

The Prairie Astronomer

April 2019 Volume 60, Issue #4

***Astronomers Capture
First Image of a
Black Hole***



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer

NEXT PAC MEETING: April 30 at 7:30pm at Hyde Observatory

PROGRAM

For our April meeting, we will be hearing from Julie Allen of the local Lead Up organization on upcoming opportunities to do outreach activities with local youth. We hope to use these opportunities to train and teach the next generation of PAC members and Hyde volunteers! The meeting will be at Hyde on April 30 at 7:30 p.m.

FUTURE PROGRAMS (Tentative)

May: Annual Club Dinner

June: Solar Star Party

July: The History of PAC

August: NSP Review

September: to be determined

October: Club Viewing Night

November: How to Buy a Telescope

December: Club Holiday Gathering

CONTENTS

- 4 Minutes
- 5 President's Message
- 6 Mantrap Skies
- 8 Mars Eclipses
- 10 April Observing
- 11 Double Star
Observing Program
- 12 Curiosity
- 14 Black Hole
- 16 From the Archives
- 17 NSP
- 18 Club Information



The Prairie Astronomy Club:
Fifty Years of Amateur Astronomy

**Buy the book! The Prairie
Astronomy Club: Fifty Years
of Amateur Astronomy.**

Order online from [Amazon](https://www.amazon.com) or
[lulu.com](https://www.lulu.com).

EVENTS



PAC Meeting
 Tuesday April 30, 2018, 7:30pm
 Program: "Lead Up"

PAC Meeting
 Tuesday May 28, 2019, 7:30pm
 Annual Club Dinner

PAC Meeting
 Tuesday June 25, 2019, 7:30pm
 Program: Solar Star Party

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

PAC Meeting
 Tuesday August 27, 2019, 7:30pm

2019 STAR PARTY DATES



Photo by Brian Sivill

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

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



PAC E-MAIL:

info@prairieastronomyclub.org

PAC-LIST:

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

pac-list@googlegroups.com

ADDRESS

The Prairie Astronomer
 c/o The Prairie Astronomy Club, Inc.
 P.O. Box 5585
 Lincoln, NE 68505-0585

WEBSITES

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



Night Sky Network

Meeting Minutes

PAC business meeting 3-26-19 - as recorded by Bill Lohrberg

Jim Kvasnicka conducted the meeting for President Bob Kacvinsky and 2nd vice president Rick Brown who were both not able to attend.

Jim called the meeting to order at 7:31pm – welcoming all in attendance with approximately 16 members and 2 or 3 visitors.

Upcoming events and announcements

- Hyde observatory will be closed until further notice due to the roof being stuck. Lee Thomas added that this notice is on the web site and on the phone answering message. Jim expressed concern on behalf of many that we may lose volunteer participation as a result, but some suggested we could have PAC members bring their own scopes – which Lee agreed is a great idea, especially since there is no way to predict when the roof will be fixed.
- Club star parties March 29th at Branched Oak Observatory, and at the Cortland Farm April 5th weather permitting
- Next PAC meeting April 30th
- Jim stressed the need for PAC volunteers to consider the many outreach activities occurring July 20th Homestead National Monument in Beatrice, Indian Caves State Park, Lead-up Program in Lincoln for solar observing.
- Nebraska Star Party July 28 through August 2nd

Jim proceeded with the observing report for the month of April.

- Messier list for April; M40, 65, 66, 95, 96, 105, 106, 108, 109
- NGC objects 2841, 2903, 3115, 3166, 3169, 3184, 3132

Current news events of interest

- Jim shared that related to the upcoming anniversary of the 1969 moon landing, NASA announced some samples from the moon collected in 1969 will be unsealed for study
- We had fun with an Apollo 11 trivia quiz

The meeting concluded at approximately 7:46pm with no further club business other than a reminder for July 20th help needed for the many activities.

Jim introduced Elsbeth Magilton – Executive director of UNL College of Space, Cyber and Telecommunications Law programs who did a presentation on Space Law.

The President's Message

Bob Kacvinsky

Welcome to SPRING – Finally.

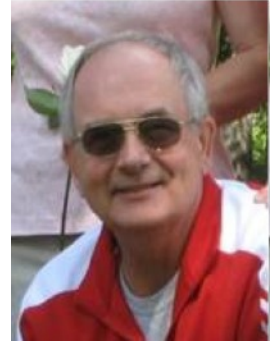
As the weather begins its slow climb up in temps I'm sure all of us are looking forward to getting back outside to enjoy the night skies. This time of year also brings requests from the public to share our hobby passions with star parties and public viewing events.

In July will be the 50th anniversary of the Apollo landing on the moon. There will be several activities surrounding this anniversary in which PAC will have the opportunity to participate. We will keep you informed in the monthly newsletters along with updates at our monthly meetings. With Hyde down for the foreseeable future our club public outreach activities will be critical to support Astronomy.


At the upcoming April meeting, April 30th at 7:30 PM, we will have a presentation from the founder and CEO of "Lead Up", Julie Allen. Lead Up is a program that develops young people from diverse backgrounds to become community leaders. PAC will help to train the 30 members this summer to operate telescopes and conduct a Star Party. Later this fall the 30 youth will partner with PAC members to conduct a large community Star Party. We are looking forward to helping the youth in this leadership opportunity. This opportunity will also help us create more awareness and exposure to youth across Lincoln.

On a personal note, I recently traveled to Rwanda in east central Africa located at 1-2

degrees south. I was able to see both Sirius (Canis Major) and Canopus (Carina) in the same

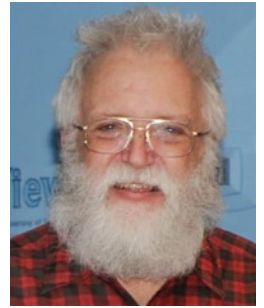


view. These are the brightest two stars outside of the sun in the sky. In the southern horizon was Crux, the Southern Cross where several of the closest stars to our solar system reside. Unfortunately, the 3 nights that we were "in the country" proved to be cloudy with rain so I was not able to get a closer look at some of the binocular objects.



A small asteroid was caught in the process of spinning so fast it's throwing off material, according to new data from NASA's Hubble Space Telescope and other observatories. Image Credit: NASA, ESA, K. Meech and J. Kleyana (University of Hawaii), and O. Hainaut (European Southern Observatory)
[Full caption here.](#)

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.



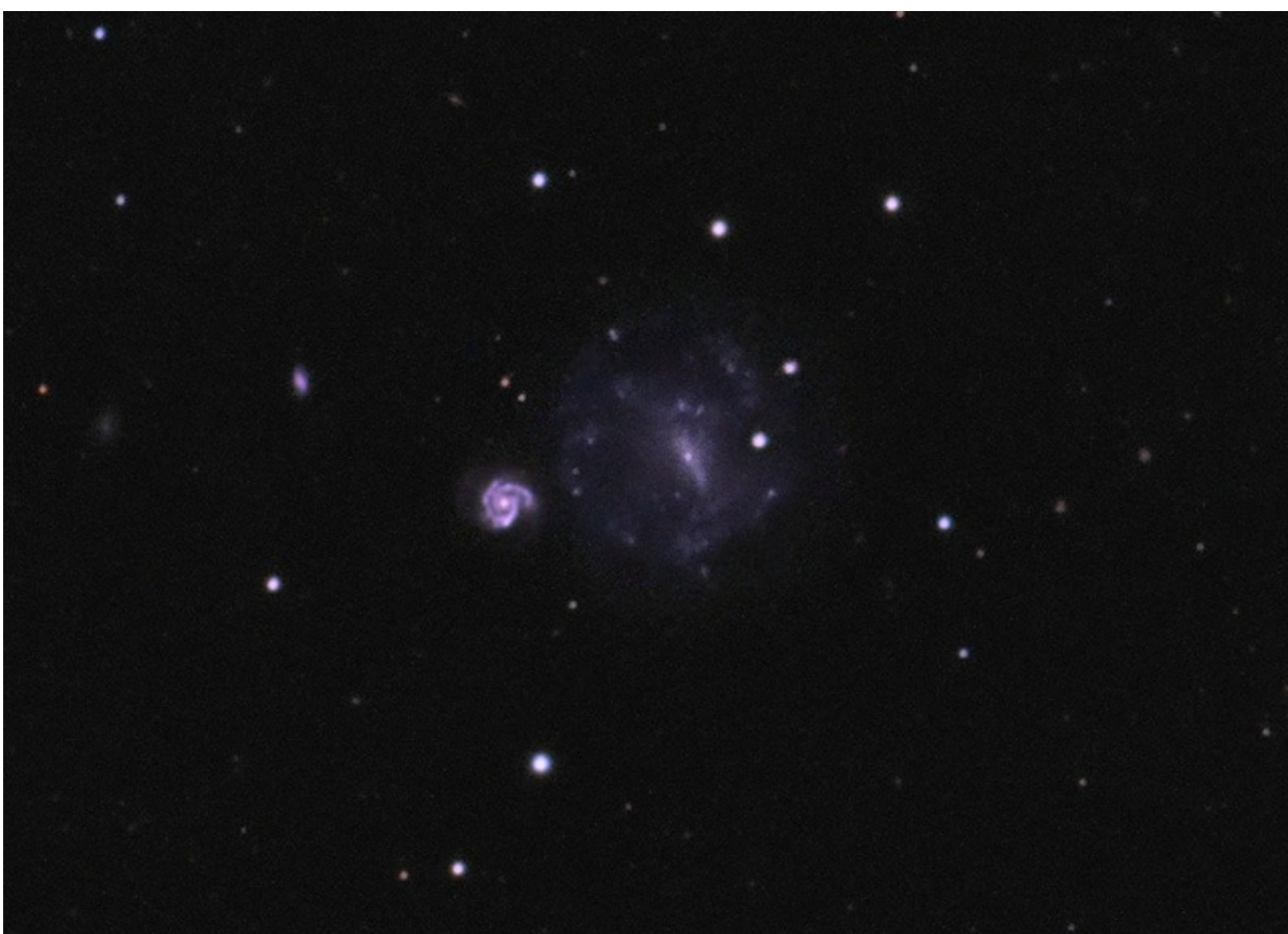
Not surprisingly, Arp 4/MCG -02-05-050 falls under his classification for low surface brightness spiral galaxies. These tend to be very blue. That is the case here. It is quite nearby at only about 60 to 65 million light-years away in the constellation of Cetus. Its classification is IAB(rs)m

indicating it is an irregular galaxy with characteristics of both a barred and normal spiral and falls into the Magellanic class as does our Magellanic clouds.

It has two companions. To the east is the very obvious spiral MCG -02-05-050a. It may carry the same catalog number but it certainly isn't related. Redshift

data puts it at about 630 million light-years or ten times further

away. While an obvious spiral I find no classification at NED. The other companion is star-like and lies on the other side. To find it go to the obvious star



directly west (right) then up steeply to the star-like companion. Seeing was too poor this low in the sky (-12 degrees) to see much of its "fuzz". It is APMUKS(BJ) B014555.12-123703.0. There's no redshift data for it but it isn't very likely related to Arp 4 though some papers call it a companion. There are only two other galaxies in the image with redshift data. One is to the northeast of the bright spiral MCG -02-05-050a. It is an IR galaxy, 2MASX J01483906-1222128, and appears to be a disk galaxy. Its redshift shows a

distance of about 675 million light-years. To its east and slightly south is another low surface brightness galaxy, APMUKS(BJ) B014618.61-123728.4. I find nothing on it however. The only other galaxy with a known redshift is the bright oval galaxy near the west edge of the image a bit below Arp 4. It seems oddly red at one end and blue at the other. Probably an artifact of imaging low and a change in conditions during the color data collection. In any case it is listed at about 370 thousand light-years. As you likely guessed NED has no

classification for it. It too is a galaxy seen by IRAS. It is LEDA 174158/IRAS F01451-1239.

The image contains one asteroid, (256308) 2006 WO185 at an estimated magnitude of 19.0. It is east of Arp 4. There's little else of interest that I found in this field.

Arp's image:

http://ned.ipac.caltech.edu/level5/Arp/Figures/big_arp4.jpeg

14" LX200R @ f/10, L=4x10' RGB=2x10'x3, STL-11000XM, Paramount ME

Help Wanted: Newsletter Editor

By Mark Dahmke

I took over editing the PAC newsletter in December, 2001. This is my 190th newsletter - over 25% of all PAC newsletters ever published. I enjoy working on it, but feel that it's time to find a new editor.

It usually takes from two to three hours per month to build a newsletter, depending on how much material is sent to me and if there are any press releases of interest on NASA websites. You'll need to have some experience with desktop publishing, graphics, image editing and page layout. I use Serif's Page Plus, but you could use Adobe Illustrator or equivalent desktop publishing package. MS Word is not sufficient because it lacks many of the capabilities needed for desktop publishing. PAC has a license for Page Plus. Prior newsletter editing experience would be helpful. If you're interested, please contact me.

Curiosity Captured Two Solar Eclipses on Mars

When NASA's Curiosity Mars rover landed in 2012, it brought along eclipse glasses. The solar filters on its Mast Camera (Mastcam) allow it to stare directly at the Sun. Over the past few weeks, Curiosity has been putting them to good use by sending back some spectacular imagery of solar eclipses caused by Phobos and Deimos, Mars' two moons.

Phobos, which is as wide as 16 miles (26 kilometers) across, was imaged on March 26, 2019 (the 2,359th sol, or Martian day, of Curiosity's mission); Deimos, which is as wide as 10 miles (16 kilometers) across, was photographed on March 17, 2019 (Sol 2350). Phobos doesn't completely cover the Sun, so it would be considered an annular eclipse. Because Deimos is so small compared to the disk of the Sun, scientists would say it's transiting the Sun.

In addition to capturing each moon crossing in front of the Sun, one of Curiosity's Navigation Cameras (Navcams) observed the shadow of Phobos on March 25, 2019 (Sol 2358). As the moon's shadow passed over the rover during sunset, it momentarily darkened the light.

Solar eclipses have been seen many times by Curiosity

and other rovers in the past. Besides being cool — who doesn't love an eclipse? — these events also serve a scientific purpose, helping researchers fine-tune their understanding of each moon's orbit around Mars.

Before the Spirit and Opportunity rovers landed in 2004, there was much higher uncertainty in the orbit of each moon, said Mark Lemmon of Texas A&M University, College Station, a co-investigator with Curiosity's Mastcam. The first time one of the rovers tried to image Deimos eclipsing the Sun, they found the moon was 25 miles (40 kilometers) away from where they expected.

"More observations over time help pin down the details of each orbit," Lemmon said. "Those orbits change all the time in response to the gravitational pull of Mars, Jupiter or even each Martian moon pulling on the other."

These events also help make Mars relatable, Lemmon said: "Eclipses, sunrises and sunsets and weather phenomena all make Mars real to people, as a world both like and unlike what they see outside, not just a subject in a book."

To date, there have been eight observations of Deimos eclipsing the Sun from either

Spirit, Opportunity or Curiosity; there have been about 40 observations of Phobos. There's still a margin of uncertainty in the orbits of both Martian moons, but that shrinks with every eclipse that's viewed from the Red Planet's surface.

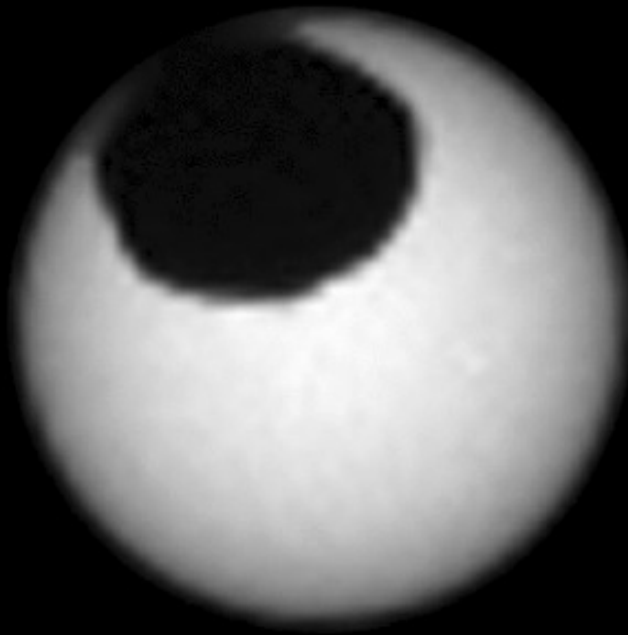
About Curiosity

NASA's Jet Propulsion Laboratory, a division of Caltech, manages the Mars Science Laboratory Project for NASA's Science Mission Directorate, Washington. JPL designed and built the project's Curiosity rover.

Malin Space Science Systems, San Diego, built and operates the Mastcam instrument and two other instruments on Curiosity.

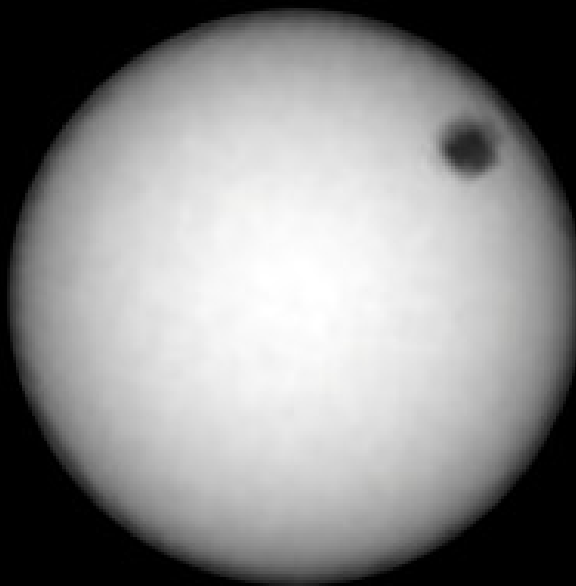
More information about Curiosity is at:
<http://mars.nasa.gov/msl/>

More information about Mars is at:
<https://mars.nasa.gov>



Above: Curiosity Observes Phobos Eclipse: Sol 2359: This series of images shows the Martian moon Phobos as it crossed in front of the Sun, as seen by NASA's Curiosity Mars rover on Tuesday, March 26, 2019 (Sol 2359). Image credit: NASA/JPL-Caltech/MSSS. [Full image and caption](#)

Below: Curiosity Observes Deimos 'Eclipse': Sol 2350: This series of images shows the Martian moon Deimos as it crossed in front of the Sun, as seen by NASA's Curiosity Mars rover on Sunday, March 17, 2019 (the 2,350th Martian day, or sol, of the mission). Image credit: NASA/JPL-Caltech/MSSS. [Full image and caption](#)



May Observing: What to View

Jim Kvasnicka

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

Planets

Mars: Sets three hours after the Sun.

Mercury: Low in the WNW in the Sun's afterglow.

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

Saturn: Brightens to magnitude 0.3 with a disk 18" wide. .

Venus: Rises an hour before the Sun at magnitude -3.8.

Uranus: On May 18th look for Uranus 1.4° north of Venus.

Messier List

M49: Galaxy in Virgo

M51: The Whirlpool Galaxy in Canes Venatici.

M61: Galaxy in Virgo.

M63: The Sunflower Galaxy in Canes Venatici.

M64: The Black Eye Galaxy in Coma Berenices.

M85: Galaxy in Coma Berenices.

M94: Galaxy in 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 4179: Elongated galaxy in Virgo.

NGC 4211: Elongated galaxy in Canes Venatici.

NGC 4244: The Silver Needle Galaxy in Canes Venatici.

NGC 4517: Elongated galaxy in Virgo.

NGC 4631/NGC 4656: The Whale Galaxy and Hockey Stick Galaxy in Canes Venatici.

Double Star Program List

Kappa Bootis: Yellow and blue stars.

Iota Bootis: Yellow primary with a dim blue secondary.

Pi Bootis: Pair of white stars.

Epsilon Bootis: Yellow and greenish yellow stars.

Xi Bootis: Yellow pair.

Delta Bootis: Yellow and bluish white stars.

Mu Bootis: Yellow pair of stars.

Zeta Corona Borealis: Light blue and greenish yellow stars.



Challenge Object

NGC 4281 Group: NGC 4281 is the brightest member of the group in Virgo that includes NGC 4270, NGC 4273, and NGC 4277.

The Double Star Program

Jim Kvasnicka

To the contrary, many of the stars we see at night are not a single point of light, but instead they are two or more stars. The Double Star Observing Program introduces observers to 100 of the finest double and multiple stars in the sky. You don't need expensive equipment to view the objects on the list. All the objects on the Double Star list were originally observed using a three inch refractor between 75X and 150X.

Double stars can be very forgiving. You don't need the darkest skies, the clearest skies, or a moonless night to observe many of the objects on the list. Some can even be observed under moderate light pollution.

To qualify for the Double Star certificate and pin you must observe the 100 selected objects on the Double Star Observing Program list. Any telescope may be used. It is preferred that you find the objects by using star hopping methods and not GO-TO, but they will accept them. It's encouraged to observe the stars with varying magnification. Some of the double stars are very close and require higher power to separate the stars.

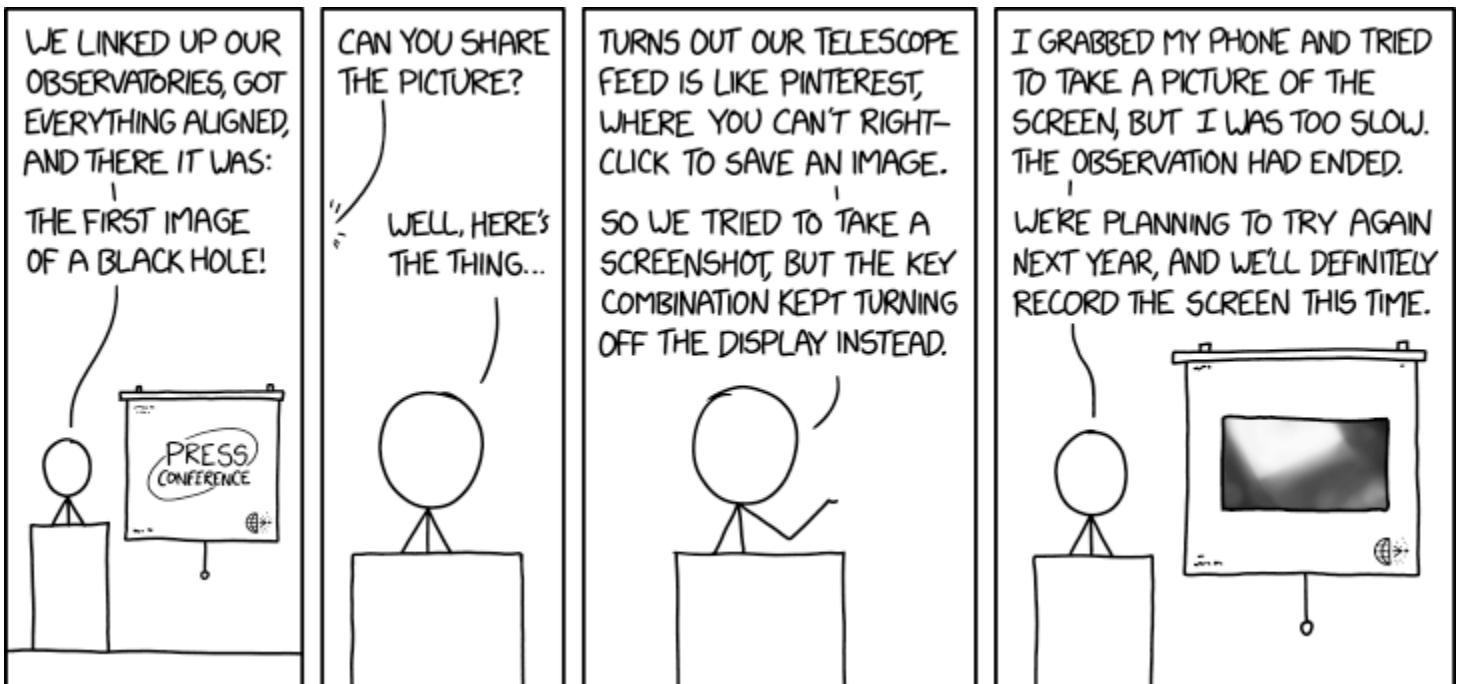
To record your observations you can use the logs provided on the Astronomical League website or

you can use your own. Your observing logs should include: object, date, time, power, seeing conditions, telescope used, and a drawing of the double or multiple star. The drawing needs to show North and either East or West. Part of the observing program is to teach celestial direction. The angle and position of the stars will be judged by your directions.

Each month in my Observing Report in the Newsletter I list double stars from the Double Star Program. If you observe the double stars I have listed each month you can complete the Double Star Program in one year or sooner if you wish.

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

If you have any questions regarding the Double Star Observing Program or need help getting started please contact me and I will be glad to help.



xkcd.com

Curiosity Tastes First Sample in 'Clay-Bearing Unit'

Scientists working with NASA's Curiosity Mars rover have been excited to explore a region called "the clay-bearing unit" since before the spacecraft launched. Now, the rover has finally tasted its first sample from this part of Mount Sharp. Curiosity drilled a piece of bedrock nicknamed "Aberlady" on Saturday, April 6 (the 2,370th Martian day, or sol, of the mission), and delivered the sample to its internal mineralogy lab on Wednesday, April 10 (Sol 2374).

The rover's drill chewed easily through the rock, unlike some of the tougher targets it faced nearby on Vera Rubin Ridge. It was so soft, in fact, that the drill didn't need to use its percussive technique, which is helpful for snagging samples from harder rock. This was the mission's first sample obtained using only rotation of the drill bit.

"Curiosity has been on the road for nearly seven years," said Curiosity Project Manager Jim Erickson of NASA's Jet Propulsion Laboratory in Pasadena, California. "Finally drilling at the clay-bearing unit is a major milestone in our journey up Mount Sharp."

Scientists are eager to analyze the sample for traces of clay minerals because they usually form in water. NASA's Mars Reconnaissance Orbiter (MRO) spied a strong clay "signal" here long before Curiosity landed in



2012. Pinpointing the source of that signal could help the science team understand if a wetter Martian era shaped this layer of Mount Sharp, the 3-mile-tall (5-kilometer-tall) mountain Curiosity has been climbing.

Curiosity has discovered clay minerals in mudstones all along its journey. These mudstones formed as river sediment settled within ancient lakes nearly 3.5 billion years ago. As with water elsewhere on Mars, the lakes eventually dried up.

The clay beacon seen from space brought the rover here, but the region clearly has several other stories to tell. Now that Curiosity is searching this

area, scientists can peer around as geological tourists, finding a landscape both ancient and new. There are several kinds of bedrock and sand, including active sand ripples that have shifted in the past year. Pebbles are scattered everywhere - are they eroding from the local bedrock? Several eye-catching landmarks, such as "Knockfarril Hill," stick out as well.

"Each layer of this mountain is a puzzle piece," said Curiosity Project Scientist Ashwin Vasavada of JPL. "They each hold clues to a different era in Martian history. We're excited to see

what this first sample tells us about the ancient environment, especially about water."

The Aberlady sample will give the team a starting point for thinking about the clay-bearing unit. They plan to drill several more times over the course of the next year. That will help

them understand what makes this region different from the ridge behind it and an area with a sulfate signal up higher on the mountain.

More information about Curiosity is at:

<https://mars.nasa.gov/msl/>

More information about Mars is at:

<https://mars.nasa.gov/>



[Click here for animation](#)

The Mast Camera, or Mastcam, on NASA's Curiosity Mars rover captured this set of images before and after it drilled a rock nicknamed "Aberlady," on Saturday, April 6, 2019 (the 2,370th Martian day, or sol, of the mission). The rock and others nearby appear to have moved when the drill was retracted. This was the first time Curiosity has drilled in the long-awaited "clay-bearing unit."

The scene is presented with a color adjustment that approximates white balancing to resemble how the rocks and sand would appear under daytime lighting conditions on Earth.

Malin Space Science Systems in San Diego built and operates Mastcam. A division of Caltech, the Jet Propulsion Laboratory in Pasadena, California, manages the Mars Science Laboratory Project for NASA's Science Mission Directorate in Washington and built the project's Curiosity rover. For more information about Curiosity, visit <http://mars.jpl.nasa.gov/msl> or https://www.nasa.gov/mission_pages/msl/index.html.

Astronomers Capture First Image of a Black Hole

An international collaboration presents paradigm-shifting observations of the gargantuan black hole at the heart of distant galaxy Messier 87

The Event Horizon Telescope (EHT) — a planet-scale array of eight ground-based radio telescopes forged through international collaboration — was designed to capture images of a black hole. Today, in coordinated press conferences across the globe, EHT researchers reveal that they have succeeded, unveiling the first direct visual evidence of a supermassive black hole and its shadow.

This breakthrough was announced today in a series of six papers published in a special issue of *The Astrophysical Journal Letters*. The image reveals the black hole at the center of Messier 87, a massive galaxy in the nearby Virgo galaxy cluster. This black hole resides 55 million light-years from Earth and has a mass 6.5 billion times that of the Sun.

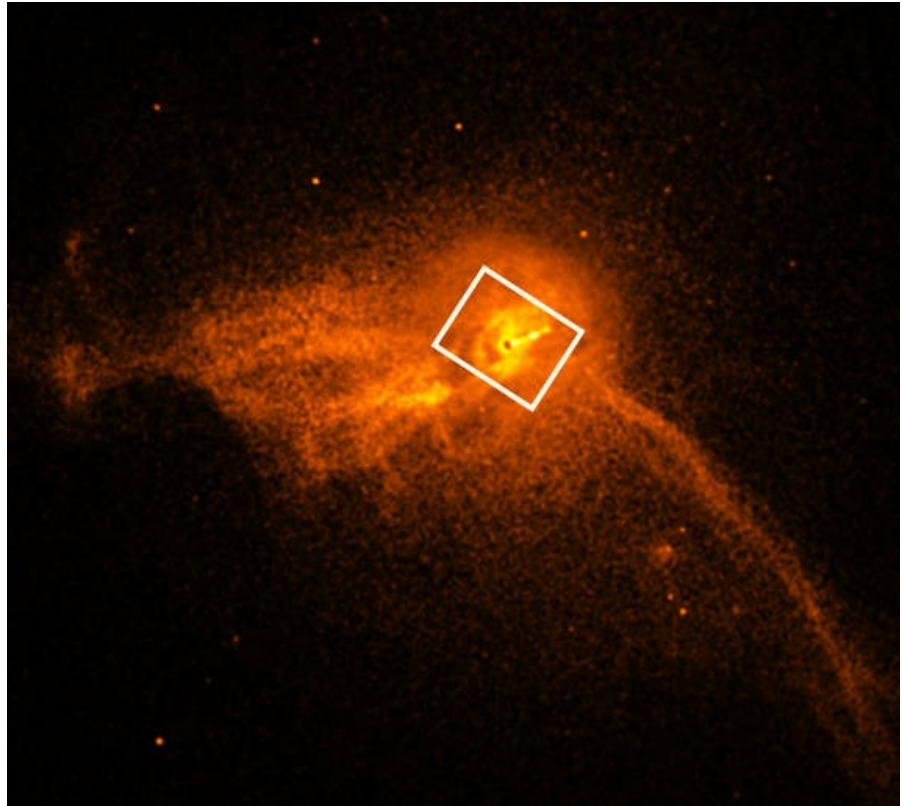
The EHT links telescopes around the globe to form an Earth-sized virtual telescope with unprecedented sensitivity and resolution. The EHT is the result of years of international collaboration, and offers scientists a new way to study the most extreme objects in the Universe predicted by Einstein's general relativity during the centennial year of

the historic experiment that first confirmed the theory.

"We have taken the first picture of a black hole," said EHT project director Sheperd S. Doeleman of the Center for Astrophysics | Harvard &

heating any surrounding material.

"If immersed in a bright region, like a disc of glowing gas, we expect a black hole to create a dark region similar to a shadow —



Chandra X-ray Observatory close-up of the core of the M87 galaxy. Credits: NASA/CXC/Villanova University/J. Neilsen

Smithsonian. "This is an extraordinary scientific feat accomplished by a team of more than 200 researchers."

Black holes are extraordinary cosmic objects with enormous masses but extremely compact sizes. The presence of these objects affects their environment in extreme ways, warping spacetime and super-

something predicted by Einstein's general relativity that we've never seen before, explained chair of the EHT Science Council Heino Falcke of Radboud University, the Netherlands. "This shadow, caused by the gravitational bending and capture of light by the event horizon, reveals a lot

about the nature of these fascinating objects and allowed us to measure the enormous mass of M87's black hole."

Multiple calibration and imaging methods have revealed a ring-like structure with a dark central region — the black hole's shadow — that persisted over multiple independent EHT observations.

"Once we were sure we had imaged the shadow, we could compare our observations to extensive computer models that include the physics of warped space, superheated matter and strong magnetic fields. Many of the features of the observed image match our theoretical understanding surprisingly well," remarks Paul T.P. Ho, EHT Board member and Director of the East Asian Observatory. "This makes us confident about the interpretation of our observations, including our estimation of the black hole's mass."

Creating the EHT was a formidable challenge which required upgrading and connecting a worldwide network of eight pre-existing telescopes deployed at a variety of challenging high-altitude sites. These locations included volcanoes in Hawai'i and Mexico, mountains in Arizona and the Spanish Sierra Nevada, the Chilean Atacama Desert, and Antarctica.

The EHT observations use a technique called very-long-baseline interferometry (VLBI)

which synchronises telescope facilities around the world and exploits the rotation of our planet to form one huge, Earth-size telescope observing at a wavelength of 1.3 mm. VLBI allows the EHT to achieve an angular resolution of 20 micro-arcseconds — enough to read a newspaper in New York from a sidewalk café in Paris.

The telescopes contributing to this result were ALMA, APEX, the IRAM 30-meter telescope, the James Clerk Maxwell Telescope, the Large Millimeter Telescope Alfonso Serrano, the Submillimeter Array, the Submillimeter Telescope, and the South Pole Telescope. Petabytes of raw data from the telescopes were combined by highly specialised supercomputers hosted by the Max Planck Institute for Radio Astronomy and MIT Haystack Observatory.

The construction of the EHT and the observations announced today represent the culmination of decades of observational, technical, and theoretical work. This example of global teamwork required close collaboration by researchers from around the world. Thirteen partner institutions worked together to create the EHT, using both pre-existing infrastructure and support from a variety of agencies. Key funding was provided by the US National Science Foundation (NSF), the EU's European Research Council (ERC), and funding agencies in East Asia.

"We have achieved something presumed to be impossible just a generation ago," concluded Doeleman. "Breakthroughs in technology, connections between the world's best radio observatories, and innovative algorithms all came together to open an entirely new window on black holes and the event horizon."

4-79

THE PRAIRIE ASTRONOMER

Volume 19, Number 5

April 24, 1979

PRESIDENT'S REPORT:

National Astronomy Day was Saturday, April 7, and, thanks to you, it was well-publicized in Lincoln. I'm really proud of the members of our club who helped man the display area in the Gateway Mall, who brought their own telescopes out to put on display, who entered and helped to run the Astrophotography contest, and who worked at the Observatory that night. About 60% of our club members were involved in Astronomy Day activities in one way or another.

If you got up early, you heard me talking to Judy Converse on KLMS radio about our club's activities and the Gateway showing. The main office out at Gateway estimated that over 3000 people walked through the mall that Saturday and saw our display of telescopes and photographs. We passed out about a thousand free sky calendars and the publicity must have paid off because Doc Manthey reports that a very good crowd showed up at the Observatory for public viewing that night.

The Astrophotography Contest turned out to be the biggest surprise. Including a whole raft of submissions that final week, we had 41 separate photos entered by 11 individuals-- 5 members of our club and 6 non-members. First prize went to Steve Myatt for a beautifully detailed picture of

Saturn. Second prize was awarded to John Lortz for his mystical double-exposure titled "Midsummer's Eve." And third prize was won by Mark Novatny for a color photo of the "diamond ring" effect. Also, five Honorable Mention certificates were presented to Steve Myatt (2), Bradley Leseberg, Ron Veys, and Dave Knisely.

All of the contest entries are now on display at the Observatory for the next three weeks or so. We hope to make this an annual event. Next year's contest should be even bigger and better.

Once again, thanks to everyone involved.

-- RON VEYS

APRIL MEETING NOTICE

The April meeting of the Prairie Astronomy Club of Lincoln will be held at Hyde Observatory Tuesday night, April 24, at 7:30 p.m. Preceding this meeting, the Hyde Observatory Steering Committee will meet at 6:30 p.m.

This month's advanced program will be presented by Sekhar Chivukula. He will be discussing black holes. The "fundamentals" program will be "How to set up your telescope and find your way around the Sky" by Rick Johnson.

26th Nebraska Star Party - July 28-August 2



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

The early registration deadline is July 1st!

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

NSP Schedule of Events

Sunday: registration and check-in, optional dinner.

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

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

Wednesday: Brewer’s Niobrara Canoe or tube float, optional dinner.

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

Friday: public star party at 9pm.

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

Register online!

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 Dobsonian: Lee Taylor
13 inch Truss Dobsonian: Available

CLUB APPAREL



Order club apparel from cafepress.com:



Shop through Amazon Smile to automatically donate to PAC:



CLUB OFFICERS

President	Bob Kacvinsky kacvinskyb@yahoo.com
Vice President	Rick Brown rickerbrown2000@gmail.com
2nd VP (Program Chair)	Christine Parkyn cpparky@gmail.com
Secretary	Bill Lohrberg wmlohrberg89@gmail.com
Treasurer	John Reinert jr6@aol.com
Club Observing Chair	Jim Kvasnicka jim.kvasnicka@yahoo.com
Outreach Coordinator	Mike Kearns mkearns@neb.rr.com
Website and Newsletter Editor	Mark Dahmke mark@dahmke.com

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.