



# Reflections

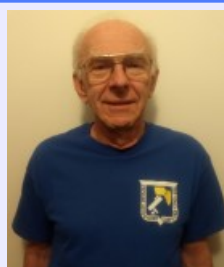
The Newsletter of the Popular Astronomy Club

ESTABLISHED 1936



April 2023

## REFLECTIONS from the President



Dale Hachtel

Our public observing programs got off to a rough start this year with cloudy weather, but we finally were able to do

some outreach observing on rain dates, except one for one rain date that was snowed out.

April will be a busy month, with our monthly observing at Niabi, and public sessions at Kewanee Central School, Moline Public Library, and John Deere Middle School, and other outreach sessions for WQPT, the local PBS TV station, and the Putnam Museum.

At our monthly meeting in March, we ran out of time for member observations. For our April monthly meeting, we will have an expanded member observation program.

Alan Sheidler and Byron Davies took advantage of one rare clear night recently to go to our Paul Castle Observatory and observe as many Messier objects as they could.

Our meeting with the Quad City Engineering & Science Council (QCESC) was postponed from March, but we still will be able to learn more from each other about what we do, and possibly to work with them in promoting STEM activities.

Mars and Venus will be visible in the evening all month, but Mars and Earth are moving farther apart. Therefore, Mars is getting dimmer as the month progresses.

Mercury can be visible low in the west just after sunset, particularly during the first two weeks of April. Jupiter and Neptune are hiding behind the sun now, and Saturn appears very close to the sun just before sunrise.

Uranus is appearing closer to the sun and will be difficult to see only right after sunset.

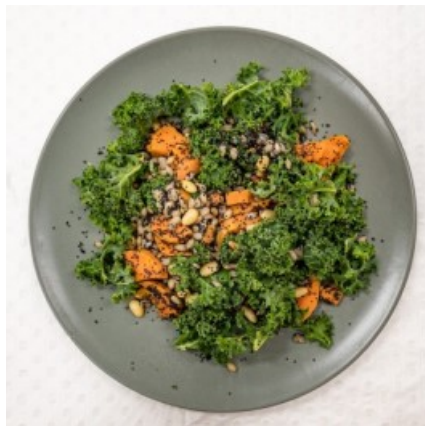
With the planets being difficult this month, it may be a good time to turn the scopes to the interesting Messier objects in our spring skies.

Our Niabi public observing is on April 15. We hope to see you there, and until then, keep looking up !



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## How to make a 'space salad'

An international team of scientists have created a recipe for a "space salad" designed to keep astronauts well-nourished on long missions.

The salad consists of seven ingredients — soybeans, poppy seeds, barley, kale, peanuts, sunflower seeds, and sweet potatoes. The ingredients were chosen for their nutritional value, and also because they can be grown in small enclosures on spacecraft.

The salad's ingredients can all be grown relatively quickly using hydroponic fertilizers. Any inedible portions of the plants, such as leaves and stalks, will be burned and recycled into the hydroponic system.

Researchers from the U.S., United Kingdom and Australia came up with the salad recipe. The research team is working on selectively breeding the plants used in the salad to further increase their nutrient density, and decrease the amount of space, water and fertilizer needed to grow them.

## 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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If you have questions or request,  
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## SUMMARY OF PAC BOARD MEETING

The board of the Popular Astronomy Club held a meeting via Zoom on Sunday, March 12. PAC President Dale Hachtel called the meeting to order at 7 p.m.

Those present were Past President / Observing Coordinator Alan Sheidler; Treasurer Michael Haney; Secretary Paul Levesque; and Observatory Director Rusty Case. Vice-President Dino Milani was absent due to a scheduling conflict; ALCOR Correspondent Roy Gustafson attempted to log onto the meeting but was unable to do so due to connectivity issues on his end.

Michael presented a treasurer's report covering the timeframe December 2022 through February 2023, and also for the full calendar year 2022. The report showed that revenue was up last year, due to an increase both in donations collected through outreach programs and in membership dues. Most of the increase was due to the memorial gift given by the estate of the late Terry Dufek.

Dale asked if individuals who still counted themselves as members but had not paid their dues for the year could be contacted one more time and asked to renew.

The current balance in PAC's account now stands at \$36,595.16. At a previous meeting, the possibility of transferring some of the large balance in the checking account to a financial instrument that would pay a higher interest rate was discussed, with the understanding that the funds so transferred would be tied up for a period of time.

Michael reported on the current interest rates paid on certificates of deposit by Vibrant Federal Credit Union, the institution used by PAC for its savings and checking account. He suggested that the best CD might be one with an 18-month maturity that pays 4.65 percent interest.

After further discussion, board members agreed that the club should keep at least

Popular Astronomy Club Balance Sheet As of February 28, 2023	
	Feb 28, 23
<b>ASSETS</b>	
Current Assets	
Checking/Savings	
Business Special	46.44
Cash	0.00
Checking	30,722.56
Money Market	5,410.88
Savings	10.25
Total Checking/Savings	36,180.10
Accounts Receivable	
Accounts Receivable	430.00
Total Accounts Receivable	430.00
Total Current Assets	36,595.16
<b>TOTAL ASSETS</b>	<b>36,595.16</b>
<b>LIABILITIES &amp; EQUITY</b>	
Equity	
Opening Balance Equity	9,422.33
Unrestricted Net Assets	27,157.54
Net Income	15.19
Total Equity	36,595.16
<b>TOTAL LIABILITIES &amp; EQUITY</b>	<b>36,595.16</b>

\$10,000 in the checking and savings accounts to cover known and unexpected expenses, and that \$25,000 could be invested to obtain a higher interest rate. The possibility of purchasing treasury bills issues by the U.S. government, some of which currently pay at a rate of 5 percent or better if held for a year or less, was also discussed.

Al made a motion that \$25,000 from the checking account be invested in a treasury bill, provided that it paid at a higher rate and at the same or lower maturity period as the Vibrant Credit Union CD; if not, the money should then be invested in the Vibrant CD. Rusty seconded the motion, which passed.

In his secretary's report, Paul said that he had prepared a nomination letter for the NCRA Newsletter Editor of the Year award. The letter should be signed by the club president and accompanied by a copy of one issue of the newsletter; Paul suggested the Novem-

*Continued on Page 4*

# Board meeting

*Continued from Page 3*

ber 2022 issue of Reflections. Dale said he would review the nomination and that it would likely go forward, possibly with other nominations from PAC for NCRAL awards.

In his report, Rusty said that the PACMO was still covered and that getting it ready for the first scheduled public night at Niabi Zoo on Saturday (March 18) might not be possible, due to a weather forecast calling for cloudy and rainy weather most of the upcoming week. He explained that it takes three or four people to remove the tarp and that this should be done after a day or so of dry, sunny weather, since storing the tarp when it is wet will lead to mold. Wednesday might be a good day to remove the tarp, per the forecast, but there may not be enough volunteers to get it done that day.

In his report, Al said that he had just developed an observing list for upcoming Niabi Zoo public night. It was noted, however, that the forecast for that night was calling for clouds and possible rain.

While Roy was unable to log on, Dale said that he had contacted him and told him that there was nothing to report on the ALCOR front. It was noted that the "early bird" rate for the upcoming NCRAL convention would only be available through March 15.

Dale said that PAC had 32 t-shirts on hand, but that none were in blue / size large, the most popular color and size. Al said it had been "several years" since t-shirts had been ordered and that they had been made by Power Grafx, which he suggested using again.

Some club members want replacement t-shirts, and t-shirts are issued to new members. It was suggested that new t-shirts be given to PAC members who receive advanced outreach awards, given the number of times they wore their t-shirts at public events.

Popular Astronomy Club Income & Expenses January through December 2022	
	Jan - Dec 22
Ordinary Income/Expense	
Income	
Banquet Inc.	666.00
Donation	
Member	25,973.80
Misc.	437.25
Program	2,096.10
Total Donation	28,507.15
Interest Income	4.51
Membership	
Family Member	120.00
Patron	80.00
Regular	887.50
Supporting	80.00
Sustaining	240.00
Total Membership	1,407.50
Misc. Inc.	215.00
Sales	15.00
Total Income	30,815.16
Expense	
Banquet Exp.	493.42
Castle Observatory	301.00
Charitable Contributions	50.00
Dues and Subscriptions	250.00
Honorarium	300.00
Miscellaneous Expense	50.00
PACMO	
Operation	1,286.41
Rent	612.00
Total PACMO	1,898.41
Reimbursement	314.69
Total Expense	3,657.52
Net Ordinary Income	27,157.64
Net Income	27,157.64

Dale noted that the Cedar Amateur Astronomers had shown the entire recording of the presentation given at the February PAC membership meeting at its latest meeting.

The presentation scheduled for the April meeting is no longer available. Dale is working on finding an alternate program.

Dale did draft a "Skywatch" column for March, which Paul submitted to the local newspaper. More writers for these columns are needed, and Paul reiterated that he would help edit any submission.

The tripod for Meade ETX-125 telescope is not yet on order, but the scope itself is in Dale's garage and is ready for use on a table.

The Quad Cities Science and Engineering Council has reached out to organizations in-

*Continued on Page 5*

# **Board meeting**

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**Continued from Page 4**

volved in STEM education and promotion, including PAC. QCESC director Dan D'Alessandro has invited PAC to the council's next meeting on March 15 at 6 p.m. to discuss how the club could work together with the council. Dale said he planned to attend and invited other members to come along.

As previously noted, the PACMO may not be available for the March 18 public observing session at Niabi Zoo. It was agreed that there was no reason to "rush the PACMO" and that plenty of other telescopes would be available that night, provided that the weather is favorable and the event does take place.

Dale said that he had talked with Niabi Zoo and they have agreed to allow PAC to postpone its public sessions to the following Saturday, if the session could not take place on the original date due to cloudy or rainy weather. Last year, four of nine Niabi Zoo sessions were cancelled due to weather, which Dale said "disappointed a lot of people."

PAC will be allowed to move its public sessions to the following week only if Niabi Zoo does not have another event planned for that night. Word of any delay will have to go out, and any delays could cause some scheduling challenges for club members.

Alternate programs should be developed for outreach sessions that cannot be delayed but don't allow for observing due to the weather. The recent program at John Deere Middle School, held on an overcast night, featured such a program that was well received, and that led to good questions and discussions with the students and parents who were present.

Chad Potter at JDMS has suggested watching the forecast and rescheduling the programs at the school if cloudy or rainy weather is expected. Dale told him this was possible,

though it could depend on the availability of PAC members.

Upcoming public programs were then reviewed, including requests from Bishop Hill and St. Mary's Monastery in Rock Island. The Moline Public Library has applied for another grant for the 2023-24 school year, and has already requested that PAC put on a program for the solar eclipse taking place in April 2024.

The telescope loaned out by the public library in Eldridge has been repaired, and it was reported that the Moline library and the library in Port Byron were also interested in purchasing telescopes. Rusty said that telescopes similar to the one used in Eldridge were available for \$300 or less, and that PAC could help set up the telescopes and make them ready for use.

Dale said that he was planning to develop a volunteer sign-up sheet to help cover short-term requests and cut down on the number of calls and emails needed to find members to cover such requests.

PAC business cards need to be updated and reprinted.

As stated earlier, the NCRAL convention "early bird" registration deadline is approaching. Several members are planning to attend the convention and Dale said he is not sure if he will. The rate for lodging has gone up substantially and the hotel hosting the event requires a minimum two-night stay.

Wayland and Ann Bauer will again be asked to lead the planning of the annual PAC picnic and meteor shower viewing in August.

Dale reminded the board members of the membership meeting on the following night, and said that Dino had line up four smorgasbord talks. Paul said that he might have an item to give away at the meeting.

With no further business, the board meeting adjourned at 8:20 p.m.



# SUMMARY OF MARCH PAC MEETING

The Popular Astronomy Club held a general membership meeting at the Butterworth Center in Moline on March 13 at 7 p.m.

Seventeen PAC members and guests were present for the membership meeting, with another 12 joining the meeting via Zoom, including guests and members of other astronomy clubs in the region.

PAC President Dale Hachtel began the meeting by welcoming new member Dan Cusack, who was present at the meeting, to the club. A business meeting then followed.

Treasurer Michael Haney presented a financial report, showing a balance sheet for 2022 and a quarterly report showing income and expenses for December 2022 through February 2023. He noted that PAC's cash on hand currently exceeds \$36,000, owing mostly to a memorial gift donated last year by the estate of the late Terry Dufek.

Dale then stated that minutes of last month's meeting, and of all past board and membership meetings, are posted as articles in *Reflections*, PAC's newsletter. He encouraged club members to read these minutes and then provide any comments and questions that they might have.

Following a motion by Roy Gustafson and second by Wayland Bauer, both the treasurer's report and the minutes were approved; the treasurer's report is subject to audit.

Observatory Director Rusty Case reported that the PACMO is still cov-

ered and that, given the unfavorable weather forecast, that it may not be possible to remove the tarp and have the mobile observatory ready for the first Saturday night public observing session at Niabi Zoo on March 18. He noted that Paul Castle Observatory is available for all

members and that training on use of the observatory can be provided to first-time users.

Observing Coordinator Al Sheidler said that he had developed an observing list for the March 18 observing session at Niabi Zoo.

ALCOR Roy Gustafson said that he had nothing to report, though it was noted that the "early bird" registration deadline for the NCRAL convention was March 15; prices will go up for those who register after that date.

Following the business meeting, two awards from the Astronomical League were presented. Rolando Gamino, who was not present in person at the meeting but was attending via Zoom, received the league's Outreach Award for his high level of participation in PAC public outreach events.

Al Sheidler was presented with an observing award for his observations of carbon stars. Al has observed and taken images of over 100 carbon stars, making him one of the top observers of those celestial objects in the

***Continued on Page 7***



***During the meeting, Roy Gustafson presented Al Sheidler with an observing award from the Astronomical League; Rolando Gamino, who was not present (but attended via Zoom) received the outreach award. Al later demonstrated a Meade telescope recently donated to PAC.***

# March meeting

*Continued from Page 6*

Astronomical League.

The meeting proceeded with a smorgasbord of presentations by club members. Al demonstrated the 10-inch Meade telescope that was recently donated to the club, and that he has cleaned up and made operational. The telescope is over 25 years old, meaning that its electronics needed to be replaced.

Al said that this telescope, like others belonging to the club, can be checked out for use by any PAC member.

Wayland Bauer then got up to discuss how he spent the winter months pursuing amateur astronomy, noting to laughter that his answer was “No!” when invited to the observatory on cold nights.

Instead, Wayland puts together jigsaw puzzles, many with an astronomical theme. He discussed his approach to putting together puzzles and what he does with them when he’s finished. In some cases, he and his wife Ann glue the puzzles together and frame them, meaning that several are now on display at the Bauer residence.

Wayland created one puzzle using a photo he took at Meteor Crater Natural Landmark in Arizona. The thousand-piece puzzle is among those that have been framed by the Bauers. There are several outlets online which can convert photographs into jigsaw puzzles.

Ann Bauer gave a presentation on various astronomy-related gifts she has received, including a bathrobe which she modeled. She also showed a blanket, draped on a table in the lobby, which showed a star map showing what was in the sky at the date, time and location of her son’s birth. She then showed tumblers with similar sky maps marking the birth of her daughters.



Dino Milani displayed a mount for a telescope and demonstrated how he had fixed and adapted it, using a base fabricated at a local welding shop.

Nancy Boelens said that her granddaughter, Tiffany Fields, had received a master’s degree in astronomy from a college in Halifax, Nova Scotia. Tiffany and another professor at the college have produced a YouTube video comparing a Celestron telescope to the telescope in an observatory mounted on the 24th floor of a college dormitory.

A few minutes of the video was shown to those attending the meeting. The full video can be seen at this link: <https://youtu.be/ZVA365OAsyA>.

Paul Levesque announced that he would be retiring from Rock Island Arsenal, effective April 3. He then gave away a book that he had received as a Christmas gift: “The Last Stargazers,” by Emily Levesque (no relation). Roy Gustafson took the book and promised to pass it on when finished.

With presentations complete, Dale provided a brief rundown of upcoming club events.

A recording of the meeting is available on YouTube via the following link: <https://youtu.be/4pnyOq2DuDc>.

***Ann Bauer showed some astronomy-related gifts she has received, including a bathrobe and some tumblers, while Wayland Bauer showed how he spent the winter months putting together jigsaw puzzles.***



# MEMBER OBSERVATIONS & CLUB ACTIVITIES

*Dawn Levesque hand-held a Nikon camera to take this photo of the crescent moon and Venus as seen from Bonita Springs, Florida, on March 24.*



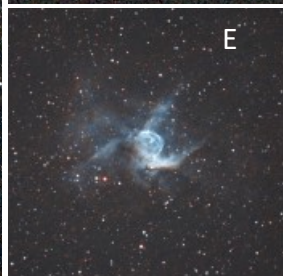
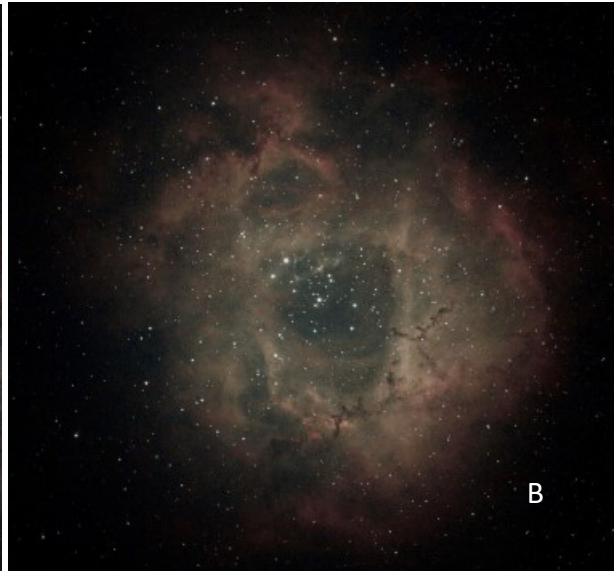
*Al Sheidler took advantage of clear skies on March 25 by using the club's LX200 telescope to capture this image of the Sun showing some impressive sunspots, a few of which probably exceed the Earth in size. He then turned the scope to Venus and caught a daytime image of the cloud-shrouded planet in its gibbous phase. In the next few months, Venus will shrink to a crescent before disappearing into the Sun.*



*PAC participated in the Moline Public Library's 'Project Next Generation' by holding an outreach event at the library on March 27. About 30 members of the public attended the event; club members who provided support included Rolando Gamino, Dale Hachtel, Mike Haney, Dino and Mitch Milani, and Al and Sara Sheidler. These images taken during the event show the Cigar Galaxy (M82), Polaris (double star) and the Moon; observations were also made of the Orion Nebula and the planets Mars, Venus and Uranus.*



# MEMBER OBSERVATIONS & CLUB ACTIVITIES



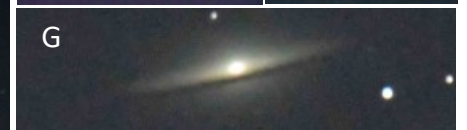
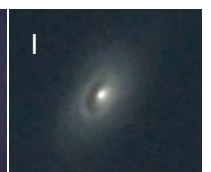
*Byron Davies sent in these awesome astro-photos taken during March; shown are (A) Orion Nebula; (B) Rosette Nebula; (C) Cone Nebula; (D) Northern Trifid Nebula; (E) Thor's Helmet Nebula; (F) Hubble's Variable Nebula. The Rosette Nebula image was the first taken with with Byron's Takahashi "Baby Q" refractor.*



# MEMBER OBSERVATIONS & CLUB ACTIVITIES



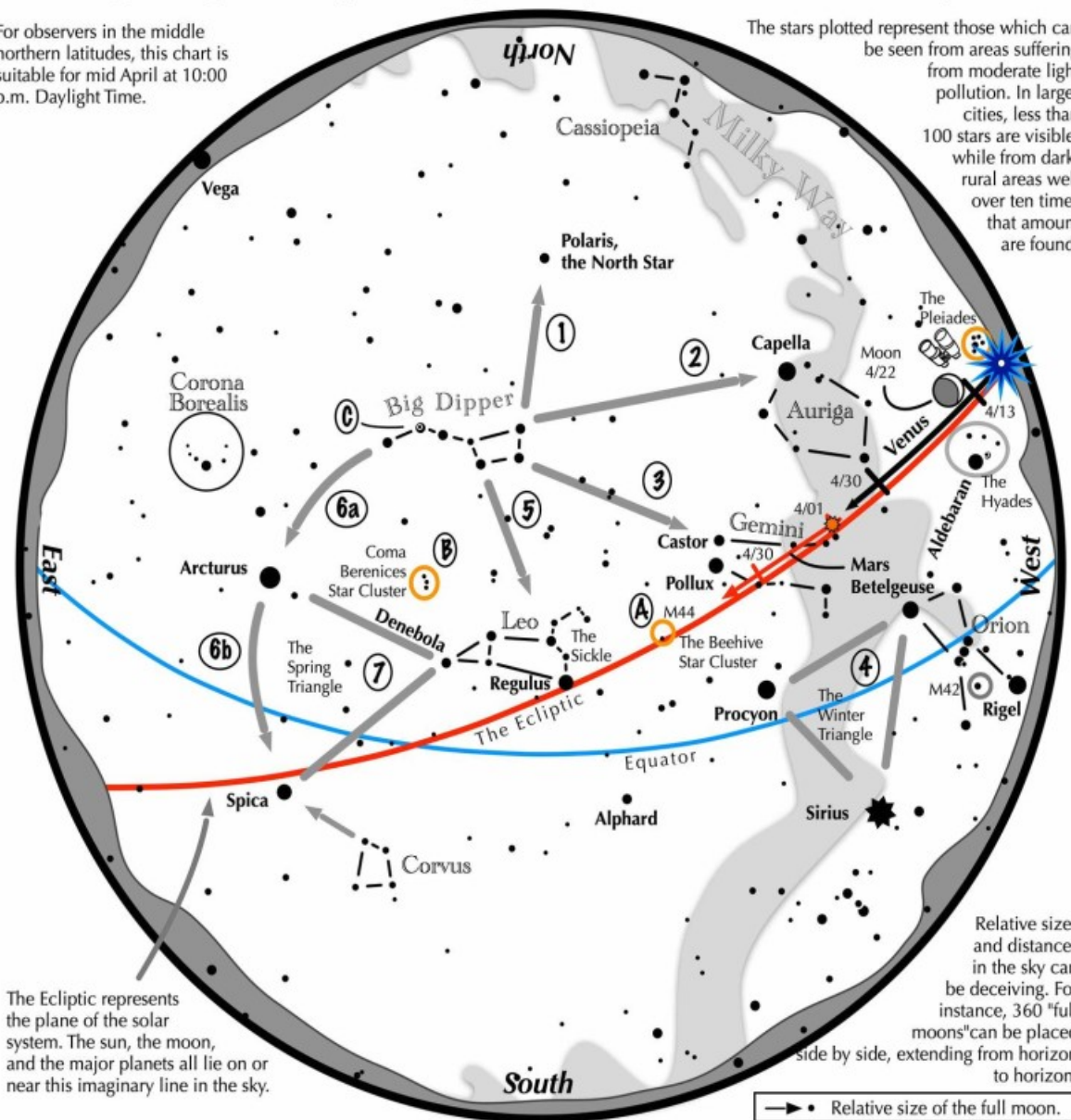
March 19 was a chilly, breezy, moonless night, but PAC members (from left) Al Sheidler, Byron Davies and Dan Cusack - joined later by Bryan Raser - braved the conditions at Paul Castle Observatory to hunt for Messier objects. They opened the observatory and used the CPC1100 HD with a Nikon D7500 camera to capture numerous images, including a composite created of the Orion Nebula (M42, upper left). Also shown are the Crab Nebula (A, M1); the Needle Galaxy (B); the Blow Dryer Galaxy (C, M100); the Owl Nebula (D, M97); five objects in one image (E); M65 and M66 (F); the Sombrero Galaxy (G, M104); Bode's Galaxy (H, M81); and the Black Eye Galaxy (I, M64).



# Navigating the April Night Sky, Northern Hemisphere

For observers in the middle northern latitudes, this chart is suitable for mid April at 10:00 p.m. Daylight Time.

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.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→ • Relative size of the full moon.

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

- 1 Extend an imaginary line north from the two stars at the tip of the Big Dipper's bowl. It passes Polaris, the North Star.
- 2 Draw another imaginary line west across the top two stars of the Dipper's bowl. It strikes Capella low in the northwest.
- 3 Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
- 4 Look in the west-southwest for the bright Winter Triangle stars of Sirius, Procyon, and Betelgeuse.
- 5 Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
- 6 Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica.
- 7 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.

### Binocular Highlights

- A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.  
 B: Look nearly overhead for the loose star cluster of Coma Berenices.  
 C: In the Big Dipper's handle shines Mizar next to a dimmer star, Alcor.



Astronomical League  
[www.astroleague.org/outreach](http://www.astroleague.org/outreach)

Duplication allowed and encouraged for all free distribution.





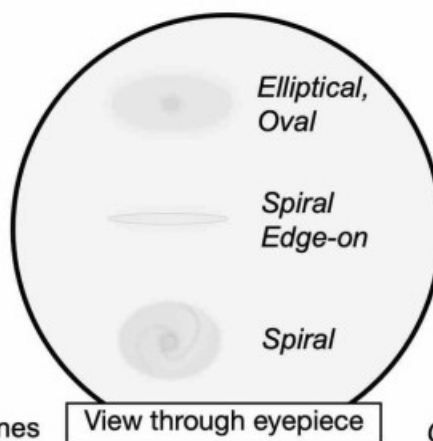
# Observing Galaxies

*Because galaxies are so very far away, they are typically faint. Therefore, your goals are to increase light collection and to maximize visual contrast whenever possible.*

- Clear, dark skies are best.
- The larger the aperture of the telescope, the better. A four inch telescope barely reveals less than a dozen dim, indistinct glows, while an 8 inch scope picks out several dozen under the best conditions. Larger scopes begin to show internal structures such as dark dust lanes and spiral arms.

## Consider these factors when observing:

- Note the general shape and apparent size of the galaxy. Is it more round than oval? Is it thin?
- If it is oval, in what direction does its major (long) axis point?
- What does the core look like? Is it star-like, or a round glow? Is it indistinct?
- Are spiral arms visible?
- For edge-on galaxies, are dust lanes visible?
- How quickly do the boundaries fade into blackness?
- Are smaller and dimmer galaxies also visible in the field?



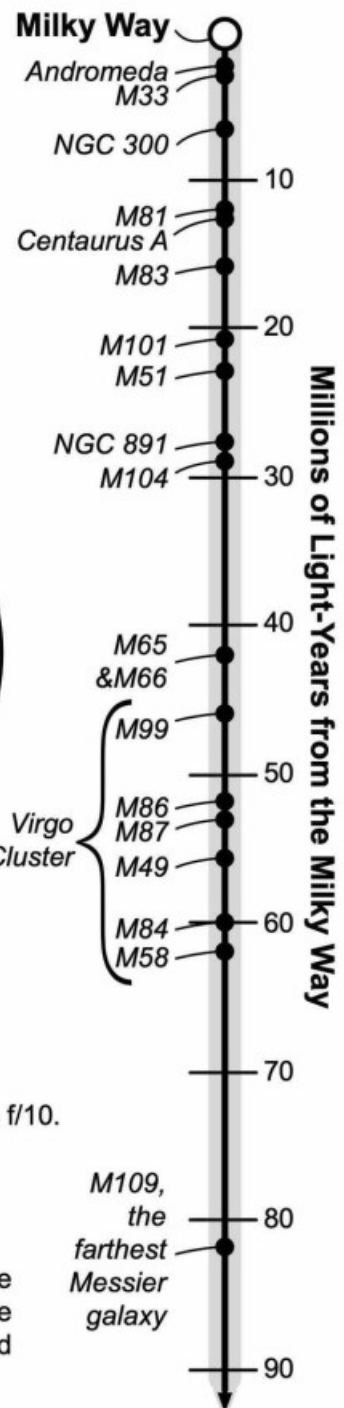
## Enhance your view:

- Use averted vision.
- For better perception of small details, increase the magnification.
- To increase contrast, use a smaller focal ratio scope—f/5 is better than f/10.
- Tap the telescope tube to help bring out detail.
- Increase apparent field contrast by covering your head with a hood.

## The importance of surface brightness:

The published magnitude of a galaxy refers to its brightness as if it were a point source. A galaxy, however, spreads its light over an appreciable area, making it appear dimmer than its published magnitude would suggest. As a result, it may be surprisingly difficult to discern.

Record your observations! Use a logbook, tablet, laptop, or voice recorder. Your notes are too precious to lose! You will refer to them years later.



**Deepen your experience:**  
Appreciate the distance of your target galaxy, and how long its light took to reach your eyes!





# Andover Cub Scouts learn about astronomy

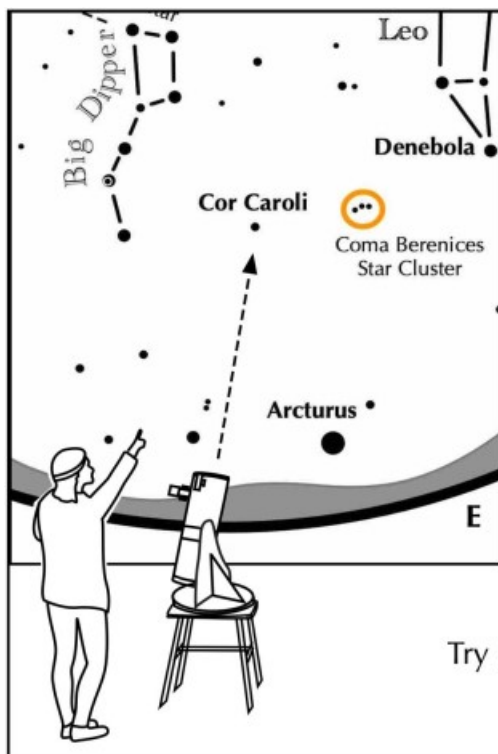
PAC members Roy and Jan Gustafson led a presentation on astronomy to an enthusiastic group of Cub Scouts in Andover, Illinois, on March 7.

Ten Tiger Cubs from Pack 123, joined by their parents, attended the presentation. Cloudy skies made outside observing impossible, but the presentation was a success anyway. "The kids were very interested and behaved fabulously!" Roy reported.

During the event, PowerPoint slides showing photos of celestial objects were displayed. Roy and Jan also led hands-on activities and set up a telescope which the boys were able to peer through, learning how it worked.

"The sad thing is that astronomy is not taught much in schools, and kids need to rely on us to provide this enhancement to their education," Roy said.

Pack members and parents were invited to the upcoming public observing event at Niabi Zoo, and to other PAC events where they could observe the night sky. Thanks to the Gustafsons for providing this outreach to the potential astronomers of tomorrow!



## Other Suns: Cor Caroli

### How to find Cor Caroli on an April evening

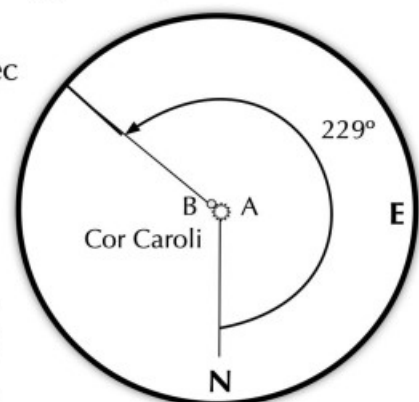
Look northeast toward the Big Dipper. A star, slightly dimmer than the handle stars, is placed near the center of the handle's curvature. That is Cor Caroli.

Suggested magnification: >20x  
Suggested aperture: >2 inches

### Cor Caroli

A-B separation: 19 sec  
A magnitude: 2.9  
B magnitude: 5.5  
Position Angle: 229°  
A color: white  
B color: pale blue

Try using steadily held and sharply focused 10x50 binoculars.





**April  
2023**

## **A magic beagle and the stars**

It is my honor to introduce you, dear readers, to my latest book, “Clipper, Cosmos, and Children: Finding the Eureka Moment.” It is a book specially designed to inspire young people to enjoy the night sky. Whether you are physically young, or even just young at heart, this new book is meant to inspire you to reach for the stars.

This book’s genesis came one day a few years ago. As I strolled into the office in the east wing of our home, I saw my wife, Wende, engrossed in the reading of an old book entitled “Clipper.”

“When did you write this book?” she inquired.

“I wrote it when I was ten. Around 1958.” Not a word about the stars in it.

“David, this is the best book I have ever read of yours. In fact,” she laughed, “all your other books have gone downhill since this one.”

She asked me that day to rewrite Clipper as an astronomy book. I did, and the book was published by RJI publishing in 2022 and is available from Amazon for about \$20.

As I wrote and revised the book, my mind frequently wandered back to the simple, carefree time of my youth. The original Clipper was a bar mitzvah present for my older brother,

Richard.

Perhaps my fondest memory of this little beagle dates back to the cloudy evening of December 17, 1965. That was the night I had planned to begin my search for comets.

At around 11 p.m., I took Clipper for a walk up the hill near our house. As I ambled up the streets nearby, I began to notice a small clearing to the west. I quickly decided to hurry home. Clipper had other ideas.

As I headed south, Clipper tried to go north. Our tug-of-war lasted a few unforgettable seconds until a quick jerk on the leash persuaded him who was boss. (He was, but he turned around anyway.)

At 11:50 that evening, I began my comet search program through a break in the clouds that lasted less than ten minutes. Now, 58 years later, I am still searching for comets.

Each chapter of my book begins with a passage from the original Clipper. In the story, a young boy named Stephen (the original name, now termed for my grandson Matthew Stephen) goes on a nightly adventure with a magic beagle who, with an equally enchanted telescope, takes him on a frolic through the cosmos, seeing the planets, comets, and asteroids, then the stars of our galaxy, and fi-

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***This illustration is from “Clipper, Cosmos, and Children: Finding the Eureka Moment,” a book about a magic beagle with an enchanted telescope.***



# Solar eclipses (both kinds) are coming

Have you ever witnessed a total solar eclipse? What about an annular solar eclipse? If not, then you are in luck if you live in North America: the next twelve months will see two solar eclipses darken the skies for observers in the continental United States, Mexico, and Canada.

Solar eclipse fans get a chance to witness an annular eclipse this fall. On Saturday, October 14, 2023, the Moon will move exactly in front of the Sun from the point of view of observers along a narrow strip of land stretching from Oregon to Texas, and continuing on to Central and South America.

Since the Moon will be at its furthest point in its orbit from Earth at that time (known as apogee), it won't completely block the Sun; instead, a dramatic "ring" effect will be seen as the bright edge of the Sun will be visible around the black silhouette of the Moon.

The distinct appearance of this style of eclipse is why it's called an annular eclipse, as annular means ring-like. If you are standing under a tree or behind a screen, you will see thousands of ring-like shadows projected everywhere during maximum eclipse, and the light may take on a wan note, but it won't actually get dark outside; it will be similar to the brightness of a cloudy day.

This eclipse must only be observed with properly certified eclipse glasses, or other safe observation methods like pinhole projection or shielded solar telescopes. Even during the peak of the eclipse, the tiny bit of the Sun seen via the "ring" can damage your retinas and even blind you.



***This map shows the paths of where and when the Moon's shadow will cross the United States for the upcoming 2023 annular solar eclipse and 2024 total solar eclipse. To download a larger copy of the map, go to: <https://svs.gsfc.nasa.gov/5073>.***

Just six months later, a dramatic total solar eclipse will darken the skies from Mexico to northeast Canada, casting its shadow across the USA in a strip approximately 124 miles (200 kilometers) wide, on Monday, April 8, 2024.

While protection must be worn to safely observe most of this eclipse, it's not needed to witness totality itself, the brief amount of time when the Moon blocks the entire surface of the Sun from view. And if you try to view totality through your eclipse viewer, you won't actually be able to see anything!

The Moon's shadow will dramatically darken the skies into something resembling early evening, confusing animals and delighting human observers. You will even be able to see bright stars and planets – provided you are able to take your eyes off the majesty of the total eclipse!

While the darkness and accompanying chill will be a thrill, the most spectacular observation of all will be the Sun's magnificent corona. Totality is the only time you can observe the corona, which is actually the beautiful outer fringes of the Sun's atmosphere.

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# Eclipses

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For observers in the middle of the path, they will get to experience the deepest portion of the eclipse, which will last over four minutes – twice as long as 2017’s total solar eclipse over North America.

While some folks may be lucky enough to witness both eclipses in full – especially the residents of San Antonio, Texas, whose city lies at the crossroads of both paths – everyone off the paths of maximum eclipse can still catch sight of beautiful partial eclipses if the skies are clear.

The Eclipse Ambassadors program is recruiting volunteers across the USA to prepare communities off the central paths in advance of this amazing cosmic ballet. Find more information and apply to share the excitement at [eclipseambassadors.org](http://eclipseambassadors.org).



NASA has published a fantastic Eclipse Safety Guide which can help you plan your viewing at [bit.ly/nasaclipsesafety](http://bit.ly/nasaclipsesafety). And you can find a large collection of solar eclipse resources, activities, visualizations, photos, and more from NASA at:

[solarsystem.nasa.gov/eclipses](http://solarsystem.nasa.gov/eclipses)

**David Prosper**

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

# Clipper

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*Continued from Page 14*

nally to the massive filaments of galaxies that mark the edges of our known universe. Stephen is soon joined by Kaia, a young girl student named in honor of my granddaughter Summer Kaia.

There is also a strange extraterrestrial girl named Tania who lives on the Moon. Tania comes from a dream I enjoyed decades ago, at the height of the appearance of my brightest comet in 1990, when I encountered a creature shaped like a box, with four feet and four hands and a small head.

“I do not have the power to send comets your way,” Tania told me, “but I can change their orbits just a bit so there is a greater chance that you might find them.” There is even a chapter about nothing, in which Clip-

per takes the children on a tour across the great voids, bereft of galaxies, that are an integral part of our cosmos.

You are likely all familiar with Peter, Paul, and Mary’s wonderful song about a magic dragon, and how it describes how “a dragon lives forever, but not so girls and boys.” The book’s closing chapter explores what happens when the children grow up and pursue their lives.

The book might be fun, but actually, every telescope, from the tiniest department store telescope to the James Webb Space Telescope, is charmed. All it takes is a single, thoughtful gaze that launches you on your own life’s journey across the endless wonder of space and time.



# Stargazing for all

## *Local astronomy club brings the green comet closer*

*This article originally appeared in Spartan Shield, a student publication produced at Pleasant Valley High School.*

All eyes turn towards the sky as the much anticipated comet makes its way towards Earth's atmosphere. Amateurs and astronauts alike rave at the rarity

of experiencing a comet with the naked eye. The visibility of the comet without equipment creates a unique opportunity to increase scientific engagement, bringing communities together.

The comet C/2022 E3, fondly referred to as The Green Comet, is making its first appearance since The Stone Age. The nickname refers to its bright green glow, a result of the chemical composition of the comet and its interactions with sunlight as it burns up along Earth's atmosphere. As extraordinary as the comet sounds in most headlines, trying to view it without equipment is incredibly underwhelming, especially to the untrained eye. Between light pollution, faulty positioning and unfavorable weather, the comet is difficult to pinpoint for most viewers.

Using equipment can help the experience meet expectations. However, access to equipment and a knowledgeable astronomer is seldom available to most. This is where amateur astronomy clubs come in, providing a bridge between expectation and experience. They offer access to equipment and learned members, making the experience more fulfilling.

The Quad Cities is home to its very own amateur astronomy club. The Popular Astronomy Club, founded in 1935 by Carl Gamble, has worked hard to bring the community to-



***Pleasant Valley High School students gather at a recent astronomy event coordinated by PV teacher Ian Spangenberg.***

gether in the name of scientific discovery.

Pleasant Valley's resident astronomer and Astronomy teacher Ian Spangenberg has been tied to the club for years and believes their work makes a great impact on keeping young scientists engaged. "They have the equipment already, they've spent the money and gotten nice telescopes, but they also have the know-how, and can help people have the experience they want because they've already done that background work," he said.

Spangenberg spoke about the difficulty of learning astronomy, as it can be intimidating. The interwoven nature of astronomy makes it difficult to start learning without falling down a rabbit hole of required prior knowledge and confusing terminology. Community outreach on a more basic level helps young scientists and first time astronomers have a more fulfilling experience and aids in nurturing their curiosity without intimidation.

Pleasant Valley alum Ashley Linquist often visited Spangenberg during her free period to learn more about physics and astronomy outside of class. "Sometimes it's hard to know what questions to ask and having someone I could just go to and say 'I want to learn interesting stuff' helped immensely" she shared.

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**Popular Astronomy Club**  
**Income & Expense Detail**  
December 2022 through February 2023

Date	Name	Memo	Split	Amount
<b>Ordinary Income/Expense</b>				
<b>Income</b>				
<b>Donation</b>				
<b>Member</b>				
12/1/2022	Terry Dufek Trust	Terry Dufek Trust	Checking	18,973.80
1/23/2023	Rolando Gamino	Deposit	Checking	250.00
Total Member				19,223.80
<b>Program</b>				
12/1/2022		PACMO	Checking	15.00
1/23/2023	City of Moline	Public Library 1/18/23	Checking	250.00
2/26/2023	John Deere Middle Sch...	Popular Astronomy CL...	Accounts Receivable	200.00
Total Program				465.00
Total Donation				19,688.80
<b>Interest Income</b>				
12/2/2022		Deposit	Checking	0.26
12/2/2022		Deposit	Money Market	0.05
12/31/2022		Deposit	Checking	3.70
12/31/2022		Deposit	Money Market	0.04
1/31/2023		Deposit	Checking	3.94
1/31/2023		Deposit	Money Market	0.05
2/28/2023		Deposit	Checking	3.56
2/28/2023		Deposit	Money Market	0.04
Total Interest Income				11.64
<b>Membership</b>				
<b>Family Member</b>				
12/19/2022	QC Alarm LLC.	2023 Mitchell Milani	Checking	7.50
12/19/2022	QC Alarm LLC.	2023 Ellen Tsagaris	Checking	7.50
Total Family Member				15.00
<b>Regular</b>				
12/1/2022	Lee Carkner	2023	Checking	30.00
12/1/2022	Joel Carter	2023	Checking	30.00
12/19/2022	Ian Spangenberg	2023	Checking	30.00
12/19/2022	Daniel Cusack	2023	Checking	30.00
12/19/2022	QC Alarm LLC.	2023 Dino Milani	Checking	30.00
1/23/2023	Sharon Kendall-Dunn	Deposit	Checking	30.00
Total Regular				180.00
<b>Supporting</b>				
12/1/2022	Bryan Raser	2023	Checking	40.00
Total Supporting				40.00
<b>Sustaining</b>				
12/1/2022	Tom Ervin	2023	Checking	60.00
Total Sustaining				60.00
Total Membership				295.00
Total Income				19,995.44
<b>Expense</b>				
<b>Banquet Exp.</b>				
2/2/2023	Riverfront Grille	Deposit for 2023 Banq...	Checking	100.00
Total Banquet Exp.				100.00
<b>Castle Observatory</b>				
1/1/2023	Gary Nordick	2023 Power	Checking	300.00
1/1/2023	Gary Nordick	2023 Rent	Checking	1.00
Total Castle Observatory				301.00
<b>Equipment</b>				
1/9/2023	Eugene Case	Eldridge Library Teles...	Checking	39.90
2/2/2023	Alan Sheidler	LX200 Repair	Checking	231.50
Total Equipment				271.40
<b>Honorarium</b>				
2/16/2023	Jim Plaxco	2/13/23 Program	Checking	50.00
Total Honorarium				50.00

# UPCOMING EVENTS



**Date: April 10, 2023**

**Event: Membership meeting @ 7 p.m.**

**Location: Butterworth Center / Zoom**

**Program: Member Observations**

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

## UPCOMING EVENTS

- **April 15:** Public observing at Niabi Zoo
- **April 18:** Kewanee Central School, 'Steamer Success' astronomy night
- **April 22:** Putnam Museum; opening of meteorite display
- **April 24:** Moline Public Library; 'Project Next Generation' talk and observing session (*May 1 rain date*)
- **May 16:** Moline Public Library; 'Project Next Generation' talk and observing session (*May 18 rain date*)
- **May 20:** Public observing at Niabi Zoo
- **June 17:** Public observing at Niabi Zoo
- **June 26:** Eldridge Public Library astronomy night (*June 27 rain date*)
- **July 1:** Illiniwek Campground public observing session (*July 8 rain date*)
- **July 7:** Silver Bell Alpaca Farm public observing session
- **July 15:** Public observing at Niabi Zoo
- **July 25:** DeWitt Public Library Summer Reading Program 'Stargazing'

## Stargazing for everyone

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Lindquist attributes much of her continued interest in astronomy to Spangenberg and their enlightening conversations. "[P]eople sometimes see these [STEM] fields as boring and closed off, when in reality there's a lot of cool stuff to see," she continued. Lindquist often spends her time volunteering at observing nights at the University of Iowa, and finds joy in seeing people's curiosity in a subject she enjoys so much.

The Popular Astronomy Club holds observing nights for QC residents, allowing curious minds to come together and learn in an encouraging envi-

ronment. Their efforts towards spreading scientific curiosity and providing resources to the community are appreciated by many.

In 2017, the club was recognized by NASA for its efforts in preparing the community for the solar eclipse.

Pleasant Valley has its own reason to show gratitude to the PAC and its constituents. Last year, long time member and amateur astronomer Terry Dufek donated his telescope to the PV Astronomy club with hope the students would be able to further their own curiosity.

**Arissa Khan, Opinion Editor**



Popular Astronomy Club Income & Expense Detail December 2022 through February 2023				
Date	Name	Memo	Split	Amount
<b>PACMO</b>				
<b>Operation</b>				
12/12/2022	Rusty Case	Mileage	Checking	111.43
12/12/2022	Alan Sheldier	Mileage	Checking	209.98
Total Operation				321.41
Total PACMO				321.41
Total Expense				1,043.81
Net Ordinary Income				18,951.63
Net Income				18,951.63