

# *The Prairie Astronomer*

March 2019 Volume 60, Issue #3

## *Opportunity's Parting Shot* *Was a Beautiful Panorama of Mars*



**Night Sky Network**



The Newsletter of the Prairie Astronomy Club

# ***The Prairie Astronomer***

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## **NEXT PAC MEETING: March 26 at 7:30pm at Hyde Observatory**

### **PROGRAM**

#### **Space Law 101**

Our March meeting will feature Elsbeth Magilton as the speaker. She is from the UNL Space, Cyber, and Telecommunications program. Our program will be on Space Law. The meeting will start at 7:30 p.m. with club business followed by this interesting program. We'll be meeting at Hyde Observatory.

### **FUTURE PROGRAMS (Tentative)**


April: Webb Space Telescope  
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

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*Cover: This image is a cropped version of the last 360-degree panorama taken by the Opportunity rover's Panoramic Camera (Pancam) from May 13 through June 10, 2018.*

*Credit: NASA/JPL-Caltech/Cornell/ASU*



The Prairie Astronomy Club:  
Fifty Years of Amateur Astronomy

**Buy the book! The Prairie Astronomy Club: Fifty Years of Amateur Astronomy.**  
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COMPILED AND EDITED BY MARK DAHMKE

# EVENTS



PAC Meeting  
 Tuesday March 26, 2019, 7:30pm  
 Program: Space Law 101

PAC Meeting  
 Tuesday April 30, 2018, 7:30pm  
 Program: Webb Space Telescope

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

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

## 2019 STAR PARTY DATES



Photo by Brian Sivill

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

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



## PAC E-MAIL:

[info@prairieastronomyclub.org](mailto:info@prairieastronomyclub.org)

## PAC-LIST:

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

[pac-list@googlegroups.com](mailto:pac-list@googlegroups.com)

## ADDRESS

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 Lincoln, NE 68505-0585

## WEBSITES

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



**Night Sky Network**

## Meeting Minutes

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Minutes – PAC meeting February 26, 2019 – as recorded by Bill Lohrberg

Approx 24 in attendance, including 3 or 4 guests

7:30pm President Bob Kacvinsky called the meeting to order, introduced Eric Balcom from OAS and NSP board to announce the 26<sup>th</sup> annual Nebraska Star Party will be July 28 through August 2<sup>nd</sup>. Registration is open.

Bob welcomed visitors and introduced Jim Kvasnicka to present the observing report.

- March 1 Star party at Branched Oak Observatory is cancelled due to snow cover making the site difficult to access in or out.
- March 8 Star party is scheduled but advise checking conditions ahead of time for same reason, likely not accessible either.
- Planets visible for March; Mercury, Neptune and Uranus, Mars dims by end of month, morning planets – Jupiter, Saturn, Venus.
- Messier list for March – M41, M44, M46/47, M48, M50, M67, M81/82 & M93
- NGC objects for March – 2438, 2440, 2477, 2539, 2683, & 2775

Recent notable news & highlights:

- On Feb 14 NASA declared the Mars rover Opportunity officially done after repeated attempts to communicate since last summer due to a dust storm.
- Mars InSight rover is sending us daily weather measurements (temperature, wind, pressure). It was noted on this date our high temperature of 1 degree (Fahrenheit) in Lincoln Nebraska was lower than on Mars at 7 degrees.

Upcoming events announced

- Hyde open to public on Saturday evenings

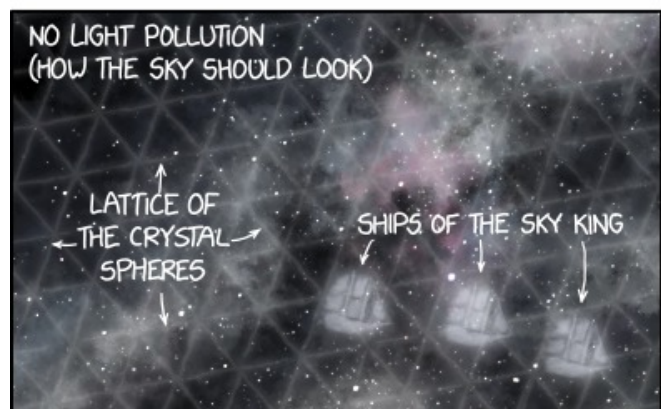
- Upcoming March 1 and March 8 club star parties not recommended to attempt getting into either site due to snow cover and ice.
- Bob announced that for the April meeting we will have a short 5 minute presentation by Julie Allen from Lead up Nebraska Program (a youth development program) to talk about training approximately 30 high school youth in May at Hyde Observatory on the use of telescopes and astronomy basics. This in preparation for a series of events; July 20<sup>th</sup> in the afternoon downtown on the centennial mall where we will set up some telescopes for solar observing, and at Hyde in September either open for attendance by the schools or possibly open to the general public. The Hyde board has also been made aware and this serves as a “heads up” for PAC to prepare. More details to come at the April meeting.
- Mid States Regional Astronomical League (MSRAL) convention will be in Kansas City June 14 – 16 2019. Bob asked for a show of hands for who is planning to go, 4 or 5 from PAC indicate they are interested or will attend.
- One of the founding members of PAC Peter Schultz will be in Lincoln in July for the celebration of the 50<sup>th</sup> anniversary of the Apollo 11 moon landing events. Pete is Professor of Geological Sciences at Brown university and specializes in the study of planetary geology, impact cratering on the Earth and other objects in the Solar system and volcanic modifications of planetary surfaces. In communicating with program chair Christine Parkyn proposed

having a PAC meeting on July 23<sup>rd</sup> with Pete offering to join us. Additionally, instead of having the dinner normally scheduled in May it was suggested we move this to the July 23<sup>rd</sup> meeting as well. A unanimous show of hands were raised in favor of this.

- PAC members are urged to participate and perhaps co-sponsor with Branched Oak Observatory in volunteering for July 20<sup>th</sup> “Stargazing at Indian Cave State park” event. As of this date (Feb 26) have had 11,100 interested replies on Facebook to the event invitation! Last year’s event there were an estimated 1,000 who attended.
- Nebraska Star Party at Merritt Reservoir will be July 28 through August 2<sup>nd</sup>

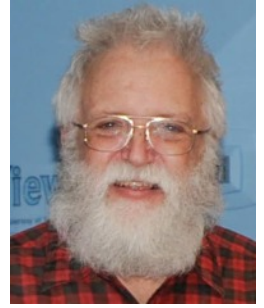
7:55 meeting adjourned to the program – Mary Ann Andrei and Ellen Kreutz from NET presented a pre-release video of our club and footage from NSP 2018 which will be aired in April on NETV series “Nebraska Stories”

## LIGHT POLLUTION AND THE DISAPPEARING NIGHT SKY



xkcd.com

*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](http://www.mantrapskies.com).*



Arp 3, MCG-01-57-016, is a low surface brightness spiral, which is also where Arp put it in his catalog. It's located in Aquarius a bit southeast of the "Water Jug." Redshift data puts it about 60 million light years distant. Using the Tully-Fisher method of determining galaxy distance based on its brightness and rate

of rotation one team says it is about 75 million light years distant. That seems too far. In fact, the 60 million light years sounds too far to me. Hubble should find a few Cepheids in it but it hasn't looked at it. NED classes it as SA(s)m. It looks rather distorted with a large faint loop to the south. I did a NED

search with a default radius of 100 arc minutes looking for any galaxy with a similar redshift but nothing was found. This may just be due to this area being so poorly surveyed. In any case, I couldn't find another galaxy to blame for



this distortion. It may be due to something it ate leaving only the plume as evidence of the crime.

There are many fuzzy spots in this galaxy besides a few stars. The APMUKS catalog lists them as separate galaxies. But this is an automated plate solved catalog which is rather "dumb" just logging the position of galaxy-like objects. I think it quite likely, given that there are few outside the galaxy, that these are star clusters within the galaxy. All are rather blue as such clusters usually are while small distant galaxies would tend toward the red end of the spectrum.

There's little on this entire field. Probably due to its location in a rather obscured area of the sky. No redshift data is present for the entire field. Nearly all the galaxies are either from the APMUKS catalog or are IR

strong galaxies from the 2MASX catalog.

I did pick up two asteroids in the image. The obvious one below Arp 3 is (41031) 1999 UA47 at an estimated magnitude of 18.4. The fainter one is 8.5 minutes of arc east and a bit over one minute south. It is (140880) 2001 VL20 at an estimated magnitude 20. Its tilted up with the high end to the east just a bit more than (41031) 1999 UA47. Thanks to its motion it is rather faint and difficult to spot. I didn't notice it until I was looking up the other and was told it was in the field. A third one is just out of the field to the south.

One of the more interesting field galaxies is to the southwest of Arp 3 two-thirds of the way to the lower right corner. It is just to the upper right of a rather bright orange star. I was wondering if it was a double galaxy or just had

a core well to the southeast. Unfortunately, NED shows no galaxies within 2 minutes of its location. Another blue galaxy that was missed even by the APMUKS catalog. Or is it two galaxies? I still don't know.

This image was taken back with my old filters that created blue halos around some stars. At the time my processing abilities couldn't deal with them.

## ***Help Wanted: Newsletter Editor***

*By Mark Dahmke*

I took over editing the PAC newsletter in December, 2001. This is my 188<sup>th</sup> 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.

## Opportunity's Parting Shot Was a Beautiful Panorama

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Over 29 days last spring, NASA's Mars Exploration Rover Opportunity documented this 360-degree panorama from multiple images taken at what would become its final resting spot in Perseverance Valley. Located on the inner slope of the western rim of Endeavour Crater, Perseverance Valley is a system of shallow troughs descending eastward about the length of two football fields from the crest of Endeavor's rim to its floor.

"This [final panorama](#) embodies what made our Opportunity rover such a remarkable mission of exploration and discovery," said Opportunity project manager John Callas of NASA's Jet Propulsion Laboratory in Pasadena, California. "To the right of center you can see the rim of Endeavor Crater rising in the distance. Just to the left of that, rover tracks begin their descent from over the horizon and weave their way down to geologic features that our scientists wanted to examine up close. And to the far right

and left are the bottom of Perseverance Valley and the floor of Endeavour crater, pristine and unexplored, waiting for visits from future explorers."

The trailblazing mission ended after nearly 15 years of exploring the surface of Mars, but its legacy will live on. Opportunity's scientific discoveries contributed to our unprecedented understanding of the planet's geology and environment, laying the groundwork for future robotic and human missions to the Red Planet.

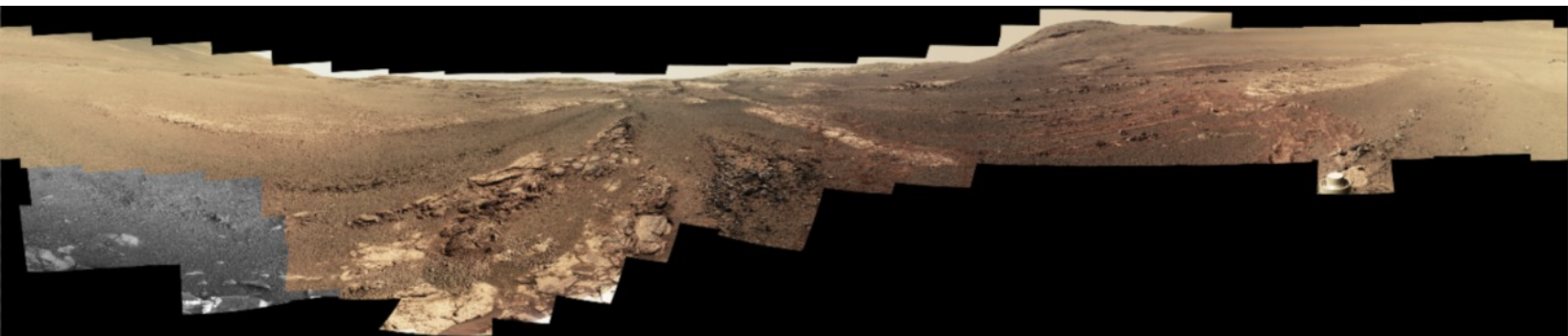
The panorama is composed of 354 individual images provided by the rover's Panoramic Camera (Pancam) from May 13 through June 10, or sols (Martian days) 5,084 through 5,111. This view combines images taken through three different Pancam filters. The filters admit light centered on wavelengths of 753 nanometers (near-infrared), 535 nanometers (green) and 432 nanometers (violet).

A few frames (bottom left) remain black and white, as the solar-powered rover did not have the time to record those locations using the green and violet filters before a severe Mars-wide dust storm swept in on June 2018.

The gallery includes the last images Opportunity obtained during its mission (black-and-white thumbnail images from the Pancam that were used to determine how opaque the sky was on its last day) and also the last piece of data the rover transmitted (a "noisy," incomplete full-frame image of a darkened sky).

After eight months of effort and sending more than a thousand commands in an attempt to restore contact with the rover, NASA declared Opportunity's mission complete on Feb. 13, 2019.

JPL, a division of the California Institute of Technology in Pasadena,

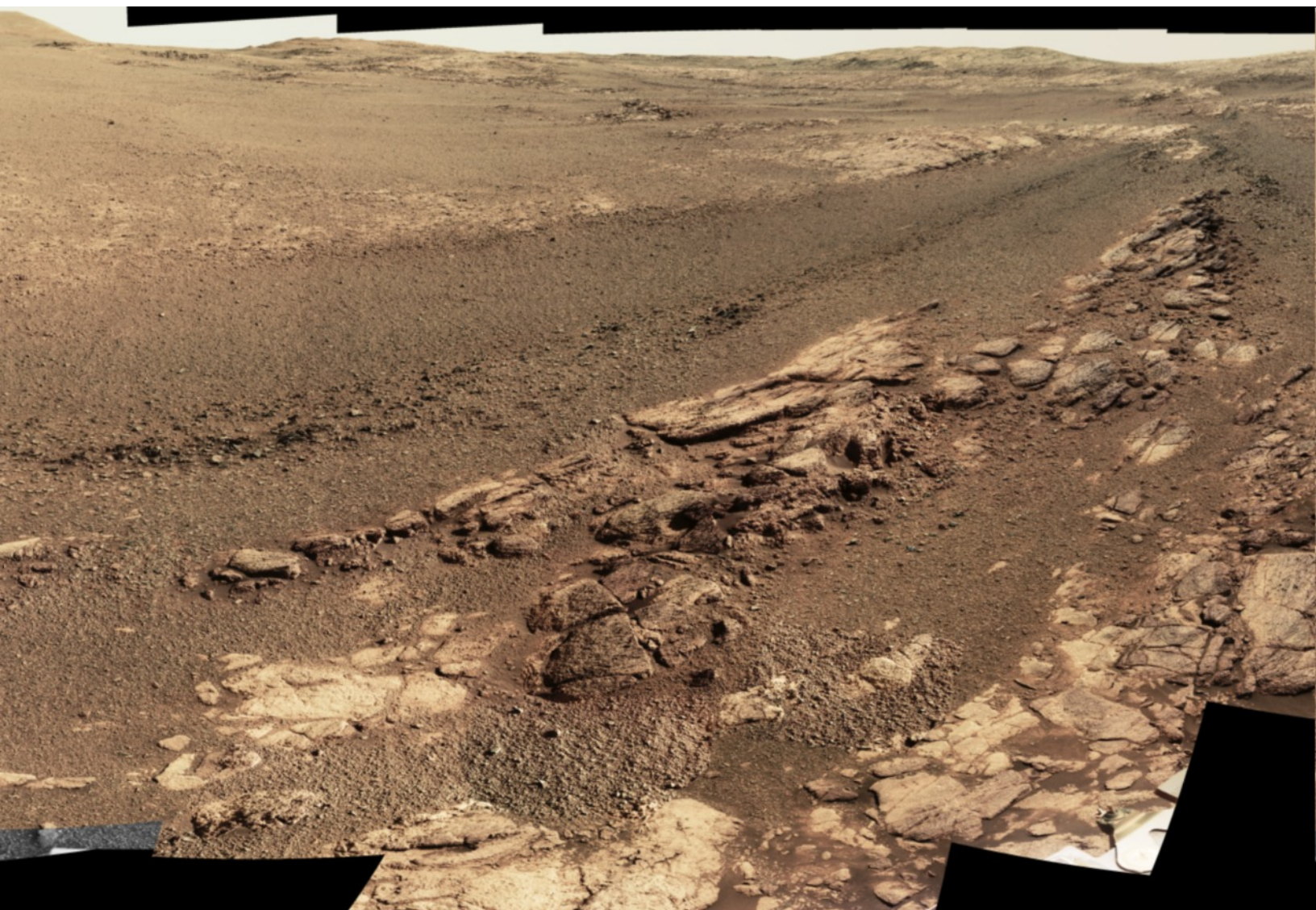




managed the Mars  
Exploration Rover Project  
for NASA's Science Mission  
Directorate in Washington.

For more information about  
Opportunity, visit  
<http://www.nasa.gov/rovers>  
and  
<https://mars.nasa.gov/mer/>.

For more information  
about the agency's Mars  
Exploration program, visit:  
<https://www.nasa.gov/mars>





*I took this photo of the moon last night (March 15, 2019) with my iPhone 5c attached to a "SnapZoom Universal Digiscoping Adapter." The telescope I used is a Meade LX10 SCT - f/10, with 8" aperture, focal length 2000mm through a 25mm Plossl eyepiece at 80x. (I did not edit the photo other than to change its orientation and crop the edges)*

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

### Planets

**Mars:** Sets four hours after the Sun to start the month.

**Jupiter:** Rises by 11:00 pm at the end of April.

**Saturn:** Rises by 1:00 am to end the month.

**Venus / Mercury:** Both rise during morning twilight.

**Neptune:** Visible with a telescope at dawn.

**Uranus:** Is at conjunction with the Sun and not visible.

### Messier List

**M40:** Multiple star in Ursa Major.

**M65/M66:** Galaxies in the Leo Triplet Group.

**M95/M96:** Galaxies in Leo that fit in the same FOV.

**M105:** Galaxy in Leo.

**M106:** Galaxy in Canes Venatici.

**M108:** Galaxy in Ursa Major.

**M109:** Galaxy in Ursa Major.

**Last Month:** M41, M44, M46, M47, M48, M50, M67, M81, M82

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

### NGC and other Deep Sky Objects

**NGC 2841:** Galaxy in Ursa Major.

**NGC 2903:** Galaxy in Leo.

**NGC 3115:** Galaxy in Sextans.

**NGC 3166/NGC 3169:** Galaxy pair in Sextans.

**NGC 3184:** Galaxy in Ursa Major.

**NGC 3432:** Galaxy in Leo Minor.

### Double Star Program List

**Alpha Leonis:** Regulus, white primary with a yellow secondary.

**Gamma Leonis:** Algieba, pair of yellow stars.

**54 Leonis:** Yellow primary with a greenish colored secondary.

**Alpha Canum**

**Venaticorum:** Blue-white and greenish yellow stars.

**Zeta Ursa Majoris:** White pair of stars.

**Gamma Virginis:** Close pair of yellow stars.

**24 Comae Berenices:** Yellow and pale blue stars.

**Delta Corvi:** White primary with a rose colored secondary.

### Challenge Object

**NGC 3158 Group:** NGC 3158 is the brightest and central member in a galaxy group that also includes NGC 3163, NGC 3161, NGC 3159, and NGC 3150 south of NGC 3158. NGC 3152 and NGC 3160 are north of NGC 3158.



## The Lunar Observing Program

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*Jim Kvasnicka*

Most of us plan our observing around dark skies when the moon is not up. The Lunar Observing Program gives amateur astronomers something to do when the moon is up and we don't have the dark skies we long for.

The Lunar Program allows observers in heavily light polluted areas to participate in an observing program. Since no special observing skills are required the Lunar Program is well suited for the observer just getting started into the hobby of astronomy. The Lunar Program is well balanced because it develops naked eye, binocular, and telescopic observing skills. The Lunar Program was created as a project that can easily be done by schools and school children, especially those in the inner city.

To qualify for the Astronomical League Lunar Program you need to be a member of the Astronomical League which all PAC members are. The Lunar Program includes 100 features on the moon to observe. These 100 features are divided into three groups: 18 naked eye features, 46 binocular features, and 36 telescopic features. Any pair of binoculars and telescope will do. All features can easily be seen with a pair of 7x35 binoculars and a 60mm refractor. If you have trouble with the naked eye features you can use

the binoculars, and if you are having trouble with the binocular features you can use the telescope.

Go to the Astronomical League website and go to Observing Programs, once you are there find the Lunar Program and you can print out the observing log that has all 100 features for you to observe. The observing log is easy to use, just check off when you observe a feature and list the date and time.

It helps to have a good lunar map to use when doing the Lunar Program. There are some good maps you can purchase or you can find some on line to download.

When you complete the Lunar 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 Lunar Program chair for approval. The chair will mail to me your lunar certificate and pin which I will present to you at our monthly PAC meeting.

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



**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.org](http://nightsky.jpl.nasa.org) to find local clubs, events, and more!

April's skies find Mars traveling between star clusters after sunset, and a great gathering of planets just before sunrise.

**Mars** shows stargazers exactly what the term "planet" originally meant with its rapid movement across the evening sky this month. The ancient Greeks used the term *planete*, meaning *wanderer*, to label the bright star-like objects that travelled between the constellations of the zodiac year after year.

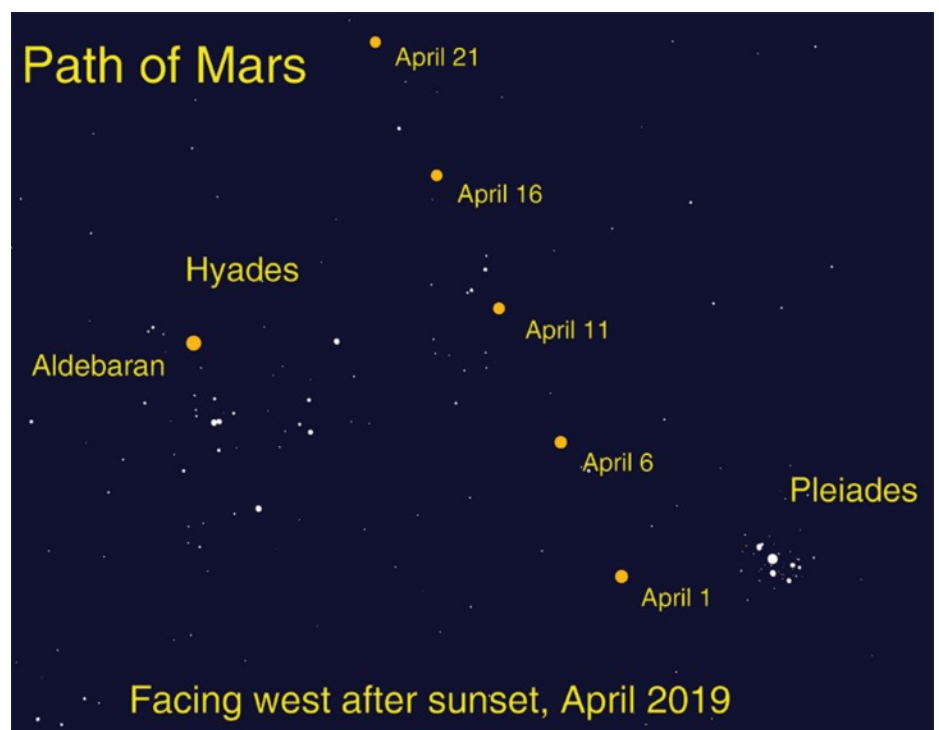
You can watch Mars as it wanders through the sky throughout April, visible in the west for several hours after sunset. Mars travels past two of the most famous star clusters in our night sky: the **Pleiades** and **Hyades**. Look for the red planet next to the tiny but bright Pleiades on April 1st. By the second week in April, it has moved eastward in Taurus towards the larger V-shaped Hyades. Red Mars appears to the right of the slightly brighter red-orange star **Aldebaran** on April 11th. We see only the brightest stars in these clusters with our unaided eyes; how many additional stars can you observe through binoculars?

Open clusters are made up of young stars born from the same "star nursery" of gas and dust. These two open clusters are roughly similar in size. The Ple-

iades appears much smaller as they are 444 light years away, roughly 3 times the distance of the Hyades, at 151 light years distant. Aldebaran is in the same line of sight as the Hyades, but is actually not a member of the cluster; it actually shines just 65 light years away! By comparison, Mars is practically next door to us, this month just a mere 18 light minutes from Earth - that's about almost 200 million miles. Think of the difference between how long it takes the light to travel from

these bodies: 18 minutes vs. 65 years!

The rest of the bright planets rise before dawn, in a loose lineup starting from just above the eastern horizon to high above the south: **Mercury, Venus, Saturn, and Jupiter**. Watch this month as the apparent gap widens considerably between the gas giants and terrestrial planets. Mercury hugs the horizon all month, with Venus racing down morning after morning to join its dimmer inner solar system companion right before sunrise. In contrast, the



Caption: The path of Mars between the Pleiades and Hyades in April. Image created with assistance from Stellarium.

giants Jupiter and Saturn move away from the horizon and rise earlier all month long, with Jupiter rising before midnight by the end of April.

The **Lyrids** meteor shower peaks on April 22nd, but sadly all but the brightest meteors will be washed out by the light of a bright gibbous Moon.

You can catch up on all of NASA's current and future missions at [nasa.gov](http://nasa.gov)

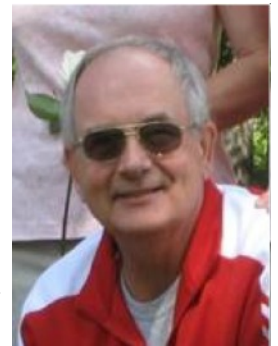
## **The President's Message**

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*Bob Kacvinsky*

Finally!!! That seems to be the common thought for most of us as the snow has melted, flood waters are going down, and the skies have finally opened up for observing. Last night at Hyde we had the first clear night in what seems like an eternity to observe with the public – although the roof at Hyde is still stuck in its winter slumber.

The club has begun receiving requests from different groups expressing interest in learning more about “what’s up there?” The Prairie Astronomy Club has been a great group when it comes to outreach to the public. What better way to enjoy your hobby and love of astronomy then to share it with others. When a young child gets their first look at an object in the sky and you hear that inevitable “WOW,” there is no better compliment a hobbyist can experience.



Over the next few months we will have a number of great opportunities to share our hobby with the public. I would ask that when you get an email asking for your help with an outreach event, please consider volunteering and helping out.

The typical comment we hear back is “I really don’t know enough about the stuff up there to help out.” Yet, every Saturday night we have high school youth who come to Hyde for the first time to help out and get their community credits. We always have someone within our group to help them with explaining the object and a little background, and the best part is they seem to want to come back to volunteer again. Remember, that the definition of an expert is someone who knows just a very little bit more than the other person. You can do it, and along the way get to help someone experience the beauty of “What’s up there.”

Please consider helping out this summer. Even if you do not have a telescope we can use the extra help. Your new leadership at PAC also would appreciate your ideas, comments, recommendations, and suggestions about how we can make your experience within the Prairie Astronomy Club the best it can be.

Dark Skies to you.

Bob Kacvinsky  
[kacvinskyb@yahoo.com](mailto:kacvinskyb@yahoo.com)  
402-499-1816

## President's Message

The Deed Has Been Done. On March 24th, I delivered a check for \$100, earnest money for our purchase of the decommissioned Atlas Missile Site, to Firth Co-op. On the day before, Del Motycka and I went to Firth and had a final sit-down with the Co-op manager, then went to the site in a driving rainstorm to ponder where we wanted to draw the final boundaries.

For those who have been out to look at the property, and know where the boundary stakes had been placed tentatively, we have now agreed to pull the East boundary of our parcel in to the west shoulder of the access road, and, to compensate, extend our parcel further towards the south. It now will extend comfortably south of the trees so we can do anything we want with all of them. It also provides some space for tiering individual observing sites south of the missile pad.

This manipulation of boundaries allows the farmer to our north to access his property simply by extending a road due north from where the present access road turns west into our property.

The Co-op has agreed to remove the junk automobiles from the site prior to closing. They have also agreed to let us take some earth off their property to help fill in the silo access shaft and level our property, and they will allow us to begin using the site from now until we formally take possession; a new lock is on the gate, and we have a key. So, anybody who wants to go down and try it out can stop by my place and pick up the key.

A side note: it appears we will have a brightly-lit neighbor sometime soon, although it shouldn't cause us any problem. The Beatrice FM station, KMAZ, says that they have obtained FAA and Gage County approval to erect a 740-foot tower about 1-1/2 miles northeast of Cortland, at a site just inside the Gage County line. We reckon that places them about 1-1/2 to 2 miles West-Northwest of us. It's not in a direction that many people will want to point their scopes, so Rick Johnson, Del and I decided there was little cause for concern. We have no definite word on whether the tower will be outfitted with standard aviation red beacons or strobes.

We will want to get a crew together early in April, as soon as the Co-op removes the junk cars, to start cleaning up the site. With enough bodies, I think we can do a respectable job in one day. Please come to the next meeting prepared to get serious about volunteering cleanup time.

Some folks around Firth have already expressed an interest in taking a look through our telescopes, according to Dick Osterhaus, the Co-op manager. We want to quickly establish a rapport with our neighbors, so we might try to engineer a Star Party on Friday, April 25, and put some invitations out around the area. The more local interest--and members--we can get, the less likelihood of continuing vandalism at the site.

It is starting to get exciting now! A chunk of Prairie under dark skies that we can call our own, and begin to develop into a permanent home for the club telescope. From a personal standpoint, I might finally have found an excuse strong enough to motivate me to complete my Messier list!

Come to this month's meeting, and let's talk plans.

Lee Thomas



## 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](http://cafepress.com):



Shop through Amazon Smile to automatically donate to PAC:



## CLUB OFFICERS

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

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