

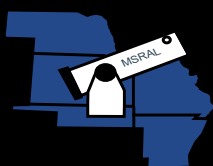
The Prairie Astronomer

July 2021 Volume 62, Issue #7

**July Meeting: Solar Observing
Party at Hyde Observatory**



MARS



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer



NEXT MEETING AND PROGRAM

July 27, 6:00pm: Solar party, Hyde Observatory

This month we'll have a Solar party and a brief meeting on preparing for NSP at 7:45pm.

FUTURE PROGRAMS

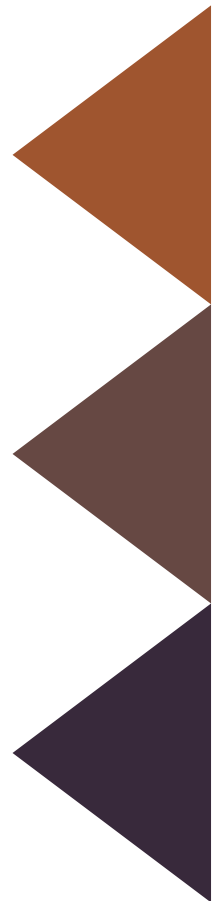
August: Tentatively scheduled to be a review of the Nebraska Star Party

September: Nominations for club officers and a report from survey committee.
Program to be announced.

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Cover: This VIS image shows part of the south polar cap on Mars. The dark bands are troughs in the ice. NASA/JPL-Caltech/Arizona State University.



CALENDAR

PAC Meeting
 Tuesday, July 27, 2021, Hyde Observatory
 Solar party at 6pm, meeting at 7:30pm

Nebraska Star Party
 August 1-6, 2021
 Merritt Reservoir, Valentine, Nebraska

PAC Meeting
 August 31, 2021, 7:30pm
 Hyde Observatory

PAC Meeting
 September 28, 7:30pm
 Hyde Observatory

2021 STAR PARTY DATES

	Date	Date
January	8	15
February	5	12
March	5	12
April	2	9
May	7	14
June	4	11
July	2	9
August	Jul 30	6
September	Aug 27	3
October	1	8
November	Oct 29	5
December	Nov 26	3

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

CLUB OFFICERS

President	Bob Kacvinsky kacvinskyb@yahoo.com
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Treasurer	John Reinert jr6@aol.com
Club Observing Chair	Jim Kvasnicka jim.kvasnicka@yahoo.com
Outreach Coordinator	Mike Kearns mkearns@neb.rr.com
Website and Newsletter Editor	Mark Dahmke mark@dahmke.com



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www.prairieastronomyclub.org

The President's Message

Bob Kacvinsky



After a long drought, the sun has finally started to become active again with sunspots. The weather did not cooperate for our June Solar Observing Party, so Dave Churilla and others have agreed to try again for our July 27th Club meeting date. The Solar Observing Party will start again at 6 PM set up and we will plan to have a brief meeting around 7:45 pm. In preparation for the Nebraska Star Party the following week, our Club Meeting agenda will focus on things to be sure to pack for a multi-day star party. We will especially focus on what to expect and maybe some items not on your normal packing list. The June and July Solar Observing Parties are our first transition into gathering for our club meetings. Please plan to attend and let's get reacquainted.

The Nebraska Star Party August 1-6 is the first

national event on the AL calendar. If you have not attended an NSP, this would be a great year to get out and experience some dark skies. There are few places you can drive to with better observing skies. Details and registration information can be found at www.nebraskastarparty.org.

Since late 2019 we have a dozen new members, many of which have recently purchased new telescopes. Our plans will be to have 3-4 experienced members available to help as needed during special Lunar observing events. The next Lunar Star Party will be listed in the newsletter. Details for all our star parties are listed within the newsletter. Please consider attending one of the club star parties. It is a great way to get involved, learn for others, and be amazed at the night wonders.

Hyde is officially open again for public viewing every Saturday night. We have lost a few of our volunteers during the Covid shutdown, so if you would like to help as a volunteer, please let the Hyde Board or PAC Board members know and we can get you trained. Running the telescopes on the deck are quite easy and it takes no special talents or experiences so please come in and give it a try.

Recently you received an email from Jim Kvasnicka with a PAC survey. Please take a couple of minutes to provide your thoughts, ideas, suggestions, or critiques. The PAC Board established a committee made up of past PAC presidents and asked them to gather inputs from each of you on ways to improve our club. Your comments will be kept private within the small committee, so we are asking for candid and

frank feedback. The success of PAC is determined by how the club meets your expectations and needs. Please take a few minutes and provide your comments and ideas. The committee will consolidate the information and provide a summary to the

Board for action. The survey will focus on both short- and long-term areas, club activities, outreach, meeting formats, speakers, and officer makeup as potential subjects.

Please participate and
THANK YOU in advance

for your participation and feedback to the committee.

Dark and Clear Skies to you, Bob Kacvinsky
PAC-President
kacvinskyb@yahoo.com
402-840-0084

Observing Award

Congratulations to Brett Boller for completing the Binocular Messier Observing Program. Brett is the 6th PAC member to complete the Binocular Messier Observing Program and this is the 5th observing award that Brett has received.



Rick Johnson

ARP 32

ARP 32, UGC 10770 was classified by Arp as one of six spiral galaxies of the "Integral Sign" type. By this he meant it somewhat resembles the calculus symbol of that name, + is the closest I can do with Unicode but lean it over a bit. Usually, it is due to a spiral seen at just the right angle but this case is different. It is two colliding galaxies. While these look very small and distant that is misleading. They are really two very small dwarf galaxies that are rather close as galaxies go at about 55 million light years. About the same distance as the many galaxies of the Virgo Cluster. So these are two very tiny galaxies. Star formation, triggered by their collision has turned both of them very blue. The PGC lists the two galaxies separately with the southern one being PGC 59804 and the northern, PGC 59862. Given a distance of about 55 million light-years, the

southern galaxy is about 20,000 light-years across and the northern about 15,000. There's a star from our own galaxy that just happens to be right at the point where the two galaxies appear to touch each other. It makes a rather nice pseudo nucleus making the two galaxies appear as one. There are very few images of this pair to be found anyplace on the net. An image of it from the Sloan Digital Sky Survey can be found at:

<http://cas.sdss.org/dr6/en/tools/places/page5.asp>

It's the third down in the left column. Color has been severely enhanced in this image to bring out subtle color differences. My shot is more in line with the colors the eye would see if the scene were bright enough to trip our color cells in the retina. Seeing was rather poor the night I took this so things are a bit fuzzy.



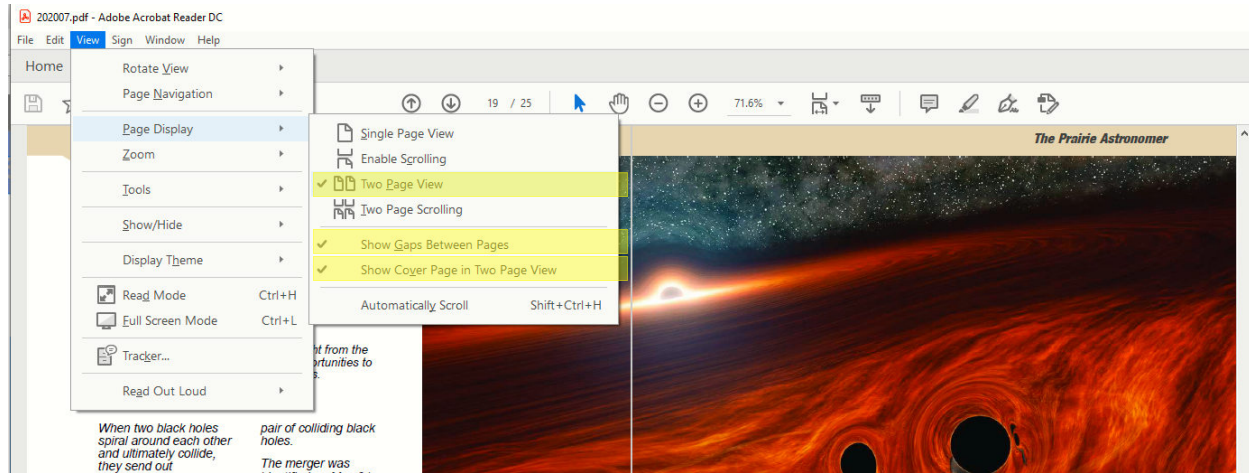
The Mantrap Skies Image Catalog

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.



New Newsletter 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 now available online:
<https://www.prairieastronomyclub.org/newsletters>

August Observing

Jim Kvasnicka



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

Planets

Jupiter and Saturn: Both start August in Capricornus. Jupiter at -2.7 and Saturn at +0.2 magnitude.

Mars and Mercury: Both set by 9:00 pm in Leo.

Uranus and Neptune: Look for Uranus in Aries and Neptune in Aquarius.

Venus: Magnitude -3.9 in the west at dusk.

Meteor Showers

Perseids: Peaks the night of August 11-12. Expect up to 100 meteors per hour in dark skies. The waxing crescent Moon won't interfere.

Messier List

M6/M7: Open clusters in Scorpius.

M8: The Lagoon Nebula in Sagittarius.

M9/M10: Class VIII and VII globular clusters in Ophiuchus.

M12/M19: Class IX and VIII globular clusters in Ophiuchus.

M20: The Trifid Nebula in Sagittarius.

M21/M23: Open clusters in Sagittarius.

M62/M107: Class IV and X globular clusters in Ophiuchus.

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

Next Month: M13, M14, M22, M28, M54, M69, M70, M92

NGC and other Deep Sky Objects

NGC 6717: Palomar 9, Class VIII globular cluster in Sagittarius.

NGC 6741: Planetary nebula in Aquila.

NGC 6781: Planetary nebula in Aquila.

NGC 6818: Little Gem, planetary nebula in Sagittarius.

B86: The Ink Spot, dark nebula in Sagittarius.

Double Star Program List

Struve 2404: Close pair of orange stars in Aquila.

57 Aquilae: Pair of white stars.

Beta Cygni: Albireo, gold and blue stars.

31 Cygni: Yellow primary with a blue secondary.

61 Cygni: Two orange stars.

Epsilon Lyrae: The Double Double.

Zeta Lyrae: Yellow pair.

Beta Lyrae: Yellow primary with multiple white stars.

Focus on Constellations

Sagittarius

Jim Kvasnicka

Sagittarius, the Archer, covers 867 square degrees. Toward Sagittarius lies the center of our Galaxy and the bulk of the cool dust that lies along the spiral arms of our Milky Way. Because most of the 150+ globular clusters are congregated around the central hub of our Milky Way, Sagittarius is rich in globular clusters. Sagittarius contains 15 Messier objects, more than any other constellation. Most of these Messier objects are famous and well known. They include M8, The Lagoon Nebula; M17, The Swan or Omega Nebula; M20, The Trifid Nebula; and M22, one of the best globular clusters in the sky. Sagittarius contains a large variety of objects, enough to keep any observer busy for a while. The constellation Sagittarius is best seen in August.

Showpiece Objects

Globular Clusters: M22, M28, M55, M75

Planetary Nebulae: NGC 6818 (Little Gem)

Open Clusters: M21, M23

Dark Nebulae: B86 (Ink Spot)

Bright Nebulae: M8 (Lagoon), M17 (Swan), M20 (Trifid)

Mythology

Two Centaurs are immortalized among the stars. The Centaur represented by Centaurus, and the Centaur Sagittarius, one of the zodiac signs. In Greek-Roman mythology, Sagittarius was the Archer-Centaur who slew

the scorpion that had killed Orion.

Number of Objects
Magnitude 12.0 and Brighter

Galaxies: 3
Globular Clusters: 20
Open Clusters: 23
Planetary Nebulae: 16
Dark Nebulae: 9
Bright Nebulae: 3



By Till Credner - Own work: AlltheSky.com, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=20042019>

From the Archives

July, 1974

Our last months newsletter was a bit late for a couple of reasons. First, Our printing machine broke down on the Saturday before the meeting and a replacement was not available until Monday. Otherwise, the newsletters would have been in the mail by Saturday night. Second, when the newsletters were finished and mailed on Monday, the postal service failed to get them delivered until Wednesday.

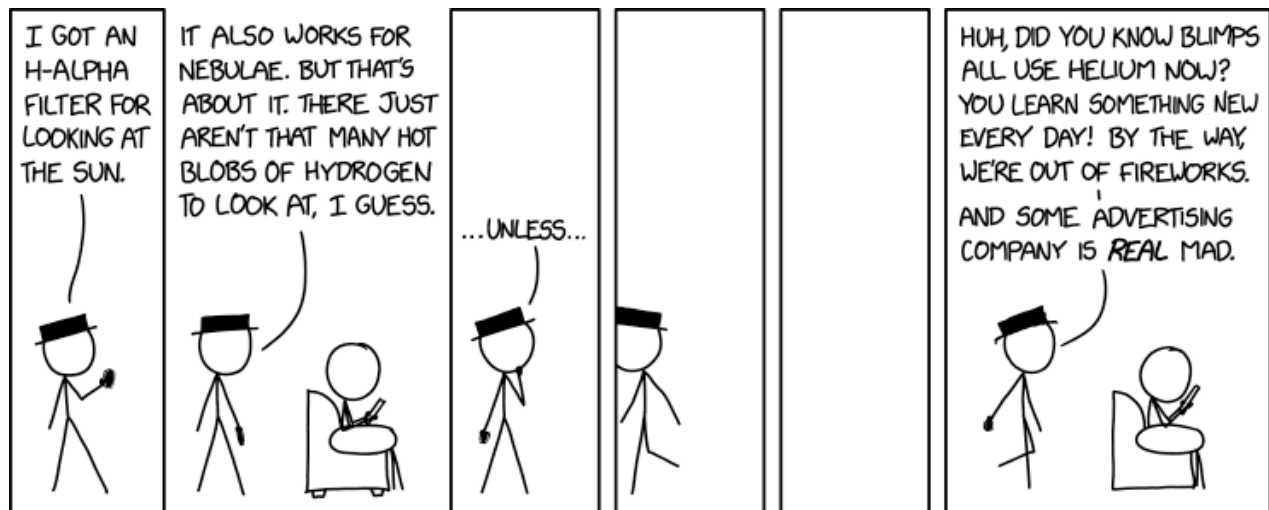
We hope this does not happen again, but if it does, remember that our meetings are always the last Tuesday of the month, 7:30pm, at Wesleyan. If there are any changes we will let you know, by phone if we have to.

Our family picnic and star party will be held on Saturday, August 10, at the Wagon Train recreation area 3 miles east of Hickman. Come out early Saturday afternoon, and plan to stay late. Bring your parents, brothers, sisters, friends, wife, children or whoever you consider family. Bring along yard games if you have them, boats, swimsuits, and don't forget the telescopes. Bring a picnic basket with a meat dish, salad, desert, and table service for your family. We will have a pot-luck supper at 6:00 pm. The Club will provide cold pop, but you can also bring your own hot or cold drink if desired. We have invited the Omaha Club again this year, and although I appreciate a good turn out from Omaha, I hope that I won't be embarrassed by a larger turn out from Omaha than from Lincoln. If the skies are clear at sundown, I will bring out the Club telescope and hopefully all will get a chance to use it. Remember too that this will be a day before the peak of the Perseid meteor shower, so we should have a few meteors as a bonus.

See you at the meeting! but if not I certainly hope you can make it to the picnic and star party on August 10.

I will be gone on a short vacation August 4-9. If you have any problems concerning Club matters, call our Vice-President, Dr. Manthey at 489-3237.

Earl Moser
President

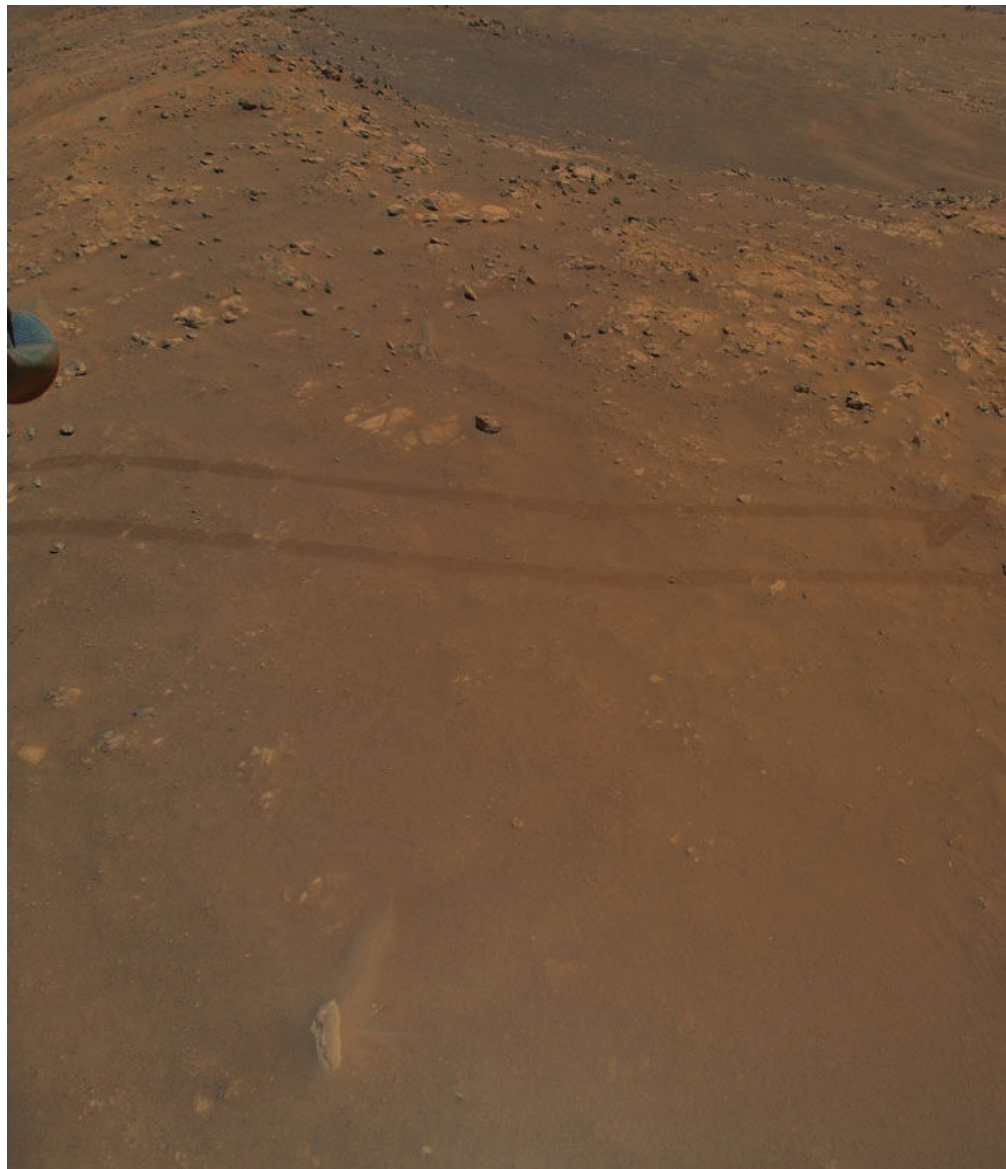


NASA's Mars Helicopter Reveals Intriguing Terrain for Rover Team

Ingenuity's ninth flight provided imagery that will help the Perseverance rover team develop its science plan going forward.

Images snapped on July 5 by NASA's Ingenuity Mars Helicopter on its ambitious ninth flight have offered scientists and engineers working with the agency's Perseverance Mars rover an unprecedented opportunity to scout out the road ahead. Ingenuity provided new insight into where different rock layers begin and end, each layer serving as a time capsule for how conditions in the ancient climate changed at this location. The flight also revealed obstacles the rover may have to drive around as it explores Jezero Crater.

During the flight – designed to test the helicopter's ability to serve as an aerial scout – Ingenuity soared over a dune field nicknamed "Séítah." Perseverance is making a detour south around those dunes, which would be too risky for the six-wheeled rover to try crossing.



NASA's Ingenuity Mars Helicopter captured this image of tracks made by the Perseverance rover during its ninth flight, on July 5. A portion of the helicopter's landing gear can be seen at top left. Credits: NASA/JPL-Caltech

The color images from Ingenuity, taken from a height of around 33 feet (10 meters), offer the rover team much greater detail than they get from the orbiter images they typically use for route planning. While a camera like HiRISE (the High Resolution Imaging Science Experiment)



aboard NASA's Mars Reconnaissance Orbiter can resolve rocks about 3 feet (1 meter) in diameter, missions usually rely on rover images to see smaller rocks or terrain features.

"Once a rover gets close enough to a location, we get ground-scale images that we can compare to orbital images," said Perseverance Deputy Project Scientist Ken Williford of NASA's Jet Propulsion Laboratory in Southern California. "With Ingenuity, we now have this intermediate-scale imagery that nicely fills the gap in resolution."

Below are a few of Ingenuity's images, which completed the long journey back to Earth on July 8.

Raised Ridges

Ingenuity (its shadow is visible at the bottom of this image) offered a high-resolution glimpse of rock features nicknamed "Raised Ridges." They belong to a fracture system, which often serve as pathways for fluid to flow underground.

Here in Jezero Crater, a lake existed billions of years ago. Spying the ridges in images from Mars orbiters, scientists have wondered whether water might have flowed through these fractures at some point, dissolving

minerals that could help feed ancient microbial colonies. That would make them a prime location to look for signs of ancient life – and perhaps to drill a sample.

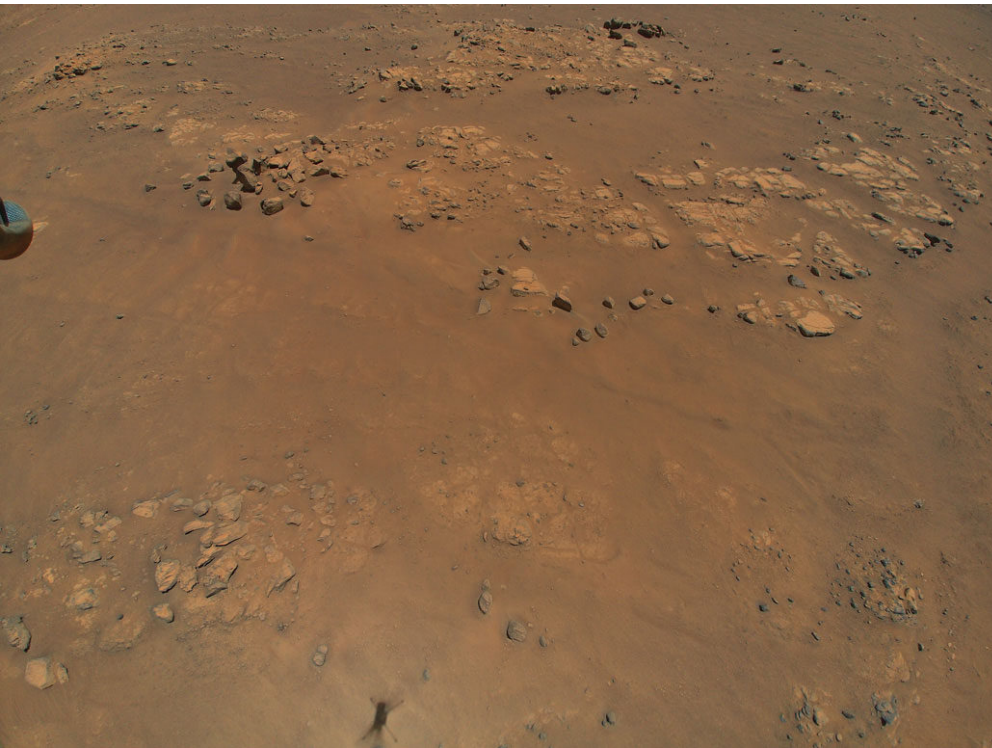
The samples Perseverance takes will eventually be deposited on Mars for a future mission that would take them to Earth for in-depth analysis.

"Our current plan is to visit Raised Ridges and investigate it close up," Williford said. "The helicopter's images are by far better in resolution than the orbital ones we were using. Studying these will allow us to ensure that visiting these ridges is important to the team."

Dunes

Sand dunes like the ones in this image keep rover drivers like JPL's Olivier Toupet awake at night: Knee- or waist-high, they could easily cause the two-ton rover to get stuck. After landing in February, Perseverance scientists asked whether it was possible to make a beeline across this terrain; Toupet's answer was a hard no.

"Sand is a big concern," said Toupet, who leads the team of mobility experts that plans Perseverance's drives. "If we drive downhill into a



NASA's Ingenuity Mars Helicopter spotted this location, nicknamed "Raised Ridges," during its ninth flight, on July 5. Scientists hope to visit "Raised Ridges" with the Perseverance rover in the future. Credits: NASA/JPL-Caltech

dune, we could embed ourselves into it and not be able to get back out."

Toupet is also the lead for Perseverance's newly tested AutoNav feature, which uses artificial intelligence algorithms to drive the rover autonomously over greater distances than could be achieved otherwise. While good at avoiding rocks and other hazards, AutoNav can't detect sand, so human drivers still need to define "keep-out zones" around areas that could entrap the rover.

Bedrock

Without Ingenuity, visible in silhouette at the bottom of this next image, Perseverance's scientists would never get to see this section of Séítah so clearly: It's too sandy for Perseverance to visit. The unique view offers enough detail to inspect these rocks and get a better understanding of this area of Jezero Crater.

As the rover works its way around the dune field, it may make what the team calls a "toe dip" into some scientifically compelling

spots with interesting bedrock. While Toupet and his team wouldn't attempt a toe dip here, the recent images from Ingenuity will allow them to plan potential toe-dip paths in other regions along the route of Perseverance's first science campaign.

"The helicopter is an extremely valuable asset for rover planning because it provides high-resolution imagery of the terrain we want to drive through," said Toupet. "We can better assess the size of the dunes and where bedrock is poking out. That's great information for us; it helps identify which areas may be traversable by the rover and whether certain high-value science targets are reachable."

More About the Mission

A key objective for Perseverance's mission on Mars is astrobiology, including the search for signs of ancient microbial life. The rover will characterize the planet's geology and past climate, pave the way for human exploration of the Red Planet, and be the first mission to collect and cache Martian rock and regolith (broken rock and dust).

Subsequent NASA missions, in cooperation with ESA (European

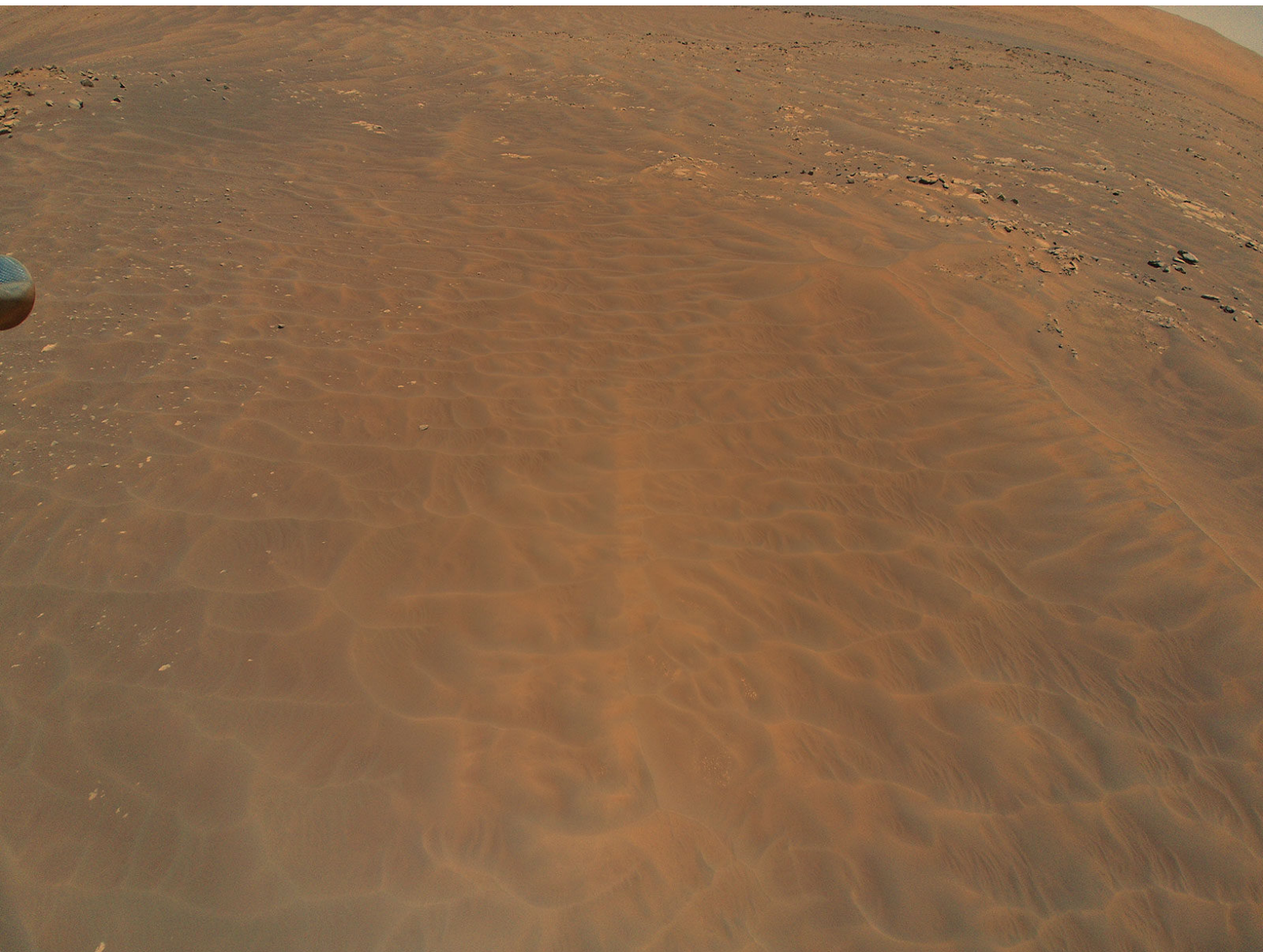
Space Agency), would send spacecraft to Mars to collect these sealed samples from the surface and return them to Earth for in-depth analysis.

The Mars 2020 Perseverance mission is part of NASA's Moon to Mars exploration approach, which includes

Artemis missions to the Moon that will help prepare for human exploration of the Red Planet.

JPL, which is managed for NASA by Caltech in Pasadena, California, built and manages operations of the Perseverance rover.

The Ingenuity Mars Helicopter was built by JPL, which also manages the technology demonstration project for NASA Headquarters. It is supported by NASA's Science, Aeronautics Research, and Space Technology mission directorates. NASA's Ames Research Center in



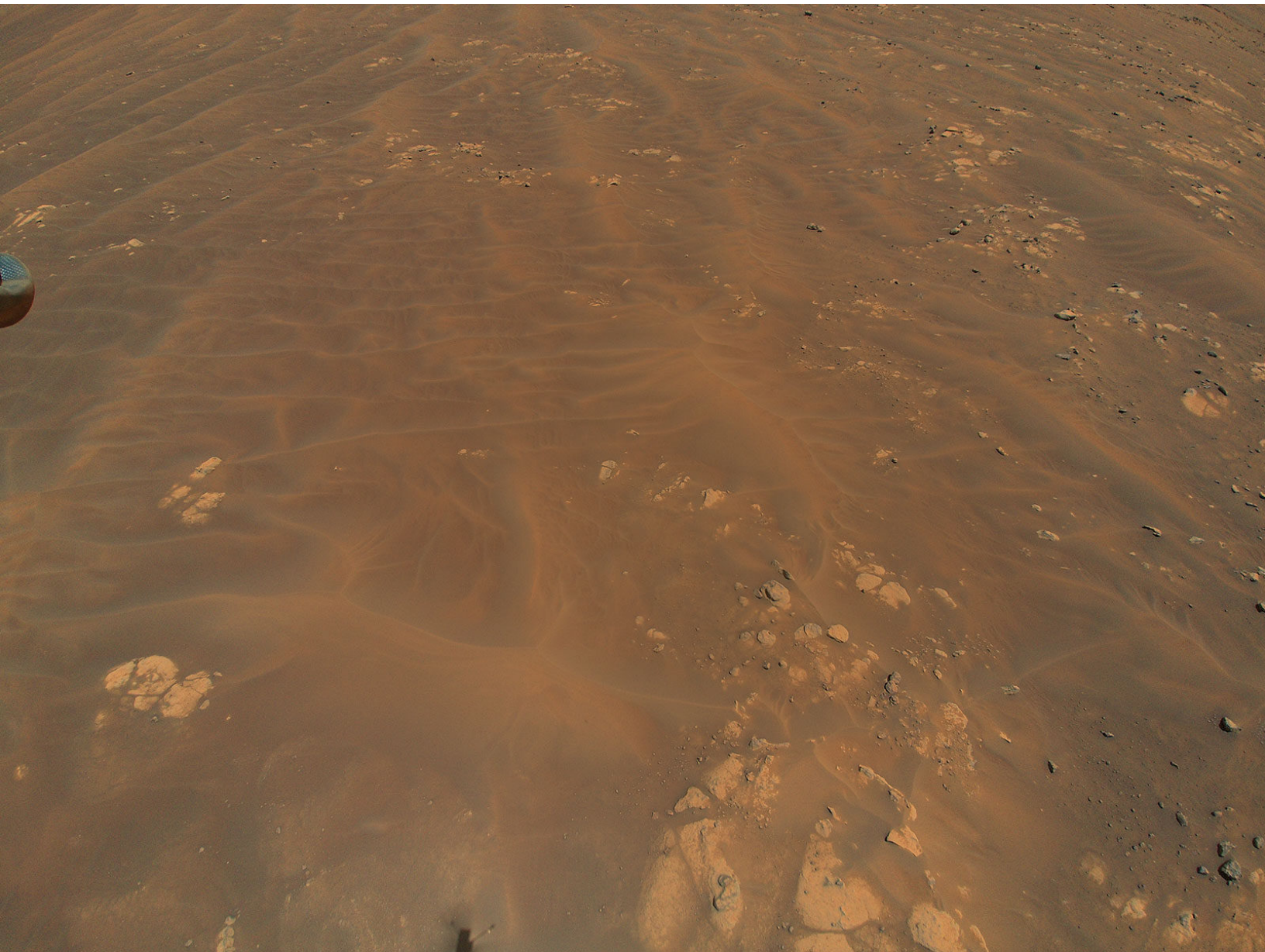
NASA's Ingenuity Mars Helicopter flew over this dune field in a region of Jezero Crater nicknamed "Séítah" during its ninth flight, on July 5, 2021. A portion of the helicopter's landing gear can be seen at top left. Credits: NASA/JPL-Caltech

California's Silicon Valley, and NASA's Langley Research Center in Hampton, Virginia, provided significant flight performance analysis and technical assistance during Ingenuity's development. AeroVironment Inc., Qualcomm, and SolAero

also provided design assistance and major vehicle components. Lockheed Martin Space designed and manufactured the Mars Helicopter Delivery System.

JPL manages the MRO mission for NASA's

Science Mission Directorate in Washington. The University of Arizona, in Tucson, operates HiRISE, which was built by Ball Aerospace & Technologies Corp., in Boulder, Colorado.



NASA's Ingenuity Mars Helicopter flew over these sand dunes and rocks during its ninth flight, on July 5, 2021. While the agency's Perseverance Mars can't risk getting stuck in this sand, scientists are still able to learn about this region by studying it from Ingenuity's images. Credits: NASA/JPL-Caltech

28th Annual Nebraska Star Party

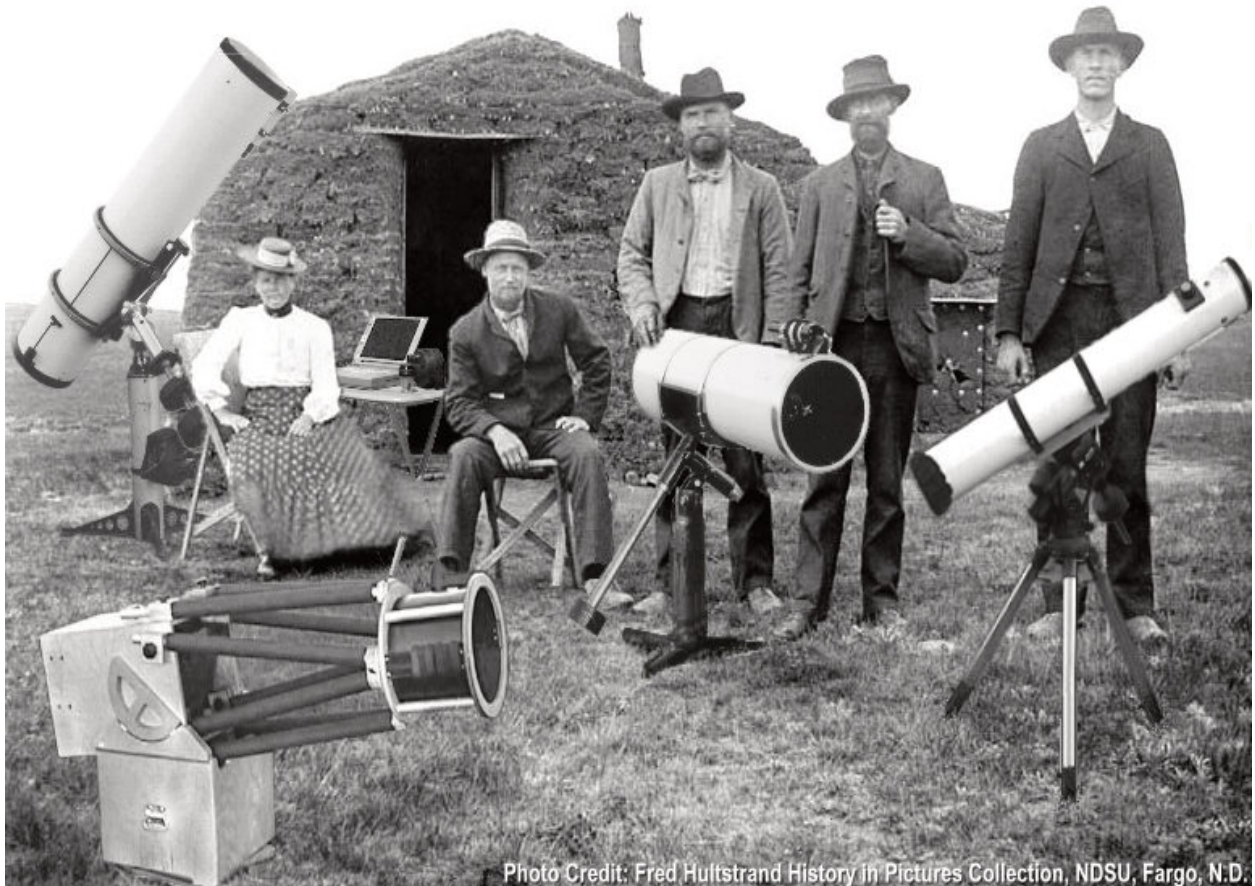


Photo Credit: Fred Hultstrand History in Pictures Collection, NDSU, Fargo, N.D.

Join us this summer as families from all over the US and around the world gather in the sparsely populated sand hills of North Central Nebraska to spend a good week under a galaxy of stars.

**August 1 - 6 at Merritt Reservoir,
Valentine, Nebraska**

Corner the Great Square of Pegasus

David Prosper



This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

The Summer Triangle may be the most famous seasonal star pattern, but during early August evenings another geometrically-themed asterism rises: the Great Square of Pegasus. This asterism's name is a bit misleading: while three of its stars - Scheat, Markab, and Algenib - are indeed found in the constellation of the winged horse Pegasus, its fourth star, Alpheratz, is the brightest star in the constellation Andromeda!

August evenings are an excellent time to look for the Great Square, as it will be rising in the east after sunset. If not obvious at first, wait for this star pattern to rise a bit above the murky air, and remember that depending on your point of view, it may appear more like a diamond than a square.

Look for it below the Summer Triangle, or to the southeast of nearby Cassiopeia at this time. As the Great Square rises in prominence during autumn evenings, it becomes a handy guidepost to finding more constellations, including some of the dimmer members of the Zodiac: Aries, Pisces, Aquarius, and Capricornus. Like the Summer Triangle, the Great Square of Pegasus is also huge, but Pegasus itself is even larger; out of the 88 constellations, Pegasus is 7th in size, and feels larger as the stars in its neighboring constellations are much dimmer.

There are many notable deep-sky objects found within the stars of Pegasus - ranging from easily spotted to expert level targets - making it a

great constellation to revisit as your observing skills improve. Notable objects include the densely-packed stars of globular cluster M15, a great first target. The potential "Milky Way look-alike" galaxy NGC 7331 is a fun target for more advanced observers, and

While the stars of the Great Square of Pegasus are not as bright as those of the Summer Triangle, they still stand out compared to their neighbors, and make a great foundation for exploring this area of the night sky. Note that the brightness of the stars near the horizon is exaggerated in this picture.



expert observers can hop nearby to try to tease out the much dimmer interacting galaxies of Stephan's Quintet. A fascinating (but extremely difficult to observe) object is a gravitationally-lensed quasar famously known as the Einstein Cross. Pegasus has quite a storied history in the field of exoplanet research: 51 Pegasi was the first Sun-like star discovered to be host to a planet outside our solar system, now officially named Dimidium.

While observing Pegasus and its surroundings, keep your eyes relaxed and ready to catch some Perseids, too! August 2021 promises an excellent showing of this annual meteor shower. The crescent Moon sets early on the evening of the shower's peak on August 11-12, but you can spot stray Perseids most of the month. If you trace the path of these meteors, you'll find they originate from one point in Perseus - their radiant. Giant

planets Jupiter and Saturn will be up all evening as well. Look south - they easily stand out as the brightest objects in the faint constellations Aquarius and Capricornus.

Pegasus truly holds some fantastic astronomical treasures! Continue your exploration of the stars of Pegasus and beyond with NASA at [nasa.gov](https://www.nasa.gov).

Continued on next page...



st 2021, early evening; mid-northern latitudes.

Pegasus... continued.



Stephan's Quintet is one of the most famous deep-sky objects in Pegasus. First discovered in 1877, it contains the first galaxy group discovered (which includes 4 of the 5 galaxies making up the Quintet) – and has been studied extensively ever since. One day this group will merge into one supergalaxy! While famous, these galaxies are hard to spot in all but the largest backyard telescopes – but are a favorite target of astrophotographers. Take a virtual flyby of these galaxies with a tour created from Hubble data at: bit.ly/quintetflyby

Credit: NASA, ESA, and G. Bacon, J. DePasquale, F. Summers, and Z. Levay (STScI)

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

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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.

