

The Prairie Astronomer

October 2021 Volume 62, Issue #10



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer



NEXT MEETING AND PROGRAM

October 26, 7:30pm via Zoom: VLA Virtual Tour

Join us for a one of a kind virtual tour experience. Enjoy a personal, in-depth look at this world renowned radio telescope and the field of radio astronomy. The tour will include an introduction to the history and science of the Very Large Array, video segments that will transport the audience to parts of the observatory otherwise off limits to the public, and a Q&A session with our tour guides.

Also: election of new club officers.

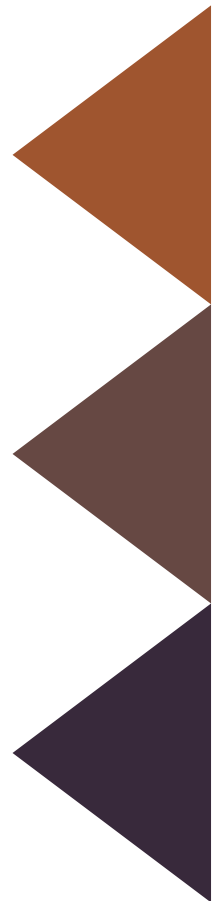
FUTURE PROGRAMS

To be announced

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Cover: Two holes are visible in the rock, nicknamed "Rochette," from which NASA's Perseverance rover obtained its first core samples. The rover drilled the hole on the left, called "Montagnac," on Sept. 7, and the hole on the right, known as "Montdenier," on Sept. 1. Below it is a round spot the rover abraded.



CALENDAR

PAC Meeting
October 26, 7:30pm via Zoom

PAC Meeting
November 30, 7:30pm

PAC Meeting
December 28, 7:30pm

PAC Meeting
January 25, 7:30pm

2021 STAR PARTY DATES

	Date	Date
January	8	15
February	5	12
March	5	12
April	2	9
May	7	14
June	4	11
July	2	9
August	Jul 30	6
September	Aug 27	3
October	1	8
November	Oct 29	5
December	Nov 26	3

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

CLUB OFFICERS

President	Bob Kacvinsky kacvinskyb@yahoo.com
Vice President	Rick Brown rickbrown2000@gmail.com
2nd VP (Program Chair)	James Quach jamesq@utexas.edu
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



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Night Sky Network



www.prairieastronomyclub.org

Meeting Minutes

Bill Lohrberg

PAC meeting minutes
September 28, 2021 as
recorded by Bill Lohrberg

The Zoom meeting was hosted again by President Bob Kacvinsky and called to order at 7:35 pm, 22 attended. Bob welcomed all and announced the night's agenda including nomination of club officers and program review of the recent PAC member survey results.

Jim Kvasnicka presented the observing report for October (details are available in the newsletter) and announced upcoming club start parties for October 1 and 8. Also there is to be a lunar observing party at Jim's house Oct 15.

In the news and current event topic was presented by Bob Kacvinsky. An article from Sky & Telescope November issue - the Mars rover InSight lander findings that Mars crust is determined to be 12-24 miles in thickness. Also found its core is liquid about 2300 to 2400 miles across and has some magnetic field although weak. New discoveries and study are ongoing with the InSight mission.

Bob repeated no change in status at Hyde Observatory remaining on hold until the risk dial goes back down. Bob also reviewed the previously mentioned PAC star party dates, and to check via the night sky network for weather conditions or any other special announcements before venturing out to either the Cortland site or Branched Oak Observatory.

The October 26 PAC meeting will likely be another Zoom meeting where the election of club officers will take place. A video presentation for the program is planned pending confirmation. Bob also announced that all public star parties are on hold until the covid-19 risk dial gets back into the "green".

Bob mentioned as a side note there are telescopes available for sale from members – get in touch with Bob if interested. 6", 8" and 12" Newtonians with Dob mounts.

Club Treasurer John Reinert reported the 2019,20, 21 spread sheets all up to date through August and all commensurate paperwork ready as soon as can be

scheduled for the club audit. John would like to review some of our membership information for the purpose of getting it more complete, and in his opinion should be published in the newsletter. Otherwise P.O. Box was paid, general liability insurance, filed the N990, and the most recent CD to come due was going to generate .02 percent but he got it to .2 percent. Member roster is due to the Astronomical league by the end of September. There was a discussion about enabling electronic payment of dues. It is not set up as an option at this time but is being explored.

Bob announced that the 2022 Astronomy League convention is set to be live July 28-30 in Albuquerque NM, encouraged all to consider attending.

Prior to nominations a review of duties and responsibilities for each office was discussed. Nominations for election of club officers was called for each office as follows:

President – remained open

First Vice President –

Jason O'Flaherty

2nd Vice President –
remained open

Treasurer – John Reinert

Secretary – Jim White

All members were encouraged to make nominations and reminded that any member can nominate another as well as themselves. Election is

held at the October meeting.

Bob also wanted to mention the positions being held currently by the following members are appointed by the newly elected board in November.

Outreach coordinator –
Mike Kearns

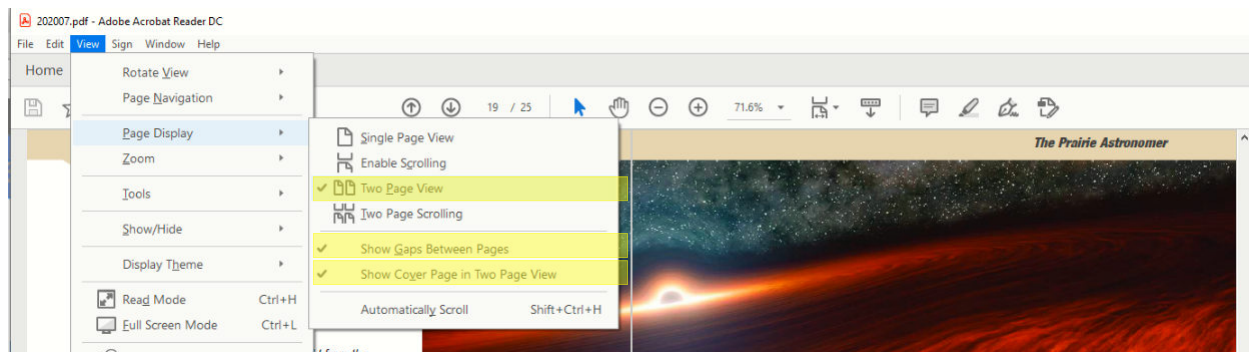
Observing Chair – Jim
Kvasnicka

Publications Chair/Editor
– Mark Dahmke

At approximately 8:00pm the meeting was adjourned to the program, a review and discussion of the results of recent PAC member survey by Dan Delzell and Jim Kvasnicka.

New Newsletter Format

How to Adjust Adobe Acrobat Settings for Two Page View



To view this newsletter in magazine spread format in Acrobat, select View -> Page Display-> Two Page View. Acrobat will then show two pages side by side. Also make sure the checkboxes "Show Cover Page in Two Page View" and "Show Gaps Between Pages" are checked. **If you have it setup correctly, the cover page will be displayed by itself and subsequent pages will be side by side with the odd numbered pages on the left.**

PAC Newsletter Archive

Back issues of the *Prairie Astronomer* from 1962 to present are now available online:
<https://www.prairieastronomyclub.org/newsletters>

PAC-LIST

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

To post messages to the list, send to this address: pac-list@googlegroups.com

The President's Message

Bob Kacvinsky



Welcome to October as we transition from the summer triangle, Hercules, and the tea pot to Pegasus, Andromeda, Perseus, and the age of Aquarius. Sorry, I flashed back to a time in college. October also brings back cooler temps that reduce the insect bombardments and sharpens the celestial views in our telescopes. Time to put on your boots, scarves, and jackets and get out and enjoy the view of Jupiter and Saturn as they dance across our fall evening skies.

In addition to our regular star party dates, Jim Kvasnicka has offered to host this month a Lunar Observing night where 3-4 experienced members will be available to help with telescope and observing questions. The next Lunar Star Party will be October 15th and hosted at Jim's estate in SE Lincoln. Anyone may participate in this star party but we especially want to invite new

members who want some extra time working with their telescopes. Details for all our star parties are listed within the newsletter. Please consider attending one of the club star parties. It is a great way to get involved, learn from others, and be amazed at the night wonders. We are safely able to maintain distances between telescopes so will continue our private PAC parties during the fall.

Our next PAC Meeting is Tuesday October 26th at 7:30 PM. In October is our annual election of club officers. Our program this month will be a presentation from a member of the staff at the Very Large Array Radio Telescope in New Mexico. They will present an update on the Array activities, discoveries, and answer questions from our group. Please take the time to join the Zoom meeting to hear how the

VLA is opening up the secrets of the Universe. It would be nice to have a big attendance at the meeting for these very special guests.

If you are looking at getting a new telescope or upgrading, please let one of the officers know. We have members who have recently upgraded equipment and there are a 6", 8", and 12" Dob style reflector telescopes available for sale. We typically do not advertise items for sale, but this is an opportunity to get a high-quality telescope upgrade from within our club. Let us know if you are interested.

Based on feedback from a survey of our newer and prospective members we will be hosting a Basic Astronomy class later this fall. We are still working on details, dates, and possible locations for a face-to-face classroom environment – fall back is via Zoom. Jim Kvasnicka

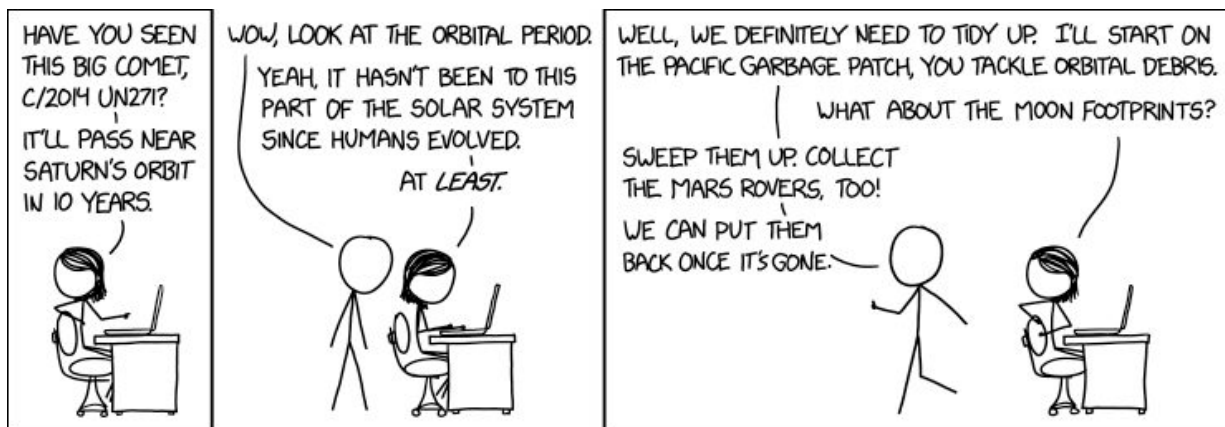
has been pulling together resource packets for new members and course materials. We will announce more details at the October meeting so please plan to attend. Special thanks to Dan Delzell and Jim Kvasnicka for taking the lead on this project.

Over the past 20 months Covid has wreaked havoc with our society, community, and PAC Outreach activities. Our

club has a great reputation for our involvement in the community through Hyde and public observing events. I suspect many of you are anxious like me to get back out to sharing the wonders of our Universe to others. Once this latest wave of Covid subsides (at some point it will) please consider how you can safely reenergize your Astronomy passion. Whether volunteering at Hyde, participating on

PAC Outreach events, or just gathering again at meetings we hope you will join in the fun. The public will be looking for activities to safely “get out” and being outside looking at the night sky is a great place to begin.

Dark and Clear Skies to you,
Bob Kacvinsky
PAC-President
kacvinskyb@yahoo.com
402-840-0084





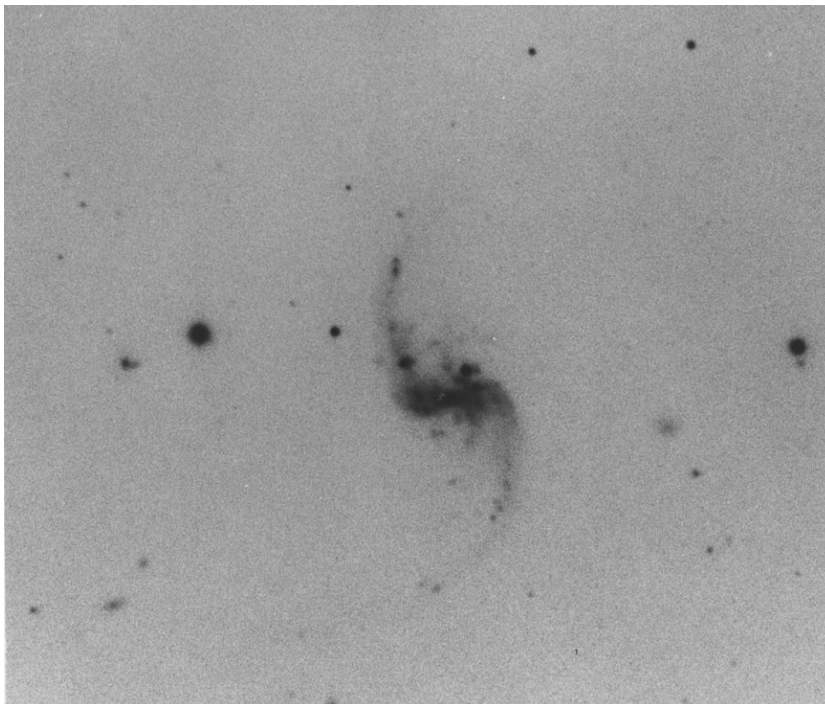
Rick Johnson

ARP 35

Arp 35 is considered a pair of interacting galaxies even though they are widely separated. The two galaxies are LEDA 001434 in the center and LEDA 001431 well below it. They are in the constellation of Pisces. Both are about 210 million light-years from us. The later seems mostly unchanged by the encounter but 1434

certainly has been torn up by the near collision. Arp has a class for integral sign galaxies, none of which is the integral sign galaxy oddly enough. Like Arp 24 the companion isn't involved in his classification of the galaxy and isn't mentioned that I find. Still, some catalogs consider both to be part of Arp 35.

ARP's image:



The Mantrap Skies Image Catalog

Rick Johnson, a founding member of the Prairie Astronomy Club, passed away in January, 2019. His legacy lives on through his comprehensive catalog of over 1600 images at www.mantrapskies.com.



November Observing

Jim Kvasnicka



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

Planets

Jupiter: Shines at -2.3 magnitude with a disk 38" wide in Capricornus.

Saturn: At magnitude +0.6 with a disk 16" wide in Capricornus.

Uranus and Neptune: Look for Uranus in Aries and Neptune in Aquarius.

Venus: Low at sunset in Sagittarius at -4.4 magnitude.

Mars and Mercury: Both are low in the dawn sky in Virgo. On November 10th Mars is 1° to the lower right of Mercury.

Messier List

M27: The Dumbbell Nebula in Vulpecula.

M30: Class V globular cluster in Capricornus.

M56: Class X globular cluster in Lyra.

M57: The Ring Nebula in Lyra.

M71: Class XII globular cluster in Sagitta.

M72: Class IX globular cluster in Aquarius.

M73: Asterism in Aquarius.

Last Month: M11, M16, M17, M18, M24, M25, M26, M55, M75

Next Month: M2, M15, M29, M31, M32, M39, M110

NGC and other Deep Sky Objects

NGC 7662: The Blue Snowball in Andromeda.

NGC 128: Elongated galaxy in Pisces.

NGC 247: Galaxy in Cetus.

NGC 253: The Silver Coin Galaxy in Sculptor.

NGC 288: Class X globular cluster in Sculptor.

NGC 457: The E. T. Cluster in Cassiopeia.

Double Star Program List

Iota Trianguli: Yellow primary with a pale blue secondary.

Gamma Arietis: Two equal white stars.

Lambda Arietis: Yellow and pale blue stars.

65 Piscium: Yellow pair.

Psi 1 Piscium: Equal bluish white pair.

Zeta Piscium: White primary with a secondary.

Alpha Piscium: Close white pair.

Gamma Andromedae: Almach, gold and greenish blue pair.

Challenge Object

NGC 193 and NGC 194: Two small round galaxies in Pisces that fit in the same FOV.

Focus on Constellations

Andromeda

Jim Kvasnicka

Andromeda the Princess extends from the NE corner of the Great Square of Pegasus. Andromeda is the 19th largest constellation with an area of 722 square degrees. Due to her position away from the galactic plane few nebulae can be found in the constellation; however, the area is a window to deep space allowing us to see galaxies of all types. The most famous is M31 the Andromeda Galaxy along with its two companion galaxies M32 and M110. These are the only Messier objects in the constellation. Andromeda is best seen in the month of November.

Showpiece Objects

Galaxies: M31 (The Andromeda Galaxy), M32, M110, NGC 891

Planetary Nebulae: NGC 7662 (The Blue Snowball)

Double Stars: Gamma Andromedae (Almach)

Mythology

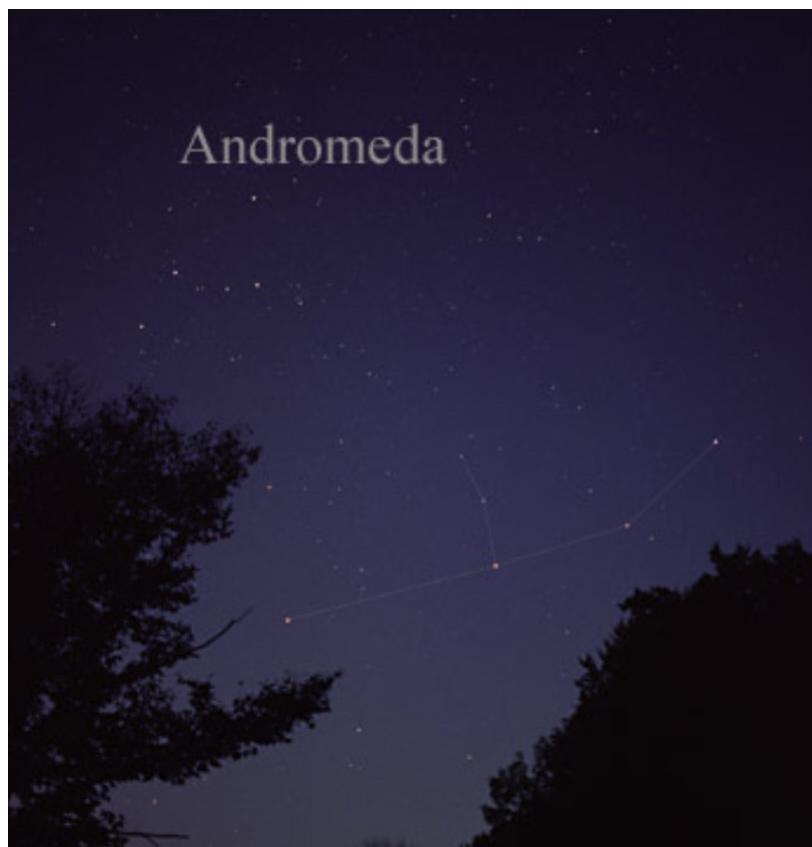
The mythology around Andromeda is one of the most famous Greek myths. Andromeda was

chained to the rocks on the shore by her father, Cepheus, as a sacrifice to appease the avenging sea monster Cetus. The hero in the myth, Perseus, comes to her rescue riding Pegasus the winged horse. Perseus slays the monster and marries Andromeda. Adjacent constellations represent all the characters in the myth: her parents Cepheus and Cassiopeia, her hero Perseus and his winged horse Pegasus, and the

sea monster Cetus.

Number of Objects
Magnitude 12.0 and Brighter

Galaxies: 8, Open
Clusters: 3, Planetary
Nebulae: 1



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

Lunar Party, October 16

Dave Knisely, John Reinert

Well, most of us amateur astronomers kind of hate the time when the moon is out, as its light tends to drown out the "faint fuzzies" (deep-sky objects) we like to observe with our telescopes. However, our Prairie Astronomy Club holds monthly "Lunar Parties" at a member's home in southern Lincoln where we *do* bother to

look at the moon and log observing all its various surface features (along with looking at brighter objects like the planets and double stars). The weather didn't look promising around sunset, but it cleared off nicely, with very cool crisp air to take in. There were only six of us there, but we had a lot of fun, not just viewing the skies, but

getting together and talking while "spaced out" a bit on the observing field (Covid-19 has forced us to hold our regular club meetings on-line). Here is a shot taken by our club treasurer John Reinert of three of our members working on the Astronomical League's Lunar Observing Program.





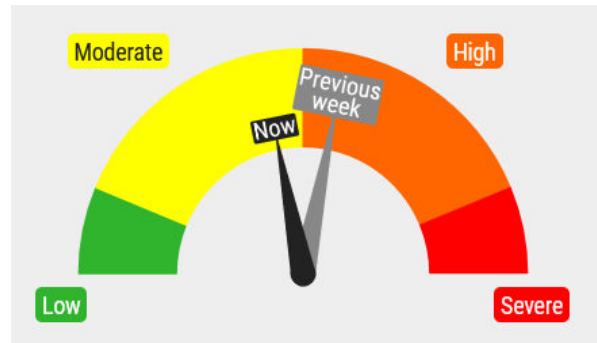
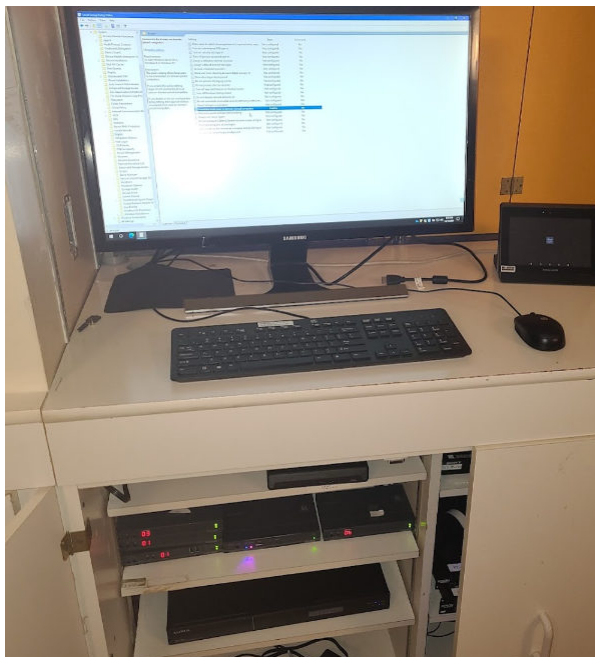
Hyde Observatory Upgraded, Ready to Reopen

As the old saying goes, “all dressed up and nowhere to go.” Hopefully by December the Covid risk dial will return to green so Hyde can welcome visitors again.

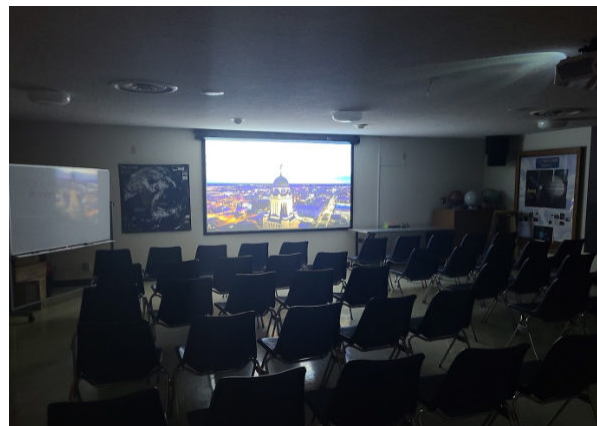
Last year Hyde’s AV (Audio Visual) system was upgraded to support 4K/UHD video and now has a PA system that covers the entire building.

On October 13th, the PC was replaced with a new HP DeskPro with an Nvidia GPU, supporting native 4K/UHD video. All new programs will be rendered in UHD (3840x2160) resolution. All programs will be copied over to the hard drive, instead of running programs off the Blu-ray player.

The new PC will also have an external 1TB backup drive containing copies of all the videos.



The AV system uses a matrix switch with video encoders and decoders. The encoders convert the HDMI output of all input devices to a protocol that can be sent over cat5 cable and routed to decoders connected to the computer monitor and 4K projector. The result is native end-to-end 4K video from sources in the control room, the front of the lecture room and at the C14 telescope. This opens up the possibility of feeding 4K webcam output from the C14 to the lecture room projector.



Hyde has come a long way since it opened in 1977 - with two slide projectors, a program sequencer and an audio cassette deck connected to a stereo amplifier.

Hyde's first computer and video projector were installed in 2003, with an upgrade to HD in 2009.

In 2003 Lincoln Telephone donated DSL Internet service. At a maximum of 10 megabits per second, it is still in use today. But Hyde's bandwidth will soon go up by two orders of magnitude. The Allo gopher has tunneled all the way from 70th Street to Hyde Observatory, and within a few months Hyde will finally have gigabit fiber.

The Unisteller eVscope saw limited use in "test mode" when Hyde was open for a few weeks this summer. The Hyde Board is currently looking at the best place to locate it on the deck, and expects that it will go into regular service when the observatory reopens.



The digital sign got a new frame and posts this summer and the sidewalks were replaced.



NASA's Perseverance Rover Collects Puzzle Pieces of Mars' History

The rocks it has analyzed for sample collection are helping the team better understand a past marked by volcanic activity and water.

NASA's Perseverance Mars rover successfully collected its first pair of rock samples, and scientists already are

which was marked by volcanic activity and periods of persistent water.

water was there a long time."

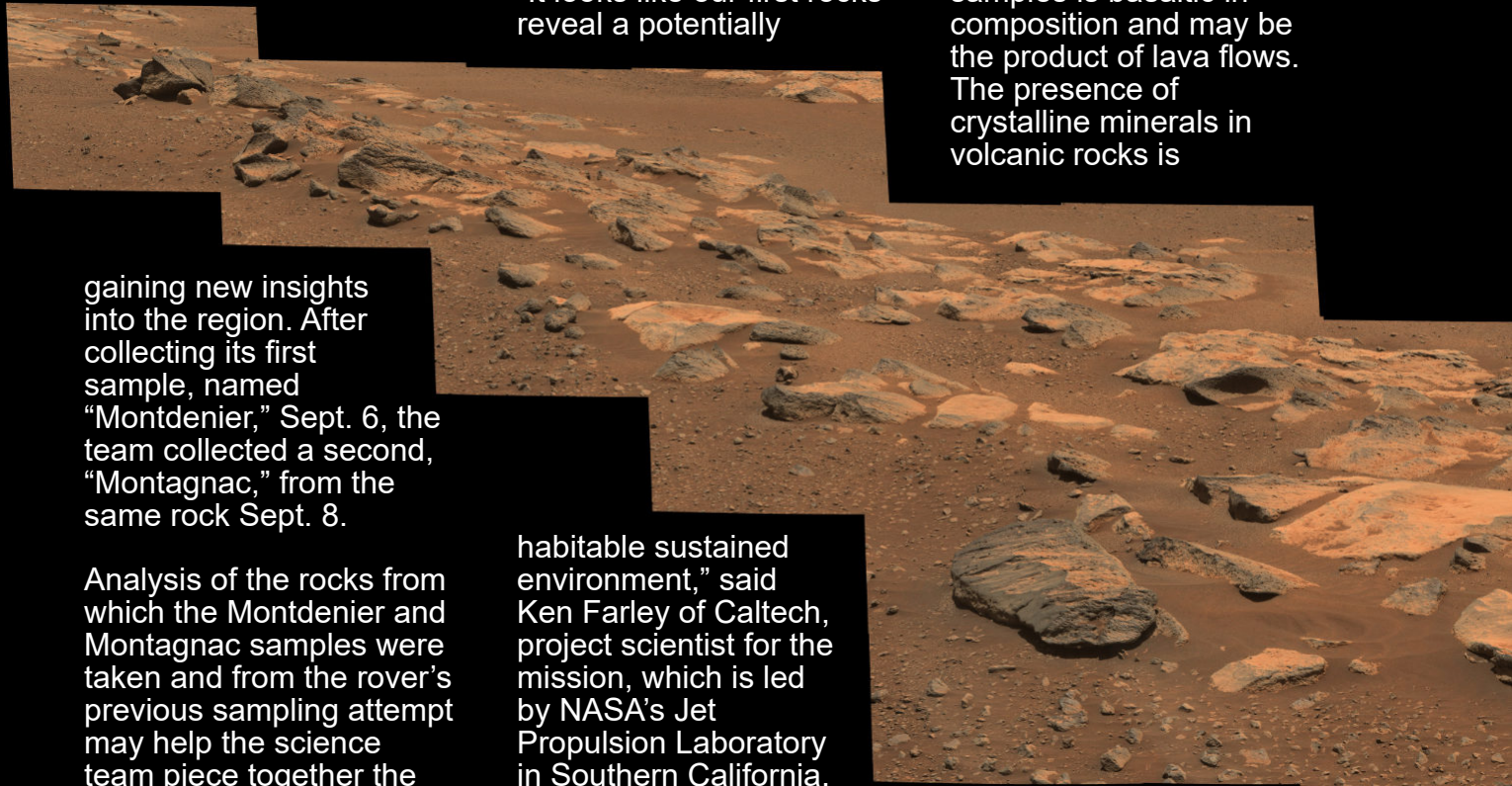
The rock that provided the mission's first core samples is basaltic in composition and may be the product of lava flows. The presence of crystalline minerals in volcanic rocks is

"It looks like our first rocks reveal a potentially

gaining new insights into the region. After collecting its first sample, named "Montdenier," Sept. 6, the team collected a second, "Montagnac," from the same rock Sept. 8.

Analysis of the rocks from which the Montdenier and Montagnac samples were taken and from the rover's previous sampling attempt may help the science team piece together the timeline of the area's past,

habitable sustained environment," said Ken Farley of Caltech, project scientist for the mission, which is led by NASA's Jet Propulsion Laboratory in Southern California. "It's a big deal that the



This mosaic image (composed of multiple individual images taken by NASA's Perseverance rover) shows a rock outcrop in the area nicknamed "Citadelle" on the floor of Mars' Jezero Crater. Credit: NASA/JPL-Caltech/ASU/MSSS

especially helpful in radiometric dating. The volcanic origin of the rock could help scientists accurately date when it formed. Each sample can serve as part of a larger chronological puzzle; put them in the right order, and scientists have a timeline of the most important events in the crater's history. Some of those events include the formation of Jezero Crater, the emergence and disappearance of Jezero's lake, and changes to the planet's climate in the ancient past.

What's more, salts have been spied within these rocks. These salts may have formed when groundwater flowed through and altered the original minerals in the

ancient Martian water. If present, they could serve as microscopic time capsules, offering clues about the ancient climate and habitability of Mars. Salt minerals are also well-known on Earth for their ability to preserve signs of ancient life.

The Perseverance science team already knew a lake once filled the crater; for how long has been more uncertain. The scientists couldn't dismiss the possibility that Jezero's lake was a "flash in the pan": Floodwaters could have rapidly filled the impact crater and dried up in the space of 50 years, for example.

But the level of alteration that scientists see in the rock that provided the core samples – as well as

This groundwater could have been related to the lake that was once in Jezero, or it could have traveled through the rocks long after the lake had dried up. Though scientists still can't say whether any of the water that altered these rocks was present for tens of thousands or for millions of years, they feel more certain that it was there for long enough to make the area more welcoming to microscopic life in the past.

"These samples have high value for future laboratory analysis back on Earth," said Mitch Schulte of NASA Headquarters, the mission's program scientist. "One day, we may be able to work out



rock, or more likely when liquid water evaporated, leaving the salts. The salt minerals in these first two rock cores may also have trapped tiny bubbles of

in the rock the team targeted on their first sample-acquisition attempt – suggests that groundwater was present for a long time.

the sequence and timing of the environmental conditions that this rock's minerals represent. This will help answer the big-picture science question

Perseverance, continued.

of the history and stability of liquid water on Mars.”

Next Stop, ‘South Séítah’

Perseverance is currently searching the crater floor for samples that can be brought back to Earth to answer profound questions about Mars’ history. Promising samples are sealed in titanium tubes the rover carries in its chassis, where they’ll be stored until Perseverance drops them to be retrieved by a future mission.

Perseverance will likely create multiple “depots” later in the mission, where it will drop off samples for a future mission to bring to Earth. Having one or more depots increases the likelihood that especially valuable samples will be accessible for retrieval to Earth.

Perseverance’s next likely sample site is just 656 feet (200 meters) away in “South Séítah,” a series of ridges covered by sand dunes, boulders, and rock shards that Farley likens to “broken dinner plates.”

The rover’s recent drill sample represents what is likely one of the youngest

rock layers that can be found on Jezero Crater’s floor. South Séítah, on the other hand, is likely older, and will provide the science team a better timeline to understand events that shaped the crater floor, including its lake.

By the start of October, all Mars missions will be standing down from commanding their spacecraft for several weeks, a protective measure during a period called Mars solar conjunction. Perseverance isn’t likely to drill in South Séítah until sometime after that period.

More About Perseverance

A key objective for Perseverance’s mission on Mars is astrobiology, including the search for signs of ancient microbial life. The rover will characterize the planet’s geology and past climate, pave the way for human exploration of the Red Planet, and be the first mission to collect and cache Martian rock and regolith --broken rock and dust.

Subsequent NASA

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

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

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

For more about Perseverance:

<https://www.nasa.gov/perseverance>

and

<https://mars.nasa.gov/mars2020/>

Hubble Shows Winds in Jupiter's Great Red Spot Are Speeding Up

The Winds at the Outer Edge Are 'Winning the Race' in This Enormous Storm System

Like the speed of an advancing race car driver, the winds in the outermost "lane" of Jupiter's Great Red Spot are accelerating – a discovery only made possible by NASA's Hubble Space Telescope, which has monitored the planet for more than a decade.

Researchers analyzing Hubble's regular "storm reports" found that the average wind speed just within the boundaries of the storm, known as a high-speed ring, has increased by up to 8 percent from 2009 to 2020. In contrast, the winds near the red spot's innermost region are moving significantly more slowly, like someone cruising lazily on a sunny Sunday afternoon.

The massive storm's crimson-colored clouds spin counterclockwise at speeds that exceed 400 miles per hour – and the vortex is bigger than Earth itself. The red spot is legendary in part because humans have observed it for more than 150 years.

"When I initially saw the results, I asked 'Does this

make sense?' No one has ever seen this before," said Michael Wong of the University of California, Berkeley, who led the analysis

published today in *Geophysical Research Letters*

. "But this is something only Hubble can do. Hubble's longevity and ongoing observations make this revelation possible."

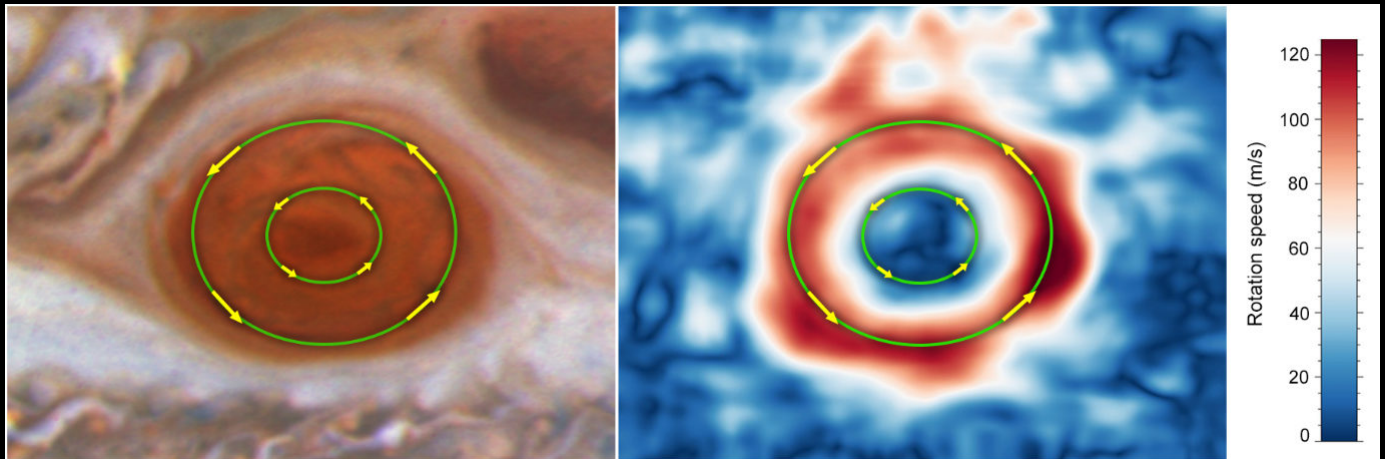
We use Earth-orbiting satellites and airplanes to track major storms on Earth closely in real time. "Since we don't have a storm chaser plane at Jupiter, we can't continuously measure the winds on site," explained Amy Simon of NASA's Goddard Space Flight Center in Greenbelt, Maryland, who contributed to the research. "Hubble is the only telescope that has the kind of temporal coverage and spatial resolution that can capture Jupiter's winds in this detail."

The change in wind speeds they have measured with Hubble amount to less than

1.6 miles per hour per Earth year. "We're talking about such a small change that if you didn't have eleven years of Hubble data, we wouldn't know it happened," said Simon. "With Hubble we have the precision we need to spot a trend." Hubble's ongoing monitoring allows researchers to revisit and analyze its data very precisely as they keep adding to it. The smallest features Hubble can reveal in the storm are a mere 105 miles across, about twice the length of the state of Rhode Island.

"We find that the average wind speed in the Great Red Spot has been slightly increasing over the past decade," Wong added. "We have one example where our analysis of the two-dimensional wind map found abrupt changes in 2017 when there was a major convective storm nearby."

To better analyze Hubble's bounty of data, Wong took a new approach to his data analysis. He used software to track tens to hundreds of thousands of wind vectors



By analyzing images taken by NASA's Hubble Space Telescope from 2009 to 2020, researchers found that the average wind speed just within the boundaries of the Great Red Spot, set off by the outer green circle, have increased by up to 8 percent from 2009 to 2020 and exceed 400 miles per hour. In contrast, the winds near the storm's innermost region, set off by a smaller green ring, are moving significantly more slowly. Both move counterclockwise. Credits: SCIENCE: NASA, ESA, Michael H. Wong (UC Berkeley)

(directions and speeds) each time Jupiter was observed by Hubble. "It gave me a much more consistent set of velocity measurements," Wong explained. "I also ran a battery of statistical tests to confirm if it was justified to call this an increase in wind speed. It is."

What does the increase in speed mean? "That's hard to diagnose, since Hubble can't see the bottom of the storm very well. Anything below the cloud tops is invisible in the data," explained Wong. "But it's an interesting piece of data that can help us understand what's fueling the Great Red Spot and how it's maintaining energy." There's still a lot of work to do to fully understand it.

Astronomers have pursued ongoing studies of the "king" of solar system storms since the 1870s. The Great Red Spot is an upwelling of material from Jupiter's interior. If seen from the side, the storm would have a tiered wedding cake structure with high clouds at the center cascading down to its outer layers. Astronomers have noted that it is shrinking in size and becoming more circular than oval in observations spanning more than a century. The current diameter is 10,000 miles across, meaning that Earth could still fit inside it.

In addition to observing this legendary, long-lived storm, researchers have observed storms on other

planets, including Neptune, where they tend to travel across the planet's surface and disappear over only a few years. Research like this helps scientists not only learn about the individual planets, but also draw conclusions about the underlying physics that drive and maintain planets' storms.

The majority of the data to support this research came from Hubble's Outer Planets Atmospheres Legacy (OPAL) program, which provides annual Hubble global views of the outer planets that allow astronomers to look for changes in the planets' storms, winds, and clouds.

[MORE INFO...](#)

From the Archives

October, 1994

Those who were ambitious enough to venture out to the Atlas Site on Saturday October 10th were treated to what was probably the best night for observing since July. The temperature dropped to a brisk 44 degrees, there were no bugs, seeing and transparency were near perfect, and the thin crescent moon set around 10:00 pm.

For me, it was great because it was the first night of real observing with my 10" scope since it got new enhanced coatings on the primary. It made a huge difference with nearly every object I observed. It was also great to view through the new & improved Hubble Telescope. It was Eric's first night at the site since he got a new primary mirror for HST. Another new experience was Tom Miller's new portable computer, allowing us to use Megastar and B&T CCD Atlas while observing.

A night of observing is not complete until you have found at least one new

October at the Atlas Site - Dave Scherping

object, especially if it's a good one. This time it was NGC255 and NGC246 in Cetus.

NGC255 is a 12th magnitude galaxy, 3 arc-minutes across and NGC246 is an 11th magnitude planetary nebula, 5 arc-minutes across. In front of NGC246 is a cluster of 5 or 6 stars. NGC246 & 255 are about 1/2 degree apart and fit nicely in the same field of view in my scope at 100 power. As expected, an O-III filter brings out the planetary nebula giving it more well defined edges.

Referring to Megastar, we found that the stars in front of NGC246 were not listed as an open cluster and we noticed that there was a 14th magnitude galaxy 1/2 degree to the west of NGC255/246. As I was trying to find the galaxy, I noticed there were two 13.5 magnitude stars where there was previously only one. Then I realized one of them was a satellite, moving slowly across the field. I knew it must be in a high orbit to be moving so slowly and

decided to time it. Then I realized it stayed put while the stars drifted past. It was a geostationary satellite! Another first!

My six year-old daughter, Lauren, had a good time observing too. After looking at Saturn, the moon, and the swan nebula, she asked me to show her the "Doughnut" (also known as M57), which she described as being "cream filled" that night. Shortly afterwards, she went to sleep on the lawn chair under a pile of blankets, while the rest of us stayed up observing until well past 2am. That's when I left.... The hard-core observers stayed past 4.

Club Offices and Duties

Nominations for next year's officers will begin at the September meeting, and remain open until election at the October meeting.

Club officer nominations are made in September and elections are held in October. The following is a list of responsibilities of each of the officers and what is required to maintain a functioning club.

As stated in the bylaws, the club has five officers: President, Vice President, Secretary, Treasurer and Second Vice President. The business of the club is managed by a Board of Directors. The Board consists of the five elected officers. Each decision of the Board requires an affirmative vote by at least three Board members. The Board can also create additional non-elected offices as required and can initiate impeachment proceedings against officers who have been negligent in performing their duties.

The Prairie Astronomy Club has a fifty year history of service to club members and the community. Potential club officers should have a good understanding of the history of the club, its formation and mission, its relationship with Hyde Observatory and the types of events, activities and outreach that is part of the tradition of the club.

The most complete resource is the book *The Prairie Astronomy Club: Fifty Years of Amateur Astronomy*, which is in the club library or available as a PDF document.

President

The President organizes and directs the regular monthly meetings and all other club activities. The President also prepares the meeting agenda and PowerPoint for the meeting.

The President also officially represents the club at meetings at the regional and national level where he/she is in attendance or delegates this authority. The President has the authority to call meetings of the Board and to appoint non-elected officers.

The President should have good communication skills and be comfortable interacting with the media and public, be a good public speaker, be available to do radio and TV interviews and to deliver prepared introductions and remarks at club-sponsored events.

Another duty of the President is the annual club audit. Within 10 days of assuming office, the

President must appoint a committee of three club members to perform the audit. The audit must be completed within 45 days of the close of the fiscal year which is October 31.

When assuming office, the President should hold a meeting of the Board to present his/her direction and ideas for the club for the coming year, and appoint any unfilled non-elected positions.

Vice President

The Vice President is responsible for running club meetings and other events in the absence of the President. The VP is also to be the mediator in cases of procedural dispute and must be available to assume the duties of any officer at the direction of the President. The VP also maintains control of the current inventory of all club property.

Secretary

The Secretary handles all Club correspondence, is responsible for the distribution of information received through official club correspondence and is in charge of Club publicity (often the job of Publicity or Outreach Coordinator is delegated to a non-elected member). The Secretary

also sends out membership renewal notices and delivers meeting minutes to the newsletter editor. The Secretary is responsible for maintaining an accurate club membership roster. The master copy of the roster is currently maintained on the Night Sky Network website. The bylaws also require publication of the complete roster in the newsletter on an annual basis.

Treasurer

The Treasurer is responsible for all Club funds and for keeping accurate records of all monetary transactions. The Treasurer must submit a written report of the club's monetary status at the request of the President or give a verbal report at the request of any member during regular meetings. He/she also prepares an annual financial report in November for publication in the newsletter and presentation at the November meeting. The Treasurer is also responsible for all tax filings and reporting requirements, to maintain the club's 501c3 status.

Second Vice President (and Program Chair)

The Second Vice President is responsible for the formation and presentation of the monthly club programs. Ideally the 2nd VP should try to plan ahead six months to one year to build a list of potential presenters or programs. The 2nd VP also sends out email announcements of

upcoming programs to the membership, and sends a program description to the newsletter/website editors.

The club usually has several appointed positions:

The **Publications Chairperson** (or Newsletter Editor) is responsible for editing and publishing the Prairie Astronomer. The newsletter editor may also be the website manager/editor. The newsletter editor should have a good working knowledge of desktop publishing software (and computers in general), graphics, photo editing, some design and layout experience and some experience with social networking and Internet marketing. The Website editor needs to be familiar with WordPress (or similar CMS software) and HTML, graphics and word processing applications. Ideally the newsletter and website editor(s) should have prior experience with the publication of a newsletter or website, or demonstrated skills. The publications chairperson is also responsible for social networking for the club - posting Facebook and Twitter announcements for club meetings and events.

If the club has an appointed **Outreach Coordinator**, the coordinator takes on some of the roles performed by other officers - organizes outreach events, shares in media communications tasks, puts together flyers, etc.

The **Club Librarian** (often the Vice President) manages the club library. He/she keeps a current bibliographic listing of all Club library material including the archive of all back issues of The Prairie Astronomer. The Club Librarian and Secretary work together to maintain a record of club activities and regularly update the official club history.

The **Observing Chairperson** presents a monthly report at Club meetings and/or in the Prairie Astronomer. He/she keeps members informed of upcoming celestial events, sky objects of special interest and star parties.

The **Recording Secretary** (often the Club's elected Secretary) is responsible for keeping the minutes of the club meetings and filing a copy with the Club Secretary. Minutes need to be kept in a systematic fashion as they record the history and life of the club and need to be published in the Prairie Astronomer on a monthly basis.

The **Site Chairperson** (if one is appointed) is responsible for establishing a site committee to oversee the maintenance and security of the club observing site.

While not a requirement of the bylaws, all club officers and appointees should have good computer and social media skills, should be accessible and responsive via email and phone. §

James Webb's 30 Days of Terror

Nancy Atkinson, [Universe Today](#)

It's been a long and winding road getting the James Webb Space Telescope from concept to reality. And finally, after decades of planning, work, delays, and cost overruns, the next generation of space telescopes is finally ready to launch. But even now, as the telescope might be secretly traveling by cargo ship to the European Space Agency (ESA) launch site in French Guiana, everyone involved with the JWST project knows a

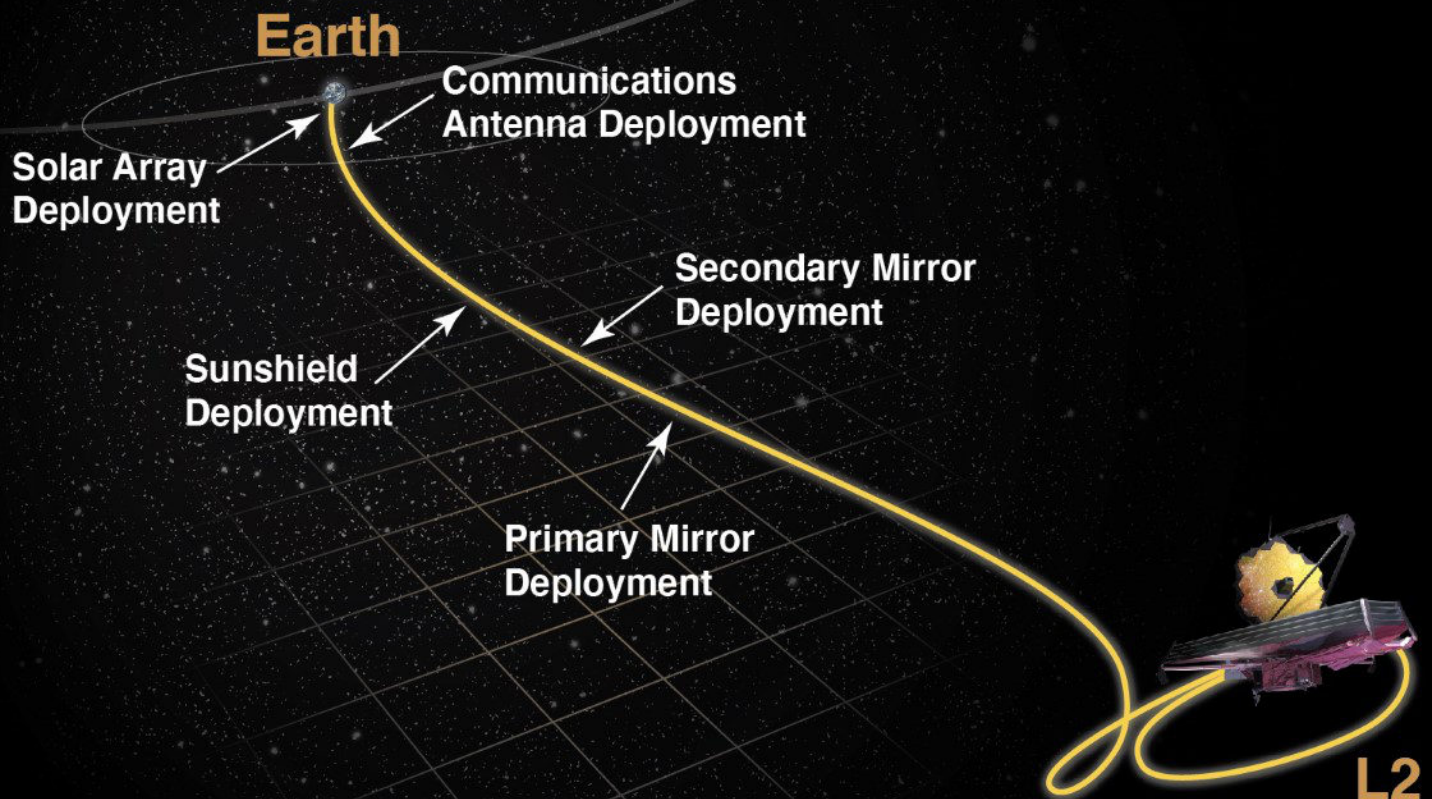
successful launch isn't the final victory.

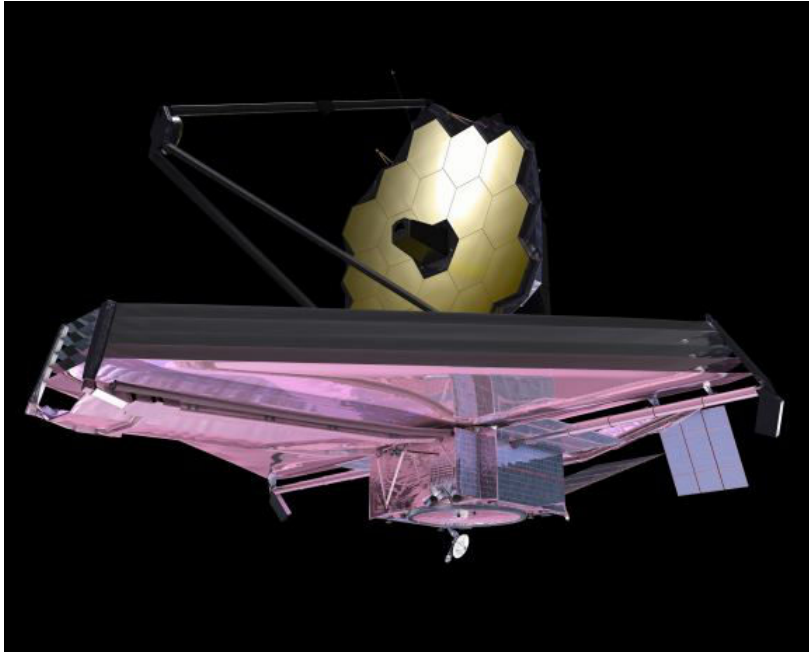
In reality, post launch is when the real nail-biting begins. While the Mars rover teams undergo "Seven Minutes of Terror" to land their spacecraft on the Red Planet, the JWST teams will have more than 30 days of excruciating, slow-motion terror as the telescope embarks on its month-long-day, 1.5-million-kilometer (million-mile) journey out to the second Lagrange point (L2).

And all the while, JWST will be unfolding to its desired configuration, with more than 40 major deployments of various systems, needing hundreds of actuators to fire and hold mechanisms to release, along with cables to unspool, joints to work and electrical systems to activate.

Everything has to work perfectly during the 30 straight days of make-or-break for the mission, all taking place in the unyielding environment of

● Sun





Artist conception of the James Webb Space Telescope.
Credit: NASA

space, with the telescope on its own. Not only are there 30 days of terror, there could also be 30 sleepless nights for everyone involved.

Of course, it all starts with the launch, a terror in itself.

“We’re putting this incredibly precious resource on top of a controlled explosion,” said Heidi Hammel, an interdisciplinary scientist and vice president of the Association of Universities for Research in Astronomy. “It’s frightening, but rocket science is what it is. It will be a huge sigh of relief to have a successful launch.”

If all goes well, the deployment excitement/terror starts about 30 minutes into the flight. The Ariane 5 rocket will provide thrust for roughly 26 minutes, sending JWST about 10,400 kilometers on its trip. After second stage cutoff, Webb will separate and detach from the Ariane 5’s second stage.

“This will trigger the solar arrays to deploy 30 minutes after launch,” said Massimo Stiavelli, head of Webb’s mission office at the Space Telescope Science Institute (STScI). “This is crucially important because we need power. But this is only the first of a number of important

deployments on the way out to L2.”

The next event is what keeps Stiavelli up at night. While the Ariane will put JWST on a direct route to L2, without first orbiting Earth, an important thruster firing will ensure the telescope is headed exactly in the right direction.

“We have to turn on the observatory’s rocket engine to put us out towards the desired orbit of L2,” he said. “The Mid Course Correction 1 (MCC1) could take place about 12.5 hours after launch. This is the most important burn of the mission.”

“JWST has to go into the orbit at L2, that’s how the mission is designed,” said Hammel. “If the thrusters don’t fire to get us there, there goes the mission.”

Following the thruster firing is another important moment, the release and deployment of the high gain antenna to for communication to the telescope, and for the all-important science data to be sent back to Earth.

Within Webb’s first week in space will be a second trajectory correction maneuver, and then comes a sequence of major deployments with nearly 200 actuators

Webb... continued.



During a test, engineers and technicians fully deployed all five layers of the James Webb Space Telescopes sunshield. Image Credit: NASA/Chris Gunn

needed to work, just to prepare for JWST's sunshield to unfold. This includes booms extending and radiators releasing and deploying.

Here's where the real nail-biting starts. The tennis-court-sized sunshield itself requires over 150 release mechanisms to fire correctly over the course of three days.

"The number of unexploded actuators can give one a little bit of a headache, as all of them have to work," said Helmut Jenkner, a longtime scientist at STScI. "At even over 99.9% reliability, if you multiply that by the number of actuators, you get to a fairly hair-raising number."

The complicated sunshield deployment involves around 7,000 parts, including 400 pulleys, numerous cables and eight motors. But the sunshield's deployment is crucial to shading the telescope from any heat or light from the Sun, Earth and Moon, to keep the telescope's infrared components as cold as possible. This will allow JWST to detect the faint signatures of distant object in the universe. The telescope and scientific instruments will start to cool rapidly in the shade of the sunshield, but it will take several weeks for them to cool all the way down and reach stable temperatures.

During the second week after launch, the telescope will begin to

take shape, first with the secondary mirror deployment. Then comes the big moment, when JWST's 6.5 primary mirror begins to unfold. The 18 gold-plated beryllium segments will unfurl, beginning with the side wings. Then 132 small actuators will push or pull each of the mirror segments into a micron-precise alignment, putting the primary mirror into focus. Again, everything must work perfectly.

While the first month is the tensest part of deployment, it will take six months for all the instruments to be turned on, calibrated and commissioned. Only then will scientists see "first light" from the telescope.

"There are myriad ways that things could go wrong," Hammel admitted. "But over the past 20 years and especially over the past 5 years, we have tested this telescope and all the systems in every way imaginable: shaking it, thermal cycling it, putting it into zero pressure. We've really exercised it in order to find out all the little things that might go wrong, making sure we've done everything we can to ensure a successful mission."

Learn more about JWST at this [NASA website](#), or at the [STScI website](#).

CLUB MEMBERSHIP INFO

REGULAR MEMBER - \$30.00 per year. Includes club newsletter, and 1 vote at club meetings, plus all other standard club privileges.

FAMILY MEMBER - \$35.00 per year. Same as regular member except gets 2 votes at club meetings.

STUDENT MEMBER - \$10.00 per year with volunteer requirement.

If you renew your membership prior to your annual renewal date, you will receive a 10% discount.

Club members are also eligible for special subscription discounts on Sky & Telescope Magazine.

CLUB TELESCOPES

To check out one of the club telescopes, please contact a club officer. Scopes can be checked out at a regular club meeting and kept for one month. Checkout can be extended for another month if there are no other requests for the telescope, but you must notify a club officer in advance.

100mm Orion refractor: Available
 10 inch Meade Starfinder Dobsonian: Available
 13 inch Truss Dobsonian: Needs repair
 10 inch Zhumell: Needs mount

Buy the book! The Prairie Astronomy Club: Fifty Years of Amateur Astronomy. Order online from Amazon or lulu.com.

ADDRESS

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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.

