

The Prairie Astronomer

April 2022 Volume 63, Issue #4

IN THIS ISSUE: MINI MESSIER MARATHON
PERSEVERANCE ROVER
ARP 42



April Program:
"Chasing Radio
Galaxies Across the
Universe" Dr. Emily
Moravec



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer



NEXT MEETING AND PROGRAM

April 26, 7:30pm: Chasing Radio Galaxies Across the Universe

Our speaker will be Emily Moravec. “The jets of active galaxies can produce spectacular structures in the radio wavelengths known as a radio galaxy. The morphology and characteristics of the jets of a radio galaxy can be used as a diagnostic to understand the physics occurring within and surrounding it. In this talk, I will first introduce active galactic nuclei (AGN), radio galaxies, galaxy clusters, and studying these astronomical objects with radio telescopes. I will then present the results of several investigations of the interplay between radio AGN and their environment that use multi-wavelength observations of AGN in massive galaxy clusters.”

FUTURE PROGRAMS

June: Solar Observing Party

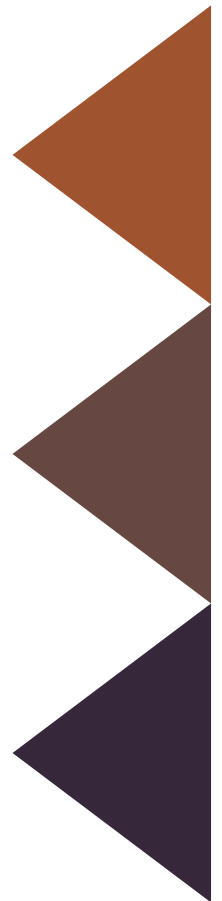
August: Review of NSP

October: Club Viewing Night

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Cover: NASA’s Perseverance Mars rover looks back at its wheel tracks on March 17, 2022, the 381st Martian day, or sol, of the mission. Photo Credit NASA/JPL-CalTech



CALENDAR

PAC Meeting
 Program: Chasing Radio Galaxies Across the Universe, Emily Moravec
 April 26, 7:30pm

Astrophotography class at Hyde Observatory
 May 5, 7pm.

Midstates Astronomical League Conference, June 3-5, St. Louis, Missouri

Nebraska Star Party
 July 24-29, Merritt Reservoir, Valentine, NE

ALCON, New Mexico, July 28-30

2022 STAR PARTY DATES

	Date	Date
January	28	2/5
February	25	3/4
March	25	4/1
April	22	29
May	20	27
June	17	24
July	22	29
NSP	7/24	7/29
August	19	26
September	23	30
October	21	28
November	18	25
December	16	23

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

CLUB OFFICERS

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www.prairieastronomyclub.org

Meeting Minutes

Jim White

Bob Kacvinsky called the meeting to order at 7:40 pm. Tonight's meeting is being held in person at Hyde Observatory and also on-line through Zoom. Tonight's presentation after the meeting will be live on-line through Zoom with JPL mechanical engineer Evan Hilgemann, who received his mechanical engineering degree from the University of Nebraska and works on the team responsible for driving Perseverance on Mars. Tonight's presentation is "How To Drive A Rover On Mars/ Perseverance Year One Successes."

Bob turned the meeting over to Jim Kvasnicka for his monthly observing report for the month of April, which is available in this newsletter along with a look ahead at May. We had a star party on March 25th at the observing site near Cortland. We had three mentee's attend for a total of eight people and had a few people at Branched Oak Observatory. A couple of the mentors and mentees were able to complete the observing challenge from the Astronomical League

and observe 12 of the 22 galaxies on the AL list. There is another star party for this coming Friday, April 1st, although the weather forecast does not look good. Looking ahead to the month of April, star parties are scheduled for the 22nd and 29th. Jim turned the meeting back over to Bob at 7:50.

We got some good feedback from mentees who attended the star party on the March 25th and between the club site and Branched Oak Observatory we had a total of 17 people in attendance. PAC has been accepted as one of the 400 locations across the country for the first image Webb telescope event. We don't know when this will be but it is expected to happen sometime between the middle of July and September. What we have committed to is possibly featuring it at a club meeting for the public, we have also reached out to the science coordinator at LPS, the Hyde board and Brett and Mike at Branched Oak Observatory to see about

collaborating on this event. One idea for consideration would be presenting a Hubble image next to a Webb image, the Hubble image being visual (RGB) and the Webb image in infrared. Bob asked for a show of hands for people willing to be on a committee to work on a plan for the Webb event(s). Lee, Dave, Ron, myself who were in-person at the meeting volunteered and Bob asked that anyone attending online or in-person who is interested could send him a text or email. We would like to put together a meeting toward the middle or latter part of April to discuss things that we can do from July through October. Stay tuned!

Events!

On hold right now is Hyde, due to the pandemic, but we are in the green now, so a target date for re-opening Hyde to the public could be Saturday, April 23rd. April's meeting will feature Emily Moravec talking about radio telescopes, she will join us online through Zoom. Brett said that Friday, April 1st

Branched Oak Observatory is having a public Messier marathon if the weather cooperates. On May 5th PAC is having an astrophotography class from 7:00pm to 8:00pm for those that are interested, more details to come.

John Reinert is continuing to work with the integration team to work on a web based dues collection service and some of this takes us into a paperless realm so he wants to make sure of the accounting and that it's a

seamless process for the membership. John has some questions that he is addressing and it is coming along. If your dues are due please keep them up to date.

Upcoming events, ALCON will be July 28th to 30th in Albuquerque, New Mexico which overlaps NSP (Nebraska Star Party). MSRAL (Mid States Region of the Astronomical League) is June 1st to 3rd just outside of Columbia, Missouri. Rocky Mountain Star Stare (<https://>

[rmss.org](https://)) is June 22nd to 26th and is outside of Colorado Springs at around 7600 ft. Bob Kacvinsky and Jim Kvasnicka are planning to attend so if anyone else is interested feel free to get in touch with Bob or Jim. Okie-Tex Star Party is September 23rd to October 1st.

The club meeting was adjourned at 8:00pm and turned over to our guest speaker Evan Hilgemann from JPL.

The April program will be presented by Dr. Emily Moravec, via Zoom.

Dr. Emily Moravec is a postdoctoral fellow at Green Bank Observatory. She grew up in Nebraska, then she went North to receive her B.A. from St. Olaf College in 2014 with a major in Physics, and then went South to receive her M.S. and Ph.D. from the University of Florida in 2019 in Astronomy. In 2020, she moved internationally to Prague, Czech Republic for her first postdoc to work at the Astronomical Institute of the Czech Academy of Sciences and then came back to the US in October 2021 to start at Green Bank Observatory. Emily is a radio astronomer who investigates the evolution of active galaxies.



The President's Message

Bob Kacvinsky



Spring has sprung !! Kinda. Temps close to 90 one day and mid 30's the next means we are starting to get back to "normal" in Nebraska. Normal in many ways with Hyde opening this month, Star Party attendance is gaining, monthly meetings back live at Hyde, and requests for public events starting to trickle in. We may not be quite back to a past normal but definitely at a new normal.

PAC's next meeting will be Tuesday, April 26th at 7:30 pm. Our speaker will be Emily Moravec who will update us on her exciting research in radio astronomy from Green Bank. This is a great break away from our normal visual observing programs. Special thanks to Jack Dunn and Bill Lohrberg for coordinating our speaker this month.

Special thanks to those who have already completed the Astronomical League's Special Galactic Observing Challenge. Our mentorship participants and several members have already completed the project. Please be sure to turn in your

observing logs to Jim Kvasnicka for submission. If you have not yet finished the program, don't fret, the program runs through to the end of June. Most observers have been able to finish the program in a single evening session (2-3 hours). The program requires observing 12 bright spring objects from a list of 22 provided by the AL. Nine of the objects are brighter (9 or lower magnitudes) and could possibly be done with binoculars at a dark sky site like the Farm. Let's see how many of the club can complete the program. If you need a copy of the observing list or an observing log sheet, please contact Jim Kvasnicka for a copy.

The Lincoln risk dial has been lowered into the green this month, so the Hyde Board has targeted reopening Hyde Observatory on April 23rd. If you would like to help out as a Supervisor, Deck Lead, or deck worker please let any of the PAC officers know or drop me an email and I will forward it to the coordinator. There are high school

volunteers that operate the telescopes with only a little basic training, so you don't need to be a rocket scientist to help out. Most volunteers only work once every 6 weeks, so the time commitment is minimal. Come give it a try, you will find it is a lot of fun seeing the expressions of a 5-year-old seeing Saturn's rings for the first time.

The new PAC Shed is up and the outside has been painted. Once warm weather returns the inside painting will be finished and Katelyn Farneth has offered to share her artistic talents to add a little "space" to the final outside view. Once completed we will move our loaner equipment to the shed for easier access for members. Rick Littrell has taken on the management of the equipment loaning coordination. Stay tuned for more details and information.

At the March meeting we announced that PAC has been approved as a program site for the first images released from the

Webb Space Telescope. A committee of volunteers will be meeting to begin the planning for activities. We will be part of a national celebration of public events to share the exciting astronomy images with the public. PAC has successfully reached out to coordinate our activities with the Hyde Board, Branched Oak Observatory, LPS, Nebraska Lead Up Program, and potentially OAS. If you would like to be part of the planning process please let any

PAC officer know.

Checkout the newsletter for upcoming observing events including early June MSRAL in St Louis, late June Rocky Mountain Star Stare west of Colorado Springs (4 members attending to date), NSP at the end of July, to mention a couple. PAC, OAS, and Chicago astronomers are meeting this month at Lord Ranch near Valentine, NE to work on spring galaxy programs. If you want to get out and observe there

are a lot of great options available including our monthly star parties.

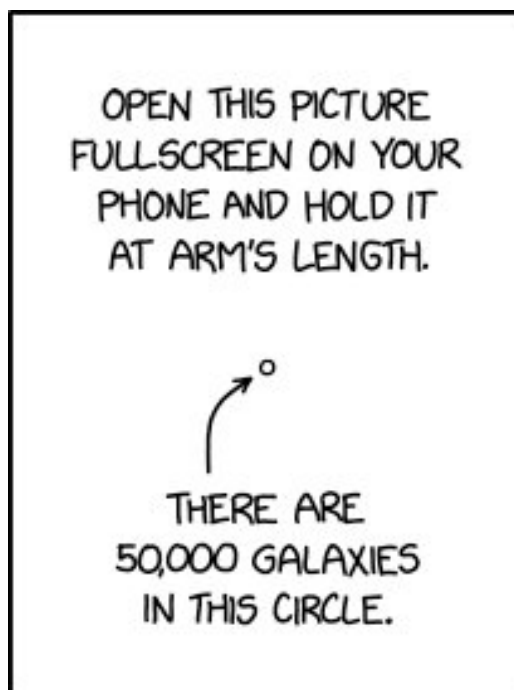
Look forward to seeing all at an upcoming PAC meeting live or via Zoom, and our star parties. Emphasis on the word "parties".

Wish you all Clear Dark Skies – and hopefully a few daily rain showers.

Bob Kacvinsky
kacvinskyb@yahoo.com
402-840-0084

Feedback from a visitor to a recent PAC star party:

I can't thank you enough, my mind is absolutely blown at the things I saw! I can't believe how much stuff is out there, my mind is just flabbergasted. Honestly seeing that stuff in real life was beyond my wildest dreams and expectations thank you guys so so so very much!!! I have so many vivid pictures in my mind it's just crazy, I am fascinated with what I got to experience tonight!



ASTRONOMY FACT: THERE ARE TOO MANY GALAXIES.

xkcd.com

29th Annual Nebraska Star Party



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

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

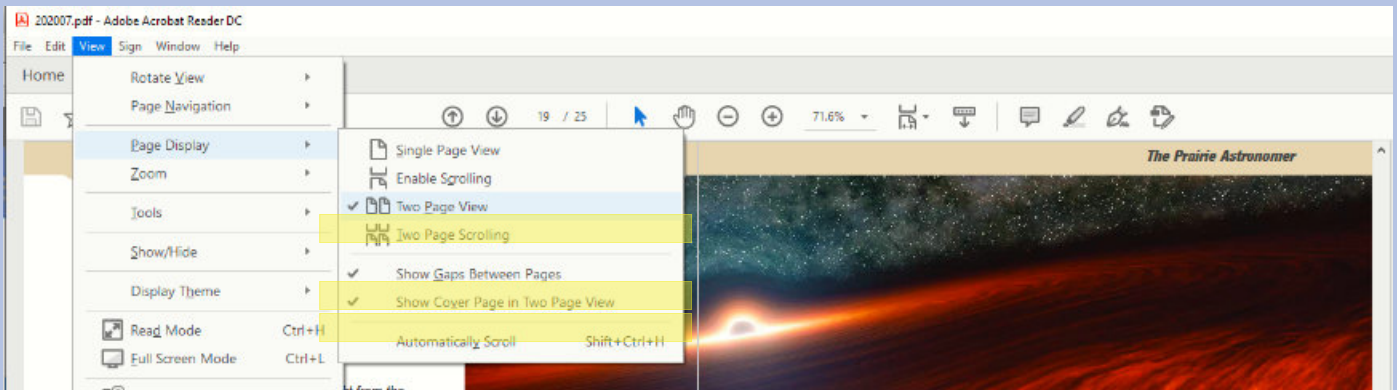
**July 24-29 at Merritt Reservoir, Valentine,
Nebraska**

[Online Registration is now open](#)

Notices

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](https://www.prairieastronomyclub.org/newsletters)

PAC-LIST

Subscribe through [GoogleGroups](#) or contact Mark Dahmke to be added to the list. You'll need a Google/gmail account, but if you want to use a different email address, just associate that address with your google account to access Google Groups. Once subscribed, you can view message history through the GoogleGroups website.

To post messages to the list, send to this address: [pac-
list@googlegroups.com](mailto:pac-list@googlegroups.com)



Rick Johnson

ARP 42

Arp 42/NGC 5829 and IC 4526 falls under Arp's category of spiral galaxies with a low surface brightness companion on an arm. Though in this case, I can't see that the companion is on a spiral arm nor that it is of low surface brightness. It seems rather bright in my image. The wrap around arm is very faint, however. The pair is located in the constellation of Bootes about... Houston we've had a problem. Seems the red shift distance to NGC 5829, the nice spiral is 265 million light-years but the "companion" has a redshift distance of 620 million light-years according to NED. If correct, it isn't a companion at all but a distant background galaxy. Adding to the confusion is that both are members of the Hickson 73 galaxy group. This is described in a note at NED as: "Hickson 73 - Group is actually formed by a bright low redshift galaxy - detected also at radio wavelengths - plus an accordant triplet at

much higher redshift. Galaxy e is a background object." These 5 galaxies are noted on the annotated image with the prefix 73 and the Hickson letter followed by its redshift distance. Why the 6th blue galaxy at the distance as NGC 5829 isn't included in the group I don't know. It would seem worthy of inclusion. The galaxy was discovered by Edouard Stephan on May 11, 1882.

Arp's comment on this one indicates he likely didn't realize they weren't related when he commented: "Faint bifurcated arm to companion, one faint arm on companion coiled in same direction as parent."

The close spiral is classed at NED as SA(s)c with HII emission. The "companion", (IC 4526), is classed as Im. It was discovered by Stephane Javelle on July 25, 1903.

Note the two very blue spots in the bifurcated arm. The lower one is bigger



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 42, continued.

than the upper. At NED it is shown as an HII region in the VV catalog and a galaxy in the Sloan survey. NED, however, has an essential note saying it is most likely an HII region in the arm. The upper one only has a Sloan entry and also as a galaxy. NED has no essential note. Still, I think it likely is another HII region in the galaxy.

Near the northeastern member of the Hickson group is the center of a small galaxy cluster, MaxBCG J225.70820+23.36644 at 2.3 billion light-years. Its center is marked by a bright galaxy at the same distance. The cluster is listed as having 14 members with no diameter given. South of Arp 42 is another galaxy cluster marked by a bright galaxy. The cluster is [EAD2007] 349 with 28 members but no diameter. It's about 2.3 billion light-years distant estimated with the core galaxy at 2.2 billion light-years. At the very bottom of my image near the center is the center of Abell 2017 with a diameter of 24 minutes, a richness class of 1

(which someone else with need to interpret) and a distance of 1.5 billion light-years. Seems we have a lot of likely overlapping galaxy clusters here. At least 6 more are within a few minutes beyond the north and south edges of my image. But the one apparently obvious cluster I see about 2 minutes northeast of the galaxy at 1.6 billion light-years that is northeast of Arp 42 isn't listed at NED. There's a dozen or more in a 1 minute radius, none of which have a redshift distance though they are listed at NED, usually with a Sloan position.

To the upper right of Arp 42 is one Arp missed. Two very distant galaxies merge into one in my image except their different color gives them away. One is blue with a tail going down, the other rather red with a tail going to the right. Only the blue one has a redshift which puts it at 1.4 billion light-years. They look like two merging tadpoles. The blue galaxy is SDSS J150202.65+232518.8, the red one 2MASX J15020259+2325187.

Now to convince Hubble to take a look, though it hasn't even looked at Arp 42 as yet.

I did it again. In the upper left corner is an asteroid trail. Unfortunately, it is another unknown at the Minor Planet Center. It was taken April 9, 2010 so too late for me to follow up on it. It will be unknown a while longer it appears. Edit: While this asteroid was unknown in 2010 it was discovered officially in 2011 and is now known as 2011 WP45 at an estimated magnitude of 20.1 when I took my image. I've left it as unknown on the annotated image as it was unknown at the time the image was taken.

Focus on Constellations

Canes Venatici

Jim Kvasnicka

Canes Venatici, the Hunting Dogs, is a constellation with few stars but rich in galaxies. Almost all of the galaxies in Canes Venatici are visible in a small telescope. Looking towards Canes Venatici we seem to be looking through three layers of galaxy groups. The closest group the Canes Venatici I Cloud is an average of 20 million light years distant. It includes M94 and M106. The next group the Canes Venatici II Cloud is centered 35-40 million light years away and includes M51 and M63. The third layer of galaxies in Canes Venatici is 70-80 million light years distant. Besides the four Messier galaxies, M51, M63, M94, and M106, Canes Venatici contains one of the three brightest globular clusters in the northern hemisphere in M3. The constellation Leo is best seen in May.

Showpiece Objects

Galaxies: M51, M63, M94, M106, NGC 4244, NGC 4449, NGC 4631, NGC 5005

Globular Clusters: M3

Multiple Stars: Alpha Canes Venatici (Cor Caroli), 2 Canes Venatici

Mythology

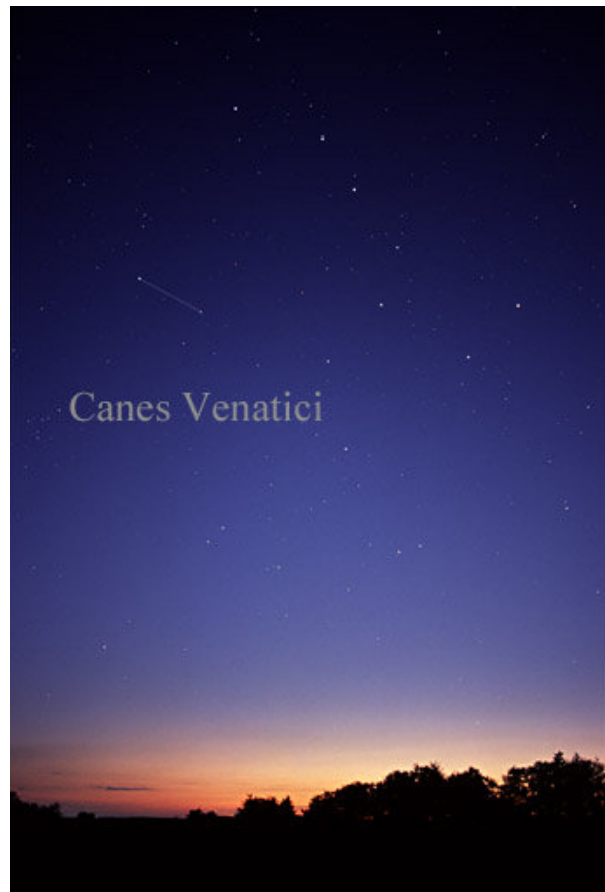
Canes Venatici was introduced by the Polish astronomer Johannes Hevelius in 1690. It represents the two dogs Asterion and Chara, both held on a leash by Bootes as they chase the Great Bear

around the North Pole.

Number of Objects Magnitude 12.0 and Brighter

Galaxies: 44

Globular Clusters: 1



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

NASA's Perseverance Rover Hightails It to Martian Delta

The rover's self-driving capabilities will be put to the test this month as it begins a record-breaking series of sprints to its next sampling location.

NASA's Perseverance Mars rover is trying to cover more distance in a single month than any rover before it – and it's doing so using artificial intelligence. On the path ahead are sandpits, craters, and fields of sharp rocks that the rover will have to navigate around on its own. At the end of the 3-mile (5-kilometer) journey, which began March 14, 2022, Perseverance will reach an ancient river delta within Jezero Crater, where a lake existed billions of years ago.

This delta is one of the best locations on Mars for

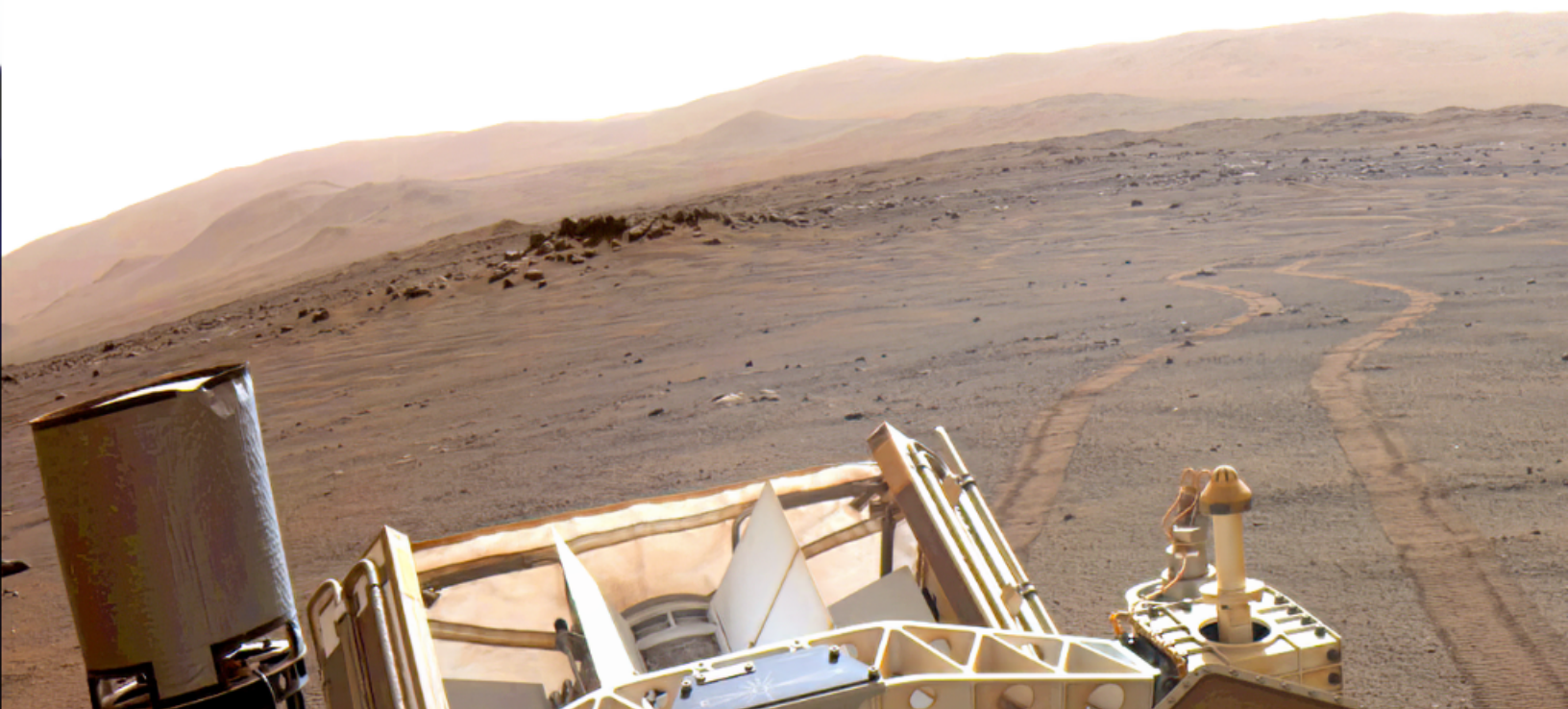
the rover to look for signs of past microscopic life. Using a drill on the end of its robotic arm and a complex sample collection system in its belly, Perseverance is collecting rock cores for return to Earth – the first part of the Mars Sample Return campaign.

“The delta is so important that we've actually decided to minimize science activities and focus on driving to get there more quickly,” said Ken Farley of Caltech, Perseverance's project scientist. “We'll be taking lots of images of the delta during that drive. The

closer we get, the more impressive those images will be.”

The science team will be searching these images for the rocks they'll eventually want to study in closer detail using the instruments on Perseverance's arm. They'll also hunt for the best routes the rover can take to ascend the 130-foot-high (40-meter-high) delta.

But first, Perseverance needs to get there. The rover will do this by relying on its self-driving AutoNav system, which has already set



impressive distance records. While all of NASA's Mars rovers have had self-driving abilities, Perseverance has the most advanced one yet.

"Self-driving processes that took minutes on a rover like Opportunity happen in less than a second on Perseverance," said veteran rover planner and flight software developer Mark Maimone of NASA's Jet Propulsion Laboratory in Southern California, which leads the mission. "Because autonomous driving is now faster, we can cover more ground than if humans programmed every drive."

How Rover Planning Works

Before the rover rolls, a team of mobility planning experts (Perseverance has 14 who trade off shifts) writes the driving commands the robotic explorer will carry out. The

commands reach Mars via NASA's Deep Space Network, and Perseverance sends back data so the planners can confirm the rover's progress. Multiple days are required to complete some plans, as with a recent drive that spanned about 1,673 feet (510 meters) and included thousands of individual rover commands.

Some drives require more human input than others. AutoNav is useful for drives over flat terrain with simple potential hazards – for instance, large rocks and slopes – that are easy for the rover to detect and work around.

Thinking While Driving

AutoNav reflects an evolution of self-driving tools previously developed for NASA's Spirit, Opportunity, and Curiosity rovers. What's different for AutoNav is "thinking while driving" –

allowing Perseverance to take and process images while on the move. The rover then navigates based on those images. Is that boulder too close? Will its belly be able to clear that rock? What if the rover wheels were to slip?

Upgraded hardware allows "thinking while driving" to happen. Faster cameras mean Perseverance can take images quickly enough to process its route in real-time. And unlike its predecessors, Perseverance has an additional computer dedicated entirely to image processing. The computer relies on a single-purpose, super-efficient microchip called a field-programmable gate array that is great for computer vision processing.

"On past rovers, autonomy meant slowing down because data had



Perseverance, continued.

to be processed on a single computer,” Maimone said. “This extra computer is insanely fast compared to what we had in the past, and having it dedicated for driving means you don’t have to share computing resources with over 100 other tasks.”

Of course, humans aren’t completely out of the picture during AutoNav drives. They still plan the basic route using images taken from space by missions like NASA’s Mars Reconnaissance Orbiter. Then, they mark obstacles such as potential sand traps for Perseverance to avoid, drawing “keep out” and “keep in” zones that help it navigate.

Another big difference is Perseverance’s sense of space.

Curiosity’s autonomous navigation program keeps the rover in a safety bubble that is 16 feet (5 meters) wide. If Curiosity spots two rocks that are, say, 15 feet (4.5 meters) apart – a gap it could easily navigate – it will still stop or travel around them rather than risk passing through.

But Perseverance’s

bubble is much smaller: A virtual box is centered on each of the rover’s six wheels. Mars’ newest rover has a more sensitive understanding of the terrain and can get around boulders on its own.

“When we first looked at Jezero Crater as a landing site, we were concerned about the dense fields of rocks we saw scattered across the crater floor,” Maimone said. “Now we’re able to skirt or even straddle rocks that we couldn’t have approached before.”

While previous rover missions took a slower pace exploring along their path, AutoNav provides the science team with the ability to zip to the locations they prioritize the most. That means the mission is more focused on its primary objective: finding the samples that scientists will eventually want to return to Earth.

More About the Mission

A key objective for Perseverance’s mission on Mars is astrobiology, including the search for signs of ancient microbial life. The rover will characterize the planet’s geology and past climate,

pave the way for human exploration of the Red Planet, and be the first mission to collect and cache Martian rock and regolith (broken rock and dust).

Subsequent NASA missions, in cooperation with ESA (European Space Agency), would send spacecraft to Mars to collect these sealed samples from the surface and return them to Earth for in-depth analysis.

The Mars 2020 Perseverance mission is part of NASA’s Moon to Mars exploration approach, which includes Artemis missions to the Moon that will help prepare for human exploration of the Red Planet.

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

May Observing

Jim Kvasnicka



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

Planets

Venus, Jupiter, Mars, and Saturn: All four planets are in the morning before sunrise.

On May 1 Jupiter and Venus are separated by just 33'.

Mercury: In the evening after sunset.

Uranus and Neptune: Both are not visible.

Total Lunar Eclipse

May 15-16. The partial eclipse starts at 9:28 pm. Totality runs from 10:29 pm to 11:54 pm with the partial eclipse ending by 12:56 am.

Messier List

M49/M61: Galaxies in Virgo.

M51: The Whirlpool Galaxy in Canes Venatici.

M63: The Sunflower Galaxy in Canes Venatici.

M64: The Black Eye Galaxy in Coma Berenices.

M85/M94: Galaxies in Coma Berenices and Canes Venatici.

M101: The Pinwheel Galaxy in Ursa Major.

M102: Galaxy in Draco.

M104: The Sombrero Galaxy in Virgo.

Last Month: M40, M65, M66, M95, M96, M105, M106, M108, M109

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

NGC and other Deep Sky Objects

NGC 4244: The Silver Needle Galaxy in Canes Venatici.

NGC 4651/4656: The Whale Galaxy and Hockey Stick galaxies in Canes Venatici.

NGC 4666: Elongated galaxy in Virgo.

NGC 4754/4762: Galaxy pair in Virgo.

NGC 4866: Elongated galaxy in Virgo.

Double Star Program List

Kappa Bootis: Yellow and blue stars.

Iota Bootis: Yellow and dim blue pair.

Pi Bootis: Pair of white stars.

Epsilon Bootis: Yellow and greenish yellow stars.

Xi Bootis: Yellow pair.

Delta Bootis: Yellow primary with a blue-white secondary.

Mu Bootis: Two yellow stars.

Zeta Corona Borealis: Light blue and greenish yellow stars.

Challenge Object

Markarian's Chain: Galaxy group along the Virgo and Coma Berenices border. How many can you fit in your FOV?

Mini Messier Marathon

Brett Boller

After being canceled on Friday due to weather Branched Oak Observatory hosted the first annual Messier Marathon although it was a mini marathon held from 9-12 or so we thought. Clear skies at 9pm as the sun went away greeted us and everyone was off running. Brian and Brett had the 150 Esprit refractor and 11" Schmidt Cass going in their roll off. Lee Taylor was on the field. David Dickinson and Kendra Sibbernson both had their EV scopes going and Michael Sibbernson was getting his 14" Schmidt with 102 refractor piggybacked inside the dome up and running along with teaching the group of visitors about the messier objects that we were going to see tonight.

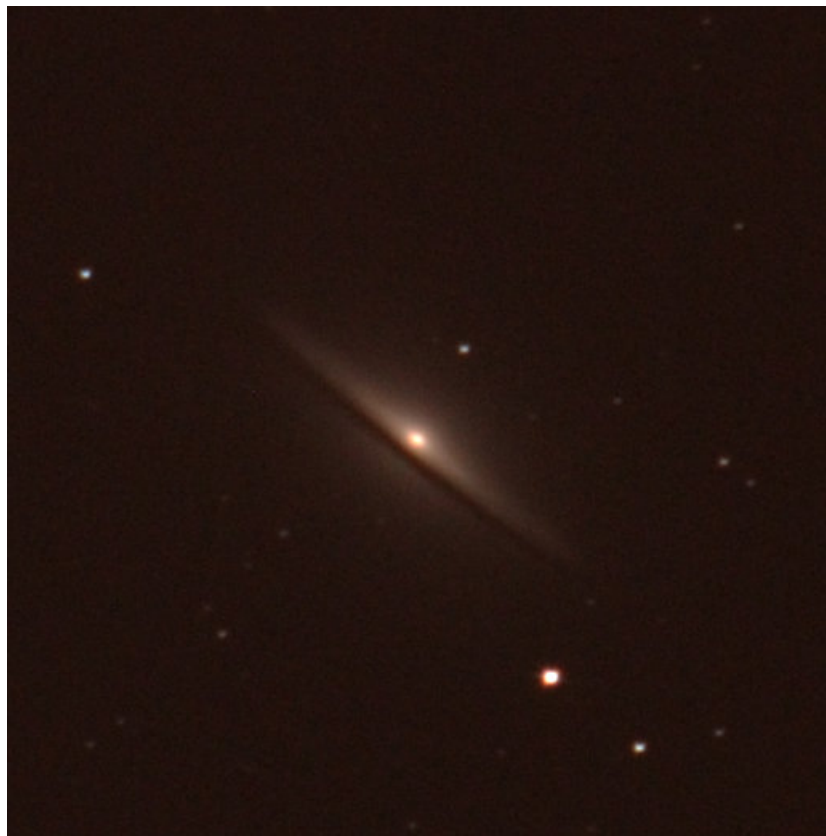
Up in the BSO Brian and I started off with M74 and M77 and unfortunately they were just in the tree branches on the western horizon. M52 was the first view I got for the night. Next up we slewed over to M31 and due to the sun still barely below the horizon we could just make out the core. Very different from the views of NSP. Unfortunately 32 and 110 were not visible. The Triangulum Galaxy was too dim to see so

onto the little dumbbell and boy was that hard to visualize, but barely picked it up in the Esprit.

Due to the sun we were running a little behind schedule from what BOO had provided for a schedule. The good part was we were getting away from the western horizon and able to see brighter objects and in darker parts of the skies. By this time Brian's daughter and grandsons came and we

started to get some public walking into the observatory. The beehive, Orion Nebula, M78, M78 were easily picked up. We slewed over to the Crab Nebula and had incredible views with Brian providing some education to his grandsons and the public.

It was about 9:30 and we came up on a list of Open Clusters to look at. We checked off M36, M37, M38, M35 and M50. It



Sombrero Galaxy, Skywatcher Esprit 150mm, Canon T7i, Deep Sky Stacker, Photoshop, 20 – 30 second images
Iso 6400

was the first time for Brian's Family had to be out at the observatory so they went off on a tour of the grounds. I continued to work on the Open clusters that remained. I finished up the group with M46/47, M93, M48, M67, and M44.

At about 10:15 I was able to catch M95 spiral galaxy and then all of a sudden the clouds rolled in and stopped everything. Of course we had groups of people just showing up so we gave tours of all the observatories and showed them all the different types of telescopes and how they worked and how the observatory works. For about an hour the clouds just stayed around and we were heading towards the end of the session.

With maybe a half an hour left in the event the clouds disappeared and the skies opened. With the EV scopes of the field the small crowd got to see a bunch of objects quickly. With the small crowd amazed at the EV scopes, I grabbed my camera and hooked it up to the Esprit in the hopes that I would take a few pictures before we packed up and left.

The skies just kept getting better. The crowd called it a night shortly after midnight and it was just the BOO crew out there. I slewed to the Sombrero galaxy and started taking one minute subs while Dave and Kendra with their EV scopes slewed to the Black Eye Galaxy.



Black Eye Galaxy, Skywatcher Esprit, 150mm, Canon T7i, Deep Sky Stacker, Photoshop, 15- 1 minute images
Iso 3200

We swapped targets and continued imaging.

At 1:30 the real fun happened for the night. As Kendra, Brian, David, and I were around the EV scopes imaging objects. David was kneeling down entering the info for a new object and we were startled by a gasp from Kendra. Coo coo coon. Everyone looks down and right to the side of David is a raccoon with a deer in the headlights look on his face and one hand in David's sack of Doritos while also looking at the computer screen at some messier objects. We'll keep it PG as Brian chased the coon past the fence to the north. We thought we were done with the coon for the night (remember PG). About 15-20 minutes later as I continued to change objects in the Esprit and

photograph other objects Michael started to work on getting the Dome operating with a guide scope and functional through the computers in the control room. I went over to see if I could help. Kendra was in the control room remotely controlling her EV scope. Kendra monitored the computer screen and Michael adjusted the 102mm refractor to match telescope views to the computer.

As we were working in the dome we heard this screeching sound outside, Michael and I looked outside to see Brian chasing another coon around the observatory field. Come to find out it was the same coon. As we watched Brian chase the coon around we knew we needed to get it away from the property as it

wasn't scared of people. As Brian chases the coon trying to get it to go away it starts to feel Brian isn't a threat and starts to arch his back more. Courtesy of Michael's Photoshop skills we watch as Brian tries to kick the coon to go away.

After a few chuckles the coon was removed from the

property and everyone went back to observing and imaging.

After the excitement I continued to image objects and switch every 20-30 minutes as we watched Michael's Observatory come to life.

It was about 4:15 am and the scheduled clouds finally rolled in to blanket the sky for good.

Here are some of the images I was able to capture from the Boller-Sivill Observatory.



Leo Triplet

Skywatcher Esprit 150mm, Canon T7i, Deep Sky Stacker, Photoshop, 40– 1 minute images
Iso 6400



Above: Owl Nebula
Skywatcher Esprit 150mm,
Canon T7i

Deep Sky Stacker, Photoshop,
25– 1 minute images Iso 3200

Pinwheel Galaxy
Skywatcher Esprit 150mm,
Canon T7i, Deep Sky Stacker,
Photoshop, 30– 1 minute
images Iso 6400

Astrophotography



The Moon, Venus, Mars and Saturn, March 28, 2022 at 6:12am. Above: 2 seconds at f/5 150mm focal length, Panasonic Lumx GH5s, ISO 6400. Below: ISO 1600, 2.5 seconds at f/2.8, 70mm, Panasonic Lumix G9. Photos by Mark Dahmke.



Gator-Back Rocks on Greenheugh

March 23, 2022. These rocks form the surface of the "Greenheugh Pediment," a broad, sloping plain in the foothills of Mount Sharp, Mars.



Club Member Profile: David Knisely



Dave has been a member of PAC since 1972

Dave has been an amateur astronomer for over 50 years, starting out at the ripe "old" age of 12 with a cheap 3-inch reflector. A year later he worked up to a somewhat better 2.4-inch refractor. He joined the Prairie Astronomy Club in the fall of 1972 and during that same year, built his first telescope, an 8-inch Newtonian. He remembers the club being a lot smaller back then, around 35 members total, and eagerly looked forward to the monthly meetings and star parties. Dave attended The University of Nebraska, receiving a BS in Physics/Astronomy. While going to school, he remembered the club was always around to help him stay in touch with his friends while away from home. He counts himself among those fortunate enough to see the club play a major part in the development of The Hyde Observatory during 1979 while watching the club grow in both size and activity

level. A year earlier, Dave was appointed club Observing Chairman and held that position for about 15 years where he provided monthly observing reports for the newsletter and scheduled club star parties. On several occasions he has served as Chairman of Astronomy Day and on the observing site committee which eventually helped the club acquire the Atlas Observing site. He purchased a 10-inch Newtonian in 1985, just in time for Halley's Comet to come by.

Dave added, "I got help from one of the founding members of the Club, Rick Johnson, as we both shared two hobbies: amateur astronomy and ham radio. Rick was the one who got me started in observing the sun in H-alpha light, as well as helping me with my early computer issues. The other item was being selected to serve on the Hyde Board of

Supervisors.

Dave was elected Vice President of the club in 1991, and served as President in 1992 and 1993, and again from 1998 to 2004. He has helped out with the Nebraska Star Party since NSP2 and in his own words "I am grateful to those people in our club who had the guts to create this wonderful observing event (my annual "vacation"), too."

As for the future of our club, Dave says: "The thing I most like about our club is its friendly social atmosphere. My hope is that we can continue to provide our members with the kinds of activities



David Knisely, continued.

which make being a club member so much fun. To do this, we do need more of our members to volunteer and become involved in things like the monthly star parties, NSP,

Astronomy Day, Hyde Observatory, and any new projects which we might want to become involved with."

Dave is retired and lives

in Beatrice. His favorite aspects of amateur astronomy are Deep-sky Observing, Solar Observing, and public outreach.



Dave Knisely with Brett Boller at Hyde Observatory

From the Archives

April, 1978

The President's Report - Rick Johnson

Between April showers that were and Northern Lights that weren't, it's been a lousy month for observing. The showers have disclosed a bad leak in the observatory's roof. No! The telescope room is dry, it's the classroom that has turned into a wading pool. The leak seems to be at the base of the solar panels. Hopefully, it will be fixed soon.

The Northern Lights were expected due to a large solar flare. Somehow, the main part of the storm seems to have missed us. At least, I saw no Northern Lights and only got a faint radio indication from them late in the afternoon of the 14th. If any Northern Lights did develop, they did so during the daylight hours when I was at work.

The open house-sky show night at Mead Observatory has been changed to May 5. Last time, the prize for best homemade telescope went begging, since none was on hand. If they are still offering that prize this year, you can probably claim it just by showing up with your homemade telescope. Last time we made a good showing compared to the Omaha club – let's do it again this year.

The Solar Telescope project is ready to start in earnest as soon as we get the cash in hand from the Junior League. Proposed completion date is prior to the start of the public schools in the fall. Assuming the money is forthcoming, the

construction should start rather soon.

I had an irreplaceable transistor go out in my homemade telescope inverter. Necessity being the mother of invention, I came up with a simple circuit using parts I had on hand. It is based on the NE555V timing circuit, but the oscillator section is cheaper and draws 80% less current than the oscillator section of the more typical NE555V circuit that appeared in Sky & Telescope magazine some years ago. Its accuracy is the same as the original circuit. If anyone is interested in the circuit, I can have some schematic drawings made available. See you Tuesday night.

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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