

PRESIDENT'S CORNER

by Dell Vance



Ann-Maree Vance

January was a great month. We had some cold and snowy days. Newton received 30 inches of snow in a 10-day period. I didn't get much observing done in January. However, we did have a good monthly meeting. It was our annual "Show and Tell" meeting. It was a very snowy night, but about 10 of us were able to make it. Some of the things that were presented ranged from a SeeStar (camera/telescope developed by ZWO) presented by Boyd Edwards and his son, to Dean's new observatory. It gave us some insights into what can be done by our fellow amateur astronomers. The SeeStar presentation was particularly interesting. It was coupled with PixInsight processing to deliver some incredible shots.

We also had two STEM Fairs that we participated in: One at North Park Elementary and another at Wellsville Elementary. Dale Hooper has some planispheres that the kids can assemble. Bruce has a very impressive demonstration of a gravity well. Both items

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Emojipedia

UPCOMING EVENTS

Club Meeting

Friday, February 9, at the USU Engineering Lab, room 109. Presentations:

- JWST Update by Randy Jost
- Charles Messier and the Messier Catalogue by Robert Cook.

STEM Fairs

Events last from 6:00 to 8:00 p.m. Please plan to arrive at 5:30.

- February 8: White Pine Elementary (Richmond)
- February 22: Cedar Ridge Elementary (Hyde Park)
- February 28: Millville Elementary

Keep up to date by visiting our website:



President's Corner, cont'd from p. 1

were very popular.

For February, we have three STEM Fairs: White Pine Elementary (February 8 in Richmond), Cedar Ridge Elementary (February 22 in Hyde Park), and Millville Elementary (Feb. 28). We also have a club meeting on February 9, at 7:00 p.m. at the USU Engineering Laboratory Building. Randy Jost will present updated information on the JWST and Robert Cook will present information about Charles Messier and his catalog of objects. We will also discuss the possibility of a Messier Marathon in March. Be sure to attend the meeting—it should be very interesting!

Thanks again for all your support.

Clear Skies!



Wikimedia Commons

What Is a Messier Marathon?

A Messier marathon is an attempt, usually organized by amateur astronomers, to find as many Messier objects as possible during one night.

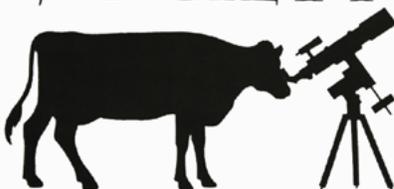
—Wikipedia, s.v. [Messier marathon](#)



Classroom Clipart

You can see CVAS events on the NASA Night Sky Network calendar at <https://nightsky.jpl.nasa.gov/clubs-and-events.cfm>. If you don't yet have access to the NSN website, please let a member of the Executive Committee know! We can add you to the roster and help you create a login and password.

CACHE VALLEY ASTRONOMICAL SOCIETY



Our Website: CVAS-UTAHSKIES.ORG

EXECUTIVE COMMITTEE

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- Vice President: Dale Hooper; dchooper5@gmail.com
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SOLAR FILTERS FOR OBSERVING THE SUN AND SOLAR ECLIPSES

by Blaine Dickey

Use of sufficient solar filters is a must when observing the sun or a total or partial solar eclipse. Failure to do so can easily lead to permanent damage to your eyes. The filters should always be placed at the front of the objective of a telescope, finder scope, or binocular—and not over the eyepiece.

Fortunately, filters to cover your eyes are readily available at online stores. On the other, hand filters for binoculars and finder scopes are not always readily available. Fortunately, filters for those can be made with a little effort using the filters that are worn on the face as shown below (*figure 1*).



I made some solar filters for my binoculars, Telrad, and finder scope using the eclipse shades that I had purchased for the total eclipse in 2017. Shown below is a filter for each objective of my binoculars. Using some thick paper, such as a manila folder, I cut out a strip of paper and wrapped it around each binocular objective and then taped them together to form two tubes. On each tube I glued the two filters I had made using the same thick paper. Then, when I'm ready to use them I slide the filters over the two objectives on my binoculars (*figures 2 and 3*).

The filter on my finder scope was made exactly the same way as before. With the filter placed over the finder objective, it is safe to use as a small solar finder scope for finding the sun during the daytime. They are



safe as long as there are no holes in the filter material covering the objective lens. These filters don't blow off because of a snug fit (*figure 4*).

The filter for my Telrad was somewhat trickier. It finally dawned on me that if I secured a solar filter precisely cut to fit onto the outside sloping glass of the Telrad using a strong rubber band to secure it in place, then I could use it for a solar finder as well. With the location of the filter on the outside of the sloping glass I can easily see the red finder circles superimposed onto the field of view and see the sun at the same time (*figure 5*).

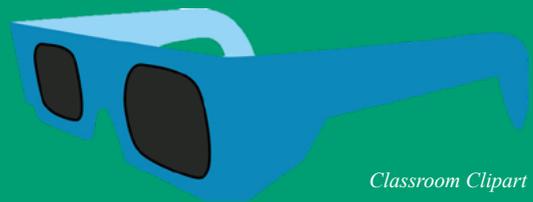
It goes without saying that your main telescope ob-

cont'd on p. 2

Solar Filters, cont'd from p. 3

jective should have a very secure solar filter covering it, as well, if you are planning on using it to observe the sun for sunspots or the upcoming eclipse on April 8, 2024.

Images courtesy of the author.

**Do Solar Eclipse Glasses Expire?**

Classroom Clipart

“If your eclipse glasses or viewers are compliant with the transmittance requirements of the ISO 12312-2 safety standard, and if their filters aren’t scratched, punctured, torn, coming loose from the frame, or otherwise damaged, you may reuse them indefinitely. Furthermore, you may look at the uneclipsed or partially eclipsed Sun through them for as long as you wish. Some glasses/viewers are printed with

warnings stating that you shouldn’t look through them for more than three minutes at a time and that you should discard them if they are more than three years old. Such warnings are outdated and do not apply to eclipse viewers compliant with the ISO 12312-2 standard and in excellent condition.”

—The American Astronomical Society

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THE BELT OF ORION

by Tom Westre

Of the 88 official constellations, perhaps the brightest and easiest to see is Orion. Orion is named after a hunter in Greek mythology. It is a very prominent winter evening constellation.

Orion consists of four major stars of 1st and 2nd magnitude. Two, Betelgeuse and Bellatrix, mark his shoulders, and Saiph and Rigel mark Orion's feet.

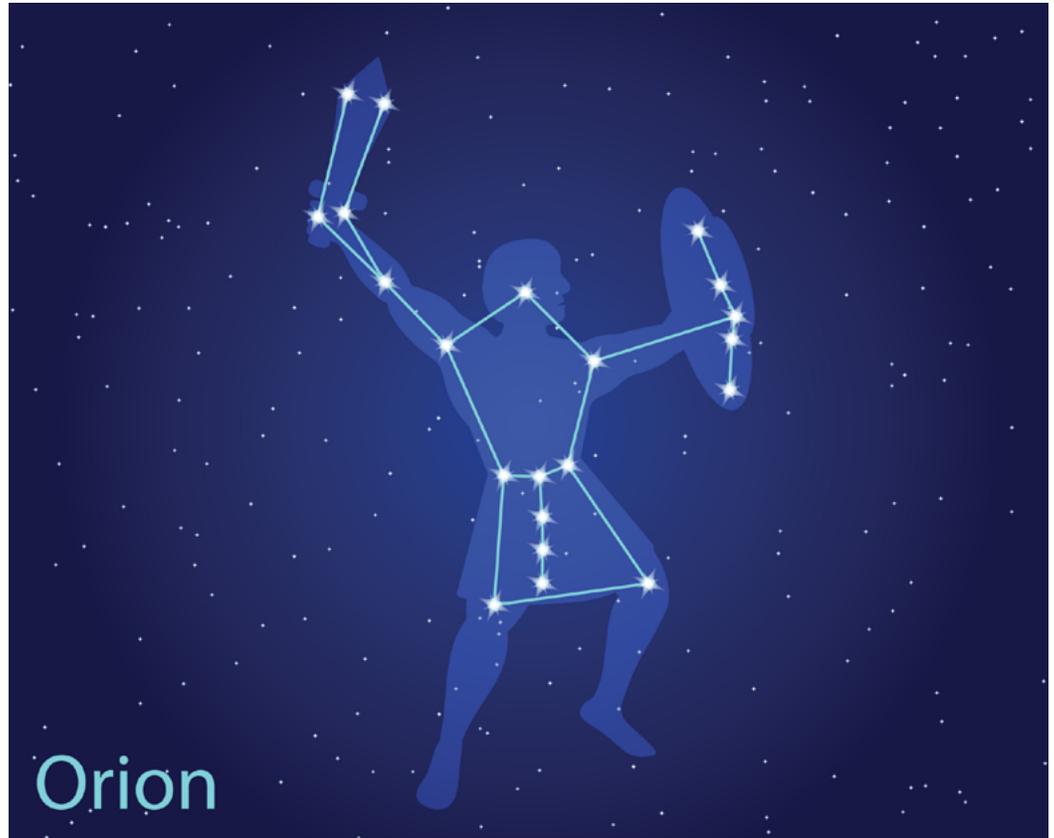
In the middle lies Orion's belt, consisting of three bright stars: Alnitak, Alnilam, and Mintaka. These three stars line up in an evenly spaced row and form what is known as an asterism, a star pattern by stars in one or more constellations.

Orion and his three-star belt dominate the evening sky from November to March.

The three belt stars formed in the same molecular cloud are about the same age. However, Alnitak and Mintaka (the leftmost and rightmost stars, respectively) are about 1,000 light-years away, while the central star, Alnilam, lies much farther away at 2,000 light-years.

Alnitak, the leftmost star, is a triple star. The primary star is 33 times the mass of the sun. It is 6 million years old. Because it is a giant blue star, it will use its hydrogen fuel faster than the sun.

Alnilam, the middle star, is also a blue supergiant star. It is the most massive of the three belt stars. It is between 40 and 44 times the mass of the sun, and is



Vecteezy

5.7 million years old.

Mintaka, the rightmost star, is a hot blue giant with a mass 24 times the sun. The primary star is part of a five-star system. The ages of the stars are currently unknown.



Clipart World

This article was originally a script for CVAS's UPR radio show, broadcast on Jan. 30, 2024.



ClipartMax

USU Observatory Public Night

The USU Observatory is closed for the winter. The next public night will be in late March or early April. More info available [here](#).

THE ELECTRONIC AUTOMATIC FOCUSER (EAF) CAN MAKE ASTRONOMY EASIER

by Bruce Horrocks

Aristotle Onassis stated, “It is during our darkest moments that we must focus to see the light.” Never is that more important than when you are trying to get a nice clear image of a deep space object. So how are you focusing? Are you still running out in the cold to adjust your telescope? If so, like my mom would say, “Stop it, and stop it right now!” For heaven’s sake, with all the new technology, get yourself an Electronic Automatic Focuser (EAF).



I don’t care how carefully you think you can move those focus knobs in or out, there is no way you can compete with the precision of the electronic focusers that are for sale. I personally use both the ZWO EAF and the Celestron EAF

for the SCT telescope. They both work great, but if I had to be honest, I prefer the ZWO over the Celestron model. My only complaint is that, after attaching the EAF to most telescopes, they will often no longer fit in the storage box. So, I wanted to show you what I have done, so hopefully you can start using an EAF and still store your telescope in its case.

My first try at this was to install the ZWO EAF on my Sky-Watcher 100mm ED refractor (*figure 1*). What I did was remove the focus knob off the telescope on the right side. I then mounted a pulley similar to what is used on printers to the little shaft where the focus knob used to be. You can find these pulleys on

Amazon in all different shapes and bore sizes that will fit on your telescope focusing shaft. I also put one of these on my ZWO EAF. After having done this, I welded up a little metal plate to mount the EAF to and made it so it would slide into the finder scope bracket on the telescope. This has kind of a loose fit so I can tighten it up later. Once this is inserted, I measured what length of belt I would need. These are also on Amazon, and for my setup, a 400-tooth belt fit pretty nice (*figure 2*). Once the belt is on, I tighten down the bolt on the finder scope bracket, and this tightens the belt around the pulleys and gives me a very nice, tight fit that will hold the telescope in focus after I have made any adjustments.

I also wanted to use something like this on my Red Cat 51. This is a bit different type of telescope, as my version is more like a telephoto zoom lens for a camera. You have to rotate the lens about 180 degrees to go the full range of the focusing movement. They make some brackets that you can use for this, but I really did not want to buy a new bracket, and then a new belt, and I wanted to try and use one of the pulleys that I happened to already have.

I installed a pulley on my ZWO EAF and then measured how high I would need to mount this in the finder scope bracket to make the same 400-tooth belt work on both telescopes and focusers.

So, it looked like if I 3D-printed a little mounting block that was about 1/2 inch above the finder scope bracket, that my 400-tooth belt would fit, and sure enough, it does (*figure 4*). I have to slide the belt over the telescope and onto the pulley on the EAF. Once it

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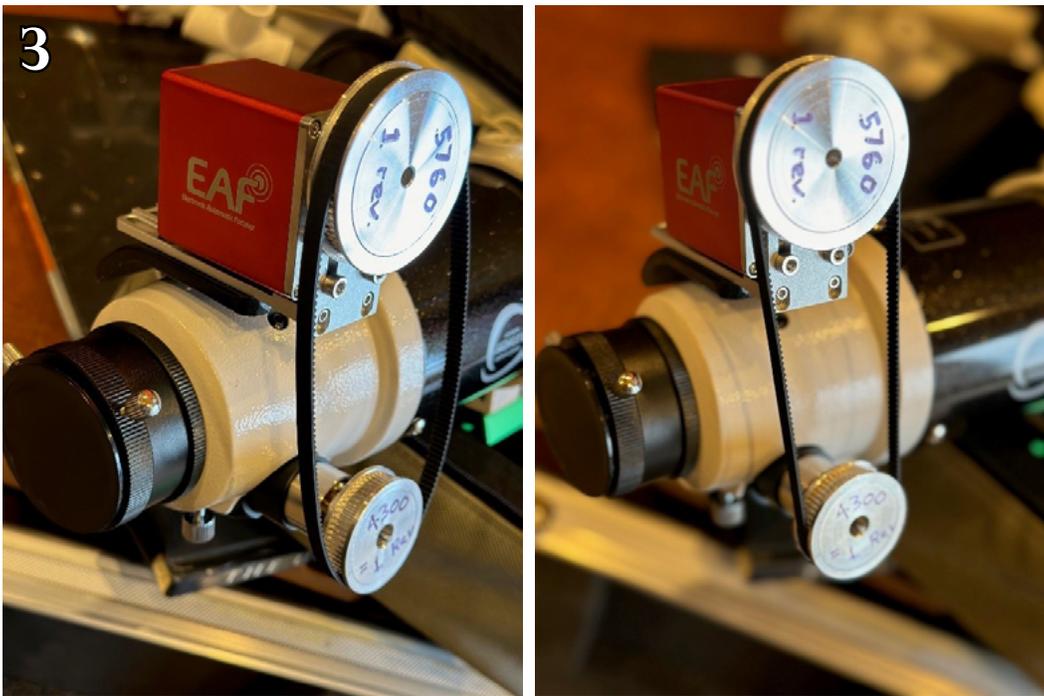


Figure 3: Before and after pictures showing the belt loose and then tightened on the Sky-Watcher 100mm.

Almost all current astronomy software has controls for these little focus motors, and I highly recommend that, if you are not using these, you start doing so now.

EAFs, cont'd from p. 6

is on, it easily slips into the finder scope bracket, and then I slide the belt down the telescope to get it more centered. Once I have it in place, I tighten the bolt on the finder scope to lock the EAF in place. And there you have it! While the belt teeth do not match the groove in my telescope focus rubber grip area, they are close enough to make a great contact and focus the telescope just perfectly.

Now, just a few quick notes. The ZWO is a stepper motor. To make one full revolution, the motor must make 5,760 steps, and you can go

60,000 steps if needed. You can also move the motor just one step at a time if you are really patient. On my 100mm Sky-Watcher, I can do three or four full rotations to focus the telescope. On the Red Cat, I only need to rotate the telescope focuser about 180 degrees for the full range. For this reason, I used a small, 20-tooth pulley that could move a full range and still

not move the Red Cat focus that much. I believe that after 12,000 steps on the motor, I have gone full motion on the telescope focus.

Almost all current astronomy software has controls for these little focus motors, and I highly recommend that, if you are not using these, you start doing so now.

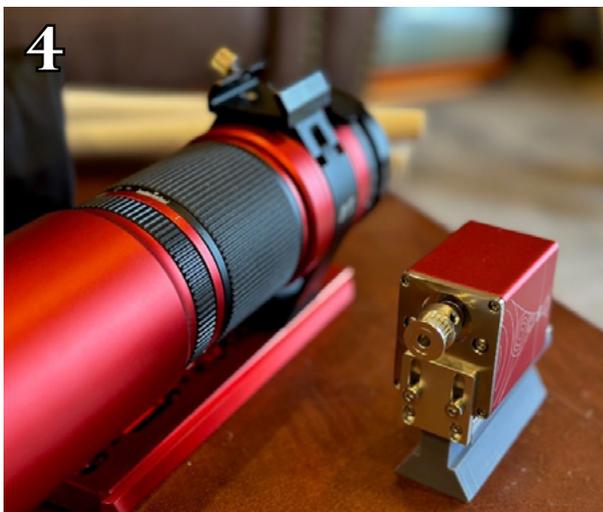


Figure 4: Before and after pictures showing the EAF and mounting block setup for the Red Cat 51.

Images courtesy of Amazon and the author.

AN INCESSANT CURIOSITY THAT HAS FILLED AND ENRICHED MY LIFE

My Astronomy Origin Story

by Layne Pedersen

I think most astronomers have a few experiences in their life that they remember that were fundamental in their lifelong exploration.

I would imagine most people can recall when they saw Saturn for the first time. I was a child the first time I saw the ringed planet and I still remember it, all these years later. I don't remember exactly how old I was, but my parents had decided to take me to a Salt Lake Astronomical Society star party. We ended up going to several of them when I was a child. It was exciting to arrive at Stansbury Park. Once the headlights were off, you knew you were in for something fun. Walking around while your eyes adjusted made it seem that the event was slowly fading into reality. I remember seeing the rings for the first time and being overwhelmed with exhilaration of what I was seeing. I had a cursory understanding of what planets were at the time.

Some years later, as an adult, I would take friends out to Stansbury Park and share what I saw. Some seemed to be as thrilled to be seeing Saturn as I was when I was younger. Some years after that, I would eventually purchase my own telescope and participate

in star parties with my own modest equipment. That wonder for the stars never left, as I'm sure it hasn't for you, if you are reading this.

What continues to amaze and inspire me is that my or our collective understanding of what Saturn is or what the stars are will never be complete. We might be able to track them, admire them, and catalogue them, but there is always more to learn. For many, the insatiable quest for more knowledge lasts an entire lifetime.

We live in an incredible astronomical and scientific era where instrument sensitivity has become so punctilious that we have proven even the great Albert Einstein wrong—only in that he thought gravitational waves were too weak to be detected. This is one of my favorite modern astronomy events that has occurred in my lifetime.

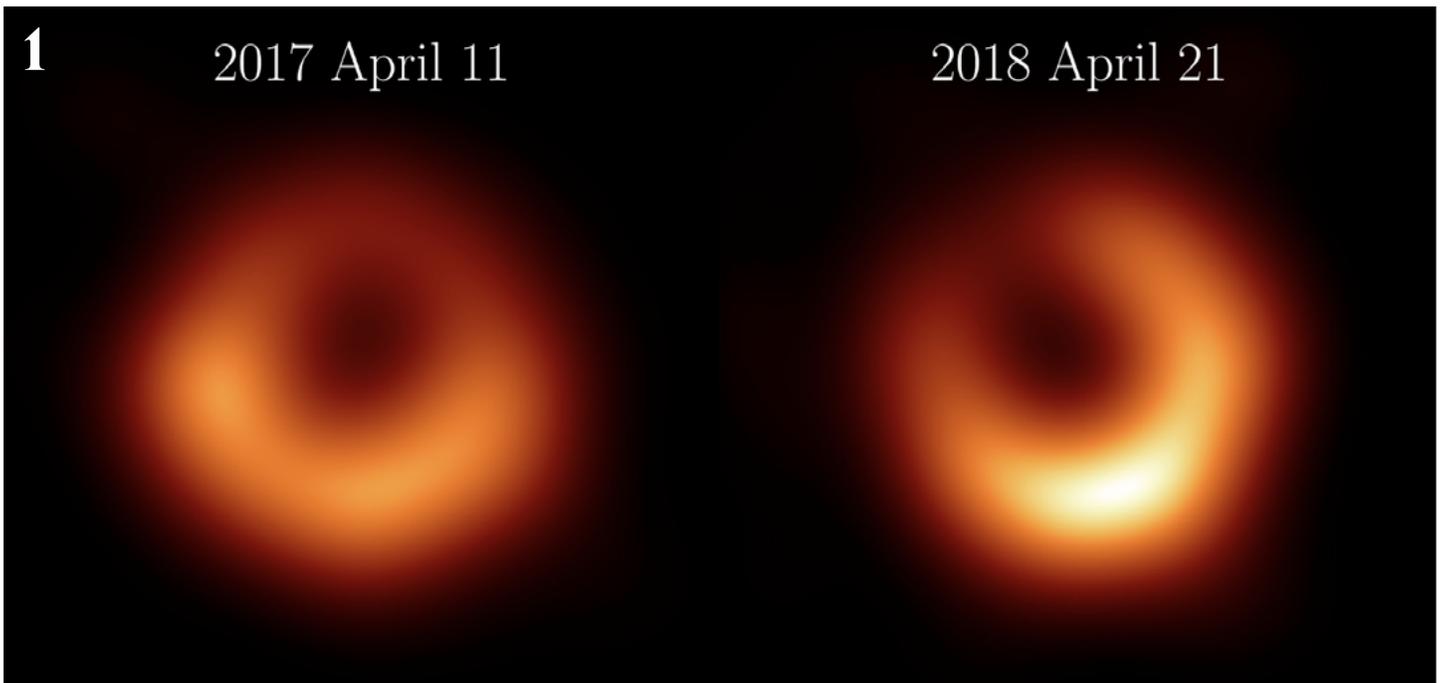
Another event is the results from the Event Horizon Telescope (EHT). I remember seeing the results of the M87 image, which shows the shadow of the black hole at the center of the galaxy M87, some 55 million light-years away. For reference, 1 light year is nearly 6 trillion miles, making this distance some 3.30×10^{20}

cont'd on p. 9

1

2017 April 11

2018 April 21



Incessant Curiosity, cont'd from p. 8

miles. This is an unfathomable distance, yet the EHT was able to image it.

Figure 1 shows the ring of light around the black hole in 2017 and then in 2018. The EHT collaboration reports in this image, “the brightest part of the ring in 2018 has shifted by about 30° relative from 2017 to now lie in the 5 o’clock position.”

Another contribution to modern science is computational modeling of physical phenomena. Computers are fast enough to not only process the data that created this image but also model black holes, as well as countless other physical processes. The EHT team predicted the brightness peak shifting around the ring and published it only for it to be confirmed in their observations. They have continued with observations on 2021 and 2022 and are scheduled for the first half of 2024.

The success of the James Webb Space Telescope (JWST) is an astounding tribute to modern science, as well as engineering. The JWST orbits near the second Lagrange point (L2) some 930,000 miles away from the Earth’s orbit and has instrumentation that must be kept really cold. I remember watching first results of the telescope where they announced, among other things, the composition of an exoplanet atmosphere. I would have never guessed that would be possible. The images from the telescope are just as stunning. The image to the right is the famous Pillars of Creation in the Eagle Nebula, some 6,500 – 7,000 light-years away, taken by the NIRCam instrument. Because this is a near-infrared image, the colors are not the true colors we would see if we could travel there. This image is a false-color image where colors are mapped to specific wavelengths. The detail revealed is unprecedented and allows us to learn more of how these structures



are created and what is going in inside.

Last year, our first child was born, and I can’t wait to be a part of her first discovery as a future astronomer. I hope it will give her a similar experience as I had, which she will remember forever and which may spark that incessant curiosity that has filled and enriched my life—as I’m sure it has yours.

Last year,
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Images courtesy of [EHT Collaboration](#) (figure 1) and [NASA, ESA, CSA, STScI](#); [Joseph DePasquale \(STScI\)](#), [Anton M. Koekemoer \(STScI\)](#), [Alyssa Pagan \(STScI\)](#) (figure 2).

IS CVAS THE CURE FOR LONELINESS?

by Bonnie Schenk-Darrington

It seems that everywhere you look these days, people are talking and writing about loneliness. An isolated life is widely acknowledged to be unnatural, maladaptive, unsuitable, and unhealthy for a human being. But I argue that the cure for loneliness is CVAS! In this article, I will talk about the emotional and physical consequences of loneliness, how loneliness became an epidemic in the United States, and how you can (and why you should!) beat loneliness by participating in CVAS.

People are social animals—even the introverts—and everyone needs other humans to love and lean on. Psychologist Dr. Stephen Braren explains, “Our need for social connection is so important that we have evolved a signaling mechanism that lets us know when we need more of it. Loneliness is a vital warning signal that tells us that our basic human need for social connection is not met. Just like hunger and thirst are signals that we need food and water, loneliness signals that we need connection. And this signal is rooted deep within our brain. . . . Loneliness is a vital warning signal that tells us that our basic human need for social connection is not met.”¹ When we are lonely, we become literally emotionally hungry for friends.

But the consequences are not only emotional. Loneliness can cause physical ailments, and is nothing short of a public health crisis. “It is linked to strokes, heart disease, dementia, inflammation and suicide; it breaks the heart literally as well as figuratively. Loneliness is as deadly as smoking 15 cigarettes a day and more lethal than consuming six alcoholic drinks a day,” reports Nicholas Kristof of *The New York Times*.²

So, if human connection is a biological need with emotional and physical consequences for health, how on earth did we get so lonely? Why is loneliness such a problem nowadays? Many people point to the pandemic, but experts say that loneliness was already

an epidemic for about half of U.S. adults, and then the pandemic just made it worse.³

Surgeon General Vivek Murthy released a report in May 2023 about this problem. He explained on National Public Radio (NPR) that “loneliness isn’t a uniquely American problem, but instead a feature of

modern life around the globe. Yet he noted that in the U.S., participation in community organizations—from faith groups to recreational leagues—has declined in recent decades.”⁴ He also explains that the quality of connections is more important than the quantity. In-person, close connections are better for us than internet connections.⁵

Dr. Murthy recommended “being more intentional about how you spend your free time. The report encourages readers to seek out close relationships with others, keep phones put away in social settings and join community groups.”⁶ The report advises, “Participate in social and community groups

such as fitness, religious, hobby, professional, and community service organizations to foster a sense of belonging, meaning, and purpose.”⁷

I know that’s not always easy. Sometimes things happen that make it difficult to participate in in-person group activities. Sometimes, as you’re putting on your grubbier jeans and grabbing your rake, you think you’d literally rather do anything than go participate in community service that day. Sometimes, as you’re wrestling your sobbing child into church clothes, you wonder why you bother. And sometimes, freak snowstorms derail your plans to attend a CVAS meeting, as happened for many who missed our January meeting.

But I ask you to persevere nonetheless, because the health and happiness benefits are so good for you. (Except in the case of freak weather—stay safe!) And once you’ve missed a few events, it just seems easier



Pixabay

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Loneliness, cont'd from p. 10

to stay home in your sweats and watch TV. After the pandemic, the CVAS ExecComm had many discussions on this topic: How could we entice our members back to meetings? Have you heard from so-and-so? Are they OK? How can reach our missing members?

We still think about you all and hope you'll come spend some time with us again! If you haven't joined us in a while, please consider this your invitation to come back!

Whether you enjoy chatting directly with others or participating in "side-by-side bonding" over a shared hobby,⁸ CVAS is the place for you.

Before and after meetings, folks arrive early or linger to chat. I find that our meetings are also very interactive in a casual, friendly way—it's very common for audience members to raise their hand to ask a question or make a comment. We have conversations guided by a presenter more often than presentations at our meetings. Star parties are, I think, where we excel at side-by-side bonding, as club members help each other set up and look through their telescopes and compare their latest gadgets.

Another great strength of CVAS is that we have a cross-generational membership and outreach programs that give us perspective on other people's lives. A very interesting study I read explained that intergenerational relationships enrich the lives of all involved: "There is a well-established body of literature on the importance of intergenerational relationships and programs. Intergenerational programs are designed to actively bring the younger generation and the older generation together with the purpose of improving both generations. Intergenerational programs can benefit both generations through a combination of emotional, mental, physical, social, and sensory stimulation."⁹ Our meetings, STEM Fairs, and public star parties bring multiple generations together in surprising and loneliness-defeating ways.

It can be hard to break out of a loneliness pattern, especially if you have become very used to being alone. Social interaction can cause nervousness, but I want to assure you that we are all nice people and would never judge you for being shy or quiet. How

Whether you enjoy chatting directly with others or participating in "side-by-side bonding" over a shared hobby, CVAS is the place for you.

can you come back to CVAS, or participate a bit more if your participation has become less robust?

I recommend that you start small, and seek a CVAS activity that is a bit more within your comfort zone.

- If adults intimidate you, how about volunteering at a STEM Fair? It can be very rewarding to see a kid's eyes light up as you show them some astronomy artifact or activity.
- If you feel awkward around others, why not attend a star party? It's less awkward to talk with a stranger in the dark—no one expects you to be eloquent or make eye contact.
- If coming in person is too overwhelming for whatever reason, maybe one of our online platforms might serve you best. Join in the discussion on our [Facebook page](#), send us some of your images in the [Groups.io email](#), or send [me](#) some pictures or a brief article for the newsletter. I find that our CVAS friends are unfailingly positive. Once you have had a few people admire your latest images or compliment you on a well-written article or thoughtful Facebook post, maybe you will feel more confident about attending an event in person.

Finally, I'd just like to say this about CVAS: I have been through some very difficult trials in the past two years, and whenever I was struggling, a text or an email from a CVAS friend seemed to pop up. Seeing dear friends like Sherell and Linda and Dale and Blaine at meetings gave me a reason to attend, even on my most anxiety-clouded days. Being able to sit down and put together the newsletter pulled my gloomy thoughts away from myself, and caused me to think about how I could serve others. Literally, there have been days that the only thing that got me out of bed in the morning was the burning need to find the perfect clipart of a kid with a telescope. And some days, the only thing that got me through the workday was so I could make it to my ExecComm meeting and kid Bruce and Dale about their conflicting opinions about

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Loneliness, cont'd from p. 11

the Artemis missions over ice cream.

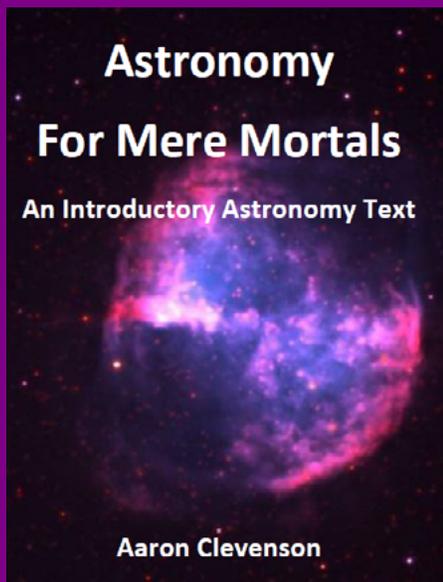
So, if you're lonely, I invite you to lean on your CVAS friends. If you are not sure about coming to a meeting, [please send me an email](#). I would love to sit by you! Do not let loneliness destroy your mental and physical health. Come see us at CVAS! Because I am convinced that CVAS is the cure to loneliness.

References

1. Braren, Stephen. May 24, 2023. "The Evolution of Social Connection as a Basic Human Need." Ed. Rose Perry. *Social Creatures*, <https://www.thesocialcreatures.org/thecreaturetimes/evolution-of-social-connection>, accessed Jan. 27, 2024.
2. Kristof, Nicholas. Sept. 6, 2023. "We Know the Cure for Loneliness. So, Why Do We Suffer?" *The New York Times*, <https://www.nytimes.com/2023/09/06/opinion/loneliness-epidemic-solutions.html?smid=nytcore-android-share>, accessed Jan. 21, 2024.
3. Summers, Juana, Vincent Acovino, and Christopher Intagliata. May 2, 2023. "America Has a Loneliness Epidemic. Here are 6 Steps to Address It." National Public Radio, <https://www.npr.org/2023/05/02/1173418268/loneliness-connection-mental-health-dementia-surgeon-general>, accessed Jan. 21, 2024.

Seeing dear friends at CVAS meetings gave me a reason to attend, even on my most anxiety-clouded days.

4. Summers et al.
5. Ibid.
6. Dallas, Kelsey. May 16, 2023. "Why the Surgeon General Is Worried about Declining Church Attendance." *The Deseret News*, <https://www.deseret.com/faith/2023/5/16/23725827/surgeon-general-report-loneliness-church-religion>, accessed Jan. 21, 2024.
7. Ibid.
8. Cottle, Michelle. July 19, 2023. "Is the Cure to Male Loneliness Out on the Pickleball Court?" *The New York Times*, <https://www.nytimes.com/2023/07/19/opinion/male-loneliness.html>, accessed Jan. 21, 2024.
9. Holloway, et al., p. 3.



Astronomical League

Astronomy for Mere Mortals

You can download the e-book, *Astronomy for Mere Mortals* by Aaron Clevenson, a complete introductory textbook, available free, updated annually.

You can download a PDF [here](#). You may print it, or if you would like a printed copy, please contact the author, Aaron Clevenson, at aaron@clevenson.org.



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ASTROPHOTOGRAPHY GALLERY

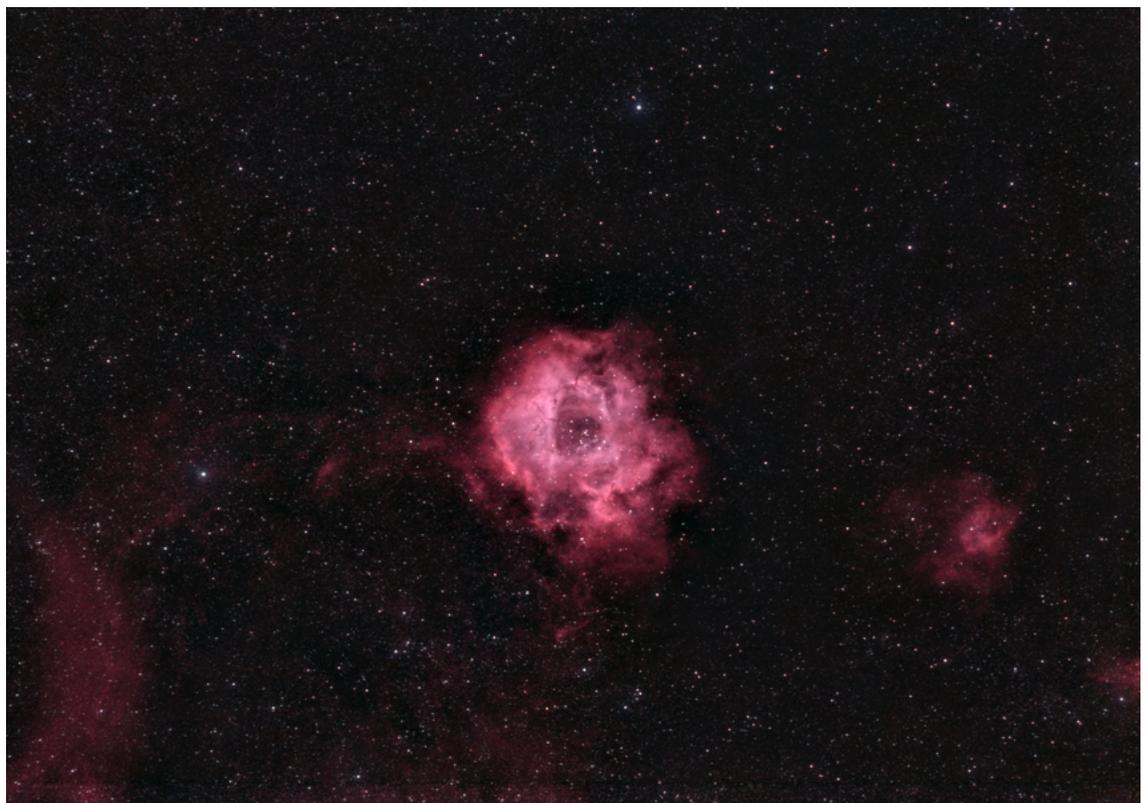
Recent Images by Club Members

Thomas Sorensen

Upper right: The California Nebula. Shot from my backyard in Tremonton with about 13 hours of integration time. I used a Sky-Watcher Star Adventure 2i Pro with guiding in RA, a TPO 180 triplet refractor, and the Optolong L-extreme filter. I processed this in DeepSkyStacker and Photoshop.

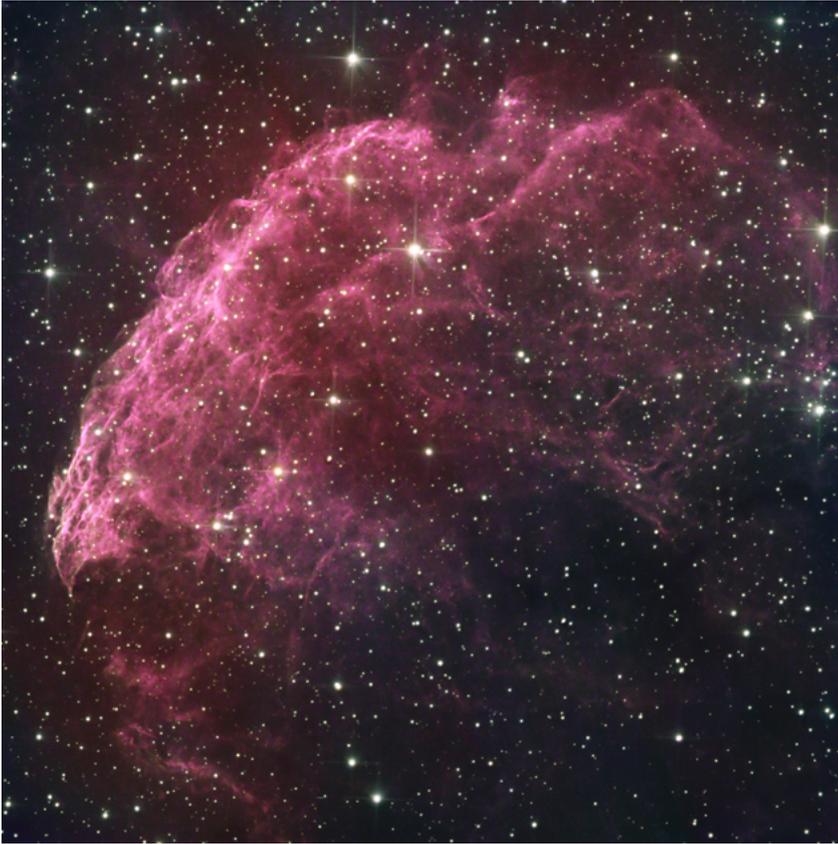


Lower right: The Rosette Nebula. Shot from my backyard in Tremonton with about six hours of integration time. I used a Sky-Watcher Star Adventure 2i Pro with guiding in RA, a TPO 180 triplet refractor, and the Optolong L-extreme filter. I processed this in DeepSkyStacker and Photoshop.



ASTROPHOTOGRAPHY GALLERY

Recent Images by Club Members



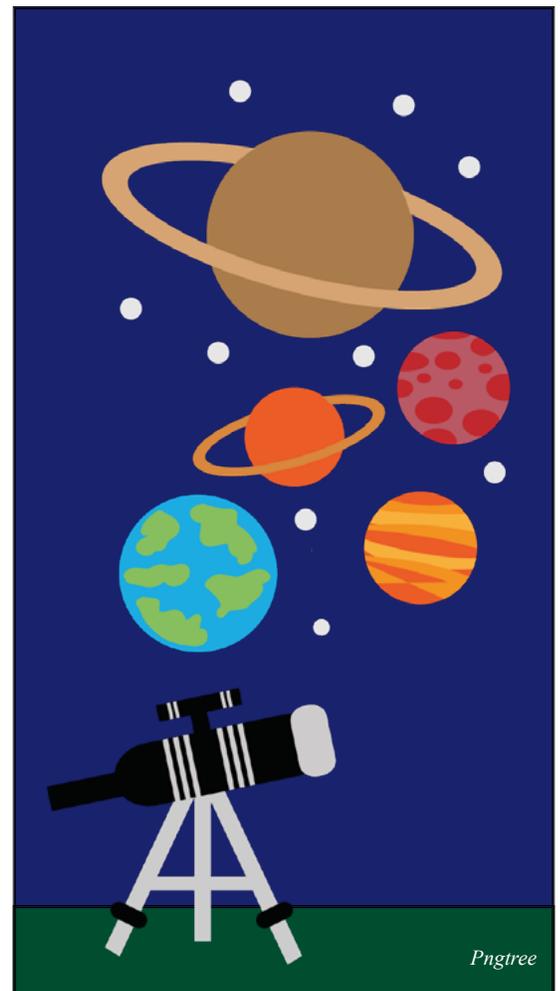
Dean L.

The equipment I used are: an 8-inch f/5 Newtonian scope, a Player One Saturn-M camera, and a Celestron CGE mount. All images were processed with Pixinsight.

Upper left, p. 14: The image of the Jellyfish Nebula (LC 443) was taken with 12 hours of exposure.

Lower left, p. 14: The image of the Horsehead Nebula was taken with one hour of exposure.

Upper left, p. 15: The Sunflower Galaxy (M63) was taken with four hours of exposure.



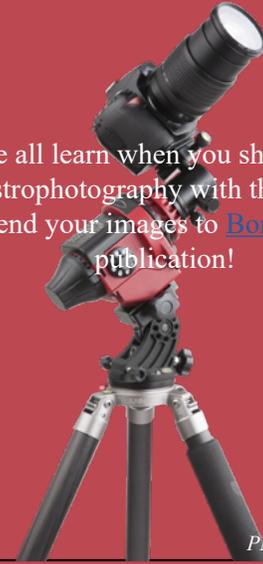
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PNGEgg

SHOW-AND-TELL

by Paul Yamaguchi

Because of the bad weather, I didn't get to show this at the January meeting. This is my new telescope. It's a Celestron 130 Sky Prodigy. This should make finding objects faster during a star party. It is self-aligning by using a StarSense camera. The C8 telescope has a new finder scope.

Image courtesy of the author.

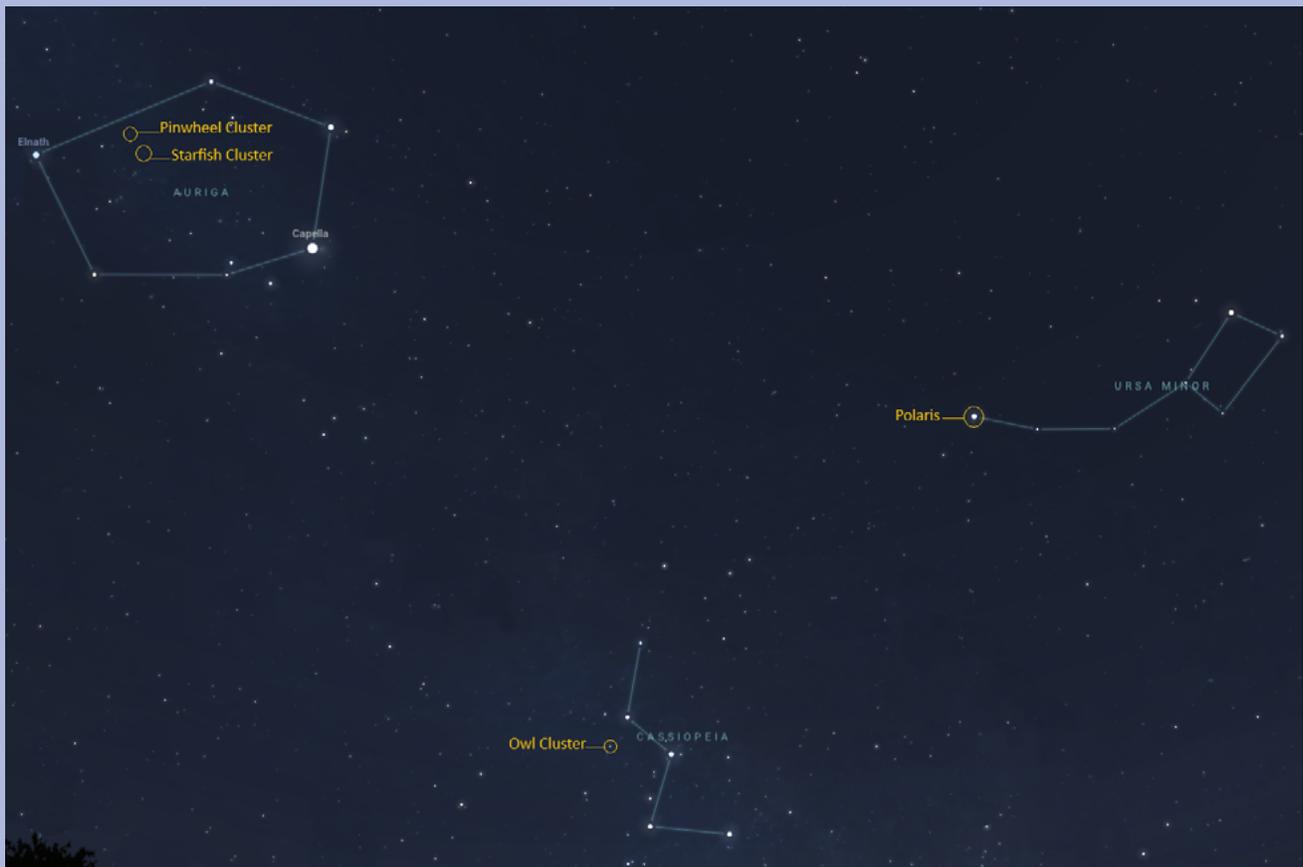


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CONSTANT COMPANIONS: CIRCUMPOLAR CONSTELLATIONS, PART I

by Kat Troche

Winter in the northern hemisphere offers crisp, clear (and cold!) nights to stargazers, along with better views of several circumpolar constellations. What does circumpolar mean when referring to constellations? This word refers to constellations that surround the north and south celestial poles without ever falling below the horizon. Depending on your latitude, you will be able to see up to nine circumpolar constellations in the northern hemisphere. Today, we'll focus on three that have gems within: Auriga, Cassiopeia, and Ursa Minor. These objects can all be spotted with a pair of binoculars or a small- to medium-sized telescope.

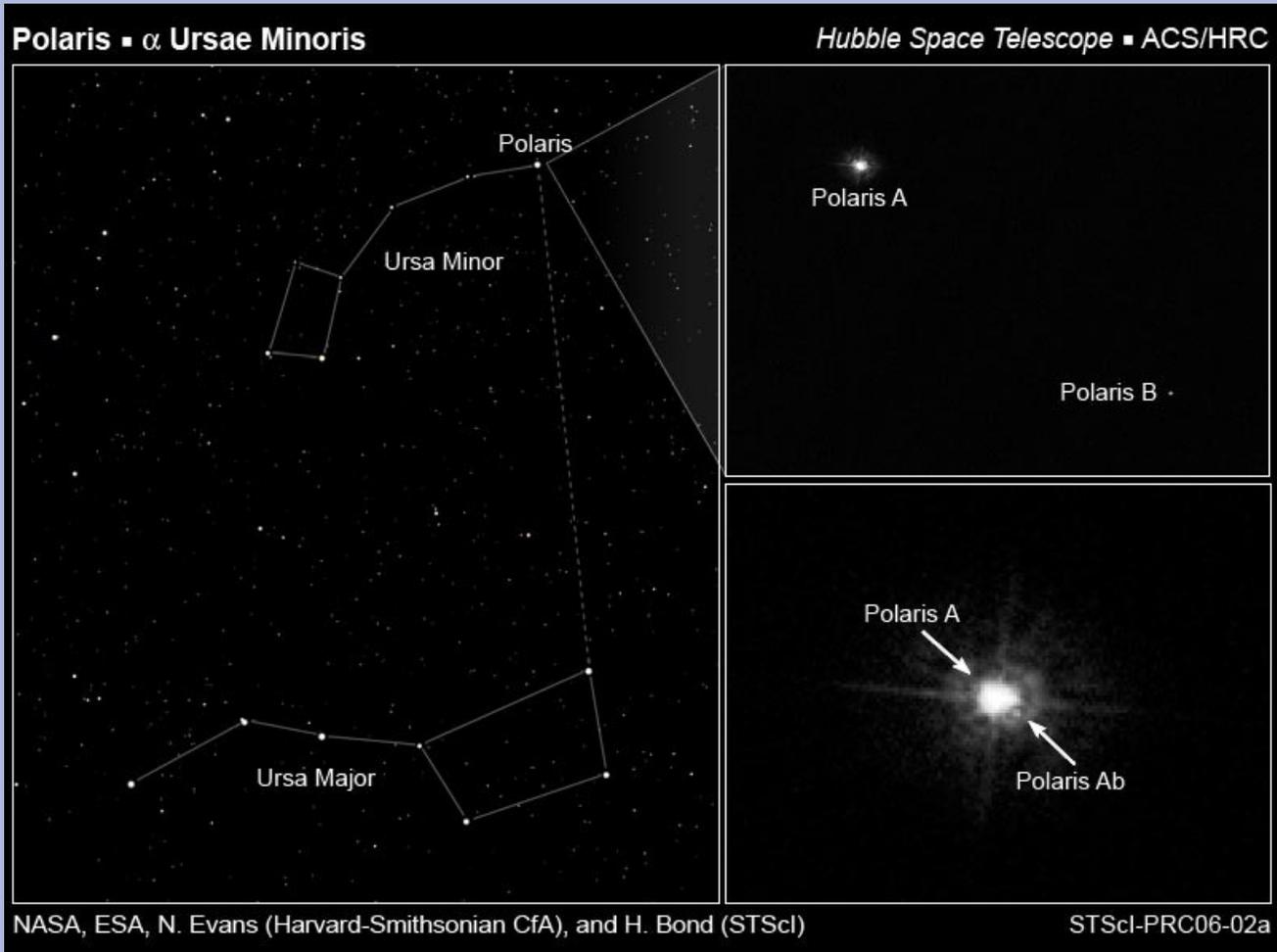


The counterclockwise circumpolar constellations Auriga, Cassiopeia, and Ursa Minor in the night sky, with four objects circled in yellow labeled: Pinwheel Cluster, Starfish Cluster, Owl Cluster, and Polaris. Image courtesy of Stellarium Web.

- The Pinwheel Cluster: Located near the edge of Auriga, this open star cluster is easy to spot with a pair of binoculars or small telescope. At just 25 million years old, it contains no red giant stars and looks similar to the Pleiades. To find this, draw a line between the stars Elnath in Taurus and Menkalinan in Auriga. You will also find the Starfish Cluster nearby.
- The Owl Cluster: Located in the 'W' or 'M' shaped constellation Cassiopeia, is the open star cluster known as the Owl Cluster. Sometimes referred to as the E.T. Cluster or Dragonfly Cluster, this group of stars never sets below the horizon and can be spotted with binoculars or a small telescope.

cont'd on p. 17

Circumpolar, cont'd from p. 16



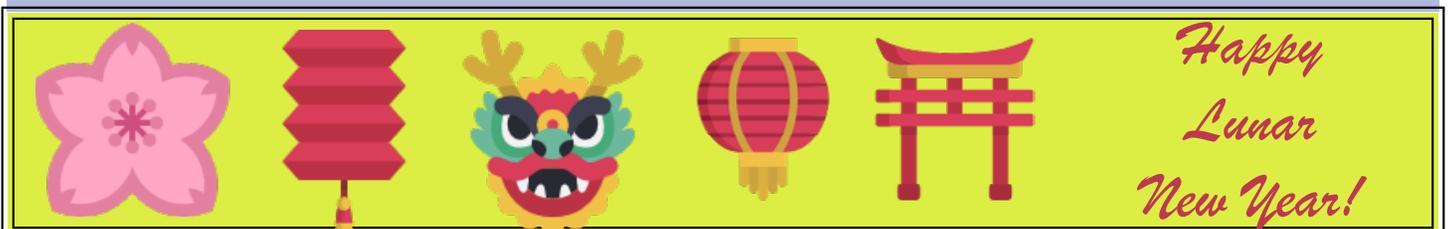
A black and white image from the Hubble Telescope of the Polaris star system, showing three stars: Polaris A, Ab, and Polaris B. Image courtesy of NASA, ESA, N. Evans (Harvard-Smithsonian CfA), and H. Bond (STScI).

- Polaris: Did you know that [Polaris is a triple star system?](#) Look for the North Star on the edge of Ursa Minor, and with a medium-sized telescope, you should be able to separate two of the three stars. This star is also known as a [Cepheid variable star](#), meaning that it varies in brightness, temperature and diameter. It's the closest one of its kind to Earth, making it a great target for study and [conceptual art](#).



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A LITTLE ASTRONOMY HUMOR



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