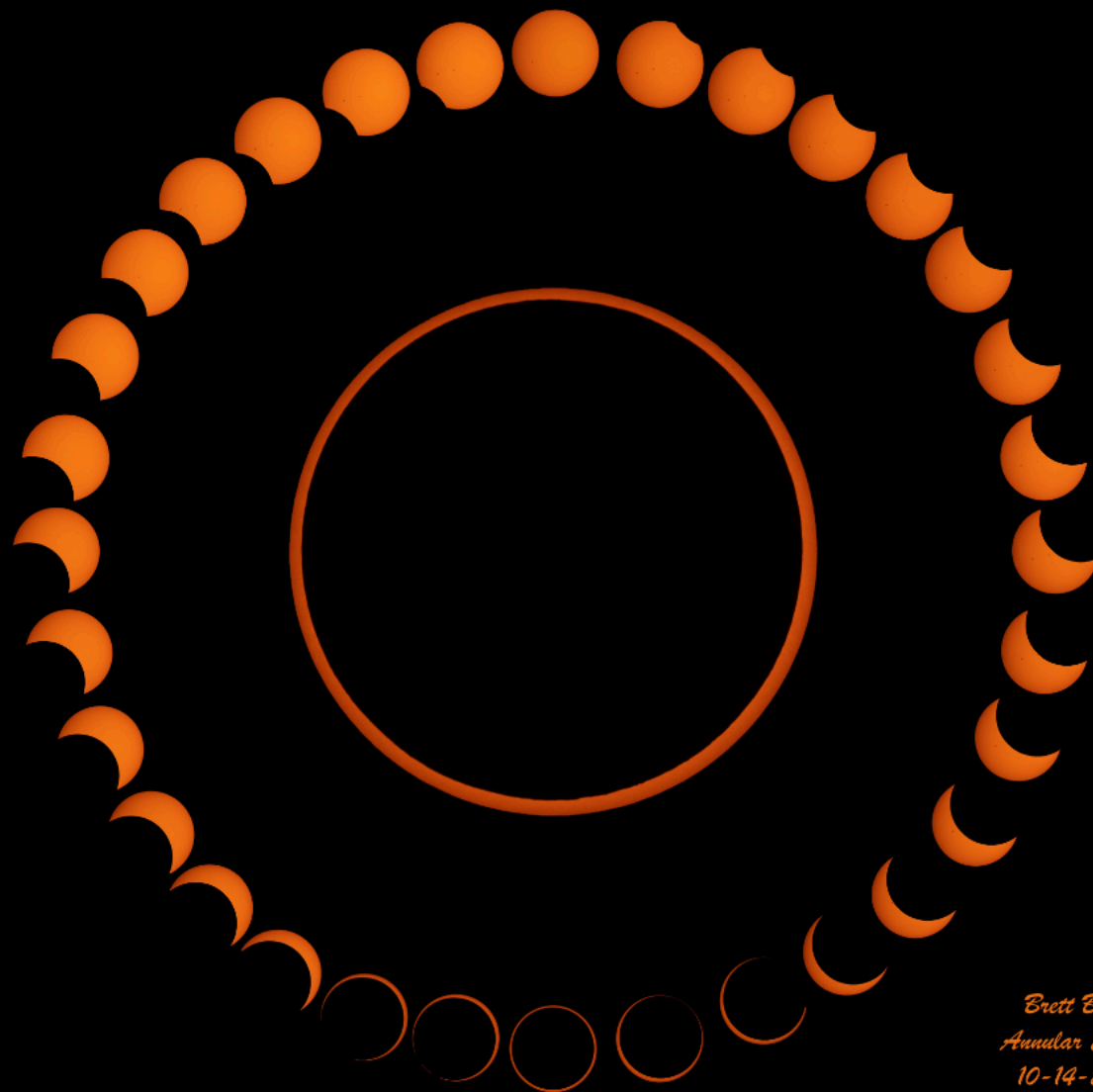


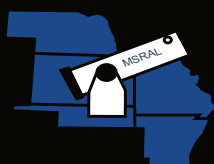
The Prairie Astronomer

November 2023 Volume 64, Issue #11



*Brett Boller
Annular Eclipse
10-14-2023
Odessa, Texas*

IN THIS ISSUE: The Crab Nebula as Seen by JWST
Boller-Sivill Observatory Update



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer



The next meeting is November 28th at 7:30pm at Hyde Observatory

NEXT MEETING AND PROGRAM

The accelerating expanding universe: Dark Matter, Dark Energy and Einstein's Cosmological Constant

Dark energy is the leading candidate for the mechanism that is responsible for causing the cosmological expansion to accelerate. Bharat Ratra will describe the astronomical data which persuade cosmologists that (as yet undetected) dark energy and dark matter are by far the main components of the energy budget of the universe at the present time. He will review how these observations have led to

UPCOMING PROGRAMS

December: Holiday Gathering

the development of a quantitative "standard" model of cosmology that describes the evolution of the universe from an early epoch of inflation to the complex hierarchy of structure seen today. In this non-technical talk, he will also discuss the basic physics, and the history of ideas, on which this model is based.

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Cover: Annular Solar Eclipse on October 14, 2023 by Brett Boller



CALENDAR



Lincoln Parks & Recreation

Most of our club meetings are held at Hyde Memorial Observatory in Holmes Park.

The Observatory is owned and maintained by the City of Lincoln Parks and Recreation Department, but is operated by volunteers, many of whom are also members of the Prairie Astronomy Club.

PAC Meeting
 Tuesday, November 28th, 7:30pm at Hyde Observatory
 Program: *Bahrat Ratra: The Accelerating Expanding Universe*

Holiday Gathering, December 19th at 7:00pm,
location to be announced.

PAC Meeting
 Tuesday, January 30th, 7:30pm at Hyde Observatory

<https://www.prairieastronomyclub.org/event-calendar/>



www.prairieastronomyclub.org

2024 STAR PARTY DATES

	Date	Date
January	5	12
February	2	9
March	1	8
April	3/29	5
May	4/26	3
June	5/31	7
July	6/28	5
NSP	7/28	8/2
August	7/26	2
September	8/30	6
October	9/26	4
November	11/22	29
December	20	27

Dates in **BOLD** are closest to the New Moon.

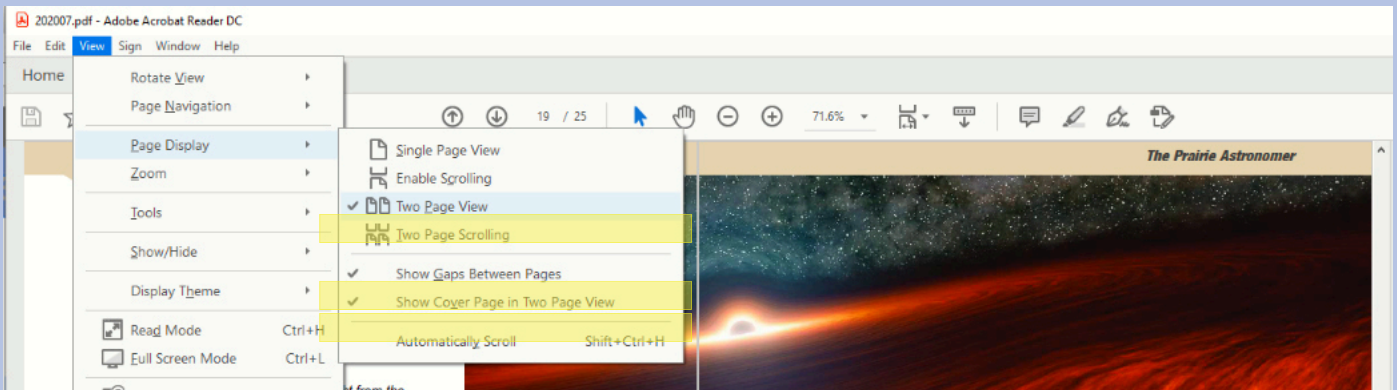
CLUB OFFICERS

President	Jason O’Flaherty jflaher@gmail.com
Vice President	Brett Boller proboller86@yahoo.com
2nd VP (Program Chair)	Bill Lohrberg wmlohrberg89@gmail.com
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Outreach Coordinator	Christine Parkyn cpparkyn@gmail.com
Website and Newsletter Editor	Mark Dahmke mark@dahmke.com

Notices

Newsletter Page View Format

How to Adjust Adobe Acrobat Settings for Two Page View



To view this newsletter in magazine spread format in Acrobat, select View ->Page Display->Two Page View. Acrobat will then show two pages side by side. Also make sure the checkboxes “Show Cover Page in Two Page View” and “Show Gaps Between Pages” are checked. If you have it setup correctly, the cover page will be displayed by itself and subsequent pages will be side by side with the odd numbered pages on the left.

PAC Newsletter Archive

Back issues of the *Prairie Astronomer* from 1962 to present are available online:
<https://newsletters.prairieastronomyclub.org/>

Pay Dues Online

<https://www.prairieastronomyclub.org/pay-dues-online/>

If you're already a member and are renewing within 30 days of your anniversary date, select the early renewal option for a discount.

PAC-LIST

Subscribe through [GoogleGroups](#) or contact Mark Dahmke to be added to the list. You'll need a Google/gmail account, but if you want to use a different email address, just associate that address with your google account to access Google Groups. Once subscribed, you can view message history through the GoogleGroups website.

To post messages to the list, send to this address: pac-list@googlegroups.com

The President's Message

Jason O'Flaherty

Dear PAC Members,

I am honored to address you once again as the president of our beloved Prairie Astronomy Club for a second term. Your support is humbling, and I am glad to continue serving you.

I hope this letter finds you in good health and high spirits. Thanks to everyone who attended our October meeting at the Branched Oak Observatory. It was great to witness such a remarkable turnout—it was one of the largest gatherings of club members I've ever seen. A special thank you goes to the volunteers who shared their time and expertise, guiding us through the buildings and equipment.

In the spirit of education and outreach, I regret to inform you that we won't be hosting our "How to Buy a Telescope" class this year. However, please visit our club's YouTube page, where last year's class is available to

rewatch for free. Please share this resource with friends, family, or anyone interested in telescopes.

Looking ahead, mark your calendars for our upcoming club meeting on Tuesday, November 28th. We will be voting to enact new club by-laws, a big step in shaping the future of PAC. To make the vote binding, we need a minimum of 24 members in attendance in person. Additionally, we will welcome Bharat Ratra, who will present live on the intriguing topics of dark energy and matter.

As we anticipate the holiday season, please note that our December meeting is set for Tuesday, December 19th, at 7:00 p.m. for our annual Holiday Party. I'm still finalizing the location. Due to our club's growth, many venues are requesting we do a catered meal instead of off-the-menu ordering. Save the date and watch your email for an official invitation with the confirmed



location details. We hope you and a guest can join us for this fun event.

As we approach the Thanksgiving season, I want to take a moment and express my gratitude to all of you. The sense of community and shared passion for astronomy make PAC truly special. Wishing you all a happy holiday filled with warmth, joy, and celestial wonders.

Clear skies and warm wishes,

Jason O'Flaherty

ARP 61

The Mantrap Skies Image Catalog

Arp 61/UGC 3104 falls under Arp's category for spiral galaxies with high contrast companions on an arm. It is located in the constellation of Eridanus. While redshift puts the main galaxy at about 440 million light-years there's no redshift measurement for the companion that I could find. So there's no way to tell for sure that it a companion though it appears likely. Many other galaxies in the image have approximately the same redshift. All are labeled with the catalog name and distance indicated by the redshift in the annotated image. If they are all members of the same group, as appears likely, most of the distance differences are likely due to motions of the various galaxy as they orbit around the group's center of gravity. The apparently nearby MCG +00-12-053 has no redshift data I could find. I assume it is part of the group. UGC 3105 to the east appears to be the most massive galaxy in the group. Its redshift distance is 400 million light-years. Being so massive it likely is rather near the core distance of the group. It is classed as S0-. Arp 61 is Sa.



Rick Johnson

Rick Johnson, a founding member of the Prairie Astronomy Club, passed away in January, 2019. His legacy lives on through his comprehensive catalog of over 1600 images at www.mantrapskies.com.



Meeting Minutes

Jim White

10-24-2023

Tonight's meeting is being held at the newly opened Kunkel Family Multipurpose Center at Branched Oak Observatory.

Jason O'Flaherty started tonight's meeting at 7:31 p.m. We had a few newer members in attendance and a couple of guests. We had a full house for tonight's meeting, at the time of writing this I am not sure of the total number of attendees in person or how many people we had join via Zoom.

At 7:31 p.m. Jason turned over the meeting to Jim Kvasnicka, PAC's Observing Chair Person, for his monthly observing report. November's club star parties are scheduled for November 3rd and 10th at the Clatonia Recreation Area located approximately 1 ½ miles north of Clatonia NE. The Leonid's meteor shower will peak the night of November 17th and 18th and you can expect 15 meteors per hour and the moon

will not be up to interfere. Jim's complete monthly observing report can be found in the newsletter.

At 7:37 p.m. Jim concluded his observing report and turned the meeting back over to Jason. Jason then asked John Reinert for his treasurer's report. The most expeditious way to join the club or renew your dues is to go to the club's website at <https://www.prairieastronomyclub.org/pay-dues-online/> but if you prefer to pay in person John is more than happy to oblige. The club accounts have not changed much since the last report and the club checking account currently has \$1,514.48. John's report finished up at 7:38 p.m. and the meeting was turned back over to Jason.

Tonight is election night for club officers. Jason asked the membership if there were any other new nominations for officers before we close nominations and there were none. Jason asked

if someone would make a motion to close nominations and the motion was made and seconded and the club membership voted unanimously by voice vote to approve the motion. We then moved directly into elections. Jason O'Flaherty was re-elected to the office of President by unanimous voice vote. Brett Boller was re-elected to the office Vice President by Unanimous voice vote. Bill Lohrberg was re-elected to the office of Second Vice President by unanimous voice vote. Jim White was re-elected to the office of Secretary by unanimous voice vote. John Reinert was re-elected to the office of Treasurer by unanimous voice vote. Elections were finalized and closed.

Tonight's next item of business for the club is a review of proposed changes to the clubs' bylaws. The clubs' bylaws were published in the previous months' newsletter with the exception of the last

Meeting Minutes, continued.

page which got missed. Jason's plan is to briefly go over the bylaws section by section and explain any changes or additions and briefly cover why these areas were changed or added. At the end of each section he will take questions or suggestions that members may have about the section. The bylaws were originally reviewed by the Bylaws Committee which then made changes and additions to the document and then presented it to the PAC Board for their review. After feedback from the PAC Board the document was discussed and revised again by the Bylaws Committee and has now been presented to the membership for review and discussion so that the document can ultimately be voted on by the club membership at our November monthly meeting.

The first section gives the name of the club and states that it is a nonprofit organization under the laws of the state of Nebraska.

The second section is to explain the Purpose of the club.

The third section is a Definitions section just to define some terms or phrases used in the document.

The fourth section is the Classes of Membership available in the club.

The fifth section is on Procedures.

The sixth section is on Debts and Obligations.

The seventh section is on Board of Directors.

The eighth section is on Election of Officers.

The ninth section is on Duties of the Elected Officers.

The tenth section is on Duties of Non-Elected Officers.

The eleventh section is on Meetings.

The twelfth section is on Voting.

The thirteenth section is on the Rights of Members.

The fourteenth section is on Resignation and Termination.

The fifteenth section is on Dues.

The sixteenth section is on Audit.

The seventeenth section is on Newsletter.

The eighteenth section is on Data Security and Continuity.

The nineteenth section is on Data Retention Policy.

The twentieth section is on Dissolution.

There were several brief discussions at the end of a few sections. Everything thing seemed well organized and there were a couple of items brought up that needed to be modified or reworded to make things clearer. Look forward to an updated version in your email.

Please plan on attending the November meeting if you are able as we need 2/3 majority of a

Meeting Minutes, continued.

quorum, which as of last months' membership roll, requires that we need 27 voting members to be able to vote to approve the new bylaws.

We normally do our "How to buy a telescope" program at our November meeting so we need to decide if we are still going to do that or if we are going to

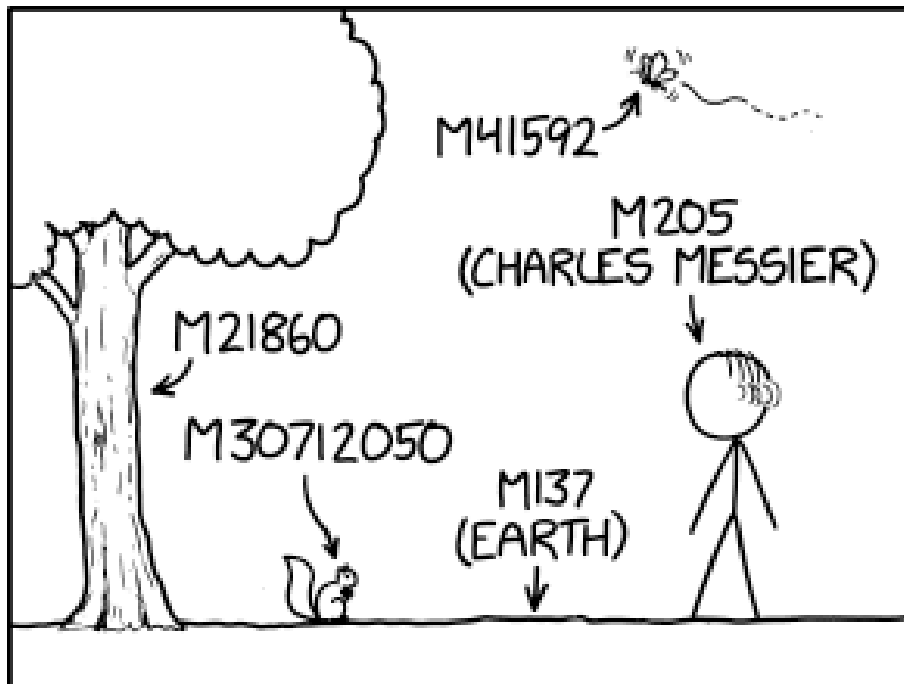
try to schedule it for another time. Last year we did try having it on a Sunday afternoon in person at Hyde and also streaming live online and it turned out to be a lesson in maybe what not to do. We had no in person attendance and only had a few people view it online. There was a discussion about possibly doing it on a weeknight or on a

Saturday evening at Hyde before public viewing begins, the latter would require approval by the Hyde Board.

Tonight's meeting adjourned at 8:12 p.m.

Tonight's program is a "Tour of BOO"! (Branched Oak Observatory).

Messier Objects

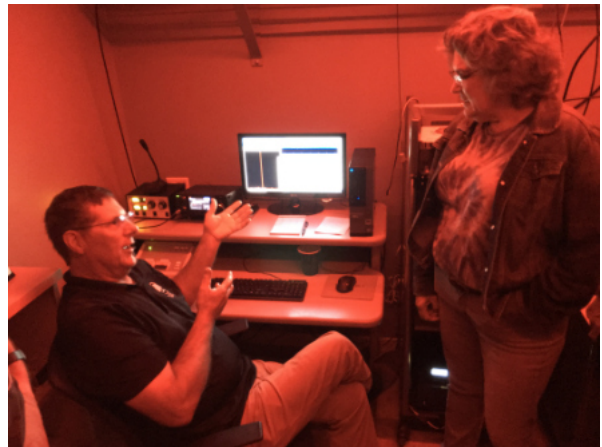


PEOPLE USUALLY FOCUS ON THE FIRST 110, BUT THE MESSIER CATALOG ACTUALLY INCLUDES ALL OBJECTS.

October Meeting at Branched Oak Observatory



The October meeting was held at Branched Oak Observatory. Pizza was served and we got a tour of the new meeting room and facilities including the radio astronomy observatory.



December Observing

Jim Kvasnicka



This is a partial list of objects visible for the upcoming month.

Planets

Venus: Bright morning planet at magnitude -4.1.

Mercury: Visible one hour before sunrise, low in the southeast.

Mars: Too close to the Sun to be seen.

Jupiter: In Aries at magnitude -2.8 with a disc 48.0" wide.

Saturn: In Aquarius at magnitude +0.9 with a disc 16.9" wide.

Uranus and Neptune: In Aries and Aquarius.

Meteor Showers

Geminids: Peaks the night of December 13-14 with no interference from the Moon. Expect more than 100 per hour from dark sky sites.

Messier List

M2: Class II globular cluster in Aquarius.

M15: Class IV globular cluster in Pegasus.

M29: Open cluster in Cygnus.

M31: The Andromeda Galaxy.

M32/M110: Companion galaxies to M31.

M39: Open cluster in Cygnus.

Last Month: M27, M30, M56, M57, M71, M72, M73

Next Month: M33, M34, M52, M74, M76, M77, M103

NGC and other Deep Sky Objects

NGC 578: Elongated galaxy in Cetus.

NGC 779: Elongated galaxy in Cetus.

NGC 869/884: The Double Cluster in Perseus.

NGC 972: Galaxy in Aries.

NGC 1187: Galaxy in Eridanus.

Double Star Program List

Eta Cassiopeiae: Yellow primary with a rose-colored secondary.

Sigma Cassiopeiae: Yellow and light blue stars.

Theta Aurigae: Bright white and pale blue pair.

1 Camelopardalis: White and pale blue stars.

32 Camelopardalis: Equal white pair.

Gamma Ceti: White primary with a pale-yellow secondary.

Chi Tauri: White primary with a pale blue secondary.

118 Tauri: White and yellow stars.

Challenge Object

NGC 697 Galaxy Group: Group of six galaxies in Aries that include NGC 678, NGC 680, NGC 691, NGC 694, NGC 695, and NGC 697.

Focus on Observing Programs

Jim Kvasnicka

Comet Observing Program

This month we focus on the Comet Observing Program. To some astronomers there are no more wondrous and beautiful objects as comets. Since the invention of the telescope astronomers have searched the skies for new comets.

Comets are invisible except when they are near the Sun. When they are near the Sun and active, comets have several distinct parts:

- **Nucleus:** Relatively solid and stable, mostly ice and gas with a small amount of dust and other solids.
- **Coma:** Dense cloud of water, carbon dioxide and other gases sublimed from the nucleus.
- **Dust Tail:** Up to 10 million km long. Made up of dust particles driven off the nucleus by escaping gases.
- **Ion Tail:** As much as several hundred million km long. Made up of plasma and laced with rays and streamers caused by interaction with solar wind.

There are two levels of recognition for the Comet Observing Program.

Silver Level

- Observe at least 12 different comets.
- Two of the comets can be observed prior to January 1, 2001.

Gold Level

- Observe at least 18 additional comets.
- Two of the comets can be observed prior to January 1, 2001.

Your observations should include the standard information: your name, date and time, comet name, size of your telescope, location, observing notes, a sketch or image of the comet.

When you complete the Comet Observing Program you will need to submit a copy of your observing logs to me for review. If your logs are accurate and complete I will submit your name to the Comet Observing Program chair for approval. The chair will mail to me your certificate and pin which I will present to you at the next monthly PAC meeting.

If you have any questions regarding the Comet Observing Program or any other observing program, or need help getting started please contact me and I will be glad to help.

The Crab Nebula Seen in New Light by NASA's Webb

NASA's James Webb Space Telescope has gazed at the Crab Nebula, a supernova remnant located 6,500 light-years away in the constellation Taurus. Since the recording of this energetic event in 1054 C.E. by 11th-century astronomers, the Crab Nebula has continued to draw attention and additional study as scientists seek to understand the conditions, behavior, and after-effects of supernovae through thorough study of the Crab, a relatively nearby example.

Using Webb's NIRCam (Near-Infrared Camera) and MIRI (Mid-Infrared Instrument), a team led by Tea Temim at Princeton University is searching for answers about the Crab Nebula's origins.

"Webb's sensitivity and spatial resolution allow us to accurately determine the composition of the ejected material, particularly the content

of iron and nickel, which may reveal what type of explosion produced the Crab Nebula," explained Temim.

At first glance, the general shape of the supernova remnant is similar to the optical wavelength image released in 2005 from NASA's Hubble Space Telescope: In Webb's infrared observation, a crisp, cage-like structure of fluffy gaseous filaments is shown in red-orange. However, in the central regions, emission from dust grains (yellow-white and green) is mapped out by Webb for the first time.

Additional aspects of the inner workings of the Crab Nebula become more prominent and are seen in greater detail in the infrared light captured by Webb. In particular, Webb highlights what is known as synchrotron radiation: emission produced from charged particles, like electrons, moving around

magnetic field lines at relativistic speeds. The radiation appears here as milky smoke-like material throughout the majority of the Crab Nebula's interior.

This feature is a product of the nebula's pulsar, a rapidly rotating neutron star. The pulsar's strong magnetic field accelerates particles to extremely high speeds and causes them to emit radiation as they wind around magnetic field lines. Though emitted across the electromagnetic spectrum, the synchrotron radiation is seen in unprecedented detail with Webb's NIRCam instrument.

To locate the Crab Nebula's pulsar heart, trace the wisps that follow a circular ripple-like pattern in the middle to the bright white dot in the center. Farther out from the core, follow the thin white ribbons of the radiation. The curvy wisps are closely grouped together, outlining the structure

Crab Nebula, continued.



Webb's NIRCam (Near-Infrared Camera) and MIRI (Mid-Infrared Instrument) reveal new details of the Crab Nebula in infrared, including different chemical elements (represented in red-orange and blue), dust (yellow-white and green), and light created by accelerated particles (white). [Download the full-resolution image here.](#)

Credit: NASA, ESA, CSA, STScI, T. Temim (Princeton University)

Crab Nebula, continued.

of the pulsar's magnetic field, which sculpts and shapes the nebula.

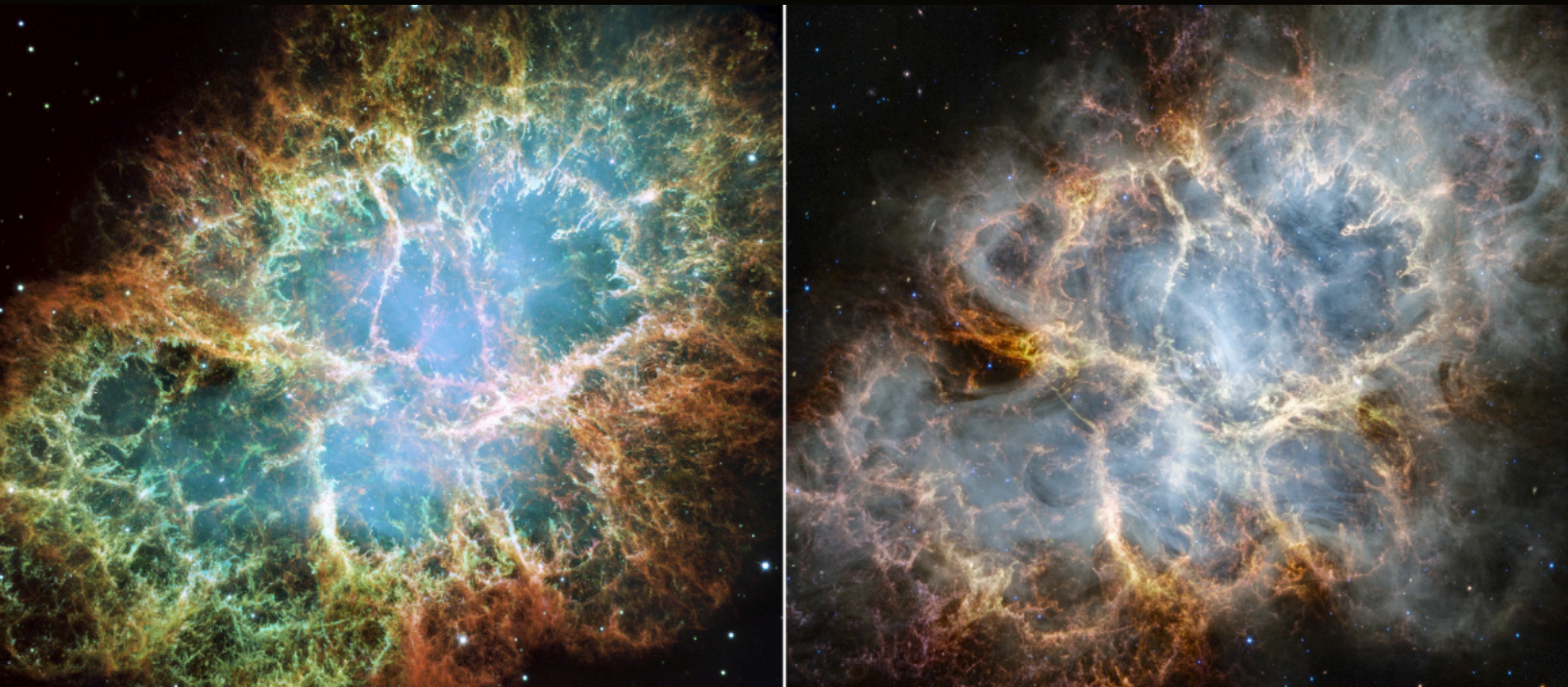
At center left and right, the white material curves sharply inward from the filamentary dust cage's edges and goes toward the neutron star's location, as if the waist of the nebula is pinched. This abrupt slimming may be caused by the confinement of the supernova wind's expansion by a belt of

dense gas.

The wind produced by the pulsar heart continues to push the shell of gas and dust outward at a rapid pace. Among the remnant's interior, yellow-white and green mottled filaments form large-scale loop-like structures, which represent areas where dust grains reside.

The search for answers

about the Crab Nebula's past continues as astronomers further analyze the Webb data and consult previous observations of the remnant taken by other telescopes. Scientists will have newer Hubble data to review within the next year or so from the telescope's reimaging of the supernova remnant. This will mark Hubble's first look at emission lines from the Crab



Different details of the Crab Nebula are revealed when viewed by the Hubble Space Telescope in optical light, left, and by Webb in infrared, right. Multiple wavelengths provide astronomers with a more comprehensive understanding of this supernova remnant. [Download the full-resolution image here.](#)

Credit: Hubble Image: NASA, ESA, J. Hester, A. Loll (Arizona State University); Webb Image: NASA, ESA, CSA, STScI, T. Temim (Princeton University).

Crab Nebula, continued.

Nebula in over 20 years, and will enable astronomers to more accurately compare Webb and Hubble's findings.

NASA's Universe of Learning

Want to learn more? Through NASA's Universe of Learning, part of NASA's Science Activation program, explore images of the Crab Nebula from other telescopes, a 3D visualization, data sonification, and hands-on activities. These resources and more information about supernova remnants and star lifecycles can be found at NASA's Universe of Learning.

NASA's Universe of Learning materials are based upon work supported by NASA under cooperative agreement award number NNX16AC65A to the Space Telescope Science Institute, working in partnership with Caltech/IPAC, Center for Astrophysics | Harvard & Smithsonian, and Jet Propulsion Laboratory.

More About the Mission

The James Webb Space Telescope is the world's premier space science observatory. Webb is solving mysteries in our solar system, looking beyond to distant worlds around other stars, and probing the mysterious structures and origins of our universe and our place in it. Webb is an international program led by NASA with its partners, ESA (European Space Agency) and CSA (Canadian Space Agency).

MIRI was developed through a 50-50 partnership between NASA and ESA. NASA's Jet Propulsion Laboratory led the U.S. efforts for MIRI, and a multinational consortium of European astronomical institutes contributes for ESA. George Rieke with the University of Arizona is the MIRI science team lead. Gillian Wright is the MIRI European principal investigator.

The MIRI cryocooler

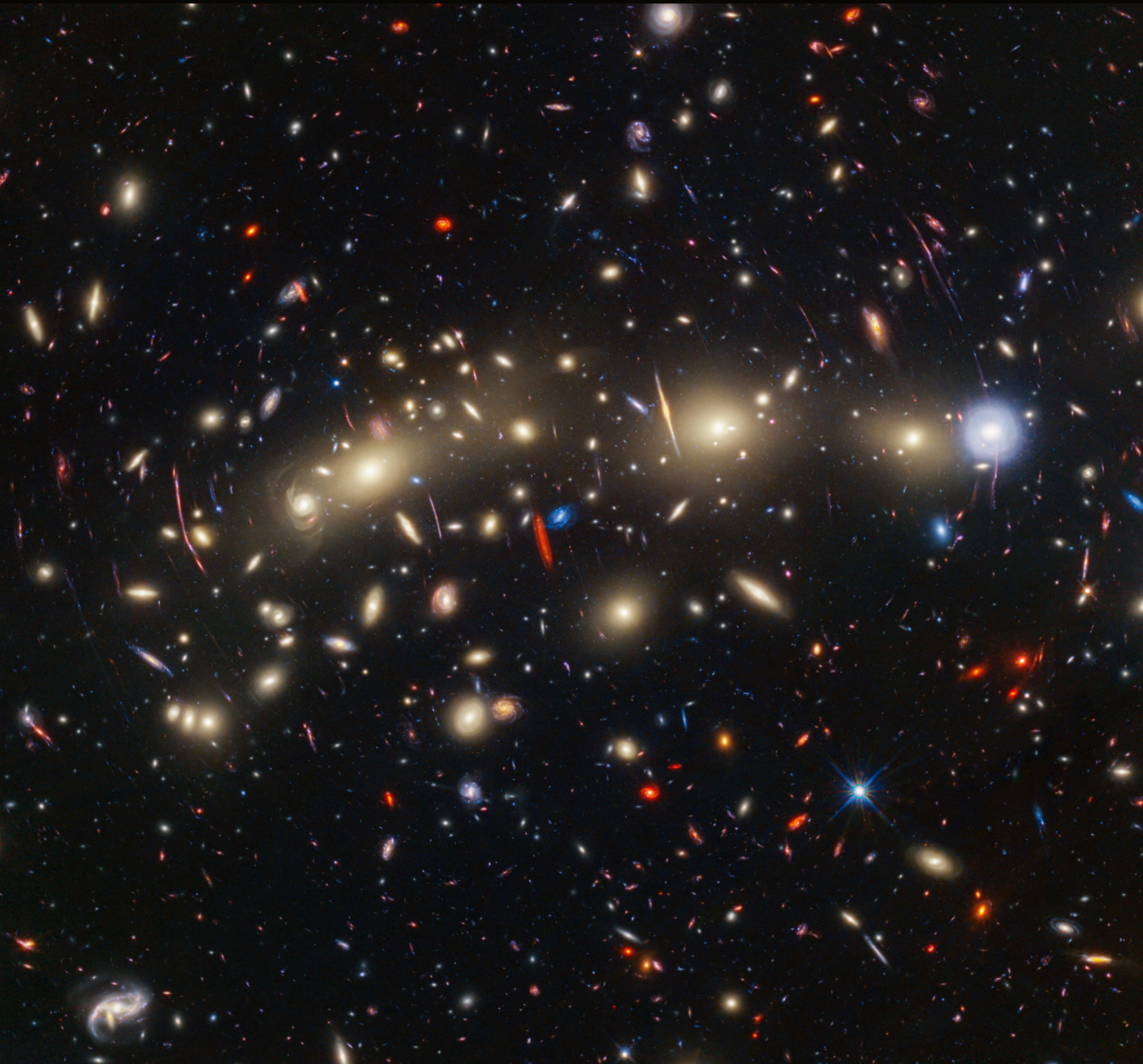
development was led and managed by JPL, in collaboration with Northrop Grumman in Redondo Beach, California, and NASA's Goddard Space Flight Center in Greenbelt, Maryland.

To learn more about Webb, go here:

<https://webbtelescope.org/home>

Webb, Hubble Combine to Create Most Colorful View of Universe

This panchromatic view of galaxy cluster MACS0416 was created by combining infrared observations from NASA's James Webb Space Telescope with visible-light data from NASA's Hubble Space Telescope. Credit: NASA, ESA, CSA, STScI, Jose M. Diego (IFCA), Jordan C. J. D'Silva (UWA), Anton M. Koekemoer (STScI), Jake Summers (ASU), Rogier Windhorst (ASU), Haojing Yan (University of Missouri)



Webb, Hubble, continued.

Webb and Hubble have brought you one of the most colorful and comprehensive views of the universe ever taken. This image showcases MACS0416, a gigantic galaxy cluster located about 4.3 billion light-years from Earth.

Colors were mapped to different wavelengths of light. Galaxies colored blue are relatively nearby and full of intense star formation, as best detected in visible light by Hubble. Galaxies colored red are typically farther or dustier, as best detected with Webb's infrared vision.

One object stood out in this field: a monstrously bright star nicknamed "Mothra," located in a galaxy that existed 3 billion years after the big bang. This star has been magnified by the gravity of the galaxy cluster – plus a mystery object – by a factor of at least 4,000 times! This panchromatic view of galaxy cluster MACS0416 was created by combining infrared

observations from NASA's James Webb Space Telescope with visible-light data from NASA's Hubble Space Telescope. The resulting wavelength coverage, from 0.4 to 5 microns, reveals a vivid landscape of galaxies whose colors give clues to galaxy distances: The bluest galaxies are relatively nearby and often show intense star formation, as best detected by Hubble, while the redder galaxies tend to be more distant, or else contain copious amount of dust, as detected by Webb. The image reveals a wealth of details that are only possible to capture by combining the power of both space telescopes. In this image, blue represents data at wavelengths of 0.435 and 0.606 microns (Hubble filters F435W and F606W); cyan is 0.814, 0.9, and 1.05 microns (Hubble filters F814W, and F105W and Webb filter F090W); green is 1.15, 1.25, 1.4, 1.5, and 1.6 microns (Hubble filters F125W, F140W, and

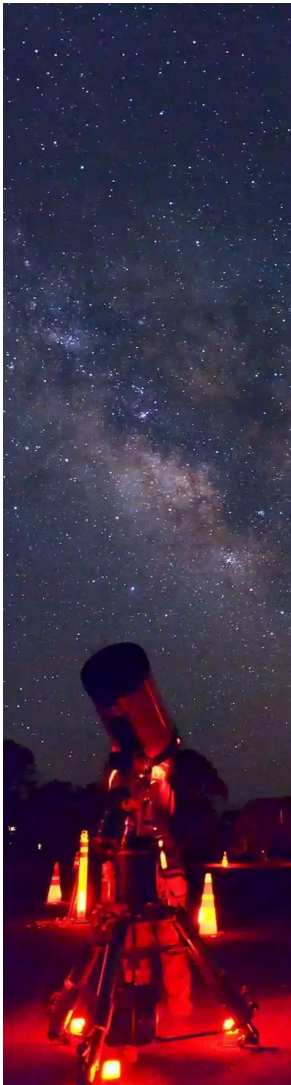
F160W, and Webb filters F115W and F150W); yellow is 2.00 and 2.77 microns (Webb filters F200W, and F277W); orange is 3.56 microns (Webb filter F356W); and red represents data at 4.1 and 4.44 microns (Webb filters F410M and F444W).

[Learn more here...](#)



Introduction to *Amateur Astronomy*

Stargazing is easy, and astronomy is something anyone can do and enjoy. You just have to get started off on the right foot. Starting out wrong can lead to disappointment, frustration, and wasted money. Starting out right can lead to a lifetime of celestial exploration and enjoyment. Today, the hobby of astronomy - the biggest and most mind-boggling branch of amateur nature study - is attracting more people than ever. The **Kalamazoo Astronomical Society** is happy to present a five-part lecture series that will help you become a star-hopping skymaster!



Part 1: Our Place Among the Infinities

January 13

For a long time, the stars were merely pinpoints of light on the black backdrop of the heavens. Before massive telescopes on mountaintops came along, all we could observe were the Sun, Moon, planets, their satellites, and the occasional comet. Today we know that those pinpoints of light are distant suns and that we live in a remote corner of one galaxy amongst billions. For our first presentation, we'll travel through our solar system, explore the star clusters and nebulae of our Milky Way Galaxy, and the countless other galaxies in this vast, infinite universe.

Part 2: Discovering the Night Sky

January 27

Is that a bright star or a planet? Where's the constellation Orion? Your first task as an amateur astronomer is to learn your way around the night sky. We'll show you how to find any star or constellation in the night sky with the use of a simple star map or planisphere. We'll also look at wealth of other celestial wonders you can observe with just your eyes alone.

Part 3: Binocular Basics

February 10

Every amateur astronomer, novice or advanced, should own at least one good pair of binoculars. They make an ideal first "telescope" because of their wide field of view, ease of use, portability, versatility, and low cost. Several types of binoculars are available, but which ones are best for astronomy? You'll be amazed at what you can see!

Part 4: Telescope Tutorial

February 24

Sooner or later, every amateur astronomer faces the decision of purchasing a first telescope. There are literally hundreds of choices today! What's the difference between a refractor and reflector? Which telescope is the right one for you? To make this daunting task easier, we'll compare several of the top telescopes available today and tell you which ones to avoid. We'll also look at the countless array of accessories available for your telescope.

Part 5: The Art of Astrophotography

March 9

Astrophotography is the art of photographing the night sky. Over the past two decades that art has undergone a revolution as digital cameras have overtaken their film counterparts. In some ways this has made the field more technical, but in many ways shooting the sky is easier than ever! We'll start with the basics like using a stationary photographic tripod and work our way up to imaging with sophisticated CCD or CMOS cameras. Constellation patterns, the Milky Way, the night-to-night motion of the planets, bright comets, northern lights, and perhaps a meteor all await you.

Time: 1:00 pm → 3:00 pm EST

Admission: FREE

Location: Online via Zoom

Registration: www.kasonline.org



Boller-Sivill Observatory Extension Update Brett Boller

Doug Buhrman and Brett Boller have been working non stop to get the new warm room control room and deck up against the weather as we have had such a nice stretch of no rain here recently. If you haven't been out to the Branched Oak

have more people in ear shot of the discussions going on around the scopes without being crammed in the observation area. It will also allow us to have some nice Adirondack chairs or zero G chairs out there for people to use.

As of 11/15 we have all but the North side tin up. We plan to have it up against the weather by this weekend and the Season's End Star Party on the 18th.



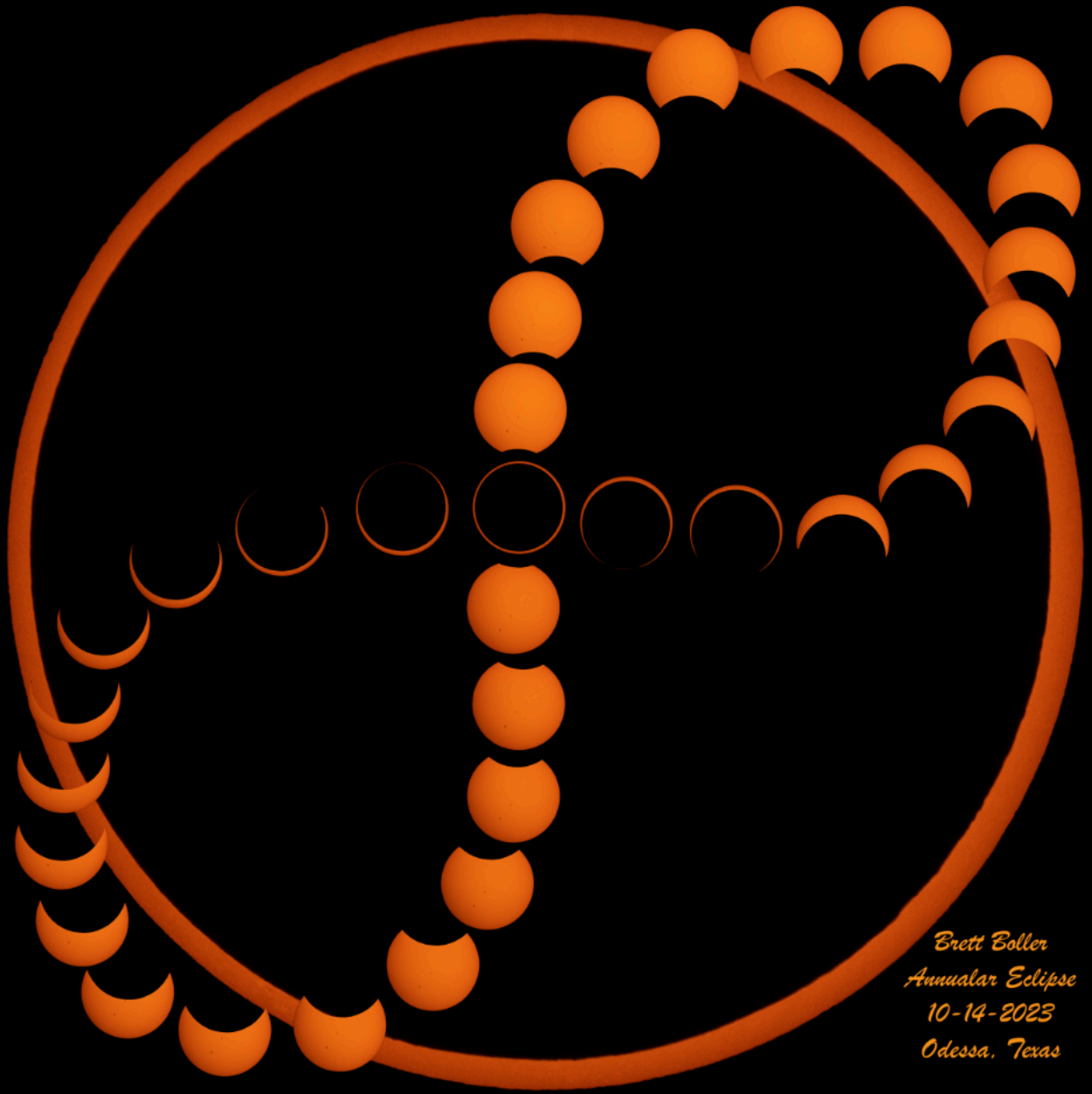
We will then as time allows start working on taking out the wall in between the two room to create the new room and get the interior finished. This can be done anytime during the off season. Looking forward to seeing you all out there in the future.

Observatory recently or even if you have it changes constantly and fast. This new addition will enable us to have more people in the observatory at any given point. It will allow wheel chair access with a soon to be built ramp. This might be pushed to spring if the weather changes on us though. The deck gives us the opportunity to

The new warm room will greatly expand the area where you can escape the cold weather and hopefully soon the warm weather with plans for a split inside to offer both heating and AC. Our current area is 8x12 feet that has a desktop, couch and file cabinets. Its a tight fit. The new space will be 12x20 feet. 2.6 times as much space.



Astrophotography



*Brett Boller
Annular Eclipse
10-14-2023
Odessa, Texas*



Astrophotography



Moon/Venus Conjunction, by Mark Dahmke

November 9, 2023, 5:18am

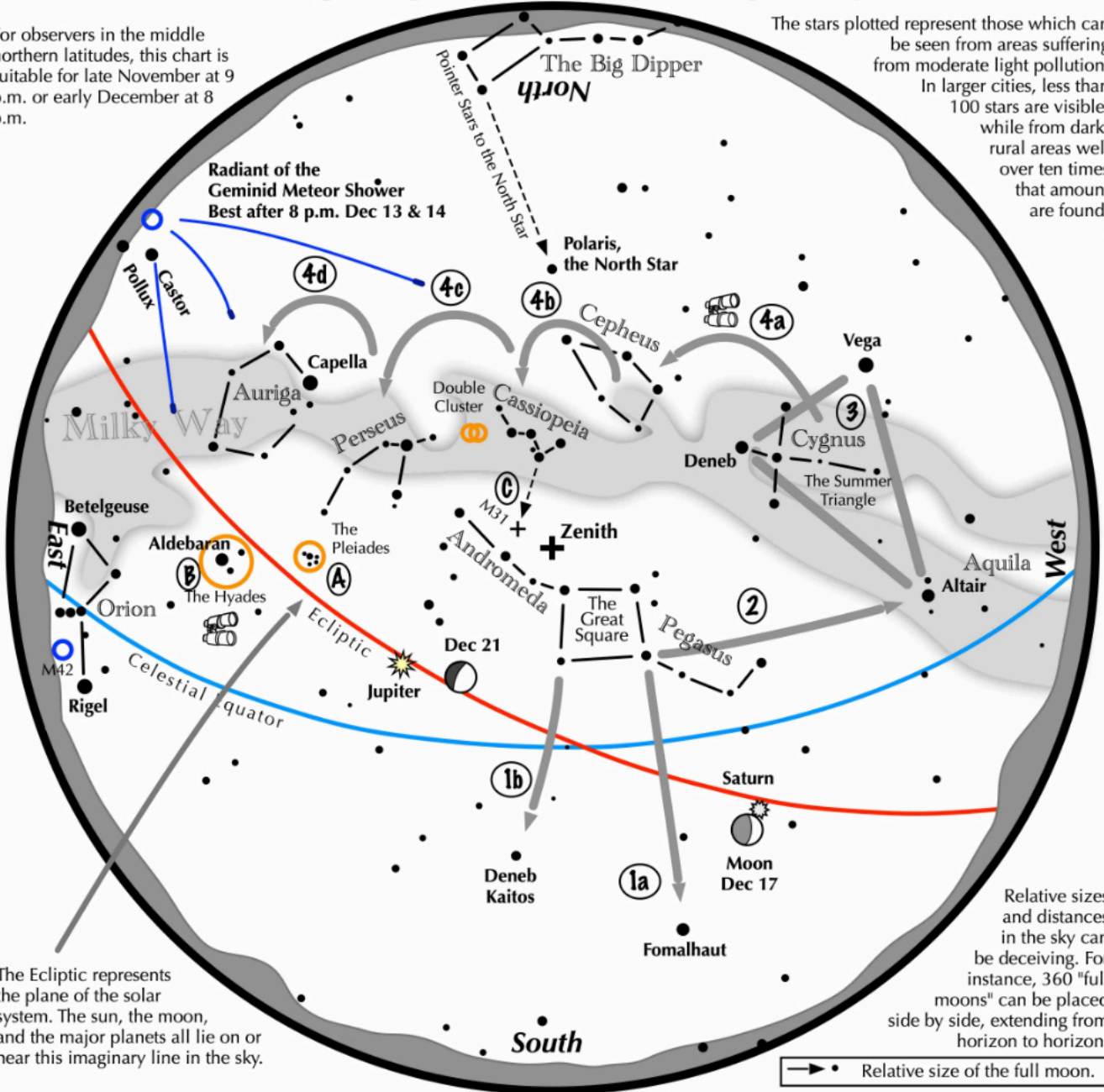
Panasonic Lumix GH5s, 600mm

ISO 800, f/11, 1/80 second

Navigating the December Night Sky

For observers in the middle northern latitudes, this chart is suitable for late November at 9 p.m. or early December at 8 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.



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

- 1 Face south. Almost overhead is the "Great Square" with four stars about the same brightness as those of the Big Dipper. Extend an imaginary line southward following the Square's two westernmost stars. The line strikes Fomalhaut, the brightest star in the southwest. A line extending southward from the two easternmost stars, passes Deneb Kaitos, the second bright star in the south.
- 2 Draw another line, this time westward following the southern edge of the Square. It strikes Altair, part of the "Summer Triangle."
- 3 Locate Vega and Deneb, the other two stars of the "Summer Triangle." Vega is its brightest member while Deneb sits in the middle of the Milky Way.
- 4 Jump along the Milky Way from Deneb to Cepheus, which resembles the outline of a house. Continue jumping to the "W" of Cassiopeia, to Perseus, and finally to Auriga with its bright star Capella.

Binocular Highlights

- A and B:** Examine the stars of the Pleiades and Hyades, two naked eye star clusters.
- C:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.
- D:** Sweep along the Milky Way from Altair, past Deneb, through Cepheus, Cassiopeia and Perseus, then to Auriga for many intriguing star clusters and nebulous areas.



ASTRONOMICAL LEAGUE Double Star Activity



Other Suns: Eta Tauri (Alcyone)

How to find Eta Tauri on a December evening

Face east. Look for the Pleiades star cluster. Eta Tauri is the cluster's brightest member. It is a quadruple star.

Eta Tauri

A-B separation: 118 sec

A magnitude: 2.8

B magnitude: 6.3

Position Angle: 290°

A-C separation: 182 sec

C magnitude: 8.2

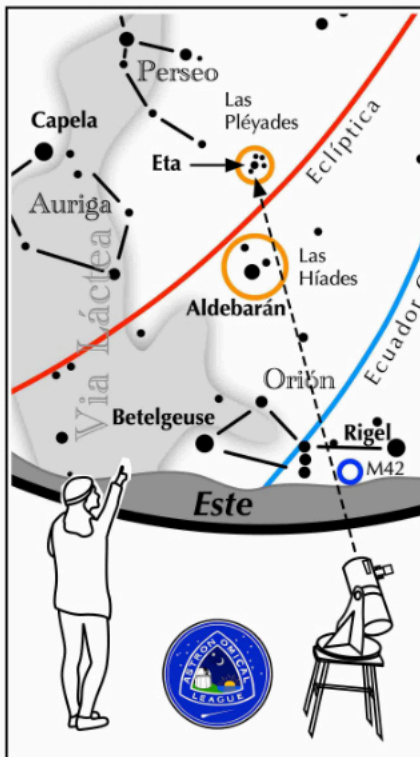
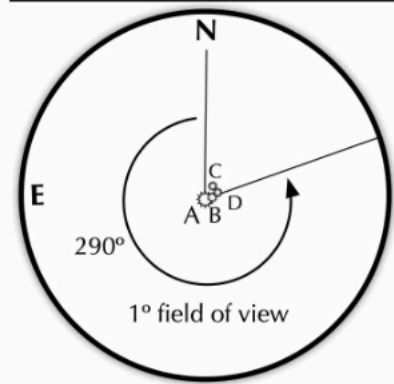
Position Angle: 313°

A-D separation: 192 sec

D magnitude: 8.7

Position Angle: 296°

Suggested magnification: >20x
Suggested aperture: >3 inches



Otros Soles: Eta Tauri (Alcyone)

Cómo encontrar a Eta Tauri en una tarde de Diciembre

Mira al Este. Busque el cúmulo de estrellas de las Pléyades. Eta Tauri es el miembro más brillante del grupo. Es una estrella cuádruple.

Eta Tauri

A-B separación: 118 sec

A magnitud: 2.8

B magnitud: 6.3

PA: 290°

A-C separación: 182 sec

C magnitud: 8.2

PA: 313°

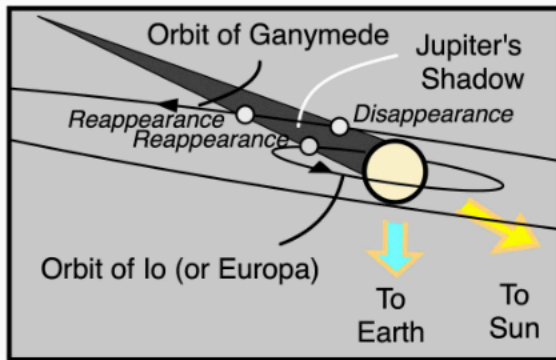
A-D separación: 192 sec

D magnitud: 8.7


PA: 296°


Ampliación sugerida: >20x,
Apertura sugerida: >75 mm






Galilean moon emergence
(Elapsed time varies with moon)

Elapsed time: 30 sec. 

Elapsed time: 2 min. 

Elapsed time: 4 min. 



An "Oh! Wow!" moment through your telescope

Imagine seeing a world emerge in the darkness, taking several minutes to fully appear. Such a body is Io, Europa, or Ganymede on multiple occasions this December.

Aim a telescope at Jupiter shining in the south a few minutes before the event is predicted to take place. Look away from the planet's bright disk, about one planet diameter from its eastern edge. At the designated time, a faint speck can be discerned. As the seconds pass, that speck grows brighter and brighter.

This is one of the large Galilean moons, slowly leaving Jupiter's shadow while orbiting the giant planet. December is a good month this year to witness an event like this in the evening sky, because Jupiter's shadow angles to the east of the planet, putting the emerging moon relatively far from the planet's glare. Each moon takes a different time to fully emerge, because of its diameter and of its orbital velocity around the planet.

Note: December 12 and 19 have Ganymede disappearing into the shadow and reappearing. December 21 and 28 have Io and Europa both disappearing near the same time.

Make sure that Jupiter is sufficiently above the horizon at your location and that the evening twilight has sufficiently darkened. Begin viewing a few minutes before the listed times.

Event commencement: (all times CST)

- Io Dec 5, 11:34 pm
- Io Dec 7, 6:04 pm
- Ganymede Dec 12, disappearance 5:41 pm, reappearance 7:48 pm
- Io Dec 13, 1:30 am
- Europa Dec 14, 6:24 pm
- Io Dec 14, 7:58 pm
- Ganymede Dec 19, disappearance 9:45 pm, reappearance 11:49 pm
- { Europa Dec 21, 9:03 pm
- { Io Dec 21, 9:53 pm
- { Europa Dec 28, 11:42 pm
- { Io Dec 28, 11:48 pm
- Io Dec 30, 6:18 pm

Use a "high" magnification!

From the Archives

November, 1968

The President's Report

Arrangements have been made for a New and Closer relationship with the Omaha Club, Bob Allen, President of the Omaha Astronomical Society told me that he would like to exchange programs with our Club. This sounds like a good way to start things.

Rick and I went to Omaha on Nov 17th. We showed some of our slides and movies. Then Mr. Allen will be at our next meeting to take part in our Program. I don't know what the subject will be but you bet it will be well worth your while to come to the meeting. We will have a series of these exchanges and in the future may have some joint meetings with the full membership of both clubs attending.

Of course this is just a prelude of things to come— a good relationship between our Clubs will be a great asset to all. Learning to work together now will be a great help toward the success of the 1970 Mid-States Convention.

I got pictures back from American Education publications in Connecticut. Of the 14 that I sent they used only one. Its the picture of the Orion and Horse head Nebula. They sent along a copy of the Weekly Reader. Its a weekly worksheet for a Grade School. It seems strange to see my pictures in school books.

Remember the Meeting on Tuesday evening November 26th at 7:30pm, Science Building, Nebraska Wesleyan and the special program by the Omaha Club.

Earl Moser, President

CLUB MEMBERSHIP INFO

REGULAR MEMBER - \$30.00 per year. Includes club newsletter, and 1 vote at club meetings, plus all other standard club privileges.

FAMILY MEMBER - \$35.00 per year. Same as regular member except gets 2 votes at club meetings.

STUDENT MEMBER - \$10.00 per year with volunteer requirement.

If you renew your membership prior to your annual renewal date, you will receive a 10% discount.

Club members are also eligible for special subscription discounts on Sky & Telescope Magazine.

CLUB TELESCOPES

To check out one of the club telescopes, please contact a club officer. Scopes can be checked out at a regular club meeting and kept for one month. Checkout can be extended for another month if there are no other requests for the telescope, but you must notify a club officer in advance.

100mm Orion refractor: Available
 10 inch Meade Starfinder Dobsonian: Available
 13 inch Truss Dobsonian: Needs repair
 10 inch Zhumell: Needs mount

Buy the book! The Prairie Astronomy Club: Fifty Years of Amateur Astronomy. Order online from Amazon or lulu.com.

ADDRESS

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The Prairie Astronomer is published monthly by the Prairie Astronomy Club, Inc. Membership expiration date is listed on the mailing label. Membership dues are: Regular \$30/yr, Family \$35/yr. Address all new memberships and renewals to: The Prairie Astronomy Club, Inc., PO Box 5585, Lincoln, NE 68505-0585. For other club information, please contact one of the club officers listed to the right. Newsletter comments and articles should be submitted to: Mark Dahmke, P. O. Box 5585, Lincoln, NE 68505 or mark@dahmke.com, no less than ten days prior to the club meeting. The Prairie Astronomy Club meets the last Tuesday of each month at Hyde Memorial Observatory in Lincoln, NE.

