

The Prairie Astronomer

May 2025 Volume 66, Issue #5



IN THIS ISSUE: Dying Star's Energetic Display Comes into Focus
How do We Find Exoplanets?
Astrophotography



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer



The next club meeting is May 27th at 7:30pm - AT HYDE OBSERVATORY

NEXT MEETING AND PROGRAM

Psyche: Journey to a Metal World

A video of Dr. David Williams, lead scientist from the University of Arizona of the Psyche mission. The Psyche mission is sending a spacecraft to an asteroid of the same name which, based on current evidence, contains vast deposits of precious and industrial metals, which may one day be useful resources.

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UPCOMING PROGRAMS

June: Nearest Star Party

July: Nebraska Star Party Review

Cover: M81 by David Dickinson



CALENDAR



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.

May PAC Meeting

Tuesday, May 27, 7:30pm, Hyde Observatory

Program: Psyche: Journey to a Metal World

June PAC Meeting

Tuesday, 24, 7:30pm, Hyde Observatory

Nearest Star Party

Nebraska Star Party

July 20-25, Merritt Reservoir

July PAC Meeting

Tuesday July 29th, Hyde Observatory

Program: Nebraska Star Party Review

August PAC Meeting

Tuesday, August 26th, 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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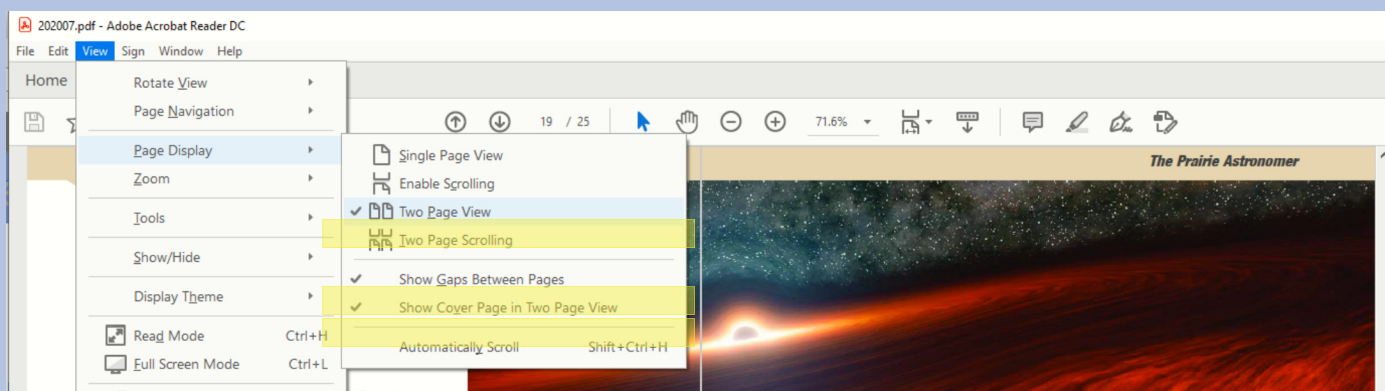
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Notices

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,

While April was relatively quiet, I want to thank Lee Taylor for providing the presentation on Europa at our last meeting. It was a great recap of our history and future with this unique moon.

I'd also like to congratulate everyone who contributed to the Hyde Observatory renovation, especially Mark Dahmke. The place looks fantastic, and seeing it ready to serve the public once again is exciting. It will continue to be a great place for the citizens of Lincoln to explore the stars.

On that note, Hyde Observatory has now transitioned to its summer hours. It is open to the public every Saturday from sundown to 11 p.m.. Additionally, Branched Oak Observatory will begin its summer hours on May 29th. They'll be open Thursdays, Fridays, and Saturdays, rain or shine, from 7 p.m. to 11 p.m. Admission is \$5 per person, and children 4 and under are free.

Our next PAC meeting will be at Hyde Observatory on Tuesday, May 27th, at 7:30 p.m.

I mentioned this at our last meeting, but I also want to remind everyone

here. PAC has an event calendar, which you can find here:

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

There's an option to add it to your Google Calendar using the link at the bottom.

As discussed last month, we'll be updating it to include meeting and star party locations to help everyone stay informed.

I hope you all have a great spring season of observing!

Clear skies,

Jason O'Flaherty

Meeting Minutes

Jim White

Jason O'Flaherty started the meeting at 7:40, tonight's meeting is being held at Hyde Memorial Observatory which just recently reopened after having some renovations completed over the last couple of months. We have three new members this month, Linda, Evan and Michael.

At 7:45 Jason turned the meeting over to Jim Kvasnicka, PAC's Observing Chair, for his monthly observing report. There are two star parties in the month of May, the first star party is on May 16th and the second is on May 23rd, both star parties are scheduled to be at the Clatonia Recreation Area which is approximately 1 ½ miles north of Clatonia. Planets for the month of May; Mercury is a morning planet but is probably too low to be seen, Venus is also a morning planet but is also pretty low and difficult to see, Mars is an evening planet and will cross the Bee Hive Cluster on May 4th,

Jupiter is in the evening in Taurus and by mid-May it will be getting into twilight which will make it difficult to see, Saturn is a morning planet but is also difficult to see because of twilight and Uranus and Neptune are not visible in the month of May. Jim's complete report can be found in this month's newsletter.

At 7:50 Jim finished his observing report and turned the meeting over to John Reinert for his monthly treasurer's report. John recently filed our biannual report with the Secretary of State's office. Today one of the club's CDs came due so John got a call from the bank letting him know that we would need to decide what we want to do with it going forward. The CD was earning approximately 4 ½% but current rates aren't that high. John is looking at putting the money in a 13-month CD at 3%. John's treasurer's report ended at 7:53 and he turned the meeting back over to Jason.

Jason opened up the club's website at <https://www.prairieastronomyclub.org/> and went to the "For Members" area to show where the club's event calendar is and to let members know that if they happen to use "Google Calendar" they can link the club's calendar to their calendar and can see scheduled events without having to go to the website. It was suggested that the location of the meeting be added to the meeting event and also add the star party location to the star party event. Jason mentioned that there is a book that you can order through Amazon in either print or digital format that covers the first 50 years of the Prairie Astronomy Club, this book was put together by our Newsletter Editor, Mark Dahmke, and has been available for a few years. The club is currently in its 61st year. John Reinert was asked to give an update as to what all took place in the new renovation that just took

Meeting Minutes, continued

place here at Hyde. The current renovation was phase one which involved the classroom area and there are plans to do phase two, probably next winter, which will involve renovating the projection booth and bathroom area. Phase one involved city workers through parks and recreation and a lot of work from our own Mark Dahmke. A big thank you to the Hyde board, the city, parks and recreation and Mark for all their hard work!

Bob K. was asked to come up and give the club an update on the condition of fellow club member Dave Churilla who took a bad fall while at an out-of-town star party with other members of the club.

Dave sustained some significant injuries from the fall and was taken by ambulance to the hospital in Ord Nebraska and then transferred to Bryan West hospital in Lincoln by helicopter. He is currently at Madonna Rehabilitation here in Lincoln and will hopefully be going home in the next couple of weeks.

There are a couple of volunteer opportunities coming up at BOO (Branched Oak Observatory).

May 17th is Cars and Stars which will have a car show in the morning at Speedway Motors and a star party in the evening at BOO. On May 22nd there will be a large group from the National Science Olympiad visiting BOO from 9pm

to 11pm. They are expecting approximately 700 students and parents from the National Science Olympiad. If you would like to help with one of these events you can reach out to Brett Boller or BOO.

Upcoming regional events are;
MSRAL is 6/13-6/15
Rocky Mountain Star Stare is 6/25-6/29
NSP is 7/20-7/25

Tonight's meeting ended at 8:15.

Tonight's program is Other Worlds: Europa, from NASA covering what we have discovered from previous missions and what we hope to learn from future missions.

ARP 80

The Mantrap Skies Image Catalog

Arp 80/NGC 2633 is located in northern Camelopardalis with a redshift distance of about 100 million light-years. Other distance estimates range from 89 million light-years to 108 million light-years with a mean value of 96 million light-years. The latter is in surprisingly good agreement with the redshift value. Arp put it in his category for spiral galaxies with large high surface brightness companions. His comment reads: "End of one arm heavy; absorption break in same arm near nucleus." Note it doesn't mention the "high surface brightness companion." Could that be because it doesn't exist? This has to be one of the most puzzling entries in his atlas. I'd think a high surface brightness companion would be easy to spot but where the blankety-blank is it?

The VV catalog seems to add my confusion when it reads: "3 or more galaxies with one or two "bridges" (at the left). All nearly in contact. Bordered by an arc above and below and still



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.



ARP80, continued

further above by a wide spiral arm. ... The upper arc is terminated by zigzags, or by a chance projection of a remote nest." Until that last sentence, I thought I might have the wrong galaxy but it does show a nice squiggle at the end of the upper arm. That arm is quite a bit brighter than the other arm. The UGC makes the most sense when it says of Arp 80: "Arp's class 'galaxies with one heavy arm' appears more appropriate." Amen to that! I believe the absorption break Arp speaks of is at the other end from the squiggle right where it meets the core region. At least I see a strong dust band cutting straight across the arm there which is a very unusual feature. But I can't fathom the companion or companions Arp and the VV catalog mentions. Best I can do is the "zigzag" or "nest" at the end of the arm that the VV catalog mentions.

It was discovered by Wilhelm Tempel on August 11, 1882 as was NGC 2634 below. NGC

2633 is classified by the NGC Project and NED as SBb. Seligman says SB(s)b pec?

It does, however, have a companion. It is LEDA 213530 about 3 minutes to the south and a bit east. Far from being on an arm, it is apparently a true companion having exactly the same redshift, 2160 km/s. NED classes it as Im. It is quite blue as are a surprising number of the galaxies in this image.

Below it is yet another companion NGC 2634. It is classed by NED as E1: and simply as E by the NGC Project while Seligman says E1?. Usually, elliptical galaxies are composed of old red stars but this one has outer shells of blue. The POSS plates also show it brighter in blue than red light. Continuing south yet we find yet another group member, NGC 2634A. NED and Seligman classify it as SB(s)bc? sp. The sp means it has spectral lines. It is apparently an edge on barred spiral. It certainly has some bright knots of

activity in it. The shells of NGC 2634 are usually an indication it is digesting a rather large meal after cannibalizing another galaxy well into the past. I find its shells more interesting than Arp 80. Arp has a class for such shell galaxies but didn't include this one though to me its shells structure is better defined than some he did include. All notes at NED agree it is not interacting with NGC 2634A.

Those 4 are the only ones with any redshift data but there are other interesting galaxies in the image that I marked in the annotated image. MAILYAN 035 is a very low surface brightness, and very fuzzy spiral galaxy that is also very blue. The designation is from the Mailyan Dwarf Galaxy Catalogue. So apparently it is a small galaxy much closer than the previously mentioned galaxies. Though without redshift data this is only a guess.

Every object NED lists in the field has been annotated. Most with a ? for distance. A few that

ARP80, continued

would seem reasonable for NED to know about aren't listed. Probably because those that are are either from the 2MASS catalog of 2 micron objects which omits galaxies without 2 micron radiation which usually means lots of warm dust or they are objects with strong

ultraviolet radiation. These are noted by UvES. Often these are quasar candidates though they can be just stars with unusual UV radiation and even galaxies. One that is certainly a galaxy is at the top of the image left of center. The others are star-like but without redshift data, I can't tell if

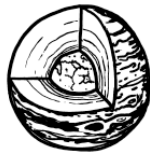
they might be quasar candidates or not.

The entire field is full of IFN, galactic cirrus. Unfortunately, my color data is somewhat noisy due to clouds so it looks rather noisy. This image was taken over a couple nights but still was severely hurt by clouds.

CURRENT LEADING THEORIES FOR WHAT'S IN THE CENTER OF JUPITER:



DIFFUSE MIX OF
HEAVY ELEMENTS
AND METALLIC
HYDROGEN



ROCKY CORE
WITH METALLIC
HYDROGEN
MANTLE



VALUABLE
TREASURE



EMERGENCY
BACKUP EARTH



REGULAR PLANET
PRETENDING TO BE
A GAS GIANT TO
AVOID ATTENTION



HARD BALL
FROM
AVOCADO



BABY
JUPITER,
STILL
GESTATING



NO CORE; FLAT
EARTH CONSPIRACISTS
ARE WRONG ABOUT
EARTH BUT RIGHT
ABOUT JUPITER

Focus on Constellations

Jim Kvasnicka

Coma Berenices

Coma Berenices, Berenice's Hair, covers 386 square degrees in the sky. Coma is exceptionally rich in galaxies even for an off Milky Way constellation. The reason for so many galaxies is that toward Southwest Coma is the dense Coma-Virgo Galaxy Cluster. Many of the galaxies are excellent to observe even in modest size telescopes. Coma contains eight Messier objects, seven galaxies and one globular cluster.

Showpiece Objects

Galaxies: M64, M85, M88, M91, M98, M99, M100, NGC 4274, NGC 4559, NGC 4565, NGC 4725

Globular Clusters: M53, NGC 5053

Multiple Stars: 24 Comae Berenices, 35 Comae Berenices, β 800

Mythology

Coma Berenices represents the hair of Queen Berenices of Egypt, who cut off her flowing locks and placed them in a shrine as an offering to the gods for the safe return of her husband, Ptolemy II from battle. When the hair disappeared the royal astronomer saved the priests from execution by claiming the offering was met with such favor the gods placed the hair in the sky for all to see.

Number of Objects Magnitude 12.0 and Brighter

Galaxies: 50

Globular Clusters: 4

Open Clusters: 0

Planetary Nebulae: 0

Dark Nebulae: 0

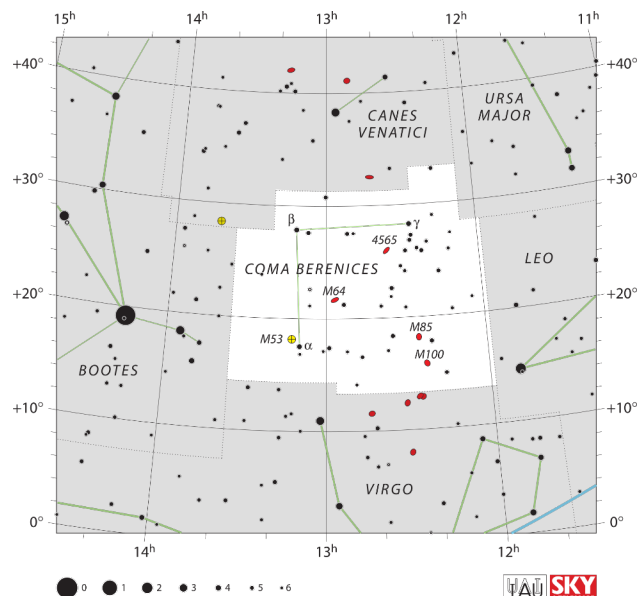
Bright Nebulae: 0

SNREM: 0

IAU Coma Berenices

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

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



June Observing

Jim Kvasnicka

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

Planets

Venus: Morning planet at magnitude -4.3.

Mercury: Evening planet, best seen at the end of June.

Mars: Morning planet, very low.

Jupiter: Evening planet close to the Sun. Solar conjunction on June 24.

Saturn: Morning planets but difficult to see.

Neptune: Morning planet but difficult to see.

Uranus: Not visible.

Messier List

M58: Galaxy in Virgo.

M59/M60: Galaxies in Virgo that fit in the same FOV.

M84/M86: Galaxies in Virgo that fit in the same FOV.

M87: Round galaxy in Virgo.

M88: Oval shaped galaxy in Coma Berenices.

M89/M90: Galaxies in Virgo that fit in the same FOV.

M91/M98: Galaxies in Coma Berenices.

M99/M100: Galaxies in Coma Berenices.

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

Next Month: M3, M4, M5, M53, M68, M80, M83

NGC and other Deep Sky Objects



NGC 5172:

Elongated galaxy in Coma

Berenices.

NGC 5248: Oval shaped galaxy in Bootes.

NGC 5676: Oval shaped galaxy in Bootes.

NGC 5689: Elongated galaxy in Bootes.

NGC 5927: Class VIII globular cluster in Lupus.

NGC 5986: Class VII globular cluster in Lupus.

Double Star Program List

Sigma Corona Borealis: Yellow stars.

16/17 Draconis: Equal pair of white stars.

Mu Draconis: Close pair of white stars.

Kappa Herculis: Pair of yellow stars.

Alpha Herculis: Orange primary with a greenish colored secondary.

Delta Herculis: White primary with a blue-purple secondary.

Rho Herculis: Two white stars.

95 Herculis: Light yellow pair.

Alpha Librae: Wide pair of yellow-white stars.

Challenge Object

NGC 5673 and IC 1029: Two galaxies in Bootes that fit in the same FOV.

Outreach Calendar

*Don Hain
dhain00@gmail.com, 402 440 5318*

The Prairie Astronomy Club has been contacted by one of the cub scout packs in Lincoln. They have a telescope that had stopped working for them. I am working with them to either get it working or substitute one of the reflector

telescopes I have on hand for them to use on camping trips this summer. I am also checking to see if they would be interested in a pair of binoculars and checking out some books on astronomy. Look for an update on this

outreach activity in our newsletter later this year or early next year once camping season is over. If you are interested in getting involved please contact me at dhain00@gmail.com or give me a call or text at 402 440 5318.

Astronomy Inreach

The Prairie Astronomy Club is a member of the Mid-States Region of the Astronomical League (MSRAL). If you think you might like to travel to Little Rock, AR early this summer for a bit of interaction with others interested in astronomy, you should check out the following links.

The 2025 MSRAL Convention will be held on the campus of the University of Arkansas at Little Rock (UALR). Friday, June 13 through Sunday, June 15, 2025
For complete information, please refer to the link:

<https://msral2025.caasastro.org/>

<https://www.astroleague.org/>

<https://www.astroleague.org/whats-up-with-the-astronomical-league-april-2025/>

Scheduled Events

Willard Community Center

When: June 10, 2025 9:30-11:00AM

Where: Willard Community Center,
1245 S Folsom St

Sponsored by: Willard Community
Center

Needs: if you would like to bring a
telescope or binoculars to share with
the kids contact dhain00@gmail.com

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 (date won't
be set until sometime in May or June)

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 -

Crete Public Library - Intro to Astronomy presentation and viewing of the night sky

When: planning for early November
(after Daylight Savings Time ends)

Where: Crete Public Library, 1515
Forest Ave, Crete NE 68333

Sponsored by: Crete Public Library

Needs: 5 or more are hoped for to bring
scopes for the night sky viewing -
contact dhain00@gmail.com

Hyde Observatory: OPEN

When: Saturday nights

Where: Hyde Observatory

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

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

•see [https://www.hydeobservatory.
info/volunteer/](https://www.hydeobservatory.info/volunteer/) for more information

•see [https://forms.gle/
ZKr4ivapvUhfejwL6](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.

Outreach Coordinator contact
information:

Don Hain dhain00@gmail.com

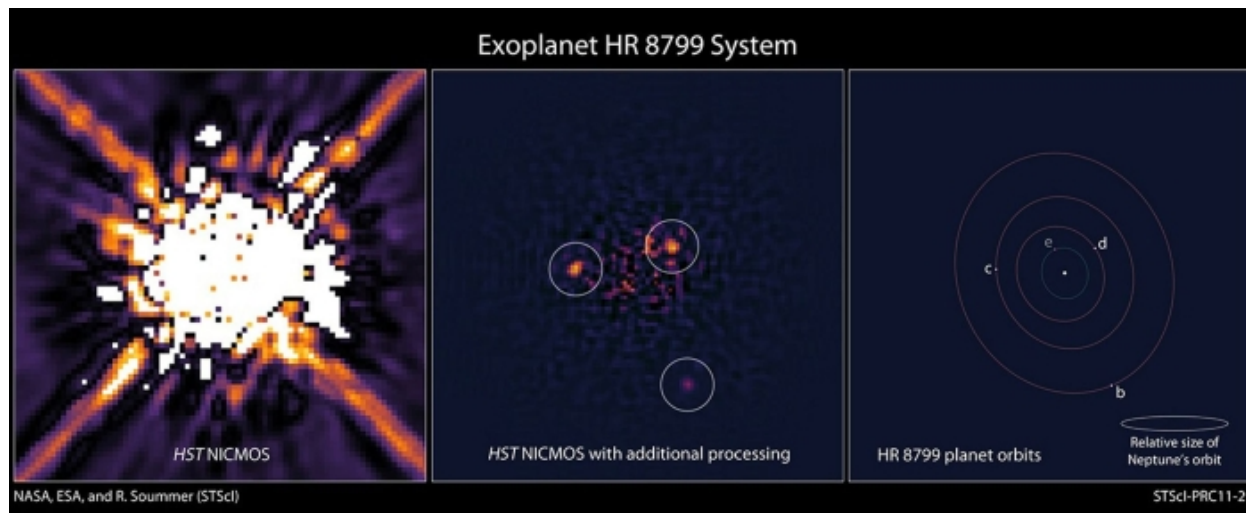
phone: 402 440 5318

May's Night Sky Notes: How do We Find Exoplanets?



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!

David Prosper & Kat Troche



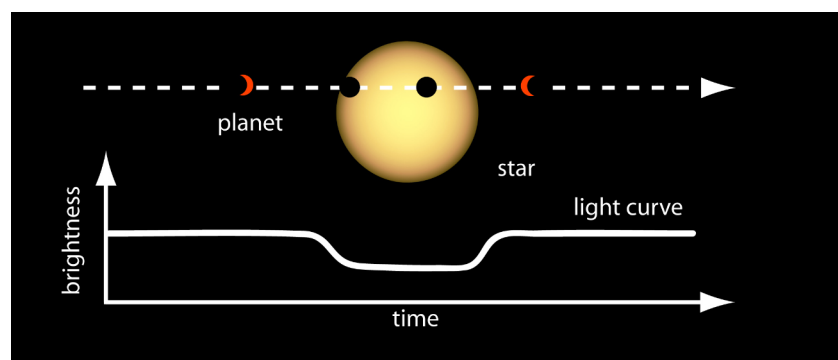
Astronomers have been trying to discover evidence that worlds exist around stars other than our Sun since the

19th century. By the mid-1990s, technology finally caught up with the desire for discovery and led to the first

discovery of a planet orbiting another sun-like star, Pegasi 51b. Why did it take so long to discover these distant worlds, and what techniques do astronomers use to find them?

The Transit Method

One of the most famous exoplanet detection methods is the transit method, used by Kepler and other observatories. When a planet crosses in front of its host star, the light from the star dips slightly in brightness. Scientists can confirm a planet orbits its host star by repeatedly detecting



A planet passing in front of its parent star creates a drop in the star's apparent brightness, called a transit. Exoplanet Watch participants can look for transits in data from ground-based telescopes, helping scientists refine measurements of the length of a planet's orbit around its star. Credit: NASA's Ames Research Center

Exoplanets, continued

these incredibly tiny dips in brightness using sensitive instruments. If you can imagine trying to detect the dip in light from a massive searchlight when an ant crosses in front of it, at a distance of tens of miles away, you can begin to see how difficult it can be to spot a planet from light-years away!

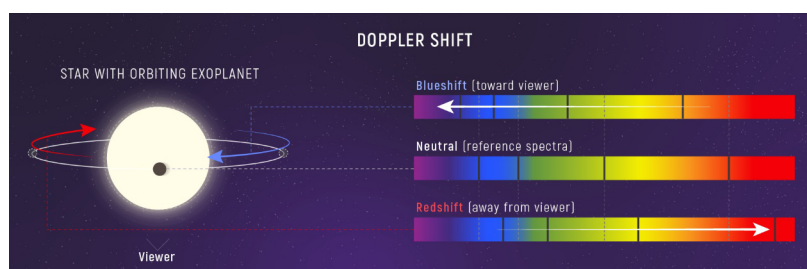
Another drawback to the transit method is that the distant solar system must be at a favorable angle to our point of view here on Earth – if the distant system's angle is just slightly askew, there will be no transits. Even in our solar system, a transit is very rare. For

example, there were two transits of Venus visible across our Sun from Earth in this century. But the next time Venus transits the Sun as seen from Earth will be in the year 2117 – more than a century from now, even though Venus will have completed nearly 150 orbits around the Sun by then!

The Wobble Method

Spotting the Doppler shift of a star's spectra was used to find Pegasi 51b, the first planet detected around a Sun-like star. This technique is called the radial velocity or "wobble"

method. Astronomers split up the visible light emitted by a star into a rainbow. These spectra, and gaps between the normally smooth bands of light, help determine the elements that make up the star. However, if there is a planet orbiting the star, it causes the star to wobble ever so slightly back and forth. This will, in turn, cause the lines within the spectra to shift ever so slightly towards the blue and red ends of the spectrum as the star wobbles slightly away and towards us. This is caused by the blue and red shifts of the planet's light. By carefully measuring the amount of shift in the star's spectra, astronomers can determine the size of the object pulling on the host star and if the companion is indeed a planet. By tracking the variation in this periodic shift of the spectra, they can also determine the time it takes the planet to orbit its parent star.



As a planet orbits a star, the star wobbles. This causes a change in the appearance of the star's spectrum called Doppler shift. Because the change in wavelength is directly related to relative speed, astronomers can use Doppler shift to calculate exactly how fast an object is moving toward or away from us. Astronomers can also track the Doppler shift of a star over time to estimate the mass of the planet orbiting it. Credit: NASA, ESA, CSA, Leah Hustak (STScI)

Exoplanets, continued

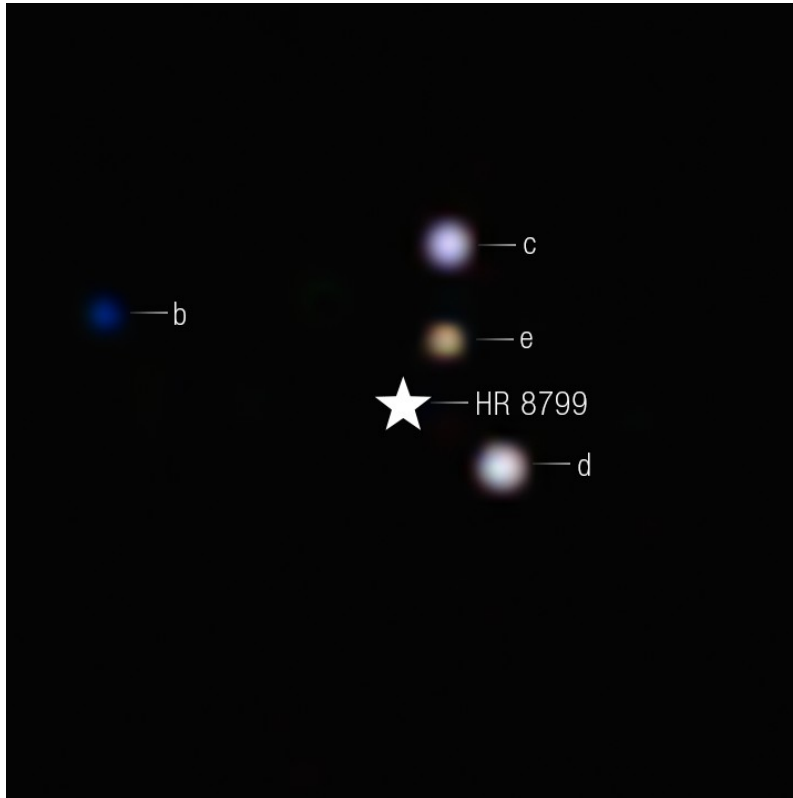


Image taken by the James Webb Space Telescope of four exoplanets orbiting HR 8799. Credit: NASA, ESA, CSA, STScI, Laurent Pueyo (STScI), William Balmer (JHU), Marshall Perrin (STScI)

Direct Imaging

Finally, exoplanets can be revealed by directly imaging them, such as this image of four planets found orbiting the star HR 8799! Space telescopes use instruments called coronagraphs to block the bright light from the host star and capture the dim light from planets.

The Hubble Space Telescope has captured images of giant planets orbiting a few nearby systems, and the James Webb Space Telescope has only improved on these observations by uncovering more details, such as the colors and spectra of exoplanet atmospheres, temperatures, detecting

potential exomoons, and even scanning atmospheres for potential biosignatures!

You can find more information and activities on NASA's Exoplanets page, such as the Eyes on Exoplanets browser-based program, The Exoplaneteers, and some of the latest exoplanet news. Lastly, you can find more resources in our News & Resources section, including a clever demo on how astronomers use the wobble method to detect planets!

The future of exoplanet discovery is only just beginning, promising rich rewards in humanity's understanding of our place in the Universe, where we are from, and if there is life elsewhere in our cosmos.

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](#)

With NASA's Webb, Dying Star's Energetic Display Comes Into Full Focus

New images from Webb's MIRI instrument, which was managed by NASA JPL through launch, reveals previously unseen layers of a dramatic cosmic scene.

Gas and dust ejected by a dying star at the heart of NGC 1514 came into complete focus thanks to mid-infrared data from NASA's James Webb Space Telescope. Its rings, which are only detected in infrared light, now look like “fuzzy” clumps arranged in tangled patterns, and a network of clearer holes close to the central stars shows where faster material punched through.

“Before Webb, we weren't able to detect most of this material, let alone observe it so clearly,” said Mike Ressler, a researcher and project scientist for Webb's MIRI (Mid-Infrared Instrument) at NASA's Jet Propulsion Laboratory in Southern California. He discovered the rings around NGC 1514 in 2010 when he examined the image from NASA's Wide-field Infrared Survey Explorer (WISE). “With MIRI's data, we



NASA's James Webb Space Telescope has taken the most detailed image of planetary nebula NGC 1514 to date thanks to its unique mid-infrared observations. Webb shows its rings as intricate clumps of dust. It's also easier to see holes punched through the bright pink central region. Credit: NASA, ESA, CSA, STScI, Michael Ressler (NASA-

can now comprehensively examine the turbulent nature of this nebula,” he said.

This scene has been forming for at least 4,000

years — and will continue to change over many more millennia. At the center are two stars that appear as one in Webb's observation, and are set off with brilliant

Webb, continued

diffraction spikes. The stars follow a tight, elongated nine-year orbit and are draped in an arc of dust represented in orange.

One of these stars, which used to be several times more massive than our Sun, took the lead role in producing this scene. “As it evolved, it puffed up, throwing off layers of gas and dust in a very slow, dense stellar wind,” said David Jones, a senior scientist at the Institute of Astrophysics on the Canary Islands, who proved there is a binary star system at the center in 2017.

Once the star’s outer layers were expelled,

only its hot, compact core remained. As a white dwarf star, its winds both sped up and weakened, which might have swept up material into thin shells.

Its Hourglass Shape

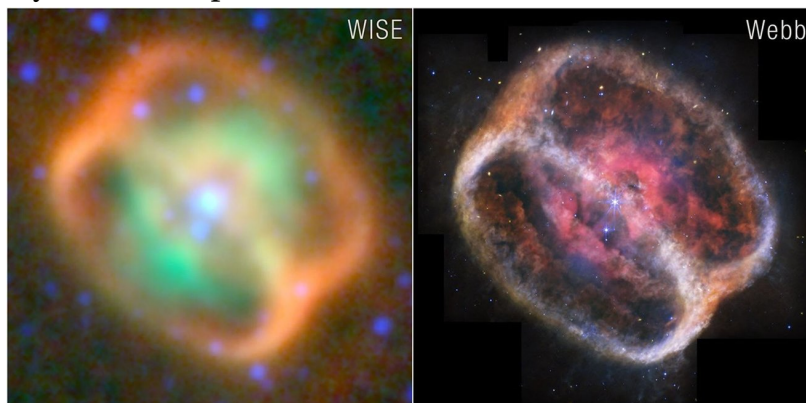
Webb’s observations show the nebula is tilted at a 60-degree angle, which makes it look like a can is being poured, but it’s far more likely that NGC 1514 takes the shape of an hourglass with the ends lopped off. Look for hints of its pinched waist near top left and bottom right, where the dust is orange and drifts into shallow V-shapes.

What might explain these contours? “When this star was at its peak of losing material, the companion could have gotten very, very close,” Jones said. “That interaction can lead to shapes that you wouldn’t expect. Instead of producing a sphere, this interaction might have formed these rings.”

Though the outline of NGC 1514 is clearest, the hourglass also has “sides” that are part of its three-dimensional shape. Look for the dim, semi-transparent orange clouds between its rings that give the nebula body.

A Network of Dappled Structures

The nebula’s two rings are unevenly illuminated in Webb’s observations, appearing more diffuse at bottom left and top right. They also look fuzzy, or textured. “We think the rings are primarily made up of very small dust grains,” Ressler said. “When those grains are hit by ultraviolet light from the white dwarf star, they heat up ever so slightly, which we think makes them just warm enough



Two infrared views of NGC 1514. At left is an observation from NASA’s Wide-field Infrared Survey Explorer (WISE). At right is a more refined image from NASA’s James Webb Space Telescope. Credit: NASA, ESA, CSA, STScI, NASA-JPL, Caltech, UCLA, Michael Ressler (NASA-JPL), Dave Jones (IAC)

Webb, continued

to be detected by Webb in mid-infrared light.”

In addition to dust, the telescope also revealed oxygen in its clumpy pink center, particularly at the edges of the bubbles or holes.

NGC 1514 is also notable for what is absent.

Carbon and more complex versions of it, smoke-like material known as polycyclic aromatic hydrocarbons, are common in planetary nebulae (expanding shells of glowing gas expelled by stars late in their lives).

Neither were detected in NGC 1514. More complex molecules might not have had time to form due to the orbit of the two central stars, which mixed up the ejected material. A simpler composition also means that the light from both stars reaches much farther, which is why we see the faint, cloud-like rings.

What about the bright blue star to the lower left with slightly smaller diffraction spikes than the central stars? It’s not part of this nebula. In fact, this star lies closer to us.

This planetary nebula has been studied by astronomers since the late 1700s. Astronomer William Herschel noted in 1790 that NGC 1514 was the first deep sky object to appear genuinely cloudy — he could not resolve what he saw into individual stars within a cluster, like other objects he cataloged. With Webb, our view is considerably clearer.

NGC 1514 lies in the Taurus constellation approximately 1,500 light-years from Earth.

More About Webb and MIRI

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

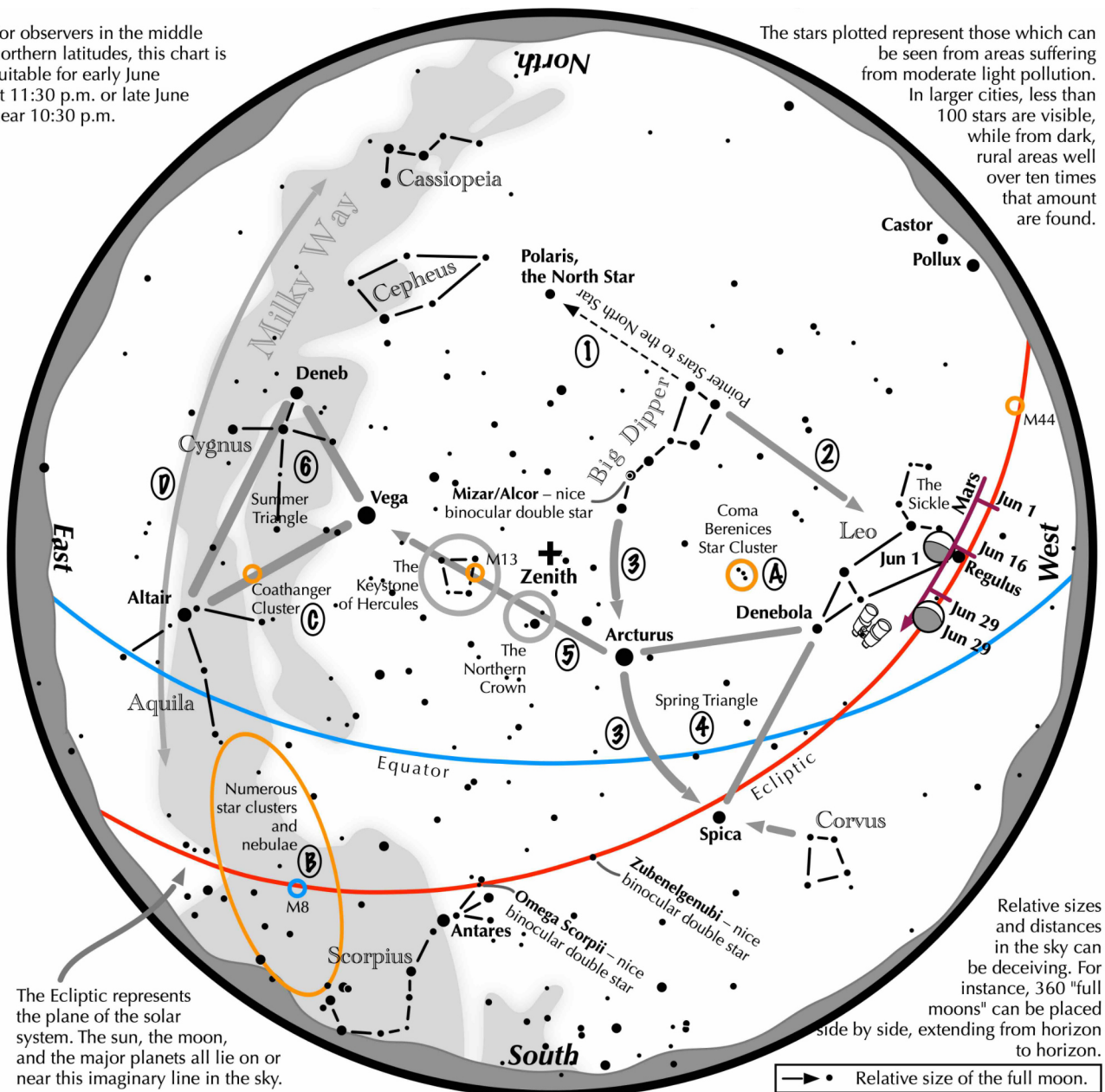
MIRI was developed through a 50-50 partnership between

NASA and ESA. A division of Caltech in Pasadena, California, the Jet Propulsion Laboratory led the U.S. contribution to MIRI. JPL also led development of MIRI’s cryocooler, done in collaboration with Northrop Grumman in Redondo Beach, California, and NASA’s Goddard Space Flight Center in Greenbelt, Maryland.

Navigating the mid-June Night Sky

For observers in the middle northern latitudes, this chart is suitable for early June at 11:30 p.m. or late June near 10:30 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 June night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Draw another line in the opposite direction. It strikes the constellation Leo high in the west.
- 3 Follow the arc of the Dipper's handle. It first intersects Arcturus, the brightest star in the June evening sky, then Spica.
- 4 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
- 5 To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 6 High in the east are the three bright stars of the Summer Triangle: Vega, Altair, and Deneb.

Binocular Highlights

- A: Between Denebola and the tip of the Big Dipper's handle, lie the stars of the Coma Berenices Star Cluster.
- B: Between the bright stars of Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- D: Sweep along the Milky Way for an astounding number of faint glows and dark bays.



Astronomical League Outreach



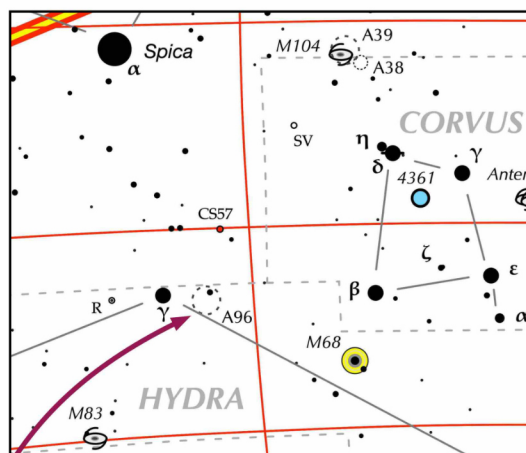
Seahorse Asterism

On the Astronomical League's Asterism list as no. 96



How to find the Seahorse ...

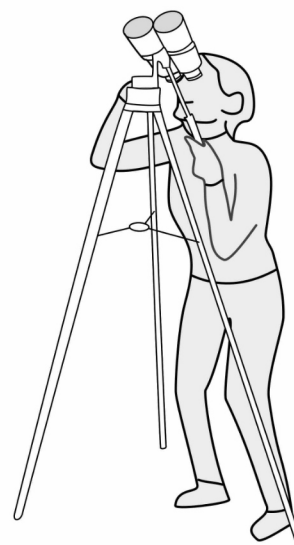
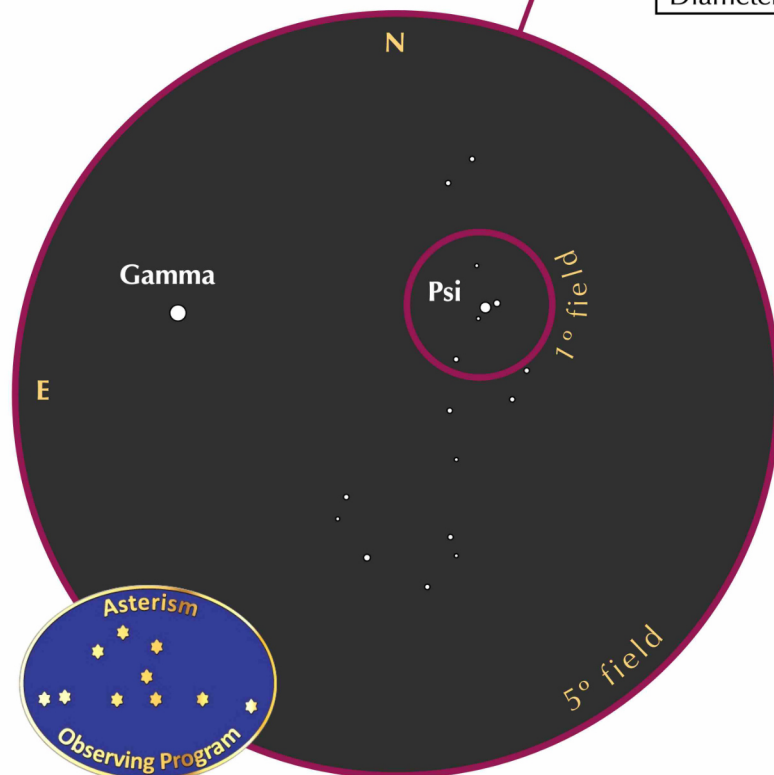
1. 10° south of Spica lies 3rd magnitude Gamma Hydrae. (10° is the angular width of your fist on your outstretched arm.)
2. Place Gamma at the center of the finder (or binocular) field.
3. At the west edge of the finder (or binocular) field lies the 4.9 magnitude Psi Hydrae.
4. Aim the finder (or binoculars) at Psi.
5. Follow the string of 7th, 8th, and 9th magnitude stars as it roughly traces the outline of a seahorse.



96 Asterism: Seahorse
Magnitudes: 4.9 – 9.6
Diameter: 15 x 90 arc-minutes

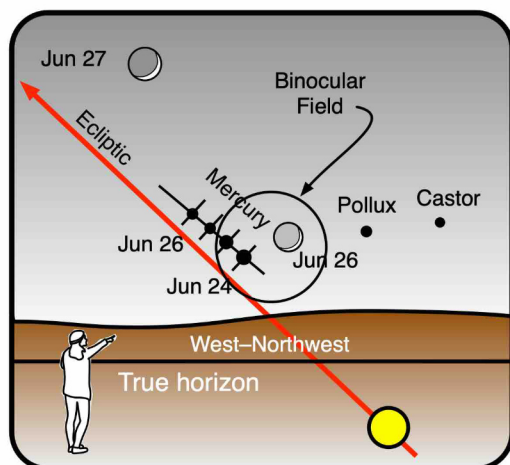
To see it through a finderscope or binoculars, clear, dark skies are a must!

Use a tripod to help bring in the asterism's 7th, 8th, and 9th magnitude stars.

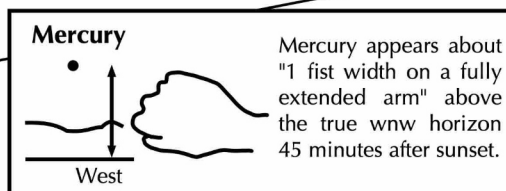
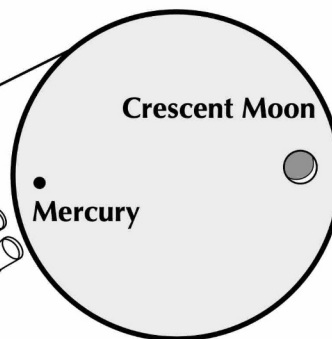


Astronomical League Outreach

Mercury, Castor & Pollux, and the young moon in the evening twilight



View through
10x50 binoculars
on June 26



June 24 – June 27, 2025:
Mercury and the young crescent moon
45 minutes after sunset in the west-northwest

The young moon & Mercury in the evening twilight

Have you ever spotted Mercury? Many stargazers have not. The early evenings of June 24 – 27 present good opportunities to catch the elusive little planet. Look low into the western twilight 45 minutes after sunset.



- Using binoculars, look on June 24 for the stars Castor and Pollux in a line with Mercury.
- Two nights later, the very thin crescent Moon joins them, floating between Mercury and Pollux. The Moon and Mercury lie in the same binocular field. Can you see Earthshine on the Moon's dark side or is the twilight too bright?
- On June 27, a slightly thicker crescent Moon hangs above Mercury. Earthshine should be more easily visible.

Hyde Observatory Volunteer Appreciation Dinner Held at Morrill Hall

The Hyde Observatory annual volunteer appreciation dinner was held on May 20th at Morrill Hall. John Reinert presented volunteer of the year awards to Kale Strizek and Mark Dahmke.

Rachel Scheet, the coordinator of Mueller Planetarium treated attendees to a fulldome program "5000 Eyes: Mapping the World With DESI."

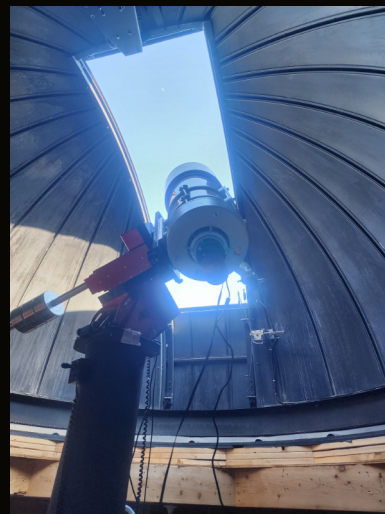


Astrophotography



First images from the Miller Astrophotography Research Center @ Branched Oak Observatory. Brett Boller and Jim White.

20 minute live stack from 10 sec subs. 120 total images. Processed in PixInsight by Jim White. May 4th 2025 Takahashi FRC300 and ZWO ASI 2400MC Pro.



Astrophotography

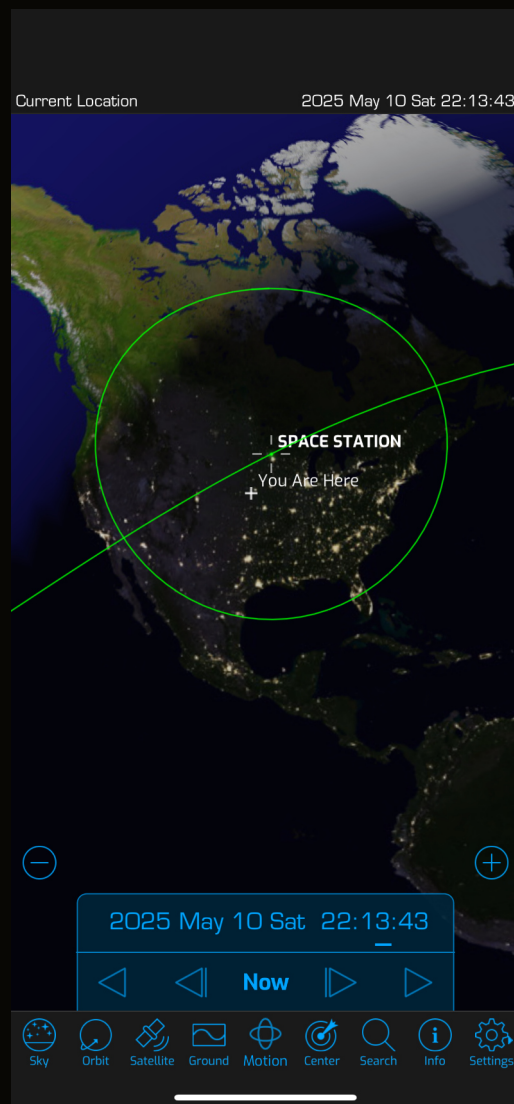


Photo by John Reinert

ISS pass as captured at Hyde during a public viewing night, 5/10. iPhone 15 Pro Max stacks several images over a three and a half second period. ISO 8000, 24mm, 0.1 ev, f1.78

Astrophotography



Photo by David Dickinson

M81 (Bode's Galaxy) taken on 5/5/25 with my Celestron Origin. No post processing - only the automated work of the telescope. ISO 200 & Total exposure of 6,070 seconds (607 frames of 10 seconds each).

From the Archives May, 1985

The 1985 Midstates Regional Convention

This year's Midstates Regional Convention is being held at Kansas Newman College in Wichita, Kansas on July 12, 13, and 14th. Information on lodging and convention events will be available at the next meeting for anyone interested.

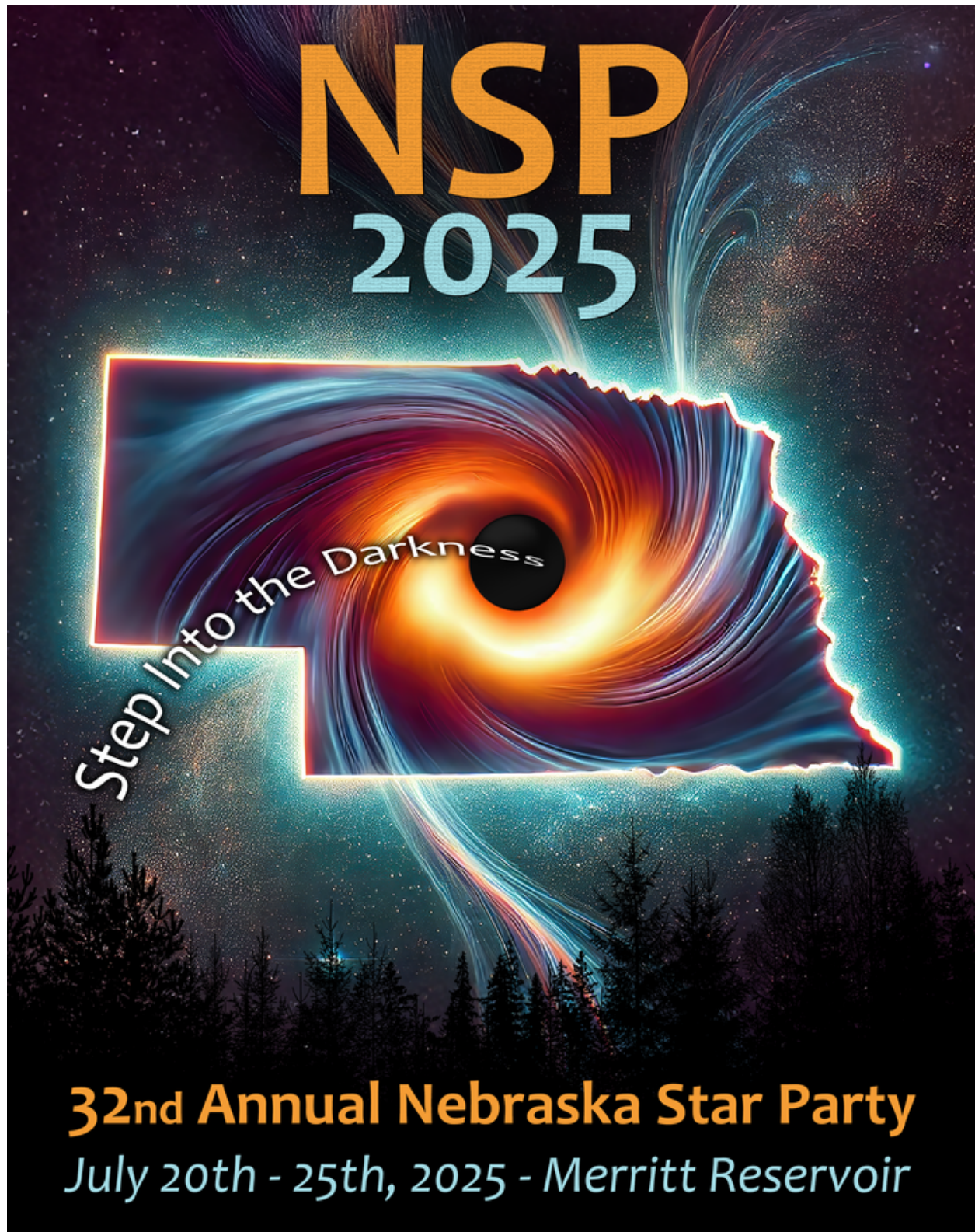
Speakers for the convention will include Dr. Ted Geisert from K-State University, Jose Olivarez, the director of the Wichita Omnisphere, and David Alexander from Wichita State University. Also, the Wichita Omnisphere will be open to everyone and is showing "The Search For E.T's."

As you all know, Astronomy Day 1985 was held about a month ago.

Because the Prairie Astronomer is printed and sent a few days before the meeting, and Astronomy Day was on the Saturday before the meeting, no mention of it was made in last month's letter. As you might have expected, this year's event was quite successful and it was all made possible by the excellent turn out of club members and the support everyone offered all during the day. We had a nice telescope display offering the public a look at a variety of club members and scopes explanations on how different telescopes work. In the main display area the public was presented with three computer displays, a stereo video tape display, and large variety of astronomy

related books to browse through.

Since Halley's Comet will arrive before the year is out, we also set up a comet display showing when and where to look for Comet Halley this winter. We even sold some Halley t-shirts and Comet Halley viewing guides. All in all it was another fine Astronomy Day. We would like to thank all of you who helped put the event especially Bev Hetzel for getting everything organized.



www.nebraskastarparty.org

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

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).

