

The Prairie Astronomer

October 2024 Volume 65, Issue #10



October Program: Frank O'Brien on the Apollo Guidance Computer

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Snowballs from Space



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer



The next club meeting is October 29th at 7:30pm at Hyde Observatory

NEXT MEETING AND PROGRAM

Flying to the Moon: A view from the Apollo Guidance Computer - Frank O'Brien

A flight to the moon seems impossibly complex, especially given the technological state of the art in the 1960's. While the details are indeed formidable, the concepts are surprisingly easy to understand.

We will discuss the three key components used in the Apollo spacecraft to voyage from the Earth to the Moon and back home again. Importantly, these components - the computer, the guidance platform, and the optics system - all worked together to fly the spacecraft with incredible accuracy. We

UPCOMING PROGRAMS

November: How to Buy a Telescope

will also answer the basic questions of spaceflight navigation: Which way is up? Where am I? Where am I going? The techniques used by the astronauts all build on these simple ideas in solving the problem of navigating to our nearest celestial neighbor.

As a special bonus, we will describe in detail of how to land on the Moon!

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Cover: M16, The Eagle Nebula, taken at NSP by Jim White



CALENDAR



Lincoln Parks & Recreation

October PAC Meeting

Tuesday, October 29th, 7:30pm at Hyde Observatory

Program: *Flying to the Moon: A view from the Apollo Guidance Computer*

PAC Meeting

Tuesday, November 26th, 7:30pm at Hyde Observatory

Program: *How to Buy a Telescope*

December: *Holiday Gathering, date to be announced*

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.

<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	9/27	4
November	11/22	29
December	20	27

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

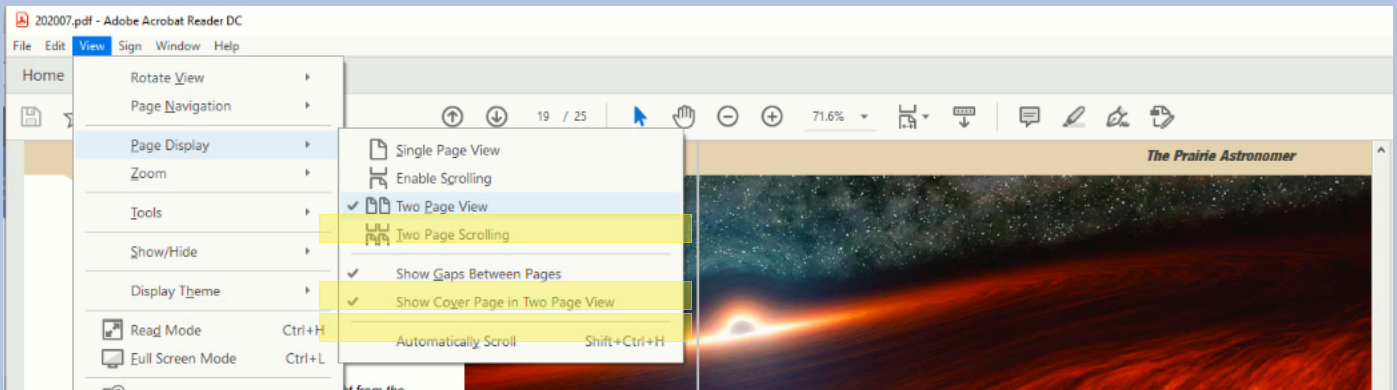
CLUB OFFICERS

President	Jason O’Flaherty jflaher@gmail.com
Vice President	Brett Boller proboller86@yahoo.com
2nd VP (Program Chair)	Bill Lohrberg wmlohrberg89@gmail.com
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.

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,
It's been a busy month as our active volunteer season comes to an end. I want to extend a huge thank you to everyone who volunteered at events like Camp Mourning Hope, the Branched Oak Observatory's 10th Annual Fall Star-B-Q, Spring Creek Prairie's Hoot' n' Howl, and the various public outreach nights at the observatories. We are incredibly fortunate to have such a dedicated group of volunteers who help share our passion for astronomy with the community.

Our last meeting was a hit! A big thank you to Ilya Kravchenko, who presented on detecting ultra-high-energy neutrinos at the South Pole. It was fascinating to see how much knowledge our club has about high-energy particle physics—who knew?

We also had two rare astronomical events this month that kept our eyes

on the sky. The Aurora Borealis graced us again, giving those who missed it in May another chance to experience the phenomenon. The aurora was visible across our state and even as far south as North Carolina! Additionally, Comet C/2023 A3 lit up the western sky, reaching perihelion on September 28th and peaking in brightness on October 12th. It was visible to the naked eye for several nights, and although, in my observation, the core wasn't as bright as Comet Neowise 2019, the comet's tail seemed twice as long, giving it a striking beauty.

Looking ahead, our October 29th meeting will be important as we hold our club elections. While I haven't received any additional nominations, there's still time! If you're interested in a position or would like to be considered for an officer-in-training, please get in touch with me at jason@oflaherty. contact. You can vote in person or via Zoom.



Thanks to club funds, we'll also enjoy some Casey's pizza and refreshments at the meeting.

I'm particularly excited about our guest presenter this month. Frank O'Brien, an expert on the Apollo Guidance Computers used during the Lunar Program, will explain the history and inner workings of the computers that made the moon landings possible. He has even authored a book on the subject! It's sure to be a fantastic presentation you will want to attend.

Finally, looking ahead to November, our meeting will double as our annual "How to Buy a Telescope" class, perfectly timed ahead of Black Friday. We'll spend about five minutes on club business before diving into the class. If you're interested in presenting, let me know, and depending on the

number of volunteers, we may split it up as we've done before. This class is a great resource for the community and newer members, so please spread the word!

We'll also be running a Facebook ad to promote the event.

That about wraps it up for this month. I told you last month I'd be back to my verbose self! I look

forward to seeing everyone on October 29th.

Clear skies,
Jason O'Flaherty

Star-B-Q at Branched Oak Observatory



Star-B-Q, continued.



Meeting Minutes

Jim White

Jason O'Flaherty started the meeting at 7:33 p.m. Jason asked if there were any new members and Cody Rieken introduced himself. Cody had attended last month's meeting and then attended one of the club star parties at the Clatonia Recreation Area and decided to join the club, welcome Cody! Our guest at this month's meeting is Ilya Kravchenko, who is also tonight's guest speaker.

At 7:35 Jason turned the meeting over to Jim Kvasnicka, PAC's Observing Chair, for his monthly observing report. Jim announced the dates for the upcoming star parties at the Clatonia Recreation Area, they will be on Friday 9/27/24 and Friday 10/4/24. Looking at the planets for October, Mercury is not visible, Mars is a morning planet in Gemini, Saturn is in Aquarius and is at a magnitude of +0.7 with a disc that is 18.7 arc seconds wide, Jupiter is in Taurus at a magnitude -2.4 with a disc that is 44 arc seconds wide,

Uranus is in Taurus and Neptune is in Pices, Venus is an evening planet at a magnitude -4.0. There is one meteor shower this month, the Orionid meteor shower will peak the nights of October 20th and 21st but the waning gibbous moon may interfere with viewing. There is a comet in October, Comet Tsuchinshan-Atlas, will come into view at dusk around the 11th of October and will keep climbing at a rate of 5 degrees per day and may become visible to the naked eye. On the night of October 15th, the comet will pass 1.2 degrees south of globular cluster M5. Jim's complete observing report can be found in the newsletter.

At 7:40 Jim turned the meeting back over to Jason who then turned the meeting over to John Reinert, PAC's Treasurer, for his treasurer's report. John filed the N990 form with the IRS this month and paid the club's insurance and the club's post office box fee. John is planning on getting the audit done in the

upcoming weeks. John said that the cost to the club membership for the convenience of paying dues online was originally projected to be around 2.4 percent is actually closer to 5-6 percent. John said that you can still pay your dues with cash or check along with being able to pay them online. It was brought up that with the original 2.4 percent projected cost that the club would just cover that cost but with the actual cost running in the 5-6 percent range the board may want to consider putting a surcharge on dues paid online to cover the transaction cost.

At 7:43 John turned the meeting back over to Jason. Club business for tonight is opening nominations for club officers, nominations will be open until the October club meeting when elections take place. Jason O'Flaherty was nominated for President and accepted the nomination. Brett Boller was nominated for Vice President and accepted the

nomination. Lee Taylor was nominated for 2nd Vice President and accepted the nomination. Jim White was nominated for Secretary and accepted the nomination. John Reinert was nominated for Treasurer and John accepted. Nominations are open until they are closed right before the election in October so if someone is interested in putting their name in for a position you can nominate yourself. If you would like to put your name in just send Jason an email and he will put your name in for the election in October. Elections will be held at the October meeting which will be held at Hyde Observatory. For

the last few years our October meeting has been held at Branched Oak Observatory but there is a conflict with that this year so the meeting and elections will take place at Hyde Observatory. A new option available for voting in this year's election is that you can vote via Zoom, which was a change made to our updated bylaws, to vote via Zoom you need to have video enabled.

Upcoming volunteer opportunities are Hoot and Howl on October 12th at 6:30 p.m. at Spring Creek Prairie. If you participate in an outreach event, please take a picture and send it to Jason so it can be included in our meeting

presentation and the newsletter. September 28th is the 10th Annual Star-BQ at Branched Oak Observatory, if anyone is interested in taking their telescope out to the Star-BQ and sharing the view with visitors your help would be appreciated. Tonight's meeting adjourned at 7:54.

Tonight's program is "Cosmic Messengers: Exploring the Universe Through Ultra-High Energy Neutrino's" and is presented by Ilya Kravchenko from UNL. Ilya is Vice-Chair and Professor in HEP in the Physics and Astronomy Department.

Club Officer Nominations

President: Jason O'Flaherty

Vice President: Brett Boller

Second Vice President: Lee Taylor

Secretary: Jim White

Treasurer: John Reinert

ARP 72

The Mantrap Skies Image Catalog

In Arp's class "spiral galaxies with small high surface brightness companions on arms"; "faint material from arm to and around companion. Opposite arm faint, sweeps around east of galaxy" (Arp)

NGC 5994 (small galaxy), 156 million light-years distant and classified S? and discovered by William Herschel on March 21, 1784 but isn't in either Herschel 400 program.

NGC 5996 Starburst galaxy SBc pec located 157 million light-years away and discovered by Bindon Stoney on March 9, 1851.

NED note says; "The UV spectrum of this starburst (classified as such by Balzano 1983 on the basis of optical data) is similar to the one of the prototype NGC 7714. Here also Si IV and C IV show P Cygni profiles, a signature of Wolf-Rayet stars. A high far-infrared luminosity confirms the presence of vigorous star formation (Deutsch & Willner 1987). This activity is possibly triggered by the strong



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.



ARP72, continued

interaction with the companion NGC 5994 (Bushouse 1987).

Limiting magnitude of this image is about 24.5! See ID image for details. Most galaxies with redshift data are about over 3 billion light-years away. NED lists over 1700 galaxies within a 23 minute circle centered on my image (not Arp 72 which is a bit high as I wanted to catch the interacting pair at the very bottom. Since all but a very few are brighter than 24.7 and the field is 33 minutes wide, not 23, I probably caught more than 2500 galaxies in this image but you may have to blow up the image to see them all. Not bad for only 40 minutes of luminosity data! Math says 3038 so I'm being conservative. The two galaxies marked with their distance are magnitude 20.2 and 20.6, left to right. This was a night of better than average seeing and transparency.

I moved Arp 72 high to catch the two possibly interacting galaxies at the bottom of the image west of center (right). The big galaxy is SDSS J154629.02+173914.4 at

magnitude 17.2. Unfortunately, there is no redshift data on it. The small round "companion" is SDSS J154629.94+173918.9 at magnitude 18.2. Redshift data is available for it and puts it at 1.2 billion light years. Both seem to have about the same intergalactic reddening so probably are about the same distance. But whether the smaller galaxy is just superimposed over the halo of the larger or they are really interacting I don't know. The very blue elongated galaxy to the NW is SDSS J154625.91+174017.7 at magnitude 18 and a redshift distance of 650 million light years. The reddish round galaxy SE of the possibly interacting pair is SDSS J154634.61+173850.2 at magnitude 17.3 and a redshift distance of 1.3 billion light-years, about the same as the nearby pair.

The round galaxy above and a bit west of Arp 72 is SDSS J154649.41+175902.0 at 620 million light years. The somewhat smaller blue "bug splat" of a galaxy above and east of

Arp 72 is SDSS J154712.85+175727.2. It is far smaller than the former galaxy being only 160 million light years distant. Thus it is likely related to Arp 72 and judging by the vivid blue color likely interacted with it in the past, triggering massive star formation that is still going on.

East of Arp 72 level with the companion is a "small spiral with a very dense core and faint disk without arms. It is SDSS J154714.35+175153.1 which is 1.7 billion light-years away. Above it at further east is a double galaxy, the eastern one being nearly starlike. The main one is SDSS J154722.89+175309.7 at 1.4 billion light years. I can't find the eastern one in NED! Checking the POSS 2 blue plates the second galaxy is plainly seen. Why the SDSS missed it I don't know.

Due west of Arp 72 is a small slightly oval blue galaxy. It is SDSS J154641.50+175337.2 at 620 million light years. Further west is the more elongated blue galaxy cataloged as SDSS J154633.14+175300.4. It

ARP72, continued

is shown at 630 million light years so likely related to its nearby companion. They are surprisingly blue for their distance.

At the eastern edge, near the center are three rather bright galaxies. The western and northernmost is a double blue galaxy. It is listed in both the SDSS catalog and the MCG catalog. The can't seem to agree on its position nor its redshift. It is SDSS J154757.80+174921.5 with a redshift of 600 million light years or MCG +03-40-041 at 500 million light years. Take your pick! It could be that they are measuring the redshift of different galaxies in the pair. If they aren't really related this difference could be real. Further east and

south is the apparently much larger yellowish elliptical galaxy known as CGCG 107-038 or ARK 485. The latter indicates it is an emission line object. Something you don't expect of an elliptical galaxy that should have used up all its gas long ago and thus not have strong emission lines. It may be bright and interesting but I couldn't find a redshift value for it. I was hoping notes at NED would help me but there was only one and it told me only what was obvious from my image; "Elliptical red object with an envelope." Below it is another very blue spiral, SDSS J154802.94+174538.4 at 440 million light years. Above these three, nearly directly north of the mystery double blue

galaxy is a reddish galaxy with what appears to be a very disturbed outer envelope. It is SDSS J154756.71+175216.1 at 1.2 billion light years. There are several nearly starlike galaxies around it, could one of them be responsible for so disturbing this galaxy.

There are hundreds of other galaxies I could mention, such as the tiny reddish but bright galaxy SE of the bright blue star below Arp 72. It is SDSS J154704.34+174833.0 at 1.3 billion light years yet shines at 18th magnitude. But I have to stop somewhere or write a book on this field so I'll stop with the comment that oddly, NED lists no quasars in this field. For going so deep I found that surprising.

November Observing

Jim Kvasnicka

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

Planets

Mercury: Evening planet, not positioned well for viewing.

Venus: Evening planet at magnitude -4.1.

Mars: At magnitude -0.2 with a disk 10" wide in Cancer.

Jupiter: At magnitude -2.7 with a disk 47.25" wide in Taurus.

Saturn: At magnitude +0.9 with a disk 18.0" wide in Aquarius.

Uranus and Neptune: In Taurus and Pisces.

Meteor Showers

Leonids: Peaks the night of November 17-18. Expect up to 15 meteors per hour. The almost full Moon will interfere.

Messier List

M27: The Dumbbell Nebula in Vulpecula.

M30: Class V globular cluster in Capricornus.

M56: Class X globular cluster in Lyra.

M57: The Ring Nebula in Lyra.

M71: Class XII globular cluster in Sagitta.

M72: Class IX globular cluster in Aquarius.

M73: Asterism in Aquarius.

Last Month: M11, M16, M17, M18,

M24, M25,
M26, M55,
M75

Next Month:

M2, M15, M29, M31, M32, M39, M110

NGC and other Deep Sky Objects

NGC 7662: The Blue Snowball in Andromeda.

NGC 128: Elongated galaxy in Pisces.

NGC 247: Galaxy in Cetus.

NGC 253: The Silver Coin Galaxy in Sculptor.

NGC 288: Class X globular cluster in Sculptor.

NGC 457: The E. T. Cluster in Cassiopeia.

Double Star Program List

Iota Trianguli: Yellow primary with a pale blue secondary.

Gamma Arietis: Two equal white stars.

Lambda Arietis: Yellow and pale blue stars.

65 Piscium: Yellow pair.

Psi 1 Piscium: Equal bluish white pair.

Zeta Piscium: White primary with a secondary.

Alpha Piscium: Close white pair.

Gamma Andromedae: Almach, gold and greenish blue pair.

Challenge Object

NGC 193 and NGC 194: Two small round galaxies in Pisces that fit in the same FOV.



Focus on Observing Programs

Jim Kvasnicka

The Herschel 400 Observing Program

Amateur astronomers have enjoyed the challenge and excitement provided by the 110 objects in the Messier Program for many years. After completing the program, however, most were left in a void. They wanted to further their quest for deep-sky objects, but there was no organized program that provided the next step. With that in mind the Herschel 400 Program was started.

The New General Catalog (NGC) contained almost 8,000 objects of which 2,477 were observed by William Herschel. After considerable study 400 of the objects were selected to comprise the Herschel 400 Program. All the objects they say can be seen through a 6 inch telescope. Having completed the Herschel 400 Program it was difficult at times to find objects with my 10 inch telescope. Some of the objects require dark skies and excellent seeing conditions. A list of the 400 objects in the Herschel 400 Program can be downloaded from the Astronomical League website.

The Herschel 400 Program is meant to be an advanced program for observers who already have a fair degree of experience. Anyone starting out should do the Messier Program first before attempting the Herschel 400 Program.

When you complete the Herschel 400 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 Herschel 400 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 Herschel 400 Observing Program or any other observing program, or need help getting started please contact me and I will be glad to help.

Outreach Calendar

Don Hain

dhain00@gmail.com, 402 440 5318

A successful September is behind us. Many of us have had opportunities to again chat with others about how our planet is connected with not only our favorite star, the sun, but with the many objects in our galaxy and beyond our galaxy as well. Thanks to Rachel Scheet and the crew at the University for sponsoring a lovely Cosmos and Cocktails evening at the State Museum and Planetarium. PAC was represented, as well as a couple groups we closely associate with, the Omaha Astronomical Society and Branched Oak Observatory. By the time the evening drew to a close, just over 185 folks had participated in the event.

At the event, Jason O'Flaherty described the mechanics of astrophotography and offered up sample photos depicting views of the night sky that require only basic camera techniques through ones requiring a more complex set of equipment and software in order to arrive at a finished product. I (Don Hain) had several sample scopes on hand, describing the differences between them. Views of dinosaur skeletons and posters across the room were used for folks to sample looking through the telescopes. Various handouts were offered. Web site links to information about next year's NE Star Party on July 20 - 25, 2025 (Sunday - Friday), as well as this year's Hoot'n'Howl fest at Spring Creek (Saturday, Oct 12th) were among the featured handouts.

Hoot'n'Howl has also now come and gone. Most of the draw for that event is

daytime activities. Many kids as well as adults did stop by starting before it got dark on through about 8:30PM. The waxing moon (already slightly gibbous, beyond 1st quarter) as well as views of Saturn were seen by those who stopped by to take advantage of the evening sky.

Scheduled outreach events to be aware of:

(we have obviously hit the time of year where we get fewer outreach requests)

Hyde Observatory: every Saturday night throughout the year (except for weekends of major holidays)

7:00pm to 10:00pm (October thru March)

Where: Hyde Memorial Observatory

Sponsored by: City of Lincoln (Parks and Recreation) and Hyde Observatory volunteers

Needs: visit <https://www.hydeobservatory.info/volunteer/> to become a volunteer

PAC Star Party at Clatonia, October 4th

Bob Kacvinsky

Friday night was clear of clouds, and the seeing and transparency predictions from Clear Sky Clock looked very good. As I traveled down to the Clatonia Recreation Area farmers were busy harvesting their soybean fields. The combines reminded me of Pig Pen from the Peanuts cartoon with the clouds of dust boiling up around them. With our lack of rainfall for the last 5 weeks, low humidity, and very dry conditions, the skies had a heavy layer of dust and haze. The lowest 20 degrees of the horizon was partially obscured from viewing.

Attending the Star Party were me, Cody Rieken, Kale Strizek, and first-time attendee Brian Stork and his daughter

Bren, son Jack. Ron (?) showed up later for binocular observing.

Cody set up his 5" on tripod. Kale set up his SeeStar. Brian set up an 8" Celestron single arm go to, and I set up my 16" Lightbridge and also a SeeStar. I was planning to gather views in the new observing program of the Local Galaxy Group which requires a nice dark clear sky. Unfortunately, the sky did not allow for much other than some of the brighter favorites.

Saturn with it's almost edge on rings with Titan provided a nice view. I spend some time with Brian's family going through a tour of the brighter Messier objects along with numerous sights from the Milky

Way core up through the plane. DS Objects were visible but extensive details were more difficult to view through the dusty atmosphere. I spent most of the time enjoying a tour along the milky way highway of brighter objects.

I purchased the SeeStar as a toy when normal viewing was less than ideal. As I was viewing with the 16" Lightbridge, I ran the SeeStar through a series of objects that I wanted to get photos. It's amazing how time lapse photos can burn through the dusty skies.

We wrapped up the evening and traveled home around 11 PM. M17; M20 Trifid Nebula; M33 Triangulum Galaxy.

Clatonia - SeeStar Images



Camp Erin Star Party, September 28th

Bob Kacvinsky

Attendees: Jim Kvasnicka, Dan Delzell, Matt Novosad, Don Hain, Bob Kacvinsky

Camp Erin is a special camp for kids who have suffered a family member loss sponsored by Mourning Hope. The camp allows kids to interact with others who have gone through a similar loss. The counselors provide support and conduct programs to help with grief therapy. This is a fantastic group and it is a fun opportunity to help the camp with their programs.

We all arrived about 8:20 pm and set up our

telescopes. Don had his 5" Refractor and worked around the summer triangle, Dan set up his 12" Dob with M13. Matt had his 8" Smart Sense Dob on the Owl/ET Cluster. Jim's 8" Dob focused on Saturn. Bob's 12" Dob was set on the Ring Nebula, and also set up the SeeStar on the Dumbbell to show both angles of a planetary. There was some light clouds that were filtering in from hurricane Helene to the SE but we were able to hold our objects during the viewing. Overall, the transparency and seeing was good to very good.

Groups of 20 (total 65 kids and 20 adult leaders) began filtering a bit before 9 and we had continuous flow till about 10. The ages ranged from 6 years old up through High School age. The best part of the evening was hearing the "Wow", "So Cool", "Neat", and "Is this real?" comments...and the kids had even better expressions. There was some disagreement over who had the best views, but the real winners we hoped were the kids.



November's Night Sky Notes: Snowballs from Space

By Kat Troche



This article is distributed by NASA's Night Sky Network (NSN). The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

If you spotted comet C/2023 A3 (Tsuchinshan-ATLAS) in person, or seen photos online this October, you might have been inspired to learn more about these visitors from the outer Solar System. Get ready for the next comet and find out how comets are connected to some of our favorite annual astronomy events.

Comet Composition

A comet is defined as an icy body that is small in size and can develop a 'tail' of gas as it approaches the Sun from the outer Solar System. The key traits of a comet are its nucleus, coma, and tail.

The nucleus of the comet is comprised of ice, gas, dust, and rock. This central structure can be up to 80 miles wide in some instances, as recorded by the Hubble Space Telescope in 2022 – large for a comet but too small to see with a telescope. As the comet reaches the inner Solar

System, the ice from the nucleus starts to vaporize, converting into gas. The gas cloud that forms around the comet as it approaches the Sun is called the coma. This helps give the comet its glow. But beware: much like Icarus, sometimes these bodies don't survive their journey around the Sun and can fall apart the closer it gets.

The most prominent feature is the tail of the comet. Under

moderately dark skies, the brightest comets show a dust tail, pointed away from the Sun. When photographing comets, you can sometimes resolve the second tail, made of ionized gases that have been electronically charged by solar radiation. These ion tails can appear bluish, in comparison to the white color of the dust tail. The ion tail is also always pointed away from the Sun. In 2007, NASA's STEREO mission



Comet McNaught over the Pacific Ocean. Image taken from Paranal Observatory in January 2007. Credits: ESO/Sebastian Deiries

Snowballs from Space, continued

captured images of C/2006 P1 McNaught and its dust tail, stretching over 100 million miles. Studies of those images revealed that solar wind influenced both the ion and dust tail, creating striations - bands - giving both tails a feather appearance in the night sky.

Coming and Going

Comets appear from beyond Uranus, in the Kuiper Belt, and may even come from as far as the Oort Cloud. These visitors can be short-period comets like Halley's Comet, returning every 76 years. This may seem long to

us, but long-period comets like Comet Hale-Bopp, observed from 1996-1997 won't return to the inner Solar System until the year 4385. Other types include non-periodic comets like NEOWISE, which only pass through our Solar System once.

But our experiences of these comets are not limited to the occasional fluffy snowball. As comets orbit the Sun, they can leave a trail of rocky debris in its orbital path. When Earth finds itself passing through one of these debris fields, we experience meteor showers! The most

well-known of these is the Perseid meteor shower, caused by Comet 109P/Swift-Tuttle. While this meteor shower happens every August in the northern hemisphere, we won't see Comet Swift-Tuttle again until the year 2126.

See how many comets (and asteroids!) have been discovered on NASA's Comets page, learn how you can cook up a comet, and check out our mid-month article where we'll provide tips on how to take astrophotos with your smartphone!



A view of the 2023 Perseid meteor shower from the southernmost part of Sequoia National Forest, near Piute Peak. Debris from comet Swift-Tuttle creates the Perseids.

Credit: NASA/Preston Dyches

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

Club Offices and Duties, continued

or giving a verbal report at the request of any 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. §

Hyde Observatory Needs You!



Volunteer at Hyde

Our crew of unpaid volunteers share an interest in Astronomy and they enjoy passing on that interest to the public.



You don't need to be an expert in astronomy or telescopes. **We'll teach you what you need to know.**



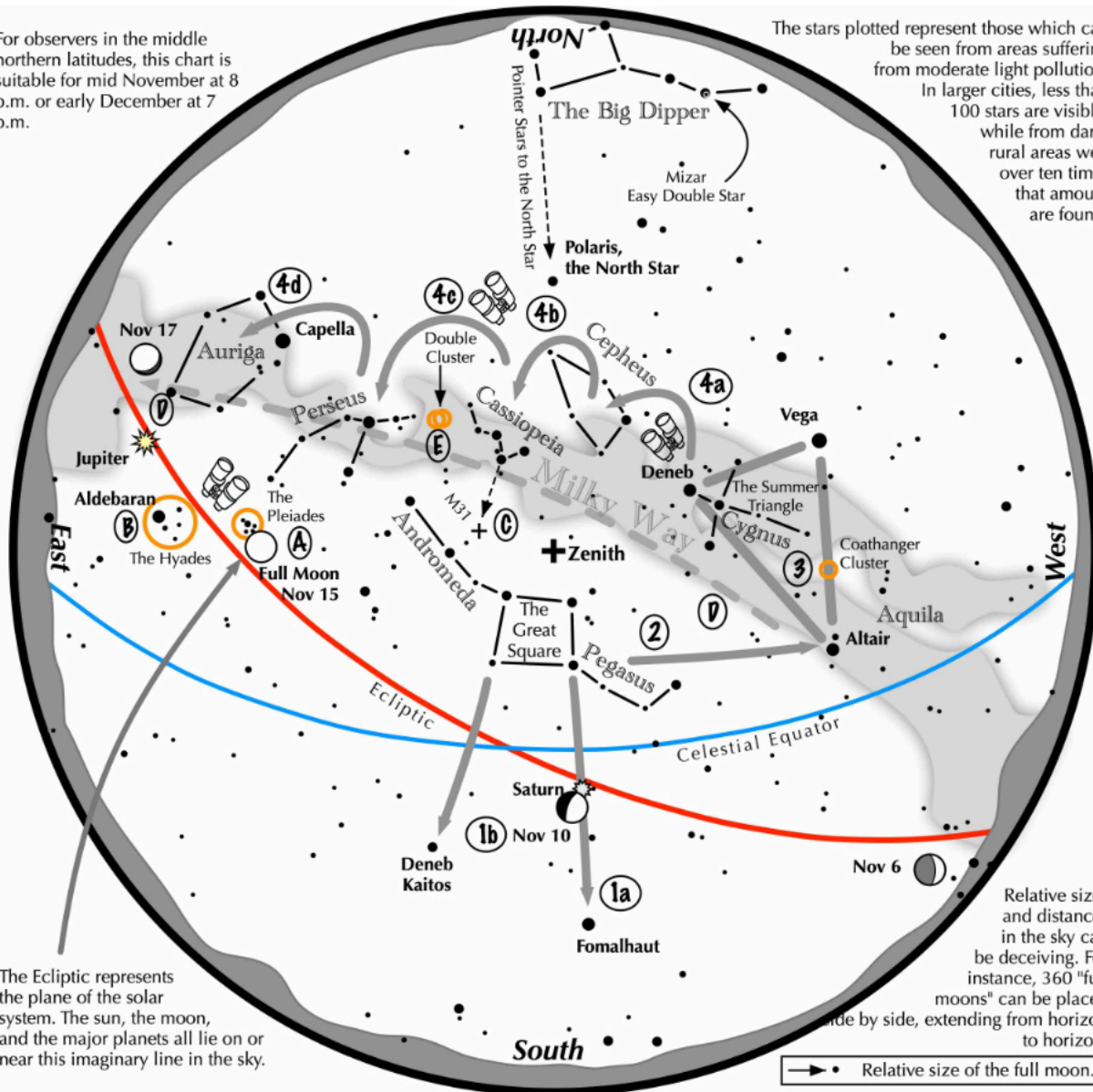
Volunteers start as telescope operators on the observing deck, which involves keeping one of the three telescopes focused on the sky objects we are showing and explaining them to our visitors. Experienced volunteers can become Deck Leaders who determine what objects to train the telescopes on, and answer the really difficult questions.

For more information, [visit our website](#)

Navigating the mid November Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid November at 8 p.m. or early December at 7 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 November night sky: Simply start with what you know or with what you can easily find.

- 1 Face south. Almost overhead lies the "Great Square" with four stars about the same brightness as those of the Big Dipper. Extend a line southward following the Square's two westernmost stars. The line strikes Fomalhaut, the brightest star in the south. A line extending southward from the two easternmost stars, passes Deneb Kaitos, the second brightest star in the south.
- 2 Draw a line westward following the southern edge of the Square until 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, then to Perseus, and finally to Auriga with its bright star Capella.

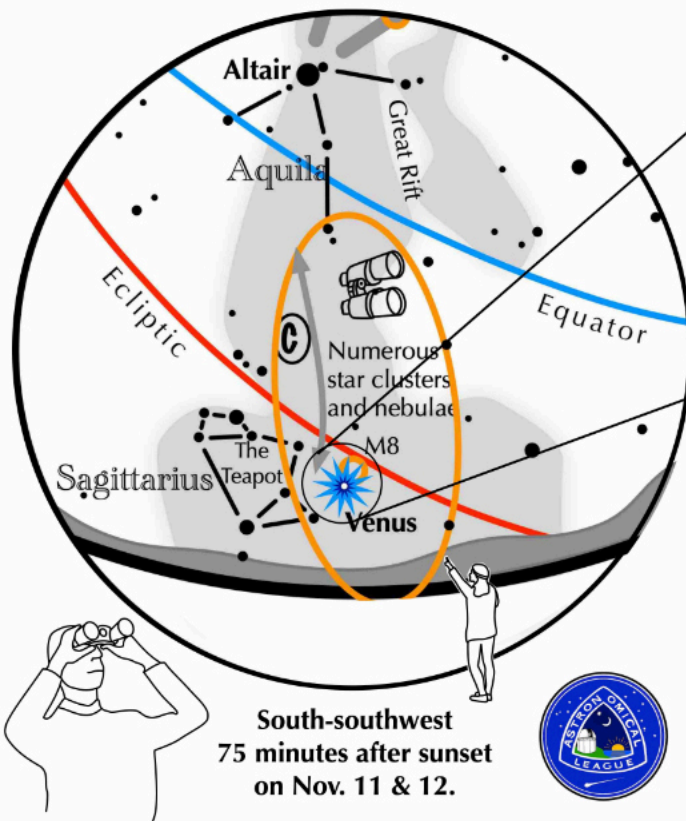
Binocular Highlights

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. **E:** The Double Cluster.

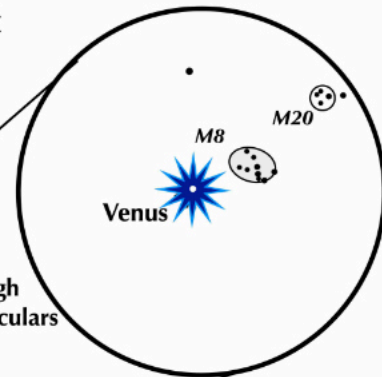


Astronomical League Outreach

If you can observe only one evening celestial event this month, consider this one:



View through
10x50 binoculars



Venus reveals celestial treasures

Look to the south-southwest 75-90 minutes after sunset.

- On November 11 & 12, look for Venus low in the south-southwest. It will be the brightest object in the area.
- Use binoculars to view Venus. To its immediate upper right, subtly glows a nebulous star cluster, M8, nicknamed "the Lagoon Nebula" (4100 L-Y distant).
- To the upper right of M8 dimly glows another star forming nebula and cluster, M20, called "the Trifid Nebula" (5200 L-Y distant).

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 - Double Stars

Other Suns: Gamma Arietis

How to find Gamma Arietis on a November evening

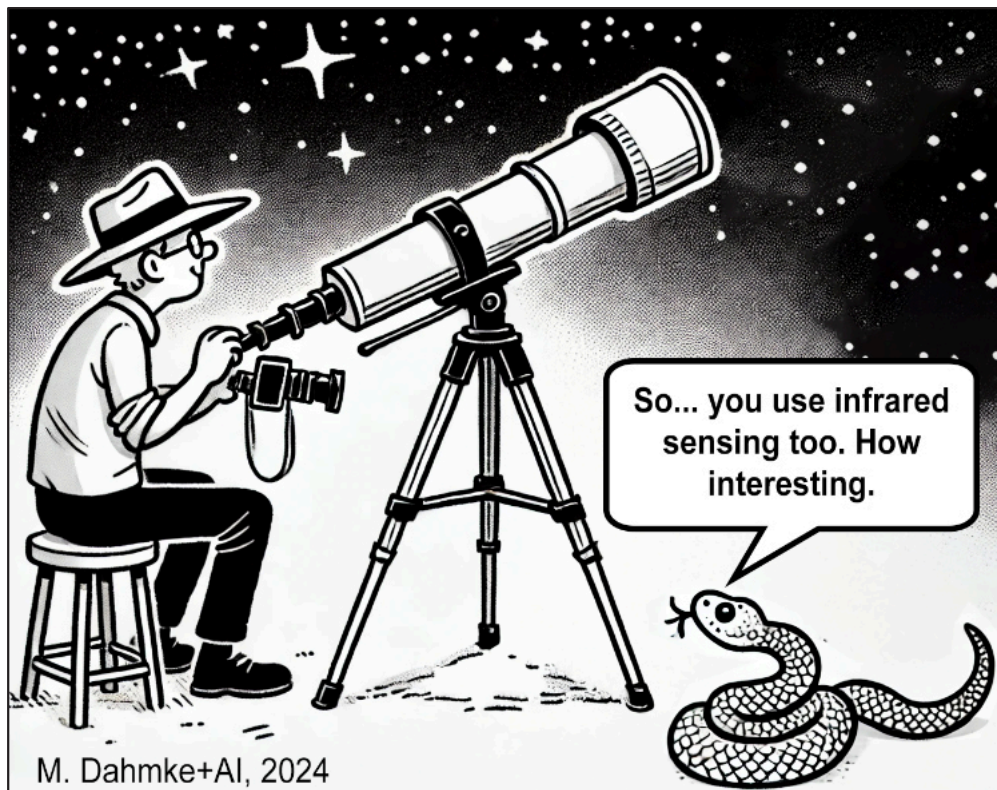
Face east. Locate the Pleiades. Aries lies to its upper right about the same distance that it is from the Hyades. Gamma is a dim star at the end of the string of stars that form Aries.

Suggested magnification: >50x
Suggested aperture: >2 inches

Gamma Arietis
 A-B separation: 7.5 sec
 A magnitude: 4.5
 B magnitude: 4.6
 Position Angle: 0°
 A & B colors: white, white

Also known as the "Ram's Eyes."

1° field of view



M. Dahmke+AI, 2024

Astrophotography



*Northern Lights near Denton NE by Leona Barratt
October 10th - Nikon Z6 - 17mm ISO 500 - 30 sec
Some PS post-processing*

Astrophotography



*Northern Lights - by Cody Rieken
October 10th, at Red Cedar Wildlife Management Area (north of Valparaiso). iPhone
15 Plus, 10 second exposures, no editing.
Above: Pleiades and Jupiter*



Astrophotography



Jim White 2024

This is M33, The Triangulum Galaxy, that was taken over two nights at NSP.

59 Exposures that were 180 seconds each, 30 taken on 8/1/2024 and 29, taken on 8/2/2024, 25 Flats taken on 8/1/2024 and 25 flats taken on 8/2/2024, 25 Darks and 25 dark flats, Telescope - Celestron 925 EdgeHD F10, 235mm aperture, 2350mm focal length. Mount - Celestron CGX, Celestron OAG (off axis guider), Guide camera - ZWO ASI174MM Mini. Imaging camera - ZWO ASI2400MC Pro, Software for imaging - Celestron CPWI, PHD2, Stellarium and N.I.N.A., Software for stacking and processing - PixInsight

Astrophotography



Comet C2/2023 A3 by Rick Brown. Taken on October 13, around 8 PM. Taken just beyond the northwest edge of Lincoln, where the sky is said to be Bortle 5.

Astrophotography



Comet C2/2023 A3 by Mark Dahmke. Taken on October 15th at 70th & Waverly Rd. Lumix GH5S, 75mm (150mm equiv), 6 seconds at f/6.3, ISO 3200. Contrast adjusted in Photoshop.

Astrophotography



Brett Boller

Harvesting Comets - by Brett Boller

Canon t7i, Canon 50 mm lens, single image, Family Farm East of Dorchester

Astrophotography



M16 by Jason O'Flaherty

Astrophotography



Jason O'Flaherty
PHOTOGRAPHY

Comet C2023 A3 and a windmill - Jason O'Flaherty

Photos from Spring Creek Prairie Hoot 'n' Howl

Jason O'Flaherty, Don Hain and Rick Brown setup their telescopes at Spring Creek Prairie for their annual Hoot 'n'

Howl event. The sky was mostly clear, with a little haze but some clouds in the west blocked the view of the comet. A

steady stream of attendees stopped by to view the Moon and Saturn, from about 7:30pm to 9pm.



Photos by Mark Dahmke

From the Archives

October, 1964

PAC Newsletters in the early years of the club were often one page and in a few cases were only a postcard, announcing the next meeting date.



The October, 1964 issue announced the election of officers, a reminder to send in \$6 for your Sky & Telescope Magazine subscription, the next

public sky show event at Gateway Shopping Center and the next club meeting at Nebraska Wesleyan.

10-64
 Lincoln Nebr
Prairie Astronomy Club
 October 1964

At the last meeting of our Club, the following members were elected for the year.

Pres, Richard (Dick) Bartley	Club Directors
Secy, Jess Williams	All Officers Plus
Treas, Marlan Franey	Philo Prell
Vic Pres Gene Robertson	Richard Johnson (Rick)
Program Earl Moser	Benj Rosenbluth
Ast Program Adrienne Valverde	Warner Klammer
	Bill Noel
	Dr John Howe

Send Your \$6.00 in Now To The Pres, Or Sec, y So you wont Miss The Sky and Telescope Magazine, And you will be a Paid up Member For The Year. We Need You You Need Us

Our Next Special event will be a Sky Show for The Public at GATEWAY SHOPPING CENTER, Oct 15th Oct 15th Oct 15th on the Mall starting at dark. Showing The MOON VENUS JUPITER Lets make this a good show, so bring your scope and any other material you care to.

Our next regular meeting will be held in the Science building at the Nebraska Wesleyan Uni- Oct 27th- Tuesday Night Oct 27th Oct 27th We are going to hold our meetings on the last Tuesday of each month and try and avoid conflicts if possible. Prof. Carol Moore said come on out, and a place will be provided for us, and we should enjoy the Place and environment.

Note- Pete Schultz- Page 230- Sky and Tel- Pop Left. Interference Filter. Oct 6th.

Did You See COMET NEHEM 1964 H ? Near Star 50 Hercules.

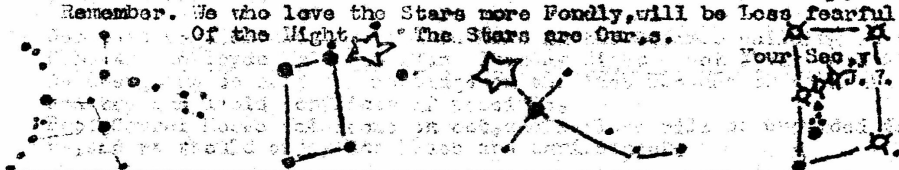
Your Sec, y Has Received a great Many Calls of late in regards to our Club and its activities. When we meet, and who is Eligible. My Answer- Visitors are all Welcome. Come Bring a Friend.

Be Sure and read " Rambling through October Skies" Page 252 Sky and T Also Deep Sky Wonders Page 245. Book Review " Habitable Planets For Man, Page 230.

Sun, Moon and Planets - Mercury (Ho) Venus Early Morning, Mars after Midnight Leo-Cancer. Jupiter, Early Evening in East. Saturn, High in South After dark in Aquarius.
 Moon New Oct 5th- Last Oct 27th .

Mark Your Calendar Oct 15th Gateway Shopping Center Reg. Meeting, Nebr Wesleyan Uni, Oct 27th 7:30 PM

Remember. We who love the Stars more Fondly, will be Less fearful Of the Night. The Stars are Our, s. Your Sec, y



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

The Prairie Astronomer
 c/o The Prairie Astronomy Club, Inc.
 P.O. Box 5585
 Lincoln, NE 68505-0585

info@prairieastronomyclub.org

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.

