

The Prairie Astronomer

May 2021 Volume 62, Issue #5

**May Program: Preserving Our
Dark Skies - Jenna Bartja**



AG CARINAE



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer



NEXT MEETING AND PROGRAM

May 25, 7:30pm: Preserving Our Dark Skies (via Zoom)

Presenter: Jenna Bartja

One third of the world's population and more than eighty percent of Americans cannot see the Milky Way from where they live. Thus, more and more people are searching for destinations where they can enjoy brilliantly starry nights amidst un-light-polluted dark skies. Recent studies have shown the market for astrotourism is growing and its potential economic impact goes well beyond tourist spending. With a little guidance, Nebraska has great potential to become an astrotourism destination. However, the pace of growth and eventual magnitude of night-sky tourism will depend on the willingness of local stakeholders to embrace and promote their region's assets.

Bob Kacvinsky will email the Zoom link to club members on the 27th. If you're not a member and would like to hear this presentation, please contact Bob.

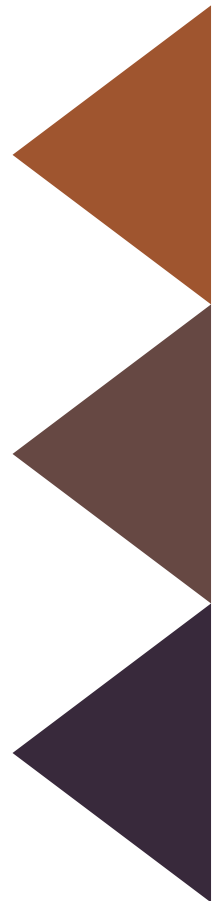
FUTURE PROGRAMS

June: Solar Observing Party

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Cover: In celebration of the 31st anniversary of the launching of NASA's Hubble Space Telescope, astronomers aimed the renowned observatory at a brilliant "celebrity star," one of the brightest stars seen in our galaxy, surrounded by a glowing halo of gas and dust. [Read more...](#) Photo credit: STScI



CALENDAR

Lunar Observing Party
May 21, 2021 at Jim Kvasnicka's home

PAC Meeting
Tuesday, May 25, 2021, 7:30pm
Jenna Bartja: Preserving our Dark Skies

PAC Meeting
Tuesday, June 29, 2021, 6:00pm
Solar Viewing Party, location to be announced

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

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

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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www.prairieastronomyclub.org

The President's Message

Bob Kacvinsky



Warm temperatures and spring showers welcome our viewing pleasures although they also bring the mosquitoes so plan accordingly if you are planning to get out and observe or attend a club star party.

We are starting to get indications of "herd immunity" in areas as public gathering options open up. 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.

We will continue to host our PAC Star Parties each month. We can safely use the Farm site and keep proper distances between observers. Jim Kvasnicka is planning to begin hosting Lunar Star Parties focused on newer members who want a little more help with their new

telescopes. 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 these special events. The first Lunar Star Party will be May 21st hosted at Jim Kvasnicka's home. Details for all our star parties are listed elsewhere within the newsletter.

We plan to evaluate any public gathering invites when they begin to come forward. We will remain cautious, but I would expect to see some smaller local star parties to begin sometime this summer. We will use the Night Sky Network to communicate with the membership and let each member decide if they wish to participate. We would expect to require social distancing and face coverings at the minimum for any event. Stay tuned for future updates.

Our May PAC meeting program on May 25th will be Jenna Bartja, presently working with the University of Nebraska. She is working with UNL, Nebraska State, Valentine, Merritt, and NSP to have the entire Merritt Reservoir designated as a Dark Sky Classification. The designation would enhance the value of the site for night viewing, improve the NSP claims, and help preserve the night sky for generations in the future. Jenna will provide an update on her work, the NSP submission, and progress.

Our June program will be our annual Lunar program hosted by Dave Churilla and other members of PAC. Last year we had over 25 members and families attend the August Lunar party. We are still evaluating the site to use depending on location access and if we can safely have public participation. We should have everything worked

by early June.

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

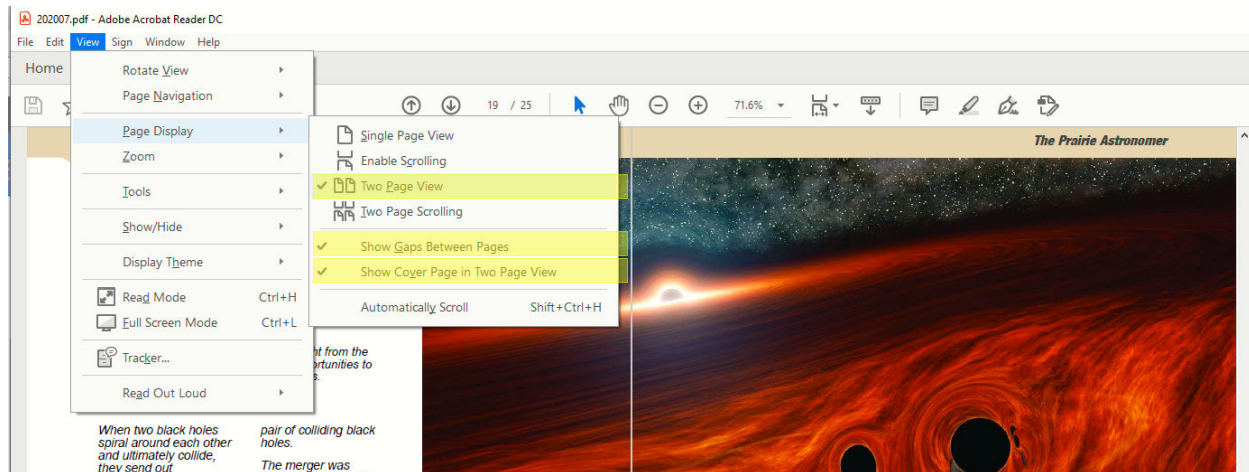
officer makeup as potential subjects.

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

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>



Rick Johnson

ARP 30

ARP 30 seems to be a pair of galaxies but that is not the case. The southern galaxy alone is the reason it made his catalog under his category: Spiral galaxies: One heavy arm. I'd expect the heavy arm to be obvious but in this case, it doesn't seem all that obvious to me. I think it is the southern arm, likely due to the piece that appears almost broken off though that's more a contrast feature of my processing than a real feature. There is also a faint arm on the west side that extends out from the main galaxy and it appears a piece of arm is sticking out from behind the east side of the northern, foreground, galaxy. The latter appears to be an extension of the arm I first mentioned going south as the likely heavy arm. It seems to have brightened again when behind the companion. Arp's image appears to show a bright arm arc above the galaxy's

core. It shows strong on his image, weakly on mine and not at all in the SDSS image. It appears to be very color dependent. So where is the "heavy arm"? I just don't know. Arp gave no clue that I've found. It isn't the edge on galaxy that is trying to fake a heavy arm. Arp knew it to be a separate galaxy.

Both galaxies carry the NGC 6365 designation with the northern one being NGC 6365B (PGC 60171) and the southern NGC 6365A NED classes them as Sdm? and SBcd? with the later noted as a Seyfert 1 galaxy. This Seyfert classification could be due to interaction with its partner feeding its black hole. I don't have enough information to say for sure. There is even some debate which galaxy is in front of which. While there is an absorption line along the the southern galaxy's edge where it meets the northern one which could



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.



ARP 30, continued.

be caused by dust in the northern one and the apparent arm that comes out from behind the northern one, one paper cites an absorption feature in the northern galaxy that could be caused by a arm of the southern. I don't buy that however. The other features seem to strong to ignore. Red shift data puts them at 363 and 368 million vlight-years north to south. Another indication the northern is in front though their relative motions could easily differ enough to negate this. Likely they are really closer together than this would indicate as well. Still they can't be really close as neither appears distorted to any obvious degree. The only oddity is the heavy arm.

The NGC project catalogs the northern

galaxy as NGC 6365 with the southern listed as UGC 10832. (Most other sources say it is both.) The northern one is UGC 10833 as that catalog lists the two separately. The NGC project classifies the northern galaxy the same as NED but leaves off the question mark. A note there indicates visually in a 17.5" scope the southern member is extremely faint. This brightness difference seen visually may account for the project not considering the NGC number as covering both.

I found no papers indicating these two could be a connected system, nor do I see any tidal features that could be due to them even being all that close but Arp's comment on the pair is; "Companion

appears physically connected to flat-on spiral system." By saying "appears" he isn't saying it really is nor does he say the appearance isn't correct. He just leaves it as undecided. I'll say I see no evidence or even hint of any that they really are connected. The pair was discovered by Lewis Swift on August 15, 1884. I found no indication he realized it was two objects.

Not a lot going on in this image but I've done an annotated version showing the quasars and distances to other galaxies in the image that I found data on. NGC 6365 was discovered by Lewis Swift on August 15, 1884.

Meeting Minutes

Bill Lohrberg

PAC meeting minutes
April 27, 2021 as recorded
by Bill Lohrberg

Club President Bob Kacvinsky hosted the Zoom meeting which began at 7:42pm with ultimately 21 attendees.

Prior to start of the PAC meeting Bob asked Ron Veys for an update on Hyde reopening. Ron explained that sometime in July is the targeted date depending on whether or not the Covid-19 meter dial stays in the green for 2 weeks to open Hyde. Hyde first would be open for just the telescopes, not the lecture room for about a month or so until things are consistently deemed safe. Hyde volunteer coordinator Annalisa will begin contacting those among the list of volunteers to organize for the opening. Ron urged volunteers to please reply when you get the email to let Annalisa know if you'd like to volunteer again so there is ample time to retrain prior to opening.

Ron also mentioned Hyde is buying a new eVscope, which has electronically enhanced viewing capabilities. Gathers the light on a CCD in the eyepiece with HD photo image quality. Really looking forward to getting it working. There was a

question if this is to replace one of the other scopes on the deck, but for now it will be used on its own tripod in test mode likely outside on the lawn. If to replace any it would be the 11".

Jim Kvasnicka presented the May 2021 observing report, details are in the club newsletter. Jim announced the dates for club star parties May 7, and 14 at the Cortland farm site. And a club Lunar observing party scheduled for May 21 at his house.

Bob provided a quick report on the spring star party at Lords Ranch south of Valentine April 7-11. 8 attended and they had quite a few good hours of clear skies and good observing. Bob showed a few photos he took of the site from his drone. Urges anyone interested to join for future fall and spring events at the site.

In the news: The Mars Ingenuity helicopter made its historic first flight, plus another 2 successful flights. More are scheduled.

Other events and announcements: Next scheduled PAC meeting is May 25. The program guest Jenna Bartja with UNL and the State of

Nebraska will talk about her submission to get the NSP site listed officially as a dark sky site designation. The June 29 meeting is the solar observing event outside at Hyde, stay tuned for further information coming up. It will start at 6pm – a little earlier than usual.

Club Treasurer John Reinert reported finances are in good shape, 3 members renewed, and John turned in the roster for the Astronomical League.

Bob received a letter from Carroll Iorg president of the regional Astronomical League to announce a virtual meeting August 19-21, there is an opportunity for the club to make a donation for door prizes, the question was put to the club whether or not we would like to contribute to the door prizes. Some had questions of how the club would be recognized... it was decided to table this until the May meeting for a vote pending more detailed information.

At approximately 8:02pm the meeting was adjourned. Jim Kvasnicka presented an intriguing program on constellation mythology.

June Observing

Jim Kvasnicka



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

Planets

Venus: Very low in the WNW after sunset at magnitude -3.8.

Mars: Sets by midnight in Gemini.

Saturn: Rises by 12:35 am in Capricornus.

Jupiter: Rises by 1:25 am in Aquarius at magnitude -2.1.

Neptune: Rises by 2:17 am in Aquarius.

Mercury and Uranus: Not visible

Messier List

M58: Galaxy in Virgo.

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

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

M87: Round galaxy in Virgo.

M88: Oval shaped galaxy in Coma Berenices.

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

M91/M98: Galaxies in Coma Berenices.

M99/M100: Galaxies in Coma Berenices.

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

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

NGC and other Deep Sky Objects

NGC 5172: Elongated galaxy in Coma Berenices.

NGC 5248: Oval shaped galaxy in Bootes.

NGC 5676: Oval shaped galaxy in

Bootes.

NGC 5689:
Elongated galaxy in Bootes.

NGC 5927: Class VIII globular cluster in Lupus.

NGC 5986: Class VII globular cluster in Lupus.

Double Star Program List

Sigma Corona Borealis: Yellow stars.

16/17 Draconis: Equal pair of white stars.

Mu Draconis: Close pair of white stars.

Kappa Herculis: Pair of yellow stars.

Alpha Herculis: Orange primary with a greenish colored secondary.

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

Rho Herculis: Two white stars.

95 Herculis: Light yellow pair.

Alpha Librae: Wide pair of yellow-white stars.

Challenge Object

NGC 5915 and NGC 5916: Two faint galaxies in Libra that fit in the same FOV.

Focus on Constellations

Coma Berenices

Jim Kvasnicka

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

Showpiece Objects

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

Globular Clusters: M53, NGC 5053

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

Mythology

Coma Berenices

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

Number of Objects
Magnitude 12.0 and
Brighter

Galaxies: 50

Globular Clusters: 4

Open Clusters: 0

Planetary Nebulae: 0

Dark Nebulae: 0

Bright Nebulae: 0

SNREM: 0



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

Astrophotography With Your Smartphone

David Prosper

Have you ever wanted to take night time photos like you've seen online, with the Milky Way stretched across the sky, a blood-red Moon during a total eclipse, or a colorful nebula? Many astrophotos take hours of time, expensive equipment, and travel, which can intimidate beginners to astrophotography. However, anyone with a camera can take astrophotos; even if you have a just smartphone, you can do astrophotography. Seriously!

Don't expect Hubble-level images starting out! However, you can take surprisingly impressive shots by practicing several basic techniques: steadiness, locked focus, long exposure, and processing. First, steady your smartphone to keep your subjects sharp. This is especially important in low light conditions. A small tripod is ideal, but an improvised stand, like a rock or block of wood, works in a pinch. Most camera apps offer timer options to delay taking a photo by a few seconds, which reduces the vibration of your fingers when taking a shot. Next, lock your focus. Smartphones use

autofocus, which is not ideal for low-light photos, especially if the camera readjusts focus mid-session. Tap the phone's screen to focus on a distant bright star or streetlight, then check for options to fine-tune and lock it. Adjusting your camera's exposure time is also essential. The longer your camera is open, the more light it gathers - essential for low-light astrophotography. Start by setting your exposure time to a few seconds. With those options set, take a test photo of your target! If

your phone's camera app doesn't offer these options, you can download apps that do. While some phones offer an "astrophotography" setting, this is still rare as of 2021. Finally, process your photos using an app on your phone or computer to bring out additional detail! Post-processing is the secret of all astrophotography.

You now have your own first astrophotos! Wondering what you can do next? Practice: take lots of photos using



A small tripod for a smartphone. They are relatively inexpensive – the author found this at a local dollar store!

This article is distributed by NASA Night Sky Network

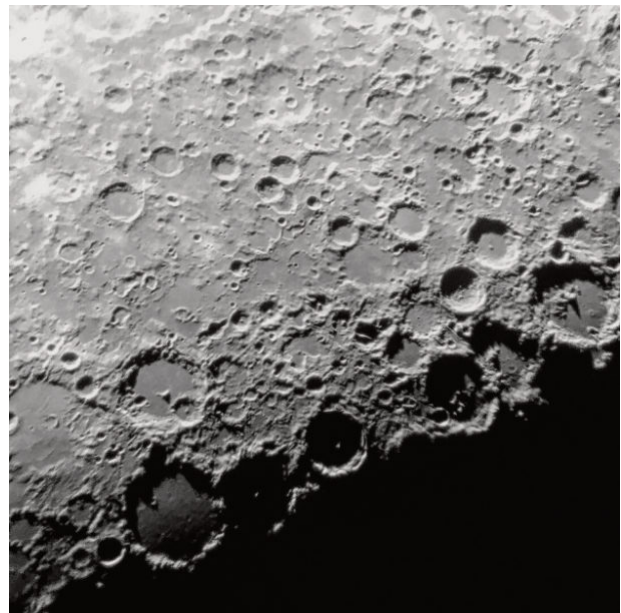
The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

different settings, especially before deciding on any equipment upgrades. Luckily, there are many amazing resources for budding astrophotographers. NASA has a free eBook with extensive tips for smartphone

astrophotography at bit.ly/smartastrophoto, and you can also join the Smartphone Astrophotography project at bit.ly/smartphoneastroproject. Members of astronomy clubs often offer tips or even lessons on

astrophotography; you can find a club near you by searching the “Clubs and Events” map on the Night Sky Network’s website at nightsky.jpl.nasa.gov. May you have clear skies!

The Moon is large and bright, making it a great target for beginners. The author took both of these photos using an iPhone 6s. The crescent moon at sunset (left) was taken with a phone propped on the roof rack of a car; the closeup shot of lunar craters (right) was taken through the eyepiece of a friend’s Celestron C8 telescope.



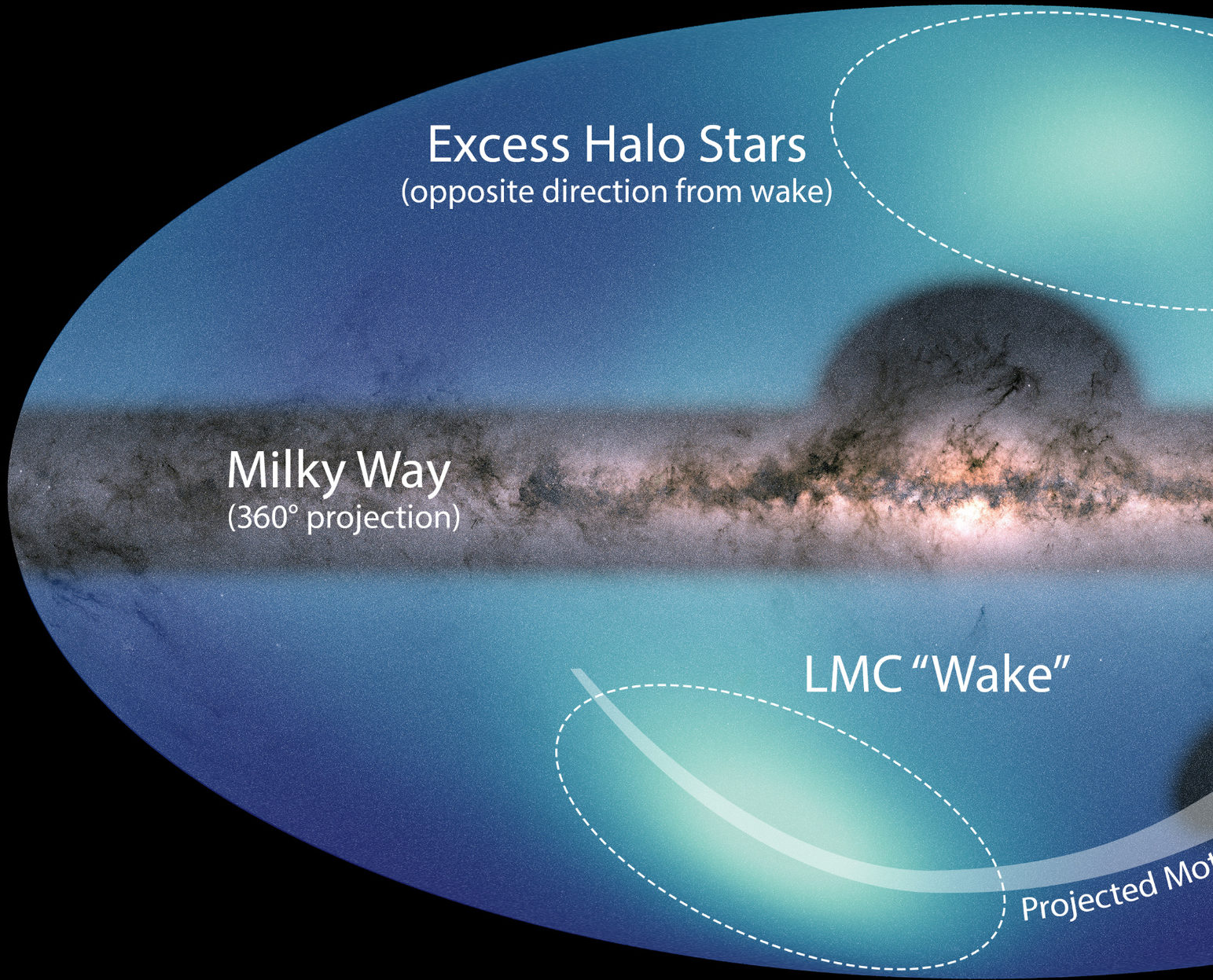
Astronomers Release New All-Sky Map of Milky Way's Outer Reaches

Astronomers using data from NASA and ESA (European Space Agency) telescopes have released a new all-sky map of the outermost region of our

galaxy. Known as the galactic halo, this area lies outside the swirling spiral arms that form the Milky Way's recognizable central disk and is

sparsely populated with stars. Though the halo may appear mostly empty, it is also predicted to contain a massive reservoir of dark matter, a

Observed Density of Stars in the



Excess Halo Stars
(opposite direction from wake)

Milky Way
(360° projection)

LMC "Wake"

Projected Mot

The highlight of the new chart is a wake of stars, stirred up by a small galaxy set to collide with the Milky Way. The map could also offer a new test of dark matter theories.

mysterious and invisible substance thought to make up the bulk of all the mass in the universe.

The data for the new map comes from ESA's Gaia mission and NASA's Near Earth Object Wide Field Infrared Survey Explorer, or NEOWISE, which operated from 2009 to 2013 under the moniker WISE. The study makes use of data collected by the spacecraft between 2009 and 2018.

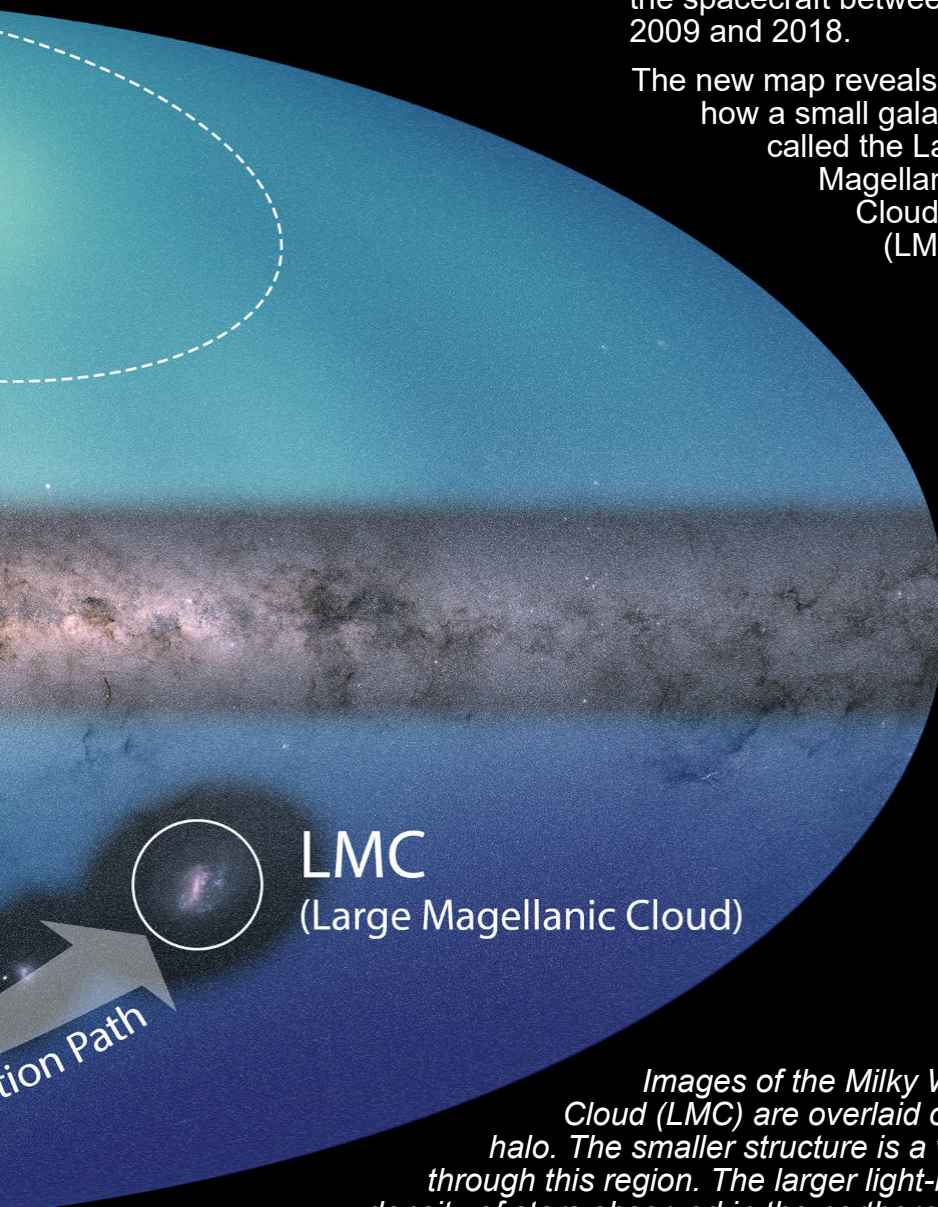
The new map reveals how a small galaxy called the Large Magellanic Cloud (LMC)

– so named because it is the larger of two dwarf galaxies orbiting the Milky Way – has sailed through the Milky Way's galactic halo like a ship through water, its gravity creating a wake in the stars behind it. The LMC is located about 160,000 light-years from Earth and is less than one-quarter the mass of the Milky Way.

Though the inner portions of the halo have been mapped with a high level of accuracy, this is the first map to provide a similar picture of the halo's outer regions, where the wake is found – about 200,000 light-years to 325,000 light-years from the galactic center. Previous studies have hinted at the wake's existence, but the all-sky map confirms its presence and offers a detailed view of its shape, size, and location.

This disturbance in the halo also provides astronomers with an opportunity to study something they can't observe directly: dark matter. While it doesn't emit, reflect, or absorb light, the gravitational

Milky Way's Halo



LMC
(Large Magellanic Cloud)

Images of the Milky Way and the Large Magellanic Cloud (LMC) are overlaid on a map of the surrounding galactic halo. The smaller structure is a wake created by the LMC's motion through this region. The larger light-blue feature corresponds to a high density of stars observed in the northern hemisphere of our galaxy. Credit: NASA/ESA/JPL-Caltech/Conroy et. al. 2021 [Full Image Details](#)

All-Sky Map, continued.

influence of dark matter has been observed across the universe. It is thought to create a scaffolding on which galaxies are built, such that without it, galaxies would fly apart as they spin. Dark matter is estimated to be five times more common in the universe than all the matter that emits and/or interacts with light, from stars to planets to gas clouds.

Although there are multiple theories about the nature of dark matter, all of them indicate that it should be present in the Milky Way's halo. If that's the case, then as the LMC sails through this region, it should leave a wake in the dark matter as well. The wake observed in the new star map is thought to be the outline of this dark matter wake; the stars are like leaves on the surface of this invisible ocean, their position shifting with the dark matter.

The interaction between the dark matter and the Large Magellanic Cloud has big implications for our galaxy. As the LMC orbits the Milky Way, the dark matter's gravity drags on the LMC and slows it down. This will cause the dwarf galaxy's

orbit to get smaller and smaller, until the galaxy finally collides with the Milky Way in about 2 billion years. These types of mergers might be a key driver in the growth of massive galaxies across the universe. In fact, astronomers think the Milky Way merged with another small galaxy about 10 billion years ago.

"This robbing of a smaller galaxy's energy is not only why the LMC is merging with the Milky Way, but also why all galaxy mergers happen," said Rohan Naidu, a doctoral student in astronomy at Harvard University and a co-author of the new paper. "The wake in our map is a really neat confirmation that our basic picture for how galaxies merge is on point!"

A Rare Opportunity

The authors of the paper also think the new map – along with additional data and theoretical analyses – may provide a test for different theories about the nature of dark matter, such as whether it consists of particles, like regular matter, and what the properties of those particles are.

"You can imagine that the

wake behind a boat will be different if the boat is sailing through water or through honey," said Charlie Conroy, a professor at Harvard University and an astronomer at the Center for Astrophysics | Harvard & Smithsonian, who coauthored the study. "In this case, the properties of the wake are determined by which dark matter theory we apply."

Conroy led the team that mapped the positions of over 1,300 stars in the halo. The challenge arose in trying to measure the exact distance from Earth to a large portion of those stars: It's often impossible to figure out whether a star is faint and close by or bright and far away. The team used data from ESA's Gaia mission, which provides the location of many stars in the sky but cannot measure distances to the stars in the Milky Way's outer regions.

After identifying stars most likely located in the halo (because they were not obviously inside our galaxy or the LMC), the team looked for stars belonging to a class of giant stars with a specific light "signature" detectable by NEOWISE. Knowing the basic

properties of the selected stars enabled the team to figure out their distance from Earth and create the new map. It charts a region starting about 200,000 light-years from the Milky Way's center, or about where the LMC's wake was predicted to begin, and extends about 125,000 light-years beyond that.

Conroy and his colleagues were inspired to hunt for LMC's wake after learning about a team of astrophysicists at the University of Arizona in Tucson that makes computer models predicting what dark matter in the galactic halo should look like. The two groups worked together on the new study.

One model by the Arizona team, included in the new study, predicted the general structure and specific location of the star wake revealed in the new map. Once the data had confirmed that the model was correct, the team could confirm what other investigations have also hinted at: that the LMC is likely on its first orbit around the Milky Way. If the smaller galaxy had already made multiple orbits, the shape and location of the wake would be significantly different from what has been observed. Astronomers think the LMC formed in the same environment as the Milky

Way and another nearby galaxy, M31, and that it is close to completing a long first orbit around our galaxy (about 13 billion years). Its next orbit will be much shorter due to its interaction with the Milky Way.

"Confirming our theoretical prediction with observational data tells us that our understanding of the interaction between these two galaxies, including the dark matter, is on the right track," said University of Arizona doctoral student in astronomy Nicolás Garavito-Camargo, who led work on the model used in the paper.

The new map also provides astronomers with a rare opportunity to test the properties of the dark matter (the notional water or honey) in our own galaxy. In the new study, Garavito-Camargo and colleagues used a popular dark matter theory called cold dark matter that fits the observed star map relatively well. Now the University of Arizona team is running [simulations](#) that use different dark matter theories to see which one best matches the wake observed in the stars.

"It's a really special set of circumstances that came together to create this scenario that lets us test our dark matter theories," said Gurtina Besla, a co-

author of the study and an associate professor at the University of Arizona. "But we can only realize that test with the combination of this new map and the dark matter simulations that we built."

Launched in 2009, the WISE spacecraft was placed into hibernation in 2011 after completing its primary mission. In September 2013, NASA reactivated the spacecraft with the primary goal of scanning for near-Earth objects, or NEOs, and the mission and spacecraft were renamed NEOWISE. NASA's Jet Propulsion Laboratory in Southern California managed and operated WISE for NASA's Science Mission Directorate. The mission was selected competitively under NASA's Explorers Program managed by the agency's Goddard Space Flight Center in Greenbelt, Maryland. NEOWISE is a project of JPL, a division of Caltech, and the University of Arizona, supported by NASA's Planetary Defense Coordination Office.

From the Archives

May, 1977

I drove by the Hyde Memorial Observatory the other evening, and I was pleased to see the progress being made. The concrete floors are in place and the frames for the walls are up, with plywood sheathing already on. I am no expert but as far as I can tell, the construction work seems to be of good quality.

Also, I can report that the lights from the baseball fields are not as much of a problem as I had feared. On a good clear night I don't think they will be noticeable.

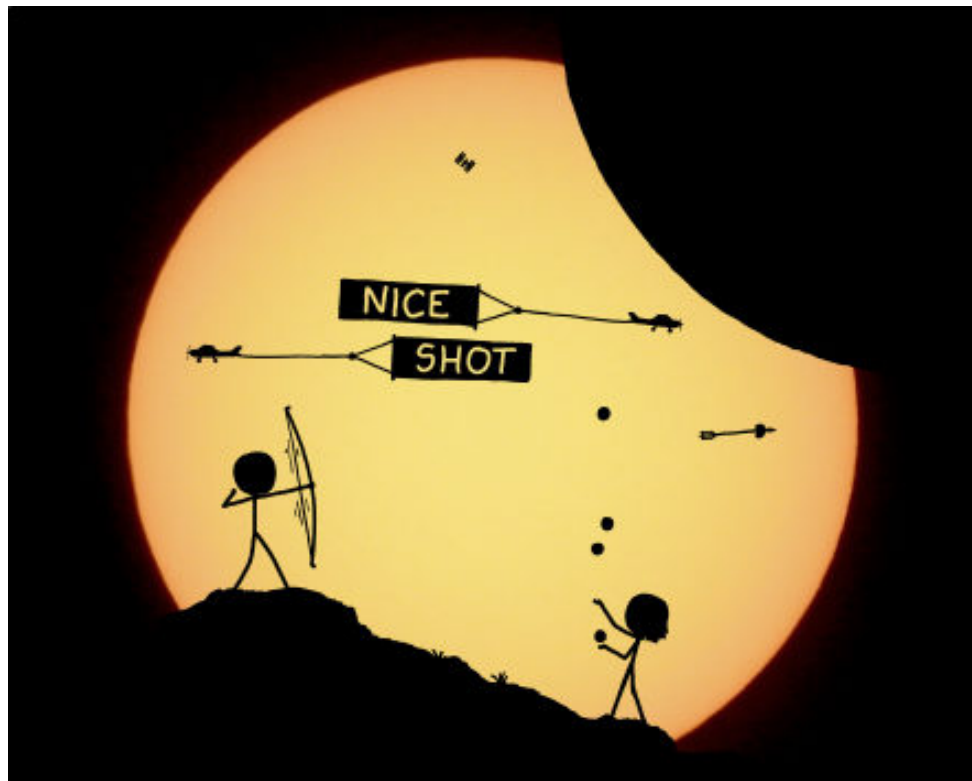
In regard to our eight inch telescope, we are going to need to send for certain parts (such as eyepieces) right away in order to get them in time, so we will need to make some

decisions at the next meeting.

We will be having a Gateway show on the 26th (before the date of our May meeting) and will report on the turnout. Keep the 23rd of June in mind for our next Gateway show, weather permitting.

One more reminder about the conventions coming up. Our Mid-States Convention (see story below) will be in Wichita on June 17-18 and 19. The National Astronomical League convention will be held in Boulder, Colorado August 10—13. These will both be well worth going to. See you at the meeting !

—Larry Stepp



OUR ASTROPHOTOGRAPHY COMMUNITY'S
ONE-UPSMANSHIP IS GETTING OUT OF HAND.

xkcd.com

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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