

The Prairie Astronomer

July 2019 Volume 60, Issue #7

Apollo 11: Fiftieth Anniversary



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer

There will be **NO MEETING IN JULY** due to NSP.
NEXT PAC MEETING: August 27 at 7:30pm
at Hyde Observatory

PROGRAM

A review of the Nebraska Star Party

FUTURE PROGRAMS (Tentative)

September: to be determined

October: Club Viewing Night


November: How to Buy a Telescope

December: Club Holiday Gathering

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Cover: This view from the Apollo 11 spacecraft shows Earth rising above the moon's horizon. The lunar terrain pictured is in the area of Smyth's Sea on the nearside. Coordinates of the center of the terrain are 86 degrees east longitude and 3 degrees north latitude. While astronauts Neil A. Armstrong, commander, and Edwin E. Aldrin Jr., lunar module pilot, descended in the Lunar Module (LM) "Eagle" to explore the Sea of Tranquility region of the moon, astronaut Michael Collins, command module pilot, remained with the Command and Service Modules (CSM) "Columbia" in lunar orbit.



The Prairie Astronomy Club:
Fifty Years of Amateur Astronomy

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).

COMPILED AND EDITED BY MARK DAHMKE

EVENTS



Rick Johnson Memorial Gathering
July 26 9-11am at Hyde Observatory

NO MEETING IN JULY

Nebraska Star Party
Merritt Reservoir, Valentine, Nebraska
July 28 - August 2, 2019

PAC Meeting
Tuesday August 27, 2019, 7:30pm
Program: NSP Review

PAC Meeting
Tuesday September 24, 2019, 7:30pm

2019 STAR PARTY DATES



Photo by Brian Sivill

	Star Party Date	Star Party Date
January	Dec 28	Jan 4
February	Jan 25	Feb 1
March	Mar 1	Mar 8
April	Mar 29	Apr 5
May	Apr 26	May 31
June	Jun 21	Jun 28
July	Jul 26	Aug 2
NSP	July 28 - Aug 2	
August	Aug 23	Aug 30
September	Sep 20	Sep 27
October	Oct 18	Oct 25
November	Nov 22	Nov 29
December	Dec 20	Dec 27

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



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Subscribe through [GoogleGroups](#).
To post messages to the list, send
to the address:

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WEBSITES

- www.prairieastronomyclub.org
- <https://nightsky.jpl.nasa.gov>
- www.hydeobservatory.info
- www.nebraskastarparty.org
- www.OmahaAstro.com
- Panhandleastronomyclub.com
- www.universetoday.com/
- www.planetary.org/home/
- <http://www.darksky.org/>



Night Sky Network

Meeting Minutes

PAC meeting minutes June 25, 2019 as recorded by Bill Lohrberg.

President Bob Kacvinsky welcomes all to meeting – 13 members, no guests. Bob presented the observing report for Jim Kvasnicka who was in Hawaii:

- Star party scheduled for Friday June 28, July 26, August 2
- Planets – Mars is best seen mid to end of July, Mercury very low in west at start of July, out of view for several weeks after, Jupiter reached opposition big and bright, Saturn brightens as month goes on reaching opposition early July, Venus low in the dawn sky, Uranus, Neptune morning planets.
- Messier list, M3, 4, 5, 53, 68 globular clusters, M83 galaxy in Hydra
- NGC edge on galaxy in Draco globular clusters, open cluster in Scorpius, bug nebula, ghost nebula in Ophiucus, eagle nebula...

News and current events:

- Space X launches Heavy Falcon rocket this morning (June 25) with several satellites, atomic clock, among other things including the Lightsail 2 – a project funded by the Planetary Society.
- Bob showed photo of the NICER X-Ray image from ISS.

Quick summary of MSRAL

- Attendees from PAC were Bob Kacvinsky, and Rev. John Rooney
- Next MSRAL event will be in Tulsa, Oklahoma – the home of Explorer Scientific – they'll give tours and observing etc.
- Most clubs around the league have been growing in membership – a lot of interest has picked up due to the upcoming 50th anniversary of Apollo moon landing
- Barbeque event was held at the Powell observatory – has an old 30" telescope which is

in the process of moving because of city development around it.

- Speakers including from IDA & several national speakers but the one Bob was especially interested in from Chuck Allen - past AL president who gave talk about distance perspective. Bob is hoping his presentation might be recorded and available to share with PAC as a program for future meeting this fall or winter.
- Estimated number of MSRAL attendees to this year's MSRAL event was around 100...most from KC and St Louis, including 2 from PAC and approx. 5 from OAS.

Upcoming dates and events

- Hyde Observatory is now open
- Next PAC star party Friday June 28
- Bob asked for a show of hands for who will be going to NSP – majority in attendance raised hands
- Bob passed around a signup sheet for the events on July 19 & 20th stressing the need for as many volunteers as available to sign up for the several events going on. Mahoney Star party (sponsored by NSP) on the 19th, Lead up program at Hyde, Morrill Hall, Homestead memorial, Indian Caves, solar observing at Nebraska Historical museum.
- Brett announced that the stars and cars event for Saturday June 29 at Branched Oak Observatory had been postponed twice due to weather, hopefully 3rd try is the charm. Could use help if available, 5pm to 11pm.
- No July PAC meeting as this coincides with NSP

The meeting adjourned at 7:50pm with a reminder to renew your membership dues early and often and the program by Dave Churilla – Solar observing. The outdoor solar observing was a bust due to overcast conditions.

The President's Message

Bob Kacvinsky

It is hard to imagine that 50 years ago on July 20th Neil Armstrong and Buzz Aldrin landed on the moon. I can remember sitting with my family watching Walter Cronkite (we only got CBS) report on the landing and the fuzzy images on our B&W TV. I had just completed freshman year of high school and in science class that fall we were all wondering when we might be able to visit the inevitable colony we would surely establish on the lunar surface. Amazing how our NASA program has evolved since that time.

This month many of our members will be participating in the numerous activities celebrating the historic moon landing. Hoping for clear clean skies to give many in the public a sense of the wonders we all tend to take a bit for granted.

Hyde is back in operations so if you would like to help out please

just let any of the club officers know. You do not need much experience to operate the telescopes or of the night sky. The deck leads are all experienced observers that help put objects into the scopes and can provide you with any quick facts that you can share. Your primary function on the deck is helping people to see into the telescope and enjoy the experience.

Our July meeting is canceled since many of you will be at the Nebraska Star Party near Valentine. The past few years we have experienced a lot of high smoke from western fires blocking some of the spectacular views we have historically seen at NSP. Let's hope for some timely rains out west to help cut down on the fires and smoke. It has been October since I have had a good night of viewing through an eyepiece and I think I share everyone's hope that we

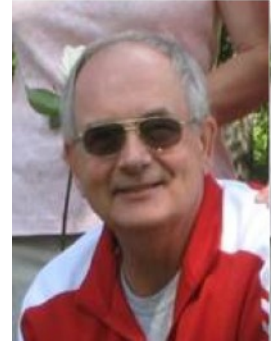
finally will get some viewing in this year.

There is still time to register and plan to attend the Nebraska

Star Party. NSP typically has over 250 observers from more than a dozen states with telescopes ranging from 2" all the way to 24" or larger. If you never experienced viewing through a larger telescope in pristine dark skies NSP is the best chance anywhere in the Midwest. It is fun to just walk around the hills at NSP and observe what people are seeing.

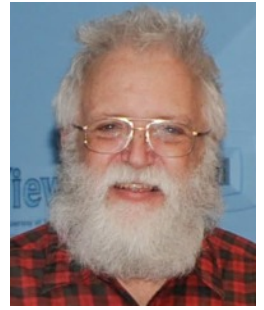
Dark Clear Skies to you.

Bob Kacvinsky



The family of Rick Johnson wish to invite Rick's friends to an informal celebration of his life, to be held at Hyde Memorial Observatory on July 26, 2019 from 9 am to 11 am.

Rick Johnson, a founding member of the Prairie Astronomy Club, passed away in January, 2019. His legacy lives on through his comprehensive catalog of over 1600 images at www.mantrapskies.com.



Arp 7, MCG -03-23-009, falls under Arp's category: Spiral Galaxy: Split arm. It is classed at NED as SB(rs)bc: and has a red shift distance of 265 million light-years. A Tully-Fisher measurement says 19 million light-years. Now that's a discrepancy! One of these must have been made by that famous Chinese astronomer Sum Ting Wong. The red shift measurement seems far more

reasonable to me. It is in both the 2MASX and IRAS catalogs of IR sources so is a strong IR emitting galaxy.

There's a small distorted galaxy just 1.3 minutes south and a bit east of it. There is no distance measurements of it. It is in the 2MASX catalog so is a IR strong galaxy. It's also NPM1G -16.0258. 5 minutes north west is the spiral 2MASX J08500148-1632260, yet another IR rich

galaxy. It has virtually the same red shift as Arp 7. It is likely in the same group with Arp 7. The similar red shift would support the redshift distance as being reasonable compared to the Tully-Fisher determined distance.

Most consider the blue object on the end of one arm a

companion galaxy and call it an M51 type pair. If so NED doesn't list the blue object. It appears starlike in my fuzzy image. Arp's image does show it slightly out of round compared to similar brightness stars so this could be the case.

There's little information on the rest of the field. Only 8 other galaxies in the field are listed in NED, none with magnitude or distance data. All members of the 2MASX catalog.

This Arp is below my -15 degree south limit. I tried anyway. The result is the L images are severely distorted by atmospheric refraction which, like a prism spread the colors along a line. While I could sort of compensate when stacking the color data it didn't help the resolution of the image or the star shapes. I tried some motion blur tools but in my hands they just made things worse. Some nights I can get away with going this low, not this night. The

diffraction spread pretty well wiped out the fine detail needed to see the split arm Arp refers to. It is easily seen in his image however. Arp had no comment on this object.

Arp's image:

http://ned.ipac.caltech.edu/level5/Arp/Figures/big_arp7.jpeg

The Jet Propulsion Laboratory's Apollo Connection

That "giant leap" from 50 years ago - when Neil Armstrong became the first human to step onto the surface of the Moon - is imprinted on several generations. Some savor that day as a treasured memory, while for others, it's an inspirational chapter in history books. While NASA's Jet Propulsion Laboratory in Pasadena, California, has long been associated with robotic missions rather than ones involving astronauts, the Lab helped pave the way for the historic Apollo missions that took humans to the Moon. Here are three contributions by JPL:

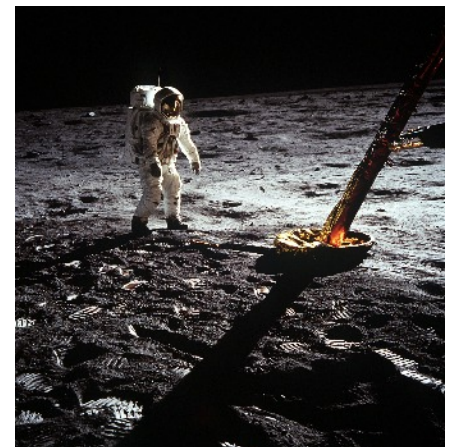
Hard Landings

JPL was tasked in the 1960s with designing and building a series of impact probes, called Rangers, designed to fly to the Moon and crash into it, and return images to Earth. The Lab's successful Mariner 2 mission to Venus was a modified

Ranger spacecraft, but when it came to the Moon, "The Rangers ran into lots of trouble, with several failed missions," said JPL Historian Erik Conway.

Seven became the lucky number for the program, when Ranger 7 collided with the Moon on July 31, 1964. (In a lighthearted moment, team members attributed the success to the fact that someone in mission control was eating peanuts. Since then, JPL teams have broken out peanuts for luck during milestone events, such as Mars landings and spacecraft orbit insertions.) The program ended in 1965, after Rangers 8 and 9 also proved successful.

One lesson learned from the Ranger missions was that the Moon has rocks, lots of them - a reality that would prove challenging for future missions to land astronauts on the surface.



A Softer Approach

Instead of building in-house, JPL developed the next generation of lunar spacecraft, the Surveyors, under a systems management contract with Hughes Aircraft.

"These were intended to land a very large, broad variety of scientific instruments," Conway said.

The wrinkle was that Surveyor development began before

the upper Centaur stage of the launch vehicle was ready, so engineers didn't know how much payload it could hoist. Because of that, Surveyor 1 carried only a TV camera - no scientific instruments. And its official mission requirements were simple by today's standards, according to Conway: "They had to survive the mid-course correction, land, and send back good engineering data." A third goal - not a requirement - was to send back television pictures.

Surveyor 1 succeeded on all three counts, landing successfully on June 2, 1966, and beaming back thousands of pictures.

Once the engineers learned the capabilities and capacity of the launch vehicle, they added instruments to subsequent landers. Five of the seven Surveyors were successful, and the missions answered a key question that would face the Apollo program: "How strong is the lunar surface? There had been some fear that the landers would merely sink into dust, and

that would be bad," Conway said. He added that while a Soviet probe had already demonstrated that the fear was probably groundless, the Surveyor series used engineering instruments that "really nailed that down."

In the lull between the Surveyors and the Apollo program, there was a plan to have a version of a Surveyor tote a lunar rover, but the Surveyor program was canceled before that rover flew. The rover hung around JPL for a long time, eventually becoming a prototype for the Mars rover program.

A Parallel Network for Space Talk

NASA'S human spaceflight program, based at what is now Johnson Space Center in Houston, originated at Langley Research Center in Virginia via an organization called the Space Task Group. It was set up before Apollo for the Mercury program.

The Mercury and Gemini programs used a ground-based

tracking and communication system called the Manned Space Flight Network and run by Goddard Space Flight Center in Maryland. It could not be adapted for use outside Earth orbit, so, Conway said, "They decided to make a clone of [JPL's] Deep Space Network," an array of giant radio antennas.

The Apollo program needed full-time communications support, and JPL had its own missions, so DSN engineers helped design and operate a "parallel network." After the Apollo program ended, the DSN inherited the equipment. Since then, the DSN has kept the legacy alive by providing communications for a very long roll call of missions - for NASA and other space agencies. Managed by JPL, the DSN will play a central role in NASA's Artemis lunar explorations and the agency's plans for astronauts to one day go beyond the Moon to Mars.

Planets

Jupiter: Shines at magnitude -2.2 with a disk 39" wide, near Antares.

Saturn: Shines at magnitude +0.3 with a disk 17.6" wide. Its rings remain tilted almost at maximum.

Neptune: In Aquarius.

Uranus: Best seen after midnight in Aries.

Mercury: At the start of August it rises more than an hour before the Sun.

Venus and Mars: Both are lost in the glare of the Sun in August.

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 6445: Planetary nebula in Sagittarius.

NGC 6522/6528: Globular clusters in Sagittarius that fit in the same FOV.

NGC 6709: Open cluster in Aquila.

NGC 6741: Planetary nebula in Aquila with a greenish-blue color.

NGC 6781: Planetary nebula in Aquila.

NGC 6818: Little Gem, planetary nebula in Sagittarius.

Double Star Program List

Struve 2404: Close pair of orange stars.

57 Aquilae: Pair of white stars.

Beta Cygni: Albireo, most observed double star.

31 Cygni: Yellow primary with a blue secondary.

61 Cygni: Two orange stars.

Epsilon Lyrae: The famous Double Double.

Zeta Lyrae: Yellow stars.

Beta Lyrae: Yellow primary with multiple white stars.



Challenge Object

NGC 6675: Small faint circular galaxy 1.25° north of Vega in Lyra.

Like the Messier Observing Program the Caldwell Program consists of various deep sky objects to observe. Sir Patrick Caldwell-Moore has put together a list of 109 beautiful and interesting objects to go out of your way to observe.

The 109 objects on the Caldwell list range from magnitude 1 through 13, and Declination +85° to -80°. To observe all 109 objects would require some travel.

The Caldwell Program has been broken into two award categories: 70 objects, and the complete list of 109 objects. The 70 object award includes the objects that can be seen from northern latitudes. The 70 object award will count towards the Master Observer Award.

Caldwell 70 Object List by Type

- Open Cluster – 14 objects
- Globular Cluster – 4 objects
- Planetary Nebula – 10 objects
- Bright Nebula – 10 objects
- Galaxy – 32 objects

A detailed list of the Caldwell objects can be downloaded from the Astronomical League website.

To qualify for the Caldwell award you must observe and record your observations. Your observations should include a detailed description of the object and a sketch if you want to include one. All the other information required by the Astronomical League must be included in your observing logs. The objects in the Caldwell list must be located manually, no GO-TO or PUSH-TO are allowed to find the objects.

When you complete the Caldwell Observing Program you will need to submit a copy of your observing logs to me for review. If your logs are accurate and complete I will submit your name to the Caldwell Observing Program chair for approval. The chair will mail to me your Caldwell certificate and pin which I will present to you at the next monthly PAC meeting.

If you have any questions regarding the Caldwell Observing Program or any other observing program, or need help getting started please contact me and I will be glad to help.

WHAT THE NUMBER OF DIGITS IN YOUR COORDINATES MEANS	
LAT/LON PRECISION	MEANING
28°N, 80°W	YOU'RE PROBABLY DOING SOMETHING SPACE-RELATED
28.5°N, 80.6°W	YOU'RE POINTING OUT A SPECIFIC CITY
28.52°N, 80.68°W	YOU'RE POINTING OUT A NEIGHBORHOOD
28.523°N, 80.683°W	YOU'RE POINTING OUT A SPECIFIC SUBURBAN CUL-DE-SAC
28.5234°N, 80.6830°W	YOU'RE POINTING TO A PARTICULAR CORNER OF A HOUSE
28.52345°N, 80.68309°W	YOU'RE POINTING TO A SPECIFIC PERSON IN A ROOM, BUT SINCE YOU DIDN'T INCLUDE DATUM INFORMATION, WE CAN'T TELL WHO
28.5234571°N, 80.6830941°W	YOU'RE POINTING TO WALDO ON A PAGE
28.523457182°N, 80.683094159°W	"HEY, CHECK OUT THIS SPECIFIC SAND GRAIN!"
28.523457182818284°N, 80.683094159265358°W	EITHER YOU'RE HANDING OUT RAW FLOATING POINT VARIABLES, OR YOU'VE BUILT A DATABASE TO TRACK INDIVIDUAL ATOMS. IN EITHER CASE, PLEASE STOP.

xkcd.com

In June my wife Andrea and I took a vacation to Hawaii. We spent the first four days on Oahu and the last four days on Hawaii, the Big Island. While on the Big Island we took a tour to the top of Mauna Kea to view the sunset. It was a long slow drive up the mountain to the peak. During the drive up our tour guide Justin pointed out some interesting facts about Mauna Kea.

Mauna Kea is the tallest mountain on Earth. Though only 13,796 feet are above sea level the majority of the mountain is below the water. If you count from the ocean floor to the peak it is over 33,000 feet. NASA has used the terrain on Mauna Kea to simulate the surface of the Moon and Mars for training. The Mars rovers were tested on the terrain of Mauna Kea before they were sent to Mars. One episode of Star Trek was shot

on the rocky terrain of Mauna Kea.

On the way to the peak the tour guide Justin stopped several times to allow us to see the telescopes. Currently there are thirteen different telescopes on the top of Mauna Kea from different nations. The types of telescope vary from radio telescopes to x-ray telescopes. Once the Sun started to set the colors became breathtaking. Sunset at 13,796 feet above the clouds is incredible. On the peak we were given heavy parkas to wear and mittens. The temperature was 24 degrees with a strong wind. The view was truly amazing. When the Sun set we got back in the tour van and started down. At 12,000 feet we stopped and Justin set up an 11" Celestron telescope and we were able to observe for one hour. At 12,000 feet the stars are so big and



bright. The Milky Way was so bright it seemed you could reach out and grab it. Our tour guide Justin was only 24 years old and had just got started in astronomy. He was very enthusiastic and excited about the night sky. He first put in Jupiter for all of us to see. There were twelve of us in our tour group and we all took our turn looking through the telescope. After Jupiter he put in Omega Centauri. WOW! It was what I had expected and did not disappoint. Justin then said he was going to put in M101. Justin had to move the telescope manually to the object. From where he was pointing the scope I know he meant M51, the Whirlpool Galaxy. I asked him if he meant M51 and he said yes and apologized saying he was just learning the Messier objects. He was having trouble finding M51 and he asked me if I could help find it. I went to the scope and



pointed the telrad to where it should be and it was in the eyepiece. M51 from 12,000 feet looks pretty amazing, the spiral arms really stood out. After everyone had their turn to look it was time to start packing up and head back down the mountain. Before he packed up the

telescope I showed Justin where to find the Ring Nebula and we put that in. He had mentioned the Ring Nebula but never seen it in a telescope. He thanked me for showing him where to find it and he would show that for sure on his future tours.

The tour from start to end was just over six hours, but very much worth it. If you take a trip to Hawaii I would highly recommend taking the tour. If you do make sure to book it well ahead of time because it fills up fast.





This stunning compilation image of Jupiter's stormy northern hemisphere was captured by NASA's Juno spacecraft as it performed a close pass of the gas giant planet. Some bright-white clouds can be seen popping up to high altitudes on the right side of Jupiter's disk. (The Juno team frequently refers to clouds like these as "pop-up" clouds in image captions.)

Juno took the four images used to produce this color-enhanced view on May 29, 2019, between 12:52 a.m. PDT (3:52 a.m. EDT) and 1:03 a.m. PDT (4:03 a.m. EDT), as the spacecraft performed its 20th science pass of Jupiter. At the time the images were taken, the spacecraft was between 11,600 miles (18,600 kilometers) and 5,400 miles (8,600 kilometers) above Jupiter's cloud tops, above a northern latitude spanning from about 59 to 34 degrees.

Citizen scientist Kevin M. Gill created this image using data from the spacecraft's JunoCam imager.

JunoCam's raw images are available for the public to peruse and process into image products at <https://missionjuno.swri.edu/junocam/processing>.



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.org to find local clubs, events, and more!

Is the summer heat getting to you? Cool off overnight while spotting one of the solar system's ice giants: **Neptune!** It's the perfect way to commemorate the 30th anniversary of Voyager 2's flyby.

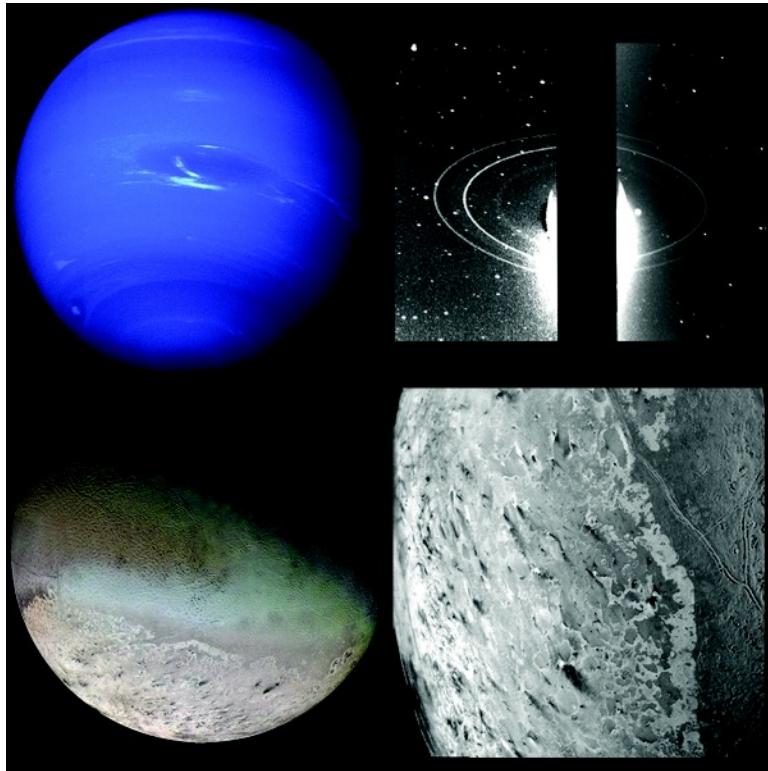
Neptune is too dim to see with your unaided eye so you'll need a telescope to find it. Neptune is at opposition in September, but its brightness and apparent size won't change dramatically as it's so distant; the planet is usually just under 8th magnitude and 4.5 billion kilometers away. You can see Neptune with binoculars but a telescope is recommended if you want to discern its disc; the distant world reveals a very small but discernible disc at high magnification. Neptune currently appears in Aquarius, a constellation lacking in bright stars, which adds difficulty to pinpointing its exact location. Fortunately, the Moon travels past Neptune the night of August 16th, passing less than six degrees apart (or about 12 Moon widths) at their closest. If the Moon's glare overwhelms Neptune's dim light, you can still use its location that evening to mark the general area to

search on a darker night. Another Neptune-spotting tip: Draw an imaginary line from bright southern star Fomalhaut up to the Great Square of Pegasus, then mark a point roughly in the middle and search there, in the eastern edge of Aquarius. If you spot a blue-ish star, swap your telescope's eyepiece to zoom in as much as possible. Is the suspect blue "star" now a tiny disc, while the surrounding stars remain points of white light? You've found Neptune!

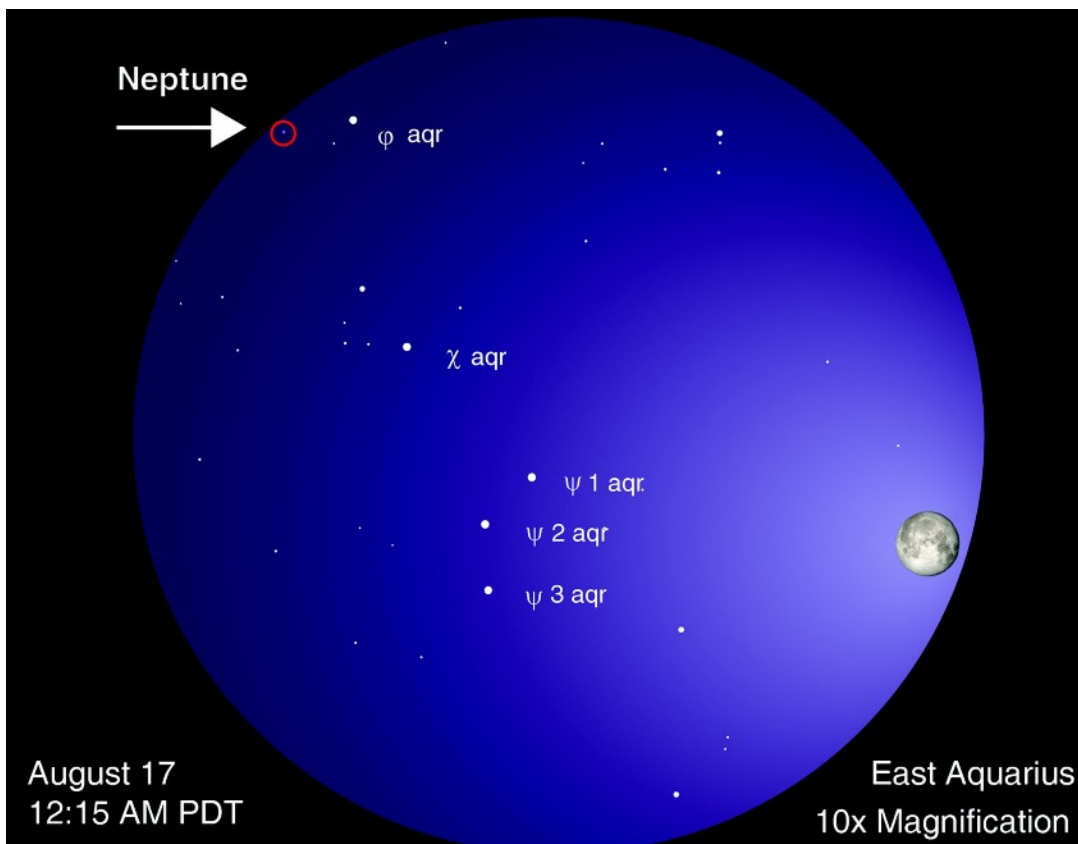
Neptune and Uranus are ice giant planets. These worlds are larger than terrestrial worlds like Earth but smaller than gas giants like Jupiter. Neptune's atmosphere contains hydrogen and helium like a gas giant, but also methane, which gives it a striking blue color. The "ice" in "ice giant" refers to the mix of ammonia, methane, and water that makes up most of Neptune's mass, located in the planet's large, dense, hot mantle. This mantle surrounds an Earth-size rocky core. Neptune possesses a faint ring system and 13 confirmed moons. NASA's Voyager 2 mission made a very

close flyby on August 25, 1989. It revealed a dynamic, stormy world streaked by the fastest winds in the solar system, their ferocity fueled by the planet's surprisingly strong internal heating. Triton, Neptune's largest moon, was discovered to be geologically active, with cryovolcanoes erupting nitrogen gas and dust dotting its surface, and a mottled "cantaloupe" terrain made up of hard water ice. Triton is similar to Pluto in size and composition, and orbits Neptune in the opposite direction of the planet's rotation, unlike every other large moon in the solar system. These clues lead scientists to conclude that this unusual moon is likely a captured Kuiper Belt object.

Discover more about Voyager 2, along with all of NASA's past, present, and future missions, at nasa.gov



Clockwise from top left: Neptune and the Great Dark Spot traced by white clouds; Neptune's rings; Triton and its famed icy cantaloupe surface; close up Triton's surface, with dark streaks indicating possible cryovolcano activity. Find more images and science from Voyager 2's flyby at bit.ly/NeptuneVoyager2 Image Credit: NASA/JPL



Finder chart for Neptune. This is a simulated view through 10x50 binoculars (10x magnification). Please note that the sizes of stars in this chart indicate their brightness, not their actual size. Moon image courtesy NASA Scientific Visualization Studio; chart created with assistance from Stellarium.

Astrophotography

This stunning photo of the Milky Way was taken by Valentine resident Chris Mosner. It was taken with a Nikon z6, Sigma 35mm lens at f/2, exposure 13 seconds, ISO 3200 and is a 12 exposure panorama. Chris said he parked in a lot south of Valentine, biked across the bridge and hiked down the embankment. Chris added, "While in the midst of trying to pan accurately through 12 exposures, I heard a tremendous splash and all this wild watery kerplunking behind me. I tried to sound menacing with a few HEY NOWs, but had to wait for the final exposure to finally turn on my headlamp to find Mr. Beaver clapping his tail on the water."





The Prairie Astronomer

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PICNIC & STAR PARTY

As tradition has it August is the month of our Prairie Astronomy Club Annual Star Party and Picnic (whew, what a mouthful). The date this year as was stated in last month's newsletter is Saturday nite August 6th. The site is Wagon Train Lake near Hickman Ne. Maps were included in last month's mailing. If the directions are unclear give me a call. I'll see if I can confuse you more. Our area clubs are more than welcome also, the Omaha club as well as the St. Joe area astronomers and the Kansas city club. We always enjoy to see new faces at this gathering. We all bring food (those that want to eat) and generally we eat between 6:00pm and 6:30pm. Then we exchange gossip, tall tales, good books, movies, etc until darkness approaches or sometimes dark rain clouds. Then we set up our telescopes and get ready for a nite of viewing. Don't worry if you do not have a telescope, you can always find one of us who will let you on.

The 6th this year should also provide more than normal viewing. It is within 6 days of peak of the Perseid Meteor shower. Even a week before should provide some good watching so bring a blanket or lawn chair and get ready.

Getting to Wagon Train is not as much of a problem as finding the site once you're in. The best way is to enter on the East side of the park and

we are generally located on the east side of the lake in a large picnic area.

Oh, be sure and bring bug spray too. You will also need a one day park permit. Earl Moser of our club who lives near Hickman says Ace Hardware is open until 6:00pm that Saturday nite and you can pick one up there. The bait shop as previously stated will not be open in August so don't plan on picking up one there. Most sporting goods outlets in Lincoln will carry them also.

So to sum it up bring your food, bug spray, telescope, tall tales, wife spouse, live in, live out, guests all out to Wagon Train August 6th. Hope to see all you there.

Russ Genzmer
President

*** NEWSWORTHY NOTES ***

AUGUST PROGRAM

Will be provided by Professor Carrol Moore. He has returned from his latest trip following the solar eclipse and if this is anything like his past programs it will be entertaining as well as informative. His shots of the eclipse have got to be more credible than Veys shots of the Lunar eclipse via his special filter glasses. But then rumor has it that Professor Moore was

26th Nebraska Star Party - July 28-August 2



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.

NSP Schedule of Events

Sunday: registration and check-in, optional dinner.

Monday: registration and check-in, field school, optional dinner.

Tuesday: registration and check-in, swap meet, field school, free "Cattle Country" hamburger dinner.

Wednesday: (All at Valentine High School) field school, registration, swap meet, speaker program, children's program, dinner on your own.

Thursday: Brewer's Niobrara Canoe or tube float, optional dinner.

Friday: public star party at 9pm.

For more information see the [NSP website](#).

Register online or at NSP!

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

CLUB APPAREL



Order club apparel from cafepress.com:



Shop through Amazon Smile to automatically donate to PAC:



CLUB OFFICERS

President	Bob Kacvinsky kacvinskyb@yahoo.com
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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.