

The Prairie Astronomer

March 2025 Volume 66, Issue #3

IN THIS ISSUE: Hyde Observatory Renovation Update
March Messier Madness
Extending Voyager 2's Mission



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer



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

NEXT MEETING AND PROGRAM

'Cosmos: A Retrospective' We'll be presenting the original first episode of 'Cosmos' with an introduction by Ann Druyan. After that, we'll have a panel discussion with newer and senior members giving their perspectives on the show and how it influenced their interest in astronomy.

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

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UPCOMING PROGRAMS

April: Europa Clipper
June: Nearest Star Party

Cover: Shimmering ejections emitted by two actively forming stars make up Lynds 483 (L483). High-resolution near-infrared light captured by NASA's James Webb Space Telescope shows incredible new detail and structure within these lobes, including asymmetrical lines that appear to run into one another. L483 is 650 light-years away in the constellation Serpens. Credit: NASA, ESA, CSA, STScI



CALENDAR



Lincoln Parks
& Recreation

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

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

March PAC Meeting

Tuesday, March 25th, 7:30pm

Branched Oak Observatory

Program: 'Cosmos: A Retrospective'

Astronomy Night, April 12, 5-9pm

University State Museum

April PAC Meeting

Tuesday, April 29th, 7:30pm

Hyde Observatory

Program: Europa Clipper Mission

May PAC Meeting

Tuesday, May 27, 7:30pm

Hyde Observatory

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

Night Sky Network



www.prairieastronomyclub.org

2025 STAR PARTY DATES

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

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

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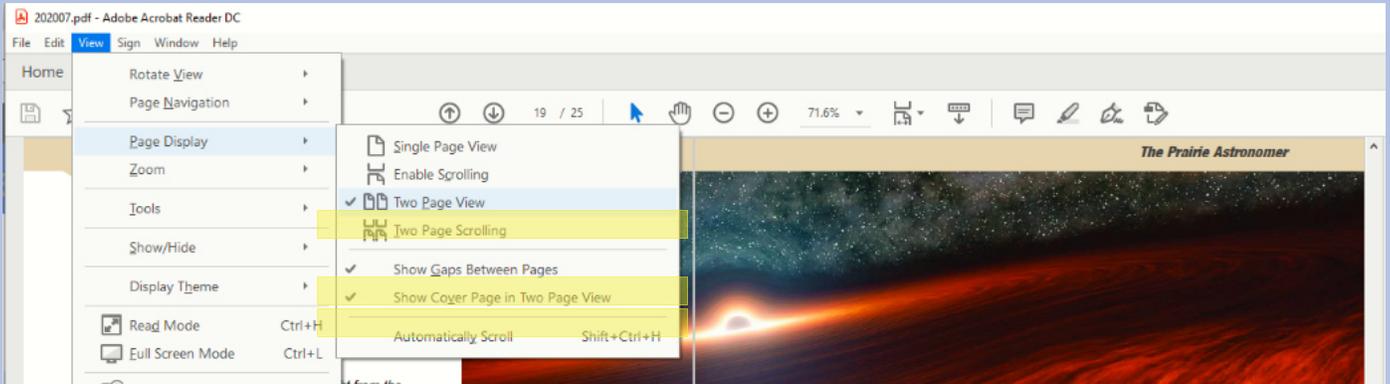
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Notices

Newsletter Page View Format

How to Adjust Adobe Acrobat Settings for Two Page View



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

PAC Newsletter Archive

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

Pay Dues Online

<https://www.prairieastronomyclub.org/dues/>

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

PAC-LIST

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

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

The President's Message

Jason O'Flaherty

Dear PAC Members,

I hope everyone had a chance to enjoy the total lunar eclipse this past Friday morning. It was great weather to observe one of the sky's more dramatic events.

I want to thank Michael Sibbernson for his presentation on T Coronae Borealis at our last meeting. It was an informative and engaging talk, and I'm personally looking forward to when this exciting event happens. It's rare to have the chance to witness a nova in relatively real-time, so I hope we'll all be

watching when the time comes.

This month, I encourage everyone to look at Saturn, as its rings are "disappearing" from view, appearing edge-on. We'll have another chance to see them in this orientation in November, but after that, it won't happen again until 2038.

Hyde Observatory's renovations are progressing, but our March meeting will again be at Branched Oak Observatory on Tuesday, March 25th, at 7:30 PM. This month, we'll be watching the



first episode of *Cosmos*, hosted by Carl Sagan. I've never seen an episode, though I know who Sagan is and am keen to see it. After the screening, we'll have a fun review and discussion panel. It should be a great chance to share memories and perspectives on this classic series.

Looking forward to seeing you all there!

Clear skies,

Jason O'Flaherty

New Members

Dylan Green and Linda Bawcom

Welcome to the club!

Meeting Minutes

Jim White

PAC Meeting Minutes
2/25/2025
By Jim White

Tonight's meeting is being held in person at Branched Oak Observatory and online via Zoom, Hyde Observatory is currently closed for renovations and should reopen in late March or April. Jason O'Flaherty started the meeting at 7:32 PM. We have a new member this month, Dylan Green. There were a few guests in attendance at tonight's meeting.

At 7:34 Jason turned the meeting over to Jim Kvasnicka, PAC's Observing Chair, for his monthly observing report. PAC has a star party coming up this Friday, February 28th and March's star parties will be on March 21st and March 28th at the Clatonia Recreation Area. There will be a total lunar eclipse in March on the night of the 13th and early morning of the 14th. The partial eclipse will begin just

after midnight, at 12:09 AM, the total eclipse will begin at 1:26 AM and will end at 2:32 AM, the partial eclipse will end at 3:48 AM. Branched Oak Observatory will be open for the eclipse. Jim covered the months of February and March in his observing report tonight since we haven't had a regular meeting in the last few months due to special event meetings in November and January and our holiday party in December. Jim's complete observing report can be found in this newsletter.

At 7:40 Jim turned the meeting back over to Jason to give John's treasurer's report, John was unable to make it to tonight's meeting. PAC's account balances are as follows; Checking \$5,148.06, CD 1 \$27,723.81, CD 2 \$5,376.99, BMO total \$38,248.75, there is a Stripe transaction pending of \$28 and a PayPal balance of \$183.17. The bi-annual report with the Nebraska

Secretary of State is due in March.

Jason went over the benefits of becoming a club member for the guests that are in attendance along with the costs of membership. March's meeting is tentatively scheduled to be back at Hyde if renovations are done in time, please be on the lookout for an email from Jason as it gets closer to that time as things could change if Hyde isn't complete. March's program is going to be "Looking at the Cosmos" with a panel discussion.

There are some volunteer opportunities coming up, Astronomy Night at Morrill Hall on April 12th from 5-9 PM. If you are interested in any volunteer opportunities watch for notifications in the monthly newsletter or contact Don Hain. There are opportunities to volunteer at Hyde Observatory also. There are several star parties coming up this spring

Meeting Minutes, continued

and summer; The Texas Star Party is 5/20/25-5/27/25, MSRAL is 6/13/25-6/15/25, The Rocky Mountain Star Stare is 6/25/25-6/29/25 and NSP is 7/20/25-

7/25/25 at Merritt Reservoir. There was no new member business so the meeting was adjourned at 7:48 PM.

Tonight's program is "Blazing The Way, An Illuminating Examination of T Coronae Borealis" presented by Michael Sibbersen.



Photos by David Dickinson



ARP 78

The Mantrap Skies Image Catalog

I've never been happy with my 2008 image of Arp 78. I tried this August on a night of good seeing to get better luminance data.

Unfortunately, the weather didn't cooperate the couple nights seeing was up to what I wanted. I tried anyway but only the core region of the galaxy had enough signal to be usable. I've merged that into the previous image. Thus only the core region shows any improvement. Below is some of the text from the original 2008 post.

Arp 78/NGC 772 is a spiral galaxy in Aries about 100 million light-years away. Arp put it in his category of spirals with small, high surface brightness companions on their arms. He also has a category for galaxies with one heavy arm. Since the companion isn't on a spiral arm, just nearby, I'd have thought the heavy arm category suited it better. Though the companion may be the cause of the "heavy arm". NED classes Arp 78 as SA(s)b with HII emission while the NGC project's



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.



ARP78, continued

simpler classification is simply Sb I. Neither call it peculiar which I find, well, peculiar. To me, it isn't just the long drawn out heavy blue arm but all the debris scattered about it due to a past interaction that would earn it such a designation. At a distance of 100 million light-years, the galaxy would be some 234,000 light-years across including the fainter extensions and plumes to the south-east and north-west. Including just the brighter inner region makes it 150,000 light-years across. Any way you look at it this is a large spiral galaxy.

The companion is NGC 770. It is at the same redshift as Arp 78 indicating they are true companions. All the debris in the area could indicate it is the interacting galaxy that did the damage though it is little distorted which bothers me a bit. Not a lot as it is a highly condensed, high mass galaxy that could withstand such an interaction with a spiral without a lot of obvious

damage. NED classes it as E3:. The colon indicates some question over this classification. The NGC project says simply E. Most papers indicate they are likely interacting.

While the Sloan Survey has imaged this field the data hasn't as yet been picked up by NED leaving me little to go on. NED lists a quasar behind the galaxy of magnitude 19.63 but gives only a very general position. Looking at the Sloan image I find a knot in Arp 78 has right at its southeast end a very strong, very blue, round object of the correct brightness. Without NED's ultraviolet capability it appears white in my image. I've noted it but with two ?? as I'm quite unsure of the identification. It is [HB89] 0156+187 for those wishing to follow up on this.

To the west of NGC 770 is a galaxy, 2MASX J01590722+1857368, at a distance of 880 million light-years. NED lists it as a "Poss. dwarf gal." I find this very odd. For

that distance, it would be about 115 thousand light-years across. By that measurement, our galaxy is also a possible dwarf galaxy! They don't show any question about the accuracy of the redshift measurement. To compound this issue, LEDA 212884 at 860 million light-years would be even larger at 142,000 light-years. It too is listed by NED as a "Poss. dwarf gal." When I first wrote up Arp 78 NED didn't have any redshift data on these two galaxies. I mentioned without it there was no way to know if they too were companions or not. I didn't note if NED had the "Poss. dwarf gal." note at that time. If so, the note may be a holdover from 2008 when the redshift data was unavailable. Other than that I know of no way to explain this situation. Wish I'd kept better notes back then.

To the east of Arp 78 is a small galaxy at 110 million light-years. It's only identification in NED is [WGB2006] 015624+18430_g. (Since this post it has made

ARP78, continued

other listings such as KIG 0080:[VOV2007] 211 I used in this annotated image not having read this text first.) It is likely part of the same group as Arp 78 and NGC 770. It would be a true dwarf at about 16,000 light-years in diameter. NED has nothing to indicate this however nor does it try to classify it. [WGB2006] is the Woods, Geller, Barton catalog in case you were wondering. (And the VOV is the Verley+Odewahn+Verdes-Montenegro catalog.)

The only other galaxy with redshift data is UGC 1445 at about twice the distance of Arp 78. NED lists it as an S0 galaxy. In fact, it appears to me to be a rather classic example of this type of galaxy. Bright core and featureless, rather red disk of old stars indicating star formation ceased some time ago in the galaxy.

There are 7 asteroids in the image, a couple very faint. When I originally looked up this data I covered only three of them. Until recently the Minor Planet Center

only allowed you to go back two years when looking up asteroids. They have greatly improved the speed and accuracy of their computer system. Now they allow you to go back much further though not all asteroids will show up this far back in time. Also, some have no magnitude data or it is obviously very wrong. Two it listed at magnitude 4 and 5! But the positions were very close. In fact more accurate than the old 2 year system was. Sometimes it only returned the asteroid number and not the yearly designation. When this happened by entering that into the ephemeris calculator I was able to get the full name. So they have a bug or two to work out but I do like the improved accuracy and ability to go back further in time to when I wasn't being very good about recording such data. (Since I wrote this those bugs have been fixed. I used the corrected asteroid data for this annotated image.)

Arp 78 was discovered by William Herschel on November 29, 1785 and is on the original Herschel 400 observing list. My notes from September 10, 1985 with my 10" f/5 from only a mile away from my present location so very dark skies but hampered by high humidity (normal for this location) reads: "Large, slightly irregular galaxy with faint difficult star-like nucleus. Appears to be a near face on spiral with some hint of detail in the spiral arms. Even a hint of its spiral nature can be seen. A very interesting galaxy."

Arp 78 is a huge galaxy. Due to all the debris from the interaction, it is hard to decide how to measure it. I get a size of 255,000 light-years though others say 245,000. But if I include the faint far-ranging debris its diameter is 350,000 light-years. In any case, it is over twice, maybe 3 times the size of our galaxy. Over time as the debris falls back into the galaxy it likely will shrink somewhat.

ARP78, continued

The companion NGC 770 was discovered by R. J. Mitchel on November 3, 1885.

The new data was taken binned 1x1 on a very

hazy night with low transparency while the original was taken binned 2x2 also on a rather poor night for transparency according

to my notes, just not as bad. I need to try yet again as there's a lot more detail I failed to pick up.



April Observing

Jim Kvasnicka

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

Planets

Mercury and Saturn: Morning planets but difficult to see.

Venus: Morning planet, rises 70 minutes before the Sun.

Mars: Evening planet in Gemini at magnitude +0.6 with a disk 7.71" wide.

Jupiter: Evening planet in Taurus at magnitude -1.9 with a disk 35.35" wide.

Uranus: Evening planet in Taurus at magnitude +5.8 with a disk 3.47" wide.

Neptune: Not visible.

Meteor Showers

Lyrids: Peaks the night of April 21-22, expect 15-20 per hour. The Moon will not interfere.

Messier List

M40: Double star in Ursa Major.

M65/M66: Part of the Leo Triplet Group.

M95/M96: Galaxies in Leo that fit in the same FOV.

M105: Galaxy in Leo.

M106: Galaxy in Canes Venatici.

M108/M109: Galaxies in Ursa Major.

Last Month: M41, M44, M46, M47, M48, M50, M81, M82, M93

Next Month: M49, M51, M61, M63, M64, M85, M94, M101, M102, M104

NGC and other Deep Sky Objects

NGC 2903: Elongated galaxy in Leo.



NGC 3077:

Galaxy in Ursa Major.

NGC 3384:

Galaxy in Leo.

NGC 3521: Elongated galaxy in Leo.

NGC 3631: Galaxy in Ursa Major.

NGC 3675: Elongated galaxy in Ursa Major.

Double Star Program List

Alpha Leonis: Regulus, white and yellow stars.

Gamma Leonis: Algieba, pair of yellow stars.

54 Leonis: Yellow primary with a greenish colored secondary.

Alpha Canum Venaticorum: Cor Caroli, bluish white and greenish yellow stars.

Zeta Ursa Majoris: Mizar, pair of white stars.

Gamma Virginis: Porrima, close pair of yellow stars.

24 Comae Berenices: Yellow primary with a pale blue secondary.

Delta Corvi: White and rose-colored stars.

Challenge Object

NGC 3577 and NGC 3583: Galaxy pair in Ursa Major.

Focus on Constellations

Jim Kvasnicka

Leo

Leo, the Lion is one of the most distinctive constellation patterns in the sky. The head and forequarters of the Lion are marked by the asterism called the sickle. Leo, as is typical of constellations off the Milky Way, contains many galaxies. A number of them are large and bright. Leo contains five galaxies with Messier numbers: M65, M66, M95, M96, and M105. The constellation contains several interesting double stars. One of them Algieba, Gamma Leonis, is one of the finest double stars in the sky. Leo contains the radiant of the Leonid meteor shower which peaks every year around November 17th. The constellation Leo is best seen in April.

Showpiece Objects

Galaxies: M65, M66, M95, M96, M105, NGC 2903, NGC 3521, NGC 3628

Multiple Stars: Alpha Leonis (Regulus), Gamma Leonis (Algieba), 54 Leonis, 88 Leonis

IAU Leo Chart

Credit: IAU and Sky & Telescope magazine (Roger Sinnott & Rick Fienberg), CC BY 3.0

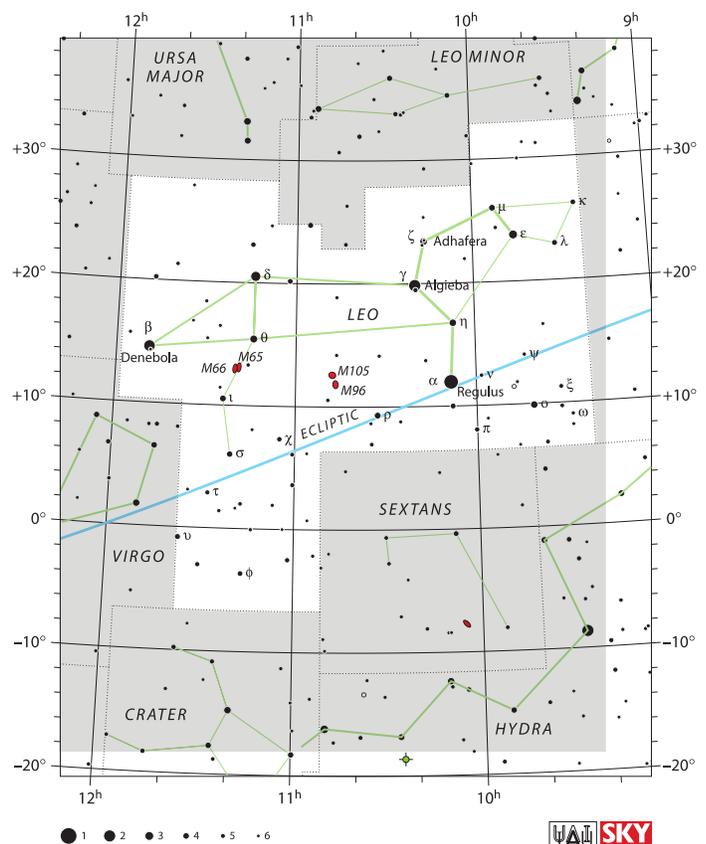
<https://creativecommons.org/licenses/by/3.0>, via Wikimedia Commons

Mythology

In Greek mythology the celestial Lion was associated with the Nemean Lion slain by Hercules as the first of his Twelve Labors. The Greeks inherited the Lion from the Babylonians before them. A common theme in Babylonian art is a battle between a Lion and a Bull with the Lion always defeating the Bull.

Number of Objects Magnitude 12.0 and Brighter

Galaxies: 58



Outreach Calendar

Don Hain
dhain00@gmail.com, 402 440 5318

As mentioned in last month's newsletter, when we head into warmer weather, we tend to see more opportunities for involvement with outreach. One opportunity that is beginning to take shape could provide fairly close opportunities for folks on the south side of Lincoln. The [Crete Public Library](#) has worked with someone from [Common Ground / Americorp](#). The person works with [Conservation Nebraska](#). The library had [involvement with Spring Creek Prairie](#) and

was one of 49 libraries in the country that were designated as [NASA@ My Library Partner](#), garnering them a dobsonian telescope among other things. I expect to have more to share about what the library is looking for in the months to come. In addition to Crete not being far from Spring Creek, they are also fairly close to the [Clatonia Recreation Area](#) where PAC holds our star parties.

Hyde will hopefully be opening up in the next few weeks. In addition

to [Hyde Observatory](#), there is the [Branched Oak Observatory](#). PAC also typically helps out by providing views of the night sky one of the nights for a [Camp Erin](#) experience for youth experiencing grief in their lives. That event is sponsored by Mourning Hope out at the [Carol Joy Holling Center](#) just south of Ashland NE. I expect we will again have an opportunity to be involved with Hoot 'n Howl out at Spring Creek Prairie again in the fall too.

Scheduled events to be aware of:

Upcoming event(s):

Annual "Astronomy Night":

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

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

Sponsored by: University of Nebraska State Museum

Needs: We should be good for this year's event. If you think you would be interested in next year's "Astronomy Night" please contact me via either the Contact Us page at <https://www.prairieastronomyclub.org/contact-us/>, (or contact me directly at dhain00@gmail.com

Outreach Calendar, continued

Camp Erin - Youth Overnight Camp

When: **September 27-29, 2025 (exact night still to be determined)**

Where: Carol Joy Holling Center- 27416 Ranch Rd, Ashland, NE 68003

Sponsored by: Mourning Hope

Needs: 5 or more volunteers are hoped for

Hoot 'n Howl - Spring Creek Prairie

When: **usually in October**

Where: Spring Creek Prairie Audubon Center - 11700 SW 100th St Denton, NE 68339

Sponsored by: Spring Creek Prairie

Needs: 2 or more volunteers are hoped for

Hyde Observatory: CLOSED into March

When: Saturday nights *

Where: Hyde Observatory

Sponsored by: Lincoln Parks and Rec /

Hyde Board of Directors

Needs: volunteers willing to work out on the deck or manage the shows in the classroom about one Saturday per month

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

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

Outreach Coordinator contact information:

Don Hain dhain00@gmail.com

phone: 402 440 5318

March's Night Sky Notes: Messier Madness



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!

Kat Troche

March is the start of spring in the Northern Hemisphere; with that, the hunt for Messier objects can begin!

What Are Messier Objects?

During the 18th century, astronomer and comet hunter Charles Messier wanted to distinguish the 'faint fuzzies' he observed from any potential new comets. As a result, Messier cataloged 110 objects in the night sky, ranging from star clusters to galaxies to nebulae. These items are designated by the letter 'M' and a number. For example, the Orion Nebula is Messier 42 or M42, and the Pleiades are Messier 45 or M45. These are among the brightest 'faint fuzzies' we can see with modest backyard telescopes and some even with our eyes.

Stargazers can catalog these items on evenings closest to the new moon. Some even go as far as having "Messier



Showing a large portion of M66, this Hubble photo is a composite of images obtained at visible and infrared wavelengths. The images have been combined to represent the real colors of the galaxy. Credit: NASA, ESA and the Hubble Heritage (STScI/AURA)-ESA/Hubble Collaboration; Acknowledgment: Davide De Martin and Robert Gendler

Marathons," setting up their telescopes and binoculars in the darkest skies available to them, from sundown to sunrise, to catch as many as possible. Here are some items to look for this season:

Messier 44 in Cancer: The Beehive Cluster, also known as Praesepe, is an open star cluster in the

heart of the Cancer constellation. Use Pollux in Gemini and Regulus in Leo as guide stars. A pair of binoculars is enough to view this and other open star clusters. If you have a telescope handy, pay a visit two of the three galaxies that form the Leo Triplet - M65 and M66. These items can be seen one

Messier Madness, continued

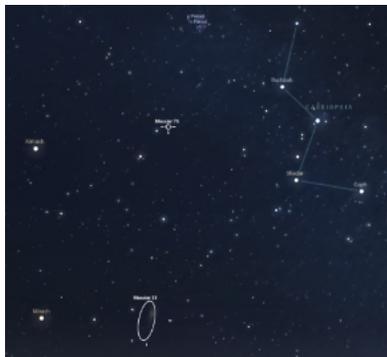


M44 in Cancer and M65 and 66 in Leo can be seen high in the evening sky 60 minutes after sunset. Credit: Stellarium Web

hour after sunset in dark skies.

Messier 3 Canes

Venatici: M3 is a globular cluster of 500,000 stars. Through a telescope, this object looks like a fuzzy



Locate M3 and M87 rising in the east after midnight. Credit: Stellarium Web

sparkly ball. You can resolve this cluster in an 8-inch telescope in moderate dark skies. You can find this star cluster by using the star Arcturus in the Boötes constellation as a guide.

Messier 87 in Virgo:

Located just outside of Markarian's Chain, M87 is an elliptical galaxy that can be spotted during the late evening hours. While it is not possible to view the supermassive black hole at the core of this galaxy, you can see M87 and several other Messier-labeled galaxies

in the Virgo Cluster using a medium-sized telescope.

Messier 76 in Perseus: For a challenge, spot the Little Dumbbell Nebula, a planetary nebula between the Perseus and Cassiopeia constellations. With an apparent magnitude of 12.0, you will need a large telescope and dark skies. You can find both M76 and the famous Andromeda Galaxy (M31) one hour after sunset, but only for a limited time, as these objects disappear after April. They will reappear in the late-night sky by September.



Locate M76 and M31 setting in the west, 60 minutes after sunset. Credit: Stellarium Web

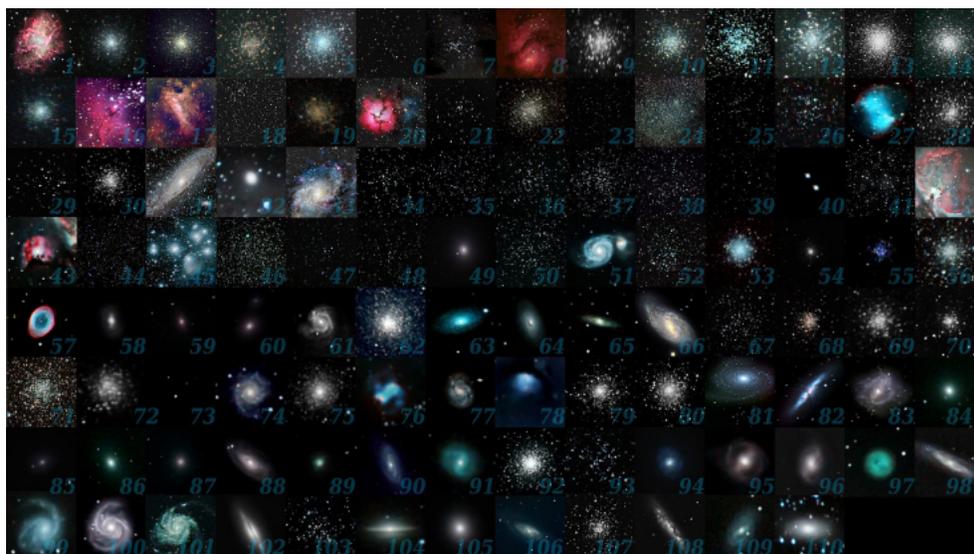
Messier Madness, continued

Plan Ahead

When gearing up for a long stargazing session, there are several things to remember, such as equipment, location, and provisions:

- Do you have enough layers to be outdoors for several hours? You would be surprised how cold it can get when sitting or standing still behind a telescope!
- Are your batteries fully charged? If your telescope runs on power, be sure to charge everything before you leave home and pack any additional batteries for your cell phone. Most people use their mobile devices for astronomy apps, so their batteries may deplete faster. Cold weather can also impact battery life.
- Determine the apparent magnitude of what you are trying to see and the limiting magnitude of your night sky. You can learn more about apparent and limiting magnitudes with our [Check Your Sky Quality with Orion](#) article.
- When choosing a location to observe from, select an area you are familiar with and bring some friends! You can also connect with your local astronomy club to see if they are hosting any Messier Marathons. It's always great to share the stars!

You can see all 110 items and their locations with NASA's [Explore the Night Sky](#) interactive map and the [Hubble Messier Catalog](#), objects that have been imaged by the Hubble Space Telescope.



Compilation of celestial objects Messier-1 up to Messier-110 made by an amateur astronomer

Credit: Michael A. Phillips, CC BY 4.0 via Wikimedia Commons

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](#)

NSP 2025

Step Into the Darkness



32nd Annual Nebraska Star Party
July 20th - 25th, 2025 - Merritt Reservoir

www.nebraskastarparty.org

NASA Turns Off 2 Voyager Science Instruments to Extend Mission

Mission engineers at NASA's Jet Propulsion Laboratory in Southern California turned off the cosmic ray subsystem experiment aboard Voyager 1 on Feb. 25 and will shut off Voyager 2's low-energy charged particle instrument on March 24. Three science instruments will continue to operate on each spacecraft. The moves are part of an ongoing effort to manage

electricity from the heat of decaying plutonium. Both lose about 4 watts of power each year.

"The Voyagers have been deep space rock stars since launch, and we want to keep it that way as long as possible," said Suzanne Dodd, Voyager project manager at JPL. "But electrical power is running low. If we don't turn off an instrument on each Voyager now, they

Some of the instruments, geared toward collecting data during planetary flybys, were turned off after both spacecraft completed their exploration of the solar system's gas giants.

The instruments that remained powered on well beyond the last planetary flyby were those the science team considered important for studying the solar system's heliosphere, a protective bubble of solar wind and magnetic fields created by the Sun, and interstellar space, the region outside the heliosphere. Voyager 1 reached the edge of the heliosphere and the beginning of interstellar space in 2012; Voyager 2 reached the boundary in 2018. No other human-made spacecraft has operated in interstellar space.

Last October, to conserve energy, the project turned off Voyager 2's plasma science instrument, which measures the amount of plasma — electrically charged atoms — and the direction it is flowing. The instrument had



An artist's concept depicts one of NASA's Voyager probes. The twin spacecraft launched in 1977.

Credit: NASA/JPL-Caltech

the gradually diminishing power supply of the twin probes.

Launched in 1977, Voyagers 1 and 2 rely on a radioisotope power system that generates

would probably have only a few more months of power before we would need to declare end of mission."

The two spacecraft carry identical sets of 10 science instruments.

Voyager 2, continued

collected only limited data in recent years due to its orientation relative to the direction that plasma flows in interstellar space. Voyager 1's plasma science instrument had been turned off years ago because of degraded performance.

Interstellar Science Legacy

The cosmic ray subsystem that was shut down on Voyager 1 last week is a suite of three telescopes designed to study cosmic rays, including protons from the galaxy and the Sun, by measuring their energy and flux. Data from those telescopes helped the Voyager science team determine when and where Voyager 1 exited the heliosphere.

Scheduled for deactivation later this month, Voyager 2's low-energy charged particle instrument measures the various ions, electrons, and cosmic rays originating from our solar system and galaxy. The instrument consists of two subsystems: the low-energy particle

telescope for broader energy measurements, and the low-energy magnetospheric particle analyzer for more focused magnetospheric studies.

Both systems use a rotating platform so that the field of view is 360 degrees, and the platform is powered by a stepper motor that provides a 15.7-watt pulse every 192 seconds. The motor was tested to 500,000 steps — enough to guarantee continuous operation through the mission's encounters with Saturn, which occurred in August 1980 for Voyager 2. By the time it is deactivated on Voyager 2, the motor will have completed more than 8.5 million steps.

"The Voyager spacecraft have far surpassed their original mission to study the outer planets," said Patrick Koehn, Voyager program scientist at NASA Headquarters in Washington. "Every bit of additional data we have gathered since then is not only valuable bonus science for heliophysics, but also a testament to the exemplary engineering

that has gone into the Voyagers — starting nearly 50 years ago and continuing to this day."

Addition Through Subtraction

Mission engineers have taken steps to avoid turning off science instruments for as long as possible because the science data collected by the twin Voyager probes is unique. With these two instruments turned off, the Voyagers should have enough power to operate for about a year before the team needs to shut off another instrument on both spacecraft.

In the meantime, Voyager 1 will continue to operate its magnetometer and plasma wave subsystem. The spacecraft's low-energy charged particle instrument will operate through the remainder of 2025 but will be shut off next year.

Voyager 2 will continue to operate its magnetic field and plasma wave instruments for the foreseeable future. Its cosmic ray subsystem is scheduled to be shut off in 2026.

Voyager 2, continued

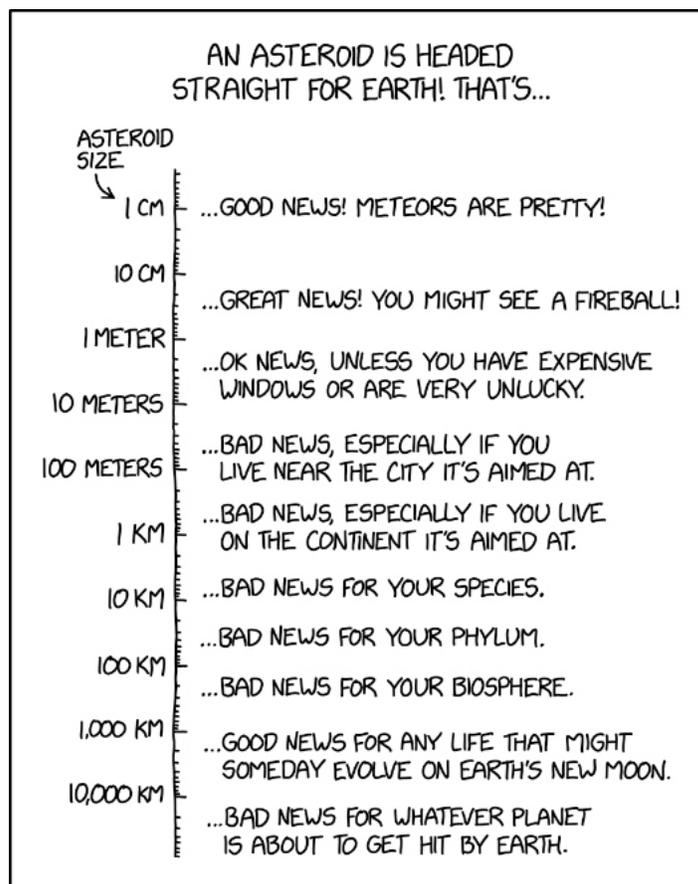
With the implementation of this power conservation plan, engineers believe the two probes could have enough electricity to continue operating with at least one science instrument into the 2030s. But they are also mindful that the Voyagers have been weathering deep space for 47 years and that unforeseen challenges could shorten that timeline.

Long Distance

Voyager 1 and Voyager 2 remain the most distant human-made objects ever built. Voyager 1 is more than 15 billion miles (25 billion kilometers) away. Voyager 2 is over 13 billion miles (21 billion kilometers) from Earth.

In fact, due to this distance, it takes over 23 hours to get a radio signal from Earth to Voyager 1, and 19½ hours to Voyager 2.

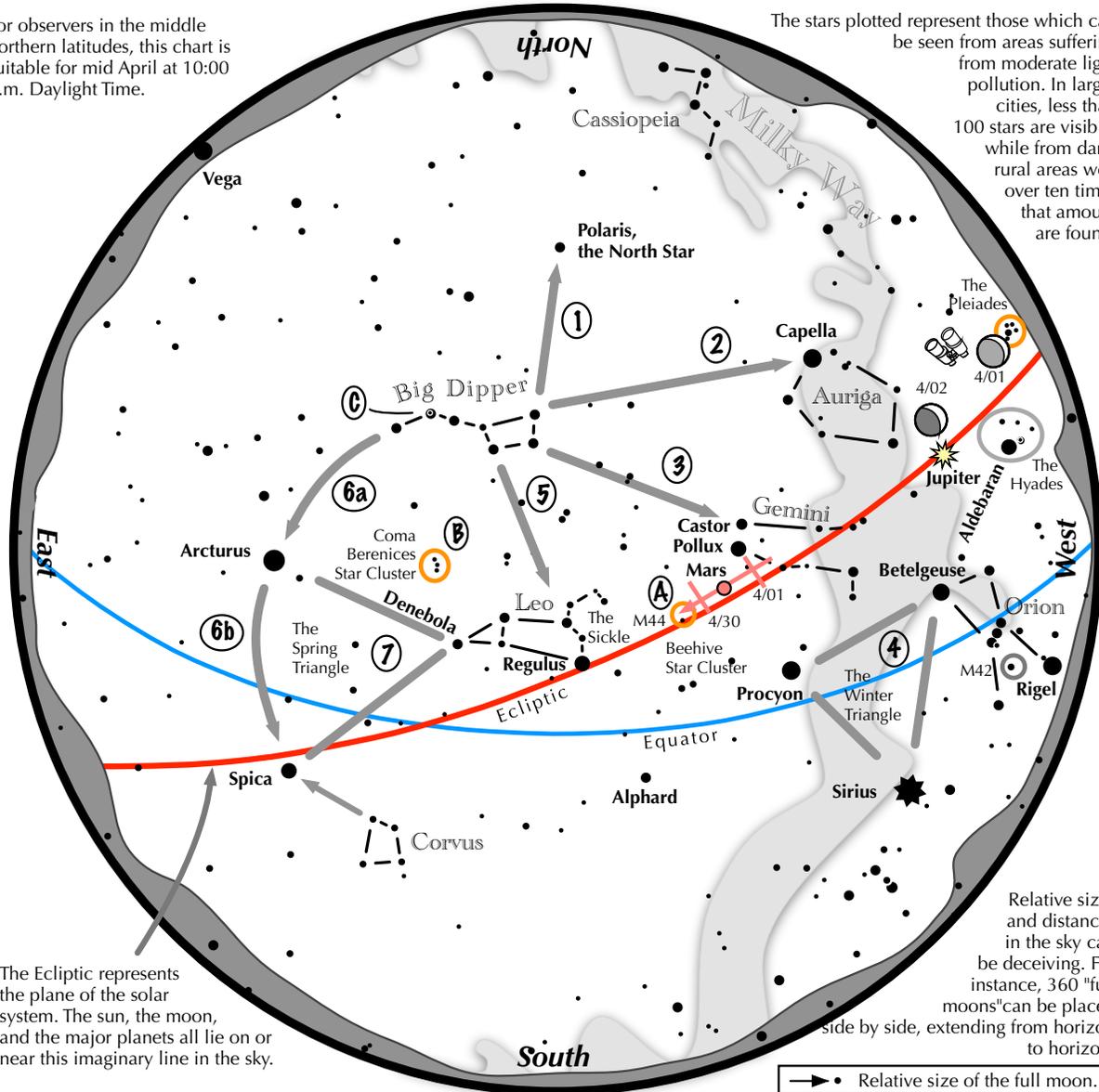
“Every minute of every day, the Voyagers explore a region where no spacecraft has gone before,” said Linda Spilker, Voyager project scientist at JPL. “That also means every day could be our last. But that day could also bring another interstellar revelation. So, we’re pulling out all the stops, doing what we can to make sure Voyagers 1 and 2 continue their trailblazing for the maximum time possible.”



Navigating the mid-April Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid April at 10:00 p.m. Daylight Time.

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



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

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

→ • Relative size of the full moon.

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

- 1 Extend an imaginary line north from the two stars at the tip of the Big Dipper's bowl. It passes Polaris, the North Star.
- 2 Draw another imaginary line west across the top two stars of the Dipper's bowl. It strikes Capella low in the northwest.
- 3 Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
- 4 Look in the west-southwest for the bright Winter Triangle stars of Sirius, Procyon, and Betelgeuse.
- 5 Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
- 6 Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica.
- 7 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.

Binocular Highlights

- A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.
- B: Look nearly overhead for the loose star cluster of Coma Berenices.
- C: In the Big Dipper's handle shines Mizar next to a dimmer star, Alcor.



Astronomical League Outreach

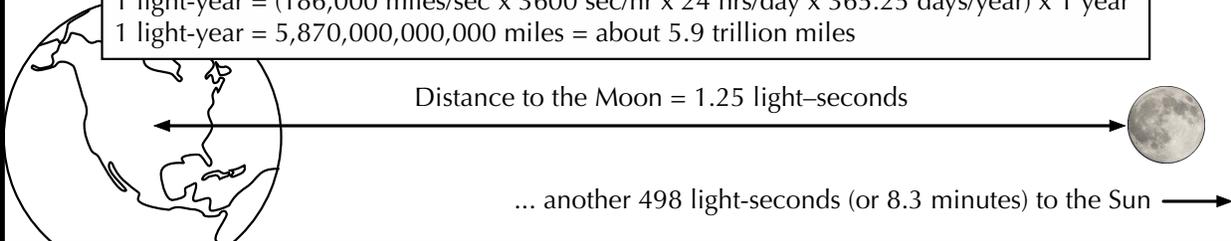


A light-year is a unit expressing distance, not time.

Understanding the Light-Year (ly)

**One light-year equals the distance that light travels through a vacuum in one year:
about 5.9 trillion miles (or about 9.5 trillion km)**

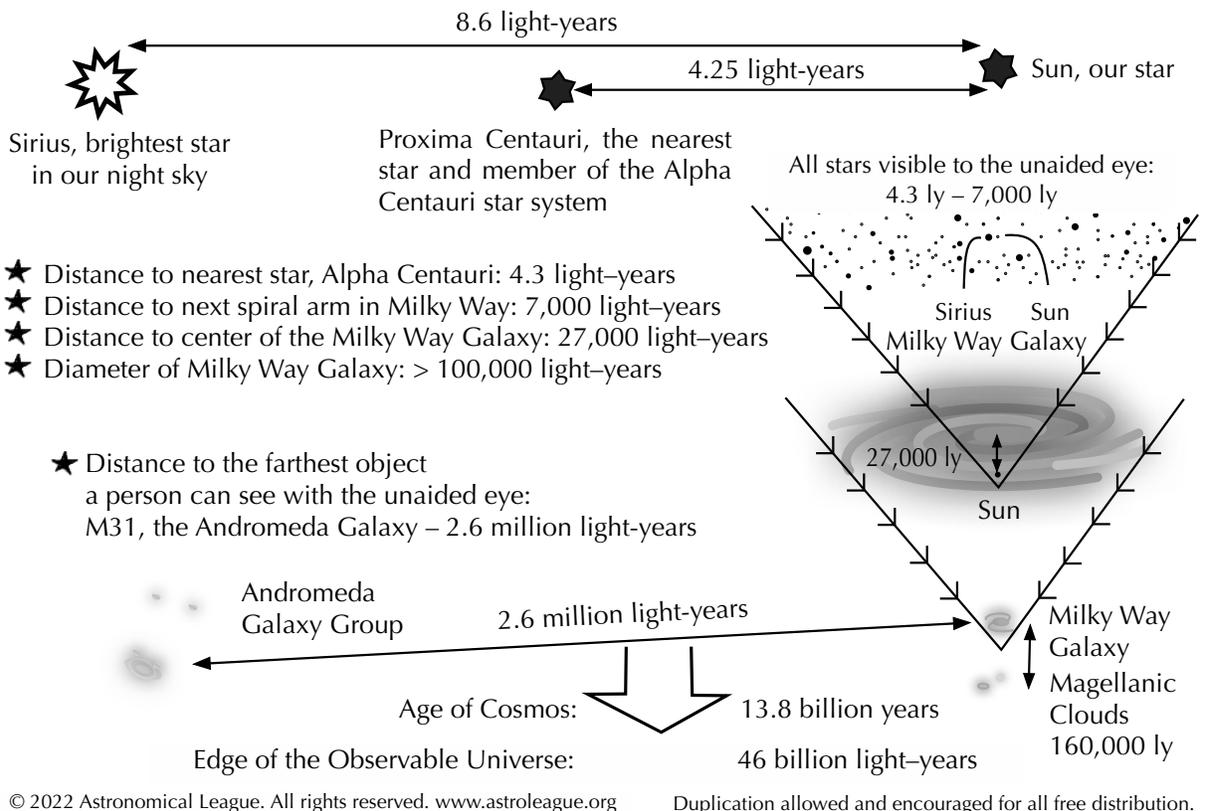
1 light-year = distance that light travels through a vacuum in 1 year
 1 light-year = (velocity of light) x 1 year
 1 light-year = (186,000 miles/sec x 3600 sec/hr x 24 hrs/day x 365.25 days/year) x 1 year
 1 light-year = 5,870,000,000,000 miles = about 5.9 trillion miles



Distance from the Sun (light-minutes)

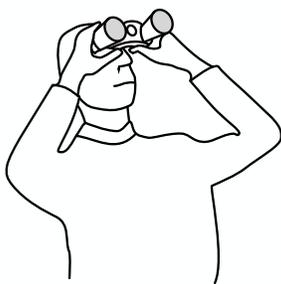
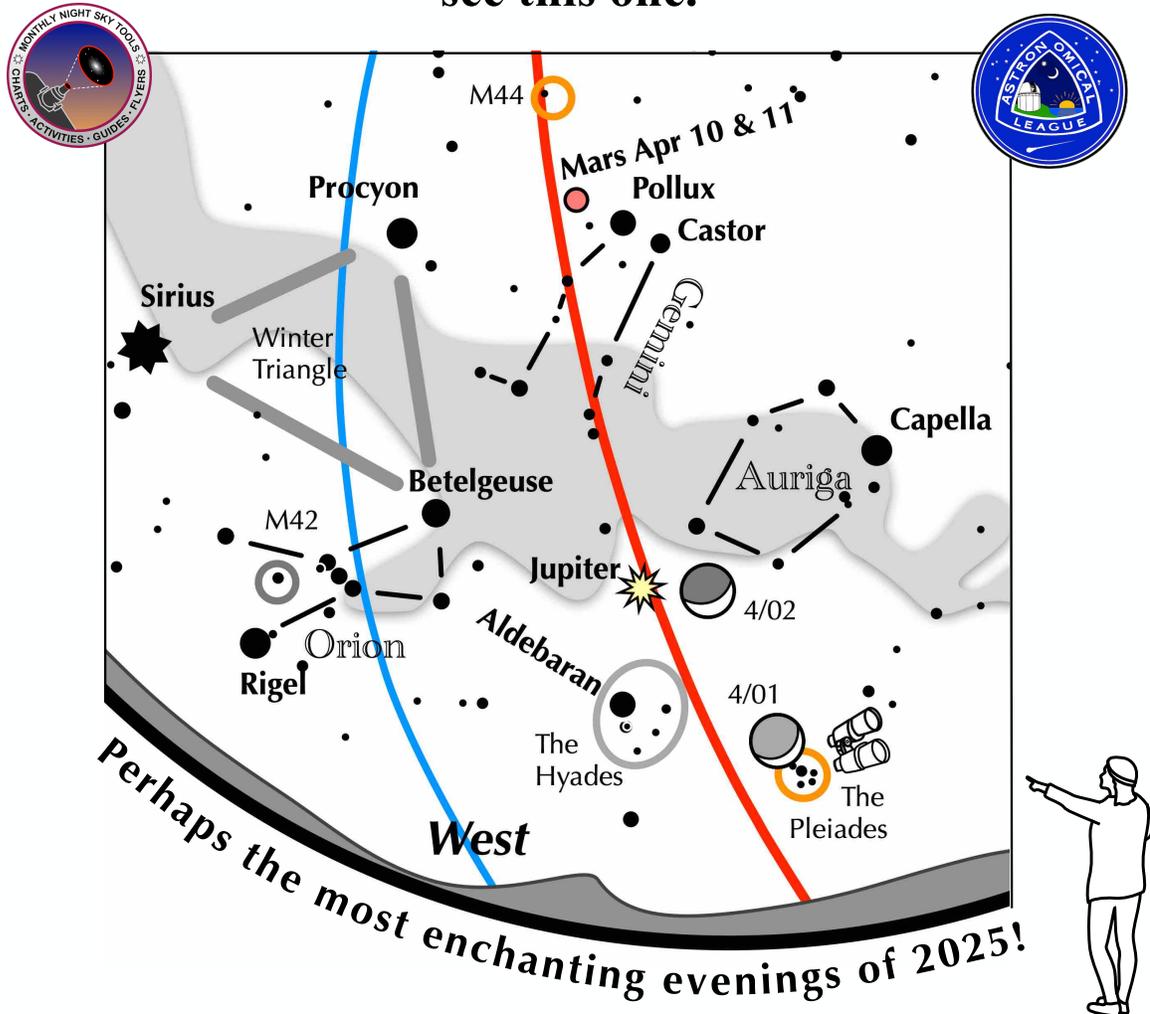


Distance to the Stars - and beyond (light-years) ...



Astronomical League Outreach

If you can see only one celestial event this April, see this one.



Enhance the scene –
use binoculars!

www.astroleague.org

On April 1 & 2, look low in the west-northwest 60 minutes after sunset.

- On the first evening, the crescent moon, glowing full with earthshine, floats immediately above the delicate Pleiades star cluster. To its upper left, shine Aldebaran and the intriguing Hyades star cluster. And bright Jupiter lies above that.

- On the second evening, the slightly thicker, but more pronounced crescent moon moves above the Pleiades and next to Jupiter.

- Above it all, red Mars plows through Gemini, reaching alignment with Castor and Pollux on April 10 & 11.

This Old Observatory

Episode 3: New Lights, New Colors and Carpet!



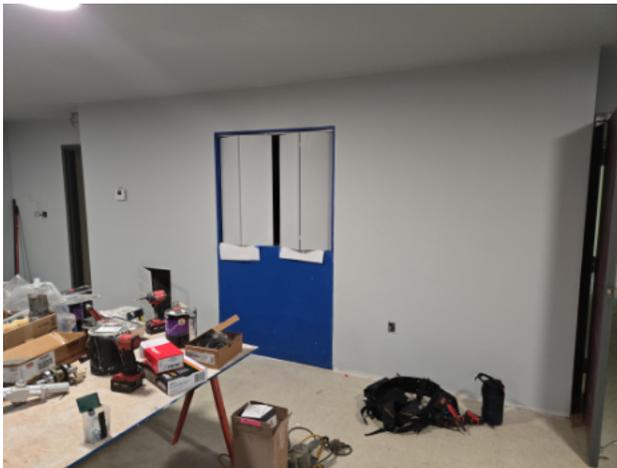
March: Drywall, paint, electrical work, poster frames and multimedia equipment ordered

Drywall work was finished by the end of February and painting began in early March. It was decided to use a neutral gray to minimize glare and light bounce from the projector. Dimmable LED lights

were installed. New speakers have been ordered, along with a multimedia LCD monitor for the west wall and acrylic frames for posters. Network wiring was completed on March 9th and carpet

installation began on March 10th. Frames and the new speakers are expected to be installed by March 25th, The date of reopening will be announced shortly.

Hyde Observatory Renovation, continued



Hyde Observatory Renovation, continued



Astrophotography

Photos by Dave Churilla

Right: NGC 281, also known as the Pacman Nebula, is a bright emission nebula that is 9,459 light years from earth and 48 Light Years across. It's in the constellation Cassiopeia and part of the Milky Way's Perseus Spiral Arm. This was shot with the SeeStar S50 stacking 180 10 second exposures over 30 minutes.

Left: This is the Silver Sliver Galaxy NGC 891 in Andromeda. It's 27.4 million Light Years away and 60,000 Light Years in Radius. It's approximate age is 13.29 billion years old. This was taken with my SeeStar as well. It's 659 10 second exposures stacked over 77 minutes.



Astrophotography



Photo by David Dickinson

Horse head Nebula

This was taken on my Celestron Origin. ISO = 200. The exposure was 15 seconds per frame x 521 frames, for a total exposure of 7,815 seconds (or 130.25 minutes). I used an Alkina OIII filter. I took this straight from the Celestron's photo gallery and then used my iPad's auto editing - no manual processing.

Astrophotography



Photos by Jason O'Flaherty

Sower and the Moon

This was a crop from a slightly larger 16-image mosaic panorama.

Nikon Z8, 800mm, f/13, 1/4 sec, ISO 12800, monopod

Capitol and the Moon

This is a 25-image mosaic panorama.

Nikon Z8, 115mm, f/6.3, 0.6 sec, ISO 1250, monopod

From the Archives

March, 1978

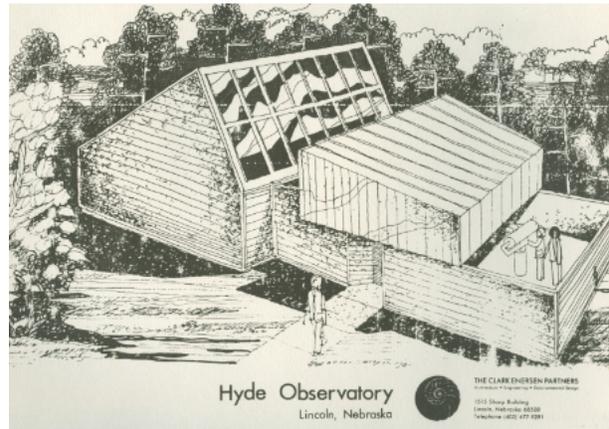
Practice Sessions are Planned for Observatory Scope Operators

We have had excellent turnouts at the Observatory public nights, even in unbelievably miserable weather. We do, however, need more people to help with the telescopes. Starting this club meeting, we will have a practice session after the meeting (assuming good skies) to find the six objects for the coming month. We will also have at least one experienced observer who will help those who would like to learn. So, don't be bashful.

A reminder that Rick Johnson, Earl Moser and Larry Stepp are the only people thus far assigned the job of adjusting and keeping the scopes in good repair. It is very important that we

don't have everyone making these adjustments (even though they may be very capable.) It just gets down to the fact that we will soon have a mess if each person adjusts things to his own liking.

Another reminder: the six selected objects should always be shown so that the public gets to see what is advertised for the month. If time permits and everyone has seen the six, then other objects of interest can be viewed. It's a good idea to remember that many people have not used a so keep up a kind of running commentary explaining the telescope, and the object on view.



Above: architect's drawing of Hyde Observatory, 1976.

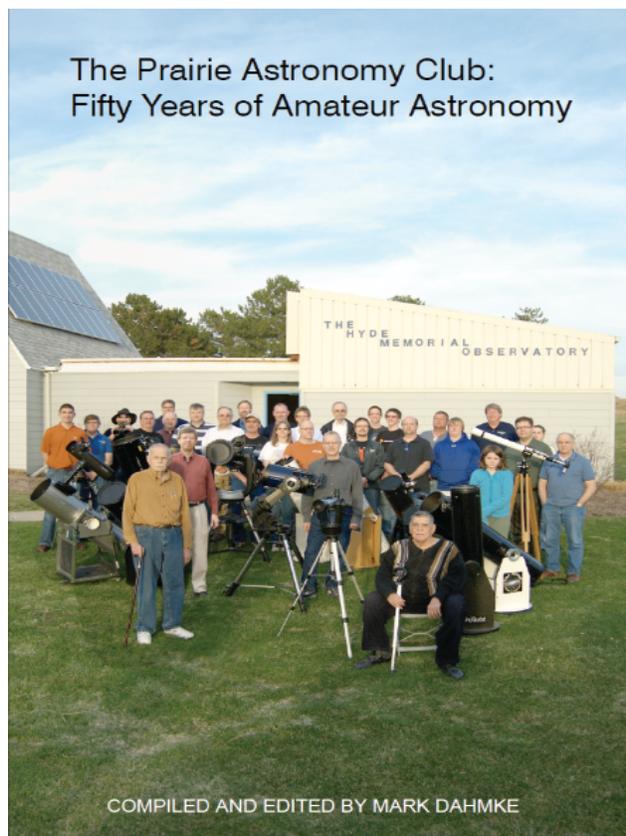
Right: Prof. Carroll Moore with one of Hyde's original telescopes. August 2, 1988, Lincoln Journal Star.

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CLUB MEMBERSHIP INFO

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

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

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

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

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

CLUB TELESCOPES

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

100mm Orion refractor: Available
10 inch Meade Starfinder Dobsonian: Available.

13 inch Truss Dobsonian: Needs repair.

10 inch Zhumell: Needs mount.

Buy the book! The Prairie Astronomy Club: Fifty Years of Amateur Astronomy. Order online from [Amazon](https://www.amazon.com) or [lulu.com](https://www.lulu.com).