

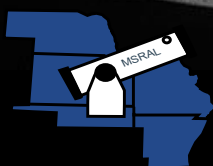
The Prairie Astronomer

June 2021 Volume 62, Issue #6

**June Meeting: Solar Viewing at
Hyde Observatory, 6:00pm**



Ganymede



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer



NEXT MEETING AND PROGRAM

June 29, 6:00pm: Solar Viewing Party

Annual Solar Viewing Party at Hyde Observatory. There will not be a business meeting.

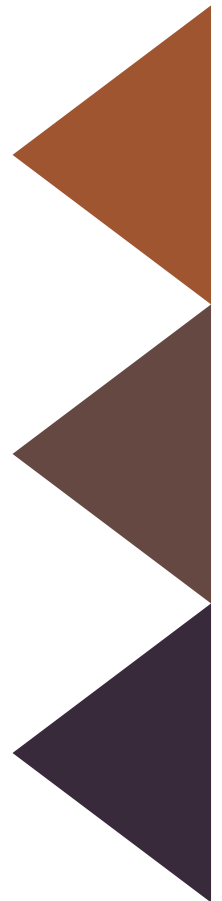
FUTURE PROGRAMS

To be announced

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Cover: This image of the Jovian moon Ganymede was obtained by the JunoCam imager aboard NASA's Juno spacecraft during its June 7, 2021, flyby of the icy moon. At the time of closest approach, Juno was within 645 miles (1,038 kilometers) of its surface – closer to Jupiter's largest moon than any other spacecraft has come in more than two decades.



CALENDAR

PAC Meeting
Tuesday, June 29, 2021, 6:00pm
Solar Viewing Party, Hyde Observatory

PAC Meeting
Tuesday, July 27, 2021, 7:30pm

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

PAC Meeting
August 31, 2021, 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

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Night Sky Network



www.prairieastronomyclub.org

The President's Message

Bob Kacvinsky

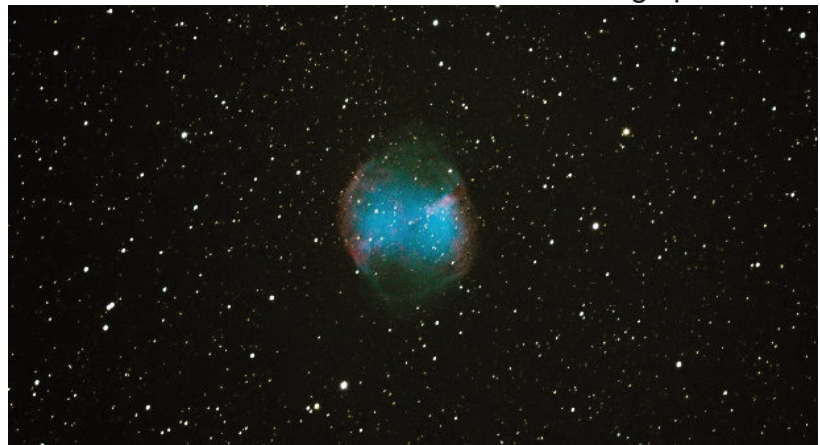


If you have been waiting for warmer weather to get your telescope out of storage, you got your wish.

Unfortunately, with the warm conditions also bring in the buzzing critters that seem to find us after dark. On June 4th we experienced an initial flight of misquitos along with dive bombing June bugs, but it was short-lived - as the skies darkened the bugs went away for the night. It ended up being an excellent night for observing. Members included Jim Kvasnicka, James Quach, Jim White, Mike Kearns, Mike Engel, Bob Kacvinsky, and John Lammers visited for viewing during the night.

The DSC showed average transparency and seeing, but conditions were much better until closer to 2 am, and by 2:30 we were tearing down. The Milky Way was bright and demonstrated significant details along the central and southern ribbon. The skies rivaled

some of the best nights we have had at The Farm. I hope members - especially newer members who have not attended - will consider participating in future club Star Parties. Our club observing site can provide a great location to pull in some fantastic views of deep sky objects. Photo 1: Dumbbell Nebula by Jim White. Photo 2 6/12 Star Party by James Quach.



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. Early bird discounts run during the month June 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.

June marks the reopening of the Hyde Observatory.

June 19th and 26th will be test runs with the deck open and then starting July 10th Saturday night viewing at Hyde will resume a more normal observing program with both the deck and classroom programs available. 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

over 25 members and families attend the August Lunar party. The Solar party this year will be back on the front lawn of Hyde Observatory. If you have a telescope set up for Solar Observing, please plan to attend and set up. Set up is planned for 6 PM and observing will run till the sun gets too low to observe (~8 pm). We will not have any formal PAC business meeting in June in order to allow everyone to enjoy the Solar Observing and stay with their equipment for any public that might attend.

for your input, ideas, suggestions, etc. 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



experiences so please come in and give it a try.

Our June 29th program will be our annual Solar Observing program hosted by Dave Churilla and other members of PAC. Last year we had

The PAC Board established a committee made up of past PAC presidents and asked them to gather input from each of you on ways to improve our club. They are presently planning to send out a survey asking



Rick Johnson

ARP 31

Arp 31/IC 167 made Arp's list under the category for spiral galaxies resembling the integral sign. It is the first of 6 in this category. UGC 3697 is usually referred to as the integral sign galaxy but isn't one of the 6 Arp put in his integral sign category.

To me, Arp 31 is just a wide two arm galaxy showing a short bar. It is located in western Aries about 120 million light-years from us by redshift. It was discovered on January 4, 1889 by Guillaume Bigourdan. It is classified as SAB(s)c.

The other major galaxy in the image is below Arp 31 and to the right. It is NGC 691, an SA(rs)bc galaxy. It is about 110 million light-years distant by redshift and 120 million light years by Tully-Fisher measurements so may be related to Arp 31. It was discovered by William Herschel on November 13, 1786 by William Herschel

but isn't in either of the Herschel 400 programs.

Lesser galaxies are IC 1730 to the far upper right. It is listed as a, S0?? galaxy at 120 million light-years so again possibly related to the others. It was first seen by Stephane Javelle on January 17, 1896.

At the top center above Arp 31 is NGC 694 an S0? Pec starburst galaxy. It too, is 120 million light-years distant. It was discovered by Heinrich d'Arrest on December 2, 1861.



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.



Hyde Observatory Reopening

Hyde Observatory's volunteers got together on Thursday June 17 for a review and training session prior to Hyde's reopening on Saturday the 19th.

They got a preview of the new audio/video system with native 4K projector, PA speakers in the classroom, vestibule and on the deck, and the new Unistellar eVscope.

The eVscope is currently being evaluated to determine best operating procedures, since it isn't on a permanent pier and operates on rechargeable batteries.

Hyde will go back to full operation with classroom and programs starting on July 10th.



Preview of the 4K projector.



Ethan Van Winkle demonstrates the eVscope and phone app.



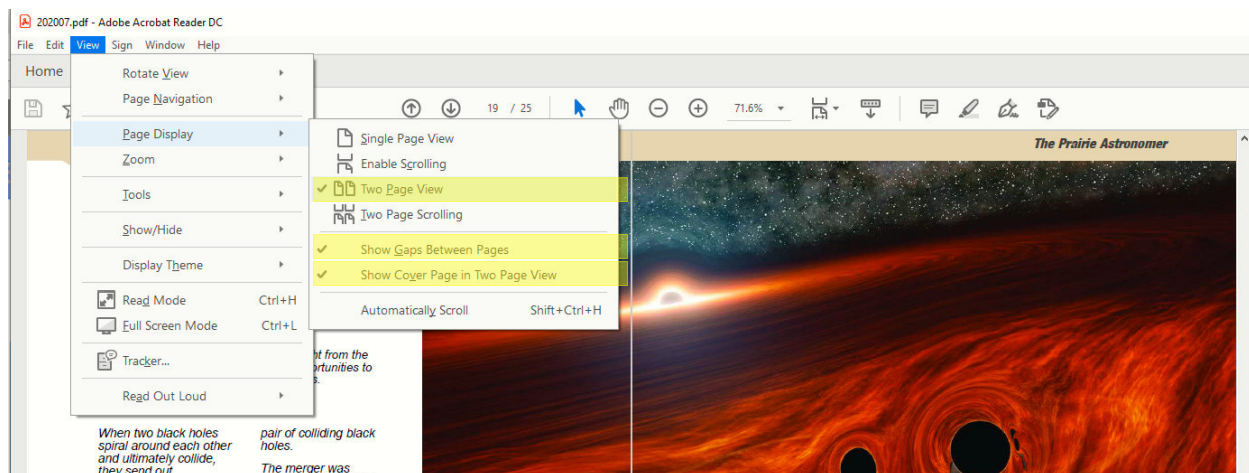
Sample image from the eVscope app.



Opening night, June 19. In spite of overcast skies there were several dozen people waiting for the observatory to open. Fortunately the Moon was visible most of the time.

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.

Meeting Minutes

Bill Lohrberg

PAC meeting minutes
May 25, 2021 as recorded
by Bill Lohrberg

Club President Bob Kacvinsky hosted the Zoom meeting which began at 7:34pm with 21 attendees.

Bob welcomed all to the club meeting and introduced Jenna Bartja, presenting the program on the proposed Dark Sky designation for Merritt Reservoir in Nebraska.

Jim Kvasnicka gave the May 2021 observing report, announced Star parties scheduled for June 4, and June 11, as well as possibility of another Lunar observing party slated for June 18 at his house. Last Lunar party had 10 people show up so this is something we plan to continue as long as turnout is good.

Bob continued with other club events and activities coming up including a lunar eclipse May 26, Hyde observatory continues to be on hold

but hopefully not much longer.

For the June PAC meeting we will be doing solar observing out on the lawn at Hyde – No formal meeting inside.

The July meeting will be mostly about prepping for NSP, more to come on that as we get closer.

And the August meeting will be a recap of NSP and sharing of photos etc.

Bob reminded everyone to register for NSP 2021 if you're planning on going, which is August 1 through 6, you can sign up at Nebraskastarparty.org

Other club business: Astronomical League Convention (ALCON) August 19-21 holding a virtual meeting, \$5 registration. If you want to attend, you can register online (even up to the last day). In the April meeting there was a discussion whether or not the club would like to donate for door prizes, however

nothing was concluded at this time, stay tuned for more information and updates regarding this.

Club Treasurer John Reinert reported the Astronomical League dues are being submitted in June, please continue to update your club membership dues and contact information especially if you have any changes from last renewal.

At approximately 7:50pm the meeting was adjourned to the program – Jenna Bartja's presentation "Preserving our dark skies". Note that the presentation was recorded and can also be found [here](#):

<https://visitnebraska.com/sites/default/files/2019-10/Star%20Grazing%20PP%20Presentation.pdf>

PAC Newsletter Archive

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

July Observing

Jim Kvasnicka



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

Planets

Venus: Low in the WNW at dusk at magnitude -3.9.

Mars: On July 11 Mars is just 1° to the left of bright Venus.

Saturn: Rises by 10:30 pm in Capricornus at magnitude +0.3.

Jupiter: Rises by 11:30 pm in Aquarius at magnitude -2.5.

Mercury: Increases in brightness to -0.3 by July 9 in the morning before sunrise.

Neptune and Uranus: Low in the morning but difficult to see.

Messier List

M3: Class VI globular cluster in Canes Venatici.

M4: Class IX globular cluster in Scorpius.

M5: Class V globular cluster in Serpens Caput.

M53: Class V globular cluster in Coma Berenices.

M68: Class X globular cluster in Hydra.

M80: Class II globular cluster in Scorpius.

M83: Galaxy in Hydra.

Last Month: M58, M59, M60, M84, M86, M87, M88, M89, M90, M91, M98, M99, M100

Next Month: M6, M7, M8, M9, M10, M12, M19, M20, M21, M23, M62, M107

NGC and other Deep Sky Objects

NGC 6210: Blue colored planetary

nebula in Hercules.

NGC 6229: Class IV globular cluster in Hercules.

NGC 6302: The Bug Nebula in Scorpius.

NGC 6309: Planetary nebula in Ophiuchus.

NGC 6369: The Little Ghost Nebula in Ophiuchus.

NGC 6543: The Cat's Eye Nebula in Draco.

IC 4703: The Eagle Nebula in Serpens, M16 is the open cluster embedded in the nebula.

Double Star Program List

Nu Draconis: Equal pair of white stars.

Psi Draconis: Pair of light yellow stars.

40/41 Draconis: Equal pair of light yellow stars.

Xi Scorpii: Yellow primary with a light blue secondary.

Struve 1999: Two yellow-orange stars.

Beta Scorpii: Bluish white primary with a light blue secondary.

Nu Scorpii: Yellow and light blue pair.

Delta Serpentis: Light yellow stars.

Theta Serpentis: Two blue-white stars.

Challenge Object

NGC 6207: Galaxy 28' NNE of M13 in Hercules.

Thor's Hammer "Mjolnir" on the Moon

Dave Knisely

While perusing the fabulous Lunar Reconnaissance Orbiter's "QuickMap" feature, I noticed an odd geologic feature in Mare Imbrium which looks wonderfully close to the Marvel Comics version of the Norse superhero Thor's famous hammer known as "Mjolnir" (spelling and punctuation differ depending on the source). The object is located in the northeastern part of the Mare Imbrium impact basin not far from the large impact craters Cassini and Aristillus.

For those keeping track on maps with grids, Thor's Hammer is located at Latitude 38.17 degrees north and 1.81 degrees west lunar longitude. The feature is visible even in rather modest aperture telescopes at moderate to high power, as it is fairly decently sized. It spans

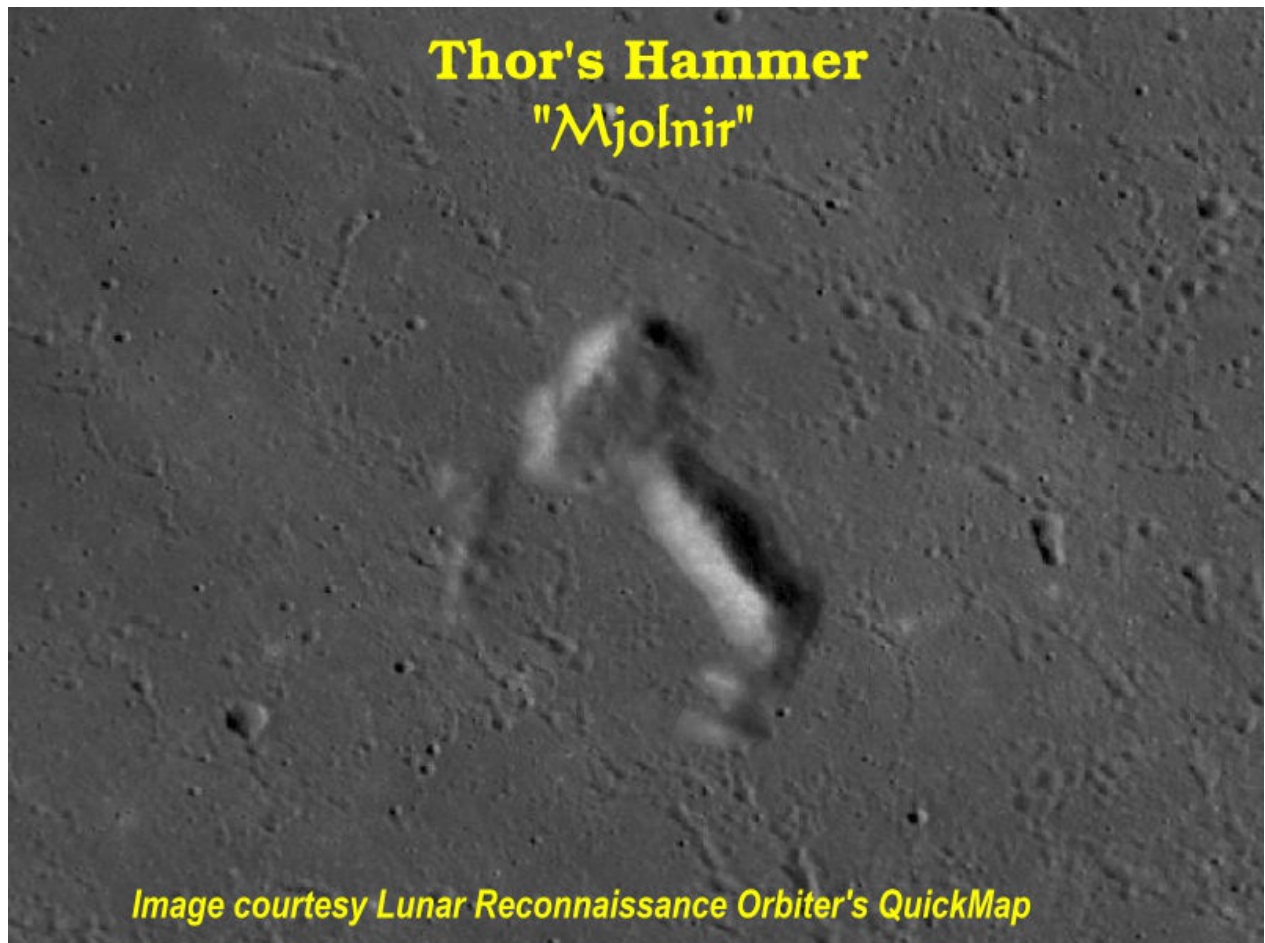
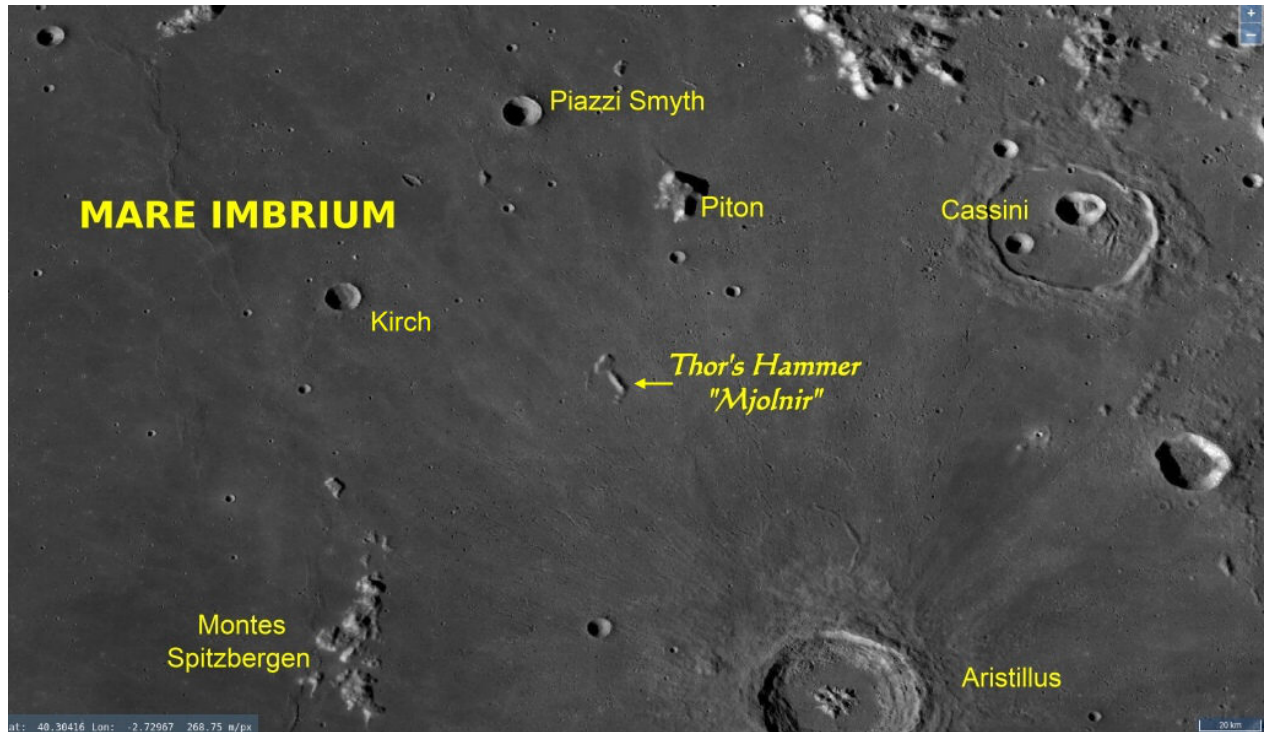
approximately 17 km (10.6 miles) with its "handle" being about 11 km (6.8 miles) long and 3.2 km (2 miles) wide.

The "hammer's" head is 9 km x 5 km (5.6 mi x 3.1 miles) and is slightly distorted, as if it were tilted a bit. The height of the feature varies quite a bit (250 meters to 500 meters depending on what highpoint you might be standing on), but its highest point is about 600 meters (1,970 ft) above the surrounding terrain at a location near the southern end of the handle.

There is even a very low double mound-like feature near its southern end that could be considered to be the "strap" that Thor used to swing Mjolnir around as he does in the various Marvel movies!

The feature is very probably a section of the jumbled multi-ring structure of the Imbrium impact basin that is just barely sticking up above the deep extensive lava flows that completely flooded most the basin not long after it was formed.

The feature is visible almost any time between first quarter and last quarter, although it is harder to see at high sun and is best seen when the sun angle is low, as happens near first and last quarter. So, next time the first quarter moon rolls around, take a look for Thor's Hammer!



Observe the Milky Way and Great Rift

David Prosper

Summer skies bring glorious views of our own Milky Way galaxy to observers blessed with dark skies. For many city dwellers, their first sight of the Milky Way comes during trips to rural areas - so if you are traveling away from city lights, do

yourself a favor and look up!

To observe the Milky Way, you need clear, dark skies, and enough time to adapt your eyes to the dark. Photos of the Milky Way are breathtaking, but they usually show far

more detail and color than the human eye can see – that’s the beauty and quietly deceptive nature of long exposure photography. For Northern Hemisphere observers, the most prominent portion of the Milky Way rises in the southeast as



The Great Rift is shown in more detail in this photo of a portion of the Milky Way along with the bright stars of the Summer Triangle. You can see why it is also called the “Dark Rift.” Credit: NASA / A.Fujii



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!

marked by the constellations Scorpius and Sagittarius. Take note that, even in dark skies, the Milky Way isn't easily visible until it rises a bit above the horizon and the thick, turbulent air which obscures the view. The Milky Way is huge, but is also rather faint, and our eyes need time to truly adjust to the dark and see it in any detail. Try not to check your phone while you wait, as its light will reset your night vision. It's best to attempt to view the Milky Way when the Moon is at a new or crescent phase; you don't want the Moon's brilliant light washing out any potential views, especially since a full Moon is up all night.

Keeping your eyes dark adapted is especially important if you want to not only see the haze of the Milky Way, but also the dark lane cutting into that haze, stretching from the Summer Triangle to Sagittarius. This dark detail is known as the Great Rift, and is seen more readily in very dark skies, especially dark, dry skies found in high desert regions. What exactly is

the Great Rift? You are looking at massive clouds of galactic dust lying between Earth and the interior of the Milky Way. Other "dark nebulae" of cosmic clouds pepper the Milky Way, including the famed Coalsack, found in the Southern Hemisphere constellation of Crux. Many cultures celebrate these dark clouds in their traditional stories along with the constellations and Milky Way.

Where exactly is our solar system within the Milky Way? Is there a way to get a sense of scale? The "Our Place in Our Galaxy" activity can help you do just that, with only birdseed, a coin, and your imagination: bit.ly/galaxyplace. You can also discover the amazing science NASA is doing to understand our galaxy – and our place in it - at nasa.gov.



If the Milky Way was shrunk down to the size of North America, our entire Solar System would be about 1 inch in diameter. At that scale, the North Star, Polaris - which is about 433 light years distant from us - would be 11 miles away! Find more ways to visualize these immense sizes with the Our Place in Our Galaxy activity: bit.ly/galaxyplace

Focus on Constellations

Ophiuchus

Jim Kvasnicka

Ophiuchus, the Serpent Bearer, is a large constellation covering 948 square degrees making it the eleventh largest constellation. Most of it lies just NW of the southern part of the summer Milky Way. The SE wing of the constellation extends into the Milky Way almost to the direction toward the Galactic Center. Because most of our Galaxy's globular clusters are distributed around the direction toward the Galactic Center, Ophiuchus is rich in globular clusters, which make up most of its showpiece objects. The constellation Ophiuchus is best seen in July.

Showpiece Objects

Globular Clusters: M9, M10, M12, M14, M19, M62, M107

Planetary Nebulae: NGC 6309, NGC 6369 (Little Ghost Nebula), NGC 6572

Open Clusters: NGC 6633

Dark Nebulae: B57, B60, B61, B62, B63, B64,

B59/65-7/78 (Pipe Nebula), B72 (Snake Nebula)

Multiple Stars: Rho Ophiuchi, Lambda Ophiuchi, 24 Ophiuchi, 36 Ophiuchi, Omicron Ophiuchi

Mythology

Ophiuchus represented the god of medicine Aesculapius, son of Apollo. Aesculapius/Ophiuchus was taught the art of healing by Chiron, the Centaur in the constellation Centaurus. According to one story, when Aesculapius once killed a snake another came along with a medicinal herb in its mouth that revived the first snake. Aesculapius took some of the herb and gained the power to restore life. Hence the symbol of Aesculapius and medicine in general, is the staff of two intertwined serpents. Aesculapius was so successful that the kingdom of Pluto, god of the Nether World, was threatened. Pluto appealed to Zeus, who killed Aesculapius with a thunderbolt. Apollo

interceded on his dead son's behalf with Zeus, who relented and immortalized Aesculapius in the heavens as the constellation Ophiuchus.

Number of Objects
Magnitude 12.0 and Brighter

Galaxies: 1

Globular Clusters: 17

Open Clusters: 4

Planetary Nebulae: 8

Dark Nebulae: 19



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

From the Archives

June, 1980

President's Report:

Twenty-five lucky club members and guests attended the premier showing of the new Star wars movie, "THE EMPIRE STRIKES BACK" on Tuesday evening, June 17. That's the number of ticket Lee Thomas managed to get to pass out free to members who attended our club's May meeting.

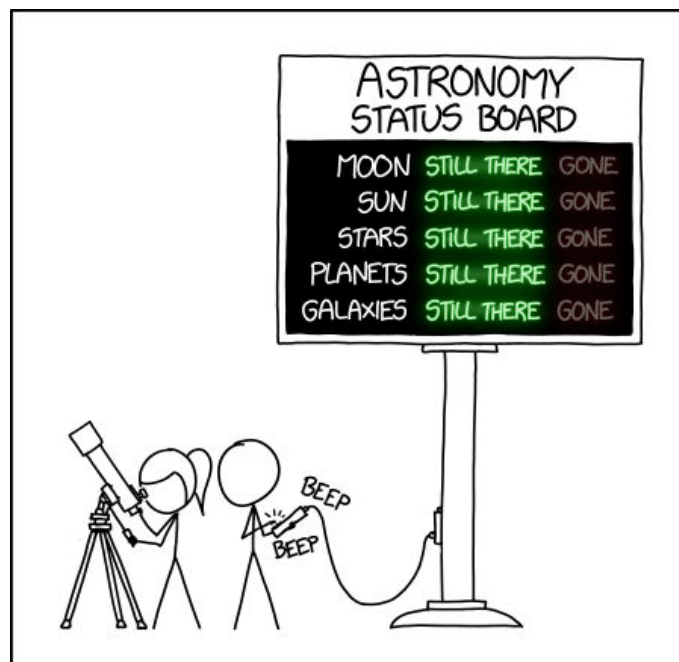
Unfortunately, we had over 40 requests for tickets at the meeting. I must admit, a few of the faces at that meeting were unfamiliar to me - I wish we could get that kind of attendance at all of our meetings. We do occasionally give away unannounced door prizes to members at the meetings (note: we are announcing one this month) as an incentive to attend if the information, conversation, programs and friendship at the meetings aren't enough for you.

At any rate, I hope the members who did not get movie tickets were not too disappointed. There just were not enough to go around. (Of course, those many members who called me trying to get tickets were completely out of

luck, since those who attended the meeting had priority). Lee distributed the available tickets by random drawing to those members who requested them this time, but in the future we may consider giving preference to the who are most active in the club—sort of a "merit system." I feel that those who give their time and energy to the club's activities (working at the observatory, astronomy day, Lincolnfest, coming to meetings, serving as officers or activities chairmen, participating in programs, etc.) deserve to receive some special benefits back from the club.

I cannot sign off without giving a special word of thanks to Lee Thomas, KLMS Radio and the Stuart Theater for making the tickets available to our club. It's people like Lee and special events like the movie that make our club the enjoyable and unique organization that it is. —Ron Veys

P.S.: If you've seen "Star Wars", you won't want to miss this month's program...
"HARDWARE WARS!!"



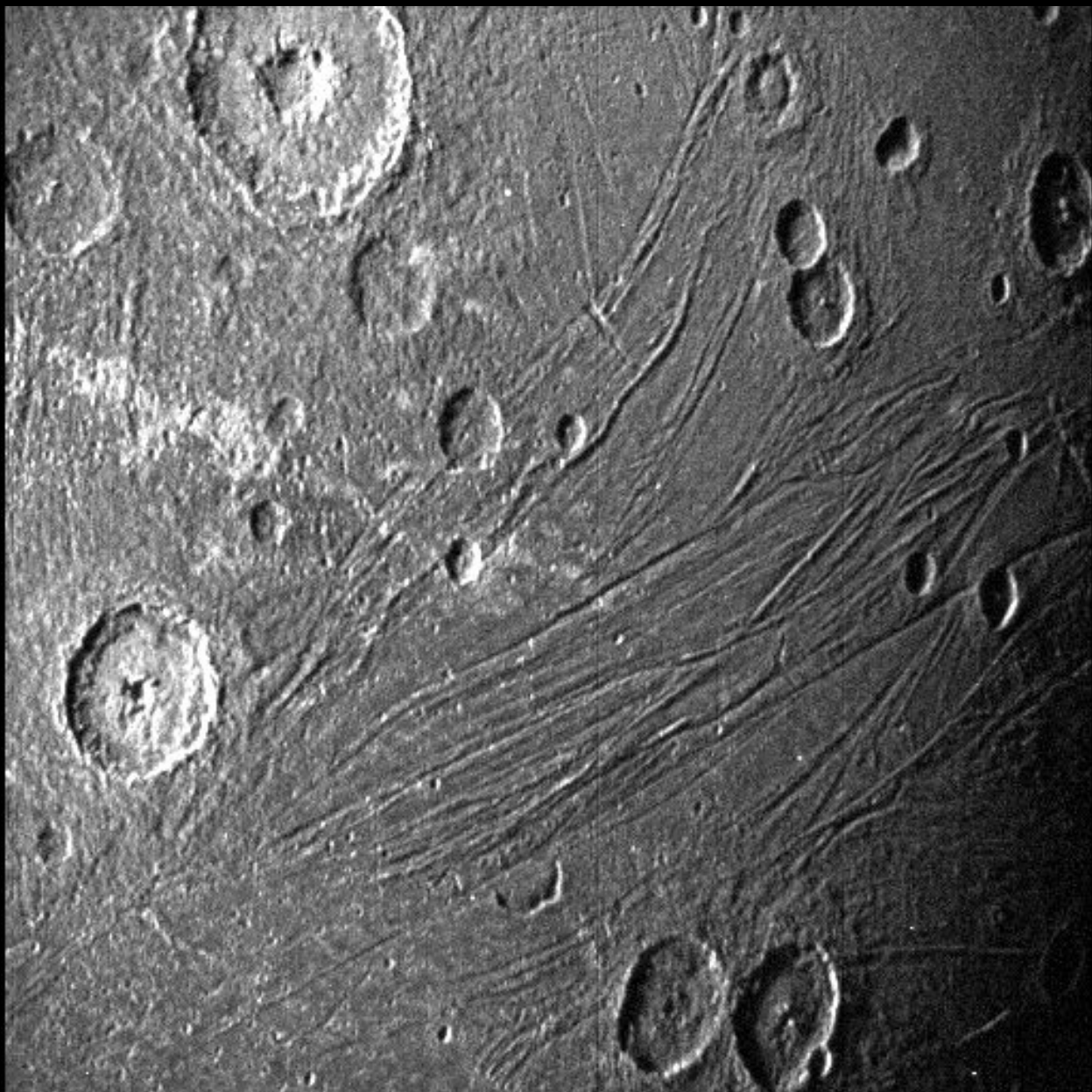
xkcd.com

See the First Images NASA's Juno Took as it Sailed by Ganymede

The first two images from NASA Juno's June 7, 2021, flyby of Jupiter's giant moon Ganymede have been received on Earth. The photos – one

from the Jupiter orbiter's JunoCam imager and the other from its Stellar Reference Unit star camera – show the surface in remarkable

detail, including craters, clearly distinct dark and bright terrain, and long structural features possibly linked to tectonic faults.



The spacecraft flew closer to Jupiter's largest moon than any other in more than two decades, offering dramatic glimpses of the icy orb.

"This is the closest any spacecraft has come to this mammoth moon in a generation," said Juno Principal Investigator Scott Bolton of the Southwest Research Institute in San Antonio. "We are going to take our time before we draw any scientific conclusions, but until then we can simply marvel at this celestial wonder."

Using its green filter, the spacecraft's JunoCam visible-light imager captured almost an entire side of the water-ice-encrusted moon. Later, when versions of the same image come down incorporating the camera's red and blue filters, imaging experts will be able to provide a color portrait of Ganymede. Image resolution is about 0.6 miles (1 kilometer) per pixel.

In addition, Juno's Stellar Reference Unit, a navigation camera that keeps the spacecraft on course, provided a black-

and-white picture of Ganymede's dark side (the side opposite the Sun) bathed in dim light scattered off Jupiter. Image resolution is between 0.37 to 0.56 miles (600 to 900 meters) per pixel.

"The conditions in which we collected the dark side image of Ganymede were ideal for a low-light camera like our Stellar Reference Unit," said Heidi Becker, Juno's radiation monitoring lead at JPL. "So this is a different part of the surface than seen by JunoCam in direct sunlight. It will be fun to see what the two teams can piece together."

The spacecraft will send more images from its Ganymede flyby in the coming days, with JunoCam's raw images being made available here.

The solar-powered spacecraft's encounter with the Jovian moon is expected to yield insights into its composition,

ionosphere, magnetosphere, and ice shell while also providing measurements of the radiation environment that will benefit future missions to the Jovian system.

More About the Mission

JPL, a division of Caltech in Pasadena, California, manages the Juno mission for the principal investigator, Scott J. Bolton, of the Southwest Research Institute in San Antonio. Juno is part of NASA's New Frontiers Program, which is managed at NASA's Marshall Space Flight Center in Huntsville, Alabama, for the agency's Science Mission Directorate in Washington. Lockheed Martin Space in Denver built and operates the spacecraft.

This image of the dark side of Ganymede was obtained by Juno's Stellar Reference Unit navigation camera during its June 7, 2021, flyby of the moon. Credit: NASA/JPL-Caltech/SwRI

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.

