



## A total success

### ***PAC partial solar eclipse public observing draws large crowd***

***April showers bring May flowers, but rain and clouds would have been particularly unwelcome on April 8, the date that a solar eclipse passed over a well-populated portion of the United States, as well as Mexico and Canada.***

***Fortunately, the sky was blue and clouds were few and far between on April 8 in the Quad Cities. In fact, the weather was generally favorable in most areas that were in the path of totality.***

***The solar eclipse was not total in this area, but Quad Citians were able to observe a partial eclipse which, at its peak at about 2 p.m., saw about 90 percent of the Sun occluded by the Moon's shadow.***

***It truly was a spectacular celestial show, and it gave the Popular Astronomy Club a chance to shine while the sunshine was diminished. PAC set up a public observing session during the partial solar eclipse at Moline Public Library, like the club did during a similar eclipse on August 21, 2017.***

***Just as in 2017, a large and enthusiastic crowd turned out for the session. The number of attendees was estimated at more than 500.***

***Members of the public got to observe the partial eclipse through ten telescopes equipped with solar filters set up by PAC members; the PACMO was also available for solar observing.***

***All in all, the partial eclipse proved to be a total success for PAC. Thanks to these members who were on the scene at the library: Rusty Case, Pam Kollar, Eva Davison, Dan Cusack, Rolando Gamino, Wayland and Anne Bauer, Al and Sara Sheidler, Mike and Madeline Morrell, John Douglas, and Dale Hachtel.***

***Meanwhile, some PAC members and others from the community traveled to the path of totality to observe the total eclipse in all its glory. Look inside this issue of Reflections for their photos and observations. ✈***



#### LOOKING INSIDE



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The Popular Astronomy Club of the Quad Cities – 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](http://www.popularastronomyclub.org), or find us on Facebook at [www.facebook.com/QCPAC](http://www.facebook.com/QCPAC). To contact PAC, send an email to [popularastronomyclub@gmail.com](mailto:popularastronomyclub@gmail.com).

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**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](mailto: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](http://popularastronomyclub.org/news-letters).*

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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](http://www.astroleague.org) and the NCRAL website at [ncral.wordpress.com](http://ncral.wordpress.com)



Dale Hachtel

## REFLECTIONS FROM THE PRESIDENT

We had a successful solar eclipse observing session at the Moline Public Library on April 8, with about 500 visitors viewing the eclipse. We are continuing to receive additional requests for our observing sessions and will have a full schedule this year of providing observing sessions to the public through other host organizations, in addition to our Niabi Zoo observing nights.

Another significant event in April was providing a library telescope to the Western District Library in Orion. This donation by our club will result in benefits to library patrons, by providing them with a telescope available to borrow; to the library, by enabling them to provide additional services to their community; and to PAC, by reaching more potential amateur astronomers.

PAC will provide ongoing training, maintenance and repair of the library scope as needed. We are considering the continuation of this activity with additional libraries in the Quad Cities area.

A major benefit of PAC membership is the ability of members to borrow club equipment use for observing. The variety of equipment available allows members access to telescopes of the type they may be considering buying for themselves. Members can also use scopes with extra capability to complete activities such as the Messier marathons, or to just to have fun with learning and observing new things.

We are having a "Telescope Swap Day" on May 5 where members can see most of the club equipment at one time, as described elsewhere in this newsletter.

We have several opportunities this summer to learn more and meet with other amateur astronomers at the conventions of the Astronomical League.

For the North Central Region, the NCRAL 2024 convention in De Pere Wisconsin, near Green Bay, is coming up on May 17 and 18. More information can be found at [ncral.wordpress.com/conventions](http://ncral.wordpress.com/conventions).

In the Mid States Region, the MSRAL convention will be on June 7-9, at Eugene Mahoney State Park, near Omaha, Nebraska. More information can be found at [msral2024.org](http://msral2024.org).

For the Astronomical League as a whole, ALCON will be July 17-21 in Overland Park, Missouri, near Kansas City. More information can be found at [alcon2024.astroleague.org](http://alcon2024.astroleague.org).

Our May meeting will feature Dave Weinrich presenting "Keep Looking Up - One Sky, One World."

It's time for the 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.

All donations are increased by at least 5% by the Birdies organization. The tournament will be July 1-7 this year, and the deadline to guess the number of birdies in the tournament with your donation is June 26.

Donations only, without the birdies guess, can still be made until the tournament date. Donate online at [birdiesforcharity.com](http://birdiesforcharity.com), using Bird Number 2046 for the Popular Astronomy Club.

Keep looking up! 



**The Mid States Region of the Astronomical League will celebrate its 75th anniversary at the upcoming MSRAL convention.**

## SUMMARY OF PAC APRIL MEETING

The Popular Astronomy Club held a general membership meeting at the Butterworth Center in Moline on April 8 at 7 p.m.

The meeting was attended in person by 18 PAC members and guests, with another six joining the meeting via Zoom.

After calling the meeting to order, PAC President Dale Hachtel introduced Robert Gregory, Astronomy Professor at Scott Community College, who joined the meeting in person.

Professor Gregory's presentation was titled "Solar Flares and Neptune's Chemistry," and was based on a recent study showing that the solar cycle apparently impacts the formation of clouds on Neptune.

"I found this conclusion to be immediately odd," Professor Gregory said. He pointed out that Neptune is the most distant planet in our Solar System and receives a tiny fraction – approximately 0.1% – of the sunlight received by Earth. Because of its vast distance, it takes Neptune about 165 Earth years to complete one orbit around the Sun.

Nevertheless, peaks in solar activity such as the formation of solar flares apparently do correlate with the formation of clouds on Neptune. This correlation is based on data collected by the Hubble Space Telescope and by the Keck Observatory in Hawaii and the Lick Observatory in California.

Solar flares send out bursts of ultraviolet radiation, Professor Gregory said, and this could lead to changes in the chemistry of Neptune's atmosphere, which consists largely of methane. The atmosphere may become more volatile due to the formation of free radicals, i.e. molecules with at least one unpaired electron.

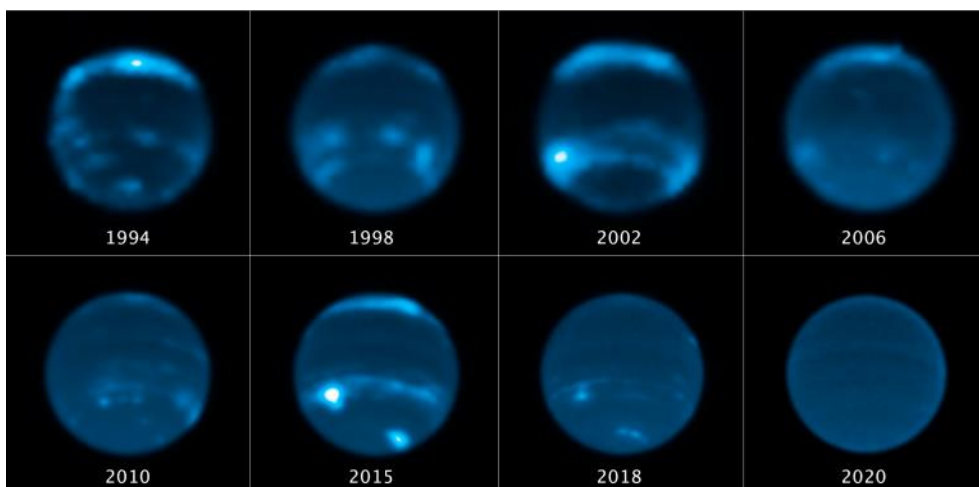
Professor Gregory demonstrated this volatility with a video of the "whoosh bottle" experiment, which shows how a tiny amount of alcohol vapor in the glass jug can lead to a violent reaction.

There is a two-year time lag between the time the ultraviolet radiation reaches Neptune and the time that it impacts cloud formation, and Professor Gregory said it is believed that this is the period of time it takes for chemical changes in the planet's lower atmosphere to rise upward and affect clouds at the top of the atmosphere.

Professor Gregory noted that the data for the study were collected over 30 years, which seems like a long time but in fact represents less than one quarter of Neptune's total orbit. He concluded that more studies will be needed to conclusively prove the correlation between solar activity and the formation of clouds on Neptune.

Dale then presented member observations, all of which involved that day's solar eclipse. Dale showed photos taken during the eclipse at Moline Public Library, where PAC set up a public observing session.

Al Sheidler noted that, although the eclipse was not total in the Quad Cities, nearly 90 percent of the Sun was covered by the Moon's shadow, so observers at the library could certainly notice a dimming of the sunlight and a drop in the air temperature.



***These images taken by the Hubble Space Telescope between 1994 and 2020 show how cloud formations on Neptune have changed; the changes may be related to solar activity, despite Neptune's vast distance from the Sun.***

## 'One Sky, One World' is theme of May meeting

"One Sky, One World" will be the theme of a presentation at the May membership meeting of the Popular Astronomy Club. The meeting on May 13 will be held at Moline's Butterworth Center and streamed live via Zoom.

The in-person presentation will be led by Dave Weinrich, who served as an astronomy instructor and planetarium director at Minnesota State University at Moorhead for 31 years until his recent retirement. He is an active member of the International Planetarium Society and once served as president of IPS.

A native of Wabasha, Minnesota, Dave states that he "fell in love with the universe" in his teenage years, igniting a lifelong interest in astronomy. Dave began traveling the world while teaching science in Iowa and later spent four years in the Peace Corps, serving in Liberia and Ghana.

Dave currently resides in Nelson, Wisconsin, but considers himself a "citizen of the world," having traveled to more than 50 countries and spreading his love of astronomy along the way.

Dave summarizes his viewpoint as follows: "We are connected to the stars in a very literal sense when we look at the night sky. We sense something bigger than ourselves and gain new perspectives of the cosmos, the Earth and each other." ✈



**DAVE WEINRICH**

## April meeting

*Continued from Page 4*

Also displayed were some photos taken by Roy Gustafson, who traveled to Texas to see the total eclipse, and Michael Haney, who flew down to Mount Vernon in southern Illinois with some friends to observe totality.

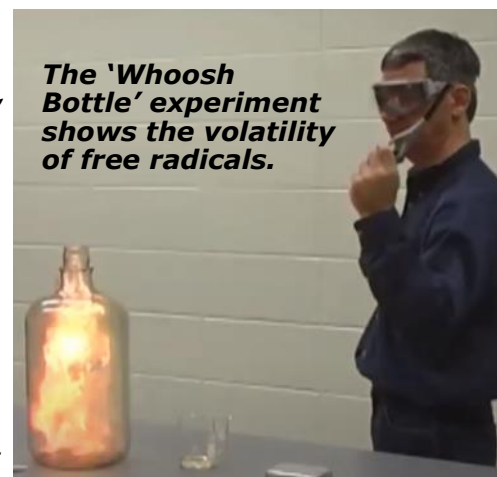
Michael reported that, as totality neared, the runway lights at the Mount Vernon Airport came on and the shadow cast by the Moon could be seen approaching from the southwest. Flares and prominences from the Sun could be viewed when the eclipse became total, and a "diamond ring" effect that appeared at the end of the eclipse drew gasps from the crowd gathered at the airport. He described it as "quite the experience" and something that cannot be described in words.

Dale concluded the meeting with a review of upcoming public outreach observing sessions and events, including conventions that will be held by organizations such as the Astronomical League. He again encouraged those who haven't renewed their memberships to do so soon, and asked for input for the monthly "Skywatch" column that appears in the local newspapers.

The meeting adjourned at 8:35 p.m. A recording of the meeting is available on YouTube via the following link:

<https://www.youtube.com/watch?v=ophwO1lwluE>.

The next membership meeting is scheduled for May 13 at 7 p.m. at the Butterworth Center and via Zoom. ✈



**The 'Whoosh Bottle' experiment shows the volatility of free radicals.**

## Scopes for sale

**PAC member Rolando Gamino has two refractor telescopes for sale; an Astro Tech AT115 EDT triplet (right) and an Astro Tech AT130 EDT. For details, contact Rolando at: [rolandogamino@sbcglobal.net](mailto:rolandogamino@sbcglobal.net).**



# PAC presents telescope to Orion library

The Popular Astronomy Club has donated a telescope to the Western District Library in Orion.

PAC President Dale Hachtel formally presented the telescope during a meeting of the library board on April 22. Also attending the presentation were PAC members Al Sheidler and Roy and Jan Gustafson, who reside in Orion.

The telescope, coincidentally made by Orion Telescopes and Binoculars, is a 4.5-inch "StarBlast" reflector. The compact "grab and go" design of the telescope makes it portable and easy to use for novice and intermediate level amateur astronomers, but still powerful and versatile enough to observe a full range of celestial objects.

The donated telescope can now be borrowed by library patrons, expanding the range of services offered by the Western District Library.

PAC was awarded the telescope last year during the annual convention of the Astronomical League. This is the second library telescope awarded to PAC by the Astronomical League; the other telescope was given to the Eldridge Branch of the Scott County Library, where it has proven popular among patrons.

Before donating these telescopes, PAC inspected them and performed some minor modifications to make them easier to use. User manuals in plain language accompany the telescopes. PAC maintains and repairs the telescopes as needed and provides other support when requested.

Library telescopes are an excellent way to make astronomy more accessible, so PAC may expand its library telescope program in the future. 🦋



**Jeanine McGaughy, Vice President of the Western District Library Board (above, left) peers through the donated telescope; PAC President Dale Hachtel and PAC members and library board members pose with the telescope.**

**In the early evening on May 13, try this challenge:**

**View to the west on May 13 90 minutes after sunset**

**View through binoculars**

**Crescent moon meets the Beehive**

On the evening of May 13, the crescent moon floats right of M44, the Beehive star cluster. Look in the west 90 minutes after sunset.

Be sure to use binoculars to spot the many stellar bees of M44. The cluster has over 1000 stars, but only two dozen will be picked out with binoculars.

Even though they lie near each other in binoculars, they are nowhere near each other in three-dimensional space. M44 is 150 million times farther than the moon!

It has taken the light from M44's stars over 600 years to reach your eyes!

**T Coronae Borealis**  
*A nova waiting to happen – soon!*  
 also known as HIP 78322 and the 'Blaze Star'

**How to find T Coronae Borealis**

- Locate bright Arcturus and the kite shaped constellation Boötes.
- Corona Borealis lies directly east of Boötes.
- Trace the semi-circle of the stars of the crown.
- Epsilon and Delta are fourth magnitude stars shining east of Alpha (Gemma), the brightest member of the crown.
- Place Epsilon in the northern half of the binocular (or finder) field. Fifth magnitude Pi Serpentis lies near the bottom of the field.
- T Coronae Borealis is about 1/4 the distance between Epsilon and Pi.
- Move two low power eyepiece fields south of Epsilon.
- Then move 1/2 low power eyepiece field east.
- This is the vicinity of 10th magnitude T CrB.

**Stellar Magnitude**

- 3
- 4
- 5
- 6
- 7
- 8
- <8.5

**Between now and September, T CrB is predicted to nova, quickly reaching 2nd magnitude and rivaling the brightness of Alpha CrB (Gemma).**

- Its brightness rise will take one day or less.
- It will likely remain near maximum brightness (2nd mag.) for only a few days.

• The star normally is magnitude 10.3.  
 • Ten years before its outburst, it rises to magnitude 9.8. It did this 10 years ago.  
 • It then dims to about magnitude 12 one year before outburst. It did this in April 2023.

© 2024 Astronomical League T CrB: Blaze Star

## May 5 is 'Telescope Swap Day'

**Equipment available to PAC members will be displayed**

Do you need a telescope or other astronomical equipment to view the night sky? Would you like to use and evaluate a different type of scope before investing in one yourself? If you're a PAC member, you may borrow a scope and see what's available for loan on Sunday, May 5.

That's the date of event we're calling "Telescope Swap Day," which will be held from 2 to 4 p.m. in the parking lot of the American Doll and Toy Museum at 3059 30th Street in Rock Island.

PAC has seven large telescopes, one medium sized telescope, two smaller scopes (good for children or casual use), and a pair of binoculars. There is no charge to borrow this equipment as long as you are a member in good standing.

You may use these loaned telescopes for as long as you wish. You will be asked to fill out a sign-out form when you borrow a scope or other equipment. Members borrowing a portable scope would be encouraged, but not required, to bring it to public outreach sessions to share its capability with visitors.

We've had many donations of telescopes over the years, and it's time to start sharing them with our members. Also, if you have equipment to share or donate, bring it to the swap day! Someone else may find a use for these items.

I will set up pop-up covers and tables for the telescopes. There are restrooms - if needed - and soft drinks offered.

A catalogue of the equipment available for loan can be found via links on the "Documents" page of the PAC website, both as a PDF file and a longer list in Excel format:

[www.popularastronomyclub.org/club-documents](http://www.popularastronomyclub.org/club-documents).

See you there, and keep looking up! 🔭



**These telescopes are among the items that can be borrowed by PAC members.**



Dino Milani

## Wisconsin Observers Weekend offers discount

The annual Wisconsin Observers Weekend will take place June 6-9 at Hartman Creek State Park, located in a dark sky site near Waupaca in central Wisconsin about 35 miles northwest of Oshkosh.

For the first time this year, members of clubs affiliated with the North Central Region of the Astronomical League - including PAC members - who'd like to attend this star party are being offered a discounted registration fee. PAC members can register for \$25 per individual and \$35 per couple.

"WOW" is sponsored by the Northeast Wisconsin Stargazers. Along with observing, the event features an ice cream social and door prizes. Visitors to Hartman Creek State Park can enjoy hiking and cycling on ten miles of trails - including a segment of the Ice Age Trail - along with fishing, swimming and canoeing on Hartman Lake.

Five group campsites are set aside for WOW; space is limited, so those planning to use these campsites should register soon. Lodging, dining and other amenities are available in Waupaca.

To register, and for more information on Wisconsin Observers Weekend, go to this website:

[Wisconsin Observers Weekend](http://Wisconsin Observers Weekend). 🔭



# MORE ECLIPSE PHOTOS FROM THE MOLINE PUBLIC LIBRARY







# SOLAR ECLIPSE 2024



**Students and staff at John Deere Middle School in Moline were able to get out and observe the eclipse, thanks to eclipse glasses provided by PAC under its partnership with the Moline School District.**



**Moline resident John Kustes sent these photos of the total eclipse which he took at Beaver Creek, located southeast of Mason, Texas.**



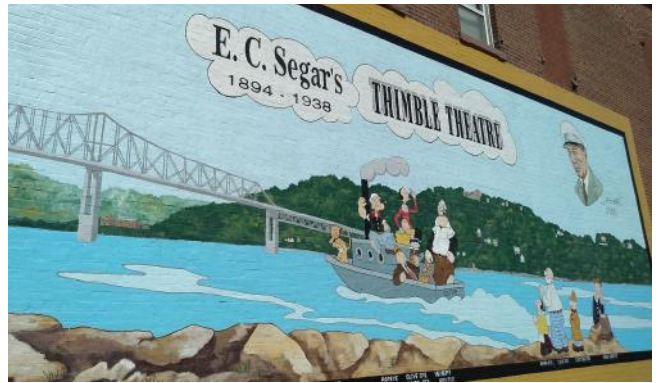
**Seth Freeman, who was visiting the Quad Cities from West Virginia, attached his camera to one of the telescopes at the Moline Library; the result was these beautiful images.**





# SOLAR ECLIPSE 2024

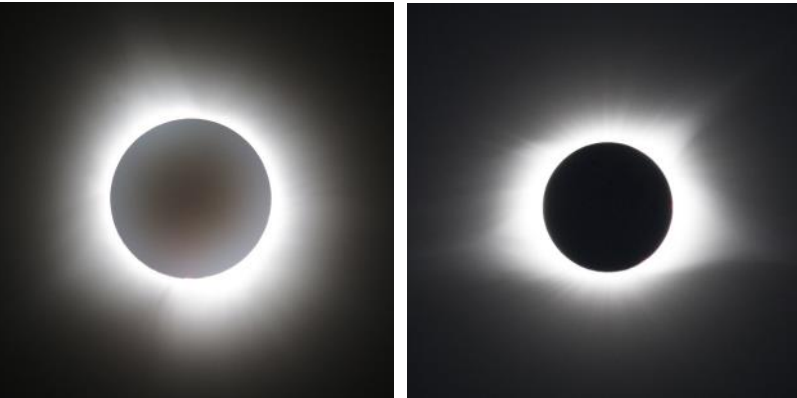
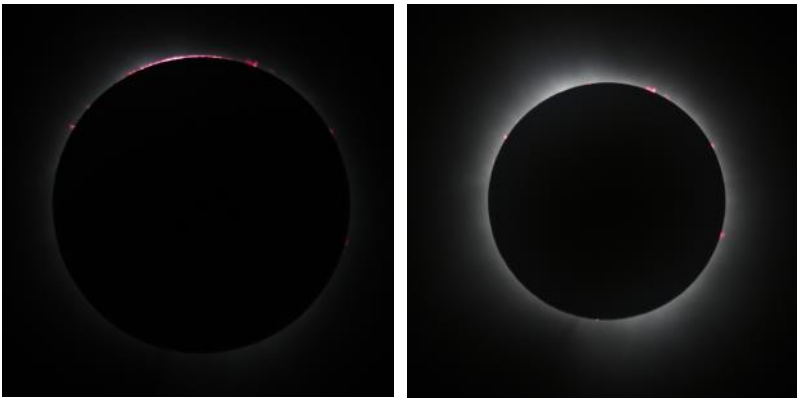
**Dino Milani and Ellen Tsagaris were among the hundreds of thousands who flocked to Southern Illinois to view the total solar eclipse. After spending the night in Waterloo, they drove through heavy traffic to Chester, famed as the hometown of Elzie Segar, creator of Popeye the Sailor Man. They set up a tent and two telescopes in Cole Park, among food, refreshment, t-shirt and beer vendors, and report that about 250 people peered through their scopes. After being interview by a St. Louis TV reporter, they captured images of the eclipse.**



**Joined by some friends, Michael Haney flew down to Mount Vernon Outland Airport in Mount Vernon, Illinois, and gathered with a crowd of people awestruck by the approach of totality and a beautiful view of an eclipsed Sun. Mike said he made a 'feeble attempt' to capture some eclipse images; actually, we think they're pretty good!**



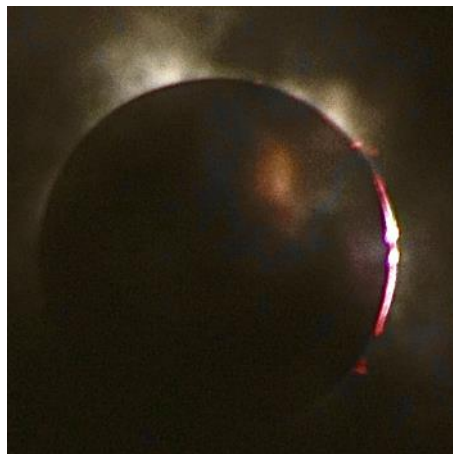
# SOLAR ECLIPSE 2024



**After watching the weather report, Mike and Wanda Gacioch crossed their fingers and headed south to Mount Vernon, Illinois. They set up shop at a rest area east of town and proceeded to take these photos of totality. Mike reports using Canon 7D-II with 100-400 zoom set at 400mm, f/8 and various ISO and shutter speeds.**



**As part of its pre-eclipse public outreach, PAC distributed hundreds of certified eclipse glasses for free to various groups. Team members at the Planning Center in downtown Moline were among those who used the eclipse glasses to observe one of nature's greatest wonders.**



**Roy and Jan Gustafson traveled down to Harper, Texas, a small town in a remote area northwest of San Antonio. It was cloudy and breezy but the skies cleared long enough to enable them to capture these images, taken during a period of totality that lasted more than four minutes.**

# Stargazing for beginners

## *Some pointers for new (and old) amateur astronomers*

Millions were able to experience the solar eclipse on April 8, inspiring folks to become amateur astronomers – hooray! Now that you’ve been “bitten by the bug” and decided to join your local astronomy club, here are some stargazing tips.

### **The Bortle Scale**

Before you can stargaze, you’ll want to find a site with dark skies. To do so, it’s helpful learn what your Bortle Scale is.

The Bortle Scale is a numeric scale from 1 to 9, with 1 being the darkest and 9 being extremely light polluted, thus rating your night sky’s darkness. For example, Times Square in New York City would be a Bortle 9, whereas Cherry Springs State Park in Pennsylvania – rated as perhaps the best site in the eastern U.S. for stargazing – is a Bortle 2.

Determining the Bortle Scale of your night sky will help narrow down what you can expect to see after sunset. Of course, other factors such as weather (i.e. clouds) will impact “seeing” conditions, so plan ahead. Find Bortle ratings near you at this website: [www.lightpollutionmap.info](http://www.lightpollutionmap.info).

### **No Equipment? No Problem!**

There’s plenty to see with your eyes alone. Get familiar with the night sky by studying star maps in books, or with a planisphere. These are great to begin identifying the overall shapes of constellations, and what is visible during various months.

Interactive sky maps, such as Stellarium Web, work well with mobile and desktop browsers, and are also great for learning the constellations in your hemisphere. There are also several astronomy apps on the market today that work with the GPS of your smartphone to give an accurate map of the night sky.

Keep track of Moon phases. Both the interactive sky maps and apps will also let you know when planets and our Moon are out. This is especially important because, if you are trying to look for bright deep sky objects, like the Andromeda Galaxy or the Perseus Double Cluster, you want to avoid the Moon as much as possible.

Moonlight in a dark sky area will be as bright as a streetlight, so plan accordingly. And if the Moon is out, check out this Skywatcher’s Guide to the Moon: [MoonHandout](#).

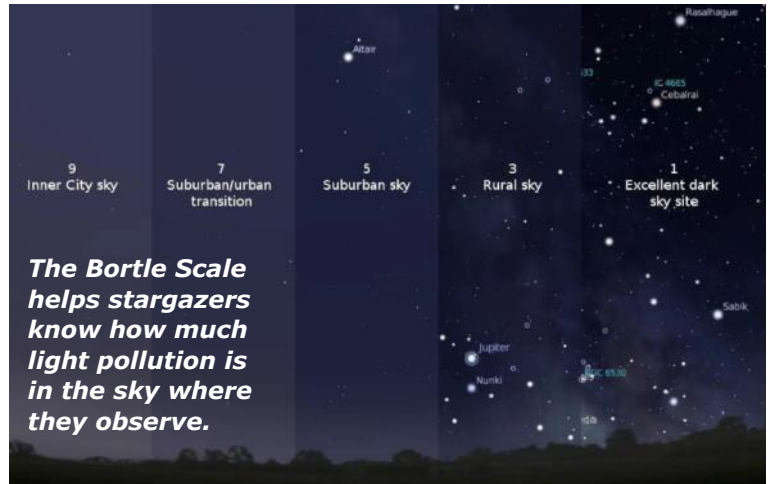
### **Put On That Red Light**

If you’re looking at your phone, you won’t be able to see as much. Our eyes take approximately 30 minutes to get dark sky adapted, and a bright light can ruin our night vision temporarily.

The easiest way to stay dark sky adapted is to avoid any bright lights, from car headlights, your smartphone, or any other source. To avoid this while still lighting your way, use red lights, such as a red flashlight or headlamp.

This helps because while white light constricts the pupils of your eyes, making it hard to see in the dark, red light allows your pupils to stay dilated for longer. Most smartphones come with adaptability shortcuts that allow you to make your screen red, but if you don’t have that feature, use red cellophane on your screen and flashlight.

Binoculars can sometimes be the best starter telescope; find out why by checking out the Night Sky Network’s upcoming mid-month article through NASA's website. 🦋



INTERNATIONAL DARK SKY ASSOCIATION

**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](http://nightsky.jpl.nasa.gov) to learn more.*

## Use the Big Dipper to navigate the May night sky

May will be a month of transition in the sky. The evening planets will be gone, and it will be late summer before any return. The only planets visible during May will be Saturn and Mars, which will be crawling up and out of the predawn glow.

The bright stars of winter also will be leaving the sky, although the more northerly Castor and Pollux in Gemini (the Twins) and Capella in Auriga (the Charioteer) will stay low in the western sky until June.

The constellations of winter have been replaced by the constellations of spring, most notably Leo (the Lion) and Bootes (the Herdsman). In addition, the unmistakable Big Dipper, made up of the brightest stars in Ursa Major (the Great Bear), will be upside down, high in the northern sky.

In this lofty position, the Big Dipper can be used to help find the constellations of spring, which are generally not as bright as the winter constellations. Once the Big Dipper has been located, use its two end bowl stars to point from the open part of the bowl down to the moderately bright star Polaris, the North Star.

Once Polaris is found, you will know that you are facing north, and this will help you navigate the rest of the sky. Polaris is also the end of the tail of dim Ursa Minor (the Little Bear), which extends eastward during May evenings.

Once you are oriented, use the Big Dipper's two pointer stars and point in the opposite direction from the North Star to find the bright star Regulus, shining high in the southern sky in Leo (the Lion). Next, extend the curve of the Big Dipper's handle to "arc" to the bright star Arcturus in the kite-shaped Bootes, which extends generally northward

Then, "speed on" to the bright star Spica in the otherwise dim and hard to trace constellation Virgo (the Maiden). Just beyond Spica are four moderately bright stars that form the unequal sided, box-like figure of Corvus (the Crow).

You also can use the stars of the open, top part of the Big Dipper's bowl to point in the direction away from the handle (northwestward during May) to find the bright star Capella in the five-sided Auriga (the Charioteer). Finally, use the star at the base of the Big Dipper's handle to point diagonally past the star at the bottom front of the bowl to Castor and Pollux, the bright twin stars of Gemini. They will also be southeast of Capella. Look soon after dark before they set.

On May 11, we will celebrate both the Black Hawk Astronomy Club's first star party of the year and the 75th anniversary of President Truman's signing the law that established a rocket proving ground at Cape Canaveral, Florida. The first rocket launch took place the next year on June 24, 1950. Thousands of launches have followed, including the Apollo missions to the Moon and 135 space shuttle missions.

Some observing highlights for May:

**May 3:** Early risers will see the Moon to the right of Saturn. By the morning of the 4th, it will be between Saturn and Mars to the lower left. The Moon will be to the lower left of Mars on the 5th. Look in the eastern sky about 45 minutes before sunrise.

**May 11:** Star Party sponsored by Grout Museum and Black Hawk Astronomy Club at Prairie Grove Park in Waterloo, starting at 9 p.m. Free and open to the public.

**May 12:** The Moon will line up to the left of the bright twin stars of Gemini. Slightly brighter



COURTESY OF STELLARIUM

**A view of the Northern Hemisphere night sky in mid-May.**

# Clouds can't obscure a dramatic solar eclipse

This is a story, not a report on observations.

On April 8, a total eclipse of the Sun tracked across Mexico, the United States, and Canada. Most of the United States enjoyed clear weather, and most of Canada did too.

We were in Texas. We did not have clear weather.

Admittedly, we knew we might be in for bad luck a week out. But when my friends, David and Pam Rossetter, came by Friday morning at 5:45 a.m., we knew we would be in for quite an adventure.

We arrived at the home in which we planned to stay early Friday evening. Dena McClung, former president of the Denver Astronomical Society, was an important part of our group. It appeared that the house had been vacant for months or years.

Although we decided to grin, bear it, and make do, by the next afternoon Scott Roberts, our host, had put us up in a wonderful hotel.

The afternoon before the eclipse, a new report predicted clearing during the eclipse. We were heartened, but that prediction was wrong.

Eclipse day dawned cloudy with drizzle. We arrived at the Explore Scientific site near Leakey, Texas.

We did see the Sun for a few seconds now and then. The eclipse began right on time – to the second, even though it may first have been predicted by astrologers in ancient Greece.

I remembered how happy my Dad was when the 1963 eclipse began the same way. We did get several brief views of the incoming partial. But as the Moon advanced inexorably, the clouds thickened. As totality neared, it became pretty obvious we would miss the total phase.

About ten minutes before the total phase began, someone in our group asked me to share a poem at the start of totality. The one I had in mind was Ross's speech after Macbeth murders King Duncan:

*By th' clock 'tis day,  
And yet dark night strangles the travelling lamp.  
Is 't night's predominance, or the day's shame  
That darkness does the face of Earth entomb  
When living light should kiss it?*

Short and sweet, and so Shakespeare. But two minutes before the onset of the total eclipse, I thought of Wendee's favorite passage: The closing lines of the poem "The Song of Honour" by Ralph Hodgson. I suddenly missed Wendee more than I can write.

During the 2017 eclipse, my wife opined that she hoped still to be alive to see this one. I understood that I would have to appreciate this eclipse for both of us. The idea of her not being here, at this moment, hit me like a clap of thunder.

The sky was darkening fast. The temperature was falling like a stone. It grew much colder. And still the sky grew darker. It was past noon and it was night. We were silent.

It was the moment of total eclipse.

I stood and faced the group. I said, quoting Hodgson's poem:

*Continued on Page 15*

**David Levy describes this as a 'weak image' of the total solar eclipse which he took in Leakey, Texas—an eclipse which inspired some strong emotions in those who shared the experience.**



## Dramatic eclipse

Continued from Page 13

*I stood and stared; the sky was lit,  
The sky was stars all over it,  
I stood, I knew not why,  
Without a wish, without a will,  
I stood upon that silent hill  
And stared into the sky until  
My eyes were blind with stars, and still  
I stared into the sky.*



**Ralph Hodgson (1871-1962) was a British poet noted for simple and mystical lyrics that express a love of nature and a concern for modern man's progressive alienation from it.**

The group listened with rapt attention. When I was done, there were smiles and some applause. We would not see a total eclipse, but we had a poem. Then there was silence.

Twenty seconds passed. And then, the Sun appeared in total eclipse. Just like that.

I could not believe it. For about half a minute; for 30, maybe 45 seconds, we saw the Sun's corona, the centerpiece of a total eclipse of the Sun.

I did not notice the big prominence at the bottom of the Sun, but I did not care. The Sun's corona, circular because this was near the maximum of the sunspot cycle, smiled at us. (At other parts of the cycle the corona would be more oval.) It was the most dramatic thing I have ever seen.

After that unforgettable, precious, sight, clouds came in again. We did get to glimpse the corona on and off a few times after that. I noticed the sky starting to brighten as the end of totality approached. Suddenly it was over.

Only it wasn't. For one delicious moment, the Sun's photosphere appeared. The Sun was shining through valleys at the edge, or the limb, of the Moon. It was a magnificent, stunning view of Baily's beads.

First described by Francis Baily after he observed them during the eclipse of May 15, 1836, the effect bears his name. However, the first person to describe this effect was actually Edmond Halley of comet fame, who recorded them 121 years earlier during the total eclipse of May 3, 1715.

What we saw was splendid. And then we got to see a large portion of the ending partial phase. Clouds again obscured the very end of the eclipse.

I sat in my chair, alone. I thought of Wendee. I missed her so much. I could not stop crying. Scott Roberts sat with me and put his hand on my shoulder. Even as I write these words, I am not quite over it.

This eclipse, by far the most dramatic I ever saw, was my twelfth total eclipse, and the 101st eclipse I have seen since October 2, 1959. ✎

## May sky

Continued from Page 14

Pollux will be close to the Moon with Castor farther to the right.

**May 13:** The Moon will be to the upper right of the Beehive open star cluster in the dim constellation Cancer (the Crab). Binoculars will be needed to find the Beehive.

**May 15:** The Moon will be to the upper right of Regulus, the brightest star in Leo. The body of the lion will extend to the left of the Moon and the head and mane will be above the Moon.

**May 19:** The Moon will be close to the upper right of Spica, the only bright star in Virgo (the Maiden). The Moon will move in its orbit and be to the lower left of Spica on the 20th.

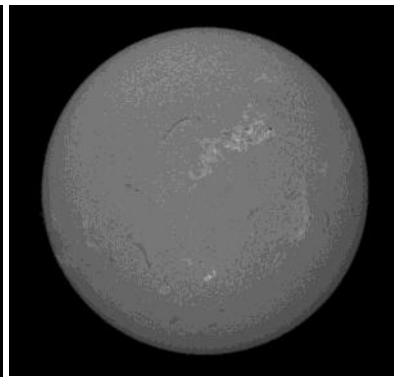
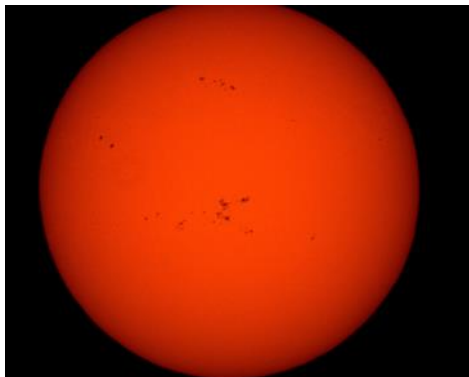
**May 31:** After they rise at about 4 a.m., the Moon will be close to the lower left of Saturn. Mars will be far to their lower left. Mars has moved eastward faster in its orbit and is much farther from Saturn than it was in early May. ✎

David Voigts, Black Hawk Astronomy Club

# OBSERVATIONS & ACTIVITIES



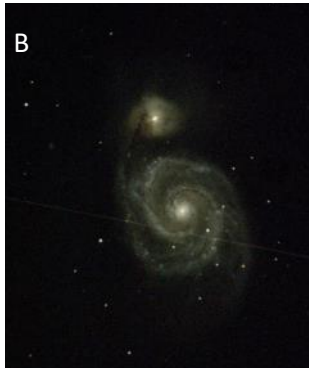
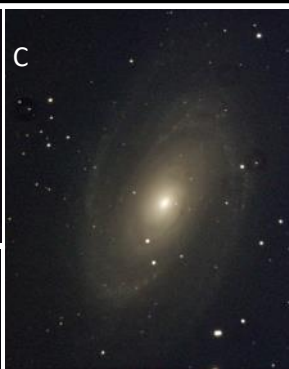
**The skies were cloudy April 20 but PAC went ahead with its monthly public outreach at Niabi Zoo. Despite the weather, a number of visitors showed up and enjoyed some good views of a nearly full moon. Those supporting the event included Al Sheidler, Robert Gregory, Eva Davison, Megan Warren, Pam Kollar, Rusty Case, Rolando Gamino, Dan Cusack, Dale Hachtel, and Tim and Hugh Holt.**



**April was an active month when it comes to sunspot activity, and here are some images of the Sun taken by Al Sheidler from his home in Moline (color) on April 19 and by Rolando Gamino from his backyard in East Moline on April 21.**



**(from left) Al Sheidler, Rolando Gamino and Dan Cusack held an observing session at Castle Observatory on April 24. Al used his 10" LX200 and new ZWO ASI 2600MC Duo camera, controlled with Dan's ASlair wi-fi unit, to capture images of these deep sky objects: (A) M3 globular cluster; (B) M51 (Whirlpool Galaxy); (C) M81 (Bode's Galaxy); (D) M64 (Black Eye Galaxy); (E) M82 (Cigar Galaxy); (F) M38 (Starfish Cluster)**





# OBSERVATIONS & ACTIVITIES



**Byron Davies sent these three images, once again proving his skill as an astrophotographer. Shown are M42 (the Orion Nebula, above); the M5 globular cluster (right, above); and M51 (the Whirlpool Galaxy).**



**(from left Al Sheidler, Gary Knapp, Dan Cusack and Megan Warren got together at Castle Observatory on April 12. Al took these photos of M82 (the Cigar Galaxy, above left) and M104 (the Sombrero Galaxy) using his new ZWO ASI2600 Duo camera. Megan used the observatory's telescope to observe Messier objects on the Spring list.**

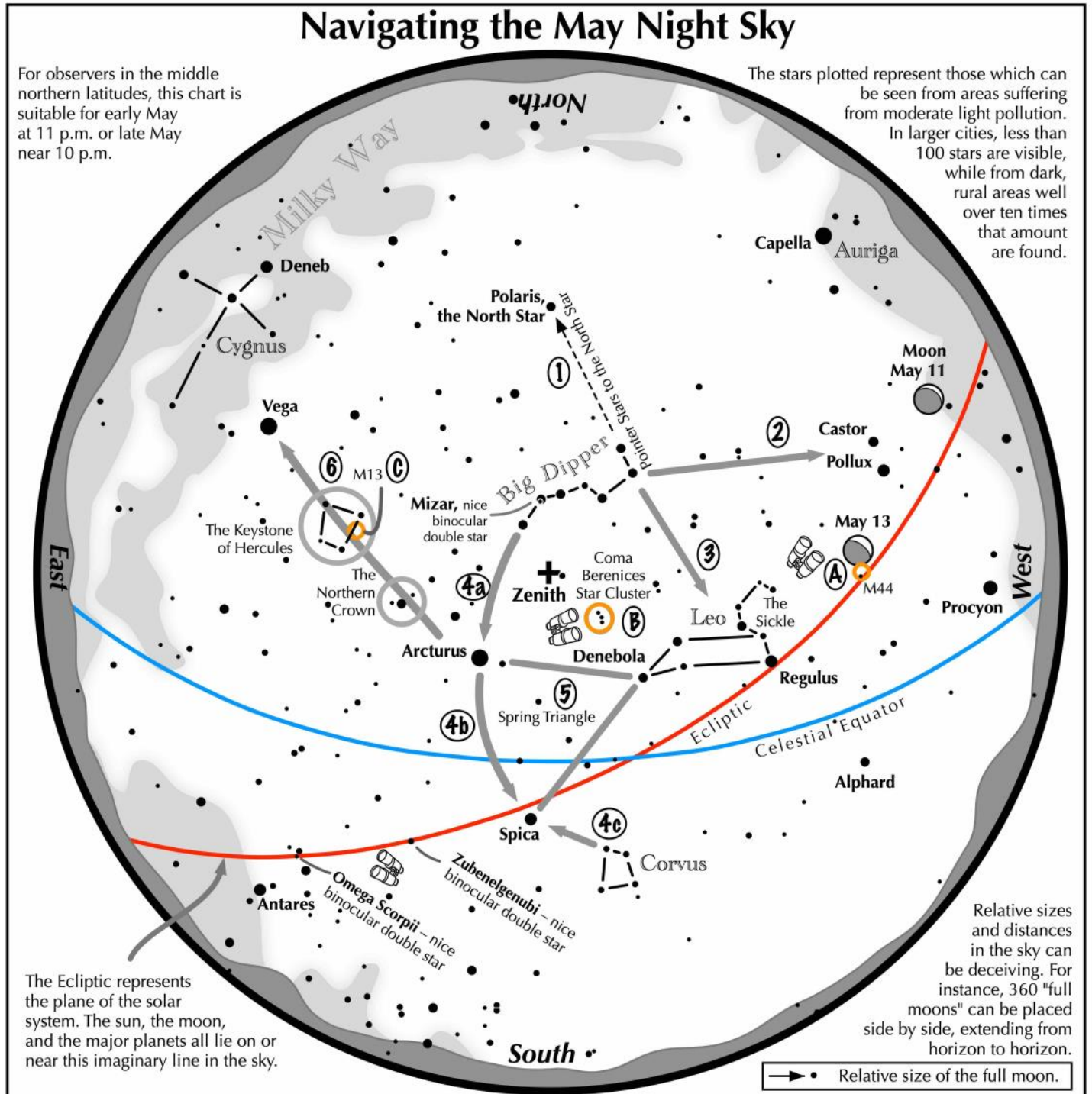


**Unfortunately, the weather was cloudy on April 4 when PAC did a public outreach event at the Watts Midtown Branch of the Rock Island Public Library. Still, about 50 guests showed up and enjoyed a program on the upcoming eclipse and how telescopes worked. The PACMO scope was used to look at the stars on the library's American flag. PAC members Rolando Gamino, Dan Cusack, Mike Haney, Ken Boquist, Al Sheidler and Dale Hachtel were there to support the event.**

# Navigating the May Night Sky

For observers in the middle northern latitudes, this chart is suitable for early May at 11 p.m. or late May near 10 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 May night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line northward from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
- 3 Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
- 4 Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica.  
Confirm Spica by noting that two moderately bright stars just to its southwest form a straight line with it.
- 5 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
- 6 Draw a line from Arcturus to Vega. One-third of the way sits "The Northern Crown." Two-thirds of the way hides the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.

### Binocular Highlights

A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. B: Look near the zenith for the loose star cluster of Coma Berenices. C: M13, a round glow from a cluster of over 500,000 stars.



NGC 129 • M31 • Hyades • M36 • NGC 1981 • M41 • M67 • Mel 111 • M87 • M5 • M7



## Urban Observing Program



*All observations must be conducted at locations where the Milky Way cannot be seen by the unaided eye.*

Observing under the starry dome is an activity that amateurs relish. After an extended period of poor weather, they eagerly prepare for a clear night, getting their gear ready. With the literally thousands of celestial treasures to examine, which ones make it on the observing agenda for the evening?

To help, the Astronomical League offers a wide range of suitable targets from which its members can pick and choose. Here is but one Observing Program ...

### Can't see the Milky Way? The Urban Observing Program is for you!

It's a crystal clear night and you want to observe. However, you live in a city and you don't have the time or energy to drive to your favorite dark sky location. So ... how about your backyard?

The **Urban Observing Program** was established to bring amateur astronomy back to the cities, back to those areas that are affected by heavy light pollution. Amateur astronomy used to be called "backyard astronomy." But as cities grew, so did light pollution, and the amateur astronomer was forced to drive further and further into the dark countryside to escape the brightening sky glow. The Urban Observing Program was created to allow those who want to enjoy the wonders of the heavens from the comfort of their homes to do so, and to maximize their observing experience despite the presence of considerable light pollution.

In addition to the moon and planets, there is a plethora of deep sky objects that can be enjoyed under poor urban skies, and it only takes a small to medium sized telescope to experience them. This program will introduce you to these wonders and to the pleasures of convenient, backyard observing.

Clear skies and good observing!

<https://www.astroleague.org/urban-observing-program/>

*You may observe the objects with the unaided eye, binoculars, or any size telescope. However, telescopes from six to ten inches of aperture are recommended since a larger aperture helps pull out fainter objects in non-contrasty skies.*

NGC 457 • M45 • M38 • M81 • M3 • M92 • M35 • NGC 2392 • M17 • M57 • Algol • M39

Double Cluster • M37 • M50 • M44 • M86 • NGC 7662 • Gamma Andromedae • M22 • M32 • M13 • M8 • Epsilon Lyrae • M15

NGC 752 • NGC 1342 • M42 • NGC 2244 • M48 • M84 • M4 • M6 • M27 • Beta Cygni • M11 • NGC 7789 • NGC 2232 • M2

# CALENDAR OF CLUB EVENTS

**MAY 11:** QCAS Public Night, Menke Observatory

**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

**MAY 18:** Public observing at Niabi Zoo; sunset at 8:18 p.m.

**JUNE 1:** Solar observing at Giant Goose Conservation Area, Atkinson

**JUNE 15:** Public observing at Niabi Zoo; sunset at 8:38 p.m.

**JUNE 24:** "Stars & S'mores" public observing session at Scott County Public Library, Eldridge, 8:30 p.m.; June 27 rain date

**JUNE 25:** Messiah Lutheran Church, Port Byron, Vacation Bible School evening observing (June 26 rain date)

**JUNE 29:** Public observing session at Illiniwek Campground; July 6 rain date

**JULY 11:** Public observing session, Gauley Field (near Barr Elementary School), Silvis; celebrating Silvis Public Library's centennial; July 18 rain date

**JULY 20:** Public observing at Niabi Zoo; sunset at 8:30 p.m.

**AUGUST 10:** Annual PAC Picnic / Perseid meteor shower observing, Paul Castle Observatory

**AUGUST 17:** Public observing at Niabi Zoo; sunset at 7:58 p.m.

**SEPTEMBER 21:** Public observing at Niabi Zoo; sunset at 7 p.m.

**SEPTEMBER 28-30:** Eastern Iowa Star Party, Menke Observatory

**OCTOBER 12:** Annual PAC Banquet, Riverfront Grille, Rock Island, 5:30 p.m.

**OCTOBER 19:** Public observing at Niabi Zoo; sunset at 6:14 p.m.

**NOVEMBER 16:** Public observing at Niabi Zoo (last of year); sunset at 4:41 p.m.

**Events subject to change; check your email for updates**

**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!**



**MAY 5:** Telescope Swap Day, American Doll and Toy Museum, Rock Island, 2 p.m.

**WE WANT TO  
HEAR FROM YOU!**

REFLECTIONS is your newsletter, so we want to hear from you! Send us your news, your photos, your comments, or anything else of that may be of interest. You can reach us at: [levesque5562@att.net](mailto:levesque5562@att.net).