



Reflections

The Newsletter of the Popular Astronomy Club

ESTABLISHED 1936



January 2022

REFLECTIONS from the President



Dale Hachtel

With the continuing COVID-19 pandemic, 2021 was a difficult year for the Popular Astronomy Club, but perhaps not as difficult as it has been for some organizations. Many

of our public programs have been outdoors where spacing for safety has been possible. We have learned to use digital displays for viewing to allow more participants to view astronomical objects safely through our telescopes. We have expanded the reach of our non-viewing programs to additional online audiences using Zoom.

Our retiring president, Al Sheidler, has been responsible for leading our efforts to many new and exciting activities, including hosting the 2019 NCRAL convention in the Quad Cities, upgrading the PACMO, rebuilding and improving the club's Paul Castle Memorial Observatory, and expanding our joint programs with other organizations, such as libraries, schools and local organizations. With help from his wife, Sara, the Popular Astronomy Club has operated efficiently to accomplish these activities.

However, after retiring from the presidency, Al will not disappear. He has agreed to help coordinate the club observing activities, which have enabled many members and guests to learn more about amateur astronomy. Al will be a difficult act to follow as president.

My interest in astronomy goes back to a grade school field trip to the former Carl Gamble's Sky Ridge observatory over 65 years ago. I can still remember being amazed at how much more I could see through the telescope at that time.

Although I did not continue actively participating in amateur astronomy, I kept an interest in the subject throughout my working years. In Columbus Ohio, I remember all the news when the WOW signal was received by a local radio telescope there. Later, I followed the news of the various spacecraft exploring the outer planets, and continued my interest by becoming a member of the Planetary Society and participating in the SETI@home distributed computing project for many years.

After retirement, I moved back to the Quad Cities area about five years ago. Talking with various new friends in the area, I was directed to attend a PAC meeting, joined the club, and have continued to learn more about astronomy at every meeting, outreach program, and observing session ever since.

The new year presents many challenges as we continue to expand our public programs. The planets generally will not be in good positions this year for evening viewing, so we will need to concentrate on other interesting astronomical objects for our public programs.

Al has set up a series of interesting and educational programs for our monthly meetings. We can look forward to another interesting year with the Popular Astronomy Club.

Keep looking up! DALE

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Byron Davies (left) and Rusty Case pose with Terry Dufek's friend Eva Davison after helping to install a ramp and pavers at Terry's house.



PAC MEMBERS INSTALL RAMP

It's no secret that PAC member Terry Dufek has struggled with some health issues recently, but it's also no secret that his fellow PAC members have come through for him during his time of need.

This happened again on December 2, when a group of PAC members got together to install a ramp and pavers at Terry's house. The ramp is needed because Terry has mobility issues and sometimes needs to use a wheelchair.

Rusty Case, Byron Davies, and Al and Eric Sheidler worked to install the ramp and pavers; Al also used his truck to haul a hospital bed and other needed items.

Terry's friend, Eva Davison, said the ramp was "a lifesaver," and added, "There is no way to tell you all how much your help means... We would be lost without all your support... God bless you all."

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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or want more information on
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A look back, and a look ahead

2022 will be a busy year for local amateur astronomers

It's that time again, when we look back at the year just past and look ahead at what the new year might bring us.

As members of the Popular Astronomy Club look back at 2021, they see a year when pandemic restrictions were slowly lifted and public outreach events resumed. During 2021, public events held by the club attracted a total audience of over 1,170 people who saw and learned about the wonders of the night sky.

Along with its regular public observing sessions at Niabi Zoo, PAC held outreach events at venues ranging from local churches and schools to a state recreation area, an alpaca farm, a local library, and both the Putnam Museum in Davenport and the Felix Adler Discovery Center in Clinton.

In 2021, PAC also formed a partnership with the Moline School District and held three events at John Deere Middle School. The partnership will continue into 2022, and more events are planned at the school.

At Niabi Zoo and other PAC public observing events, celestial objects seen through telescopes were projected onto video screens,

meaning that those attending could share in the experience of viewing the objects and look at them without peering through an eyepiece.

Technology also changed the way PAC holds its monthly meetings, which are now conducted both in person at Moline's Butterworth Center and also virtually via Zoom. This not only opens up the meetings to those who'd rather attend from home, but also allows guest speakers to make presentations from remote locations.

So, in 2021, PAC members got to hear from experts from across the nation speaking on interesting topics including astro-archeology (how ancient peoples observed the night sky), NASA solar missions, and the recently launched James Webb Space Telescope. More presentations by experts on astronomy-related topics are planned for 2022.

PAC meetings for 2022 will be held at the Butterworth Center on the second Monday of each month, with two exceptions – in August, when the annual PAC picnic is held, and October, when the club holds its annual banquet.

The public observing sessions held at Niabi Zoo are currently in hibernation for the winter, but will resume in March and run through November, on the third Saturday of each month beginning at sunset.

Meanwhile, our friends at the Quad Cities Astronomical Society will hold a number of public sessions at the Menke Observatory, located at the Wapsi River Environmental Education Center in Dixon, Iowa. The observatory is owned by St. Ambrose University and operated and maintained by QCAS in partnership with the university.

May 7 is Astronomy Day, which will be celebrated locally with a daytime open house

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Also on the agenda for 2022; the annual convention of the North Central Region of the Astronomical League, scheduled for May 13-14 at the Lakeview Conference Center in Port Washington, Wisconsin.

More information is available at a website set up for the convention: <https://ncsf.info/ncra-vision-2022>.

SUMMARY OF PAC DECEMBER MEETING

The Popular Astronomy Club held its regular monthly meeting on December 13 at the Butterworth Center in Moline. Twelve PAC members attended the meeting “live,” with another 12 joining via Zoom.

During the business portion of the meeting, PAC officers were asked if they had anything to report. PAC secretary and newsletter editor Paul Levesque asked that members send submissions for “Reflections,” including photos, articles and other items of interest.

Observatory director Rusty Case reported that the PACMO was in storage at Sun-Rys in Coal Valley, and also noted that the Paul Castle Observatory would remain open for members during the winter. Training for those interested in using the observatory is available.

Past president Wayland Bauer recommended that PAC members with Netflix watch “Countdown: Inspiration4 Mission to Space,” which chronicles the launch of four civilians on the SpaceX Dragon mission for three days in space.

Treasurer Dale Hachtel gave a brief summary of the quarterly treasurer’s report (*see page 16*) and noted that the club had a good quarter in terms of revenue received.

Vice president Dino Milani reported that the PAC website and social media sites were doing well.

All board member reports were approved by those present.

Wayland Bauer then presented a slate of candidates for club offices; if approved, these officers would serve two-year terms. A call

The following members of the Popular Astronomy Club were elected as PAC officers during the December meeting. All will serve two-year terms beginning in January.

President: Dale Hachtel

Vice President: Dino Milani

Secretary: Paul Levesque

Treasurer: Mike Haney

Observatory Director: Rusty Case

Alcor*: Roy Gustafson

* Astronomical League Correspondent

went out for other nominations, but none were received. The slate was approved by voice vote; the names of those elected accompanies this article.

Alan Sheidler then noted that this would be his last meeting as PAC president and that he was moving to the position of past president. He thanked all those who have supported him during his six years serving as president, and offered special thanks to his wife, Sara. He noted that club members were friends who helped one another and contributed to PAC’s growth.

Roy Gustafson then did a presentation titled “Year in Review” that incorporated photos and a bit of humor to summarize PAC activities during 2021.

A recording of the meeting can be viewed on YouTube via this link: <https://youtu.be/bhNOMXrl-To>.

The meeting concluded with a display of some astrophotos recently taken by club members. The next regular monthly meeting – the first of 2022 – is scheduled for January 10 at the Butterworth Center, and via Zoom.



WELCOME TO OUR NEW PAC MEMBERS

John Davis ♦ Jean Hughes ♦ Cody Oosting

Want to join or renew? Just click this link:

[PAC MEMBERSHIP FORM](#)

SUMMARY OF PAC BOARD MEETING

A meeting of the Popular Astronomy Club board was held via Zoom on Sunday evening, December 5. After waiting for late arrivals, PAC president Alan Sheidler called the meeting to order at approximately 7:05 p.m.

Along with Al, those present were Wayland Bauer, Rusty Case, Roy Gustafson, Dale Hachtel, Mike Haney, Paul Levesque and Dino Milani. Highlights of the meeting and actions taken were as follows.

- Paul Levesque noted that he had attended Festival of Trees and was fortunate enough to win a basket – baskets are raffled off as part of the event. He wondered if PAC could perhaps put together a basket full of astronomy-related items for next year's Festival of Trees, as this would be good publicity for the club in the community. Some suggestions as to what could be in such a basket were discussed. Paul said he would look into this further and report back.
- Dale Hachtel presented a treasurer's report, which showed a good flow of incoming revenue for the quarter just passed. One of the main sources of this revenue was membership renewals, though it was noted that some current members had not yet renewed. More effort will be made to reach out to those who haven't paid membership fees yet. The treasurer's report was approved by the board as submitted.
- A bill for towing and mileage fees for the PACMO was presented. The board approved payment of the fees to those who towed the PACMO to various events.
- Rusty Case reported that the PACMO was now winterized and in storage, and



The PACMO is now wrapped up for winter and in storage at Sun-Rys in Coal Valley.

that the Paul Castle observatory should also be checked and winterized as needed. A minor leak at the observatory has been repaired. Mice continue to get into the observatory, despite efforts to keep them out.

- Dino Milani reported that the website was working well and that the recent event at the new Doll Museum in Rock Island was highly successful and included a brief indoor session on asteroids.
- Al said that he was working on the Meade telescope used by John Deere Middle School. Some gears on the telescope need to be replaced and the scope also needs a software update. An invoice will be presented to the school for the cost of the parts, though PAC will need to pay up front. The board voted to approve the payment.
- Board members discussed how the upcoming election for club officers should be conducted. A slate of candidates has been presented in advance to club members, through outlets such as the

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PAC board meeting

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December newsletter. After discussion, it was decided that the entire slate should be presented to the club for a vote at the December meeting. Other candidates could be nominated at that time, though this is not expected to happen. Wayland Bauer, as past president, agreed to present the slate of nominees.

- Wayland noted that this would be his last meeting as past president and thanked everyone for their help during his tenure. Al Sheidler will now assume the role as past president and noted that he had a number of files (both electronic and hard-copy) to turn over to the incoming president and to other officers, e.g. the secretary. In addition, the authority to sign checks for PAC will need to be given to the incoming secretary.

Al noted that he currently had signature authority and it was agreed that he should retain that authority as past president. Others with signature authority should include the incoming treasurer (Mike Haney is nominated for that position) and the incoming president (Dale Hachtel, current treasurer, is nominated for that position).

The meeting adjourned at approximately 7:55 p.m.



2022 will be busy

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featuring solar observing and indoor displays at Bettendorf High School and a public observing session in the evening at Menke Observatory. In addition, QCAS will invite the public to observe the Perseid meteor shower at an event scheduled for July 31 at Pleasant Valley Middle School.

All amateur astronomers (though not the general public) are welcome at the annual Eastern Iowa Star Party, scheduled for the weekend of September 23-25 at the Wapsi River Center. Another highlight of the year for amateur astronomers will be the Messier Marathon, on dates to be determined.

Other events are sure to be added to the 2022 agenda, as local organizations request observing sessions and presentations. As you can tell, the Quad Cities has an active, vibrant group of amateur astronomers who enjoy sharing what they see and what they know with others.

Membership in these groups is open to anyone and everyone – you don't need to own a telescope or even know much about astronomy. All you need is an interest in the subject and a desire to learn about the fascinating, beautiful objects that can be found in our Solar System, our galaxy, and our universe.

You can learn more by visiting PAC's website, at [https:// www.popularastronomyclub.org/](https://www.popularastronomyclub.org/), and the QCAS website, at [https:// www.qcastro.org/](https://www.qcastro.org/). Both organizations also post announcements and updates on Facebook.

So, in 2022, perhaps you should resolve to take yourself, your family and your friends to a public observing session. Astronomy is for everyone, and local amateur astronomers are eager to share its wonders with you.

Paul Levesque

PAC ACTIVITIES 2021

As restrictions related to the coronavirus pandemic slowly eased during 2021, the Popular Astronomy Club resumed many of its regular activities and took part in a number of public outreach events. This graph illustrates what PAC did during the year just past; let's stay active throughout 2022!

PUBLIC OUTREACH EVENTS

- ◆ ***Niabi Zoo (April 17 / June 19 / July 17 / August 21 / September 18 / October 16 / November 20)***
- ◆ ***Giant Goose Recreation Area (June 5)***
- ◆ ***Putnam Museum 'Gateway to Space' (June 12-13)***
- ◆ ***Silver Bell Hollow Alpaca Farm (July 31)***
- ◆ ***Christ's Church / Bettendorf (September 17)***
- ◆ ***Cub Scouts / Orion (October 14)***
- ◆ ***Scott County Library / Eldridge (November 1)***
- ◆ ***Girl Scouts / Trinity Lutheran School, Davenport (November 2)***
- ◆ ***American Doll and Toy Museum / Rock Island (November 5)***
- ◆ ***Daisy Girl Scouts / Hoover School, Bettendorf (December 6)***
- ◆ ***Felix Adler Children's Museum / Clinton (December 12)***
- ◆ ***John Deere Middle School (May 18 / June 15 / November 18)***
- ◆ ***PAC Picnic (August 14) / PAC Banquet (October 23)***
- ◆ ***Ten monthly meetings at Butterworth Center / Zoom***

VIA PARTNERSHIP WITH MOLINE SCHOOL DISTRICT

PRESENTATIONS: ASTRO-ARCHEOLOGY, GREEN BANK OBSERVATORY, NASA SOLAR MISSIONS, WEBB SPACE TELESCOPE, ETC.

TOTAL SIZE OF AUDIENCE AT PUBLIC EVENTS:
1,172

ASTRONOMY AND SPACE HISTORY – IT HAPPENED IN JANUARY

January 1, 1925: At a meeting of the American Astronomical Society held in Washington, D.C., astronomer Edwin Hubble announces that he's found conclusive evidence showing that the Andromeda "nebula" is, in fact, a galaxy separate from the Milky Way. Until then, astronomers generally believed that the Milky Way constituted the entire universe. Hubble based his findings on the discovery of Cepheid variables in the Andromeda galaxy and on measurements showing it to be much further away than previously thought. We now know that there are at least 100 billion galaxies in the observable universe, and possibly as many as 200 billion.



January 7, 1610: In Florence, Italy, Galileo Galilei points his improved telescope toward Jupiter and sees three bright "stars" near the planet. Over the following nights, he notices that the "stars" have moved

from one side of Jupiter to the other, and are joined by a fourth "star" that also seems to move about the planet. Galileo's famous observations disrupt astronomy by providing proof positive that the Earth is not the center of the universe, validating Copernicus' theory that the Earth and other planets revolve around the sun. The movement of the four Galilean moons also shows that the laws of planetary motion outlined by Johannes Kepler can be applied throughout the Solar System.

January 14, 2005: The Huygens module separates from the Cassini spacecraft and descends via parachute onto Titan, the largest moon of Saturn. The successful landing was the first ever executed in the outer Solar System and the first landing on a natural satellite outside of Earth's own moon. Huygens returned data from Titan's surface for about 90 minutes, including more than 350 photographs, and provided proof of frozen liquids on the frigid moon.

January 16, 1978: NASA announces the names of 35 astronaut candidates, a group that includes the

first six women chosen for the astronaut program. All six – Shannon Lucid, Margaret Rhea Seddon, Kathryn Sullivan, Judith Resnik, Anna Fisher and Sally Ride – would eventually be launched on at least



one mission aboard the Space Shuttle. Ride became the first American woman in space when she lifted off aboard Challenger on June 18, 1983; at the time, she was also the youngest astronaut ever taken on a mission. Resnick also had the distinction of being America's first Jewish astronaut; on January 28, 1986, she was among those who lost their lives when Challenger exploded and broke apart 73 seconds after it was launched.

January 25, 1958: Dr. Carl H. Gamble, who founded the Popular Astronomy Club in 1936, dies in Moline at the age of 78. Born and raised on a farm in Pennsylvania, Gamble came to Moline at the age of 20 to work for Deere and Company. His interest in astronomy was piqued on a January night during a business trip to Tucson, Arizona, when he went to the roof of his hotel with a coworker and observed the Orion nebula through binoculars. Gamble estimated that he had spoken in public about astronomy more than 1,100 times in his lifetime, to audiences that totaled nearly 82,000 people.

January 26, 1949: "First light" is seen at the Hale Telescope, located at Palomar Observatory in San Diego County, California.

The 200-inch telescope was the world's largest at the time, and was the product of a project that took more than 20 years to complete, often interrupted by shortages of material and labor caused by World War II. The telescope was named for astronomer George Emery Hale, who initiated the effort but died 11 years before the telescope became operational.



MEMBER OBSERVATIONS



Here's a page filled with beautiful astrophotos taken by Byron Davies on December 3, and later on Christmas night at his parents' home in Little York where the skies are dark. Shown are (A) Orion Nebula; (B) Rosette Nebula; (C) Sculptor Galaxy; (D) M74, aka Phantom Galaxy; (E) NGC884 Double Cluster; (F) another view of the Orion Nebula; (G) Eskimo Nebula; (H) M78 Nebula; (I) NGC1491 Nebula; (J) Fish Head Nebula; (K) Westerhout 5, aka Soul Nebula

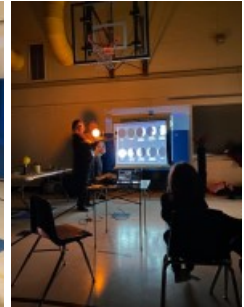
MEMBER OBSERVATIONS & CLUB ACTIVITIES



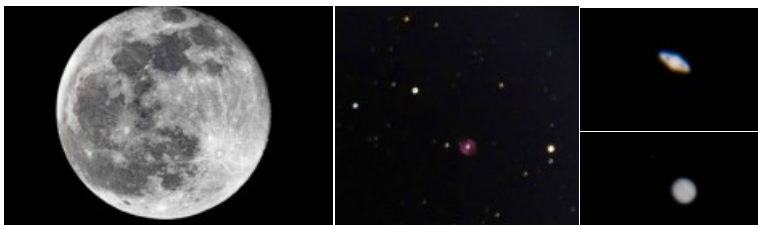
Alan Sheidler and Dave Smith went to the track at Black Hawk College during the wee hours of December 3 and got these photos of Comet Leonard. The photo at right shows the comet just below the M3 globular cluster; both images were taken at ISO 6400 with a 10-second exposure time.



Roy and Jan Gustafson went to Hoover School in Bettendorf on December 8 to make a presentation to a group of Daisy Scouts (that's the level just below Brownies). The kindergarten-age girls looked at the moon and spent two hours learning about astronomy and asking lots of questions, earning a badge as a result.



Roy Gustafson took advantage of clear skies on the night of December 13 and used Stellina to capture these images of the Horsehead Nebula and Orion Nebula.



Byron Davies, Cody Oosting, Steve Sinksen and Alan Sheidler gathered under a full moon at Paul Castle Observatory on December 19; along with the Moon, they took these images of the Bow-Tie (or Scarab) Nebula, Saturn, Jupiter, the M2 globular cluster, and the Cat's-Eye Nebula.



Rusty Case, Dale Hachtel and Alan Sheidler held a daytime observing session on December 12 in Clinton at the Felix Adler Children's Discovery Center. Visitors got a chance to look at the Sun, Moon, Jupiter and Venus, and the scopes captured these images of the Moon and of Venus at crescent phase.



**January
2022**

Imagination and the Astronomical League

"A Dragon Lives forever, but not so girls and boys."

Three-quarters of a century ago, during World War II, the famous Harvard astronomer Harlow Shapley, along with Charles Federer, founding editor of Sky and Telescope magazine, launched an association of astronomy clubs across the United States. This group called the Astronomical League, and it thrives to this day with more than 100 astronomy clubs.

NOTE: The Popular Astronomy Club is one of 22 clubs that are charter members of the Astronomical League.

Unlike the national Royal Astronomical Society of Canada, the Astronomical League is designed to be a more loosely structured organization. According to Carroll Iorg, its current president, one of its most critical and central goals is to inspire the next generation to enjoy the night sky. If that goal should fail, the possibility exists that there may be no astronomy for future generations.

As part of this vital goal, the Junior Astronomical League, a new subset of the Astronomical League, is now meeting every second Sunday over Zoom. But there is something more.

My next book will be devoted to those young stargazers. It actually began as a type-written saga I wrote in 1958 when I was ten years old. Of all the 40-plus books I have written, this is Wendee's favorite.

I am now completing a second edition of this book, in which a small group of children go on a stargazing adventure with Clipper, a

magic beagle, and with Eureka, an enchanted reflector telescope. They go past the Moon and planets, the stars, the distant superclusters of galaxies, and even the great voids in distant empty space.

In its final chapter, this book explores the theme articulated in the last verse of Peter, Paul, and Mary's famous song "Puff the Magic Dragon," which includes the line, "A dragon lives forever, but not so girls and boys."

The children, now grown, go to university. When they complete their college education, the young woman, adept at math and physics, becomes an astronomer, but the young man goes on to become a lawyer. He marries, has children who are now grown themselves, and unhappily gets a divorce.

To recover he decides to take a vacation trip to Arizona. Driving his rented car one evening, he pulls off the road, gets out of his car, and looks at the stars.

As childhood memories flood back, a second car pulls up. The young woman astronomer gets out of her car. The two cannot believe they are reuniting, and they catch up for hours.

Then, there is a break in their conversation. As the couple looks up silently at the stars, the magic beagle, and the telescope, appear and take shape. In that one ultimate celestial adventure, the magic of the night has returned.



Clipper the magic beagle first came on the scene in the 1950s as a bar mitzvah gift; he lives on as a companion to children going on a stargazing adventure.

Hunting the Hunter: Observing Orion

If you are outside on a clear January night, it's hard not to notice one distinctive star pattern above all: Orion!

While we've covered Orion in earlier articles, we've never discussed observing the constellation as a whole. Perhaps you've received a new telescope, camera, or binoculars, and are eager to test them out. Orion, being large, prominent, and full of interesting, bright objects, is a perfect constellation to test new equipment and practice observing skills – for beginners and seasoned stargazers alike.

In Greek mythology, Orion is a strong hunter, with numerous legends about his adventures. Being such a striking group of stars, cultures from all around the world have many myths about this star pattern. There are so many that we can't list them all here, but you can find a wonderful interactive chart detailing many cultures' legends on the "Figures in the Sky" website at <https://figuresinthesky.visualcinnamon.com/>.

What sights can you see in Orion? Look above the variable orange-red supergiant "shoulder star" Betelgeuse to find the stars making up Orion's "club," then move across from Betelgeuse towards the bright star Bellatrix (Orion's other "shoulder") and the stars of his bow and arrow – both essential tools for the Hunter.

Many interesting sights lie near Orion's "belt" and "sword." Orion's belt is made up of three bright giant stars forming an evenly spaced line: Alnitak, Alnilam and Mintaka.

Move from the belt stars towards the stars Rigel and Saiph (Orion's "feet" or "knees") to arrive at Orion's distinctive sword, parts of which may appear fuzzy to your unaided eyes. Binoculars reveal that fuzz to be the famed Orion Nebula (M42), perched right next to the star Hatysa.

Diving in deeper with a telescope will show star clusters and more cloud detail around the Orion Nebula, and additional magnification brings out further detail inside the nebula itself, including the "baby stars" of the Trapezium and the next-door neighbor nebula M43.

Want to dive deeper? Dark skies and a telescope will help to bring out M78, the Flame



Orion can now be found in the southeast sky, and this map shows where its major stars and some deep-sky objects are located.

Nebula (NGC 2024), along with many star clusters and traces of dark nebulas throughout the constellation. Very careful observers under dark, clear skies may be able to spot the dark nebula known as the Horsehead, tracing an equine outline below both the belt and the Flame Nebula. Warning: the Horsehead can be a difficult challenge for many stargazers, but very rewarding.

Northern Hemisphere observers can find Orion during January evenings in the east/southeast skies. Can you spot the Orion nebula with your naked eye, in Orion's sword? How does it look via binoculars or a telescope? What other details can you discern?

Please note that some deep sky objects aren't discussed here for clarity's sake. For example, M43, a nebula located directly above M42 and separated by a dark dust lane, is not shown. Orion's belt and sword are crowded, since they are star-forming regions.

This is just a taste of the riches found within

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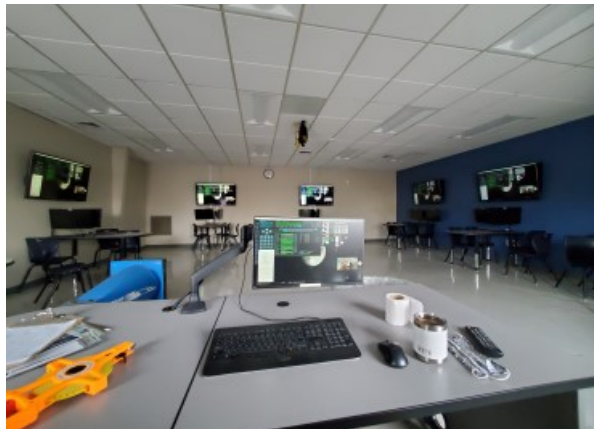
Wilton Observatory plans public viewing night

A public viewing night has been scheduled for the new observatory located on the grounds of Wilton Junior-Senior High School in Wilton, Iowa.

The free event, which will serve as a public debut for the observatory, is scheduled for Saturday, January 8, beginning at sunset.

Members of the Popular Astronomy Club, Quad Cities Astronomical Society and Cedar Amateur Astronomers are invited to bring their telescopes and equipment to support the public viewing night. Those who can attend, or who have more questions, should contact Jeff Struve at pwrhsepro@aol.com.

The Wilton Observatory is one of the more modern and advanced found at any school



The STEM Room at Wilton School; the observatory can be controlled from here and remotely.

and can be operated via remote control, allowing users to program and use it from home at any time.

Observing Orion in winter

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Orion's star fields and dust clouds; you can study Orion for a lifetime and never feel done with your observations. To be fair, that applies for the sky as a whole, but Orion has a special place for many. New telescopes often focus on one of Orion's treasures for their first test images. You can discover more of NASA's research into Orion's stars – as well as the rest of the cosmos – online at nasa.gov.

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



The inset image is the "first light" photo from the Zwicky Transient Facility, a large survey telescope designed to detect "transient objects" like comets, supernovae, gamma ray bursts, and asteroids.

Free 'Introduction to Amateur Astronomy' course offered

The Kalamazoo (Michigan) Astronomical Society is offering a free online "Introduction to Amateur Astronomy" course beginning this month.

The course consists of five two-hour sessions conducted via Zoom on Saturday afternoons beginning at noon Central time. Dates of the sessions will be January 15 and 29, Feb-

ruary 12 and 26, and March 12.

The topics covered will include the use of telescopes and binoculars, astrophotography, and overviews of the night sky and the Earth's place in the universe.

To register for the course, visit the KAS website at <https://www.kasonline.org/amastro.html>.

Meeting will feature presentation on Mars rover

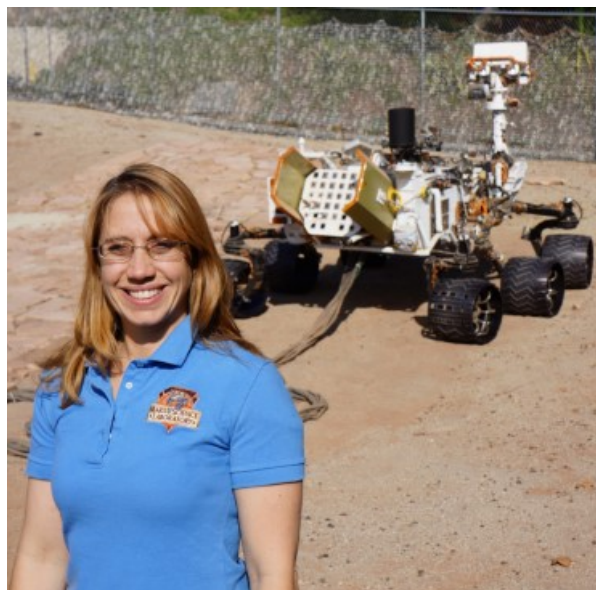
The next monthly meeting of the Popular Astronomy Club will feature a virtual presentation on a vehicle currently traversing the surface of Mars that's searching for evidence of past – and present – life on the red planet.

The presentation is titled "Wheeltracks on Mars: Exploring Mars' Habitable Past with the Curiosity Rover." The presenter will be Dr. Rebecca M.E. "Becky" Williams, a senior scientist at the Planetary Science Institute and participating scientist in experiments being conducted by the Curiosity rover.

Since landing on Mars in August 2012, Curiosity has roved around the diverse terrain of the Gale crater, drilling into the Martian surface more than 30 times and sending back reams of data and hundreds of photographs. The scientific goals of the Rover mission include searching for and identifying compounds and chemicals that make up the building blocks of life, and identifying features that may represent the effects of biological processes.

Dr. Williams' research has focused on understanding the role that water may have played in shaping the surface of Mars through comparison with similar landforms on Earth. In pursuit of this research, she has led field work at sites in California, Utah and Australia, as well as the Atacama Desert in Chile, the Earth's driest nonpolar desert.

During her presentation, Dr. Williams will provide an update on the latest scientific findings derived from the Curiosity mission and



Dr. Rebecca M.E. "Becky" Williams is shown with the Curiosity rover before its August launch; the rover is now on the Martian surface.

share some photos taken by the rover. She will also provide an overview of the mission being carried out by Perseverance, a rover that landed in Mars' Jerezo crater in February 2021.

Dr. Williams earned her doctorate in planetary science from Washington University in St. Louis, Missouri, in 2000. Since 2006, she has conducted her work from Wisconsin, where she lives near Madison in Waunakee with her husband, Scott, and their two daughters.

The presentation will take place at the PAC meeting scheduled for 7 p.m. on January 10 at Moline's Butterworth Center, and live via Zoom.

Starlink satellites everywhere

There are now more than 1,600 Starlink satellites in low-earth orbit, and that number continues to grow; Wayland Bauer captured this photo of a few of them at Paul Castle Observatory on December 3. Professional and amateur astronomers have complained about the negative impact of the satellites on their observations.



UPCOMING EVENTS



Date: January 10, 2022

Event: Regular Meeting @ 7 p.m.

- **Location: Zoom / Butterworth Center**

Program : Wheeltracks on Mars: Exploring Mars' Habitable Past with the Curiosity Rover

Presented by Dr. Rebecca M.E. 'Becky' Williams

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

MONTH	NEWSPAPER ARTICLES	MEMBER PRESENTATION	MEETING / PROGRAM
FEB 2022	Wayland Bauer	AVAILABLE	February 14 - Presentation: "Seeing Stars: How Birds Use the Night Sky During Migration" by Dr. Jennifer C. Owen, Corey Marsh Ecological Research Center, Michigan State University
MAR 2022	AVAILABLE	AVAILABLE	March 14 - Business Meeting; Smorgasbord of Member Presentations
APR 2022	AVAILABLE	AVAILABLE	April 11 - Presentation: "Fantastic Space Discoveries: Theories of Solar System Formation" by Jim Kovac, Chicago Society for Space Studies
MAY 2022	AVAILABLE	AVAILABLE	May 9 - Presentation: "Technology for the Astronomical Community & More" by Matt Dieterich, Technical Services Manager, PlaneWave Instruments, Inc., Adrian, Michigan
JUNE 2022	AVAILABLE	AVAILABLE	June 13 - Presentation: "Sky With Ocean Joined: Scaling the Stars at the U.S. Naval Observatory, 1830 to the Present" by Geoff Chester, Public Affairs Officer, U.S. Naval Observatory, Washington D.C.
JULY 2022	AVAILABLE	AVAILABLE	July 11 - Presentation: "OSIRIS-REx Mission Update" by Dolores Hill, Senior Research Specialist, Lunar & Planetary Laboratory, University of Arizona, Tucson, Arizona

UPCOMING EVENTS

- **January 8:** Public viewing night at Wilton Observatory (*see page 13*)
- **NIABI PUBLIC VIEWING:** Third Saturday of the month, beginning March 19
- **May 7:** Astronomy Day: Bettendorf High School / Menke Observatory
- **May 13-14:** NCRAL Convention, Port Washington, Wisconsin
- **August 13:** Annual PAC Picnic (*no regular meeting*)
- **September 23-24:** Eastern Iowa Star Party
- **October 22:** Annual PAC Banquet (*no regular meeting*)

Astronomical League Observing Programs

The Astronomical League offers more than 70 different observing programs, ranging alphabetically from "Active Galactic Nuclei" to "Youth Astronomer." You can earn certificates and pins for completing the programs. Click [here](#) to find an alphabetical list of observing programs.

