

**Kejlections** The Newsletter of the Popular Astronomy Club ESTABLISHED 1936

#### **REFLECTIONS from the President**



The weather once again caused cancelations of our observing events, including both our Niabi Zoo night and the rain date on the following Satur-

day, but we did have the opportunity to provide some public outreach.

At the WQPT 40th anniversary gala, we were able to show the PACMO and a telescope to attendees, though the clouds prevented observing. This event will probably result in additional opportunities to publicize our activities to the public.

The Putnam Museum opened a new meteorite display, and we were invited to participate with a literature table to help greet visitors. Dr. Paul Sipiera, president of the Planetary Studies Foundation, who presented a session at the PAC-sponsored North Central Region of the Astronomical League (NCRAL) convention in 2019, spoke about the educational meteorite exhibit, and about the donation of items from his meteorite research collection to the Peabody Museum at Yale University in New Haven, Connecticut.

The PACMO became a teaching tool for Al Sheidler's students in

physics, chemistry, and astronomy, and for his engineering academy class at Scott Community College's Belmont campus. They learned about engineering of the PACMO and how telescopes work.

The NCRAL 2023 convention at Grand Bear Lodge in North Utica, Illinois, will be attended by up to eight PAC members and will provide information for all of our members. At our May 8 PAC membership meeting, some of the attending members will brief the attendees about the NCRAL sessions and activities.

It's time for Birdies for Charity donations again. The most effective way to make a charitable donation to the Popular Astronomy Club is to give through Birdies for Charity, associated with the John Deere Classic golf tournament.

Tournament play takes place July 5 -9 this year, and the deadline to guess the number of birdies in the tournament with your donation is June 16. Donations only, without the birdies guess, can still be made until the tournament date.

Donate online at <u>birdiesforchari-</u> <u>ty.com/donate</u>, using Bird Number 2046 for the Popular Astronomy Club.

Our next Niabi Zoo public observing is on May 20. Let's all hope for clear skies, and I hope to see you there. Until then, keep looking up!



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#### MSRAL conference ANNOUNCEMENTS / INFO set for June 9-11

The Mid-States Regional Astronomical League will hold its 2023 conference June 9-11 at Jenks. Oklahoma.

All amateur astronomers are invited to attend the conference, which is sponsored by the Astronomy Club of Tulsa. Conference guests will enjoy seating in a 120-seat planetarium, located on the campus of Jenks High School south of Tulsa, along with a spacious lobby and large gathering room.

The conference kicks off with a dinner on Friday evening, followed by a trip to the observatory managed by the Astronomy Club of Tulsa. The Saturday program includes a business meeting, presentations in the planetarium, a group photo, vendors, giveaways, and an evening banquet. The event wraps up on Sunday morning with more presentations and giveaways.

Dr. Daniel Kennefick, professor of physics at the University of Arkansas, will serve as keynote speaker at the Saturday banquet. Dr. Kennefick's presentation on "Multi-Messenger Astronomy" will discuss how this emerging field makes it possible to detect two completely different types of radiation from the same source in a distant galaxy.

To register for the conference, and for more information, go to the MSRAL website, at msral2023.org.



#### 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 unre-lated 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?

weather 🌣 close to you

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**PRESIDENT** - Dale Hachtel 1617 Elm Shore Drive, Port Byron IL, 61275 Phone: (614) 935-5748

VICE PRESIDENT – Dino Milani 2317 29 1/2 Street, Rock Island, IL, 61201 Phone: (309) 269-4735

SECRETARY - Paul Levesque 5002 26th Avenue A Court, Moline, IL 61265 Phone: (309) 236-1726

TREASURER – Michael Haney 564 36th Avenue, East Moline, IL. 61244 Phone: (309) 755-7935

ALCOR – Roy E. Gustafson 11 Deer Run Road, Orion, IL, 61273 Phone: (309)526-3592

#### **DIRECTOR OF OBSERVATORIES -**

**Rusty Case** 2123 W. 16th Street, Davenport, IA, 52804 Phone: (563) 349-2444

PAST PRESIDENT - Alan Sheidler 3528 56th Street Court, Moline, IL, 61265 Phone: (309) 797-3120

#### **NEWSLETTER EDITOR -**

Paul Levesque Email: levesque5562@att.net Phone: (309) 236-1726

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

## Astronomy integrates many fields

One of the more interesting aspects of astronomy is how it integrates many fields of science and other academic disciplines.

Tracking the orbits of the planets in our Solar System, and the paths of comets and other objects, depends on mathematics. Mathematical calculations can tell us where these objects are going and when and where we can observe them.

Our observations of the stars can tell us where they are, but we then want to know what they are and how they got there. Physics helps us to answer those questions.

Advances in optics allows us to analyze light so we can identify what the stars are made of. The new James Webb Space Telescope allows astronomers to see more than the visible light of electromagnetic radiation, enabling us to see new things we didn't know were there before.

Chemistry is also involved, now that we can identify the possible composition of atmospheres around planets orbiting stars. Knowing this information also allows scientists to consider what the geology of these exoplanets may be.

This is very important as astronomers find many new exoplanets and try to determine if conditions could allow life as we know it to exist on some of those planets. That also brings in the science of biology, as we study living organisms in habitats on Earth in extreme environments and try to speculate if such types of life could exist on exoplanets.

Like most of the planets in our own Solar System, many exoplanets appear to have atmospheres of some sort. Studying Earth's atmosphere is within the realm of meteorology, so now that branch of science also has a role to play in astronomy as we analyze extraterrestrial atmospheres and learn how they function.



The exoplanet Kepler-1649c is nearly the same size as Earth and may harbor life. Biology and other sciences are critical to the study of exooplanets and their potential for life.

When the Apollo astronauts brought rocks back from the Moon, geologists got busy examining those lunar samples. Probes on Mars have scooped up samples from the Martian surface and enabled geologists to analyze Martian rocks and dirt from a distance.

The so-called "softer sciences" also play a role in astronomy. Archeologists have found numerous sites used by prehistoric humans to track the Sun, Moon, planets and stars, both to mark the progress of the seasons and for the purpose of religious rituals.

Psychology plays a key role in space exploration, because astronauts are people like the rest of us. Understanding how the mind works and how we get along as social beings helps in designing spacecraft intended for those taking long voyages together in confined quarters.

Astronomical objects have inspired visual artists, poets and authors, and philosophers and theologians have also long turned the night sky for spiritual insight. The sheer beauty of what we can find out there can be seen in the images captured through astrophotography, including the images taken by members of the Popular Astronomy Club

The universe is so vast that there will always be more to explore, and more ways that astronomy will link itself to other fields of endeavor. That's all the more reason to keep looking up.

### SUMMARY OF APRIL PAC MEETING

The Popular Astronomy Club held a general membership meeting at the Butterworth Center in Moline on April 10 at 7 p.m.

Twelve PAC members and guests were present for the membership meeting, with another nine 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 members Mike and Madeline Morrell. He then said that there had been little or no time for member observations at the last few meetings, so this meeting would largely be devoted to displaying images of observations made in the past few months.

Astrophotos taken by Roy Gustafson (who was not present), Byron Davies (present via Zoom), Al Sheidler (present in person), and others were then displayed. Those who took the images had a chance to explain how they obtained them and what they depicted. Zooming in on the images revealed great detail in some cases.

Al displayed an image he took of the M13 globular cluster in Hercules and showed how it captured the "three-blade propeller" found in the cluster, as outlined in the March 2023 issue of Reflector magazine. He also showed a photo of individuals who helped uncover and prepare the PACMO for future public outreach sessions.

Wayland Bauer displayed some photos taken during a recent presentation given by his wife, Anne, at a local elementary school.

Following the display of member observations, a program to obtain library telescopes was discussed. New PAC t-shirts may also soon be ordered.

Dino Milani stated that the next total solar eclipse in the United States was now just one year away, and advised that anyone who wants to obtain lodging along the eclipse's



path should make reservations soon before prices increase. Dale noted that an annular eclipse will cross over the western United States this October, on a date that coincides with the proposed date of PAC's annual banquet.

Dale reminded PAC members of the monthly "Skywatch" column published in the local newspaper and encouraged submissions, adding that editing assistance was available. He concluded the meeting by reviewing upcoming events and inviting PAC members to assist at those events.

A recording of the meeting is available on YouTube via the following link: <u>https://</u> youtu.be/AWxsovuN6ms.

The meeting adjourned at 8:35 p.m. The next membership meeting is scheduled for May 8 at the Butterworth Center and via Zoom.





& CLUB ACTIVITIES

Al Sheidler and Rolando Gamino took advantage of clear skies on April 2 to do astronomy at Paul Castle Observatory, using both the observatory's telescope and Rolando's 9.25-inch Celestron. Al's goal was shooting open star clusters for the Astronomical League's program; shown are photos he took of (top, from left) NGC 2169 and 2224 and (bottom, from left) NGC 2323 and 2506.



A group PAC members gathered at Paul Castle Observatory on April 8; included were Al Sheidler, Byron Davies, John Douglas, Rusty Case, Ally Nordick, Rolando Gamino, Dan Cusack and the Holt Family. Several scopes were set up, and both visual and imaging observations were taken. The images captured include (below, from left) Betelgeuse, M104 (Sombrero Galaxy), M46 cluster with the NGC 2438 planetary nebula, and NGC 4565 (Needle Galaxy).



**MEMBER OBSERVATIONS** 





Byron Davies aimed his scope at some galactic groups in April and came away with these images of the Leo Trio (left) and Markanian's Chain of galaxies, which is part of the Virgo Cluster.

## MEMBER OBSERVATIONS & CLUB ACTIVITIES



Roy Gustafson described April 7 as 'a good night to observe with Stellina,' and used it to capture images of (left, top and bottom) the Sombrero Galaxy and Bode's Galaxy, as well as the near-full Moon. Roy went back out on April 18 to take this image of the Sun showing sunspots.



Al Sheidler is teaching an engineering class at Scott Community College, and he took the PACMO to the college on April 24 to do some solar observing and to provide some hands-on instruction on the design and function of telescopes. Staff and students from other classes at the college were attracted to the PACMO and joined the session.



PAC'S public outreach event at Kewanee Central Junior High School drew a nice turnout on a cool, clear evening. Once the sky got dark enough, the observing began and a nice image was captured of the M13 star cluster.





PAC member Anne Bauer recently took part in 'Read Across America' by representing the club at Quad City Christian School. Anne read a Dr. Seuss book on the planets to a firstgrade class of about 15 students and their teacher. She also took the opportunity to share a little more information about the Solar System.



## MEMBER OBSERVATIONS & CLUB ACTIVITIES







PAC was there on April 22 when a meteorite exhibit was unveiled at Davenport's Putnam Museum. Dr. Paul Sipiera, president of the Planetary Studies Foundation, spoke at the event and then took the time to explain some of the objects in the exhibit to a potential future scientist. The meteorite exhibit can be found in the Space Gallery of the museum's Science Center.



A geomagnetic storm triggered a display of the aurora borealis that caused the "Northern Lights" to appear throughout the upper Midwest, including the region around the Quad Cities. The best display came on the night of April 23, when the Holt Family caught this image of the shimmering green lights near their home in Mineral, Illinois.

Al Sheidler and Dale Hachtel brought the PACMO to the Old Oaks Winery in Milan on April 21 for the fund-raising gala held to celebrate WQPT-TV's 40th anniversary. Unfortunately, clouds moved in, which made observing impossible. Despite the disappointment, Al and Dale made the best of it by displaying astrophotos taken by PAC members and answering questions posed by gala attendees.









## **Observing Flat Galaxies**

Eerily fascinating are Flat Galaxies with their Cheshire Cat-like qualitites of long, thin wisps suspended in the depths of space: Now you see them, now you don't.



#### The Silver Needle Galaxy

NGC 4244 (Caldwell 26), lying 14 million lightyears distant, is a prime example of a Flat Galaxy, one that is not on the minds of many observers.

#### Navigate to NGC 4244:

- 1. Find Cor Caroli (Alpha Canum Venaticorum). It is the moderately bright star 1/3 between Zeta Ursae Majoris and Denebola.
- 2. Locate Beta CVn to the northwest.
- 3. Make a right triangle so that one leg is from Alpha to Beta and the other is of the same length but extends to the southwest.
- 4. It ends near the Silver Needle, NGC 4244.
- 5. Insert a low power, wide field eyepiece and slowly scan the area.

#### Recommended Aperture:

Not less than 8 inches. The larger, the better.

Dark skies are a must!

#### Published Characteristics:

Integrated magnitude: 10.2 Size: 17.0 min x 2.2 min Surface brightness: 14.2 mag./min<sup>2</sup>, 23.2 mag./sec<sup>2</sup> Axis ratio: 7.7 Position Angle: 47°





#### Eyepiece Impressions:

• 10 inch, f/10, 100x: "SW-NE smudge about 10' x 2'. Center is slightly brighter. Low surface brightness." JG

· 12 inch, f/10, 113x: "Incredible galaxy; most extremely long and narrow; covers more than half a field: moderately bright: brighter small elongated nucleus; faint field star at NE tip." CA

 13 inch, 70 & 130x: "Long and skinny. Slight bulge. Nice object to observe." AL

 20 inch, 73 & 313x: "Very easy to see! Can actually measure the PA better when you can see the galaxy! PA: 45-50°. 18' long so it extends some distance." AL





#### May 2023

## Comet Shoemaker-Levy discovered 30 years ago

A lot can happen in 30 years, especially when it involves comets and asteroids that creep across the sky, and even more particularly with comets that go bump in the night. Such is the case with Comet Shoemaker-Levy 9, which is by far the most important and seminal of the 23 comets I have discovered.

The Jupiter-Comet story began for me on September 1, 1960, when I looked through a telescope for the first time. Jupiter was my target and I still recall that view.

Years later, Gene Shoemaker proposed that Comet Shoemaker-Levy 9 might have been orbiting Jupiter as early as 1929, and that it made a close approach to Jupiter during the year I first sighted the planet. Obviously, I did not see the comet that night; neither did anybody else.

On the first night of our March 1993 observing session at the 18-inch Schmidt telescope at Palomar Observatory, Gene Shoemaker developed the first four exposures taken and found them all blank. It appeared that someone had opened the film box since our February session and exposed the films to light. damaged films until about 3 a.m., when we switched to a new set of prepared films.

On that same night, I guided an 8-minute exposure. It was difficult to stay centered on the guide star since the glow from nearby Jupiter was interfering. We then did three other fields of sky.

Clouds arrived before we had a chance to begin the second set of exposures (so that each field would have two exposures). We stopped observing and left the building to examine the sky.

I noticed a slight break in the clouds to the southwest. Gene teased me as being "the eternal optimist."

We had a strange discussion about money. Gene said that it costs \$8 each time we load a film into that telescope. When I suggested that \$8 was not too much, Gene quipped, "That's eight American dollars! Not that Canadian play money you try to get away with!"

But after Carolyn (Gene's wife, and an astronomer herself) agreed that there was a break coming, Gene said, "Let's do it!" We somehow managed to take four exposures before more clouds came and ended the night.

On the afternoon of March 25, the sky was completely cloudy with snow flurries. Gene was reading Time magazine. I was working on a book about my favorite subject, comets. Carolyn was scanning the two Jupiter films.

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Examining the pile of films, I suggested that the ones near the bottom might be partially usable. Gene developed one of them and agreed. We continued with the partially damaged

These photos were the first taken of Comet Shoemaker-Levy 9 upon its discovery in March 1993. The photos are eight-minute exposures taken about one hour and 45 minutes apart.





Pam Kollar, shown holding Franklin the cat, needed some help moving in to her new home, so some friends from the Popular Astronomy Club came through. Moving help was provided by Byron and Sharon Davies. Wavland and Anne Bauer, and Al and Sara Sheidler. Pam reports that she's settled in, and that Franklin has found sunny spots for catnaps; she adds that she's "amazed and blessed" to receive such kindness.

### **Comet discovery**

#### Continued from Page 11

Suddenly she stopped, looked toward me, and exclaimed, "I think I have found a squashed comet."

As Gene got up to look, Carolyn approached me. "You are joking, of course?" I inquired.

Carolyn shook her head. Gene then looked toward us with the most unusual expression I had ever seen on his face. Then I looked.

There was a long bar of cometary smudge, with at least five darker centers, each with a tail going towards the top of the films. There was also a trail of cometary light stretching off either side of the central structure.

We needed to get a confirming image. I telephoned my friend, Jim Scotti, who was observing on the 36-inch Spacewatch camera atop Kitt Peak in Arizona.

He simply did not believe me when I explained what we had. He said he would try to find the time to take a confirming picture. Two hours later, I phoned him again. Jim simply grunted.

"The sound you just heard," he explained, "was me trying to lift my jaw off the floor. 'Do we have a comet?' "Wow, do you guys ever have a comet!"

That is the story of how we discovered Comet Shoemaker-Levy 9, the pinnacle moment of our professional lives. Sixteen months later we watched, along with the rest of the world, as the pieces of the comet slammed into Jupiter at the incredible velocity of 60 kilometers (37 miles) per second. A plane traveling that fast would cross the United States in just over a minute.

We spent some time with both President Clinton and Vice President Al Gore. Impact week was unforgettable. And it all began with a single look at Jupiter through my first telescope, a cloudy night, and some damaged film, on the never-to-be-forgotten night of March 23, 1993.



Date: May 8, 2023 Event: Membership meeting @ 7 p.m. Location: Butterworth Center / Zoom Program: Summary of NCRAL Convention

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

### **UPCOMING EVENTS**

- 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'



## PACMO is ready to go

A group of PAC volunteers unwrapped the PAC from winter storage on April 8, a sunny Saturday afternoon. Those who got the mobile observatory ready for public outreach included the Holt family, Rusty Case, Al Sheidler, Mike Haney and Dale Hachtel. Thanks to all who helped - members like you keep the club going!



# WELCOME TO THE CLUB!

*These new members joined PAC in the past few months:* Mike & Madeline Morrell Dan Cusack Janet Parker Steve Young Sharon Kendall-Dunn