The Prairie Astronomer

September, 2025 Volume 66, Issue #9

IN THIS ISSUE:

THE NEWSLETTER OF THE PRAIRIE ASTRONOMY CLUB

The Prairie Astronomer

David Woolf, Kalamazoo, MI at NSP 2018
Photo by Mark Dahmke

Next meeting: Tuesday September 30th 7:30pm at Hyde Observatory

NEXT MEETING

September: "Clouds out Tonight? Press a button and Bortal 1 skies await....." Russ Genzmer will cover the universe of Remote Astronomy: Just what it is, the top site offerings and rates, how to get going, support, key features to look for in a site and philosophical issues from top amateurs.

October: To be announced

November:
How to Buy a Telescope

CONTENTS

Cover: Crescent Nebula by Jim White

M31 by Brett Boller

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.

CALENDAR

September 27th: Star-B-Que at Branched Oak Observatory

September PAC Meeting
Tuesday September 30th Hyde Observatory
Program: Russ Genzmer will discuss developments on Remote Astronomy (remote telescope hosting)

October PAC Meeting
Tuesday, October 28th, ***Branched Oak Observatory***
Program: to be announced

November PAC Meeting
Tuesday, November 25th, Hyde Observatory
Program: How to Buy a Telescope

December: Holiday Gathering

PAC Google calendar:
https://www.prairieastronomyclub.org/event-calendar/

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.

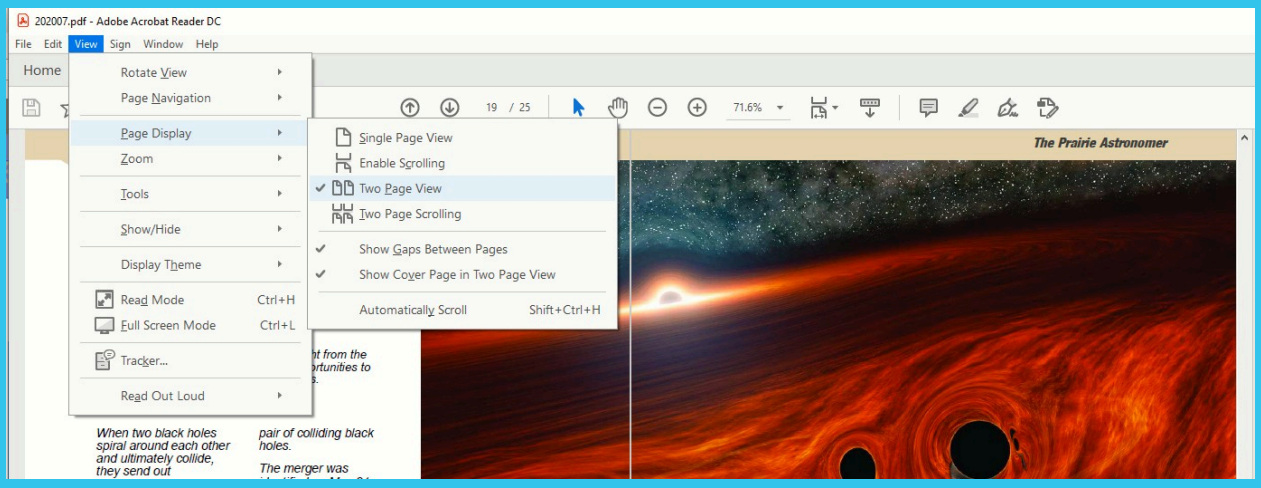
CLUB OFFICERS

President	Jason O'Flaherty jflaher@gmail.com
Vice President	Brett Boller proboller86@yahoo.com
2nd VP (Program Chair)	Lee Taylor otaylor88@gmail.com
Secretary	Jim White jrwhite2188@gmail.com
Treasurer	John Reinert jr6@aol.com
Club Observing Chair	Jim Kvasnicka jim.kvasnicka@yahoo.com
Outreach Coordinator	Don Hain dhain00@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.

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

Dear PAC Members,

As we head into the fall observing season, I want to share a few updates from our recent PAC Board Meeting, held on September 11.

We discussed reviving our Mentor Program and improving the onboarding experience for new members to make it easier for newcomers to feel welcomed and connected. We also reviewed our financial portfolio and talked about whether there might be worthwhile opportunities to invest a portion of the club's funds. While nothing stood out at the moment, we agreed that it could be helpful to use some of the funds to support guest presenters or special club initiatives with moderation.

We're also looking to invigorate club engagement beyond our meetings by exploring group activities, such as visiting astronomy exhibits or events together. As part of our outreach efforts, a PAC advertisement video will begin playing between shows at Hyde Observatory during public nights to help promote the club.

At our September meeting, we'll be opening the floor for nominations for board positions. Please consider nominating a fellow member or yourself for these roles, which we will vote on at our October meeting. Our October meeting will be held at Branched Oak Observatory as usual.

In November, we'll host our popular "How to Buy a Telescope" program. This is an excellent opportunity for the public to learn and ask questions before the holiday season. We agreed that more time needs to dedicated to modern digital telescopes.

Looking further ahead, our December meeting will be our annual Holiday Party. The exact date and location are still being finalized.

Lastly, we've decided to move our "How to Use Your Telescope" class from January to a warmer month like March, when we're more likely to have better weather.

Thanks again for being part of the club. I hope you're enjoying the cooler evenings and all that fall has to offer. I look forward to seeing everyone at our next meeting.

Clear skies,

Jason O'Flaherty

Meeting Minutes, August 26th

Jim White

Jason O'Flaherty, club president, started the meeting at 7:34 PM. Tonight's meeting is being held at Hyde Observatory and online via Zoom. We had two visitors at tonight's meeting, Anna and Ellie.

Jason turned the meeting over to Jim Kvasnicka, PAC Observing Chair, for his monthly observing report at 7:35 PM. Star parties for the month of September will be held on 9/19 and 9/26 at the Clatonia Recreation Area, approximately 1 ½ miles north of Clatonia. Planets for the month of September, Mercury and Mars will not be visible, Venus is a morning planet and will rise about 3 hours before the sun, Jupiter is a morning planet at magnitude -2.1 and a disc 36.8 arc seconds wide. Saturn will reach opposition on September 21st and its rings are almost edge on. Uranus and Neptune are morning planets, Neptune is near Saturn and will reach opposition on the 23rd of September. Jim's complete observing report can be found in the monthly newsletter. Jim turned the meeting back over to Jason at 7:41 PM.

Jason went over club membership options and dues along with membership benefits. Current club business, we have our annual election of officers in October and nominations for officers will open at our September meeting. If anyone is interested in becoming a club officer, they can nominate themself or they can reach out to Jason and let him know that you're interested. If anyone wants information on the duties of any of the club officer positions you can also reach out to Jason via email or through the Night Sky Network. Jason wants to have a board meeting before the September meeting so he would like all of the club officers, chair persons and coordinators that are present at tonight's meeting to stick around for a few minutes after the meeting to see if we can get a date that works for people to get a meeting setup.

Volunteer opportunities that are coming up. Hyde Observatory is always looking for volunteers and is open on Saturday nights throughout the year, if interested you can go to https://www.hydeobservatory.info/volunteer/ for more information and to fill out an application. Don Hain is trying to set something up for later this year for Cub Scout outreach. Camp Erin youth star gazing event is coming up in late September, this opportunity requires a background check prior

Meeting Minutes, continued

to the event and all of the volunteer spots have been filled for this year's event. Branched Oak Observatory (BOO) is having their annual Star-B-Que on September 27th so if you're interested in helping out by bringing a telescope and sharing your views with the public you can reach out to Brett Boller or contact one of the club officers and they can get you in touch with Brett or someone at BOO. Hoot and Howl is going on November 15th at Spring Creek Prairie Audubon Center, if you're interested in helping you can reach out to Don Hain for more information. Crete Public Library is looking to have an event in early November, you can reach out to Don Hain for more information or if you would like to volunteer. On Saturday 8/29 BOO is hosting Wine and Stargazing in co-ordination with James Arthur Vineyards, if you are interested in attending you can contact James Arthur Vineyards for ticket information and pricing. Tonight's meeting ended at 7:48 PM.

Tonight's program is "A Visit to the Kansas Cosmosphere and Space Museum" by PAC member Dave Knisely.

ARP 84

The Mantrap Skies Image Catalog

This is Arp 84/NGC 5394-5. Arp 263 looks like a loon. This one looks like a blue heron eating a fish. Both are commonly seen on the lake I live on. Herons however make a nasty mess on my dock! The body is NGC 5395, the neck and head NGC 5394 and the "fish" in its beak is SDSS J123826.24+372708.7. Blue herons have a crest that normally lays back across the head and down the neck. Even that shows in this galaxy trio. Actually, the fish is unrelated to the other two and is not part of the Arp designation. The two galaxies making up the blue heron are a bit over 160 million light-years from us while the fish is a bit over 650 million light-years away. Heron's may have a long bill but not that long! Arp classifies this one under "galaxies with bright companions". The interaction has really drawn out the spiral arms of NGC 5394 to make the neck and head. While arms have been ripped off of NGC 5395 helping to shape the body. Notice how the blue arm connecting to the "neck" shows no connection to the rest of NGC 5395 and in fact seems to get wider when it should get narrower. Also, the arm at

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.

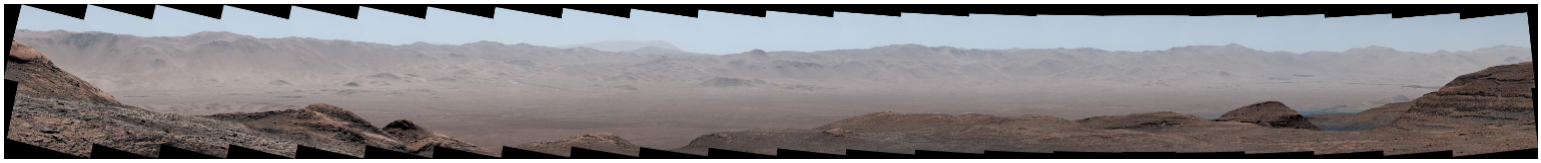
ARP 84, continued

the top going to the left comes out of nowhere and again isn't connected to the galaxy. Obviously, a lot of interaction is going on here. Both were discovered by William Herschel on May 16, 1787 but aren't in either of the Herschel 400 observing programs.

The odd blue galaxy at the far left is MAPS-NGP O_271_0033361 but I can find no distance data. To the right of the fish is a red star. below it is a small starlike galaxy. That one is 1.8 billion light-years away. Near the lower right corner are 4 galaxies. The two upper ones rather elongated the lower ones round, all are slightly to strongly orange. They are all about 770 million light-years away though I found no listing as a galaxy group for them. Nearby to the upper right is a small blue galaxy that is 1.1 billion light-years away.

The bright orange elliptical above and a bit left of the "bird" is IC 4356 and about the same distance from us as the "fish". It may be part of its galaxy group. The other galaxy to its right is an unknown. To the immediate left of NGC 5395 is a small bright blue galaxy. It too is located at the same distance as the fish so may also be part of its group.

Curiosity Views Gale Crater's Rim, Homing in on Ancient River Channel



NASA's Curiosity Mars rover captured this panorama under exceptionally clear conditions of Gale Crater's northern rim on Aug. 25, 2025, the 4,640th Martian day, or sol, of the mission. Dust in the air is at its lowest during Martian winter, providing Curiosity its best views all the way across the yawning crater floor from the rover's perch in the foothills of Mount Sharp, a 3-mile-tall (5-kilometer-tall) mountain roughly 22 miles (35 kilometers) from the crater rim. Credit: NASA/JPL-Caltech/MSSS

NASA's Psyche Images Earth and Moon

Scientists on the imaging team, led by Arizona State University, captured multiple long-exposure (up to 10-second) pictures of the two bodies, which appear as dots sparkling with reflected sunlight amid a starfield in the constellation Aries. The observations help the team determine how the cameras respond to solar system objects that shine by reflected sunlight, just like the Psyche asteroid. In January 2025, Psyche captured an image that included Mars, Jupiter, and the Jovian moons Io, Ganymede, Callisto, and Europa. The main image here was captured by Psyche's primary camera, Imager A, on July 23; Figure A was captured by the backup camera, Imager B, on July 20. Both images are annotated with labels indicating Earth, the Moon, and several stars. Photo credit: NASA/JPL-Caltech/ASU

Focus on Constellations: Pegasus

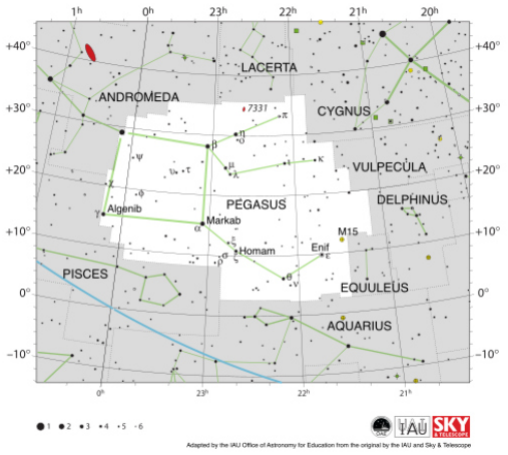
Jim Kvasnicka

Pegasus the Winged Horse is upside down with only the front half of the horse appearing in the sky. The body of Pegasus is marked by the four stars of the Great Square of Pegasus making the constellation easy to find. The NE star of the Great Square, Alpheratz, is shared by Andromeda. Pegasus contains 1,121 square degrees making it the seventh largest constellation. Even though it is big it is rather poor in objects because it is off the Milky Way. Pegasus contains one Messier object in M15, a bright globular cluster. Like most off the Milky sway constellations Pegasus has quite a few galaxies. Most of the galaxies are small and faint; requiring dark skies and moderate aperture to see. The constellation Pegasus is best seen in October.

Showpiece Objects
Globular Clusters: M15
Galaxies: NGC 7331, NGC 7332, NGC 7479, NGC 7814

Mythology
Pegasus was the winged horse of Greek Mythology. When Perseus cut the head off of the Medusa some of the blood fell into the sea and mixed with the sea foam. From this mixture sprang Pegasus the Winged Horse. Because sea foam is always white Pegasus is always shown as being white. Perseus mounted the mighty Pegasus and was riding the winged horse when he rescued the princess Andromeda from the Sea Monster Cetus.

Number of Objects Magnitude 12.0 and Brighter
Galaxies: 18
Globular Clusters: 1
Open Clusters: 3
Planetary Nebulae: 2
Dark Nebulae: 0
Bright Nebulae: 0
SNREM: 0



Pegasus Constellation Map:
IAU and Sky & Telescope magazine (Roger Sinnott & Rick Fienberg), CC BY 3.0 <https://creativecommons.org/licenses/by/3.0>, via Wikimedia Commons

October Observing

Jim Kvasnicka

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

Planets
Mercury and Mars: Evening planets but difficult to see.
Saturn: In Aquarius at magnitude +0.7 with a disk 19.4".
Neptune: Evening planet in Pisces.
Venus: Morning planet at magnitude -3.9.
Jupiter: Morning planet in Gemini at magnitude -2.1 with a disk 36.9".
Uranus: Morning planet in Taurus.

Meteor Showers
Orionids: October 20-21. Up to 20 per hour with no Moon to interfere.

Messier List
M11: The Wild Duck Cluster in Scutum.
M16: Open cluster in the Eagle Nebula.
M17: Omega or Swan Nebula in Sagittarius.
M18/M24: Open cluster and Small Sagittarius Star Cloud in Sagittarius.
M25/M26: Open clusters in Sagittarius.
M55/M75: Class XI and I globular clusters in Sagittarius.

Last Month: M13, M14, M22, M28, M54, M69, M70, M92
Next Month: M27, M30, M56, M57, M71, M72, M73

NGC and other Deep Sky Objects
NGC 7009: The Saturn Nebula in Aquarius.
NGC 7293: The Helix Nebula in Aquarius.
NGC 7331: Galaxy in Pegasus.
NGC 7479: Galaxy in Pegasus.
NGC 7510: Bright open cluster in Cepheus.
NGC 7606: Galaxy in Aquarius.

Double Star Program List
8 Lacerta: Four white stars.
Beta Cephei: White and blue stars.
Struve 2816: White primary with 2 blue stars.
Xi Cephei: Pair of yellow stars.
Delta Cephei: Yellow primary with a pale blue secondary.
Eta Persei: Yellow and blue stars.
Struve 331: White primary with a light blue secondary.
Epsilon Pegasi: Yellow primary with a white secondary.

Challenge Object
NGC 7769 / 7770 / 7771: Galaxy NGC 7769 is the brightest in this trio in Pegasus.

Club Outreach

Don Hain
dhain00@gmail.com
402-440-5318

Volunteers spots for the Camp Erin outing that Bob heads up have all been filled. Thanks so much to those taking time out to head over to Ashland that night to spend time helping youngsters and young adults have the wonders of the night sky brought into focus as an aid in working through the grief that has entered their lives. Much appreciated!

Other fall outreach events (after Camp Erin) will get going in November.

Upcoming event(s):

Camp Erin - Youth Overnight Camp
When: September Friday, September 26, 2025 9:00-10:00PM
Where: Carol Joy Holling Center- 27416 Ranch Rd, Ashland, NE 68003
Sponsored by: Mourning Hope
PAC Co-ordinator for this event: Bob Kacvinsky - volunteer spots are all filled !!

Crete Public Library - Intro to Astronomy presentation and viewing of the night sky
When: Wednesday, November 12, 2025
Where: Crete Public Library, 1515 Forest Ave, Crete NE 68333
Sponsored by: Crete Public Library
Needs: 5 or more are hoped for to bring scopes for the night sky viewing - contact dhain00@gmail.com

Nocturnal November - Spring Creek Prairie
When: Saturday, November 15, 2025
Where: Spring Creek Prairie Audubon Center - 11700 SW 100th St Denton, NE 68339
Sponsored by: Spring Creek Prairie
Needs: Another member and I are planning, however, the more the merrier. You can contact me at dhain00@gmail.com

Club Outreach

Tuesday November 25th at 7:30pm - How to Buy a Telescope
(internally organized meeting for outreach. … For those new to astronomy / wanting to learn more about it)

Per the description on the PAC website:

If you're considering buying a telescope for a family member for Christmas, the Prairie Astronomy Club will offer assistance with a session on "how to buy a telescope" at the November meeting. Experienced amateur astronomers will talk about how to select a telescope and what to look for when making your purchasing decision.

Hyde Observatory: OPEN
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.

NASA Analysis Shows Sun's Activity Ramping Up

It looked like the Sun was heading toward a historic lull in activity. That trend flipped in 2008, according to new research.

The Sun has become increasingly active since 2008, a new NASA study shows. Solar activity is known to fluctuate in cycles of 11 years, but there are longer-term variations that can last decades. Case in point: Since the 1980s, the amount of solar activity had been steadily decreasing all the way up to 2008, when solar activity was the weakest on record. At that point, scientists expected the Sun to be entering a period of historically low activity.

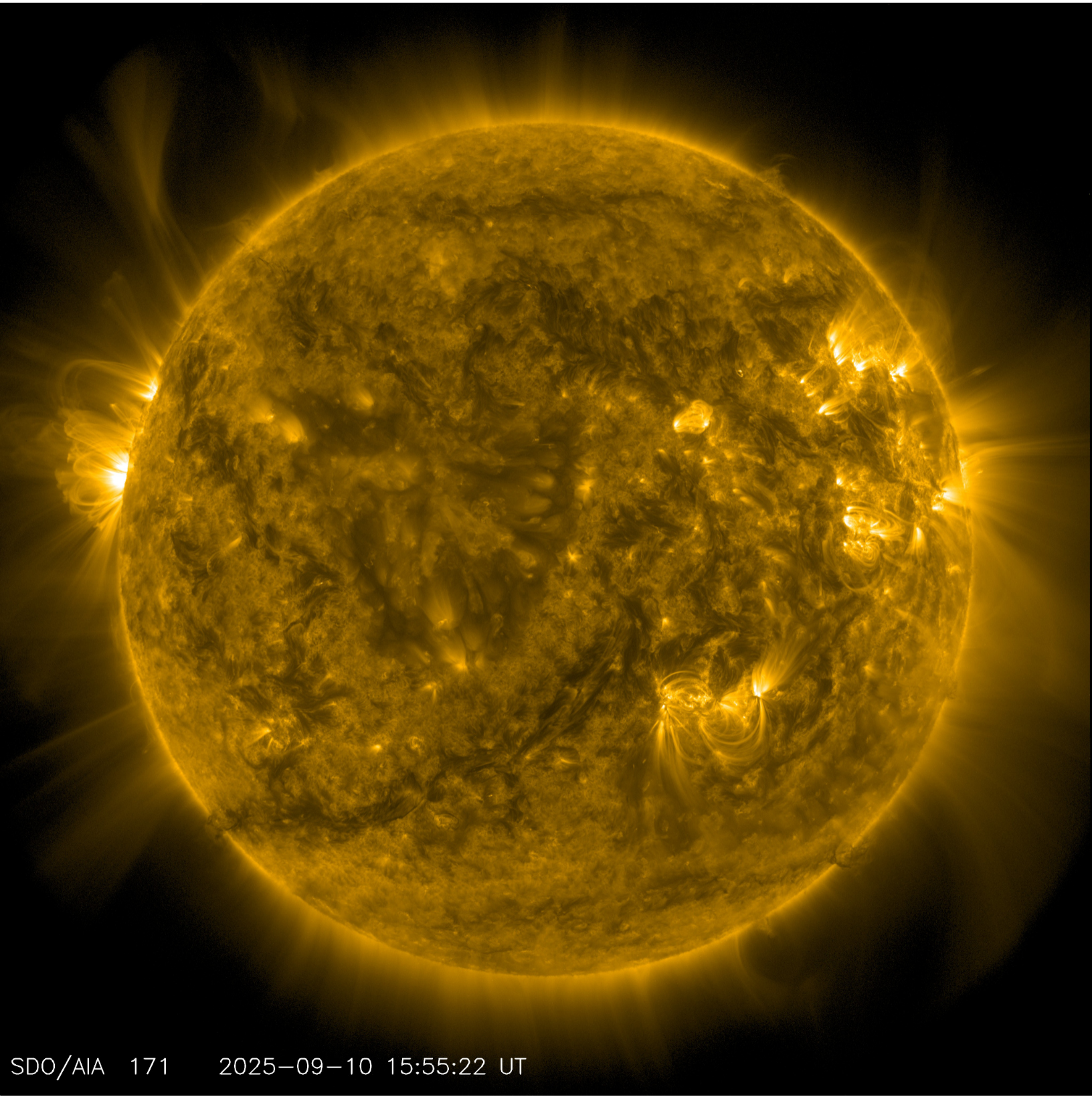
But then the Sun reversed course and started to become increasingly active, as documented in the study, which appears in The Astrophysical Journal Letters. It's a trend that researchers said could lead to an uptick in space weather events, such as solar storms, flares, and coronal mass ejections. "All signs were pointing to the Sun going into a prolonged phase of low activity," said Jamie Jasinski of NASA's Jet Propulsion Laboratory in Southern California, lead author of the new study. "So it was a surprise to see that trend reversed. The Sun is slowly waking up."

The earliest recorded tracking of solar activity began in the early 1600s, when astronomers, including Galileo, counted sunspots and documented their changes. Sunspots are cooler, darker regions on the Sun's surface that are produced by a concentration of magnetic field lines. Areas with sunspots are often associated with higher solar activity, such as solar flares, which are intense bursts of radiation, and coronal mass ejections, which are huge bubbles of plasma that erupt from the Sun's surface and streak across the solar system.

NASA scientists track these space weather events because they can affect spacecraft, astronauts' safety, radio communications, GPS, and even power grids on Earth. Space weather predictions are critical for supporting the spacecraft and astronauts of NASA's Artemis campaign, as understanding the space environment is a vital part of mitigating astronaut exposure to space radiation.

Launching no earlier than Sept. 23, NASA's IMAP (Interstellar

Sun, continued



On Sept. 9, 2025, NASA's Solar Dynamics Observatory captured this image of the Sun. Credit: NASA/GSFC/Solar Dynamics Observatory

Sun, continued

Mapping and Acceleration Probe) and Carruthers Geocorona Observatory missions, as well as the National Oceanic and Atmospheric Administration's SWFO-L1 (Space Weather Follow On-Lagrange 1) mission, will provide new space weather research and observations that will help to drive future efforts at the Moon, Mars, and beyond.

Solar activity affects the magnetic fields of planets throughout the solar system. As the solar wind — a stream of charged particles flowing from the Sun — and other solar activity increase, the Sun's influence expands and compresses magnetospheres, which serve as protective bubbles of planets with magnetic cores and magnetic fields, including Earth. These protective bubbles are important for shielding planets from the jets of plasma that stream out from the Sun in the solar wind.

Over the centuries that people have been studying solar activity, the quietest times were a three-decade stretch from 1645 to 1715 and a four-decade stretch from 1790 to 1830. "We don't really know why the Sun went through a 40-year minimum starting in 1790," Jasinski said. "The longer-term trends are a lot less predictable and are something we don't completely understand yet."

In the two-and-a-half decades leading up to 2008, sunspots and the solar wind decreased so much that researchers expected the "deep solar minimum" of 2008 to mark the start of a new historic low-activity time in the Sun's recent history.

"But then the trend of declining solar wind ended, and since then plasma and magnetic field parameters have steadily been increasing," said Jasinski, who led the analysis of heliospheric data publicly available in a platform called OMNIWeb Plus, run by NASA's Goddard Space Flight Center in Greenbelt, Maryland.

The data Jasinski and colleagues mined for the study came from a broad collection of NASA missions. Two primary sources — ACE (Advanced Composition Explorer) and the Wind mission — launched in the 1990s and have been providing data on solar activity like plasma and energetic particles flowing from the Sun toward Earth. The spacecraft belong to a fleet of NASA Heliophysics Division missions designed to study the Sun's influence on space, Earth, and other planets.

Club Offices and Duties

Nominations for next year's officers will begin at the September meeting, and remain open until election at the October meeting.

Club officer nominations are made in September and elections are held in October. The following is a list of responsibilities of each of the officers and what is required to maintain a functioning club.

As stated in the bylaws, the club has five officers: President, Vice President, Secretary, Treasurer and Second Vice President. The business of the Club shall be managed by a Board of Directors, which shall have the power to spend funds from the treasury for any valid purpose.

The Board shall create additional non-elected offices as required and initiate impeachment proceedings against officers who have been negligent in performing their duties.

Each decision of the Board shall require an affirmative vote of a majority of the Board members present, with a minimum of three members present.

The Prairie Astronomy Club has a sixty year history of service to club members and the community. Potential club officers should have a good understanding of the history of the club, its formation and mission, its relationship with Hyde Observatory and the types of events, activities and outreach that is part of the tradition of the club. The most complete resource is the book The Prairie Astronomy Club: Fifty Years of Amateur Astronomy, which is in the club library or available as a PDF document.

President

The President shall organize and direct the regular monthly meetings and all other Club activities, officially represent the Club at meetings of regional and national importance where he/she is in attendance or delegate this authority, call meetings of the Board of Directors, and appoint non-elected officers.

Vice President

The Vice-President shall be responsible for meetings when the President is absent, mediate in cases of procedural dispute, temporarily assume any duties of any officer at the direction of the President, and maintain control of the current inventory of all club property.

Secretary

The Secretary shall be responsible for taking minutes at each club meeting and shall be in charge of Club publicity.

Treasurer

The Treasurer is responsible for all Club funds, communications with club members regarding the payment of dues, and keeping accurate records of all monetary transactions. In addition, the Treasurer is responsible for:

1.Sending out membership renewal notices.

2.Submitting a written report of the Club's monetary status at the request of the President or giving a verbal report at the request of any

Club Offices and Duties, continued

member during regular meetings.

3.Providing an annual financial summary to the auditing committee. The final audit report is to be completed, and final approval will be submitted to the President and club membership by the end of February.

4.Maintaining an accurate club membership roster.

5.All tax filings and reporting requirements needed to maintain the Club's 501c3 status.

Second Vice President

The 2nd Vice-President shall be responsible for the formation and presentation of monthly Club programs.

Publications Chairperson

The Publications Chairperson (or Newsletter Editor) is responsible for editing and publishing the *Prairie Astronomer*. The newsletter editor should have prior experience with the publication of a newsletter or demonstrated technical skills required for producing a newsletter.

Site Chairperson

The Site Chairperson (if one is appointed) is responsible for establishing a site committee to oversee the maintenance and security of the Club observing site.

Recording Secretary

The Recording Secretary (often the Club's elected Secretary) is responsible for keeping the minutes of the Club meetings and filing a copy with the Club Secretary. Minutes need to be kept in a systematic fashion as they record the history and life of the Club and must be published in the *Prairie Astronomer* on a monthly basis.

Librarian

The Librarian shall keep the Club library and promote its circulation among the Club members. Dated records of persons to whom books are circulated are to be kept by the Librarian. He/she shall keep a current index of all Club library materials and file updated copies with the Club Treasurer as necessary. The Club Librarian and Secretary work together to maintain a record of club activities and regularly update the official club history.

Observing Chairperson

The Observing Chairperson presents a monthly report at Club meetings and/or in the *Prairie Astronomer*. The Chairperson keeps members informed of upcoming celestial events, sky objects of special interest, and star parties.

Outreach Chairperson

If the Club has an appointed Outreach Chairperson, the Chairperson takes on some of the roles performed by other officers – organizes outreach events, shares in media communications tasks, puts together flyers, etc.

All elected and non-elected officers must be accessible and responsive to club members via email and telephone or through other means of communication that are in common use. §

NASA's Webb Observes Immense Stellar Jet on Outskirts of Our Milky Way

Webb's image of the enormous stellar jet in Sh2-284 provides evidence that protostellar jets scale with the mass of their parent stars—the more massive the stellar engine driving the plasma, the larger the resulting jet.

A blowtorch of seething gasses erupting from a volcanically growing monster star has been captured by NASA's James Webb Space Telescope. Stretching across 8 light-years, the length of the stellar eruption is approximately twice the distance between our Sun and the next nearest stars, the Alpha Centauri system. The size and

Jet, continued

strength of this particular stellar jet, located in a nebula known as Sharpless 2-284 (Sh2-284 for short), qualifies it as rare, say researchers.

Streaking across space at hundreds of thousands of miles per hour, the outflow resembles a double-bladed dueling lightsaber from the Star Wars films. The central protostar, weighing as much as ten of our Suns, is located 15,000 light-years away in the outer reaches of our galaxy.

The Webb discovery was serendipitous. "We didn't really know there was a massive star with this kind of super-jet out there before the observation. Such a spectacular outflow of molecular hydrogen from a massive star is rare in other regions of our galaxy," said lead author Yu Cheng of the National Astronomical Observatory of Japan.

This unique class of stellar fireworks are highly collimated jets of plasma shooting out from newly forming stars. Such jetted outflows are a star's spectacular "birth announcement" to the universe. Some of the infalling gas building up around the central star is blasted along the star's spin axis, likely under the influence of magnetic fields.

Today, while hundreds of protostellar jets have been observed, these are mainly from low-mass stars. These spindle-like jets offer clues into the nature of newly forming stars. The energetics, narrowness, and evolutionary time scales of protostellar jets all serve to constrain models of the environment and physical properties of the young star powering the outflow.

"I was really surprised at the order, symmetry, and size of the jet when we first looked at it," said co-author Jonathan Tan of the University of Virginia in Charlottesville and Chalmers University of Technology in Gothenburg, Sweden.

Its detection offers evidence that protostellar jets must scale up with the mass of the star powering them. The more massive the stellar engine propelling the plasma, the larger the gusher's size.

The jet's detailed filamentary structure, captured by Webb's crisp resolution in infrared light, is evidence the jet is plowing into interstellar dust and gas. This creates separate knots, bow shocks, and linear chains.

The tips of the jet, lying in opposite directions, encapsulate the history of the star's formation. "Originally the material was close into the star, but over 100,000 years the tips were propagating out, and then the stuff behind is a younger outflow," said Tan.

Jet, continued

Outlier

At nearly twice the distance from the galactic center as our Sun, the host proto-cluster that's home to the voracious jet is on the periphery of our Milky Way galaxy.

Within the cluster, a few hundred stars are still forming. Being in the galactic hinterlands means the stars are deficient in heavier elements beyond hydrogen and helium. This is measured as metallicity, which gradually increases over cosmic time as each passing stellar generation expels end products of nuclear fusion through winds and supernovae. The low metallicity of Sh2-284 is a reflection of its relatively pristine nature, making it a local analog for the environments in the early universe that were also deficient in heavier elements.

"Massive stars, like the one found inside this cluster, have very important influences on the evolution of galaxies. Our discovery is shedding light on the formation mechanism of massive stars in low metallicity environments, so we can use this massive star as a laboratory to study what was going on in earlier cosmic history," said Cheng.

Unrolling Stellar Tapestry

Stellar jets, which are powered by the gravitational energy released as a star grows in mass, encode the formation history of the protostar.

"Webb's new images are telling us that the formation of massive stars in such environments could proceed via a relatively stable disk around the star that is expected in theoretical models of star formation known as core accretion," said Tan. "Once we found a massive star launching these jets, we realized we could use the Webb observations to test theories of massive star formation. We developed new theoretical core accretion models that were fit to the data, to basically tell us what kind of star is in the center. These models imply that the star is about 10 times the mass of the Sun and is still growing and has been powering this outflow."

For more than 30 years, astronomers have disagreed about how massive stars form. Some think a massive star requires a very chaotic process, called competitive accretion.

In the competitive accretion model, material falls in from many different directions so that the orientation of the disk changes over time. The outflow is launched perpendicularly, above and below the disk, and so would also appear to

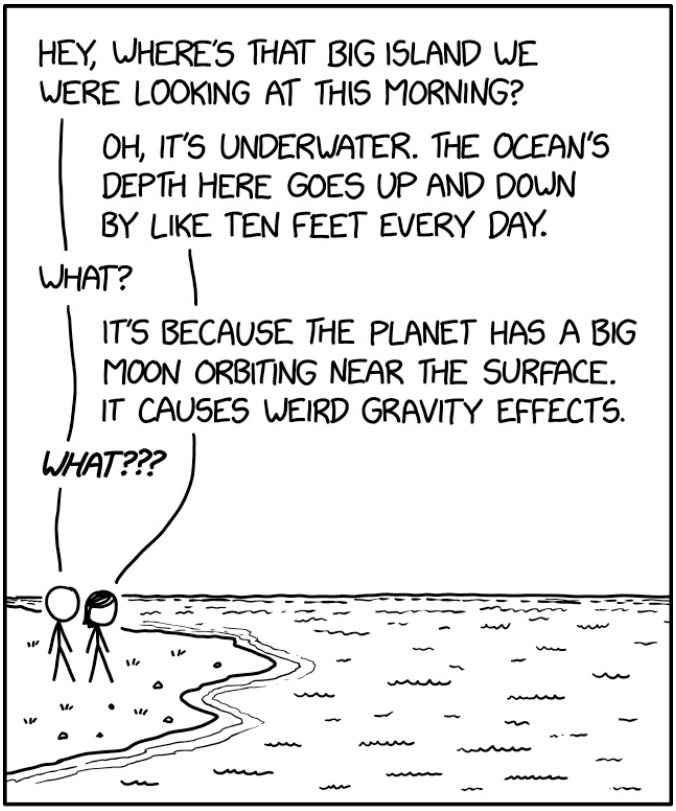
Jet, continued

twist and turn in different directions.

"However, what we've seen here, because we've got the whole history – a tapestry of the story – is that the opposite sides of the jets are nearly 180 degrees apart from each other. That tells us that this central disk is held steady and validates a prediction of the core accretion theory," said Tan.

Where there's one massive star, there could be others in this outer frontier of the Milky Way. Other massive stars may not yet have reached the point of firing off Roman-candle-style outflows. Data from the Atacama Large Millimeter Array in Chile, also presented in this study, has found another dense stellar core that could be in an earlier stage of construction.

The paper has been accepted for publication in The Astrophysical Journal.

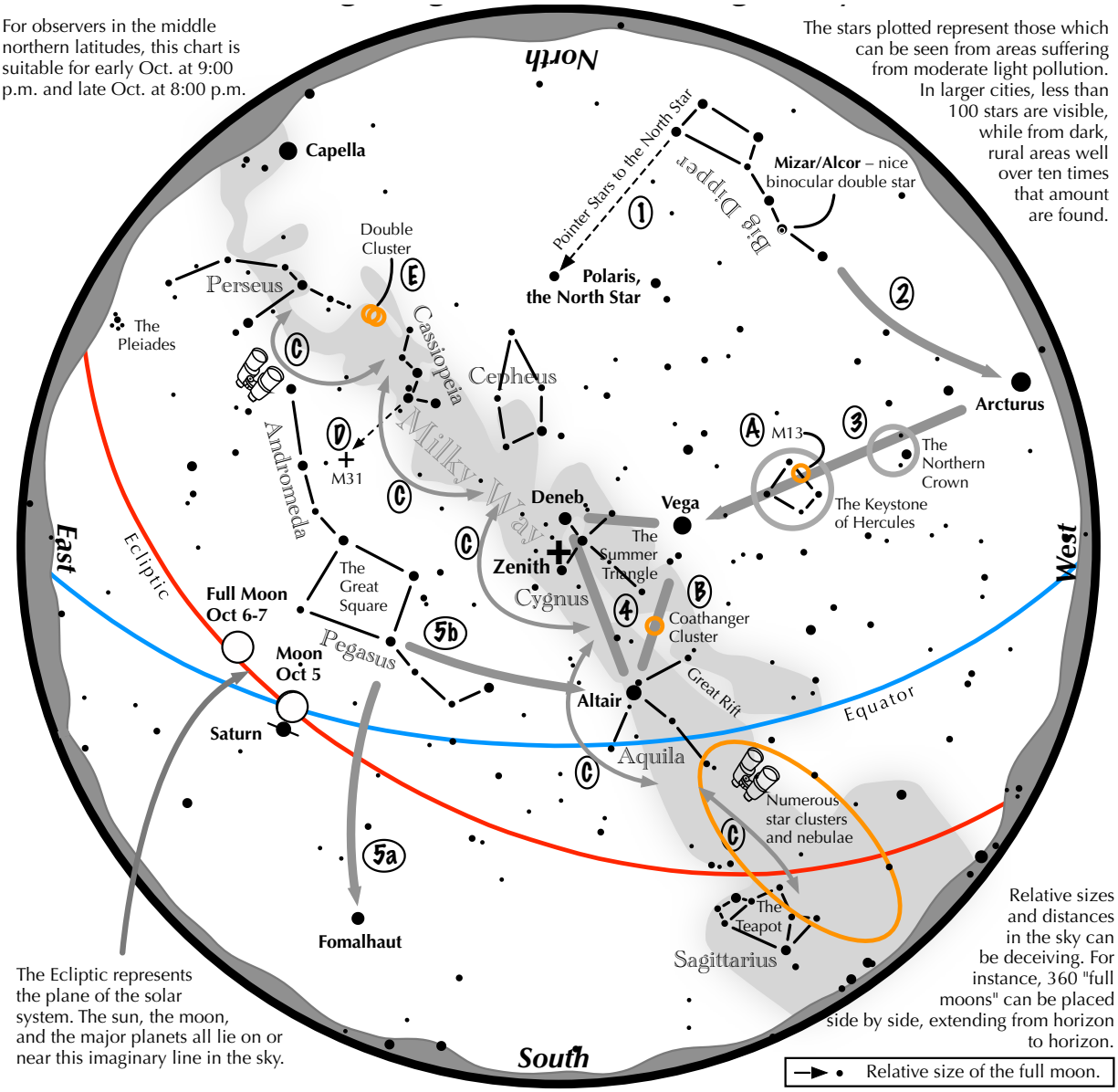


xkcd.com

Navigating the mid-October Night Sky

For observers in the middle northern latitudes, this chart is suitable for early Oct. at 9:00 p.m. and late Oct. at 8:00 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

Relative size of the full moon.

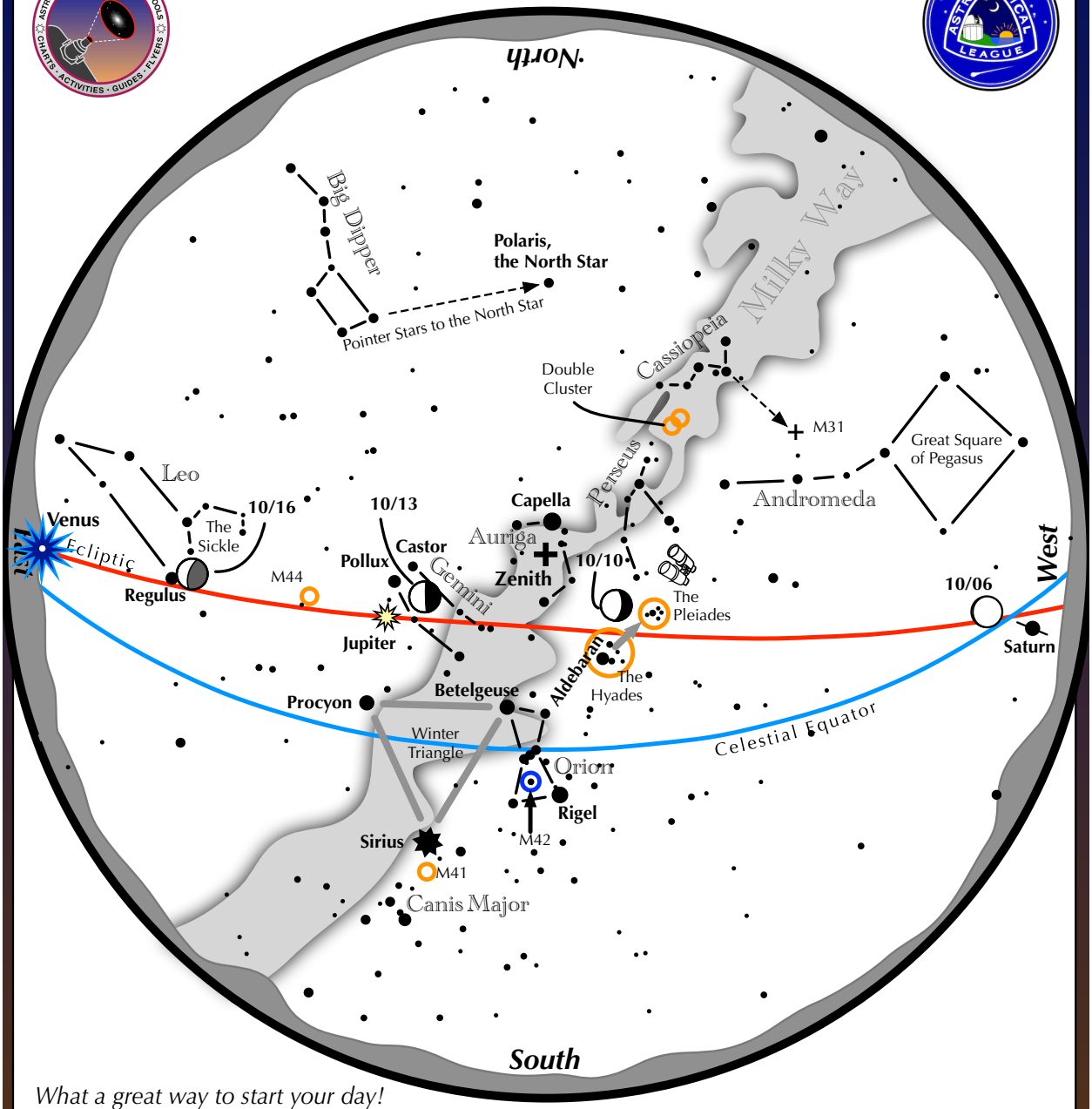
Navigating the October night sky: Simply start with what you know or with what you can easily find.

1. Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
2. Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the early October evening sky.
3. To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
4. Nearly overhead lie the summer triangle stars of Vega, Altair, and Deneb.
5. High in the east are the four moderately bright stars of the Great Square. Its two southern stars point west to Altair. Its two western stars point south to Fomalhaut.

Binocular Highlights

A: On the western side of the Keystone glows the Great Hercules Cluster, a ball of 500,000 stars. **B:** 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger. **C:** Sweep along the Milky Way for an astounding number of fuzzy star clusters and nebulae amid many faint glows and dark bays, including the Great Rift. **D:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval. **E:** Between the "W" of Cassiopeia and Perseus lies the Double Cluster.

Navigating the mid October Morning Sky



What a great way to start your day!

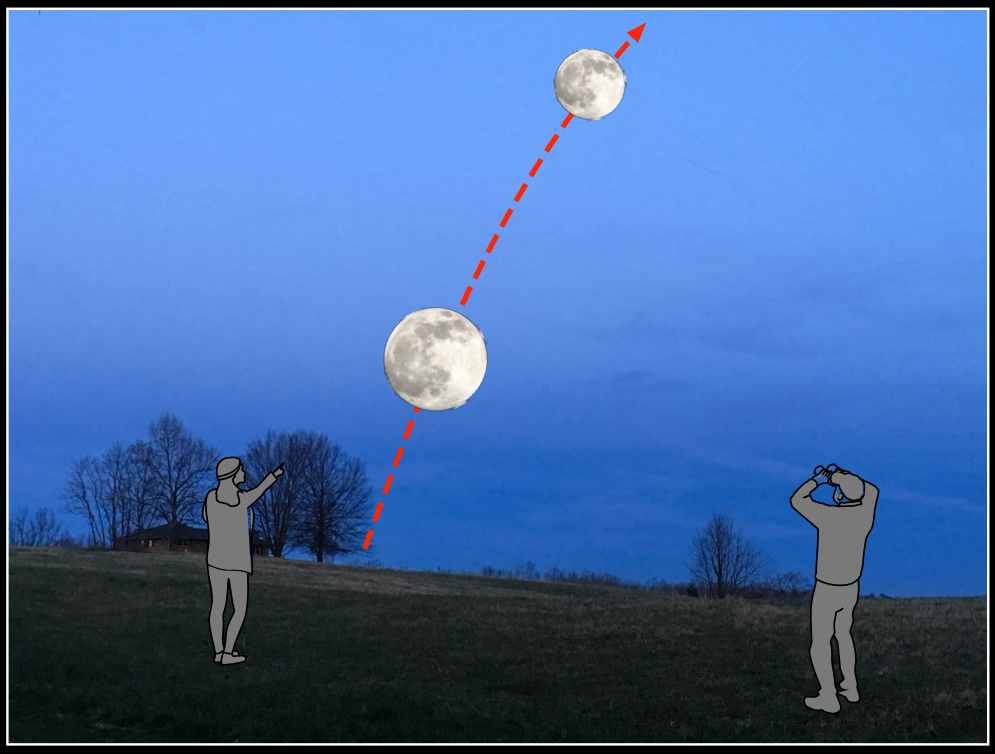
For observers in the middle northern latitudes, this chart is suitable for mid October at 5:00 a.m.

Late sunrises in October provide opportunities for early morning skywatching.

- Bright Jupiter shines nearly overhead.
- Venus climbs above the eastern horizon 60 minutes before sunrise.
- The third quarter moon glows next to bright Jupiter on October 13.
- The waning crescent moon glows next to Regulus on October 16.
- During the first half of October, gaze high in the south and overhead to see these many celestial features: the Pleiades, the Hyades with Aldebaran, Jupiter, Orion, Capella and Auriga, the Winter Triangle with Sirius and Procyon, and Gemini.

C. would be the most correct. The psychological effect is not well understood.

Big Moon Rising: Is it real?



When the full moon rises, it seems to be unusually large. Later, when it has climbed higher in the sky, it returns to its expected apparent size. Why is this the case?

A. When the moon is close to the horizon, its apparent size can be compared to those of distant landscape objects. So, it seems larger than it is.
B. When it is near the horizon, it is closer to us than when it is overhead. So, it appears bigger.
C. It is an unconscious psychological effect. The same effect occurs over a featureless sea.

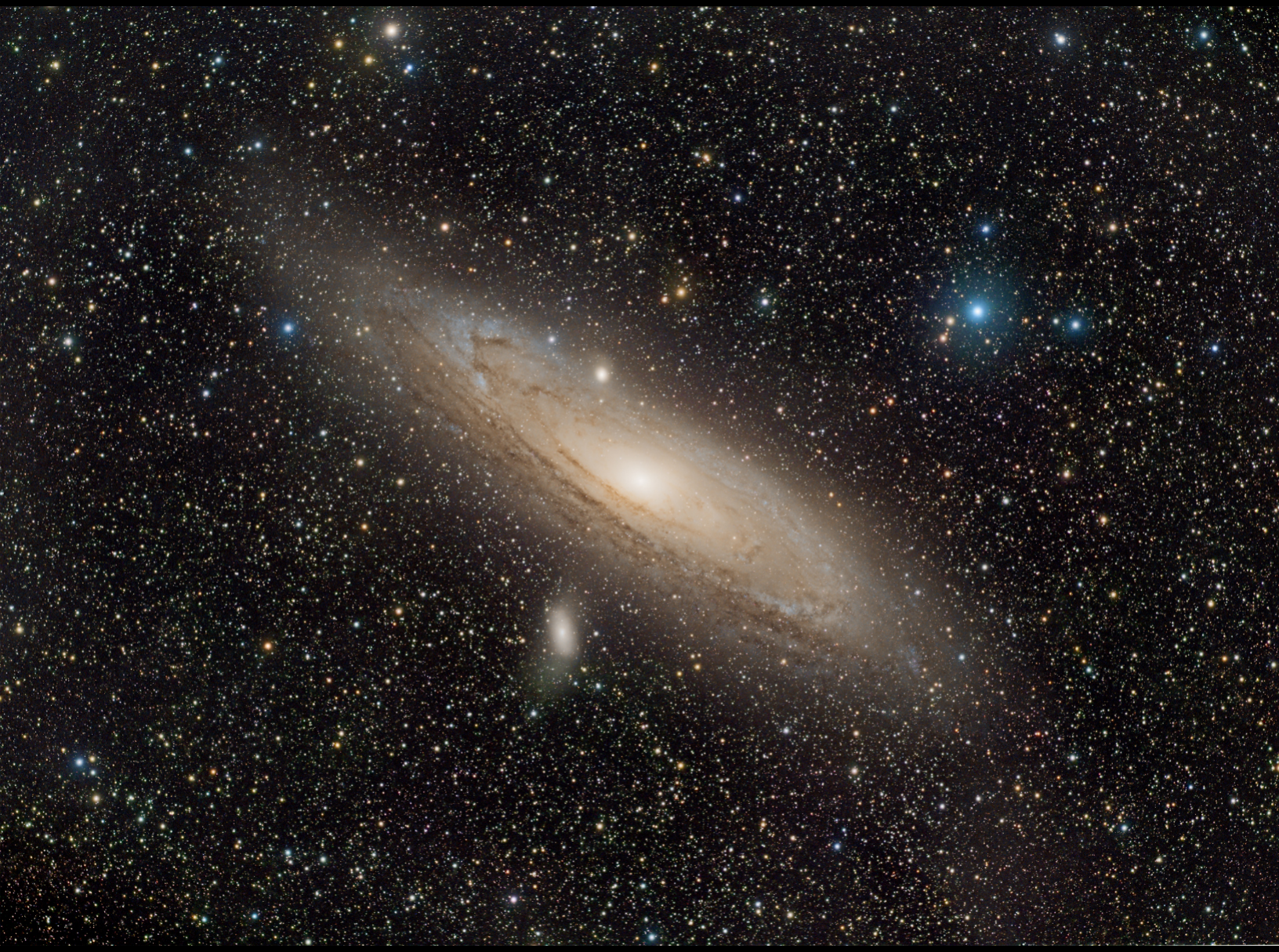
Look at the moon through a drinking straw when it is rising, and later, when it has climbed a good distance above the horizon. Does the apparent size of the moon through the straw appear to change?

2508

Astrophotography

Crescent Nebula by Jim White
(NGC 6888, Caldwell 27, Sharpless 105, Taken 8/23/25-8/24/25
63 of 87 - 3 Minute exposures (Lost 24 frames to clouds), 25 - 3 Minute dark frames, 25 - Flat frames, 25 - Dark flat frames
Telescope 925 EdgeHD SCT, Mount Celestron CGX, Camera ZWO ASI2400MC Pro
Celestron Off-Axis-Guider
Guide camera ZWO ASI174MM Mini, Control and imaging software - CPWI, N.I.N.A.,
Optolong 2" L-Quad Enhance Filter,
PHD2, Stellarium, Processing software - PixInsight

Astrophotography



Andromeda Galaxy by Brett Boller, 9-18-25
William Optics Redcat 51mm
ZWO ASI2600MC Pro Duo
ZWO AM5n
30 - 5 minute subs
Pixinsight and Photoshop
Friend NE

Astrophotography

26+ hours of data for the North American & Pelican by Brett Boller
William Optics Redcat 51mm
9-2-25 to 9-18-25
ZWO ASI2600MC Pro Duo
ZWO AM5n
320 - 5 minute subs
Pixinsight and Photoshop
Friend NE

From the Archives, October, 1985

The Observing Chairman's Report
By Dave Knisely

This month's star party will be held Friday November 8th at Moser's house in Hickman. This month promises much with presence of Halley 's comet, now easily seen in a four inch telescope . On the night of November 15-16 the comet will pass about two degrees south of the Pleiades with its expected magnitude at 7.5 and the four day moon low in the west. This is a must see for all of you with rich field instruments. A good starting place for those of you with six inch or larger instruments is the fairly bright galaxy NGC located 1/2 a degree south and three degrees west of Pi Persei. It shows as a lens shaped fuzzy patch of light with a brighter center and a faint tuft of 1ight on the east end. Also in Perseus is the open cluster M 34, located 2 1/2 degrees due north of 12 Persei. It is a moderate sized group of about 80 stars 8th magnitude and fainter and should show up well in a 4 inch or larger telescope. For those of you who like challenges, try NGC 891, a very faint edge—on spiral about three degrees east of Gamma Andromeda. It can be just barely seen in a 6 inch aperture with a 10 inch showing its broad nuclear region and vague dark lane down the length of the galaxy. An interesting open cluster I ran into lately is NGC 752, a large group of about 70 stars located about three degrees west of the star 58 Andromeda. It should be a good target for three inch and larger instruments and visible in binoculars. The observer who is working on his Messier award probably has had trouble finding M74, a faint face—on spiral galaxy in Pisces. It can be found looking just over a degree northeast of eta of eta Piscium and appears as a small circular fuzzy patch with slightly brighter center, but shows little detail in telescopes under 10 inches in aperture. A fairly easy galaxy in the Messier 1ist is M77 in Cetus. This is one of the so—called "Seifert galaxies" noted for their active almost quasar like nuclei and can be found looking one degree southeast of delta Ceti. Most telescopes show it as a fairly bright fuzzy oval with a bright star-like nucleus . A ten inch may also show hints of spiral detail although they are vague at best.

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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.

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.