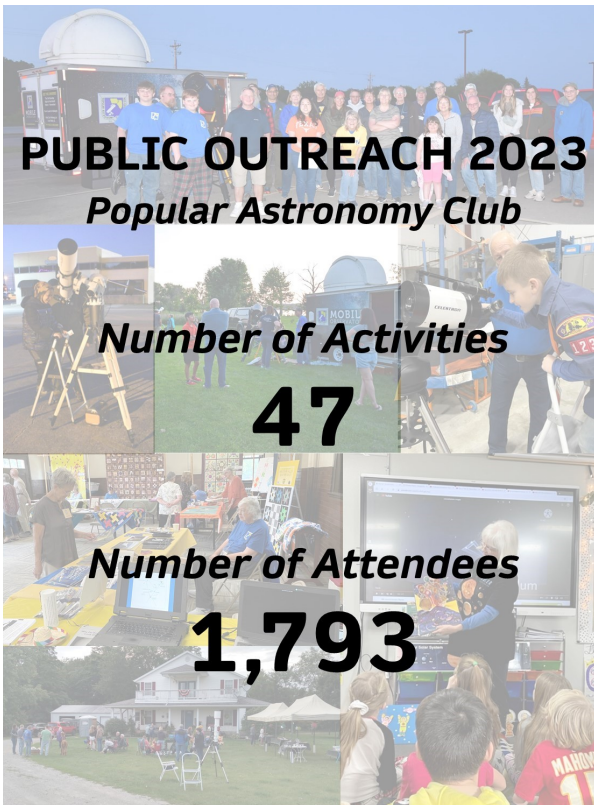
REFLECTIONS

JANUARY 2024

THE NEWSLETTER OF THE POPULAR ASTRONOMY CLUB - QUAD CITIES USA

PAC 2023

Club shares astronomy with the community



From its founding in 1936, the Popular Astronomy Club has basically had a two-part mission.

PAC serves as a place where those interested in amateur astronomy can get together with like-minded individuals in order to learn from one another, and to participate in activities such as observing and astrophotography.

Along with being a community of amateur astronomers, though, PAC also shares its passion for astronomy with the entire community in the Quad Cities and surrounding area. Public outreach has always been part of what PAC does, and the club has, for nearly nine decades now, held observing sessions and other presentations that are open to anyone who wants to see what's up in the night sky, and who wants to know more about what lies beyond our home planet.

The numbers show that public outreach was a large part of what PAC did in 2023. During the year just past, PAC held 47 public outreach activities, which were attended by a total of 1,793 people. Both totals are up slightly from 2022, a year when we the world slowly returned to "normal" in the wake of the COVID-19 pandemic.

PAC's best-known and best-attended public outreach activities are probably the monthly observing sessions held at Niabi Zoo on the third Saturday of every month from March through November. A few of those sessions in 2023 were cancelled or postponed due to uncooperative weather, but those that were held usually attracted large, enthusiastic crowds.

Mark your calendars, as PAC will continue to hold public observing at the zoo during 2024, with the first session of the year scheduled for March 16 and the last slated for November 16.

PAC also held observing sessions and activities at libraries, schools, campgrounds, and even an alpaca farm, as well as for Scout groups, churches, and other organizations.

In keeping with its educational mission, PAC has formed partnerships with John Deere Middle School in Moline and with the Moline Public Library. Both JDMS and the library hosted observing sessions and activities during 2023, and will continue to do so this year.

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LOOKING INSIDE

The Popular Astronomy Club of the Quad Cites – a two-state region comprised of several communities along the Mississippi River in Iowa and Illinois – is a non-profit organization that was founded in 1936. PAC is dedicated to promoting and advancing amateur astronomy, and to informing and educating its members and the general public about astronomy in an engaging, inclusive manner. Because PAC believes that astronomy is for everyone, membership in PAC is open to anyone with an interest in the wonders of the night sky.

To learn more, visit PAC's website, at www.popularastronomyclub.org, or find us on Facebook at www.facebook.com/QCPAC. To contact PAC, send an email to popularastronomyclub@gmail.com.

REFLECTIONS

Reflections *is a free monthly newsletter published by the Popular Astronomy Club. It is intended to serve all members of the club as well as the amateur astronomy community as a whole in the Quad Cities area.*

Reflections *serves as an open forum for PAC members and others with an interest in promoting amateur astronomy. Opinions expressed in* Reflections *are not necessarily those of the club, nor of any individual club officers or members, nor of any other businesses or organizations supporting PAC.*

Submissions to Reflections *are welcome and should be sent via email to* levesque5562@att.net. *Photos which are submitted should be high resolution in .jpeg format when possible. Text submissions need not be formatted and should be sent as Word attachments when possible. Submissions may be edited for spelling, grammar, style, clarity and length. Questions and comments should be sent to Paul Levesque, Reflections editor, at the email address above. Back issues of* Reflections *are available here:* popularastronomyclub.org/news-letters.

POPULAR ASTRONOMY CLUB OFFICERS

President: Dale Hachtel *(dale_hachtel@msn.com / 614-935-5748)*

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Observation Coordinator / Past President: Alan Sheidler *(adsheidler@gmail.com / (309) 797-3120)*

The Popular Astronomy Club is a founding member of the Astronomical League, and is a member of the North Central Region of the Astronomical League (NCRAL). To learn more, visit the Astronomical League's website at www.astroleague.org and the NCRAL website at ncral.wordpress.com

REFLECTIONS FROM THE PRESIDENT

2023 was a successful year for the Popular Astronomy Club, even though inclement weather cut back on several observing activities.

During 2023, we added 10 new members to our club *(see page 6),* and we hope to welcome even more in 2024.

PAC has received donations of telescopes and equipment that can be used for our activities, donated to associated organizations, or loaned to amateur astronomers. With this additional equipment, members have a variety of club scopes to use for observing.

We have learned interesting information about astronomy from our in-person and Zoom presentations at our monthly meetings.

See the PAC annual statistics table *(page 10)* for a comparison of our activities and attendance for the past two years. We expect 2024 to be similar to 2023, as we have our continuing public observing sessions at Niabi Zoo, requests for several repeat programs from host organizations, and new activities with new hosts for the new year.

Our biggest public program in 2024 will probably be observing at the Moline Public Library for the partial solar eclipse on April 8; this will be a total eclipse in nearby areas.

It will be a good year for observing Mars, as it has conjunctions with Jupiter, Saturn and Uranus; however, those conjunctions will be in the early morning, instead of prime night observing time.

We have interesting programs planned for our monthly meetings during the first half of the new year *(see the calendar on page 16)*.

The James Webb Space Telescope continues to provide new and interesting detail about our Universe. Astronomers are finding more exoplanets, and learning more about the exoplanets we have already found.

Searches are being done for objects in space that could possibly crash into Earth.

Astronomy events for 2024 will go beyond just observing. There are now samples to analyze, returning from probes sent to objects in our Solar System. Detecting and analyzing gravity waves opens up a new field of astronomy and astrophysics.

In the New Year, all of these new developments and more will provide more reasons to keep looking up!

New year brings a new look for *Reflections*

A brand new year has dawned, and so has a new look for *Reflections*, the newsletter of the Popular Astronomy Club.

We hope that you like what's been done to refresh *Reflections*, and hopefully make it a bit more readable and visually pleasing. Your feedback, both positive and negative, and your thoughts on improving the newsletter, are always welcome.

No matter the look, the mission of *Reflections* remains the same: To serve all PAC members, and members of the amateur astronomy community as a whole, by communicating timely, relevant, accurate and useful information, and by providing a forum for the exchange of opinions and ideas.

Reflections is an appropriate name for this newsletter, because it's intended to reflect well on PAC and its members. To do that, your submissions are always needed. This newsletter belongs to you, and relies on you to remain interesting and informative.

Send your submissions and feedback via email to *Reflections* editor Paul Levesque, at levesque5562@att.net. We look forward to hearing from you!

PAC 2023

Continued from Page 1

Other groups and organizations have already requested observing sessions for 2024, and more requests are expected. Public interest may be piqued because of a big astronomical event coming this year.

A solar eclipse will occur on April 8. Like the solar eclipse of 2017, the path of totality will cross the United States south and east of the Quad Cities. In this area, about 90 percent of the Sun will be blocked by the shadow of the Moon at the peak, at about 2 p.m. local time.

A large crowd gathered at Moline Public Library on August 21, 2017, to observe the solar eclipse. PAC plans to hold another public observing event for the solar eclipse on April 8.

PAC plans to hold a public eclipse viewing session at the Moline Public Library on the day of the eclipse. A similar viewing session held in 2017 attracted more than 1,000 people. Plan now to attend that session, or to find a place in the path of totality where you can experience one of the most awe-inspiring natural events you'll ever witness.

Club activities include monthly membership meetings held on the second Monday of the month at 7 p.m. at Moline's Butterworth Center. (Meetings are not held in August, when PAC holds its annual picnic, and October, the month of the club's annual banquet.)

These meetings are open to both members and guests, and often include presentations on interesting astronomy-related topics led by subject-matter experts. The advent of Zoom and similar meeting software has enabled PAC to attract speakers who can make presentations from remote locations.

During 2023, PAC meetings included presentations on topics such as the colonization of Mars, "extreme" astronomy, and the use of astronomical and scientific instruments on the Santa Fe and Oregon trails.

The presentations already scheduled for 2024 PAC meetings include one on the Tunguska event – a large explosion in Siberia in 1908 likely caused by an asteroid strike – and one that will be led by the director of the Vatican Observatory.

PAC believes that astronomy is for everyone, which means that membership in the club is open to everyone. You don't need to own a telescope or have any education or background in astronomy. All you need is an interest in astronomy, and a desire to learn and know more.

To learn more about PAC, visit our website, at www.popularastronomyclub.org, or find us on Facebook at www.facebook.com/QCPAC. To contact PAC, send an email to popularastronomyclub@gmail.com.

We look forward to hearing from you, and to seeing you at one of our public outreach events. Meanwhile, keep looking up!

Paul Levesque

PAC plans 2024

- 9 Niabi Zoo public observing sessions
- 3 John Deere Middle School observing sessions
- 3 Moline Public Library presentations
- Rock Island Public Library pre-eclipse program
- Moline Public Library eclipse viewing (April 8)
- 10 membership meetings; picnic & banquet
- Illiniwek Campground public observing
- Bishop Hill public observing w/ Brian Fox Ellis
- Silvis Public Library centennial public observing
- Riverdale Schools public observing

Some dates to be determined; more requests have been received; more events will be added; also see calendar on Page 16

SUMMARY OF PAC DECEMBER MEETING

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

The meeting was attended in person by 16 PAC members and guests, with another five (5) joining the meeting via Zoom.

PAC President Dale Hachtel called the business meeting to order. He began with a review of club activities for the year. He summarized the number of club and public activities held during 2023, including public and private observing sessions and other public outreach; club observing sessions at Paul Castle Observatory; and meetings and field trips.

During 2023, PAC's outreach sessions attracted 1,793 members of the public, up slightly from last year.

Dale showed current membership statistics and asked that those who had not yet renewed to do so soon. He also noted that PAC membership might make a good holiday gift, as noted in a "Skywatch" column that had appeared in the local newspaper that day.

During the meeting, Roy Gustafson presented Megan Warren with a certificate from the Astronomical League honoring her for completing the Autumn Messier Marathon.

Dale later reviewed the "Skywatch" columns that had been published during 2023, and also discussed the presentations offered at membership meetings during the year.

PAC members who won awards and earned certificates during 2023 were highlighted, as were new members who joined the club this year.

Dale provided a look ahead at activities and events already planned for 2024, and said that he expected more to be added. The highlight of the year will likely be the April 8 solar eclipse, which will reach totality in areas close to the Quad Cities but create a partial eclipse covering nearly 90 percent of the sun in this area. A public viewing event is planned for Moline Public Library, and Dale noted that a similar event held during the 2017 eclipse attracted a crowd of over 1,000.

"We are serving the public, and it's the time and effort of our members that make this outreach possible," Dale said.

PAC Treasurer Michael Haney presented a report showing PAC's current assets and expenses. He said that the current balance sheet showed that the club was in "good shape financially."

Michael reported that PAC had purchased three more U.S. Treasury bills to take advantage of current high interest rates, noting that the club had enough money on hand to cover current and anticipated expenses.

Following a motion by Roy Gustafson and second by Wayland Bauer, the treasury reports were approved, subject to audit.

Club Secretary Paul Levesque noted the he was working on a new design for the Reflections newsletter that should debut with the January issue. He said that the articles printed in Reflections on membership and board meetings (such as the articles that appear in this issue) also serve as minutes for those meetings.

With that in mind, Dale then asked members to approve minutes from the last three membership meetings, as published in Reflections. The minutes were approved as published, following a motion by Roy Gustafson and second by Al Sheidler.

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December meeting

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Vice President Dino Milani said that he was compiling a list of club-owned equipment and that he would make that list available to club members. He noted that telescopes owned by the club were available to members and urged them to make use of the scopes.

Observatory Director Rusty Case said that the PACMO was now in winter storage and added, "Paul Castle Observatory is open for business" and available for use through the winter months.

Astronomical League Correspondent Roy Gustafson said that he had nothing significant to report, but added that members should consider attending the conventions held by the league and its affiliates during 2024.

Observation Coordinator Al Sheidler reported that Rob McDonald is now trained to use Castle Observatory, and that he had revised and updated the observatory manual. Al said that the new version of the manual is being reviewed and should be available soon.

Al and Rob recently held an observing session at Loud Thunder Forest Preserve, site of an observatory located at the Scout camp. PAC has agreed to help restore the observatory to working order, and Rusty said that the parts needed to get the observatory up and running were on order.

The 12-inch telescope used in the PACMO has been removed for the winter and stored at Al's house, and he said that he does sometimes use it and could make it available to other club members upon request.

A library telescope won by Al during the 2023 Astronomical League convention was displayed at the meeting; the telescope needs some adjustments before it can be donated to a local library.

Dale said that the PAC board had discussed which library should receive the telescope, and had also looked at expanding PAC's library telescope program.

An election of PAC officers was then held, and Dale noted that all current office holders had agreed to serve another term. A call went out for other nominations, but none were received.

Following a motion by Wayland Bauer and second by Eva Davidson, all current PAC officers were reelected to two-year terms. *(See page 2 for a list of officers and contact information.)*

The business meeting was then adjourned. Member observations were shown, including astronomical images captured by Byron Davies, Al Sheidler, and former member Mike Mack.

Mike Dannenfeldt (via Zoom) urged members and others to go out and observe the Geminid meteor shower, which was expected to peak later that week.

Roy Gustafson presented a certificate to Megan Warren, who completed the NCRAL Messier Marathon for Autumn by documenting her observations of 27 Messier objects in the course of one night.

The meeting adjourned at 8:30 p.m. A recording of the meeting is available on YouTube via the following link: https://youtu.be/uSV12Vy4dqQ.

The next membership meeting is scheduled for January 8 at 7 p.m. at the Butterworth Center and via Zoom.

WELCOME!

New members who joined PAC during 2023

- **Dan Cusack**
- **Michael Donatsch**
- **Sharon Kendall Dunn**
- **Julie Ann & Daniel Hayes**
- **Mike & Madeline Morrell**
- **Janet Parker**
- **Megan Warren**
- **Steve Young**

2023 PAC AWARD WINNERS

- **Astronomical League Basic Outreach: Rolando Gamino**
- **Astronomical League Basic Outreach: Pam Kollar**
- **Astronomical League Carbon Star Observing: Al Sheidler**
- **Astronomical League Autumn Messier Marathon: Megan Warren**
- **NCRAL Newsletter Editor: Paul Levesque**
- **NCRAL Solar System Astrophotography: Al Sheidler**
- **PAC Member of the Year: Paul Levesque**

SUMMARY OF PAC BOARD MEETING

The board of the Popular Astronomy Club held a meeting on Sunday, December 3, at the home of PAC President Dale Hachtel in Port Byron. Dale called the meeting to order at 2:30 p.m.

Those present were Vice-President Dino Milani; Treasurer Michael Haney; Secretary Paul Levesque; and Observatory Director Rusty Case. ALCOR Correspondent Roy Gustafson, who was traveling, joined the meeting via telephone; Observation Coordinator Alan Sheidler was absent.

The minutes of the board meeting held September 10, as published in the October issue of *Reflections*, were approved as submitted, following a motion by Michael and second by Rusty.

Michael presented a treasurer's report which showed net income of $25,513.54 , based on income and expenses for the last 12 months. Club assets currently total $43,157.07. Michael noted that, all told, the club has more than $27,000 in ready cash, currently sitting in savings and checking accounts with low interest rates.

Following a motion by Paul and second by Roy, the board approved the treasurer's report, subject to audit.

At a previous meeting, the board approved the purchase of two U.S. Treasury bills of $5,000 each, in order take advantage of the high interest rates being offered to those holding such bills. The current interest rate for a 17-week Treasury bill is 5.469%; Michael noted that, while that rate may slip down, it should still far exceed the interest paid on checking and savings accounts, and even certificates of deposit, offered by banks and credit unions.

The Treasury bills held by PAC are "laddered" to take advantage of changing interest rates and are set up to renew automatically.

After some discussion, board members agreed that PAC could afford to purchase three more Treasury bills of $5,000 each. This would still leave more than $12,000 in cash on hand, which should be more than sufficient to cover any expenses that the club expects to incur in the coming months.

Following a motion by Roy and second by Dale, the board approved an expenditure of $15,000 for the purchase of three (3) Treasury bills.

In his Secretary's report, Paul noted that the articles on monthly meetings which appear in Reflections also serve as minutes of those meetings, as do the stories published about board meetings. He noted that he sent these articles for advance review and makes any requested corrections before publication. Dale stated that minutes of membership meetings are approved every three months when business meetings are held as part of regular membership meetings.

Paul told the board that he was working on a "new look" for *Reflections*, and that he would provide board members with an advance copy of what *Reflections* might look like going forward for their comments and input. It has been suggest-

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At its December 3 meeting, the PAC board took the following actions:

- Approved the purchase of three U.S. Treasury bills of $5,000 each, to take advantage of current high interest rates.
- Agreed to the need of a better inventory of equipment owned by the club, and discussed holding an "Equipment Day" sometime early this year.
- Deferred the donation to a local library of a telescope won during the Astronomical League convention until the scope is ready for use, and discussed expanding PAC's library telescope program.
- Approved the donation of $300 to the Butterworth Center and $200 to the foundation supporting Niabi Zoo.
- Approved an expenditure to cover mileage and hook-up fees incurred by those who towed the PACMO during 2023.
- Reviewed the schedule for 2024, including an event at Moline Public Library during the April 8 solar eclipse.
- Looked at ways keep new members interested and engaged in club activities.

PAC board meeting

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ed that *Reflections* be submitted for the Mabel Sterns Newsletter award presented by the Astronomical League; since the deadline for the award is in March, Reflections could be nominated for the award sporting its "new look."

In the Vice-President's report, Dino noted that his responsibilities include tracking all equipment owned by the club. He stated that he is currently unaware of where all of the equipment is being stored and who is using the equipment. Dino said that he knew that the equipment list included up to 12 telescopes, most of which are probably stored at either Dale's home or Al's home.

Dino said that he needed to do an inventory of all equipment to assure that it is accounted for and available for use by club members. He said that having a complete list of equipment, and an organized method for checking out equipment, would be most useful for new members, who could see having free use of such equipment as a valuable benefit of PAC membership.

Dino suggested that the club hold an "equipment day" sometime next spring, at which all telescopes and other equipment held by the club could be displayed. Members would then know exactly what equipment is on hand for borrowing, and who was available to instruct then in use of the equipment. Board members agreed that this was a good idea and would look into organizing such an event.

Popular Astronomy Club
Balance Sheet
As of November 29, 2023

	Nov 29, 23
ASSETS	
Current Assets	
Checking/Savings	
Business Special	45.44
Cash	0.66
Checking	22,746.37
Money Market	5,416.25
Savings	10.23
U.S. Treasury	
Treasury Bill	14,738.12
Total U.S. Treasury	14,738.12
Total Checking/Savings	42,957.07
Accounts Receivable	
Accounts Receivable	200.00
Total Accounts Receivable	200.00
Total Current Assets	43,157.07
TOTAL ASSETS	**43,157.07**
LIABILITIES & EQUITY	
Equity	
Opening Balance Equity	9,422.33
Unrestricted Net Assets	27,157.64
Net Income	6,577.10
Total Equity	43,157.07
TOTAL LIABILITIES & EQUITY	**43,157.07**

In the Observatory Director's report, Rusty said that he had recently resealed the deck at Paul Castle Observatory and that the PACMO has been covered and is in winter storage at Sun-Rhys in Coal Valley. He stated that, while the PACMO is "in hibernation," Castle Observatory is available for use in the winter and year-round.

In the ALCOR report, Roy noted that the flow of information from the Astronomical League to member clubs is in need of improvement. PAC generally does a good job of reporting its activities "up the chain," which can't be said for all clubs.

The library telescope won by Al at "ALCON 2023," the annual convention of the Astronomical League, has arrived. The telescope is in need of some adjustments before it can be donated for library use.

Three local libraries have expressed interest in receiving a telescope for borrowing by patrons: Orion, Port Byron and Eldridge. While Eldridge already has one telescope on hand, librarians have reported that this telescope is often out on loan, and that the library could use a second telescope to meet demand. Roy reported that the Orion Library is interested and ready to receive a library telescope. Dale reported that the River Valley District Library in Port Byron has indicated interest in a library scope, but management has recently changed; Dale will contact them again.

After discussion, the board deferred a decision as to which library should receive the telescope send from the Astronomical League, since it is not yet ready for use. Any telescope which is donat-

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PAC board meeting

Continued from Page 8

ed to a library will need to come with instructions, along with someone to contact in case the telescope is in need of repair or maintenance.

No matter which library receives the telescope sent by the Astronomical League, PAC may look into donating more telescopes to libraries, either out of its existing inventory or by purchasing new telescopes. Rusty noted that basic telescopes good for use by libraries can be bought for about $200. Michael noted that having telescopes available for library patrons increases interest in amateur astronomy and encourages more young people to engage in "stargazing."

PAC uses the Butterworth Center free of charge, and Paul and others have suggested that the club make a donation to the center, which has high maintenance expenses and is currently conducting a capital campaign. After discussion, the board approved a donation of $300 to the Butterworth Center, following a motion by Dino and second by Paul.

It was also suggested that a donation be made to Niabi Zoo for allowing use of its parking lot for monthly public observing session. Donations cannot be made directly to the zoo, as it is owned and operated by Rock Island County; however, donations can be sent to the Niabi Zoo Foundation, a nonprofit organization which supports zoo activities.

Following a motion by Rusty and second by Paul, the board approved a donation of $200 to the Niabi Zoo Foundation.

Dale said that several club members had towed the PACMO to public events and incurred a total of over $411 in mileage and hook-up fees. The board authorized reimbursement to these club members, following a motion by Roy and second by Dino.

Popular Astronomy Club
Income & Expenses
November 30, 2022 through November 29, 2023

	Nov 30, '22 - Nov 29, 23
Ordinary Income/Expense	
Income	
Banquet Inc.	866.00
Birdies for Charity	215.00
Donation	
Member	25,250.89
Program	3,213.50
Total Donation	28,464.39
Interest Income	39.96
Membership	
Family Member	105.00
Patron	80.00
Regular	725.50
Supporting	40.00
Sustaining	180.00
Total Membership	1,130.50
Misc. Inc.	50.00
Sales	617.00
T-Bill Interest	88.51
Total Income	31,471.36
Expense	
Bank Service Charges	37.59
Banquet Exp.	875.21
Castle Observatory	
Repairs and Maintenance	29.96
Castle Observatory - Other	301.00
Total Castle Observatory	330.96
Dues and Subscriptions	190.00
Equipment	1,071.40
Honorarium	150.00
PACMO	
Operation	1,321.41
Rent	612.00
Repairs and Maintenance	252.74
Total PACMO	2,186.15
Reimbursement	86.55
Repairs and Maintenance	20.00
Supplies	1,009.96
Total Expense	5,957.82
Net Ordinary Income	25,513.54
Net Income	25,513.54

The Quad City Engineering and Science Council has requested an article on PAC for its newsletter, and Dale said that he would draft such an article and send it to Paul for editing and possible inclusion in *Reflections*.

Dale is developing the schedule for 2024 and asked which board members planned to remain in town on April 8, the date of a solar eclipse that will be partial in the Quad Cities area but total in nearby locations. Several members said that they planned to travel to places in the path of totality, or would otherwise be out of town.

Moline Public Library has requested that PAC hold a public observing session on the day of the eclipse, as was done in 2017 when more than 1,000 people showed up for a session supported by three PAC members. While enough members should be available to support such a session in 2024, the club cannot support requests for other public viewings on "eclipse day." Some organizations have requested presentations in advance of the eclipse, and PAC may be able to support such requests.

Per Roy's recommendation, the club may purchase another 1,500 eclipse glasses at a discounted cost from the Astronomical League.

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PAC board meeting

Continued from Page 9

PAC has already received several requests for public outreach sessions in 2024, and Dale has said that some (including the monthly Niabi Zoo sessions) will have "rain dates." Dino said that rain dates could cause scheduling conflicts or cause outreach sessions to occur too close in time to one another. Dale replied that he did try to block out rain dates and otherwise space out sessions so they do not occur back-to-back.

Dale said that he was working to finalize the 2024 schedule and would share the schedule with board members for their review.

The Boy Scout camp at Loud Thunder Forest Preserve has an observatory which is in need of repair, and PAC has agreed to perform the repairs and put the observatory back in operation. Rusty said that he knows what parts are needed and has contacted Home-Dome about delivery and prices, but has not heard back. The Scouts will pay for all parts but PAC will perform installation.

Dino said that the club has attracted some new members recently, and suggested that the club find ways to keep these members interested and to help them engage in amateur astronomy. The proposed equipment day could be one way of doing this; Dino said that new members could also be informed of research projects they can support without even doing any observing.

A new manual for use of Paul Castle Observatory is being developed, and Paul said that publicizing the new manual could serve as an opportunity for informing new and existing members that the observatory is available for their use – a benefit of club membership.

All current club officers are eligible for reelection, and all have agreed to continue to serve. A slate of candidates will be presented for a vote at the membership meeting scheduled for December 11. It was noted that the club's by-laws may be obsolete in some areas and in need of revision.

The meeting adjourned at 4:10 p.m. The next board meeting has been scheduled for March 10, at a time and place to be determined.

PAC ANNUAL STATISTICS

TOTAL ACTIVITIES SCHEDULED:

2023: 93 ***(15 POSTPONED / CANCELLED; 78 COMPLETED)***
2022: 79 ***(16 POSTPONED / CANCELLED; 63 COMPLETED)***

PUBLIC OUTREACH ACTIVITIES

PUBLIC PROGRAMS:	**2023: 13**	**2022: 12**
PUBLIC OBSERVING:	**2023: 21**	**2022: 15**
SPECIAL PROGRAMS:	**2023: 13**	**2022: 8**

OTHER ACTIVITIES

OBSERVING:	**2023: 21**	**2022: 15**
AT PAUL CASTLE OBSERVATORY		
FIELD TRIPS etc:	**2023: 3**	**2022: 2**
MEETINGS:	**2023: 4**	**2022: 5**
OTHER:	**2023: 3**	**2022: 23**

ATTENDANCE

MEMBER ATTENDANCE:	**2023: 499**	**2022: 360**
ALL ACTIVITIES		
ZOOM MEETING ATTENDEES:	**2023: 88**	**2022: 162**
PUBLIC ATTENDEES:	**2023: 1,793**	**2022: 1,683**
ALL ACTIVITIES		

Asterisms: Connect the dots and find constellations

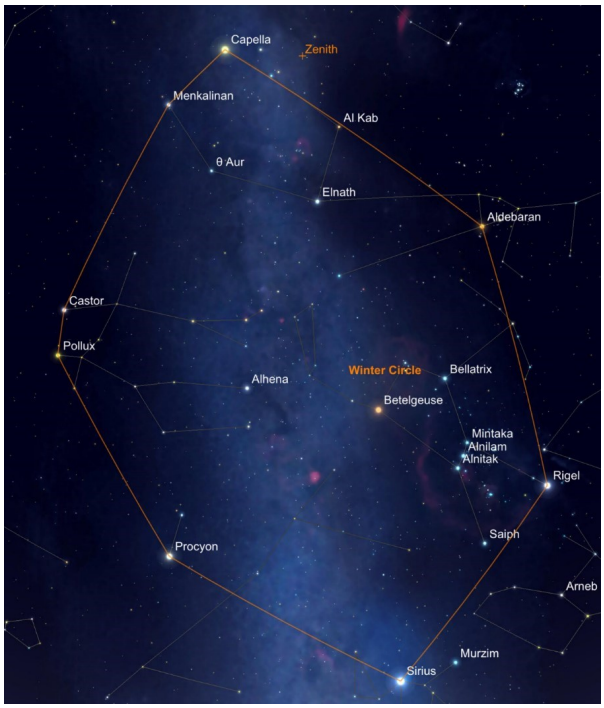
Last month, we mentioned that the Orion constellation has a distinct hourglass shape that makes it easy to spot in the night sky. But what if we told you that this is not the complete constellation, but rather, an asterism?

An asterism is a pattern of stars in the night sky, usually carrying a popular name. Though they are not constellations themselves, asterisms form shapes that make picking out constellations easy.

Cultures throughout history have created these patterns as part of storytelling, ancestry and timekeeping. Orion's hourglass is just one of many examples of this, but did you know Orion's brightest knee is part of another asterism that spans six constellations, weaving together the winter night sky?

Many asterisms feature bright stars that are easily visible to the naked eye. Identify these key stars, and then connect the dots to reveal the shape.

Try looking for these asterisms this season and beyond:



The Winter Circle (or Winter Hexagon) is an asterism with six bright stars as its points.

- Winter Circle: This asterism, also known as the Winter Hexagon, makes up a large portion of the winter sky. Its points are the bright stars Rigel, Aldebaran, Capella, Pollux, Procyon and Sirius as its points. Similarly, the Winter Triangle can be found using Procyon, Sirius and Betelgeuse as its points. Orion's Belt is also considered an asterism.
- Diamond of Virgo: This springtime asterism consists of the following stars: Arcturus, in the constellation Boötes; Cor Caroli, in Canes Venatici; Denebola, in Leo; and Spica, in Virgo. Sparkling at the center of this diamond is the bright star cluster Coma Berenices, or Bernice's Hair – an ancient asterism turned constellation.
- Summer Triangle: As the nights warm up, the Summer Triangle dominates the heavens. Comprising the bright stars Vega in Lyra, Deneb in Cygnus, and Altair in Aquila, this prominent asterism is the inspiration behind the cultural festival Tanabata, celebrated in Japan during July. Cygnus (the Swan) also forms an asterism known as the Northern Cross asterism.
- Great Square of Pegasus: In autumn, the Great Square of Pegasus can be seen throughout the night. This square-shaped asterism takes up a large portion of the sky, and consists of the stars Scheat, Alpheratz, Markab and Algenib.

Here's how to spot asterisms:

- Use Star Maps and Star Apps: Using star maps or stargazing apps can help familiarize yourself with the constellations and asterisms in the night sky.
- Get Familiar with Constellations: Learning the major constellations and their broader shapes will make spotting asterisms easier.
- Use Celestial Landmarks: Orient yourself by using bright stars, or recognizable constellations. This will help you navigate the night sky and pinpoint specific asterisms. Vega in the Lyra constellation is a great example of a landmark that can easily be found.

Kat Troche

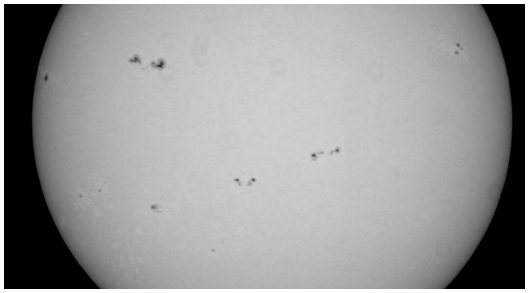
This article is courtesy of NASA's Night Sky Network program, which supports astronomy clubs and is dedicated to outreach. Visit nightsky.jpl.nasa.gov to learn more.

OBSERVATIONS & ACTIVITIES

Rob McDonald and Al Sheidler went out to the Scout camp at Loud Thunder Forest Preserve on December 8. Rob set up his homemade 6-inch reflector while Al used the club's 10-inch LX200, with the goal of capturing images of objects in the Astronomical League's 'Two in the View' program. Images taken that night include (top row, from left) Eta Cassiopeiae (binary star); Jupiter and its moons; M15; M38 (Starfish Cluster) and NGC 1907; Polaris (binary star); (bottom row, from left) M36 (Pinwheel Cluster); NGC 2276 and NGC 2300; NGC 1065 and M77 (Squid Galaxy); NGC 6543 (Cat's Eye Nebula); M1 (Crab Nebula); (left) NGC 7142 and NGC 7129.

Al Sheidler took the 10-inch LX200 out on November 29 to see what was happening with the Sun. He captured these images using a Nikon D7500 camera with a 1/400 second exposure. Look for the white dot in the right-hand photo; that's Mercury, which can be found in the daylight if you know where to look.

Byron Davies sent this astrophoto of NGC1499 (the California Nebula) which he took using his new ZWO ASI2600 color camera through a Takahashi FSQ85 refractor equipped with a quad band filter. The image is sharp, despite ambient light roughly equal to a full moon.



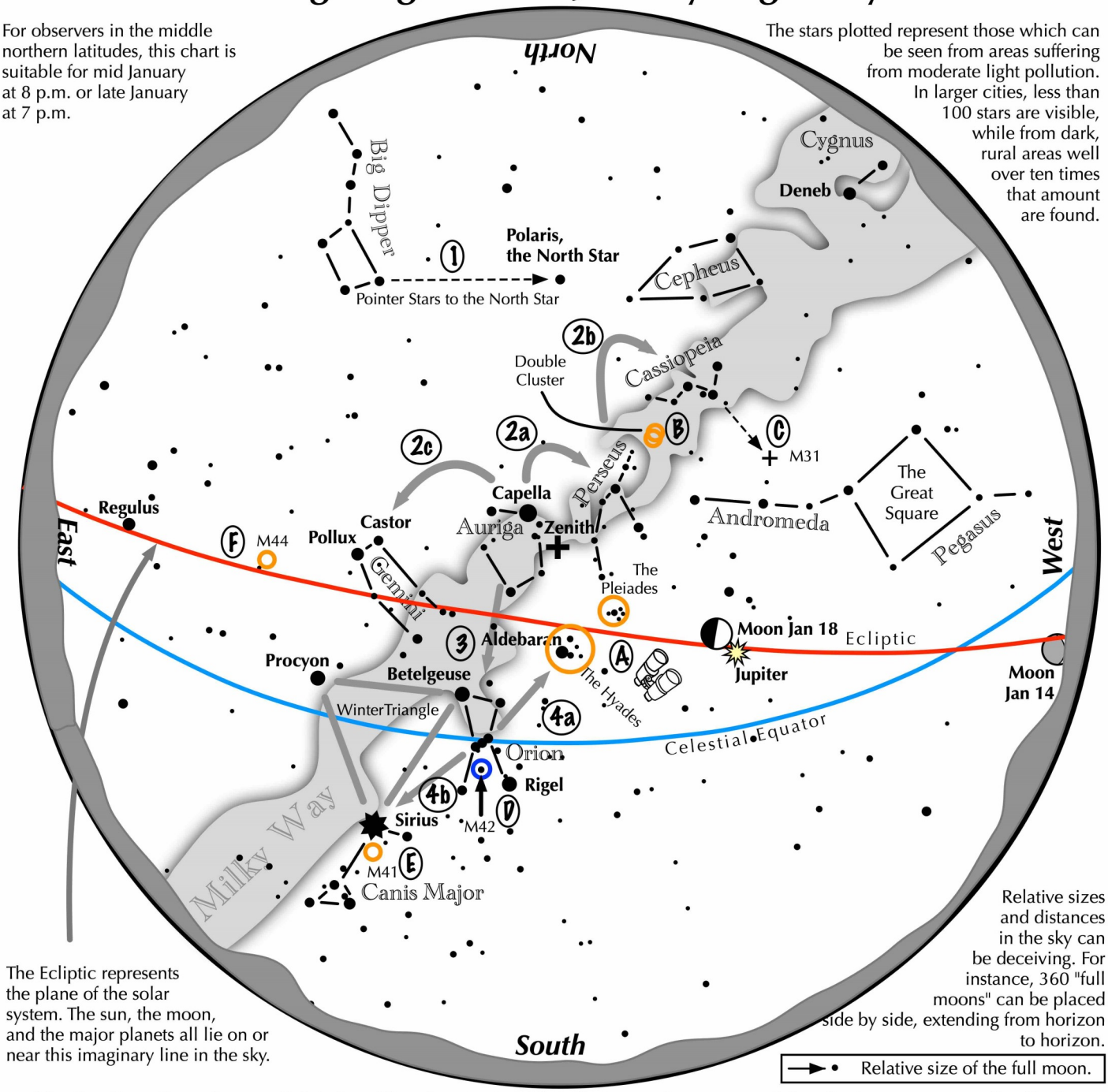
Al Sheidler captured this image of the Sun with the LX200, using the ZWO ASI2600MM camera owned by John Deere Middle School. Some nice groupings of sunspots show up in the photo.

Searching for deep sky objects? The 'Deep Sky Corner' website is an online atlas of 956 deep sky objects with finder charts, photos, and more. Find it here.

Navigating the mid January Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid January at 8 p.m. or late January at 7 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.



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 winter night sky: Simply start with what you know or with what you can easily find.

1. Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star.
2. Face south. Overhead twinkles the bright star Capella in Auriga. Jump northwestward along the Milky Way first to Perseus, then to the "W" of Cassiopeia. Next Jump southeastward from Capella to the twin stars Castor and Pollux of Gemini.
3. Directly south of Capella stands the constellation of Orion with its three Belt Stars, its bright red star Betelgeuse, and its bright blue-white star, Rigel.
4. Use Orion's three Belt stars to point to the red star Aldebaran, then to the Hyades, and the Pleiades star clusters. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius.

Binocular Highlights

A: Examine the stars of the Pleiades and Hyades, two naked eye star clusters. **B:** Between the "W" of Cassiopeia and Perseus lies the Double Cluster. **C:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval. **D:** M42 in Orion is a star forming nebula. **E:** Look south of Sirius for the star cluster M41. **F:** M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.

'Caroline Herschel's Galaxy' shines bright

This month, let us explore one of the seminal galaxies in the night sky: NGC 253, also known as the Silver Dollar Galaxy and by me as Caroline Herschel's Galaxy.

NGC 253 shines deep in the southern portion of the sky in the constellation Sculptor, south of the bright star Beta Ceti and southeast of the even brighter star Fomalhaut. This is one of my favorite galaxies, largely because of the beautiful story associated with its discovery.

NGC 253, which I call Caroline Herschel's Galaxy, is a starburst galaxy. It is so named because it is undergoing a burst of formation of new stars.

This process was set off relatively recently, at least in cosmic timekeeping terms. About 200 million years ago, a smaller, dwarf galaxy probably collided with this larger one, which set off a cacophony of new stars being formed.

The smaller galaxy was probably rich in gas, which provided the raw material for the birth of new stars. There is one thing that this galaxy does not share with other starburst galaxies, however.

Usually, these galaxies exhibit frequent exploding stars or supernovae. This one, however, has had only one recorded supernova, observed in 1940.

NGC 253 is aligned at almost right angles to our Milky Way. When you look at it, it appears as a thick, pencil-like structure.

While searching for comets during the year 1783, Caroline Herschel stumbled across this long, slender galaxy hanging above the southern horizon. She duly recorded the observation in her log "the Bills and Rec.ds of my comets." She also began and maintained a catalogue of the many objects she and her brother, William, had discovered, including beautiful drawings of most of them.

As a young girl. Caroline was close to her father, who brought her outdoors on a cold evening to view winter constellations like Orion. It is possible that this was one of the special moments which began her love of the night sky.


Caroline Herschel is credited with discovering NGC 253, sometimes called the Silver Dollar Galaxy.

As much as Caroline enjoyed working with William – who earned fame after being credited with the discover of the planet Uranus – there were some issues. One night, Caroline fell upon one of the large iron hooks that helped support the telescope on its mount. The accident left a large gash in her thigh.

Her brother, upon not seeing his telescope moving, yelled out, "Make haste!" In response, Caroline cried out, "I am hooked!" William immediately rushed over to help his sister, and she eventually recovered, with lots of rest and ointment.

When William married Mary Pitt in 1788, there was an increase in tension among the Herschels. She continued working with her brother, although the increased "family dynamics" did cause a problem. William very much wanted his sister to continue helping him with his observing, and he was successful in arranging a royal stipend for her.

In 1802, the Royal Society published the catalogue that Caroline had kept over many years. However, the publication in Philosophical Transactions of the Royal Society was credited to William, even though it was her catalogue. Over a long period of time, thanks to the work of later astronomers like John Louis Emil Dreyer,

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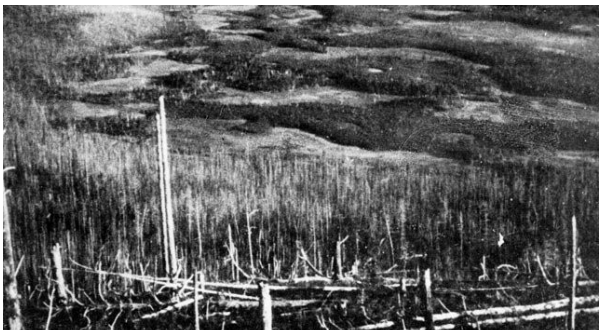
'Tunguska Event' topic of presentation at January meeting

The "Tunguska Event" will be the topic of a presentation highlighting PAC's January membership meeting. The meeting will be held January 8 at 7 p.m. at the Butterworth Center, and also available via Zoom.

The presentation will be led by Andy Bruno, Professor of History and Environmental Studies at Northern Illinois University. Professor Bruno is the author of Tunguska: A Siberian Mystery and its Environmental Legacy, which was published by Cambridge University Press in 2022.

On June 30, 1908, a large explosion occurred near the Tunguska River in a remote area of Siberia. The explosion devastated a mostly forested area of nearly 500 square miles, felling about 80 million trees in the process. Per eyewitness reports, at least three people were killed in the explosion.

In his presentation, Professor Andy Bruno will explore the mystery of a 1908 explosion that devastated a wide area of forest in Siberia.



Though it is generally believed that an asteroid or comet fragment caused the explosion, neither a crater nor unmistakable fragments of a meteorite have ever been found. The mystery surrounding the Tunguska Event has inspired science fiction writers and prompted speculation about its cause, including some who believe it may have the result of a nuclear explosion triggered by aliens.

In his presentation, Professor Bruno will recount the history of the Tunguska Event and the numerous investigations into its cause. He will explain how efforts to understand the explosion have shaped the treatment of the landscape; how uncertainty allowed alternative forms of knowledge to enter scientific conversations; and how cosmic disasters have influenced the past and might affect the future.

Caroline Herschel's galaxy

Continued from Page 14

the almost 8,000 objects listed in Caroline's catalogue now comprise the New General Catalogue.

The woman who discovered the wonderful galaxy in Sculptor certainly enjoyed a remarkable life and career, receiving numerous honors for her contributions to the science of astronomy. She died in 1848, just a few months short of her 98th birthday.

In the 1980s, Caroline's eight comet discoveries were surpassed by Carolyn Shoemaker, in what was seen at the time as the highlight of Carolyn's career. However exciting that achievement might have been, it was completely eclipsed by her discovery of Comet Shoemaker-Levy 9 in March 1993.

That comet gave humanity its first lesson in what happens when a comet strikes a planet, and, by inference, how such collisions can lead to the origin of life on a planet.

As I gaze upon Caroline Herschel's galaxy on these winter nights, I imagine life forms from there looking back – trying, as we do, to share our cosmic heritage.

We send thanks to Dan Cusack for donating this children's book to PAC that features a star-filled snow globe on the cover. The book, published in 2023, was written by noted author Patrick Bishop. It will be used at PAC outreach events geared toward kids.

CALENDAR OF CLUB EVENTS

JANUARY 8: **Monthly membership meeting at Butterworth Center / via Zoom; 7 p.m. Program: "The Tunguska Event" by Andy Bruno, Associate Professor of History and Environmental Studies at Northern Illinois University**

JANUARY 29: **Moline Public Library; "Project Next Generation" astronomy presentation, 7 p.m.; register to attend here**
Next PNG presentation at Moline Public Library in March; date to be determined

FEBRUARY 12: **Monthly membership meeting at Butterworth Center / via Zoom; 7 p.m. Program: "Discarded Worlds: Astronomical Ideas That Were Almost Correct" by Brother Guy Consolmagno , Director of the Vatican Observatory**

MARCH 11: **Monthly membership meeting at Butterworth Center / via Zoom; 7 p.m. Program: Business meeting / Smorgasbord of member presentations**

***MARCH 16*: Public observing at Niabi Zoo (first of season); sunset at 7:12 p.m.**
Niabi Zoo public observing sessions held on third Saturday of the month through November

***APRIL 8*: Eclipse viewing at Moline Public Library; partial eclipse peaks at approximately 2 p.m.**

***APRIL 8*: Monthly membership meeting at Butterworth Center / via Zoom; 7 p.m. Program: "Solar Flares and Neptune's Chemistry" by Robert Gregory, Astronomy Professor, Scott Community College**

MAY 13: **Monthly membership meeting at Butterworth Center / via Zoom; 7 p.m. Program: "Keep Looking Up - One Sky, One World " by Dave Weinrich, former Director of Minnesota State University-Moorhead Planetarium**

Volunteers are needed to support these events; to make presentations at PAC 'smorgasbord' meetings; and to write articles and provide input for the monthly 'Skywatch' column and 'Reflections.' Please contact any club officer if you can help. Your active participation makes a difference, both for PAC and for our community!

2024 astronomy conventions are scheduled

Mark you calendar: The dates of three astronomy conventions that will be held in 2024 have been announced.

The Astronomical League will hold its annual convention – dubbed "ALCON 2024" – July 17-20 in Kansas City, Missouri. Details are pending; check this link to learn more: www.astroleague.org/alcon-2024-kansas-city/.

The Mid-States Region of the Astronomical League (MSRAL) will hold its 2024 convention June 7-8 at Eugene T. Mahoney State Park in Ashland, Nebraska, which is off Interstate 80 between Omaha and Lincoln. Registration information is coming soon and can be found here: msral2024.org/.

PAC was well-represented at last year's convention of the North Central Region of the Astronomical League, and NCRAL will hold its 2024 convention in Green Bay, Wisconsin, May 17-19. "Titletown" was supposed to host the 2021 convention, which was cancelled due to the COVID pandemic. Go to this link to learn more: ncral.wordpress.com/conventions/.