

# The Prairie Astronomer

June 2020 Volume 61, Issue #6

**June Program: "You Can  
Almost Touch the Stars"**

**Tom Field, Contributing Editor,  
Sky & Telescope Magazine**



**Night Sky Network**



The Newsletter of the Prairie Astronomy Club

# The Prairie Astronomer

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**Next Meeting: June 30, 7:30pm via Zoom**

## **Program: You Can Almost Touch the Stars**

Tom Field, Contributing Editor at Sky and Telescope

Until recently, spectroscopy was too expensive and too complicated for all but a handful of amateurs. Today, though, new tools make spectroscopy accessible to almost all of us. Tom's talk, with lots of interesting examples, will show you what it's all about and help you understand how spectroscopy is used in research.

## **FUTURE PROGRAMS**

October - Club Viewing Night

November - How to Buy a Telescope

December - Holiday Gathering for club members

## **CONTENTS**


- 4 Minutes
- 5 President's Message
- 6 Mantrap Skies
- 8 July Observing
- 9 Focus on Observing
- 10 Astrophotography
- 13 Mars Geology
- 15 Perseverance
- 17 From the Archives
- 18 Club Information

Cover photo:

*This enhanced-color image from NASA's Juno spacecraft captures the striking cloud bands of Jupiter's southern latitudes. Jupiter is not only the largest planet in the solar system, it also rotates at the fastest rate, completing a full day in just 10 hours. This rapid spinning creates strong jet streams, separating Jupiter's clouds into bright zones and dark belts that wrap around the planet.*

*Citizen scientist David Marriott created this image with data from the JunoCam instrument. The original image was taken on April 10, 2020, at 7:35 a.m. PDT (10:35 a.m. EDT) as the Juno spacecraft performed its 26th close flyby of the planet.*

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).

COMPILED AND EDITED BY MARK DAHMKE

# EVENTS

PAC Meeting  
Tuesday June 30, 2020, 7:30pm  
Via Zoom

PAC Meeting  
Tuesday July 28, 2020, 7:30pm

PAC Meeting  
Tuesday August 25, 2020, 7:30pm



## 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)

## 2020 STAR PARTY DATES



Photo by Brian Sivill

	Star Party Date	Star Party Date
January	Jan 17	<b>Jan 24</b>
February	Feb 14	<b>Feb 21</b>
March	Mar 13	<b>Mar 20</b>
April	Apr 17	<b>Apr 24</b>
May	May-15	<b>May 22</b>
June	Jun 12	<b>Jun 19</b>
July	Jul 10	<b>Jul 17</b>
NSP	<b>July 19 - 24</b>	
August	Aug 14	<b>Aug 21</b>
September	Sep 11	<b>Sep 18</b>
October	Oct 9	<b>Oct 16</b>
November	Nov 6	<b>Nov 13</b>
December	<b>Dec 11</b>	Dec 27

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

## ADDRESS

The Prairie Astronomer  
c/o The Prairie Astronomy Club, Inc.  
P.O. Box 5585  
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**

PAC meeting minutes May 26, 2020 as recorded by Bill Lohrberg.

This was the second online Zoom PAC meeting. 29 in attendance. President Bob Kacvinsky began at approximately 7:33 pm with a welcome, intro of Dr. Ken Murphy and proceeded to Jim Kvasnicka's observing report.

## June Observing

- Star parties scheduled for June 12, and June 19 Cortland site
- Planets - Mercury at dusk, Jupiter and Saturn evening, Mars rises 1:45am at start of June, Neptune just 1.6 degrees NW of Mars on June 13, Uranus rises about 2 hours after Neptune, Venus rises about 45 minutes before the sun – a thin crescent .
- Comet SWAN – very low to horizon – could be difficult to pick up in city, but outside of city should be naked eye at dusk.
- Messiers – M58,59, 60, 84, 86, 87, 88, 89, 90, 91, 98, 99, 100 (Coma Berenices-Virgo galaxy cluster)
- NGC objects - 4565, 4725, 5248, 5676, 5689

## In The News

- Perseverance Mars rover being packaged and in process moving to Florida
- Comet PanStarrs was visible in FOV with M81 and M82 May 22/23. Unfortunately, sky conditions were not favorable in this region for viewing. (side note: see image by Dan Bartett on Astronomy Picture of the Day archive June 6)

## Announcements

- Waiting for decision from Parks and Rec as to Hyde reopening
- June 30 meeting still scheduled for solar observing outside Hyde – look for notification via night sky network as to any cancellations etc.
- Brett Boller reported that NSP is still a go – waiting to hear from High School as to events there, how they will handle food etc. Look for announcement on or after June 19 for final details.
- Bob announced and invited members to impromptu star party May 29 at Cortland, since weather forecast is favorable.

## Treasurer's report John Reinert

- Continues to keep membership dues collected – working on way to scan checks to go to bank
- Banking balance was given, total assets.
- Facebook ads were paid from last fall
- Earnings from Amazon Smile were reported
- As for audit – quite a bit of scanning to do in order to do this remotely
- Reminder to reconcile membership contact info at this time as this month we pay Astronomical League dues.

## Other Business

Bob again thanked volunteers for their continued patience - for public star parties we will take the lead from the Governor's and Mayor's guidelines in order to know when and how we will continue with those.

With no further business, the meeting adjourned at approximately 7:47pm to the program presented by Dr. Ken Murphy teacher of Physics and Astronomy at Southwest Minnesota State – Open Space Project. ([open-space-project.com](http://open-space-project.com))

## The President's Message

Bob Kacvinsky

We have held our last couple of monthly meetings virtually, and your attendance has been greatly appreciated. Our May speaker, Ken Murphy, SW MN State Planetarium Director provided a review of the Open Space Project, which is a software program that allows you to take a virtual tour of the Universe. The program uses images and data from multiple sources to allow the viewer a "real / non-animated" view of planets, asteroids, moon, etc. Mars was especially detailed with all the data being gathered from orbital and ground based observations. Zooming into the 2020 Rover landing site and seeing incredible details makes it feel like you are flying on Mars at low altitude. Hope you all enjoyed the presentation as much as I did.

Saturday, June 12, we had our 4<sup>th</sup> successful club star party at the Farm. In 2019 we had only 6 successful club star parties, so

we are doing much better this year. Jim Kvasnicka, Jim White, Katelyn Farneth and her cousin Sarah, and myself attended. Seeing and transparency were exceptional and rivaled the views from the more recent NSPs. Jim White captured over 300 images, and Jim K and I looked at close to 50 objects including 2 comets and many favorites. Both Panstarrs c/2017 T2 and Atlas C/2019 Y1 continue to look good. The ASSASN C/2018 N2 in Cassiopeia was just low enough to catch too much of the Lincoln sky glow to view. We were able to easily separate the spiral rings of both parts of M51 including the full arm from the large galaxy to almost completely around the smaller galaxy. Several of the galactic center objects responded well to 0 III and UHC filters including sub regional dark nebula channels within the Trifid, Lagoon, and Swan. The

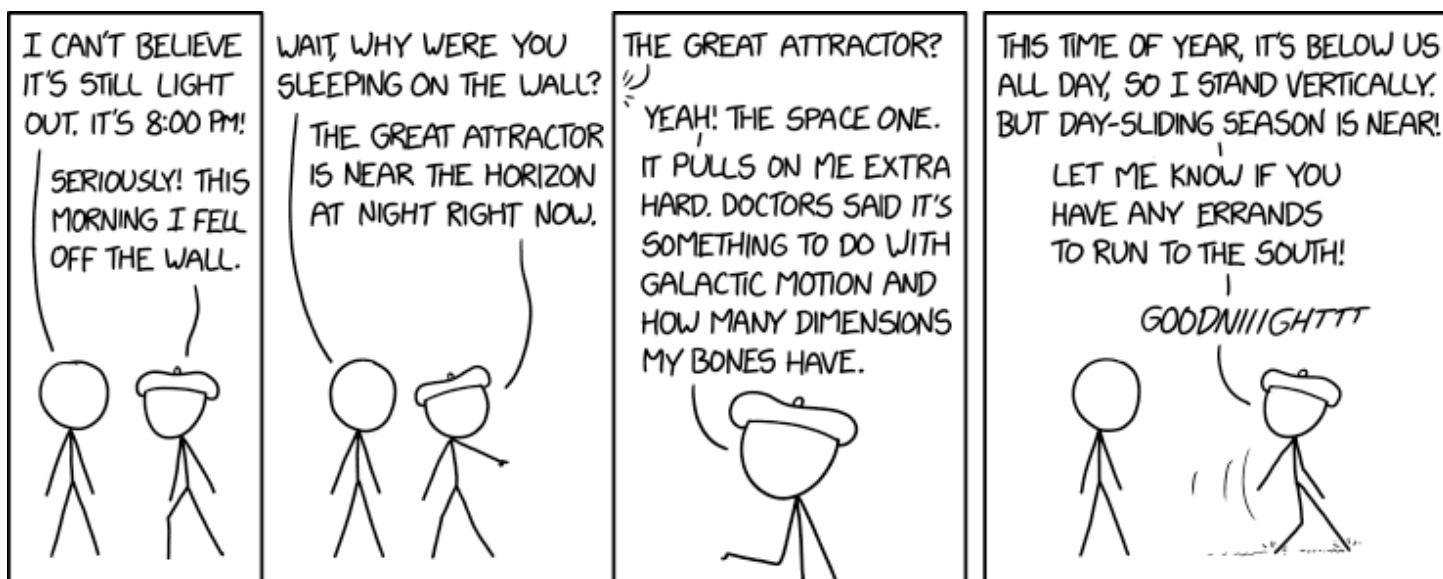
normally dim smudge 6144 between Anteras and M4 showed full shape and texture. M108 in



Ursa Major is typically a small fuzz ball, but it showed a cluster of individual stars like looking at a pin cushion. It was one of those superb nights.

June 13<sup>th</sup> was the annual MSRAL convention meeting held virtually. Most of the morning was dealing with business activities but we did have a discussion around hosting public events including star parties, observatories, and presentations. The Astronomical League has put out guidelines around "public viewing" events, sanitizing eyepieces between each

## The Great Attractor



xkcd.com

viewer, touch points, social distancing, etc. Many of you are dealing with these same issues within our work and social environments. Most star parties scheduled this summer have been canceled as organizations deal with the COVID 19 guidelines

Our June 30<sup>th</sup>, 7:30 PM club meeting will be via Zoom again in June. We had to forgo our scheduled plans for a public Solar observing night at Hyde. Instead we have lined a great speaker, Tom Field, an editor from Sky and Telescope Magazine, author of the RSpec software program. Jack Dunn heard him speak at a recent Midlands Astronomy Group and thought his presentation was

great. You can check out some of the feedback from other clubs at [www.rspect-astro.com/outreach](http://www.rspect-astro.com/outreach). I will send out Zoom call and passcode numbers the week before via the Nightsky Network to all members. Please plan to join in.

Jim Kvasnicka and I have been discussing having a Lunar Star Party / Beginning telescope program mid to late summer for newer members or members who would like to have some help getting to know how to use their telescopes. The program would be geared towards those who are new to observing and would like help setting up a telescope and using basic observing aids. It would also help members get started on the

Lunar Observing Program through the AL. If you are interested or like more information, please reach out to me at [kacvinskyb@yahoo.com](mailto:kacvinskyb@yahoo.com). If there is enough interest, we may host this type of event quarterly.

Wishing you all well and safe during these upcoming summer months. Hope you can get out and enjoy the wonders of our beautiful Nebraska clear and dark skies.

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

## ***June Program - "You Can Almost Touch the Stars"***

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Even if you wanted to touch a star, they're all impossibly distant. Despite these great distances, astronomers have learned an enormous amount about stars. How? The most common method to study the stars is called spectroscopy, which is the science of analyzing the colorful rainbow spectrum produced by a prism-like device.

Until recently, spectroscopy was too expensive and too complicated for all but a handful of amateurs. Today, though, new tools make spectroscopy accessible to almost all of us. You no longer need a PhD, dark skies, long exposures, enormous aperture ... or a big budget! With your current telescope and FITS camera (or a simple web cam or even a DSLR without a telescope) you can now easily study the stars yourself. Wouldn't you like to

detect the atmosphere on Neptune or the red shift of a quasar right from your own backyard?!

This talk, with lots of interesting examples, will show you what it's all about and help you understand how spectroscopy is used in research. Even if you are an armchair astronomer, understanding this field will enhance your understanding of the things you read and the night sky. We'll do a live Q&A after Tom's 45-minute presentation.

**Speaker Bio:** Tom Field is has been a Contributing Editor at *Sky & Telescope Magazine* for the past 7 years. He is the author of the RSpec software ([www.rspect-astro.com](http://www.rspect-astro.com)) which received the S&T "Hot Product" award in 2011. Tom is a popular speaker who has spoken to hundreds of clubs via the web at many conferences,



including NEAF, the NEAF Imaging Conference, PATS, the Winter Star Party, the Advanced Imaging Conference, SCAE, and others. His enthusiastic style is lively and engaging. He promises to open the door for you to this fascinating field!

## Mantrap Skies Image Catalog: ARP 20

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Rick Johnson

*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 20/UGC 3014 is a triple-armed (by Arp's classification) spiral located about 190 million light-years from us in Taurus. NED classifies it as SB? while Seligman says SABb? I measure its size at 52,000 light-years though Seligman says 60,000 light-years. I can't stretch it that far. The third arm seems

to come from the core rather than the ends of the bar. How it remains stable is a mystery to me. I'd think it rapidly destroyed by tidal forces. Apparently not. The other arms seem distorted. Yet there's nothing around that appears to have interacted with it. Maybe all this is due to some galaxy it is currently digesting.

That could explain the third arm and distortion of the other two.

Arp's image:  
[http://ned.ipac.caltech.edu/level5/Arp/Figures/big\\_arp20.jpeg](http://ned.ipac.caltech.edu/level5/Arp/Figures/big_arp20.jpeg)



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

### Planets

**Jupiter and Saturn:** Jupiter shines at magnitude -2.7 with a disk 47.6" wide. Saturn is at magnitude +0.1 with a disk 18.5". The two transit the meridian at 2:00 and 2:30 am.

**Mars:** Increases in brightness to -1.1 with a disk 14.5" wide. It rises around 12:30 am.

**Uranus and Neptune:** Neptune rises about one hour before Mars and Uranus is about one hour after Mars.

**Venus:** Rises about 2 hours before the Sun at magnitude -4.7.

**Mercury:** Is at inferior conjunction and won't reappear until July 17<sup>th</sup> in the dawn sky.

### Messier List

**M3:** Class VI globular cluster in Canes Venatici.

**M4:** Class IX globular cluster in Scorpius.

**M5:** Class V globular cluster in Serpens Caput.

**M53:** Class V globular cluster in Coma Berenices.

**M68:** Class X globular cluster in Hydra.

**M80:** Class II globular cluster in Scorpius.

**M83:** Galaxy in Hydra.

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

**Next Month:** M6, M7, M8, M9, M10, M12, M19, M20, M21, M23, M62, M107

### NGC and other Deep Sky Objects

**NGC 6229:** Class IV globular cluster in Hercules.

**NGC 6302:** The Bug Nebula in Scorpius.

**NGC 6369:** The Little Ghost Nebula in Ophiuchus.

**NGC 6543:** The Cat's Eye Nebula in Draco.

**IC 4703:** The Eagle Nebula in Serpens, M16 is the open cluster embedded in the nebula.



### Double Star Program List

**Nu Draconis:** Equal pair of white stars.

**Psi Draconis:** Pair of light yellow stars.

**40/41 Draconis:** Equal pair of light yellow stars.

**Xi Scorpii:** Yellow primary with a light blue secondary.

**Struve 1999:** Two yellow-orange stars.

**Beta Scorpii:** Bluish white primary with a light blue secondary.

**Nu Scorpii:** Yellow and light blue pair.

**Delta Serpentis:** Light yellow stars.

**Theta Serpentis:** Two blue-white stars.

### Challenge Object

**NGC 6207:** Galaxy 28' NNE of M13 in Hercules.



### Asterism Observing Program

People have looked at the night sky since the beginning of time and used their imagination to create pictures using the stars. Over time these pictures were better defined and organized into the constellations we know today. We identify pictures within the bigger picture as asterisms.

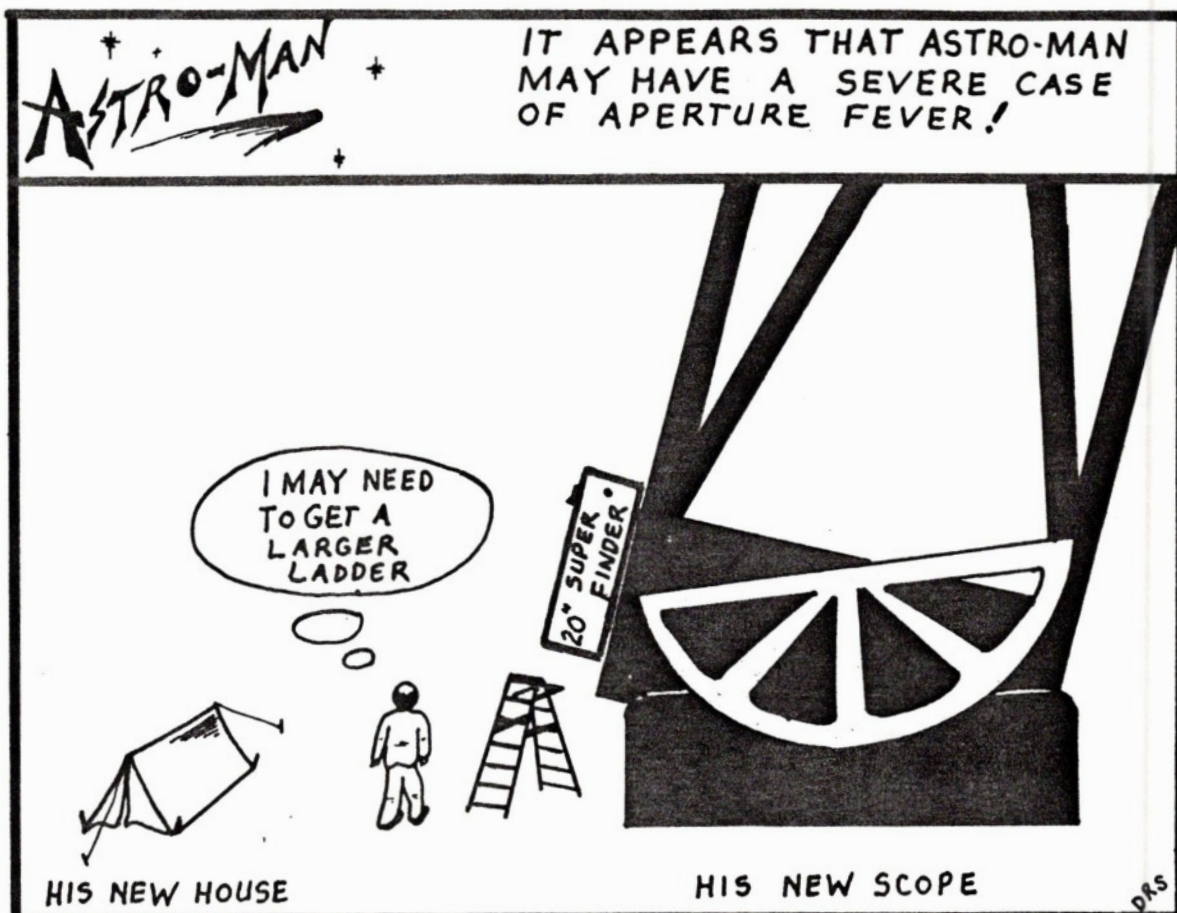
Asterisms are a group of stars that appear to be associated with each other, but are not. The best known asterism is the Big Dipper. The Big Dipper is just a small portion of the larger constellation Ursa Major. We continue to use our imagination

to create pictures in the night sky. This program was designed to help everyone appreciate the beauty and uniqueness the night sky offers us.

To qualify for the Asterism Observing Program you must observe and sketch 100 asterisms from the list of 112 asterisms. You can use your own observing logs as long as they provide the following information: date, time, location, seeing conditions, equipment used, magnification, asterism observed, and a simple sketch of the asterism.

At least 5 Naked-Eye asterisms from the list must be submitted. GO-TO and PUSH-TO telescopes are not allowed in finding the asterisms.

Once you complete the Asterism Observing Program you will need to submit your observing logs to me for review. I will contact the Asterism Observing Program chair for approval. Once I receive your certificate and pin I will present them to you at the next PAC meeting.





Jason  
O'Flaherty

*Here's a photo taken this month of Jail Rock by Jason O'Flaherty on a trip out to the Nebraska Panhandle. He used Starry Sky Stacker to combine 6 background shots and 4 foreground shots.*

*Fujifilm X-T3, 16mm f2.8, 15 seconds (background), 120 seconds (foreground, iso 6400.*

*Here's the blog post about his trip to take this photograph in the middle of the night:  
<https://flarecorpmedia.com/blog-standard/2020/5/25/4-hours-of-sleep-so-worth-it>*



*The Ring Nebula, M57, was taken at our star party on 5-29-2020 with a 50% illuminated moon casting our shadows.*

*The Hercules Cluster, M13 was taken at our star party on 6-12-2020 (which for those that weren't there was an amazing night, just ask Bob K., Jim K., Katelyn (spelling) and her cousin Sarah.) Also taken at the 6-12 star party were M51, the Whirlpool Galaxy and M104, the Sombrero Galaxy.*



## Meteorites from Mars contain clues about the red planet's geology

*Arya Udry, The Conversation*

Despite the pandemic, NASA is on track to launch its Mars rover, Perseverance, this July from Cape Canaveral, Florida. Its central mission will be to search for evidence of previous life on Mars.

An exciting component of the rover will be a specialized drill that will collect rock and soil samples to be cached on the surface of Mars. If all goes according to plan, the cache will be retrieved by a future mission in 2031 and, for the first time, material from Mars will be brought back to Earth for analysis.

As someone who studies Martian geology, I'm definitely looking forward to 2031 but am grateful I don't have to wait 11 years to study rocks from Mars. Martian rock samples are already here on Earth in the form of meteorites.

### How rocks from Mars end up on Earth

All Martian meteorites were formed millions of years ago, when asteroids and other space rocks collided into the surface of Mars with enough force to eject pieces of its crust into orbit. Sometimes these rock fragments, floating in outer space, enter Earth's atmosphere, where gravity pulls them in.

Meteorites land everywhere on Earth, but are easiest to find in hot or cold deserts, where the lack of vegetation and other rocks help them to stand out.



*Nicknamed 'Black Beauty,' this Martian meteorite was found in the Sahara Desert in 2011. It is believed to be the second oldest yet discovered. NASA*

Martian meteorites are rare: Only 261 pieces have been found on Earth, compared to the 63,758 non-Martian meteorites currently cataloged, most originating from the asteroid belt.

Martian meteorites have been recovered all over the world, including Antarctica, northwest Africa, Chile, the United States, India, Nigeria, Mali, Mauritania, Brazil and Oman. Currently, scientists like me can obtain Martian meteorites for study in two ways: either from private dealers or from the Antarctic Search for Meteorites collection.

The ANSMET program is funded by both NASA and the National Science Foundation. Antarctica is a great place to spot

meteorites due to the omnipresence of ice. Even better, meteorites tend to get trapped in moving ice floes which accumulate at the base of mountain ranges, where they often resurface.

Every year since 1976, ANSMET has sent a team of eight volunteer planetary scientists and mountaineers to Antarctica in December and January to hunt for



*Recovery of a meteorite in Antarctica by members of the Antarctic Search for Meteorites (ANSMET) expedition. A meteorite is picked up with sterile tongs and put into a clean Teflon bag. NASA*

meteorites. The crew combs promising areas by lining up snowmobiles 100 feet apart and slowly creeping through the snow and ice looking for specimens in their path.

## Mars Geology, continued.

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Scientists can also buy meteorites from trusted private dealers. Martian meteorites are expensive, however, usually running around US\$1,000 a gram on average. The majority of Martian meteorites are found by nomads in the Saharan desert, mainly in Morocco. Locals have been trained to find meteorites by looking for the presence of a fusion crust on a rock, which is formed when the exterior of the meteor melts upon entering the Earth's atmosphere. I've bought 15 samples from dealers who are well known in the meteorite community.

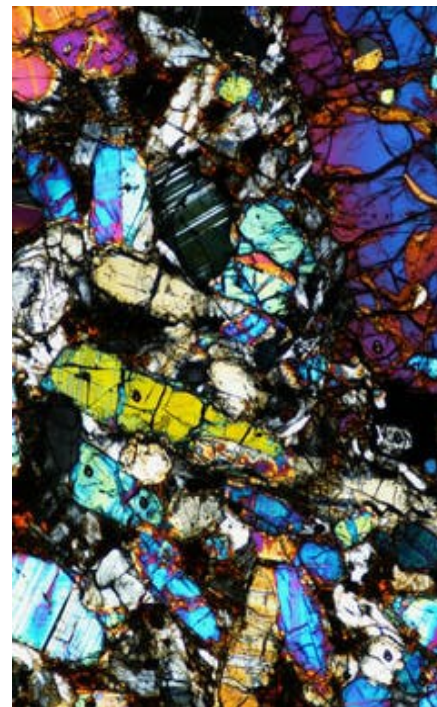
### Determining if a Meteorite is From Mars

Initially, scientists analyzed the gas pockets within the minerals of meteorites and compared them to the known atmosphere on Mars, which was established

by NASA's Viking rovers in 1976. When the gases match perfectly, scientists could conclude the meteorites came from Mars.

Starting in the 1990s, however, scientists like me began using cheaper and easier techniques to determine Martian provenance, such as oxygen isotopic compositions, which are like atomic barcodes that are unique for each planet.

All told, the 261 known meteorites from Mars collectively weigh around 440 pounds. Scientists study them using the same instruments and techniques we use to study Earth samples. My colleagues and I are interested in determining how and when these rocks were formed and how they are linked to each other.



*A thin section of a Martian meteorite under a microscope equipped with a polarizer to help distinguish the different minerals. Arya Udry, CC BY*



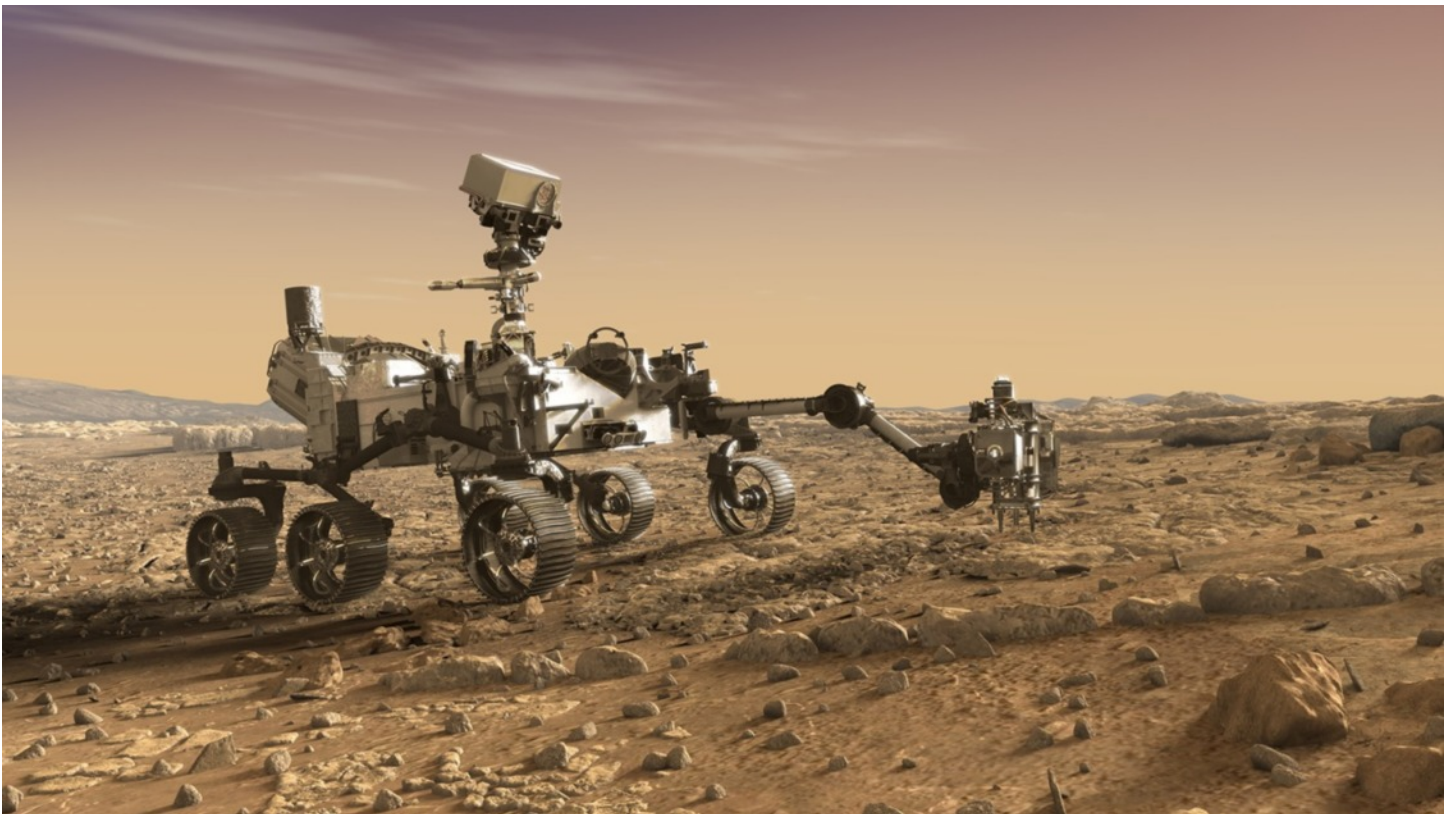
This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit [nightsky.jpl.nasa.gov](https://nightsky.jpl.nasa.gov) to find local clubs, events, and more!

NASA's latest Mars rover, Perseverance, is launching later this month! This amazing robot explorer will scout the surface of Mars for possible signs of ancient life and collect soil samples for return to Earth by future missions. It will even carry the first off-planet helicopter: *Integrity*. Not coincidentally, Perseverance will be on its way to the red planet just as Mars dramatically increases in brightness and visibility to eager

stargazers as our planets race towards their closest approach in October of this year. Perseverance's engineers built upon the success of its engineering cousin, *Curiosity*, and its design features many unique upgrades for a new science mission! In February of 2021, Perseverance will land at the site of an ancient river delta inside of *Jezero Crater* and ready its suite of seven primary scientific instruments. The rover

will search for traces of past life, including possible Martian fossils, with *WATSON* and *SHERLOC*, two advanced cameras capable of seeing tiny details. The rover also carries an amazing instrument, *SuperCam*, to blast rocks and soil outside of the rover's reach with lasers to determine their chemical makeup with its onboard suite of cameras and spectrometers. Perseverance

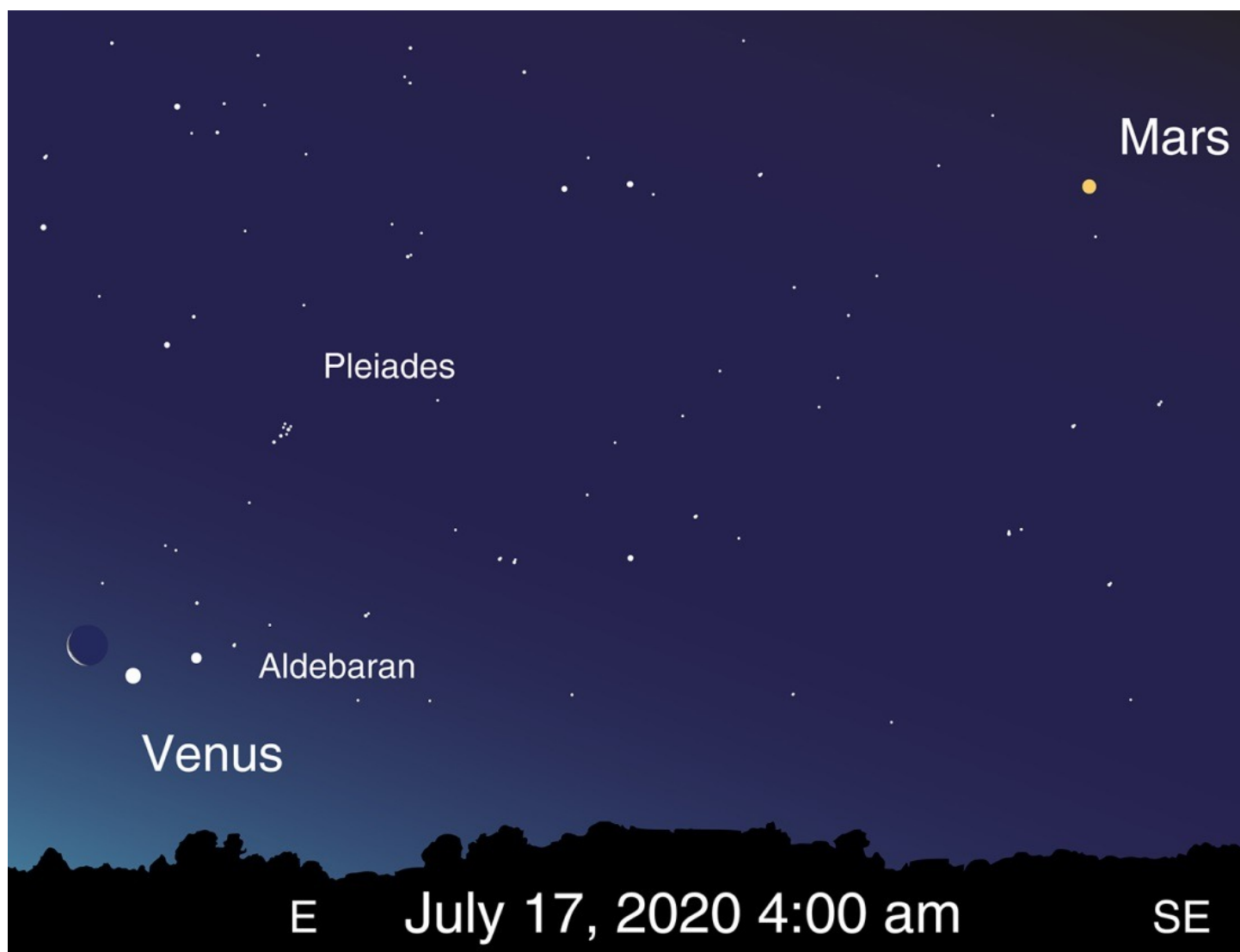


*Perseverance inspects a cluster of interesting Martian rocks with its instruments in this artist rendering by NASA JPL/Caltech*

will also take core samples of some of the most promising rocks and soil, storing them for later study with its unique caching system. Future missions will retrieve these samples from the rover and return them for detailed study by scientists on Earth. Perseverance also carries two microphones so we can hear the sounds of Mars and the noises of its instruments at work. It will even launch a small helicopter - Ingenuity - into the Martian atmosphere as a trial for future aerial exploration!

Would you like to contribute to Mars mission science? You can help NASA's rover drivers safely navigate the Martian surface by contributing to the AI4Mars project! Use this tool to label terrain features on photos taken of the Martian surface by NASA missions to help train an artificial intelligence algorithm to better read their surrounding landscape: [bit.ly/AI4Mars](http://bit.ly/AI4Mars) The launch of Mars Perseverance is, as of this writing, scheduled for July 20, 2020 at 9:15am EDT. More

details, updates, and livestreams of the event are available on NASA's official launch page: [bit.ly/Mars2020Launch](http://bit.ly/Mars2020Launch) . Dig deep into the science of the Mars 2020 mission and the Perseverance rover at: [mars.nasa.gov/mars2020/](http://mars.nasa.gov/mars2020/) . Find out even more about past, present, and future Mars missions at [nasa.gov](http://nasa.gov).



*Observe Mars yourself over the next few months! Mars can be found in early morning skies throughout July, and by the end of the month will rise before midnight. Mars gradually brightens every night until the close approach of Mars in October. The pre-dawn skies of July 17 present an especially nice view, as the*



**The President's Report**

The club observatory, or telescope shelter, if you prefer, is now ready for use and the "tilt up and over" arrangement seems to be working out just fine.

I had a little trouble at first with the sliding doors falling open or shut as the building was raised or lowered, but a system of weights and ropes attached to the doors solved that problem.

Brian Bodson is working on the clock drive, and it should be ready soon. even without the clock drive, the scope has been put to good use by a few club members during the past couple of weeks. Before long we should have several more names to add to the Messier award listings.

I plan to leave early on the morning of July 16th for Fayette, Mo., and the Mid-States Regional Convention. I have room in my car for a few passengers, but when I have a carload, I'll have to say no to any late-comers. In the past, the club has defrayed the cost of members car-expenses to the regional convention, and a vote will be taken at the upcoming meeting on whether to continue this practice. If we do continue this practice, hopefully we will have several carloads going to Fayette. See you at the meeting

Earl Moser

\* \* \* \* \*



*Editor's note: this design worked well until someone opened it on a very windy day.*



## 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

## 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)	James Quach <a href="mailto:jamesq@utexas.edu">jamesq@utexas.edu</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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