- December 11: PAC meeting, Butterworth Center; Year in Review by Roy Gustafson

PAC ANNUAL BANQUET

October 14, 2023 @ 5:30 p.m. Riverfront Grille - 4619 34th Street, Rock Island *Please RSVP by October 2*

Cost per adult: \$28 Children: \$18 (age 12 and under) Full Buffet Dinner and Cash Bar

Include payment with RSVP; checks made out to Popular Astronomy Club Mail to Dale Hachtel, 1617 Elm Shore Drive, Port Byron, IL, 61275; Phone: (614) 935-5748

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