



Reflections

The Newsletter of the Popular Astronomy Club

ESTABLISHED 1936



December 2022

REFLECTIONS from the President



Dale Hachtel

This has been an interesting year for the Popular Astronomy Club. Various organizations we have worked with in the past requested public programs again in 2022 after a

couple of years of less activity.

Our calendar has been much busier than in the past, with 60 activities accomplished, 34 of which were public observing programs. Another 16 were postponed or canceled, mostly due to weather concerns.

Four of our nine public observing sessions at Niabi Zoo had to be canceled due to bad weather, but the five that we were able to hold had relatively good attendance. In total, our public programs reached out to over 1,600 attendees during the year.

We are also expanding our range of meeting participants by sharing our Zoom connection for our monthly meetings with other astronomy clubs in the region. Some of those clubs have also shared their Zoom links with us, and I have seen a few PAC members on the list when I've been watching these meetings.

We were able to have a successful observing program at an excellent new location at the Riverdale Schools near Port Byron, hosted by the Riverdale Middle School and also sponsored by

the libraries in Port Byron and Cordova, serving the upper Rock Island County area. They have already asked us to return there for another observing program in 2023.

Unfortunately, programs at three other new locations had to be canceled for various reasons, but the hosts are planning to try again next year. We are already starting to fill out the 2023 calendar with some new locations, along with ongoing observing sessions at John Deere Middle School and the Moline Public Library.

We have had many observing sessions at Paul Castle Memorial Observatory this year, but there are still opportunities for more use of the observatory. The club also has some portable telescopes that are available to members who do not have a telescope or who want to try out a different telescope.

Thanks to the PAC members who volunteered their time and talent at our outreach sessions and other activities. By sharing your love of astronomy with the public, you made a positive difference in our community.

To hear more about the PAC activities of 2022, come to the December 12 meeting at the Butterworth Center for the Year in Review presentation by Roy Gustafson. As an added feature, we will have a Newtonian Physics Demonstration of orbital gravitational interaction.

This increased activity is a good reason for amateur astronomers to keep looking up!

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PACMO had a busy 2022

The Popular Astronomy Club Mobile Observatory – known to its friends as the PACMO – is getting a well-deserved winter rest (*see page 4*) after a busy year in 2022.

This year, the PACMO racked up a little over 310 miles from its storage site at Sun-Rys in Coal Valley. Its longest trip was to Giant Goose Recreation Area in Canton, Illinois, a distance of about 54 miles.

In all, the PACMO was used in 14 public outreach events, including five Saturday night observing sessions at Niabi Zoo. The PACMO also supported events at public libraries in Davenport, East Moline, Eldridge, LeClaire and Moline, as well as at Riverdale Schools, the American Toy and Doll Museum in Rock Island, and Illiniwek Campground in Hampton.

Thanks to Rusty Case and Al Sheidler for towing the PACMO this year and to everyone else who helped keep the mobile observatory up and running.



Al Sheidler points out Saturn on the PACMO's video screen during an outreach event last month at the East Moline Public Library.

ANNOUNCEMENTS / INFO



NCRAL 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 3/4-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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SUMMARY OF NOVEMBER PAC MEETING

The Popular Astronomy Club held its regular monthly meeting on November 14 at 7 p.m. at the Butterworth Center in Moline. Seven PAC members and three guests (including the featured presenter and two of his companions) attended the meeting “live,” with another 17 joining via Zoom, including members of other astronomy clubs in the region.

PAC president Dale Hachtel called the meeting to order. Following brief introductory remarks, the meeting proceeded with a feature presentation by Jim Dole, director of the Doug Firebaugh Observatory in Freeport, Illinois.

Jim’s presentation focused on a visit he took this summer to the Green Bank Observatory in West Virginia, home to an array of radio telescopes that constantly scan the sky for “radio whispers” that could lead to new astronomical discoveries.

The visit was conducted as part of the Educational Research in Radio Astronomy (ERIRA) program. Through the sponsorship of the University of North Carolina at Chapel Hill, ERIRA offers a small group of college students an opportunity to participate in a week-long “crash course” in radio astronomy at Green Bank.

During the visit, Jim served as a coordinator and mentor to the students, providing guidance to four small sub-groups of students on their projects.

Jim noted that the course was packed with classroom instruction, research projects and facility tours, and that students and staff usually got about four hours of sleep a night, if that.

Because one of the largest telescopes at Green Bank was in maintenance mode, Jim said, he and the students got to climb to the top of it and view the scenery from about 460 feet in the air.



Jim Dole’s presentation focused on a visit he took this summer to the Green Bank Observatory in West Virginia.

During his presentation, Jim described the operations of some of the telescopes at Green Bank, including one that is manually moved in altitude as it tracks an object that is being observed.

The students were enthusiastic, Jim said, because they applied for the program and wanted to be there. Students and educators come from across the nation, he noted, and only a small number of applicants are accepted.

The projects performed by the students included radio telescope measurements of Jupiter and the Milky Way. Some visual observing and astrophotography also took place.

Jim said that he hopes to go back next year and highly recommended the program to any student with an interest in astronomy. Meanwhile, the Firebaugh Observatory does have a small radio telescope, and Jim noted that radio astronomy is open to amateur astronomers.

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PACMO winterization is complete



A team of PAC members led by observatory director Rusty Case worked up an appetite for turkey dinner by spending some time on the afternoon before Thanksgiving preparing the PACMO for winter storage at Sun-Rys in Coal Valley. Joining Rusty in the winterization project were Dale Hachtel, Mike Haney, Al Sheidler, and Alex, Hugh and Mary Holt. After removing the battery, telescope and video screen from the PACMO, the team closed it up and tarped it over. Great work, everyone! Turn to page 2 to learn where the PACMO went during 2022.



November meeting

Continued from Page 4

Following the presentation, member observations were displayed and discussed, including some recent astrophotos by Byron Davies, Rusty Case and Alan Sheidler.

Dale then went over the schedule of upcoming events and stated that the public observing session at Moline Public Library scheduled for the following evening (November 15) would be postponed for two weeks due to a forecast calling for snow. Cloudy weather is forecast for most of the

coming week, Dale said, but may clear in time for the last Niabi Zoo public observing session of the year on Saturday (November 19).

A recording of the meeting is available on YouTube via the following link: <https://youtu.be/LNunJnuSsxE>.

The meeting adjourned at 8:25 p.m. The next membership meeting is scheduled for December 12 and will feature a PAC "Year in Review" presentation, along with a presentation on Newtonian physics.

Double stars: Wonders of the night sky

The winter skies offer the opportunity to observe an interesting kind of astronomical object called a double star.

As the name suggests, double stars consist of two stars very close to each other in the sky. Most double stars are so close together that they appear as one to the naked eye. Many, however, can be separated using a small telescope.

The first, and perhaps the most famous, double star is Polaris, also known as the North Star. This star's name comes from the fact that the Earth's north axis points almost exactly at Polaris.

Polaris, which can only be seen in the Northern Hemisphere, appears to never move in the sky. From the Quad Cities, Polaris is due north and about halfway up from the horizon, about 41 degrees. Polaris' elevation above the northern horizon is equal to the latitude of the observer.

At the North Pole, Polaris is directly overhead. At the equator, Polaris is at the horizon, making it very difficult to see. In the Southern Hemisphere, Polaris can't be seen at all.

Polaris is the brightest star in the constellation Ursa Minor, part of which is recognizable as the Little Dipper. It is the star at the end of the dipper's handle.

Though some think that Polaris is the brightest star in the sky, in fact it is not even

close. The brightness of stars is measured by magnitude, and the lower the number, the brighter the star or celestial object. The brightest objects we see have negative magnitudes.

Polaris has a magnitude of 1.98; Sirius, which is the brightest star we can see, has a negative magnitude of -1.42, making it much brighter than Polaris.

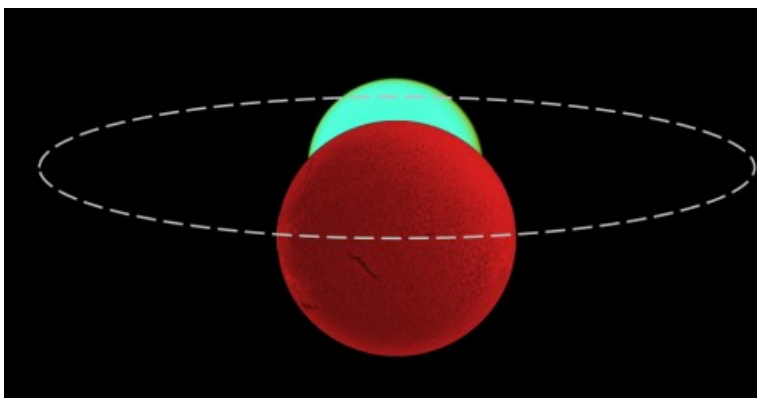
If you point a small telescope at Polaris, you can see that it actually consists of two stars: A bright yellowish primary star, and a diminutive pale white secondary star. These two stars orbit each other.

There's also a third star near the primary star; this star is so dim that it's impossible to see with a telescope. While Polaris is actually a trinary system, it's still called a double star because we can only see two stars through visual observation.

Polaris is so far from us that its distance is difficult to pin down accurately. The current estimate for the distance to Polaris is around 433 light-years, meaning that the light we see from Polaris took 433 years to get here.

Polaris' brightness suggests that the stars comprising this system are extremely large and luminous – and they are. Polaris' bright primary star is a yellow supergiant estimated to be 37 times larger in diameter, and five

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This diagram illustrates the eclipsing binary star system called Algol, aka "The Demon Star." The stars orbit around each other very rapidly, completing one orbit every 2 days, 20 hours, 48 minutes and 56 seconds. The larger, but lighter, red star, which moves at nearly 430,000 miles per hour, covers about 79% of the bright bluish star in a partial eclipse that occurs once each revolution.

Double stars

Continued from Page 5

times more massive, than our Sun. It would have to be over 2,200 times as luminous as the Sun in order to appear as bright as it does to us, given its vast distance. The other star visible in telescopes as the tiny, pale companion is about the same size as the Sun.

Another double star now visible is Eta Cassiopeia, a name often shortened to Eta Cass. It's a very attractive pair of unequally bright stars located in the constellation Cassiopeia.

The brighter, primary star is a pretty yellow, while the smaller, secondary star is reddish in color. Eta Cass is a relatively close neighbor to us, at 19.3 light-years. It's a very interesting double star and pleasing to the eye, which makes it one of my favorites.

Eta Cass' primary star is noteworthy because it is almost the same size, mass and temperature as the Sun. This means it looks about how our Sun would look if we could view it from Eta Cass. The secondary star is much smaller in size, and also less massive and much cooler in temperature, characteristics which make it appear dimmer and ruddier in the telescope.

The two stars are gravitationally involved with each other, locked in a sort of gravitational lover's embrace. They orbit around a common center of gravity.

Imagine taking a dumbbell and throwing it up into the air while, at the same time, giving it a twirl so that the weights swing around each other, held apart by the bar. This is analogous to what is happening with Eta Cass, though on a much larger scale of course.

Albireo, another double star, appears to the unaided eye as magnitude 3 star in the constellation Cygnus. In a small telescope, this celestial gem is split into two bright, beautiful gold and royal blue component

This photo, taken with a PAC telescope available at public outreach sessions, shows the blue and gold color contrast of the double star Alberio.



stars. These contrasting colors make Albireo one of the prettiest objects gracing our night sky.

Astronomical studies of Alberio suggest that it's an optical double, rather than a binary system. In other words, the component stars are lined up and appear close together from our viewpoint, but in fact are too far apart to be involved with each other gravitationally.

While the colors of individual stars can be notoriously difficult to perceive, Albireo's components are close together in the same telescopic field of view, so the colors contrast nicely and are remarkable in appearance.

Algol, also known as Beta Persei, is eclipsing binary star system located in the constellation Perseus. It is also known as the "Demon Star," because every 2.9 days, its brightness drops from the magnitude 2.1 to a much dimmer 3.4.

The Algol system has two stars, both larger in diameter than the Sun, that orbit each other very closely. They are about 6 million miles apart, a short distance on the celestial scale.

The two are so near one another that the heavier primary star may be cannibalizing material from the secondary star, which is lighter although larger in diameter. Because

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Newtonian physics will be demonstrated at meeting

The December 12 membership meeting of the Popular Astronomy Club will feature a demonstration of Newtonian physics using a unique computer program.

Ted Berenyi, a Deere and Company retiree, developed a program that animates particles which interact gravitationally or, in extreme cases, elastically or inelastically during collisions. His presentation will include demonstrations of satellites orbiting the Moon and transfer orbits between Earth and Mars.

Ted lives in Arizona so the demonstration will take place via Zoom. He worked for Deere for 36 years in jobs mostly related to various aspects of computing, analysis, and software development. He developed much of the

graphics software used in the company and was also involved in the development of precision farming projects.

Ted holds bachelors and masters degrees in Mathematics from both the University of Iowa and Iowa State University. He states that he wants to maintain his computer skills as much as possible in retirement and finds astronomy as a worthy challenge. His "Mini Universe" project is a work in progress clearly to be taken with a grain of salt.



TED BERENYI

Double stars

Continued from Page 6

these stars are so close to each other, they orbit each other at a dizzying pace—once every 2.9 days.

Because the orbital plane of the system is oriented nearly edge-on to our line of sight, the two stars eclipse each other as they rotate around a common center of gravity. When the larger, dimmer, red star passes in front of the hot, bright blue star, nearly 80% of the blue star is covered by the red star. This drops the overall brightness of the pair for a period of about 10 hours.

Halfway around the orbit, the blue star passes in front of the red star; because the

red star is much dimmer, the dip in the brightness is not noticeable visually, registering only on sensitive photoelectronic measuring devices.

Algol is located about 90 light-years from Earth. Because the stars are so close together in their orbit, it's not possible to visually split the pair even with a powerful telescope. But, with patience, Algol is a pleasing sight through the telescope, as you watch it wax and wane in brightness during its eclipses.

The universe is filled with amazing objects such as double stars, so be sure to keep looking up!

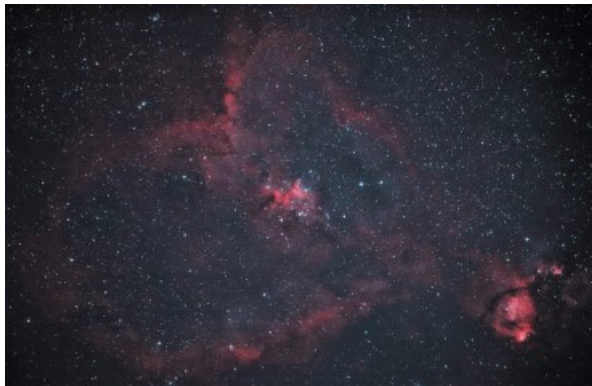
Alan Sheidler

Astronomical League Observing Programs

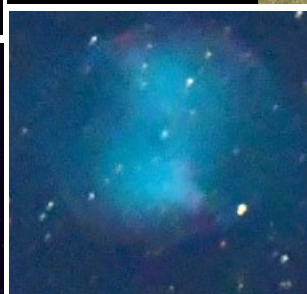
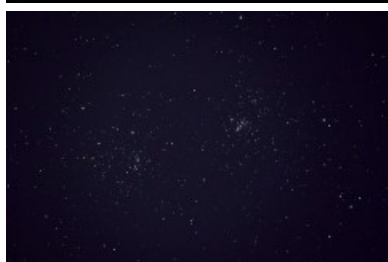
The Astronomical League offers more than 70 different observing programs, ranging alphabetically from "Active Galactic Nuclei" to "Youth Astronomer." The programs are designed to provide goals and directions for your observations and cover a full range of observable objects and skill and experience levels.

You can earn certificates and pins for completing the programs. Click on this link - [Observing Programs](#) - to find an alphabetical list of observing programs.

MEMBER OBSERVATIONS & CLUB ACTIVITIES

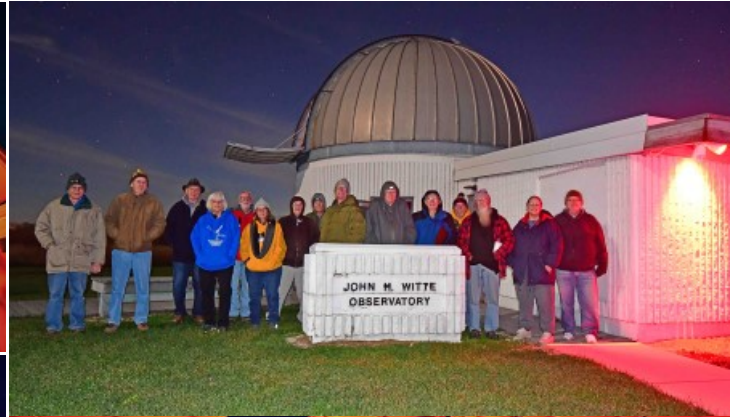


Byron Davies sent in these awesome images taken on November 25 at Menke Observatory. Shown at left are (from top) the Horsehead Nebula and Heart Nebula; above (top) the Orion Nebula; and (bottom, from left) the Jellyfish Nebula and Soul Nebula.



Al and Eric Sheidler did some father-son observing at Paul Castle Observatory on November 3. Al used a telescope recently donated to PAC (see page 16) and Eric set up his 104mm Celestron. The images captured that night included (from left, top), Eta Cassiopeia, the NGC869 double star cluster, the Dumbbell Nebula, the Moon, and Saturn and its moons.

MEMBER OBSERVATIONS & CLUB ACTIVITIES



On November 8, members of the Popular Astronomy Club and Quad Cities Astronomical Society took a field trip to the John W. Witte Jr. Observatory. The Southeastern Iowa Astronomy Club operates the observatory, which is located in Sperry, Iowa, north of Burlington. Those taking the trip included Rob McDonald, Rusty Case, Dale Hachtel, Mike Dannenfeldt, Jim Rutenbeck, John Baker and Al Sheidler. Thanks to our colleagues in southeast Iowa for being such gracious hosts!



On November 22, Al Sheidler and Steve Sinksen met at Castle Observatory, where Steve got a chance to try out his new telescope and Al continued working on the Astronomical League's carbon star observing program.

MEMBER OBSERVATIONS & CLUB ACTIVITIES



Alan Sheidler was up during the wee hours of November 8 to catch this photo of the "Election Day" lunar eclipse, with an exposure time of three seconds at ISO 1600. He then took an image of the Orion Nebula with a 15-second exposure at 3200 ISO.



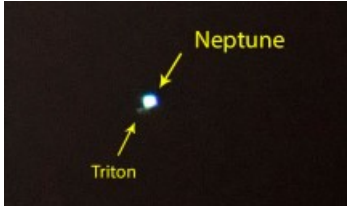
Rusty Case, Al Sheidler and Byron Davies are shown at Menke Observatory on November 25, when Al captured these images: (from top left) the Andromeda Galaxy (M31), the Fireworks Galaxy (NGC 6946), the Sculptor Galaxy (NGC 253), the Eastern Veil Nebula (NGC 6992), the Pleiades (M45), and the Bowtie Nebula (NGC 40).



MEMBER OBSERVATIONS & CLUB ACTIVITIES



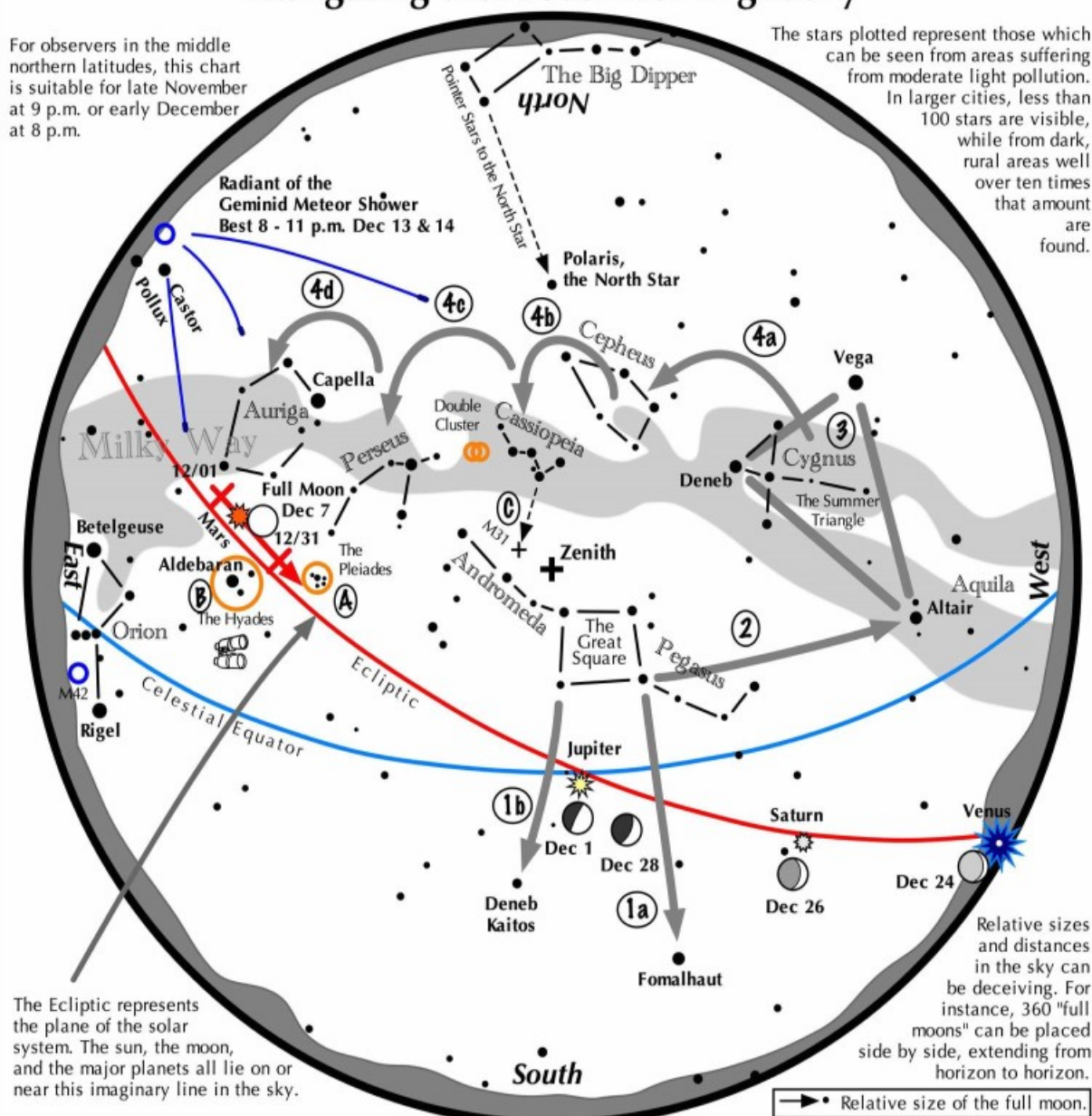
Chilly weather didn't stop the more than 100 members of the public who turned out for an outreach event on November 8 at Runners Park in East Moline sponsored by the East Moline Public Library. The event offered good views of a nearly full moon and some planets, including Neptune.



Navigating the December Night Sky

For observers in the middle northern latitudes, this chart is suitable for late November at 9 p.m. or early December at 8 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



Navigating the December night sky: Simply start with what you know or with what you can easily find.

- 1 Face south. Almost overhead is the "Great Square" with four stars about the same brightness as those of the Big Dipper. Extend an imaginary line southward following the Square's two westernmost stars. The line strikes Fomalhaut, the brightest star in the southwest. A line extending southward from the two easternmost stars, passes Deneb Kaitos, the second brightest star in the south.
- 2 Draw another line, this time westward following the southern edge of the Square. It strikes Altair, part of the "Summer Triangle."
- 3 Locate Vega and Deneb, the other two stars of the "Summer Triangle." Vega is its brightest member while Deneb sits in the middle of the Milky Way.
- 4 Jump along the Milky Way from Deneb to Cepheus, which resembles the outline of a house. Continue jumping to the "W" of Cassiopeia, to Perseus, and finally to Auriga with its bright star Capella.

Binocular Highlights

A and B: Examine the stars of the Pleiades and Hyades, two naked eye star clusters.

C: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.

D: Sweep along the Milky Way from Altair, past Deneb, through Cepheus, Cassiopeia and Perseus, then to Auriga for many intriguing star clusters and nebulous areas.

Astronomical League www.astronleague.org/outreach; duplication is allowed and encouraged for all free distribution.





**December
2022**

Another Loss

As I get older and older, the list of people who depart gets longer and increases with a greater frequency. But now I find myself writing, for the third month in a row, about the loss of someone who meant a lot to me and without whom I do not know how I will continue my own journey through the night sky.

Constantine Papacosmas introduced himself to me the first night I entered the old observatory of the Montreal Centre of the Royal Astronomical Society of Canada. The young observer had just completed a truly fabulous 8-inch reflector which we used once or twice. At that time, he was brilliant, creative and inspiring.

Within a few years, we had become great friends and we spent a lot of time together. One afternoon while walking down a hill to my junior high school classes, a car passed me, then slammed on its brakes about 300 meters away. Putting the car in reverse, the driver screeched backward until it reached me. "Hello David!" It was Constantine.

You might have read a few months ago the story of how I got my own 8-inch reflector, Pegasus. It was a loaner scope. By the time David returned from college, Constantine

suggested that my parents buy me the telescope.

We gathered in our living room and my parents listened carefully as

Constantine Papacosmas (left) is shown with David Levy.



stantine explained why they should make such an expensive purchase for me, and not for any of my siblings. He correctly persuaded them that I was never about to lose my passion for the night sky.

By the end of that day, my parents agreed to buy the telescope for \$400, (which would today amount to \$3,761). More important, that afternoon gave Dad a chance to form a bond with Constantine that he never forgot.

In 1978, Dad inquired how Constantine was doing. I had had a mild falling out with him, but I simply replied we hadn't been in touch for a while. Dad had something to say about that.

"You can count on the fingers of one hand the number of close friends you have had since your youth. You just cannot afford to lose those precious friends." The minute he left the room, I telephoned Constantine and we picked up where we had left off.

By 1984, my dad was dying from Alzheimer's disease. He could barely recognize Mom, let alone me. But he remembered Constantine. The two began talking.

"Constantine, do you know what is happening to me?"

"Yes, I am sorry, but I am afraid I do know."

"Constantine, I can't live like this. I wish.... I wish I were dead." Constantine told me that story many years later.

Those of us who knew the older Constantine may not appreciate the skill, the intelligence, the humor, and the talent of the younger amateur astronomer. But they remembered him well enough to present him the Centre's highest medal for excellence, the Charles Good award.

His clock that I received shortly before his death now tells Montreal time. It is the Constacklock.

Farewell, Constantine, and thank you for enriching my nights under the stars.

Binoculars: A Great First Telescope

Do you want to peer deeper into the night sky? Are you feeling the urge to buy a telescope?

There are so many options for budding astronomers that choosing one can be overwhelming. A first telescope should be easy to use and provide good quality views while being affordable. As it turns out, those requirements make the first telescope of choice for many stargazers something unexpected: A good pair of binoculars!

Binoculars are an excellent first instrument because they are generally easy to use and more versatile than most telescopes. Binoculars can be used for activities like stargazing and birdwatching, and work great in the field at a star party, along the hiking trail, and anywhere else where you can see the sky.

Binoculars also travel well, since they easily fit into carry-on luggage – a difficult feat for most telescopes! A good pair of binoculars, ranging in specifications from 7x35 to 10x50, will give you great views of the Moon, large open star clusters like the Pleiades (M45), and, from dark skies, larger bright galaxies like the Andromeda Galaxy (M31) and large nebulae like the Orion Nebula (M42).

While you likely won't be able to see Saturn's rings, as you practice your observing skills you may be able to spot Jupiter's moons, along with some globular clusters and fainter nebulae from dark sites, too.

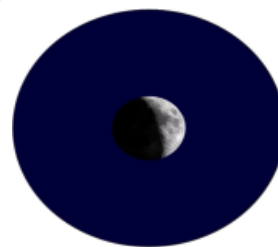
What do the numbers on those binocular specs actually mean? The first number is the magnification, while the second number is the size in millimeters (mm) of the lenses. So, a 7x35 pair of binoculars means that they will magnify 7 times using lenses 35 mm in diameter.

It can be tempting to get the biggest binoculars you can find, but try not to get anything much more powerful than a 10x50 pair



The two most popular types of binocular designs are shown here: Roof-prism binoculars (left) and porro-prism binoculars. Roof prisms tend to be more compact, lighter, and a bit more portable, while porro-prisms tend to be heavier but often offer wider views and greater magnification. What should you choose? Many birders and frequent fliers often choose roof-prism models for their portability. Many observers who prefer to observe fainter deep-sky objects, or who use a tripod with their observing choose larger porro-prism designs. If you can, try out both designs and see which works better for you.

A pair of good binoculars can show craters on the Moon around 6 miles (10 kilometers) across and larger. How large is that? It would take you about two hours to hike across a similar-sized crater on Earth. The “Can You See the Flag On the Moon?” handout showcases the levels of detail that different instruments can typically observe on the Moon, available at bit.ly/flagmoon. (Moon image courtesy of Jay Tanner)



at first. Larger binoculars with more power often have narrower fields of vision and are heavier; while technically more powerful, they are also more difficult to hold steadily in

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Constellations that didn't make the cut

In 1922, the International Astronomical Union announced the names of 88 constellations that would be used to form the boundaries of sky maps going forward. To mark the centennial of adoption of the modern constellation list, *Reflections* is looking back at some constellations that were once found on some sky maps, but didn't make the final cut.

Globus Aerostaticus, Latin for "Hot Air Balloon," was another constellation proposed by French astronomer Joseph Jérôme de LaLande during the late 18th century. LaLande's intent was to honor the invention of the hot air balloon by the Montgolfier brothers, at a time when other advances in science and technology were also lending their names to proposed constellations, including those first charted by Europeans exploring the Southern Hemisphere. "I thought the greatest discovery of the French deserved to occupy a place in the sky," LaLande once said.

Johann Elert Bode including *Globus Aerostaticus* when he published an influential collection of sky maps known as *Uranographia* in 1801. The celestial balloon floated below

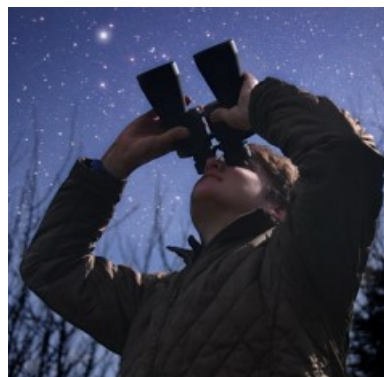


Capricorn and near the tail of *Piscis Austrinus*, the Southern Fish. It contained no bright stars and was soon excluded from subsequent sky maps, falling far out of use by the time the list of constellations was finalized in 1922.

Binoculars

Continued from Page X15

your hands and "jiggle" quite a bit unless you buy much more expensive binoculars with image stabilization or mount them to a tripod.



Would it surprise you that amazing views

One advantage of binoculars is that they offer a larger field of view than telescopes.

of some astronomical objects can be found not just from giant telescopes, but also from seemingly humble binoculars? Binoculars are able to show a much larger field of view of the sky compared to most telescopes.

For example, most telescopes are unable to keep the entirety of the Pleiades or Andromeda Galaxy entirely inside the view of most eyepieces. Binoculars are also a great investment for more advanced observing, as they are useful for hunting down objects to then observe in more detail with a telescope.

Real-world advice and experience are still the best for something you will be spending a lot of time with. Going to an in-person star party hosted by a local club is a great way to get familiar with telescopes and binoculars of all kinds – just ask permission before taking a closer look!

You can inspire your binocular stargazing sessions with NASA's latest discoveries at 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 to learn more.

UPCOMING EVENTS



Date: December 12, 2022

Event: Membership meeting @ 7 p.m.
Location: Butterworth Center / Zoom
Program: Newtonian Physics Demonstration
PAC Year in Review

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

In 2023, PAC Membership meetings will be held on the second Monday of the month at 7 p.m. at the Butterworth Center in Moline; no regular meetings scheduled for August (annual picnic) and October (annual banquet). Membership meetings of the Quad Cities Astronomical Society are generally held on the third Monday of the month at 7 p.m.

New club telescope is ready for use

I've been working on the telescope that was recently donated to the club by Bill Creasey. The scope is a Meade 10-inch LX200 Wide Field telescope with a focal length of 1600 millimeters, yielding a relatively fast focal ratio.

To get the telescope ready for use, I removed and washed the corrector plate, cleaned the cobwebs out of the optical tube assembly (OTA) using my shop vac, and repaired the electronics.

To get into the tube, I had to carefully remove the screws in front of the scope to unclamp and remove the corrector plate, which is housed by the OTA.

Unfortunately, there is a problem with the electronics which I'm still attempting to repair: The internal clock does not function. This does not seem to affect the overall functioning of the telescope, but the date and time need to be programmed every time the scope is used. I'll work through the winter months to fix this issue.

On November 1, I set the telescope up to check out the sun. I took this snapshot using the scope.

I used a homemade solar filter on the scope to enable safe viewing. The scope's focal length of 1600mm makes it a relatively fast F6.3 which, with the wider field, makes it capable of viewing faint deep sky objects. I can't wait to try this bad boy out at night.

In any event, it looks like the scope is functional again, despite the internal clock issue. Many thanks to Mr. Creasey for donating this scope.

Because this is a club telescope, it can be used at public outreach events and be rented for low cost by PAC members. Other telescopes are also available. Contact me to learn about our newest telescope and the other scopes belonging to PAC.



Alan Sheidler



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 1st 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.

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:

Michael Haney (treasurer)
564 36th Ave.
East Moline, Illinois 61244
cell # 309-781-4150

MEMBERSHIP FORM AVAILABLE ONLINE HERE: <https://www.popularastronomyclub.org/club-documents>