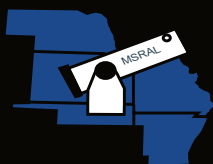


The Prairie Astronomer

February 2025 Volume 66, Issue #2

IN THIS ISSUE: Miller Astrophotography Research Center
Hyde Volunteer Night at Morrill Hall
SeeStar Discussion Group at B00
Hyde Observatory Renovation Update
Euclid Discovers Einstein Ring



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer



The next club meeting is February 25th at 7:30pm - AT BRANCHED OAK OBSERVATORY

NEXT MEETING AND PROGRAM

'Blazing the Way, An Illuminating Examination of T Coronae Borealis' Michael Sibbersen will present a program on the history and observations of the recurrent nova, T CrB.

IMPORTANT: This meeting will be held at Branched Oak Observatory.

CONTENTS

- 4 President's Message
- 5 Mantrap Skies ARP76
- 8 March Observing
- 9 Focus on Observing
- 10 Club Outreach
- 11 Euclid, Einstein Ring
- 15 MARC
- 18 SeeStar Discussion Group
- 20 Hyde Volunteer Night
- 21 The mid-March Sky
- 22 AL Outreach
- 25 Hyde Renovation
- 28 Astrophotography
- 30 From the Archives
- 31 Club Information

UPCOMING PROGRAMS

March: 'Cosmos: A Retrospective'
April: Europa Clipper
June: Nearest Star Party

Cover: The north polar region of Jupiter's volcanic moon Io was captured by NASA's Juno during spacecraft's the 57th close pass of the gas giant on Dec. 30, 2023. Image data: NASA/JPL-Caltech/SwRI/MSSS Image processing by Gerald Eichstädt



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.

February PAC Meeting
 Tuesday, February 25th, 7:30pm
Branched Oak Observatory
 Program: *T Coronae Borealis*

March PAC Meeting
 Tuesday, March 25th, 7:30pm
Hyde Observatory
 Program: *'Cosmos: A Retrospective'*

April PAC Meeting
 Tuesday, April 29th, 7:30pm
Hyde Observatory
 Program: *Europa Clipper Mission*

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



www.prairieastronomyclub.org

2025 STAR PARTY DATES

	Date	Date
January	24	31
February	21	28
March	21	28
April	3/18	25
May	16	23
June	20	27
July	18	25
NSP	7/20	7/25
August	15	22
September	19	26
October	17	24
November	14	21
December	12	19

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

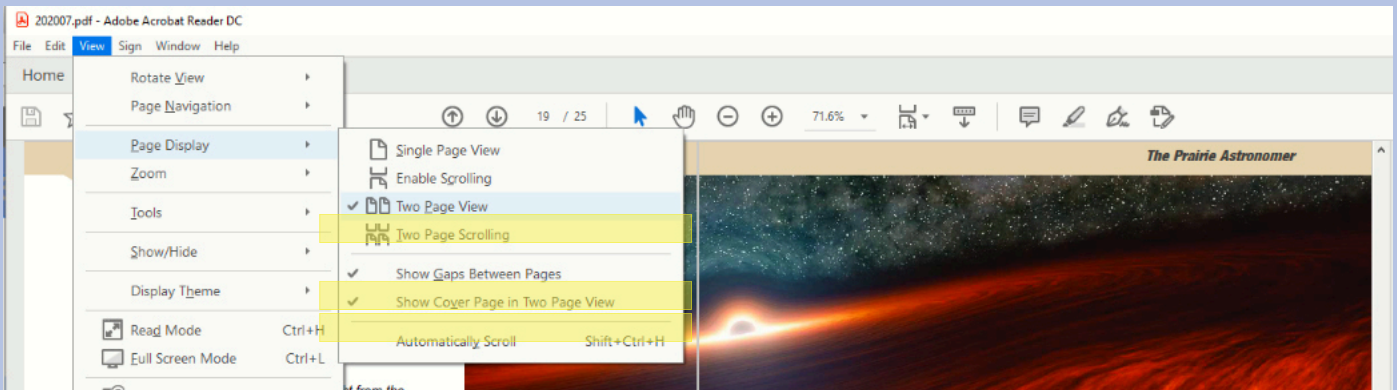
CLUB OFFICERS

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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/dues/>

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 want to start by thanking everyone who attended and helped with our "How to Use Your Telescope" class at the end of January. We had a great turnout, and many new telescope owners benefited from the hands-on experience. Events like these reinforce the importance of our outreach efforts and help more people enjoy the night sky. A big thank you to Branched Oak Observatory for hosting us and providing an excellent venue for the event.

Speaking of Branched Oak Observatory, a quick reminder that our February meeting will still be held at this location due to the ongoing renovations at Hyde Memorial Observatory. We are in for a treat this month as Michael Sibbersen will

present on T Coronae Borealis, also known as the Blaze Star. This fascinating binary star system occasionally erupts as a nova, and astronomers anticipate it will do so in the coming month(s).

If you missed last month's newsletter, check out the calendar of upcoming space events for 2025 in the Letter from the President section. It's a great resource to help you plan your observing sessions and make the most of this year's astronomical events.

Additionally, star party registrations are already kicking off across the country. If you're looking to attend, here are a few notable ones:

Nebraska Star Party (Valentine, NE) - July 20-25

Registration is open: <https://www.nebraskastarparty.org>



Texas Star Party - April 20-27

Info & registration: <https://texasstarparty.org>

Rocky Mountain Star Stare - June 25-29

More details: <https://rmss.org>

Whether you're a seasoned observer or just getting started, these star parties offer great dark-sky opportunities and a chance to connect with fellow astronomy enthusiasts.

Thank you all for your continued engagement and support of PAC. I look forward to seeing everyone at the February meeting on Tuesday the 25th at 7:30!

Clear skies,
Jason O'Flaherty

New Members

Jody Redepenning, Cade Krueger, Frank Vrba
Welcome to the club!

ARP 76

The Mantrap Skies Image Catalog

Arp 76 is better known as M 90 and IC 3583. Arp put it in his category for spiral galaxies with small, high surface brightness companions. The redshift of M 90 is actually a blue shift indicating it is moving toward us. Still, there's good reason to put the galaxy about the middle of the Virgo Cluster and thus about 60 million light-years distant. IC 3583, the "companion" on the other hand has a redshift that puts it about 67 million light-years distant. It does appear somewhat distorted. While it was considered a possible companion of M 90 at the time of Arp's atlas most today doubt that due to the very different redshifts meaning any interaction would have happened at such high speed neither would have noticed the passage. M90 is classified by NED as SAB(rs)ab;LINER;Sy. The NGC project says simply Sb. Seligman agrees with NED but adds a question mark, SAB(rs)ab?. It was discovered by Charles Messier on March 18, 1781 along with many others. IC



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.



ARP76, continued

3583 was found by Isaac Roberts on April 29, 1892. Seligman classifies it as SBm? pec. One interesting note at NED discussing if it is a companion of M90 or

not reads: "Non interacting pair with dwarf IC 3583 at 6.0 arcmin north. Possibly interacting." Now that's covering your backside!

This image dates back to 2007 when my processing skills and tools were limited as was my imaging technique.

Cassiopeia A Light Echoes



These shimmering cosmic curtains show interstellar gas and dust that has been heated by the flashbulb explosion of a long-ago supernova. The gas then glows infrared light in what is known as a thermal light echo. As the supernova illumination travels through space at the speed of light, the echo appears to expand. NASA's James Webb Space Telescope observed this light echo in the vicinity of the supernova remnant Cassiopeia A three separate times, in essence creating a 3D scan of the interstellar material. Note that the field of view in the top row is rotated slightly clockwise relative to the middle and bottom rows, due to the roll angle of the Webb telescope when the observations were taken. Image credit: NASA, ESA, CSA, STScI, Jacob Jencson (Caltech/IPAC)

March Observing

Jim Kvasnicka

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

Planets

Venus: Evening planet, lost after mid-month. Magnitude -4.8.

Mercury: Evening planet to start the month, lost from view mid-month.

Mars: Evening planet in Gemini. Magnitude -0.3 with a disk 10.9" wide.

Jupiter: Evening planet in Taurus. Magnitude -2.3 with a disk 39.6" wide.

Saturn, Neptune, Uranus: Not visible in March or difficult to see.

Total Lunar Eclipse

The night of March 13-14. Partial eclipse begins at 12:09 am, total eclipse from 1:26 - 2:32 am. Partial eclipse ends at 3:48 am.

Messier List

M41: Open cluster in Canis Major.

M44: The Beehive Cluster in Cancer.

M46/M47/M93: Open clusters in Puppis.

M48: Open cluster in Hydra.

M50: Open cluster in Monoceros.

M67: Open cluster in Cancer

M81/M82: Galaxy pair in Ursa Major.

Last Month: M1, M35, M36, M37, M38, M42, M43, M45, M78, M79

Next Month: M40, M65, M66, M95, M96, M105, M106, M108, M109



NGC and other Deep Sky Objects

NGC 2438: Planetary nebula, foreground object in M46.

NGC 2440: Planetary nebula in Puppis.

NGC 2451: Open cluster in Puppis, bright and irregular.

NGC 2477: Bright open cluster in Puppis.

NGC 2683: Edge on galaxy in Lynx.

NGC 2775: Galaxy in Cancer.

Double Star Program List

Epsilon Canis Majoris: White and light blue pair.

Delta Geminorum: Wasat, yellow and pale red stars.

Alpha Geminorum: Castor, white primary with a yellow secondary.

12 Lyncis: Close pair of yellow-white stars.

19 Lyncis: White stars.

38 Lyncis: White primary with a yellow secondary.

Zeta Cancri: Yellow and pale-yellow stars.

Iota Cancri: Yellow and pale blue pair.

Challenge Object

NGC 2350: A faint, small, elongated galaxy in Canis Minor.

Focus on Constellations

Jim Kvasnicka

Puppis

Puppis, the Ship's Stern, was once part of the ancient Greek constellation Argo Navis, the Ship. Due to its size it was divided in the 1750's into Puppis, the Ship's Stern; Pyxis, the Compass; Vela, the Sails; and Carina, the Keel. Puppis alone still covers 673 square degrees. Puppis is east and southeast of Canis Major and it contains an exceptionally star-rich portion of the Milky Way. Because of this Puppis is rich in open clusters including three Messier objects in M46, M47, and M93. The open clusters in Puppis vary a great deal. Several are large and loose, some are large and rich and a number are faint and require a medium to large telescope to be seen. The constellation Puppis is best seen in March.

Showpiece Objects

Open Clusters: M46, M47, M93, NGC 2477, NGC 2539

Planetary Nebulae: NGC 2438, NGC 2440, NGC 2452

Mythology

In Greek mythology the ship Argo was the vessel commanded by Jason and his fifty Argonauts in search of the Golden Fleece. When they returned with the Fleece, Athens commemorated the event by placing the ship Argo in the heavens.

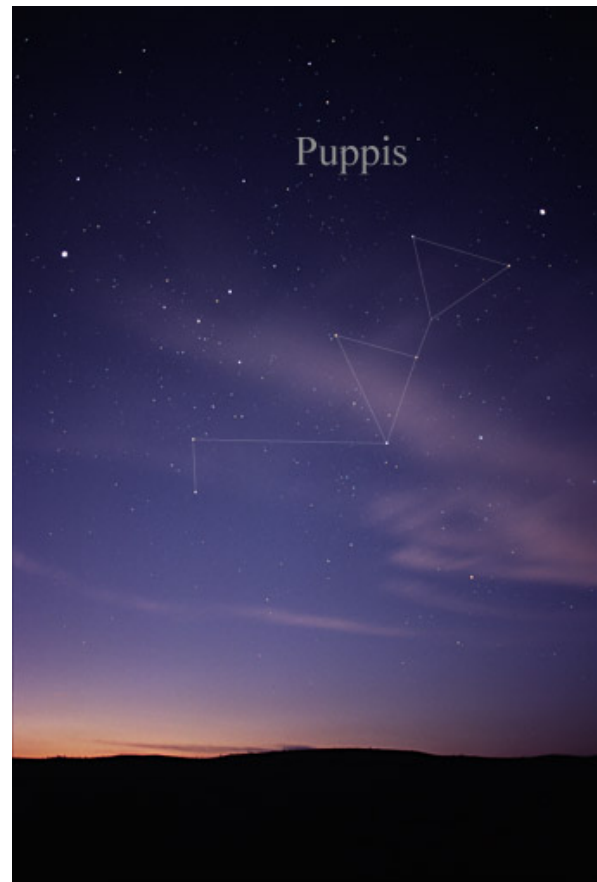
Number of Objects Magnitude 12.0 and Brighter

Galaxies: 7

Open Clusters: 46

Planetary Nebulae: 3

Globular Clusters: 1



*Photo credit: Till Credner
Creative Commons License*

Outreach Calendar

Don Hain

dhain00@gmail.com, 402 440 5318

The “How to Use Your Telescope” out at Branched Oak Observatory was a rousing success in my mind. Thanks to all of you who were able to make it out. There were a number of folks who I am sure appreciated very much the opportunity to either work with their own telescope or to chat with folks about the night sky and have a look through some of the scopes PAC members brought as well as some of those located out at the site in the observatories there.

Much progress has been made on the renovation work at Hyde Observatory. There still

remains at least the February PAC meeting to be held out at the Branched Oak Observatory site. For those who volunteer at Hyde, you should watch for an invite to a volunteer only training session out at Hyde currently being targeted to happen in mid-March. Thanks to those of you who volunteer at Hyde, and thanks to the Hyde board for putting together a get-together/training session back on the 2nd weekend of this month (on Feb 8th) at that University Museum and Planetarium. The pizza was delicious, and the planetarium makes for a great screen on which to display the

night sky as shown by the Stellarium app!

Thanks to those who considered volunteering out at the Aviation STEM day out at Oak View Mall. Even though no one was able to attend I’m glad folks considered it. In the end, I did find out that unlike previously thought, the Omaha group (OAS) was able to send a volunteer or two to the event!

We expect more dates for volunteer opportunities to start being set for spring, summer and fall activities as we leave winter behind and head toward the spring equinox in the coming month.

Scheduled events to be aware of:

Annual “Astronomy Night”:

When: Saturday, April 12th,
5:00-9:00PM

Where: University State Museum and Planetarium - 645 North 14th Street, Lincoln

Sponsored by: University of Nebraska State Museum

Needs:

let the club know via the Contact Us page at <https://www.prairieastronomyclub.org/contact-us/>

(or contact me directly at dhain00@gmail.com

help out with a hands on station or demonstration that we put together (I plan to bring a LEGO model of the earth-moon system revolving around the sun, as well as a couple telescopes,

Outreach Calendar, continued

and possibly a DSLR camera)

per the current interest in digital scopes like the Seestars S30 and S50 by ZWO and the Unistellar eVscope out at Hyde, if you would like to discuss / have one of these to demo and talk about at this event I'm sure there would be interest by the public

Hyde Observatory: CLOSED February (and probably into March a bit) !

When: Saturday nights *

Where: Hyde Observatory

Sponsored by: Lincoln Parks and Rec / Hyde Board of Directors

Needs: volunteers willing to work out

on the deck or manage the shows in the classroom about one Saturday per month

see <https://www.hydeobservatory.info/volunteer/> for more information

see <https://forms.gle/ZKr4ivapvUhfejwL6> for the volunteer form to get paperwork with the city started. Since Hyde offers the activity through city government a background check is needed. Submission of this form will get that going.

* Hopefully open Saturday nights starting in late March or early April, then throughout the year (except for weekends of major holidays)

Euclid Discovers Einstein Ring in Our Cosmic Backyard

The phenomenon appears to encircle the center of a well-studied elliptical galaxy called NGC 6505, around 590 million light-years from Earth.

Euclid, an ESA (European Space Agency) mission with NASA contributions, has made a surprising discovery in our cosmic backyard: a phenomenon called an Einstein ring.

An Einstein ring is light from a distant galaxy bending to form a ring

that appears aligned with a foreground object. The name honors Albert Einstein, whose general theory of relativity predicts that light will bend and brighten around objects in space.

In this way, particularly massive objects like galaxies and galaxy clusters serve as cosmic

magnifying glasses, bringing even more distant objects into view. Scientists call this gravitational lensing.

Euclid Archive Scientist Bruno Altieri noticed a hint of an Einstein ring among images from the spacecraft's early testing phase in September 2023.

Euclid, continued



The ring of light surrounding the center of the galaxy NGC 6505, captured by ESA's Euclid telescope, is an example of an Einstein ring. NGC 6505 is acting as a gravitational lens, bending light from a galaxy far behind it. Credit: ESA/Euclid/Euclid Consortium/NASA, image processing by J.-C. Cuillandre, G. Anselmi, T. Li; CC BY-SA 3.0 IGO or ESA Standard License

“Even from that first observation, I could see it, but after Euclid made more observations of the area, we could see a perfect Einstein ring,” Altieri said. “For me, with a lifelong interest in gravitational lensing, that was amazing.”

The ring appears to encircle the center of a well-studied elliptical galaxy called NGC 6505, which is around 590 million light-years from Earth in the constellation Draco. That may sound far, but on the scale of the entire universe, NGC

6505 is close by. Thanks to Euclid's high-resolution instruments, this is the first time that the ring of light surrounding the galaxy has been detected.

Light from a much more distant bright galaxy, some 4.42 billion light-years away, creates the ring in the image. Gravity distorted this light as it traveled toward us. This faraway galaxy hasn't been observed before and doesn't yet have a name.

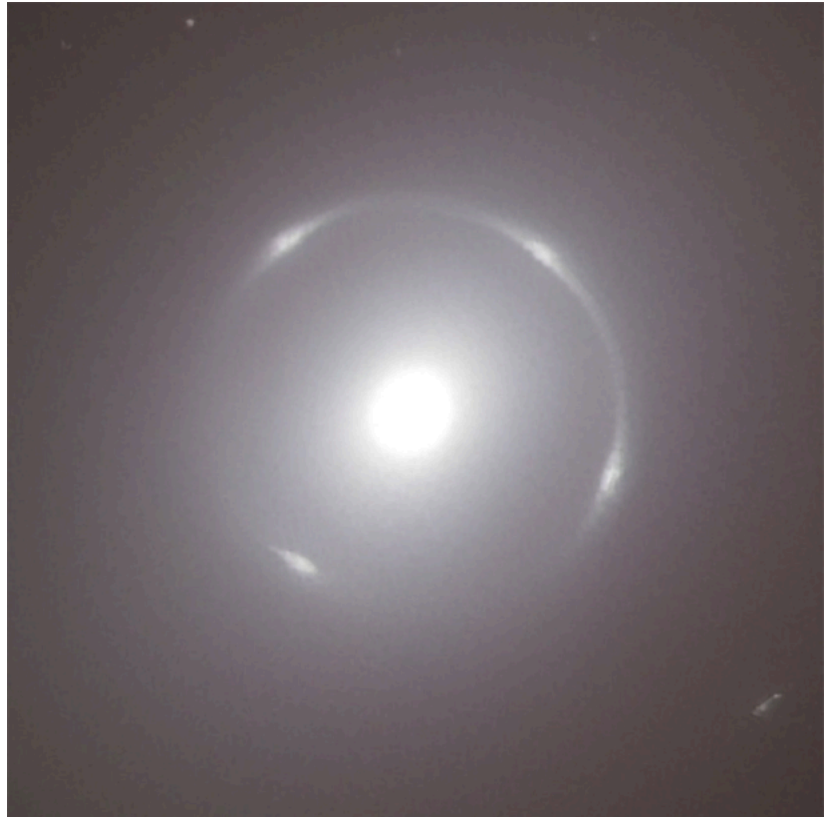
“An Einstein ring is an example of strong gravitational lensing,” explained Conor O’Riordan, of the Max Planck Institute for Astrophysics, Germany, and lead author of the first scientific paper analyzing the ring. A strong gravitational lens produces multiple images of a background source that may appear as arcs, forming a ring like this, for example. “All strong lenses are special, because they’re so rare,

Euclid, continued

and they're incredibly useful scientifically. This one is particularly special, because it's so close to Earth and the alignment makes it very beautiful."

Einstein rings are a rich laboratory for scientists to explore many mysteries of the universe. For example, an invisible form of matter called dark matter contributes to the bending of light into a ring, so this is an indirect way to study dark matter. Einstein rings are also relevant to the expansion of the universe because the space between us and these galaxies — both in the foreground and the background — is stretching. Scientists can also learn about the background galaxy itself.

"I find it very intriguing that this ring was observed within a well-known galaxy, which was first discovered in 1884," said Valeria Pettorino, ESA Euclid project scientist. "The galaxy has



A close-up view of the center of the NGC 6505 galaxy, with the bright Einstein ring aligned with it, captured by ESA's Euclid space telescope. Credit: ESA/Euclid/Euclid Consortium/NASA, image processing by J.-C. Cuillandre, G. Anselmi, T. Li; CC BY-SA 3.0 IGO or ESA Standard Licence

been known to astronomers for a very long time. And yet this ring was never observed before. This demonstrates how powerful Euclid is, finding new things even in places we thought we knew well. This discovery is very encouraging for

the future of the Euclid mission and demonstrates its fantastic capabilities."

By exploring how the universe has expanded and formed over its cosmic history, Euclid will reveal more about the role of gravity and

Euclid, continued

the nature of dark energy and dark matter. Dark energy is the mysterious force that appears to be causing the universe's expansion. The space telescope will map more than a third of the sky, observing billions of galaxies out to 10 billion light-years. It is expected to find around 100,000 strong gravitational lenses.

“Euclid is going to revolutionize the field with all this data we’ve never had before,” added O’Riordan.

Although finding this Einstein ring is an achievement, Euclid must look for a different, less visually obvious type of gravitational lensing called “weak lensing” to help fulfil its quest of understanding dark energy. In weak lensing, background galaxies appear only mildly stretched or displaced. To detect this effect, scientists will need to analyze billions of galaxies.

Euclid launched from Cape Canaveral, Florida, July 1, 2023, and began its detailed survey of the sky Feb. 14, 2024. The mission is gradually creating the most extensive 3D map of the universe yet. The Einstein ring find so early in its mission indicates Euclid is on course to uncover many more secrets of the universe.

More About Euclid

Euclid is a European mission, built and operated by ESA, with contributions from NASA. The Euclid Consortium — consisting of more than 2,000 scientists from 300 institutes in 15 European countries, the United States, Canada, and Japan — is responsible for providing the scientific instruments and scientific data analysis. ESA selected Thales Alenia Space as prime contractor for the construction of the satellite and its service module, with Airbus

Defence and Space chosen to develop the payload module, including the telescope. Euclid is a medium-class mission in ESA’s Cosmic Vision Programme.

Three NASA-supported science teams contribute to the Euclid mission. In addition to designing and fabricating the sensor-chip electronics for Euclid’s Near Infrared Spectrometer and Photometer (NISIP) instrument, NASA’s Jet Propulsion Laboratory led the procurement and delivery of the NISIP detectors as well. Those detectors, along with the sensor chip electronics, were tested at NASA’s Detector Characterization Lab at Goddard Space Flight Center in Greenbelt, Maryland. The Euclid NASA Science Center at IPAC (ENSCI), at Caltech in Pasadena, California, will archive the science data and support U.S.-based science investigations. JPL is a division of Caltech.

Miller Astrophotography Research Center Nearing Completion

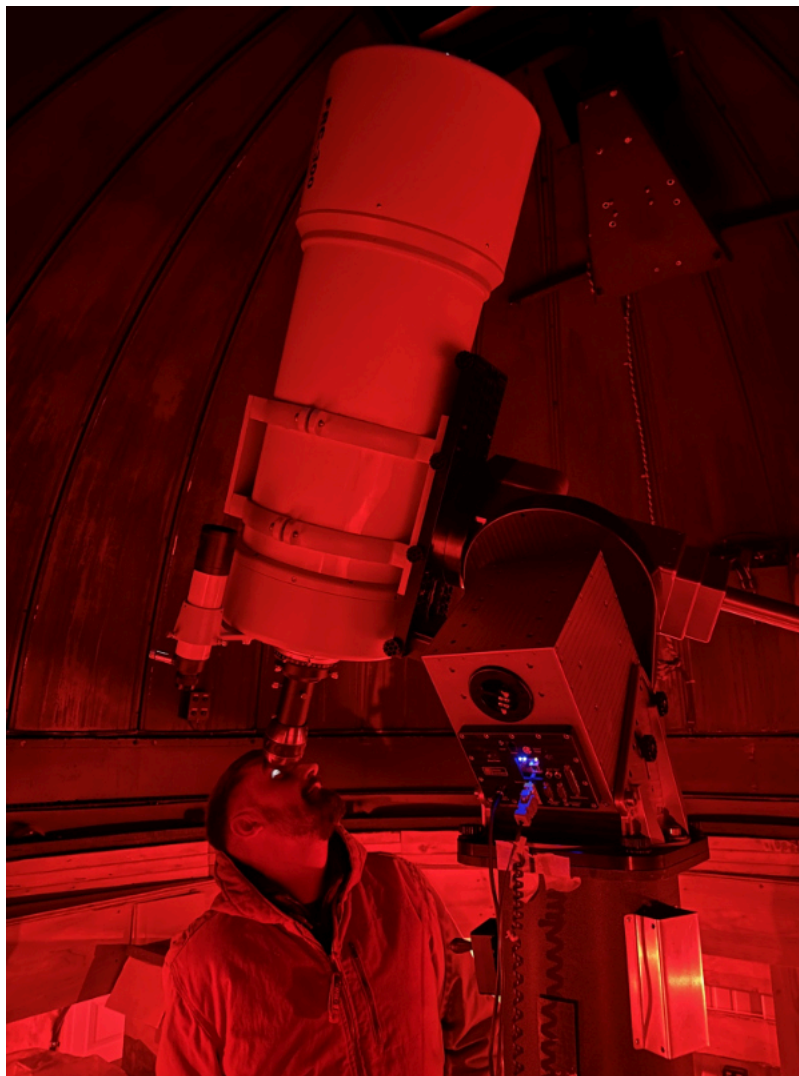
Brett Boller

The construction of the new Miller Astrophotography Research Center is nearing completion. We are finalizing the wiring and have begun installing equipment in the domes. The observatory is powered by The SkyX Professional software, a

comprehensive platform that integrates multiple essential functions into a single system. This advanced software controls dome rotation and slit opening, synchronizes dome movement with the telescope's positioning, and manages imaging equipment, including

cameras, filter wheels, focusers, and camera rotators. Additionally, it has the capability to integrate a weather station, enabling automatic dome closure in the event of inclement weather.

We are currently in the process of installing and configuring equipment generously donated by Tom Miller of Lincoln, NE. Each dome houses a massive 4x4x8-foot concrete pier foundation, weighing 20,000 pounds, ensuring the telescope remains perfectly stable for astrophotography. Both domes, along with their respective telescope mounts, are or will be fully computer-controlled. The East Dome is now fully operational for visual observations or DSLR photography.



Brett looking through the Takahashi FRC-300 at the moon. Photo by Michael Sibbersen

MARC, continued

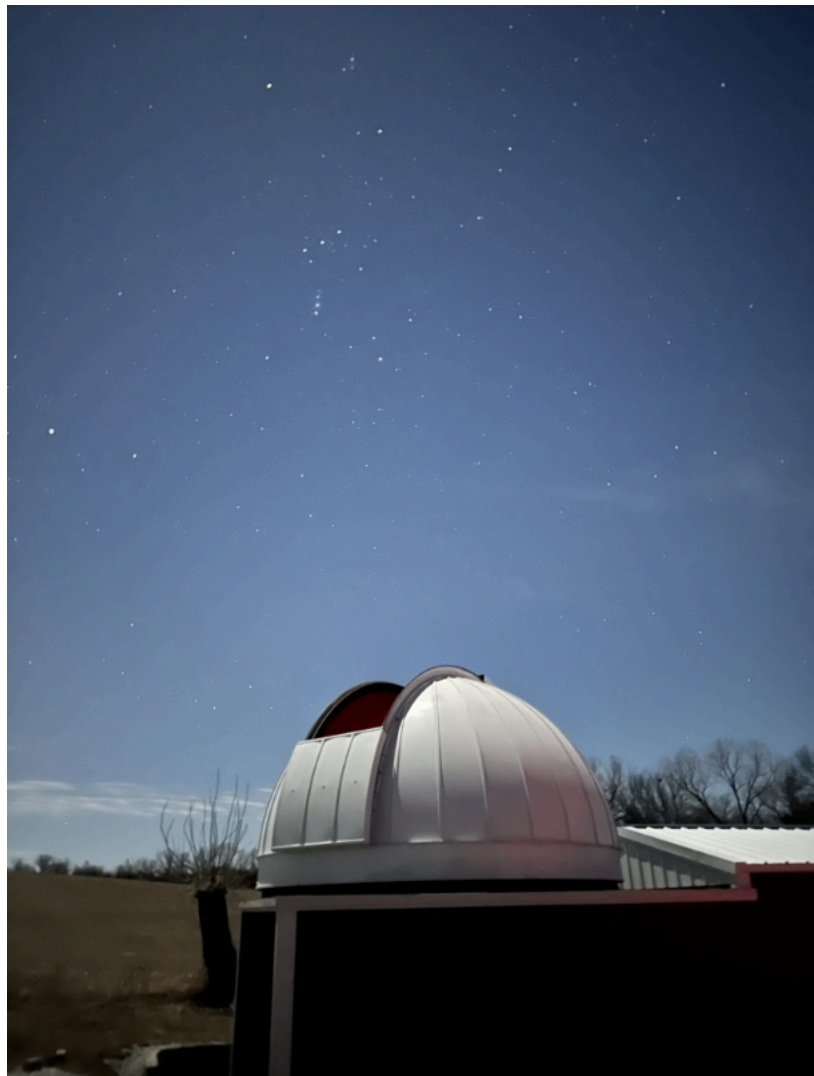
When mounting the Paramount on the pier, we found that it was already very close to proper polar alignment. The Takahashi FRC-300 telescope, with its 2348mm focal length, presents a tight field of view when used with my crop-sensor DSLR. It is remarkable that we achieved such precise alignment simply by placing the mount on the pier.

While the observatory received research-grade cameras from Tom Miller, these devices, though fully functional, are over 20 years old and incompatible with modern computer systems due to outdated

drivers. As a temporary solution, we have tested imaging with a DSLR camera, but to achieve optimal results, the acquisition of a newer CCD or CMOS camera will be necessary. We are currently exploring the possibility of controlling them via Ethernet instead of USB.

The East Dome is now operational, and I invite you to attend the February Prairie Astronomy Club meeting at Branched Oak Observatory, where I will provide a demonstration of the new system for anyone interested.

*Orion over the MARC.
Photo by Michael
Sibbersen*



MARC, continued



Jupiter frames captured by Brett Boller. Processed by Michael Sibbersen. 2700 frames stacked. Feb 8th 2025



Enjoy capturing astrophotography in comfort. MARC Control Room Panorama



The Takahashi pointed towards the moon. Photo by Brett Boller

SeeStar Discussion Group

Bob Kacvinsky

On January 21st, a group of 18 SeeStar/AstroPhoto enthusiast including PAC members Jason O’Flaherty, Dave Churilla; Mike Kerns, Mike White, Kale Strizek, Dave Dickinson, Michael Sibbernsen, and Bob Kacvinsky met at Branched Oak Observatory for a discussion meeting. Our goal focused on sharing ideas and experiences learning to use the SeeStar S50 to capture celestial photos to share with friends and family.

Much of the evening centered around walking through the operational menus of the SeeStar discussing how to set up and use each of the menu items. We started with the very basics from turning on our scopes to

more advanced settings for fine tuning photo capture. We were fortunate to have several Branched Oak Observatory members in attendance, especially Michael Sibbernsen and Dr. Jody Redepenning who have extensive experience with using the SeeStar telescope. The beautiful new meeting facilities at BOO allowed us to use the projectors to show steps to the group and also the those on the Zoom call.

We started to learn a valuable lesson immediately when 10 SeeStars were all turned on at the same time and our iPhones/iPads suddenly had 10 S50xxxx WiFi codes wanting to connect. We spent the next 5-10 minutes

sorting out who’s was who’s. Our original plan was to set up all the scopes outside on M42, the Orion Nebula, and together walk through real time each of the menus. Unfortunately, as the meeting started the clouds rolled in and we were forced to use them inside the room.

The second challenge occurred when ZWO, the SeeStar parent company, had sent out a software update the afternoon of our session causing several of our telescopes to go into update mode. Good lesson to remind everyone that if your telescope is software dependent to be sure and update it before you go out to observe. Something that us “Dob” users have never had to



SeeStar, continued

worry about.

Over the course of 2 hours, we came up with several “ah-ha” moments.

The SeeStar, as with most EV telescopes, are incredible works of engineering with powerful “almost” foolproof software. What 50mm of aperture can do is amazing.

The SeeStar can enhance your viewing experience, but it does not replace the joy and awe of viewing a deep space object live real time. The SeeStar can complement an observing night, it allows you to compare views and can produce a photo that you can share with others of what you observed during the night. It has definitely complimented my enjoyment from my 16” Dob.

EV scopes can capture colors, and if giving enough time help bring our details beyond what the naked eye snapshot can collect.

The enhancing editing software built into the SeeStar and most

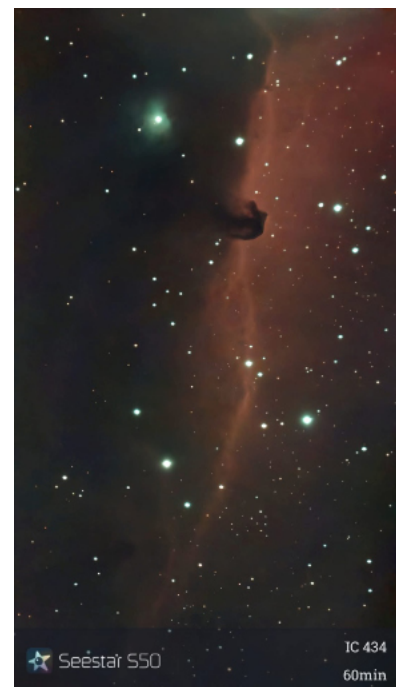
iPhone/iPads can produce an excellent photo worth sharing. The technology is incredible and requires a minimal learning curve.

With telescopes we say aperture rules, and with Astrophotography time and “subs” also rule. The 50mm SeeStar can create beautiful photos, but you can’t shortcut these two points. Most great photos we see from the SeeStar typically have an hour or more exposure time. The small aperture requires time to gather enough light photons.

Lastly, there are great software programs on the market for photo editing. Our group focused on operations and basic editing, yet some may decide to get together to explore the editing software options more deeply. This will require followup sessions.

As a followup, our little group has created a Facebook group to share ideas, photos, and also to discuss questions about the SeeStar. This group has become very active within the Facebook

group as we all continue to learn and experience the fun of basic Astrophotography. Personally, the SeeStar S50 has not replaced my love of visual observing, but it has enhanced my enjoyment along with my friends and family.



Hyde Volunteer Night at the Museum

John Reinert, Chairman of the Hyde Observatory Board of Supervisors

With 18 Hyde volunteers in attendance at the State Museum there was pizza, salad, and soft drinks for all with Archie the mastodon looking on. Rachel Scheet followed with a Stellarium show, including questions and answers regarding night sky object we are likely to see in March.

My message to everyone: you are highly valued as

volunteers for providing public access to the night sky. Thank you! Even with the many technology tools at our disposal, both hardware and software, it is our ability as volunteers to listen and respond to patron's questions that gets it done. Trust yourselves to deliver that positive message.

Classroom changes were discussed, lauding both the city workers and Mark's efforts to facilitate changes to the building. The soft and hard openings were mentioned, along with the Hyde volunteers awards banquet in May.



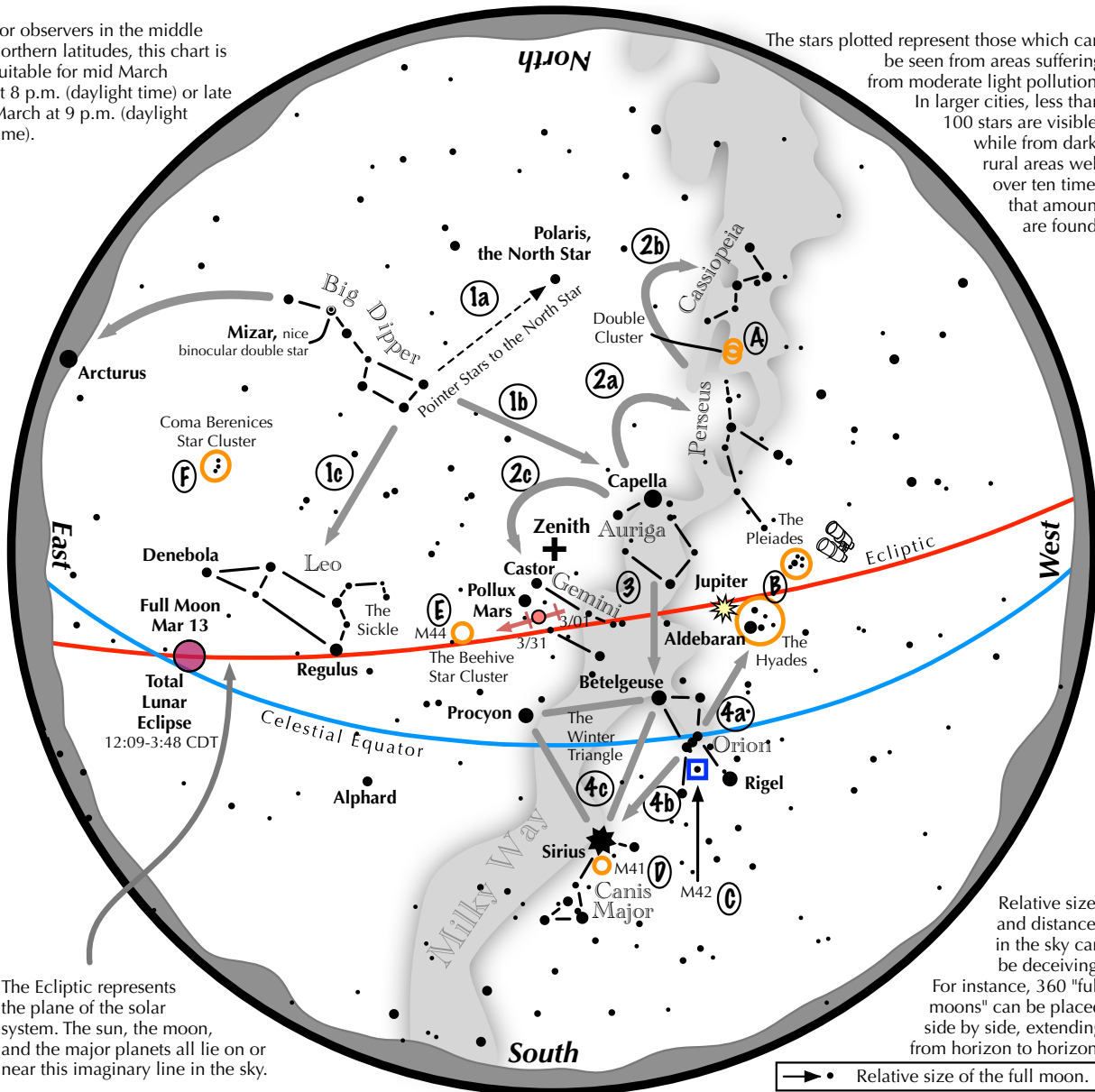
Ethan Van Winkle regaled us with his eVscope demo as we froze and then departed. I had a pair of binoculars pointed at Jupiter as it set over the Mueller Carillon.



Navigating the mid-March Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid March at 8 p.m. (daylight time) or late March at 9 p.m. (daylight time).

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

- 1 Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star. Its top bowl stars point west to Capella in Auriga, nearly overhead. Leo reclines below the Dipper's bowl.
- 2 From Capella jump northwestward along the Milky Way to Perseus, then to the "W" of Cassiopeia. Next jump southeastward from Capella to the twin stars of Castor and Pollux in Gemini.
- 3 Directly south of Capella stands the constellation of Orion with its three Belt Stars, its bright red star Betelgeuse, and its bright blue-white star Rigel.
- 4 Use Orion's three Belt stars to point northwest to the red star Aldebaran and the Hyades star cluster, then to the Pleiades star cluster. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius. It is a member of the Winter Triangle.

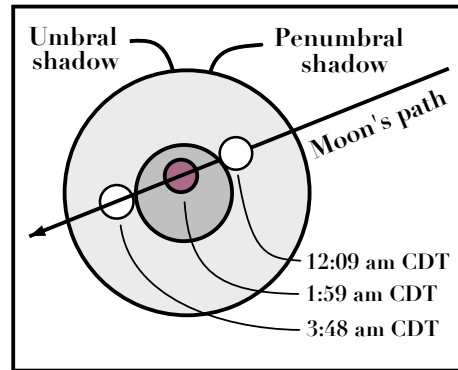
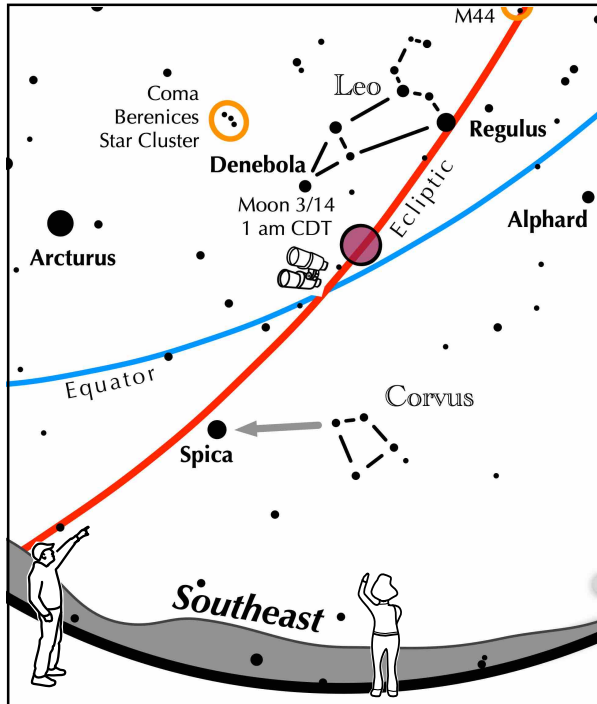
Binocular Highlights

A: Between the "W" of Cassiopeia and Perseus lies the Double Cluster. **B:** Examine the stars of the Pleiades and Hyades, two naked eye star clusters. **C:** M42 in Orion is a star forming nebula. **D:** Look south of Sirius for the star cluster M41. **E:** M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. **F:** Look high in the east for the loose star cluster of Coma Berenices.



Astronomical League Observing Project

If you can observe only one celestial event in the evening this March, see this one.



The Moon slides through a total eclipse

In the hours just after midnight on March 14, the brilliant full moon slides into Earth's shadow.

- Even though the partial umbral eclipse begins at 12:09 am CDT, darkening might not be noticed for another 5 minutes.
- When totality is reached, the full moon's brilliance is gone, allowing the stars to appear. Can you see that the moon lies mid-way between Regulus to the upper right and Spica to the lower left?
- At mid eclipse, what color is the moon? How red is it?
- During the partial phases, can you notice that the shadow's edge is not straight, but curved?



View to the southeast
on March 14
at 1 am CDT



Astronomical League

on Facebook ...

Monthly sky maps,
Observing activities,
AL LIVE sessions,
League news & a whole lot more!



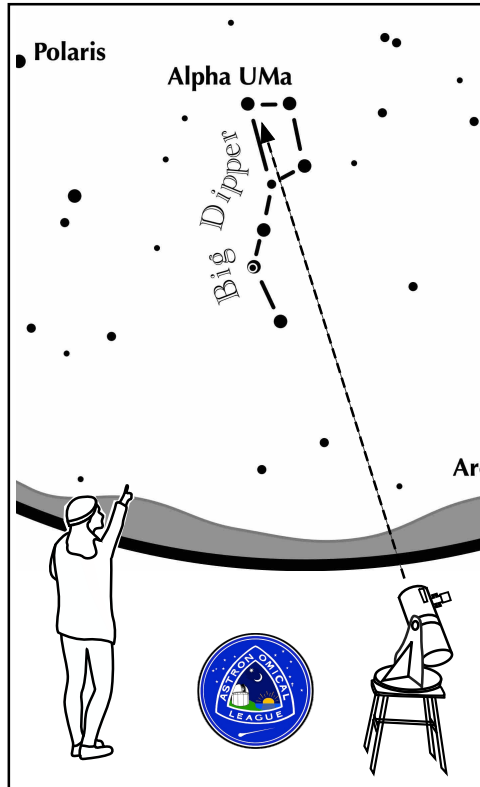
AL YouTube Channel

Observing Program Previews: What a program requires of the Observer.

Our View from Earth: How to find interesting celestial objects in three minutes. Perfect for club viewing.

Astronomical League Outreach

ASTRONOMICAL LEAGUE Double Star Activity



Other Suns: Alpha Ursae Majoris

How to find Alpha Ursae Majoris on a March evening

Face northeast. Look for the Big Dipper standing upright on its handle. Alpha is the star on the upper left corner of the bowl.

Alpha UMa

A-B separation: 381 sec

A magnitude: 2.0

B magnitude: 7.0

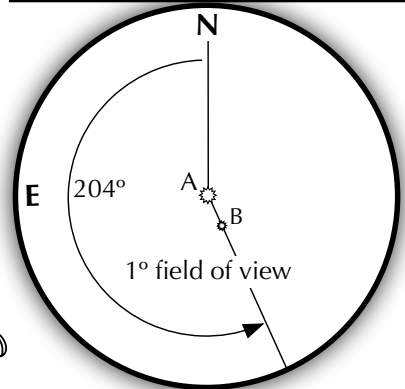
Position Angle: 204°

Colors:

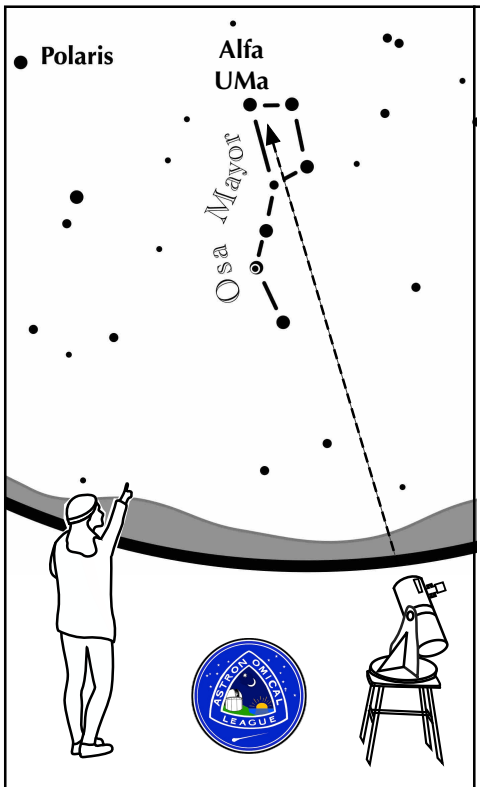
orange

dark orange

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



Try binoculars!



Otros Soles: Alfa Ursae Majoris

Cómo encontrar a Alpha Ursae Majoris en una tarde de Marzo

Mire al noreste. Busque la Osa Mayor de pie sobre su mango. Alfa es la estrella en la esquina superior izquierda del Cazo.

Alfa UMa

A-B separación: 381 sec

A magnitud: 2.0

B magnitud: 7.0

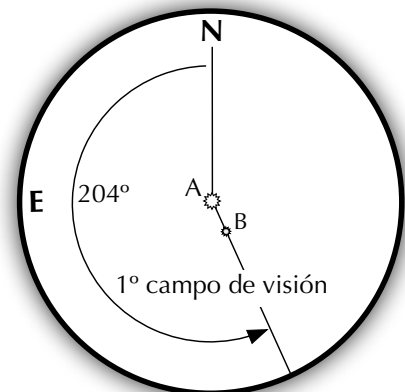
PA: 204°

Colores:

naranja

roja oscura


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



Un objeto binocular!




Astronomical League Outreach



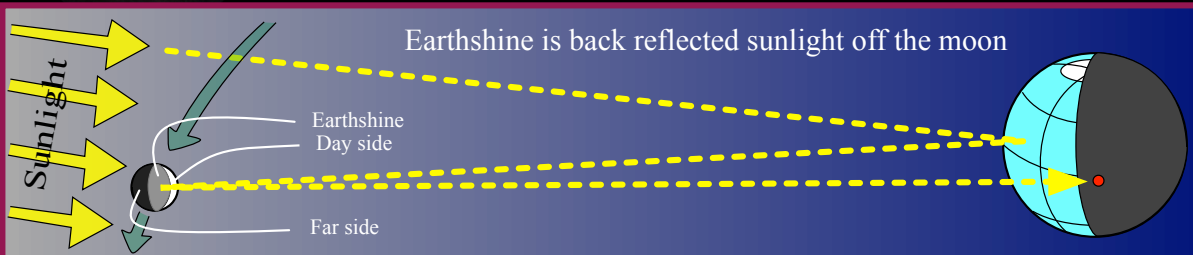
Evening Earthshine

aka "The old moon in the new moon's arms"

In a very strange sense, Earthshine is the reflection of Earth on the moon.



Earthshine is back reflected sunlight off the moon



Labels in diagram: Sunlight, Earthshine, Day side, Far side.

Older than 4 day-old moon:
Distinguishing Earthshine with the unaided becomes harder with each passing evening. However, the moon's night side can still be seen through a telescope for a few more nights.

4 day-old moon:

- Sets up to 5 hours after sunset.
- The glare from its brightly lit day side begins to make seeing Earthshine slightly more difficult.

3 day-old moon:

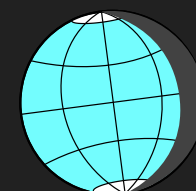
- Sets up to 3.5 hours after sunset.
- Earthshine is very prominent.

2 day-old moon:

- Sets up to 2 hours after sunset.
- The bright twilight mutes the diaphanous glow of the Earthshine.


1 day-old moon:

- Typically sets 60 minutes or less after sunset.
- Earthshine appears very subdued because of the moon's placement in the bright twilight, and the thinness and relative dimness of the crescent.
- Binoculars help pick up the very thin lunar crescent in the twilight just above the horizon.




A very bright Earth

- When the moon shows a thin crescent phase in Earth's sky, the Earth shows a thick gibbous phase in the lunar sky.
- A thick gibbous Earth covers 16 times the sky than the full moon from Earth does – and it reflects 4 times more light. This means that the near full Earth in the lunar sky is nearly 64 times brighter than the full moon is in our sky.
- For an observer on the unlit near side of the moon, the lunar landscape is illuminated by bright Earthlight.



New Moon, 0 day-old moon:

- Sets with the sun.



2502

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This Old Observatory

Episode 2: Electrical, Doors and Drywall



February: New and Repositioned Doors, Updated Electrical and Conduit, Network and A/V Wiring, Drywall

The last few weeks have seen significant progress at Hyde. Most of the electrical upgrade has been completed. The new exit on the northeast corner of the classroom is in place (required by code).

The east and west foyer doors have been repositioned to be flush with the exterior walls (another code requirement) and doors to the classroom have been repositioned, again due to code

requirements.

Carpet squares have been ordered.

Drywall work is in progress as of the first week in February.

Network cable has been

Hyde Observatory Renovation, continued

added for additional LCD monitors and digital signage.

All lights in the classroom will be

replaced with new fixtures and digital dimmers.

The upgrade is funded in part by the Hyde

Observatory Fund from donations and partly by Lincoln Parks & Recreation.



The west classroom door was repositioned to conform to accessibility code requirements. Below: the west entrance door and pad have been installed. Lower right: Roof roll tested after structural changes near the doors.



Hyde Observatory Renovation, continued



Above: a panoramic view of the classroom from the west wall looking east at the Milky Way mural.

Below: panoramic view looking north. All drywall installed as of February 6th.



*Left: the south classroom wall
Right: the west foyer entrance*

Astrophotography

Photos by Dave Churilla

Below left is the Northern Trifid Nebula (NGC 1759) in Perseus. This nebula is a Diffuse Nebula with a radius of 4 light years and is about 2000 light years away. This was a 30 Minute capture (89 stacked images).

The second is the Crab Nebula (Messier 1). This is a Super Nova Remnant that has a radius of about 5.5 light years and is 6523 light years away. It was a 32-minute capture (90 stacked images).



Astrophotography



Photo by Scott Spaulding

Horse head Nebula, taken just outside of Albuquerque NM on a Seestar, 10 minutes auto stack

From the Archives

February, 1982

Uranus: Can Voyager 2 Make It?

A recent analysis of Voyager 2's condition by engineers of the Jet propulsion Laboratory in Pasadena shows that the intrepid little explorer will make it to Uranus maybe.

There are five major problems with the craft:

THE SCAN PLATFORM that conked out after the Saturn ring plane crossing now appears to be a victim of a leaking lubricant which caused a drive gear to bind in its spindle . The unit should have been capable of doing 4000 maneuvers. It failed at #350.

A twin unit tested in the lab succumbed at #348 because of the leak problem. Engineers think they can eak another 50 to 100 rotations before the platform seizes up completely, and they can always fall back on rolling the entire spacecraft.

THE NARROW-ANGLE CAMERA may not have the lifetime originally predicted for it. A decline in the "erase current" indicates a useful life of 3,000 hours instead of the 6,500 anticipated . Solution: turn off the camera until closest approach when it is more useful anyway.

ONE OF 2 COMPUTER MEMORIES used to store and manipulate scientific data has a partial block because a 256 byte chip has failed. Slower data transmission from Uranus-Neptune space means either reducing the number of photos or observations, or resorting to "data compression", using

one memory to format the data and the other to compress it. Fine, so long as no other chips go.

ONE OF THE TWO RECEIVERS failed in 1978, and Voyager 2 has been on the spare ever since. Just in case the backup fails, a set of maneuvering plans sufficient to fly by Uranus on a quick and dirty basis have been stored in the craft's memory. It's too soon to do that for the later Neptune flyby , so it is unlikely that Neptune could be targeted if the receiver fails prior to Uranus encounter.

A PAIR OF "TRAVELLING WAVE TUBES" in the craft 's X-band transmitter were manufactured with too high a "cathode conversion temperature", which may reduce their lifetime well below the design criteria of 2,000 on-off cycles. Solution: The X-band transmitter is being left on continuously, rather than switching on—off, which leaves only the question of whether the tubes have enough operating hours to span the voyage.

It's touch and go, but Voyager 2 is still "go" for Uranus, at least.

Editor's note: in 1982 who could have imagined just how far Voyager 2 would actually travel while still in communication with Earth or all the incredible science that has been done with fifty year old hardware and a transmission rate measured in bits per second.

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](https://www.amazon.com) or [lulu.com](https://www.lulu.com).

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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.

