



# Reflections

The Newsletter of the Popular Astronomy Club

ESTABLISHED 1936



October 2021

## President's Corner: October 2021



Alan Sheidler

Welcome to the October issue of Reflections, the newsletter of the Popular Astronomy Club. This month marks the 85th anniversary of the founding of your club. Not only is the Popular Astronomy Club one of the oldest as-

tronomical societies in the region, it is without a doubt one of the best. Of course I might be just a tad bit biased, but if you feel as proud of our club as I do, then you are in the mood to celebrate PAC's birthday at this year's annual banquet which will be Saturday evening, October 23.

The in-person banquet meal will be at the Riverfront Grille in Rock Island. The after-dinner speaker for the event is Dr. Russet McMillan, who will give us a talk via Zoom about her work at Apache Point Observatory.

Dr. McMillan uses a powerful laser attached to the Apache Point telescope to zap retro-reflectors left on the surface of the moon by Apollo astronauts. Analysis of photons reflected back to the telescope (approximately a 500,000 mile round trip) enables laser-ranging experiments which you will definitely want to hear about. I am very much looking forward to this talk.

After Dr. McMillan's talk, we also will have an awards presentation. This year we have a number of award recipients: Astronomical League Outreach awards, AL Observing Awards, Attendance Award, Member of the Year Award, and one additional (mystery) award that you will have to attend the banquet to find out about. We also have

enough door prizes for everyone to win something! You won't want to miss this.

Be sure to send in your RSVP for this year's PAC Banquet. You can find the RSVP here in the newsletter (*see page 4*). Come join us for this interesting talk, fellowship of club members, and of course, good food!

As 2021 draws to a close, we will soon be thinking of a new year. During the December regular meeting, we will have elections for club officers. The two-year terms for all of your club officers expire at the end of the year. As far as I know, the current office holders for vice-president, treasurer, secretary, observatory director, and Alcor are willing to run for re-election.

I have served as your president now for six years and before that, I was the vice-president for six years. During this time, I have been fortunate to have been in leadership during a time of many positive changes and developments in the club. Your club is growing, active and vibrant. I cannot take credit for this—the fact that your club has survived and become so successful is due to every one of you. I have been the fortunate one to have been president and VP during such a wonderful time.

I believe it is now time for new leadership in our club. New concepts and new ideas are necessary to maintain and sustain growth. I would urge one of you to nominate someone or yourself for president or for any of the other positions if you desire.

If you are reluctant to run because you feel lacking in the skills necessary – relax. We have “on-the-job” training. When I am replaced with a new president, I will be the past president – which means I am not going away! But seriously, I would be willing to advise and assist the new president, as will the other office holders. We have an excellent leadership team and a great club. Why not give it a try?

Keep looking up! Al.

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## TIME TO RENEW OR TIME TO JOIN

It's that time of year again - time to renew your PAC membership, assuming that you haven't done so already.

You'll find a renewal form on the last page of this newsletter. Along with renewing yourself, you're also welcome to share the form with someone who might be interested in joining the Popular Astronomy Club.

Membership is open to anyone; all you need is an interest in astronomy and a willingness to learn more about this fascinating branch of science.

The membership form is also available on the PAC website, at this link:

[PAC MEMBERSHIP](#)

Thanks for your membership and your support!



## ANNOUNCEMENTS / INFO



### NCRAL Seasonal Messier Marathon Program

NCRAL's Seasonal Messier Marathon observing program is NOT designed to qualify observers for the Astro-nomical 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 3/4-inch enameled star pin (a different color for each season). There will be no direct cost to the membership for participating in the award program; 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](#)

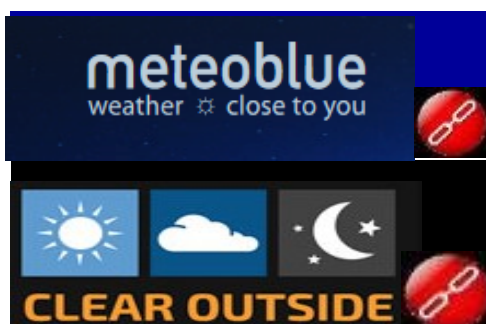
[NCRAL SPRING Seasonal Messier List](#)

[NCRAL SUMMER Seasonal Messier List](#)

[NCRAL AUTUMN Seasonal Messier List](#)

[NCRAL WINTER Seasonal Messier List](#)

## HOW'S THE WEATHER?



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If you have questions or request,  
or want more information on  
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## Fun fact: We're shooting lasers at the moon

It's been nearly five decades since the last astronaut walked on the moon, and until recently I was under the impression that any scientific studies related to the lunar missions pretty much wrapped up soon after the final Apollo splashdown.

As I recall, the Apollo astronauts brought back some rocks and dust from the moon, all of which I assume was closely examined years ago, and performed a few other experiments generating useful data that I thought had long since been compiled and analyzed.

But it turns out that there is at least one scientific experiment which began soon after Neil Armstrong took one small step that is still ongoing, and that is generating data which has increased our knowledge and understanding of the moon, the Earth, and the universe at large.

As they roved about the moon in July 1969, the Apollo 11 astronauts placed a scientific instrument known as the Laser Ranging Retroreflector, or LR3, on the lunar surface. More retroreflectors were placed during the Apollo 14 and 15 missions, both of which took place in 1971. There are also retroreflectors aboard unmanned lunar probes orbiting the moon.

For over 50 years, scientists on Earth have been firing laser beams at these retroreflectors, which then direct the beams back to the

source. The data collected is being used to measure the distance between the Earth and moon with incredible precision.

In very round numbers, the distance to the moon varies between 221,500 miles and 252,700 miles, depending on where it is in its orbit. Using laser ranging, though, astronomers can now exactly measure that distance to within one millimeter.

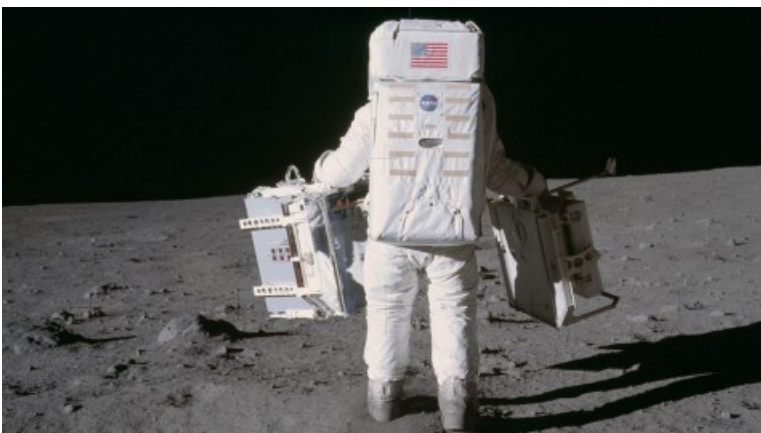
To draw an analogy, this is akin to measuring the distance from New York City to Los Angeles to within the width of a fine human hair, while never leaving Times Square.

It's nice to hear that we're capable of doing that, but does knowing this figure really advance science? It certainly does, in several ways.

Knowing the exact distance to the moon at any given point in time provides data confirming Albert Einstein's theory of general relativity, and his ideas on how gravitational attraction causes celestial objects to move. Because gravity is a universal force, knowing more about how it works between the Earth and the moon sheds light on how it works throughout the Solar System, the Milky Way galaxy, and the universe.

Laser ranging experiments also led astronomers to conclude that the moon has a liquid core, perhaps surrounding a dense solid core.

***Continued on Page 4***



***In this photo taken by his fellow Apollo 11 astronaut Neil Armstrong, Buzz Aldrin carries two packages containing instruments used in scientific experiments. Aldrin is holding the Laser Ranging Retroreflector (LR3) package in his right hand; lasers are still being beamed to and from the LR3 today, in order to more exactly measure the distance between the moon and the Earth. (Photo courtesy of NASA)***



## Shooting lasers at the moon

*Continued from Page 3*

Astronomers are also using the laser data to find out what happened to the moon's now-extinct magnetic field, and to learn more about how the moon and Earth were formed billions of years ago.

One of the places where lasers are being fired to the moon is the Apache Point Observatory in New Mexico. The experiments performed there are done under a project known as the Apache Point Observatory Lunar Laser-ranging Operation, which appropriately generates the acronym APOLLO.

Later this month, the Popular Astronomy Club will have the privilege of hearing from Dr. Russet McMillan, an APOLLO specialist from Apache Point. Dr. McMillan will give a virtual presentation on "Lasers to the Moon" during PAC's annual banquet, scheduled for October 23 at the Riverfront Grille in Rock Island (*see RSVP below*).

One of the benefits of being a PAC member is hearing from astronomers and scientists like Dr. McMillan who are kind and generous enough to take the time to pre-

**Dr. Russet McMillan will make a virtual presentation on the lunar laser project at the PAC Banquet on October 23.**



sent information on interesting topics in an understandable manner. Modern technology has made it possible for them to do this without traveling to the Quad Cities, opening up new possibilities.

You don't need to own a telescope to join the Popular Astronomy Club (I don't) or have a lot of background in science or astronomy (I'm an English major). All you really need is an interest in the night sky and a desire to learn more about it.

To find out more, visit PAC's website, at [www.popularastronomyclub.org](http://www.popularastronomyclub.org), or look us up on Facebook. You're also welcome to join us at our next public observing session, scheduled for October 16 at Niabi Zoo beginning at sunset. Meanwhile, hope for clear skies and keep looking up!

*Paul Levesque*

**RSVP**  
**kindly respond on or before**  
**October 9<sup>th</sup>, 2021**

**Cost per adult: \$25 Children: \$12.50**

**Full buffet dinner and cash bar**

**(include with RSVP, checks made out to the Popular Astronomy Club).** Mail to Dale Hachtel, 1617 Elm Shore Drive, Port Byron, IL 61275 ([dale\\_hachtel@msn.com](mailto:dale_hachtel@msn.com))

	Name
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# A look back at how PAC came to be

From "The Popular Astronomy Club: A History," by Paul R. Castle, published in 2000:

Carl Gamble began to acquire a library on astronomy. This led to a desire to see more than could be seen with the naked eye or even with good binoculars. But Gamble was not satisfied with enjoying his hobby alone. "I borrowed a good 6-inch telescope and frequently invited friends to observe with me. When the crowd grew too big for the front lawn, we moved out to the country and spent many pleasant evenings with groups ranging in size to several hundred people."

From then on he was in constant demand. He traveled at every opportunity all around the mid-west lecturing and giving demonstrations on his favorite topic. Astronomy was indeed becoming popular! Delighted with the good response from sizable crowds, he received a letter from Oscar DeVanney of Monterey Park, California. Mr. DeVanney suggested the idea of forming an astronomy club. Gamble was later to refer to Mr. DeVanney as the spark plug: A small notice was placed in the local papers announcing the possibility of forming a club by persons interested in the study of astronomy.

"The purpose of the club," Gamble said, is to gain knowledge of the universe, not to make any great scientific discoveries." October 29, 1936, was a most memorable occasion as it was on this date that the Popular Astronomy Club was organized." Its first meeting was held at the People's Power Company in Moline. The new club's first paid guest speaker was Dr. George Van Biesbroeck of the Yerkes Observatory in Williams Bay, Wisconsin.



## What else was happening in October 1936?

- As the Spanish Civil War rages on, Francisco Franco is officially invested as Spain's Chief of State.
- The New York Yankees defeat their crosstown rivals New York Giants four games to two in the World Series; in the second game, the Yankees score 18 runs, setting a World Series record that still stands.
- Boulder Dam begins producing electricity
- Jewish teachers are banned from public schools in Germany.
- Pan American Airlines begins weekly passenger service between San Francisco and Manila via Honolulu.
- Joseph Stalin releases a handwritten note denying rumors of his death.
- Germany and Italy agree to a pact that forms an alliance later known as the Rome-Berlin Axis.
- The Literary Digest releases a presidential election poll projecting that Alf Landon would



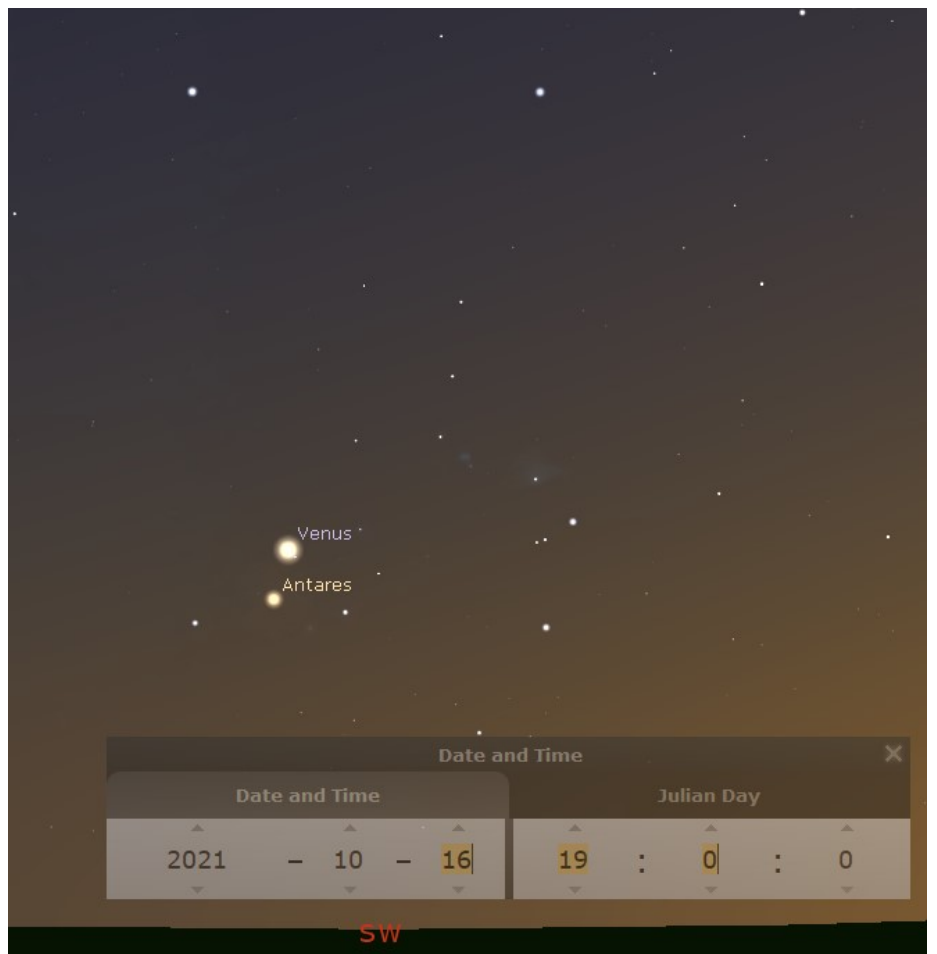
defeat incumbent Franklin Roosevelt in a landslide; in fact, Roosevelt wins the election with over 98 percent of Electoral College votes. The mistake leads in part to the demise of the Literary Digest, which ceased publication in 1938, and changes the way political polls are conducted in the future.

# The Planets in October 2021: Mercury and Venus

**Mercury** starts off the month close to western horizon at 7 p.m. Mercury reaches solar conjunction on October 9th. It moves into the morning sky. You might catch it low on the eastern horizon on the 21st at 6 am. It is barely a glimmer at magnitude 0. It then dips below the horizon for the rest of the month, meaning no good viewing opportunities. It reaches greatest elongation west on the 23rd and highest for viewing on the 25th.

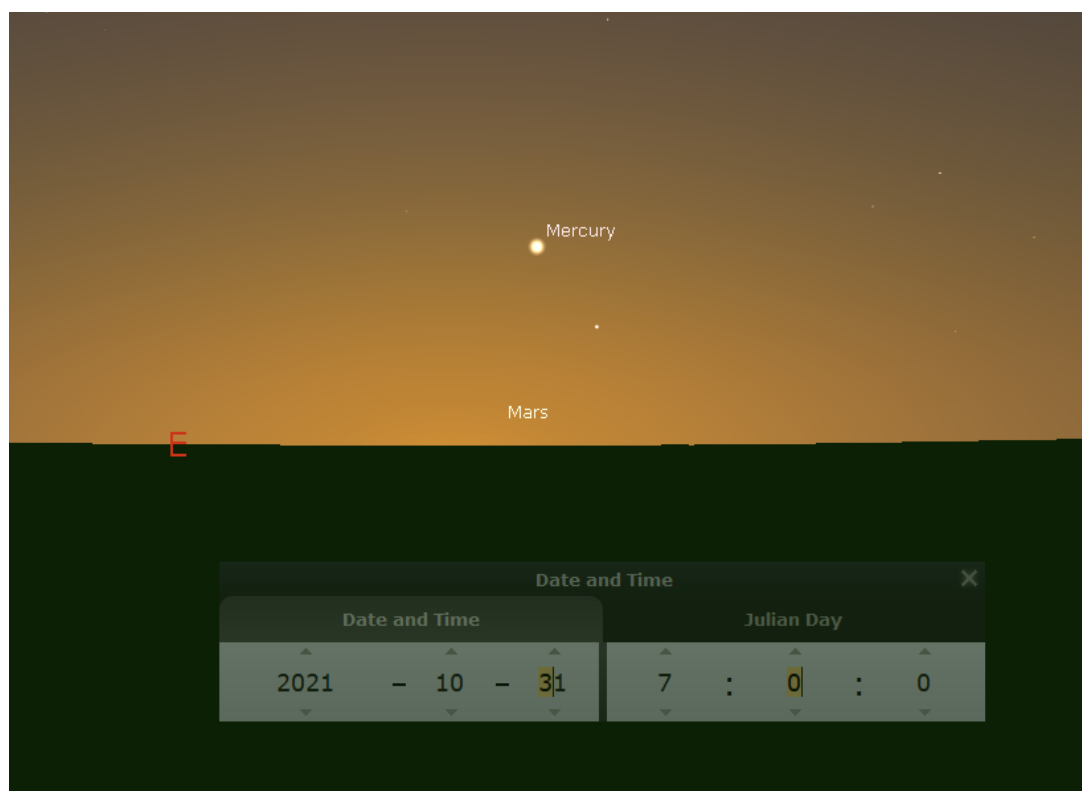


**Venus** is low in the southwestern sky of the 1st. It blazes away at magnitude  $-4.26$ . It is 61.8 % illuminated. It is  $20.52^\circ$  above the southwestern horizon at 7 p.m. Venus reaches aphelion on the 3rd. Venus's 225-day orbit around the Sun will carry it to its furthest point from the Sun – its aphelion – at a distance of 0.73 astronomical units (AU). In practice, however, Venus's orbit is almost circular. On the 9th, the four-day old moon passes to the northeast of the planet. Antares passes just west Venus on the 16th. Venus hangs about in about the same spot throughout the month, and reaches its greatest elongation east on the 29th.



# The Planets in October 2021: Mars and Jupiter

**Mars** reaches solar conjunction on the 7th and begins to slowly emerging from the sun's glare and begins to peep over the east-southeastern horizon by the 23rd at 7 a.m. Mercury hangs just over the red planet on the 31st.



**Jupiter** is high in the south on the 1st at 8 p.m. The gas giant blazes away at magnitude  $-2.42$  and has a diameter of  $46.17''$ . The nine-day old moon passes just south of Jupiter on the 15th. Jupiter ends retrograde motion on the 18th. .

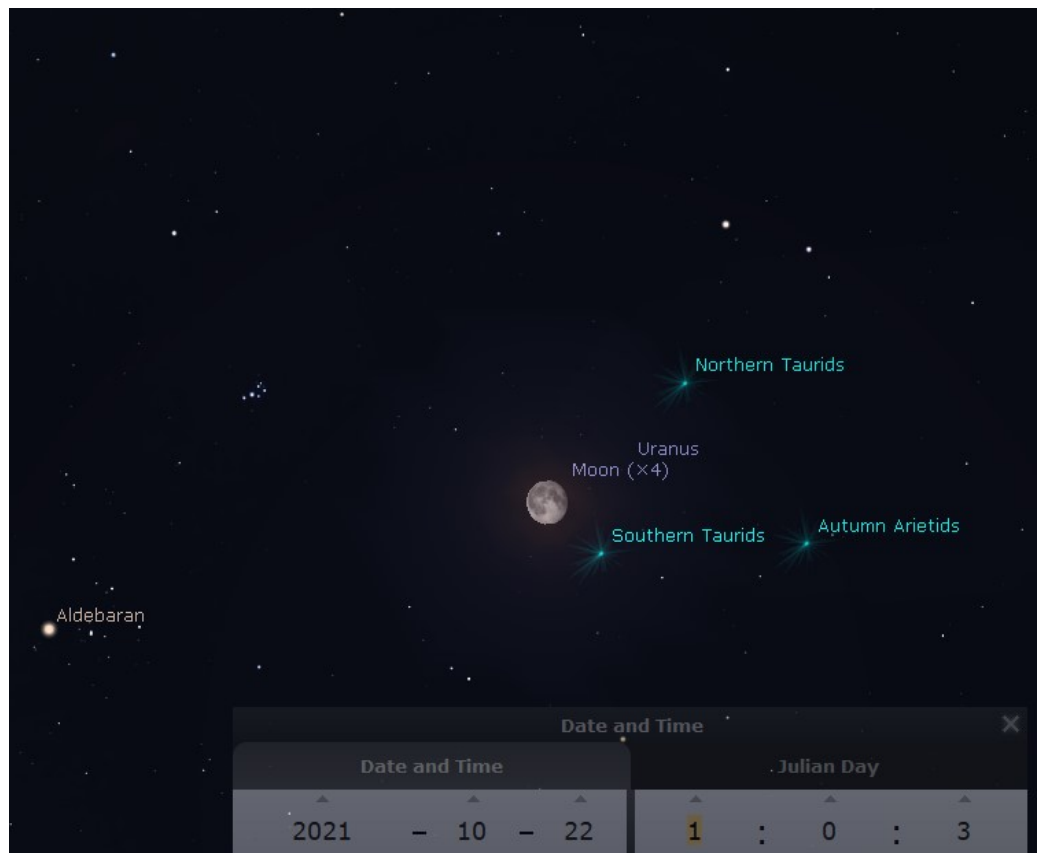


# The Planets in October 2021: Saturn, Uranus and Nep-

**Saturn** on October 1st lies due south at 8 p.m. It is magnitude 0.2. It is about  $50^\circ$  west of Jupiter. The planet's disk is  $17.65''$ ; with the rings added in, it expands to  $41.11''$ . Catch the moon pass south of the planet on October 13. Its retrograde motion ends on the 10th.

**Uranus** is low in the southeast on the 1st at 1 a.m. It is magnitude 5.84. Catch the 16-day old moon pass south of the planet on the 23rd.

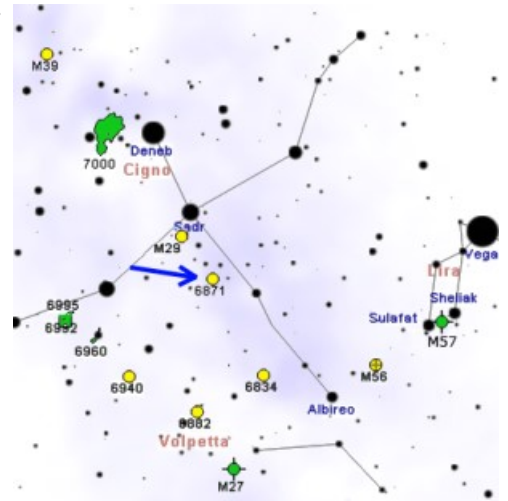
**Neptune** is just east of Jupiter on the 1st. It is magnitude 7.82. The moon passes just south of the planet on the 17th.





# Spotlight: NGC 6871

Open cluster NGC 6871 in Cygnus is comprised of less than 50 member stars which are interspersed and well detached from the background sky. The cluster is dominated by a pair of double star systems: SAO 69402 (magnitude 6.77) and SAO 69403 (magnitude 7.36) for the northern pair, and SAO 69405 (magnitude 7.86) and SAO 69404 (magnitude 8.86) which make up the southern pair. The cluster spans 20 arc-minutes in diameter and lies 5,135 light-years away from Earth. NGC 6871 has been studied fairly intensely owing, in part, to the presence of eclipsing binaries (e.g., V453 Cygnus). The cluster's age is a mere 9.1 million years old. NGC 6871 is surrounded by nebulosity, including LBN 180 to the north, LBN 182 to the east, and LBN 179 and 174 to the south and southwest. The small patch of nebulosity near the bottom right corner is the nebula GN 20.03.0. The cluster is best observed using low magnifications (50-100x) during summer when it is directly overhead and can be found to lie just to the south of 27-Cygnus (mag 5.38). NGC 6871 was discovered by Friedrich Georg Wilhelm von Struve (1793-1864) in 1825.





## ASTRONOMY AND SPACE HISTORY – IT HAPPENED IN OCTOBER

**October 2, 1608:** Dutch eyeglass maker Hans Lipershey files for a patent with the States General of the Netherlands for an instrument that can be used “for seeing things far away as if they were near.” A few weeks later, a similar patent is filed by another Dutch lensmaker named Jacob Metius. Both lay claim to inventing the telescope, as did another Dutchman named Zacharias Jansen. No matter who got the credit, word of the “Dutch perspective glass” spread to Italy, where Galileo Galilei adapted the patent to create a telescope with 20x magnification. He used it to make discoveries that forever changed humanity’s view of the universe.

**October 4, 1957:** The space race officially begins as the Soviet Union launches Sputnik 1, the first artificial Earth satellite. Sputnik is nothing more than a metal sphere less than two feet in diameter with four external antennas that emit a “beep” sound which is picked up by professional and amateur radio operators and then broadcast widely. Scientists tracking Sputnik from Earth



gather data on the Earth’s upper atmosphere and ionosphere; however, Sputnik’s greatest impact could be found in the political and social arenas. The United States responds to Sputnik by increasing its investment in science and vowing to catch up with and pass the Soviets in the exploration of space.

**October 10, 1967:** The “Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies” – more informally known as the Outer Space Treaty – takes effect, following its ratification by the United States, the United Kingdom, and the Soviet Union. Currently, 111 nations have agreed to observe the treaty, while 23 more have signed it but not completed the

ratification process. The Outer Space Treaty prohibits the placing of nuclear weapons in space, limits the use of the Moon and all other celestial bodies to peaceful purposes, and establishes that space shall be free for exploration and use by all nations, but that no nation may claim sovereignty of outer space or any celestial body. However, it does not ban all military activities in space nor the establishment of space forces.



**October 14, 1947:** With pilot Chuck Yeager at the controls, a Bell X-1 jet aircraft is drop-launched from the

bomb bay of a B-29 and embarks on a flight during which it exceeds the speed of sound, becoming the first manned aircraft to do so. After reaching a maximum speed of over 700 miles an hour, the Bell X-1 – dubbed “Glamorous Glennis” by Yeager in tribute to his wife – glides to a landing on a dry lake bed after its engines burn out. The flight demonstrated that the sound barrier could be broken without damage to an aircraft or its pilot, proving that space travel was indeed possible.

**October 27, 1577:** The Great Comet of 1577 (officially designated as C1577 / V1) reaches perihelion, i.e. its closest passage to the Sun. The comet was reportedly as bright as the Moon – so bright that it could be seen through the clouds – and had a tail measured at up to 60 degrees. Tycho Brahe carefully observed the comet and used these observations to advance the theory that comets were celestial objects, rather than atmospheric phenomena. Because the comet is classified as non-periodic, it is not expected to be visible from Earth again.



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**October 29, 1936:** The Popular Astronomy Club is officially formed; to learn more, turn to page 5.

# MEMBER OBSERVATIONS



*Due to clouds and haze, conditions were less than ideal on September 10 when (from left) Al Sheidler, Wayland Bauer, Rusty Case, Byron Davies and John Douglas (not in photo) met up at Paul Castle Observatory on September 10; these shots of the moon, a planetary nebula and two star clusters (M13 and M15) were captured during the session. Byron set up his new 7" Maksutov Cassegrain telescope, while Rusty played with his newly acquired Mallincan video camera.*



*Roy Gustafson captured these photos of the Helix Nebula and the Eastern Veil Nebula using Stellina and stacking images: 305 for the Helix, and 175 for the Eastern Veil.*



*Clear skies and warm weather attracted a crowd of more than 100 people to PAC's public observing session at Niabi Zoo on September 17. The telescope in the PACMO was used to capture some excellent views of Jupiter; those who stayed until 11 p.m. witnessed the transit of Io, shown here in this image. Freebies from NASA were handed out to kids, who also enjoyed various activities set up at tables. Those attending were also treated to views of the Moon, Venus, Saturn, double stars, star clusters and more, through both the PACMO and member telescopes.*



# MEMBER OBSERVATIONS



*Take an amateur astronomer who really knows what he's doing, put him in a place with really dark skies, and the results could be spectacular. That's what happened in September when Byron Davies took these astrophotos from his parents' country home in Little York, Illinois, located far from the bright lights of the Quad Cities. Great work, Byron; keep them coming!*





# MEMBER OBSERVATIONS



*Rusty Case and Al Sheidler went to the Eastern Iowa Star Party and came home with these photos; the top four were taken by Rusty, while Al caught a nice image of the sun just as it was going down for the day.*



**October  
2021**

## **Fond memories of Carolyn Shoemaker**

One clear evening during the summer of 2019, I was using Pegasus, one of my childhood friend Carl's telescopes, at our annual Adirondack Astronomy Retreat. When my cellphone began to ring, I picked it up with some surprise. At the other end of the line was Carolyn Shoemaker.

I was thrilled to hear from her, as it had been some time since our last contact. Carolyn was doing well, except for a mild hearing loss. She called to say that, since her daughter and son-in-law had moved to New Mexico, she would be living at the Peaks, an assisted living facility in Flagstaff, Arizona.

My colleague, Brent Archinal, gave me her cell phone number. I was able to speak with her again a few months later. I wanted to find a way to increase the frequency of our conversations.

"You speak with your brother, Richard, every Monday," Wendee, my wife, commented. She then suggested, "Why not call Carolyn every Monday as well?"

For the next 18 months, that's what I did. Carolyn would pick up the phone and announce, "It is David. It must be Monday!" Wendee would often join the discussion. But when I called on Monday, August 9, no one answered. After repeated tries, her daughter Linda called to say that Carolyn had had a minor fall and was in the hospital. On Thursday evening, August 12, she went into respiratory arrest. Carolyn died the next morning at 10:40 a.m.

With her husband, Gene, and the five-

year comet and asteroid program we shared, Carolyn was responsible for a very rich period in my life. In fact, virtually every article one reads about the Shoemakers will agree that the discovery and impacts of Comet Shoemaker-Levy 9 were the most significant part of our professional lives.

Carolyn began her observing project a few years after her husband Gene was disqualified as a potential astronaut because of Addison's disease. He decided to go at the problem of impacts, not from studying craters as he walked about on the Moon, but from the opposite direction of the comets and asteroids that collide with the Moon and the Earth.

Carolyn quickly learned to become proficient at using the stereomicroscope. She would place two films into the microscope; they were identical except that the second plate would be about 45 minutes later than the first. The films were almost always identical, except that when an asteroid was moving slowly, it would appear to float above the starry background.

Carolyn discovered 377 asteroids this way, each one charted until its orbit round the Sun could be determined accurately. When one included the asteroids for which orbits have not yet been determined, that number rose significantly, according to Car-

***Continued on Page 16***



***This photo, taken in 2004, shows Carolyn Shoemaker (left) with David and Wendee Levy at Kitt Peak National Observatory in Arizona.***



## Weird ways to observe the Moon, day or night

International Observe the Moon Night is on October 16 this year, but you can observe the Moon whenever it's up, day or night!

While binoculars and telescopes certainly reveal incredible details of our neighbor's surface – bringing out dark “seas,” bright craters, and numerous odd fissures and cracks – these tools are not the only way to observe details about our Moon. There are more ways to observe the Moon than you might expect, just using common household materials.

Put on a pair of sunglasses, especially polarized sunglasses! You may think this is a joke, but the point of polarized sunglasses is to dramatically reduce glare, so they allow your eyes to pick out some lunar details. Wearing sunglasses even helps during daytime observations of the Moon.

One unlikely tool is the humble plastic bottle cap. John Goss from the Roanoke Valley Astronomical Society shared these directions on how to make your own bottle cap lunar viewer, which was also suggested to him by Fred Schaaf many years ago as a way to view the thin crescent of Venus when close to the Sun.

“The full Moon is very bright, so much that details are overwhelmed by the glare. Here is an easy way to see more. Start by drilling a 1/16-inch diameter hole in a plastic soft drink bottle cap. Make sure it is an unobstructed, round hole.

Now look through the hole at the bright Moon. The image brightness will be much dimmer than normal – over 90% dimmer – reducing or eliminating any lunar glare. The image should also be much sharper because the bottle cap blocks light from entering the outer portion of your pupil, where imperfections of the eye's curving optical path likely lie.”

Many report seeing a startling amount of lunar detail using this technique.

You can also project the Moon. Have you heard of a “Sun Funnel”? It's a way to safely view the Sun by projecting the image from an eyepiece to fabric stretched across a funnel mounted on top. It's easy to make at home, too – directions are here: [bit.ly/sunfunnel](http://bit.ly/sunfunnel). Depending on your equipment, a Sun Funnel can view the Moon as



***Sun Funnels shown in action: Starting clockwise from the bottom left, a standalone Sun Funnel; attached to a small refractor to observe the transit of Mercury in 2019; attached to a large telescope in preparation for evening lunar observing; projection of the Moon onto a funnel from a medium-size scope (5 inches) .***

enough light to project from even relatively small telescopes.

**WARNING: NEVER** use a large telescope with a Sun Funnel to observe the Sun, as they are designed to project the Sun using small telescopes only. Some eager astronomers have melted their Sun Funnels, and parts of their own telescopes, by pointing them at the Sun; that's because large telescopes create far too much heat. However, large instruments are safe and ideal for projecting the much dimmer Moon. Small telescopes can't gather enough light to decently project the Moon, but larger scopes will work.

Large telescopes will project the full Moon and its phases, with varying levels of detail; while not as crisp as direct eyepiece viewing, it's still an impressive sight! You can also mount your smart-phone or tablet to your eyepiece for a similar

***Continued on Page 16***

# Observe the Moon Night: October 16

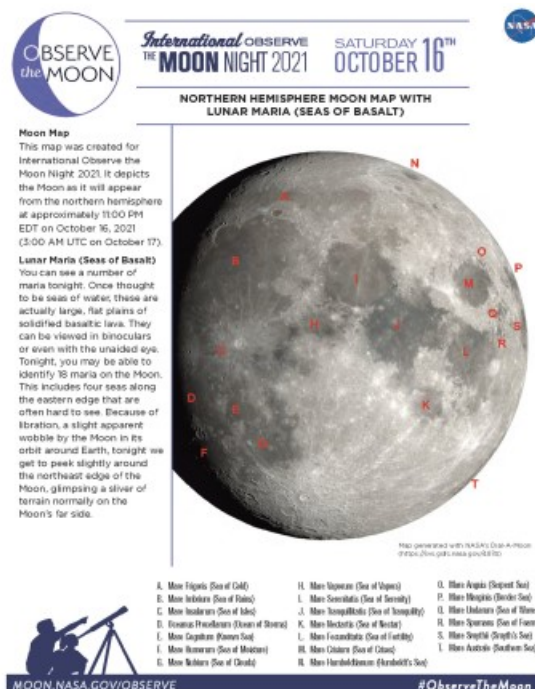
Continued from Page 14

Moon-viewing experience, but the funnel doesn't need batteries.

Of course, you can join folks in person or online for a celebration of our Moon on October 16, on International Observe the Moon Night – find details at [moon.nasa.gov/observe](https://moon.nasa.gov/observe). NASA has big plans for a return to the Moon with the Artemis program, and you can find the latest news on their upcoming lunar explorations at [nasa.gov](https://nasa.gov).

David Prosper

*This article is courtesy of NASA's Night Sky Network program, which supports astronomy clubs across the USA and is dedicated to astronomy outreach. Visit [nightsky.jpl.nasa.gov](https://nightsky.jpl.nasa.gov) to learn more.*



## Skyward: Remembering Carolyn Shoemaker

Continued from Page 14

olyn, to about 800.

In 1983, Carolyn discovered the first of her 32 comets. When Henry Holt joined the following year, the number of new comets rose rapidly. It was only a year or two after that when she surpassed the number of comets another famous astronomer, Caroline Herschel, discovered, and Sky & Telescope published a news note about "Carolyn passing Caroline."

I joined the team in 1989. In a sense, passing Herschel's record might have been Carolyn's golden moment, but it wasn't. That came later on a cloudy and dull day on March 25, 1993.

Two nights earlier, I had taken two exposures that she was scanning. Suddenly, looking up, she announced "I don't know what I have, but it looks like a squashed

comet." That was the discovery moment of Comet Shoemaker-Levy 9.

Sixteen months later, when 21 pieces of this fragmented object collided with Jupiter, we got to meet President Clinton and chat with Vice President Gore and share the world's excitement over the first collision of a comet and a planet ever witnessed by humans. It was a satisfying peak to our careers.

After Gene died in a car accident in Australia, Carolyn continued observing with Wendee and me. One evening, she confided that sometimes she wished she had died with Gene. But she did not, and the world was able to enjoy her company for 24 more years.

I shall miss the deep friendship I enjoyed with Carolyn Shoemaker, the woman whose energy, intelligence, and terrific sense of humor brightened our lives and made the night sky a happier place.



# SUMMARY OF SEPTEMBER PAC MEETING

The Popular Astronomy Club held its regular monthly meeting on September 13 at the Butterworth Center in Moline. The combined in-person / virtual meeting was attended “live” by 11 PAC members and guests – including a mother and her son from Muscatine who expressed interest in joining PAC – along with 16 others who joined the meeting via Zoom, including a guest who was interested in astrophotography and ham radio.

PAC president Alan Sheidler called the meeting to order a few minutes after 7 p.m. and said the agenda would include a business meeting, followed by a “smorgasbord” of presentations.

PAC officers provided updates at the business meeting, as follows:

- Observatory director Rusty Case discussed maintenance work and upgrades that were planned both for the Paul Castle Observatory and the PACMO.
- Secretary Paul Levesque apologized for the delay in distribution in the September issue of “Reflections,” caused by computer problems on his end, and then urged PAC members to submit photos, articles and other items for the newsletter. He stated that he was new to his duties as secretary, having recently taken over for Terry Dufek, and still learning what those duties were.
- Past president Wayland Bauer said that he would hold an observing session and presentation at a church in Davenport for the following Friday (*see page 18*)
- Treasurer Dale Hachtel presented the quarterly financial report, which included expenditures for insurance, storage of the PACMO, and annual fees for the Astronomical League. The report showed a current balance of \$7,329.29. Members present at the meeting voted unanimously to

to accept the report as submitted.

- Vice-president Dino Milani said that the PAC website was “working well,” and that he was planning an astronomy night at the American Doll and Toy Museum in Rock Island in October or November.
- President Alan Sheidler reminded everyone about the annual PAC banquet, which will take place on Saturday, October 23, at the Riverfront Grille in Rock Island. RSVPs are requested by October 9 and Al said these were needed so we know how much food to order. He also reminded PAC members of the public viewing session scheduled for Niabi Zoo on the following Saturday (September 18).

With the business meeting adjourned, the smorgasbord of presentations began. Here’s a summary:

- Anne Bauer gave a presentation on the Cincinnati Observatory, the oldest professional astronomical observatory in the United States. She discussed the history of the observatory and how former president John Quincy Adams was present for the laying of its cornerstone in 1843.
- Dale Hatchel gave two presentations; the first was on John Glenn Astronomy Park, located inside Hocking Hills State Park in Ohio. Dale showed photos from his visit last summer and discussed how the park was located in an area with dark night skies, and provided space for amateur astronomers to set up their telescopes.
- Dale then made a presentation on the James Webb Space Telescope, which is now scheduled for launch on December 18. Building and deploying the telescope has presented numerous engineering challenges, including the fact that it relies on solar power yet must be positioned in

***Continued on Page 18***

## PAC presentation draws big crowd at local church

A crowd estimated at over 100 people turned out for a public presentation by the Popular Astronomy Club at Christ's Family Church in Davenport on September 17.

The event began at about 7 p.m. and ended by 9:30 p.m. The PAC members present were Al and Sara Sheidler, Roy and Jan Gustafson, and Wayland and Anne Bauer.

Though the weather was questionable into the late afternoon, the skies cleared before sunset. Those attending were able to view the Moon, Venus, Jupiter and its moons and Saturn, along with a passage of the International Space Station.

In addition to the telescope observations, several educational activities for children were available.

PAC received a nice thank-you note, which accompanies this article, from the church, along with a generous financial gift.

Dear Wayland + Anne, Roy + Jan, Al + Sara, 9/17/2021  
+ the Popular Astronomy Club!  
• We thank you for an "Out of This World" evening!  
• We appreciate your knowledge, experience + willingness to share with Christ's Family Church family + friends.  
• We thank you for the time + effort you spent preparing activities + presentations for all ages.  
• May this small gift of appreciation be used to cover the costs of materials for tonight's program + for other needs + programs of the club.  
• You were the "stars" who "glowed" + brightened our night ~~long~~ tonight!  
Thank you again, CFC's Fellowship Committee  
on behalf of the Congregation, Family + Friends



**PAC received this thank-you note; these photos of the moon, and Jupiter and Saturn with their moons was taken during the event.**



## Summary of September meeting

### *Continued from Page 17*

- a dark area of the sky in order to perform observations.
- Dino Milani gave a presentation on comets, meteors and asteroids, and how asteroid strikes played a part in the formation of the Earth and its moon. He showed photos of the damage caused by an asteroid strike near the Russian city of Chelyabinsk in February 2013, and said that the damage could have been much more extensive had the asteroid entered the Earth's atmosphere at a different angle or if it had contained more iron.
- Roberta Wright gave a presentation on spacesuits, which can weight up to 200 pounds and contain more than 18,000 parts.

- Paul Levesque asked if PAC still had a library; it apparently does not, but he did have two astronomy-related books to give away. Both books were taken by meeting attendees. Paul encouraged future book exchanges among PAC members.
- Ally Nordick gave a presentation on the different types of telescopes.

At the conclusion of the meeting, recent astrophotos taken by Rusty Case, Byron Davies and Alan Sheidler were displayed.

The meeting was recorded; a YouTube video of the recording can be accessed via this link: <https://youtu.be/aelwDyATgQ0>.

The meeting adjourned at approximately 9 p.m. There will be no regular meeting in October; instead, all members are invited to attend the PAC banquet on October 23.

# UPCOMING EVENTS



**Date October 23, 2021**

**Event: Annual PAC Banquet**

**Location: Riverfront Grille, Rock Island**

- **Program : Lunar Laser Ranging Project**
- **Dr. Russet McMillan, Apache Point Observatory**

**All these events, dates and times are tentative and subject to change! Please check your emails for any updates and changes!**

## MORE UPCOMING EVENTS:

- **October 16:** Outreach at Niabi Zoo; sunset
- **October 18:** Quad Cities Astronomical Society meeting, via Zoom
- **November 1:** Outreach at Eldridge Public Library, featuring PACMO, member telescopes and StarLab Planetarium and inside programs; volunteers needed, especially those who can operate the planetarium.

MONTH	NEWSPAPER ARTICLES	MEMBER PRESENTATION	MEETING / PROGRAM
NOV 2021	Sara Sheidler	AVAILABLE	November 8 - Presentation: "M Dwarf Stars and the James Webb Space Telescope" by Katie Melbourne, Ball Aerospace Systems, Broomfield, Colorado
DEC 2021	Dale & Joann Hachtel	AVAILABLE	December 13 - Presentation: The Year in Review by Roy Gustafson
JAN 2022	AVAILABLE	AVAILABLE	January 10 - Presentation: "Curiosity Paving the Way for Perseverance" by Dr. Rebecca M E. Williams, Planetary Science Institute
FEB 2022	AVAILABLE	AVAILABLE	February 14 - Presentation: "Seeing Stars: How Birds Use the Night Sky During Migration" by Dr. Jennifer C. Owen, Corey Marsh Ecological Research Center, Michigan State University
MAR 2022	AVAILABLE	AVAILABLE	March 14 - Business Meeting; Smorgasbord of Member Presentations
APR 2022	AVAILABLE	AVAILABLE	April 11 - Presentation: "Fantastic Space Discoveries: Theories of Solar System Formation" by Jim Kovac, Chicago Society for Space Studies
MAY 2022	AVAILABLE	AVAILABLE	May 9 - Presentation: "Technology for the Astronomical Community & More" by Matt Dieterich, Technical Services Manager, PlaneWave Instruments, Inc., Adrian, Michigan
JUNE 2022	AVAILABLE	AVAILABLE	June 13 - Presentation: "Sky With Ocean Joined: Scaling the Stars at the U.S. Naval Observatory, 1830 to the Present" by Geoff Chester, Public Affairs Officer, U.S. Naval Observatory, Washington D.C.
JULY 2022	AVAILABLE	AVAILABLE	July 11 - Presentation: "OSIRIS-REx Mission Update" by Dolores Hill, Senior Research Specialist, Lunar & Planetary Laboratory, University of Arizona, Tucson, Arizona



## POPULAR ASTRONOMY CLUB



Thank you for your interest in the Popular Astronomy Club. To renew your membership or to apply as a new member, please fill in the information and either mail this form to the address below, or bring it to a PAC event. The membership year runs from October 1<sup>st</sup> through September 30th. There is a pro-rated amount if you join anytime during the year (see below). Our club newsletter, REFLECTIONS, will be e-mailed to you and it will be posted on the club website.

**Submission of this application and payment confirms the applicant's agreement to abide by the policies and procedures detailed in the PAC Policy & Procedures Document available at our website:**  
**[www.popularastronomyclub.org](http://www.popularastronomyclub.org)**

Membership pro-rated (for new members) amount by month:

Oct-\$30.00, Nov-\$27.50, Dec-\$25.00, Jan-\$22.50, Feb-\$20.00, Mar-\$17.50, Apr-\$15.00, May-\$12.50, Jun-\$10.00, Jul-\$7.50, Aug-\$5.00, Sep-\$2.50

**PAC renew or new member:**

(a) Regular Membership \$30.00 \$ \_\_\_\_\_

(b) Additional family member (\$7.50 each) x (#) \_\_\_\_\_ \$ \_\_\_\_\_

**Or you can elect c, d, or e (this includes the \$30.00 membership, with the balance a tax deductible gift to PAC):**

(c) Supporting Member \$40.00 \$ \_\_\_\_\_

(d) Sustaining Member \$60.00 \$ \_\_\_\_\_

(e) Patron Member \$80.00 \$ \_\_\_\_\_

(f) Student Member \$10.00 \$ \_\_\_\_\_

**Grand Total** \$ \_\_\_\_\_

Your Name: \_\_\_\_\_

Address: \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

E-Mail \_\_\_\_\_

Home Phone: \_\_\_\_\_ Cell Phone \_\_\_\_\_

Please enter name (s) of ADDITIONAL FAMILY MEMBERS:

\_\_\_\_\_

Emergency Contact: \_\_\_\_\_ phone # \_\_\_\_\_

**THANK YOU!! Welcome to the Popular Astronomy Club!!**

Make your check payable to the **Popular Astronomy Club, Inc.** Mail or present at a PAC meeting to:

Dale Hachtel (treasurer)  
1617 Elm Shore Drive  
Port Byron, Illinois 61275  
cell # [614-935-5748](tel:614-935-5748)