

The Prairie Astronomer

September 2021 Volume 62, Issue #9



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer



NEXT MEETING AND PROGRAM

September 28, 7:30pm via Zoom

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

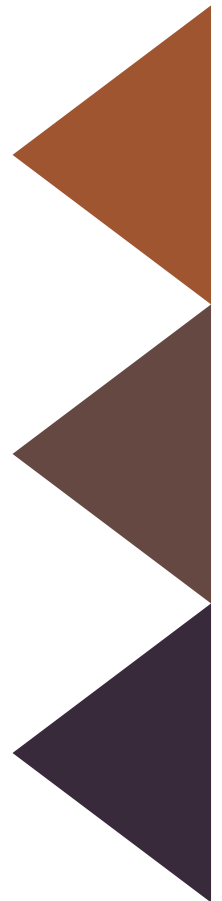
FUTURE PROGRAMS

To be announced

CONTENTS

3	Meeting Minutes	13	Ganymede
5	President's Message	16	Telescope Pier V4
7	Mantrap Skies ARP34	21	Club Offices and Duties
10	October Observing	23	Observe the Moon
11	Focus on Aquarius	26	Club Information
12	From the Archives		

Cover: This image from the NASA/ESA Hubble Space Telescope features AFGL 5180, a beautiful stellar nursery located in the constellation of Gemini (the Twins). Image Credit: ESA/Hubble & NASA, J. C. Tan (Chalmers University & University of Virginia), R. Fedriani (Chalmers University); Acknowledgment: Judy Schmidt



CALENDAR

PAC Meeting
September 28, 7:30pm via Zoom

PAC Meeting
October 26, 7:30pm

PAC Meeting
November 30, 7:30pm

PAC Meeting
December 28, 7:30pm

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
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Outreach Coordinator	Mike Kearns mkearns@neb.rr.com
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Night Sky Network



www.prairieastronomyclub.org

Meeting Minutes

Bill Lohrberg

PAC meeting minutes August 31, 2021 as recorded by Bill Lohrberg

We returned to Zoom meetings this month due to a resurgence of the Covid-19 risk dial in Lincoln/Lancaster county. The meeting was hosted by President Bob Kacvinsky and called to order at 7:38 pm, 13 participants.

Jim Kvasnicka presented the observing report for September and announced upcoming club start parties including potentially another October 15 Lunar party.

Christine Parkyn was awarded for completing the Beyond Polaris observing program. Jim noted that Christine is the first PAC member to have completed this program and it is her first observing award. Congratulations to Christine!

For current events in the news Bob Kacvinsky shared a slide of the Mars Perseverance Ingenuity helicopter aerial photo. This perspective from above is showing us the

rover's path and provides a good look of the range and scope of the rover as it explores the surface of Mars.

Bob announced that at this time Hyde Observatory is again on hold until the risk dial goes back down, looking forward to once again having public observing as well as our regular PAC meetings out there.

The September 28 PAC meeting was announced – this is the time of year where we open up for PAC officers nominations. Membership was asked to watch for further announcements via Night Sky Network whether or not the September meeting will be via Zoom or in person at Hyde.

A question was asked whether or not club star parties will continue as scheduled despite the status of PAC meetings and Hyde closure... and the answer is yes as we are set up outside at appropriate spacing from each other to observe, we feel it is safe as we have been doing through most of the pandemic period.

Upcoming club events announced included the Branched Oak Observatory StarBQ September 4, and the Wildwood Star Party in Nebraska City September 11.

Club Treasurer John Reinert reported the roster was updated and presented to everyone for review, noted it was interesting to attend the MSRAL Zoom meeting and was pleased to see that Omaha Astronomical Society has stepped up their role in this. An update of balances in accounts was given. John also reported we are getting new membership sign ups and asks that we reach out and interface as best we can to keep them updated and interested.

Bob Kacvinsky added that 14 people over the last 12 months have contacted us about membership, at least 2 of those have signed up, and we'd like to reach out to the others in hopes to sign up more. John Reinert mentioned that he ran into Leona Barrett (Earl Moser's daughter) at NSP, and that also Brad Moser has

contacted him but was interested to know if they will get the same email blasts that anyone listed as a contact gets. Mark Dahmke explained how this works and will be certain to check into this

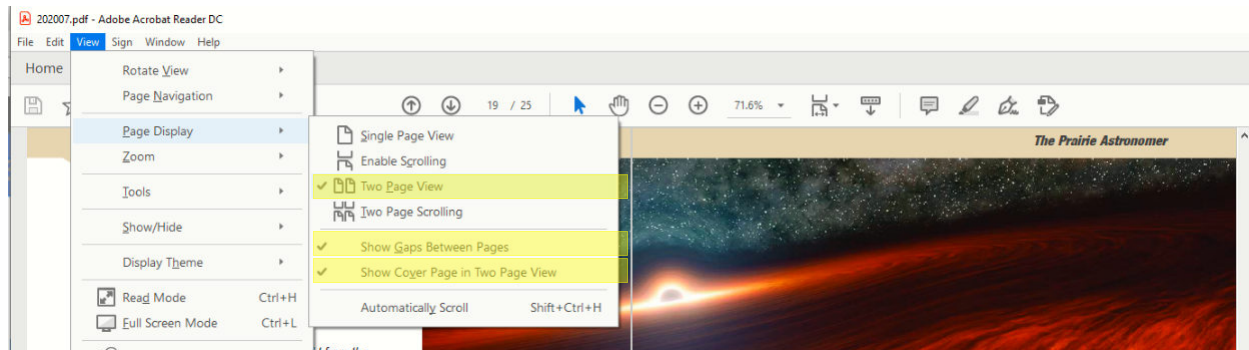
to be sure they are included if they aren't already.

At approximately 8:03pm the meeting was concluded with no further business.

Brett Boller shared photos from NSP and Mark Dahmke shared a video taken from his drone at NSP and surrounding areas.

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>

The President's Message

Bob Kacvinsky



September marked our attempt to begin public star parties with a couple scheduled since the summer. After much discussion we had to make the tough decision to cancel our participation, due to the Delta variant activity. Risks to the public, our member volunteers, and difficulty in maintaining equipment sanitation all lead to the decision. We will continue to monitor and likely error on the side of safety until further notice. This affects our public gathering activities.

Please plan to participate in the September 28th meeting starting at 7:30 PM. It is most likely that we will be meeting via Zoom for at least one more month. Watch for notification reminders to be sent out by September 24th. Program will be announced at that time and follow election nominations.

Jim Kvasnicka has offered to host quarterly Lunar Observing nights where 3-4 experienced members

will be available to help with telescope and observing questions. The next Lunar Star Party will be listed in the monthly newsletter but being targeted for mid-October. 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. We are safely able to maintain distances between telescopes so will continue our private PAC parties during the fall.

This summer you've received emails from Jim Kvasnicka with a PAC survey. If you have not yet provided feedback, please consider it. We have already made a couple modifications from the surveys. For example, Jim Kvasnicka has instituted an email communication on the night of scheduled star parties to provide a weather update and likely ability of observing. The new PAC Board in

November will have the entire summary of comments and recommendations to evaluation going into next year. Thanks to everyone who provided feedback.

September is when initial nominations for new club officers can be offered. Please heartfully consider stepping up your participation in PAC by offering your name for an office. Covid has prevented us over the past 18 months from much of the outreach and community involvement that PAC is so well recognized. This is a great opportunity for you to get in on the ground floor as PAC will begin to reactivate and reengage in public outreach. If you have any questions about any of the duties of club office positions, please reach out to the Board member or me for more information.

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

Astrophotography



©Mark Dabbs
PHOTOGRAPHY

Celestron Onyx 80EDF, 1000mm, 1/13 second, ISO 800 with Panasonic Lumix GH5s



Rick Johnson

ARP 34

While this is a nice trio of galaxies Arp 34 is only NGC 4615 the big blue one as it is classed by Arp as: Spiral Galaxies, Integral sign. To me, none of his integral sign galaxies are all that close to the appearance of the sign. To me, this one looks more like an upside down double stinger scorpion. I think he was mainly interested in the long drawn out arms. In this case NGC 4615 is a starburst galaxy as indicated not only by its vivid blue color but also by its intense IR emission indicating there are far more stars being born in this galaxy but they are hidden behind their dusty cocoons which emit strongly in IR light as that's the only frequency that can escape the dust. Its official classification is Scd. The other two galaxies are NGC 4614 the odd barred spiral with two arms that seem to form a near perfect ring. Note that on the SW side a faint outer

arm is visible. NED classes it as SB0. NGC 4613 is the smallest of the three and is classed as Sa by NED and a lenticular galaxy (S0) by a note at NED. Sa seems to better fit my image. All three are located about 230 million light-years away and do form a true group. which, if either, caused the distortions in NGC 4615 and threw it into starburst no one sees to know. Neither seems all that distorted as you'd expect after such an encounter. Maybe it was yet another galaxy out of my field. Arp 34 as well as the other two NGC galaxies in the image, 4613 and 4614, were discovered by Heinrich d,Arrest on May 9, 1864.

This note at NED about the three galaxy system is interesting:

"RSCG 64.-RSCG 64 is a very tight system (<20 kpc in radius) with a low velocity dispersion



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.



($\sigma_{\text{RSCG}} = 111 \pm 74 \text{ km s}^{-1}$). The system is near the edge of a small apparent void. Only five galaxies within the entire region are roughly coincident with the RSCG in velocity space, and the nearest of these is $560 \text{ h}^{-1} \text{ kpc}$ away from the RSCG center. RSCG 64 is probably an isolated, gravitationally bound system. No signs of tidal interaction are evident." So they can't find the cause of the starburst activity either.

Follow a line from NGC 4615 through NGC 4613 then on to an orange star a bit fainter than the one on top of NGC 4613. Go the distance between NGC 4613 and that orange star. That brings you to the center of a very distant galaxy cluster NSC J124121+260545 a bit over 3 billion light years distant. If I blow up that area I see a bunch of very faint galaxies and a few brighter ones in the area. The cluster itself though is hard to define. NED gives little information on it.

A bit west of NGC 4613 and north you come to a bright somewhat orange star. It is about in the center of another galaxy cluster, NSCS

J124121+261031 at 4.5 billion light years. 28 galaxies are listed as being in the cluster. I see far more on either side of this star arranged in two clumps one to the east and one to the WSW of the star. But there are far more than 28 in either of the clumps.

The eastern clump is a quite long group heading east. Toward the far end of this large clump of galaxies is the location of yet another galaxy cluster, NSCS

J124153+261101 at 2.6 billion light years. It has 18 members. Again I see too many. The galaxy counts may have been made from the POSS plates. I am going much deeper than they do so this may explain the excess.

I'm not done with galaxy clusters in the image! Follow the line from NGC 4615 through 4613 and on to the first bright blue star. That marks the area of yet another galaxy cluster that appears to be at the SW end of a band of galaxies and galaxy clusters. It is NSCS J124108+260838. It is listed as containing 41 members, more in line with what I see on my image, and is 4 billion light years distant.

The asteroid in the image is (46920) 1998 SX12 MAG 17.9 Color data was taken between to luminosity sessions so the trail is broken. It is near the top right of center and is aimed at a somewhat blue galaxy that also appears as a short streak.

All three galaxies were discovered by Heinrich d'Arrest on May 9, 1864.

October Observing

Jim Kvasnicka



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

Planets

Mars: Is at conjunction with the Sun on October 8th and not visible until late November.

Jupiter: Shines at magnitude -2.6 with a disk 46" wide in Capricornus.

Saturn: Magnitude +0.5 with a disk 17.7" wide in Capricornus.

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

Mercury: Rises about 1½ hours before the Sun in late October at magnitude -0.7.

Venus: In the SW at evening at a brilliant -4.3 magnitude.

Meteor Showers

Orionids: Peaks the morning of October 21st. The Waning Gibbous Moon will interfere.

Messier List

M11: The Wild Duck Cluster in Scutum.

M16: Open cluster in the Eagle Nebula.

M17: Omega or Swan Nebula in Sagittarius.

M18: Open cluster in Sagittarius.

M24: Small Sagittarius Star Cloud.

M25/M26: Open clusters in Sagittarius.

M55: Class XI globular cluster in Sagittarius.

M75: Class I globular cluster in Sagittarius.

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

Next Month: M27, M30, M56, M57, M71, M72, M73

NGC and other Deep Sky Objects

NGC 7009: The Saturn Nebula in Aquarius.

NGC 7293: The Helix Nebula in Aquarius.

NGC 7331: Galaxy in Pegasus.

NGC 7479: Galaxy in Pegasus.

NGC 7510: Bright open cluster in Cepheus.

NGC 7606: Galaxy in Aquarius.

Double Star Program List

8 Lacerta: Four white stars.

Beta Cephei: White and blue stars.

Struve 2816: White primary with 2 blue stars.

Xi Cephei: Pair of yellow stars.

Delta Cephei: Yellow primary with a pale blue secondary.

Eta Persei: Yellow and blue stars.

Struve 331: White primary with a light blue secondary.

Epsilon Pegasi: Yellow primary with a white secondary.

Challenge Object

NGC 7769 / 7770 / 7771: Galaxy NGC 7769 is the brightest in this trio in Pegasus.

Focus on Constellations

Aquarius

Jim Kvasnicka

Aquarius the Water Carrier is a faint constellation representing a man pouring water from an urn. Aquarius is the 11th sign of the Zodiac and covers 980 square degrees. The most prominent star pattern in the constellation is the Y-shaped asterism centered on Zeta Aquarii. Galaxies are the most numerous type of object in Aquarius but most are faint. Since Aquarius lies far from the plane of the Milky Way it is lacking in star clusters and diffuse nebulae. It does contain three globular clusters, two of which are Messier objects M2 and M72. A third Messier object M73 is an asterism. Aquarius does contain two notable planetary nebulae, the Saturn Nebula and the Helix Nebula. The Helix Nebula requires an OIII filter to see. Aquarius is best seen in the month of October.

Showpiece Objects

Globular Clusters: M2, M72

Planetary Nebulae: NGC 7009 (Saturn Nebula), NGC 7293 (Helix Nebula)

Mythology

In most cultures Aquarius is depicted as a man pouring water. This may arise from the fact that the Sun enters Aquarius in early winter, when the rainy season begins in many parts of the world. The Babylonians knew this area of the sky as a celestial sea, and from them the Greeks inherited not only Aquarius but also Pisces, Capricornus, and Eridanus.

Number of Objects
Magnitude 12.0 and Brighter

Galaxies: 13

Open Clusters: 1

Globular Clusters: 3

Planetary Nebulae: 2



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

From the Archives

September, 1987

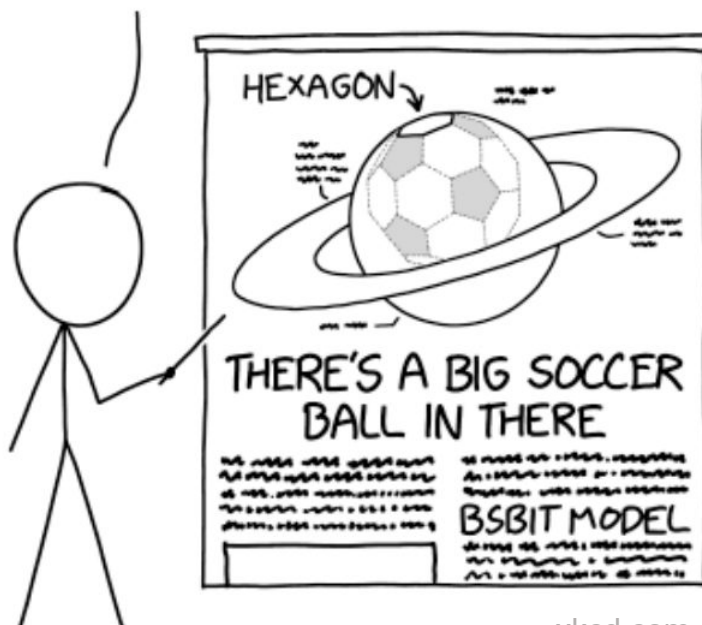
Those of you who have never seen the "Red" spot on Jupiter may want to make it a point to try and see it soon. As of September 10th, I observed it almost buried in the south equatorial belt. It is almost colorless with only a hint of pink on the south edge and seems more stretched out than usual. Downstream from the red spot in the equatorial belt is a very disturbed area consisting of four or five white spots of various sizes bunched together, I do not recall ever seeing the red spot actually existing inside

Is Jupiter Losing its Red Spot? - David Knisely

one of the major equatorial belts and I wonder whether it can continue to do so for very long before being either kicked out of the belt or possibly destroyed by the wind currents. It might even absorb some material and turn red again. In any case, it bears watching. The spot should be visible in telescopes six inches and larger at very high power. I used my ten inch f6.6 Newtonian and the Lumicon Deep-Sky filter to observe Jupiter's features. The filter makes the details stand out much

better than even the standard blue filters can, revealing small festoons and white spots that are normally lost in the glare of Jupiter's white zones. I have also noted some belt activity in the North Temperate zone that bears some watching. A series of very narrow belts are covering most of the mid and upper latitudes and some even contain a few white spots. So drag out that telescope and start taking a peek at the weird weather on the largest planet in the solar system.

WE'RE PROUD TO ANNOUNCE THAT OUR TEAM HAS FINALLY DETERMINED THE ORIGIN AND NATURE OF SATURN'S POLAR HEXAGON.



NASA's Juno Celebrates 10 Years With New Infrared View of Moon Ganymede

The science team for NASA's Juno spacecraft has produced a new infrared map of the mammoth Jovian moon Ganymede, combining data from three flybys, including its latest approach on July 20. These observations by the spacecraft's Jovian Infrared Auroral Mapper (JIRAM) instrument, which "sees" in infrared light not visible to the human eye, provide new information on Ganymede's icy shell and the composition of the ocean of liquid water beneath.

JIRAM was designed to capture the infrared light emerging from deep inside Jupiter, probing the weather layer down to 30 to 45 miles (50 to 70 kilometers) below Jupiter's cloud tops. But the instrument can also be used to study the moons Io, Europa, Ganymede, and Callisto (known collectively as the Galilean moons in honor of their discoverer, Galileo).

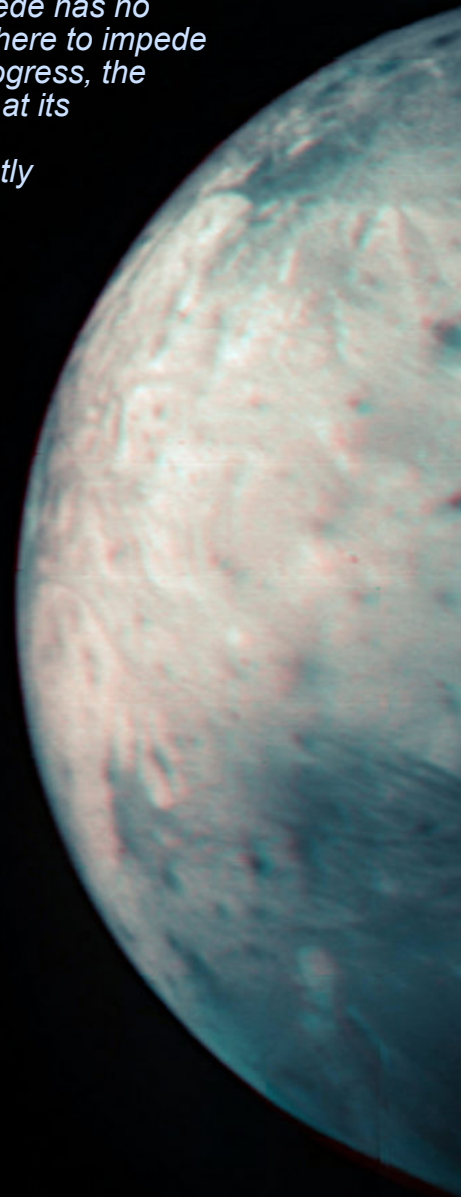
"Ganymede is larger than the planet Mercury, but just about everything we explore on this mission to Jupiter is on a monumental scale," said Juno Principal Investigator Scott Bolton of the Southwest Research Institute in San Antonio. "The infrared and other data collected by Juno during the flyby contain fundamental clues for understanding the evolution of Jupiter's 79 moons from the time of their formation to today."

Juno came within 31,136 miles (50,109 kilometers) of Ganymede, the solar system's largest moon, on July 20, 2021. During earlier flybys on June 7, 2021, and Dec. 26, 2019, the solar-powered orbiter came within 650 miles (1,046 kilometers) and 62,000 miles (100,000 kilometers), respectively. The three observational geometries provided an opportunity for JIRAM to see the moon's north polar region for the first time, as well as compare the diversity in

composition between the low and high latitudes.

Ganymede is also the only moon in the solar system with its own magnetic field. On Earth, the magnetic field provides a pathway for plasma (charged particles) from the Sun to enter our atmosphere and create auroras. Because Ganymede has no atmosphere to impede their progress, the surface at its poles is constantly being

Infrared view of Jupiter's icy moon Ganymede was obtained by the Jovian Infrared Auroral Mapper (JIRAM) instrument aboard NASA's Juno spacecraft during its July 20th flyby. Image Credit: NASA/JPL-Caltech/SwRI/ASI/INAF/JIRAM



bombarded by plasma from Jupiter's gigantic magnetosphere. The bombardment has a dramatic effect on Ganymede's ice.

"We found Ganymede's high latitudes dominated by water ice, with fine grain size, which is the result of the intense bombardment of charged particles," said Alessandro Mura, a Juno co-investigator from the National Institute for Astrophysics in Rome.

"Conversely, low latitudes are shielded by the moon's magnetic field and contain more of its original chemical composition, most notably of non-water-ice constituents such as salts and organics. It is extremely important to characterize the unique properties of these icy regions to better understand the space-weathering processes that the surface undergoes."

Juno's unique polar views and closeups of Ganymede build on observations by NASA's previous explorers, among them Voyager, Galileo, New Horizons, and Cassini. Future missions with Ganymede in their travel plans include the ESA

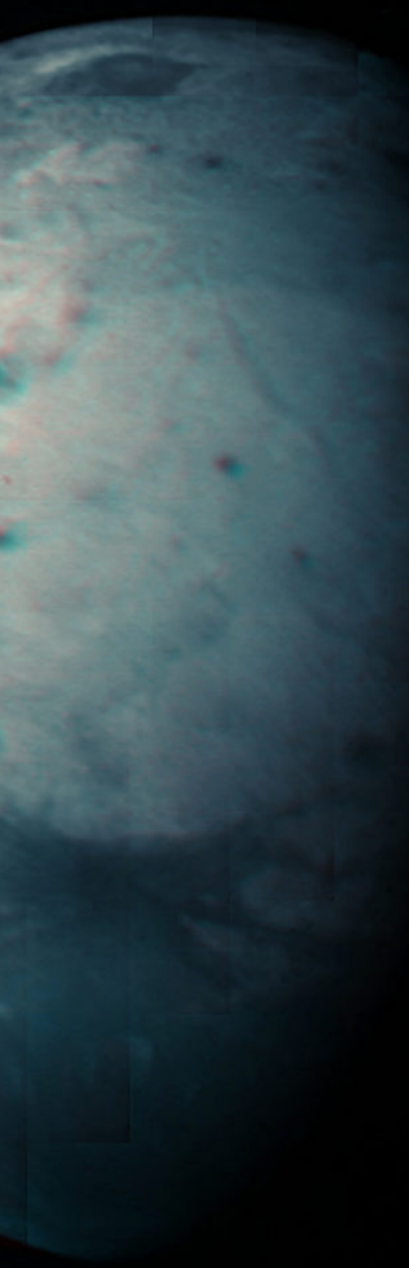
(European Space Agency) JUICE mission, which will explore the icy Galilean moons with an emphasis on Ganymede, and NASA's Europa Clipper, which will focus on Ganymede's neighboring ocean world Europa.

10 Years an Explorer

Juno lifted off from Cape Canaveral Air Force Station in Florida on Aug. 5, 2011, at 9:25 a.m. PDT (12:25 p.m. EDT). After a five-year, 1,740-million-mile (2,800-million-kilometer) journey, it arrived at Jupiter on July 4, 2016.

"Since launch, Juno has executed over 2 million commands, orbited Jupiter 35 times, and collected about three terabits of science data," said Project Manager Ed Hirst of JPL. "We are thrilled by our ongoing exploration of Jupiter, and there is much more to come. We have started our extended mission and look forward to 42 additional orbits to explore the Jovian system."

Juno's extended mission, which tasks the spacecraft with continuing its investigations through September 2025, includes close passes of Jupiter's north polar cyclones,



Ganymede, continued.

flybys of the moons Europa and Io (along with Ganymede), as well as the first exploration of the faint rings encircling the planet. It will also expand on discoveries Juno has already made about Jupiter's interior structure, internal magnetic field, atmosphere (including polar cyclones, deep atmosphere, and aurora), and magnetosphere.

More About the Mission

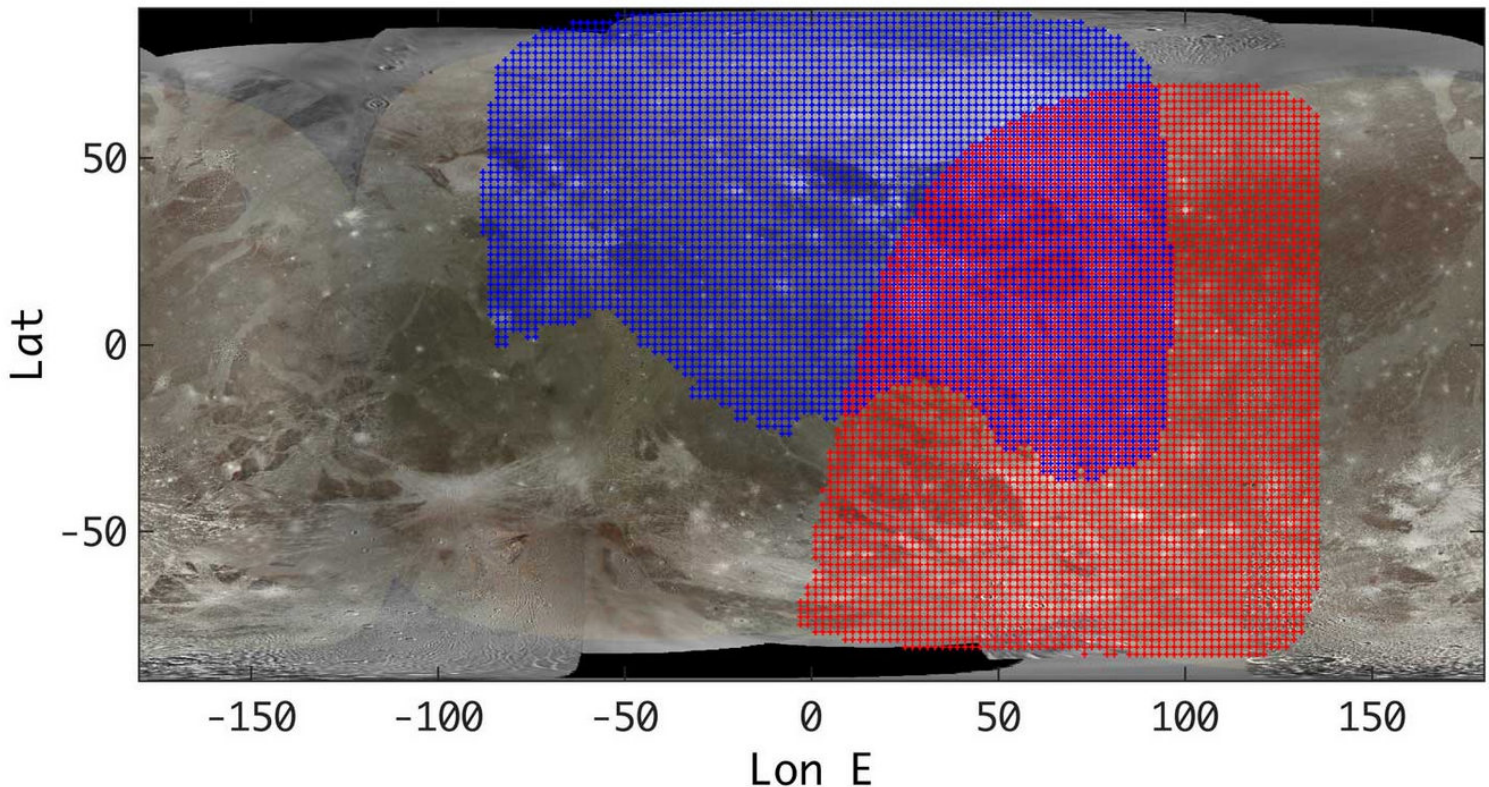
JPL, a division of Caltech in Pasadena, California, manages the Juno mission for the principal investigator, Scott J. Bolton, of the Southwest Research Institute in San Antonio. Juno is part of NASA's New Frontiers Program, which is managed at NASA's Marshall Space Flight Center in Huntsville, Alabama, for the agency's

Science Mission Directorate in Washington. Lockheed Martin Space in Denver built and operates the spacecraft.

More information about Juno is available at:

<https://www.nasa.gov/juno>

<https://www.missionjuno.swri.edu>



Annotated map of Ganymede

Image Credit: NASA/JPL-Caltech/SwRI/ASI/INAF/JIRAM/USGS

Telescope Pier V4.0

Mark Dahmke

This is the latest installment in my quest for a simple, inexpensive but solid telescope mount. The quest began in 1994 when I bought my Meade 8" LX200. In early 1994 I decided to build a deck out over the old patio, so I first poured a 12 inch tall concrete pier that was slightly below the level of the new deck.

I had Rivers Metal Products make a pier using three 1" pipes. It had a top plate with a nut welded in place that matched the threads on the base of the LX200.

This arrangement worked well for many years, until I bought the equatorial wedge. Having the scope on the deck was very convenient, but I couldn't



The 1994 steel pier



Version 4

see Polaris from there which made polar alignment difficult.

In 2003 I decided to pour a pier on the southeast corner of my lot just next to the deck. Polaris was visible from that location. I also extended the deck out around the pier to the edge of the lot.

This configuration worked well except for the street lights visible to the north.

A few years later I sold the LX200 (actually the second one) and switched to an LXD75 German Equatorial mount. The advantage was that it weighed a lot less and I wanted to be able to use different OTAs on the same mount.

I also bought a Celestron Onyx short tube refractor and later an Astro-Tech RC6. Both use the same size dovetail as the LXD75 mount.

Scope Pier, continued.



The 2003 mount (V2)

I also wanted to be able to leave the mount outside for long periods, to avoid having to redo the polar alignment each time, and to make it easier to just grab a scope and start observing with minimal setup time.

While Googling for scope enclosures I discovered [Motel o'Scope](#) and [decided to build my own](#) version. I first built a wooden base plate that matched the J-bolt mount on the concrete pier, and built a cover following the directions on the Motel o'Scope site. I bought a used tripod head compatible with the LXD75 on Cloudy Nights and cut some legs out of wood, which can be seen in the next photo. This configuration was nice in that it also gave me a

place to put accessories while observing.

In 2013 I decided to expand the patio from the deck to the full width of the lot on the south and west side. I'd already put in a fence, and then I realized that the southwest corner was a



The 2013 mount with LXD75 GEM

much better place for a telescope. It was less windy, more protected due to the fence, and the neighbor's house blocked the street light.

Before pouring the patio I added another pier in that corner. The cover worked well and I often left the LXD75 outside for months at a time. As a precaution I put a desiccant in with

the mount, but never had a problem with humidity or rust.

However, after a few years the UV exposure had taken its toll on the cover and it needed repairs.



The new pier (V3) with the Motel-O-Scope style cover



The 2013 mount with the RC6 scope

Onward to Version 4.0

In 2019 I decided to sell my house and downsize.

Before putting the house on the market, I “decommissioned” both piers - the second pier became a plant stand and the other one became a deck table.

I disassembled the Motel o’Scope cover which was already showing signs of deterioration and also recycled the wooden base plate. I kept the two aluminum 12x12x1/2 inch plates from the original pier and also the LXD75 tripod head.

My new place is a townhouse with walk-out basement and a small patio. For the past two years I’ve been using the scope tripod, but kept thinking about putting in another pier.

After giving it some thought I decided to come up with a new design. My first criteria for V4: don’t install anything permanent that requires pouring concrete. I’m not sure how long I’ll live here and don’t want the hassle of having to remove a chunk of concrete when I leave.

While Googling for ideas, I came across an interesting concept using cinder blocks. I found several variations on this idea but here’s a

[discussion thread](#) on Cloudy Nights that shows how its done.

But instead of pouring concrete I wanted one that could sit on the patio. It also had to have some mass, so once aligned it would stay put.

I bought a couple of 16” x 16” concrete stepping stones that weigh about 35 lbs each. I used a generous amount of Gorilla Heavy Duty construction adhesive to glue them together and then drilled four 3/8” holes for anchors. The holes were then cleared of all the dust using compressed air.

I rolled four 6” pieces of 3/8” threaded rod in JB Weld epoxy and made sure there was good contact with the concrete. After two days I tested the strength of the bond. One rod easily handled the weight of both stepping stones. I used some more construction adhesive to anchor the cinder block. I used four 3/8” x 4 bolts to stack the second cinder block and then mounted the 12x12 aluminum plate on top.

Instead of wooden “legs” for the tripod head, I bought three 3/8” threaded rod couplers and drilled holes at right angles to fit into the slots where the tripod legs would normally go. Three

3/8” - 5” bolts serve as the new tripod legs.

The next problem was alignment. The patio is on



the south side of the house so once again the scope can’t see Polaris. I used Google Earth to determine the offset angle to true North, which is about 2.5 degrees. From about 50 feet south of the



house I can see Polaris above the roof, so I lined up the mount visually and marked the angle on the base plate. To my surprise, when I powered



Shown on the next page is a laser mounted to a block of wood that is cut to fit in the dovetail mount.

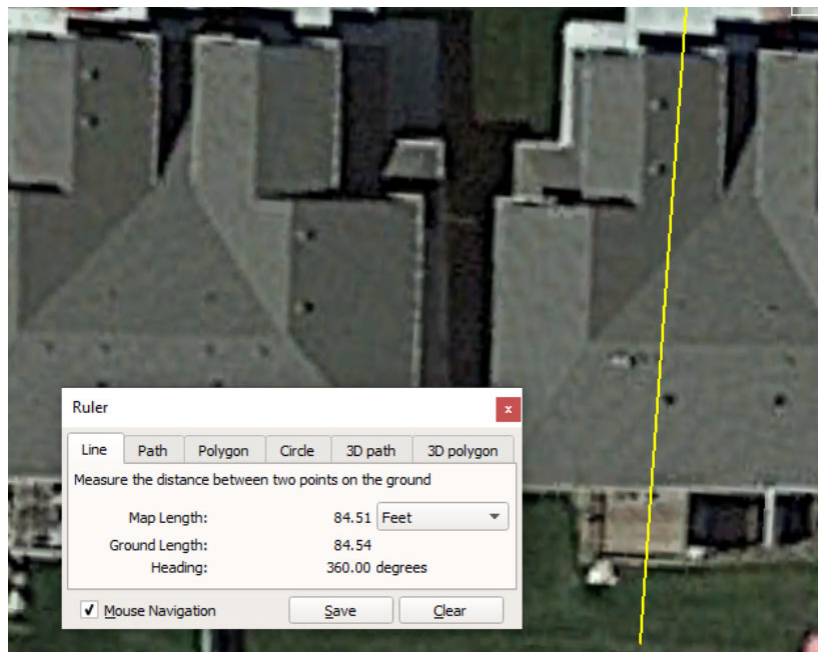
The target is a piece of wood mounted on the under-side of the deck. As long as the mount doesn't move, this method of alignment will be more than adequate for my needs, since I'm not planning to do any long guided exposures.

The new mount is surprisingly solid. The hardware cost was about \$50. If I decide to move again in a few years, I could easily take it with me. I camouflaged it with a grill cover, so unless my neighbors see it with a scope attached, they probably won't even notice it!

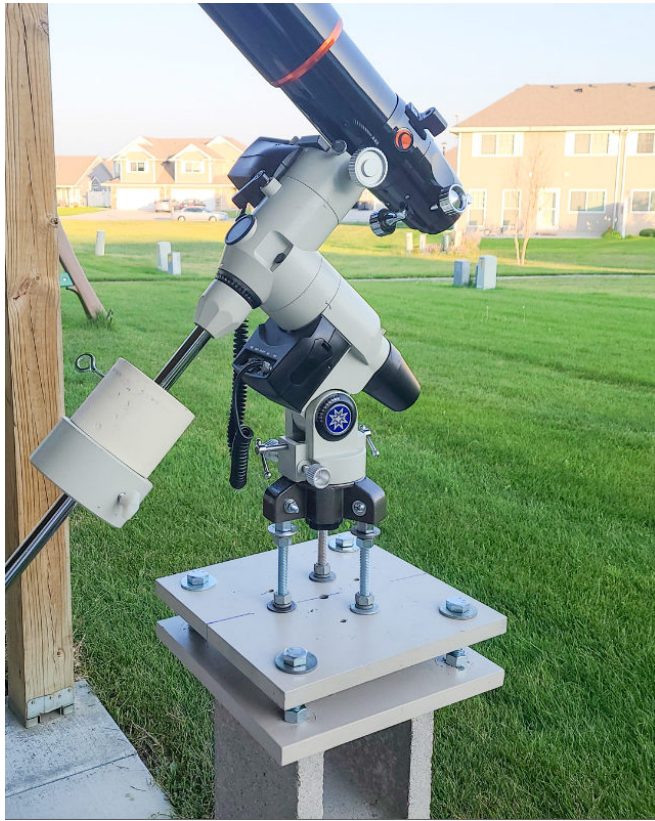
up the mount and did a rough alignment, then slewed to Jupiter, it was within the field of view.

I next did an alignment using the drift method, which was easier than expected. I next made a laser target to facilitate quick realignment when bringing the LXD75 out from the basement.

Why not just use the Autostar easy alignment process? I like the LXD75 but have never had very good luck getting repeatable results with the two star alignment.



The Google Earth ruler tool can be used to find the azimuth angle at the location of the scope pier



The sandwiched 12x12 aluminum plates can be adjusted to provide a level base for the scope mount.

A used tripod head matching the cup mount for the LX75 is securely fastened to the plate using 3/8" - 5 inch long bolts. The bolts thread into rod couplers that just happened to be the same width as the original tripod legs. I drilled holes at a right angle through the couplers to attach the tripod head.



Left: a laser clamped in the dovetail mount points to a target mounted on the deck. Assuming that the pier doesn't move, accurate realignment of the equatorial mount is easy.

Club Offices and Duties

Nominations for next year's officers will begin at the September meeting, and remain open until election at the October meeting.

Club officer nominations are made in September and elections are held in October. The following is a list of responsibilities of each of the officers and what is required to maintain a functioning club.

As stated in the bylaws, the club has five officers: President, Vice President, Secretary, Treasurer and Second Vice President. The business of the club is managed by a Board of Directors. The Board consists of the five elected officers. Each decision of the Board requires an affirmative vote by at least three Board members. The Board can also create additional non-elected offices as required and can initiate impeachment proceedings against officers who have been negligent in performing their duties.

The Prairie Astronomy Club has a fifty year history of service to club members and the community. Potential club officers should have a good understanding of the history of the club, its formation and mission, its relationship with Hyde Observatory and the types of events, activities and outreach that is part of the tradition of the club.

The most complete resource is the book *The Prairie Astronomy Club: Fifty Years of Amateur Astronomy*, which is in the club library or available as a PDF document.

President

The President organizes and directs the regular monthly meetings and all other club activities. The President also prepares the meeting agenda and PowerPoint for the meeting.

The President also officially represents the club at meetings at the regional and national level where he/she is in attendance or delegates this authority. The President has the authority to call meetings of the Board and to appoint non-elected officers.

The President should have good communication skills and be comfortable interacting with the media and public, be a good public speaker, be available to do radio and TV interviews and to deliver prepared introductions and remarks at club-sponsored events.

Another duty of the President is the annual club audit. Within 10 days of assuming office, the

President must appoint a committee of three club members to perform the audit. The audit must be completed within 45 days of the close of the fiscal year which is October 31.

When assuming office, the President should hold a meeting of the Board to present his/her direction and ideas for the club for the coming year, and appoint any unfilled non-elected positions.

Vice President

The Vice President is responsible for running club meetings and other events in the absence of the President. The VP is also to be the mediator in cases of procedural dispute and must be available to assume the duties of any officer at the direction of the President. The VP also maintains control of the current inventory of all club property.

Secretary

The Secretary handles all Club correspondence, is responsible for the distribution of information received through official club correspondence and is in charge of Club publicity (often the job of Publicity or Outreach Coordinator is delegated to a non-elected member). The Secretary

also sends out membership renewal notices and delivers meeting minutes to the newsletter editor. The Secretary is responsible for maintaining an accurate club membership roster. The master copy of the roster is currently maintained on the Night Sky Network website. The bylaws also require publication of the complete roster in the newsletter on an annual basis.

Treasurer

The Treasurer is responsible for all Club funds and for keeping accurate records of all monetary transactions. The Treasurer must submit a written report of the club's monetary status at the request of the President or give a verbal report at the request of any member during regular meetings. He/she also prepares an annual financial report in November for publication in the newsletter and presentation at the November meeting. The Treasurer is also responsible for all tax filings and reporting requirements, to maintain the club's 501c3 status.

Second Vice President (and Program Chair)

The Second Vice President is responsible for the formation and presentation of the monthly club programs. Ideally the 2nd VP should try to plan ahead six months to one year to build a list of potential presenters or programs. The 2nd VP also sends out email announcements of

upcoming programs to the membership, and sends a program description to the newsletter/website editors.

The club usually has several appointed positions:

The **Publications Chairperson** (or Newsletter Editor) is responsible for editing and publishing the Prairie Astronomer. The newsletter editor may also be the website manager/editor. The newsletter editor should have a good working knowledge of desktop publishing software (and computers in general), graphics, photo editing, some design and layout experience and some experience with social networking and Internet marketing. The Website editor needs to be familiar with WordPress (or similar CMS software) and HTML, graphics and word processing applications. Ideally the newsletter and website editor(s) should have prior experience with the publication of a newsletter or website, or demonstrated skills. The publications chairperson is also responsible for social networking for the club - posting Facebook and Twitter announcements for club meetings and events.

If the club has an appointed **Outreach Coordinator**, the coordinator takes on some of the roles performed by other officers - organizes outreach events, shares in media communications tasks, puts together flyers, etc.

The **Club Librarian** (often the Vice President) manages the club library. He/she keeps a current bibliographic listing of all Club library material including the archive of all back issues of The Prairie Astronomer. The Club Librarian and Secretary work together to maintain a record of club activities and regularly update the official club history.

The **Observing Chairperson** presents a monthly report at Club meetings and/or in the Prairie Astronomer. He/she keeps members informed of upcoming celestial events, sky objects of special interest and star parties.

The **Recording Secretary** (often the Club's elected Secretary) is responsible for keeping the minutes of the club meetings and filing a copy with the Club Secretary. Minutes need to be kept in a systematic fashion as they record the history and life of the club and need to be published in the Prairie Astronomer on a monthly basis.

The **Site Chairperson** (if one is appointed) is responsible for establishing a site committee to oversee the maintenance and security of the club observing site.

While not a requirement of the bylaws, all club officers and appointees should have good computer and social media skills, should be accessible and responsive via email and phone. §

Weird Ways to Observe the Moon

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!

International Observe the Moon Night is on October 16 this year— but you can observe the Moon whenever it's up, day or night! While binoculars and telescopes certainly reveal incredible details of our neighbor's surface, bringing out dark seas, bright craters, and numerous odd fissures and cracks, these tools are not the only way to observe details about our Moon. There are more ways to observe the Moon than you might expect, just using common household materials.

Put on a pair of sunglasses, especially polarized sunglasses! You may think this is a joke, but the point of polarized sunglasses is to dramatically reduce glare, and so they allow your eyes to pick out some lunar details! Surprisingly, wearing sunglasses even helps during daytime observations of the Moon.

One unlikely tool is the humble plastic bottle cap. John Goss from the Roanoke Valley Astronomical Society shared these directions on how to make your own

bottle cap lunar viewer, which was also suggested to him by Fred Schaaf many years ago as a way to also view the thin crescent of Venus when close to the Sun:

“The full Moon is very bright, so much that details are overwhelmed by the glare. Here is an easy way to see more! Start by drilling a 1/16-inch (1.5 mm) diameter hole in a plastic soft drink bottle cap. Make sure it is an unobstructed, round hole. Now look through the hole at the bright Moon. The image brightness will be much dimmer than normal – over 90% dimmer – reducing or eliminating any lunar glare. The image should also be much sharper because the bottle cap blocks light from entering the outer portion of your pupil, where imperfections of the eye's curving optical path likely lie.” Many report seeing a startling amount of lunar detail!

You can project the Moon. Have you heard of a “Sun Funnel”? It's a way to safely view the Sun by projecting the image from

an eyepiece to fabric stretched across a funnel mounted on top. It's easy to make at home, too – directions are here: bit.ly/sunfunnel. Depending on your equipment, a Sun Funnel can view the Moon as well as the Sun— a full Moon gives off more than enough light to project from even relatively small telescopes. Large telescopes will project the full Moon and its phases, with varying levels of detail; while not as crisp as direct eyepiece viewing, it's still an impressive sight! You can also mount your smartphone or tablet to your eyepiece for a similar Moon-viewing experience, but the funnel doesn't need batteries.

Of course, you can join folks in person or online for a celebration of our Moon on October 16, with International Observe the Moon Night – find details at moon.nasa.gov/observe. NASA has big plans for a return to the Moon with the Artemis program, and you can find the latest news on their upcoming lunar explorations at nasa.gov.



Sun Funnels in action! Starting clockwise from the bottom left, a standalone Sun Funnel; attached to a small refractor to observe the transit of Mercury in 2019; attached to a large telescope in preparation for evening lunar observing; projection of the Moon onto a funnel from a medium-size scope (5 inches). Safety tip: NEVER use a large telescope with a Sun Funnel to observe the Sun, as they are designed to project the Sun using small telescopes only. Some eager astronomers have melted their Sun Funnels, and parts of their own telescopes, by pointing them at the Sun - large telescopes create far too much heat, sometimes within seconds! However, large instruments are safe and ideal for projecting the much dimmer Moon. Small telescopes can't gather enough light to decently project the Moon, but larger scopes will work.

Observe the Moon... continued.



International OBSERVE
THE MOON NIGHT 2021

SATURDAY 16TH
OCTOBER



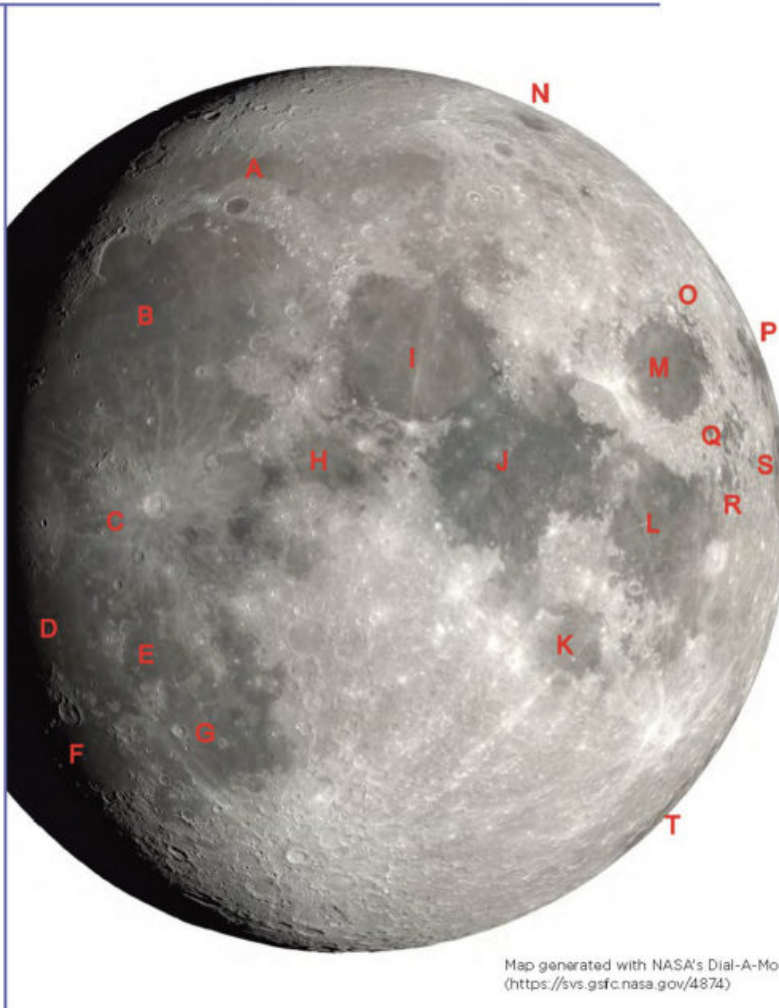
NORTHERN HEMISPHERE MOON MAP WITH LUNAR MARIA (SEAS OF BASALT)

Moon Map

This map was created for International Observe the Moon Night 2021. It depicts the Moon as it will appear from the northern hemisphere at approximately 11:00 PM EDT on October 16, 2021 (3:00 AM UTC on October 17).

Lunar Maria (Seas of Basalt)

You can see a number of maria tonight. Once thought to be seas of water, these are actually large, flat plains of solidified basaltic lava. They can be viewed in binoculars or even with the unaided eye. Tonight, you may be able to identify 18 maria on the Moon. This includes four seas along the eastern edge that are often hard to see. Because of libration, a slight apparent wobble by the Moon in its orbit around Earth, tonight we get to peek slightly around the northeast edge of the Moon, glimpsing a sliver of terrain normally on the Moon's far side.



Map generated with NASA's Dial-A-Moon (<https://svs.gsfc.nasa.gov/4874>)



- | | | |
|--|--|---------------------------------|
| A. Mare Frigoris (Sea of Cold) | H. Mare Vaporum (Sea of Vapors) | O. Mare Anguis (Serpent Sea) |
| B. Mare Imbrium (Sea of Rains) | I. Mare Serenitatis (Sea of Serenity) | P. Mare Marginis (Border Sea) |
| C. Mare Insularum (Sea of Isles) | J. Mare Tranquillitatis (Sea of Tranquility) | Q. Mare Undarum (Sea of Waves) |
| D. Oceanus Procellarum (Ocean of Storms) | K. Mare Nectaris (Sea of Nectar) | R. Mare Spumans (Sea of Foam) |
| E. Mare Cognitum (Known Sea) | L. Mare Fecunditatis (Sea of Fertility) | S. Mare Smythii (Smyth's Sea) |
| F. Mare Humorum (Sea of Moisture) | M. Mare Crisium (Sea of Crises) | T. Mare Australe (Southern Sea) |
| G. Mare Nubium (Sea of Clouds) | N. Mare Humboldtianum (Humboldt's Sea) | |

[MOON.NASA.GOV/OBSERVE](https://moon.nasa.gov/observe)

#ObserveTheMoon

You can download and print NASA's observer's map of the Moon for International Observe the Moon Night! This map shows the view from the Northern Hemisphere on October 16 with the seas labeled, but you can download both this map and one of for Southern Hemisphere observers, at: bit.ly/moonmap2021 The maps contain multiple pages of observing tips.

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.

