STRATFORD ASTRONOMY GROUP

SEPTEMBER 12TH, 2023

AGENDA

- Meet and Greet
- Club NEWS and Activities
- Club Q & A
- Equipment Lessons
- Software and Imaging Information
- Latest Astronomy NEWS
- What's UP this Month
- Show and Tell
- Astronomy Lessons
- Cosmology Lessons
- Conclusion

MEET AND GREET

Welcome

New Visitors

Regrets

PREVIOUS MEETING REVIEW

Meeting attended by 17:

Nick Assiouras
Michael Burns
Colleen Devine
Patrick Hayes
Tom Hislop
Wolfgang Keller
Rick Lyons
Tim Pauli
Peter Tenits
Richard Skevington
Rena Sperack
Ken Roberts
Mary Montizambert

CLUB NEWS AND ACTIVITIES

Group Funds

Total = $1112.23

- If you would like to contribute to the group, then please e-transfer Tim at:

timannemariepauli@gmail.com

or by cheques:

Tim Pauli

96 Front Street

Stratford, ON

N5A4H2

CLUB NEWS AND ACTIVITIES

EQUIPMENT:

STRATFORD ASTRONOMY CLUB EQUIPMENT

CLUB EQUIPMENT LOCATION:

Paul Bartlett is now storing all the group's equipment. If you wish to borrow an item, then please contact him at:

1948paul.bartlett@gmail.com

519-274-2010

UPCOMING MEETINGS

NEXT MEETING DATES

Date	Start	End	Facility and Spaces
September 12, 2023	7.00 PM	9:00 PM	St. Michael's CSS, Room 104
October 3, 2023	7.00 PM	9:00 PM	St. Michael's CSS, Room 104
November 7, 2023	7.00 PM	9:00 PM	St. Michael's CSS, Room 104
December 12, 2023	7.00 PM	9:00 PM	St. Michael's CSS, Room 104
January 9, 2024	7.00 PM	9:00 PM	St. Michael's CSS, Room 104
February 6, 2024	7.00 PM	9:00 PM	St. Michael's CSS, Room 104
March 5, 2024	7.00 PM	9:00 PM	St. Michael's CSS, Room 104
April 2, 2024	7.00 PM	9:00 PM	St. Michael's CSS, Room 104
May 7, 2024	7.00 PM	9:00 PM	St. Michael's CSS, Room 104
June 4, 2024	7.00 PM	9:00 PM	St. Michael's CSS, Room 104

CLUB NEWS AND ACTIVITIES

- New Web site: (https://stratfordastronomy.com/)
  Tim Pauli - Owner/Administrator
  Ken Roberts - technical contact
  Tom Kimber - Administrator/Editor
  Doug Fyfe - Administrator
  Michael Burns- Administrator
  Tom will build it on WordPress.

CLUB Q & A

- Tim and next Museum presentation
  - September 22 7:30 p.m - 9:30 pm. is the date of the event at the museum. Please bring along a scope if possible and arrive between 7:00 -7:30 p.m.
  - Rain Date: October 06th at 7:30 pm

LATEST ASTRONOMY NEWS

JULY-SEPT

JULY 3RD: PERSEVERANCE DISCOVERS A DOUGHNUT-SHAPED ROCK ON MARS

•A NASA's Perseverance Mars rover captured this doughnut-shaped rock in Jezero Crater from about 328 feet (100 meters) away using its Remote Microscopic Imager (RMI), part of the SuperCam instrument, on June 22, 2023, the 832nd Martian day, or sol, of the mission.

•Oddly shaped rocks aren't uncommon, either on Earth or Mars; they're often formed over eons as winds sandblast rock faces.

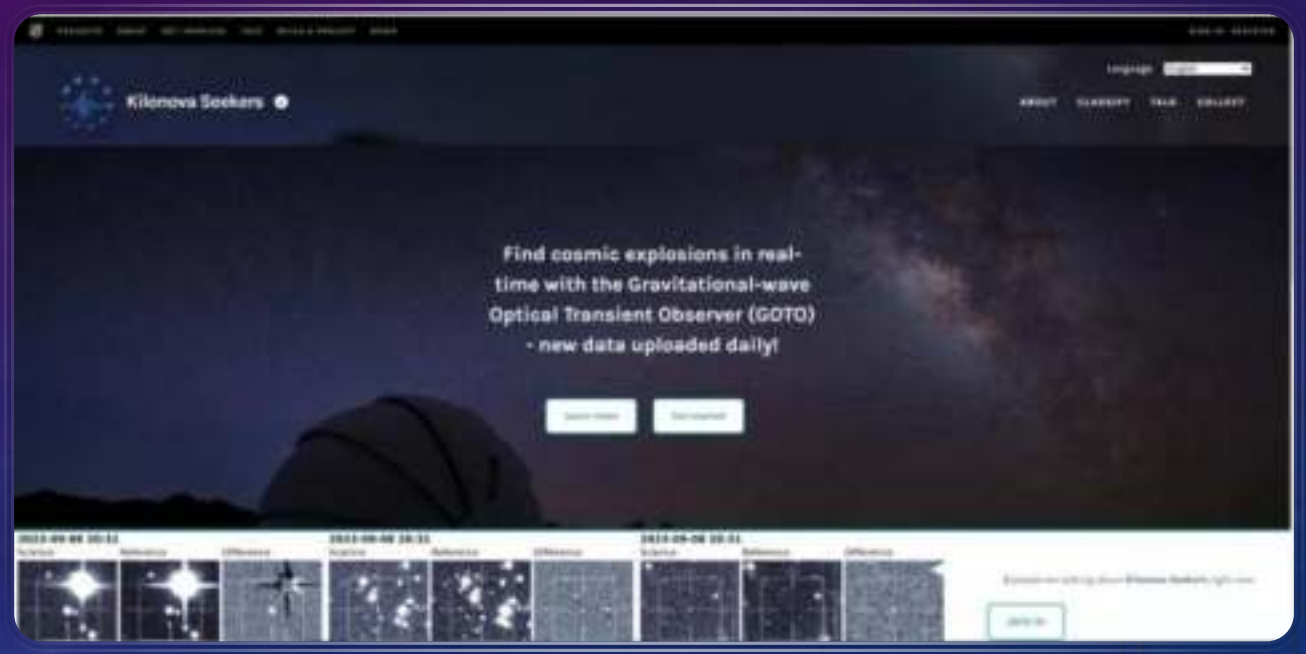
•This particular rock may have formed after a smaller rock (or multiple rocks) eroded near its center. That left behind a cavity that was later enlarged by the wind.

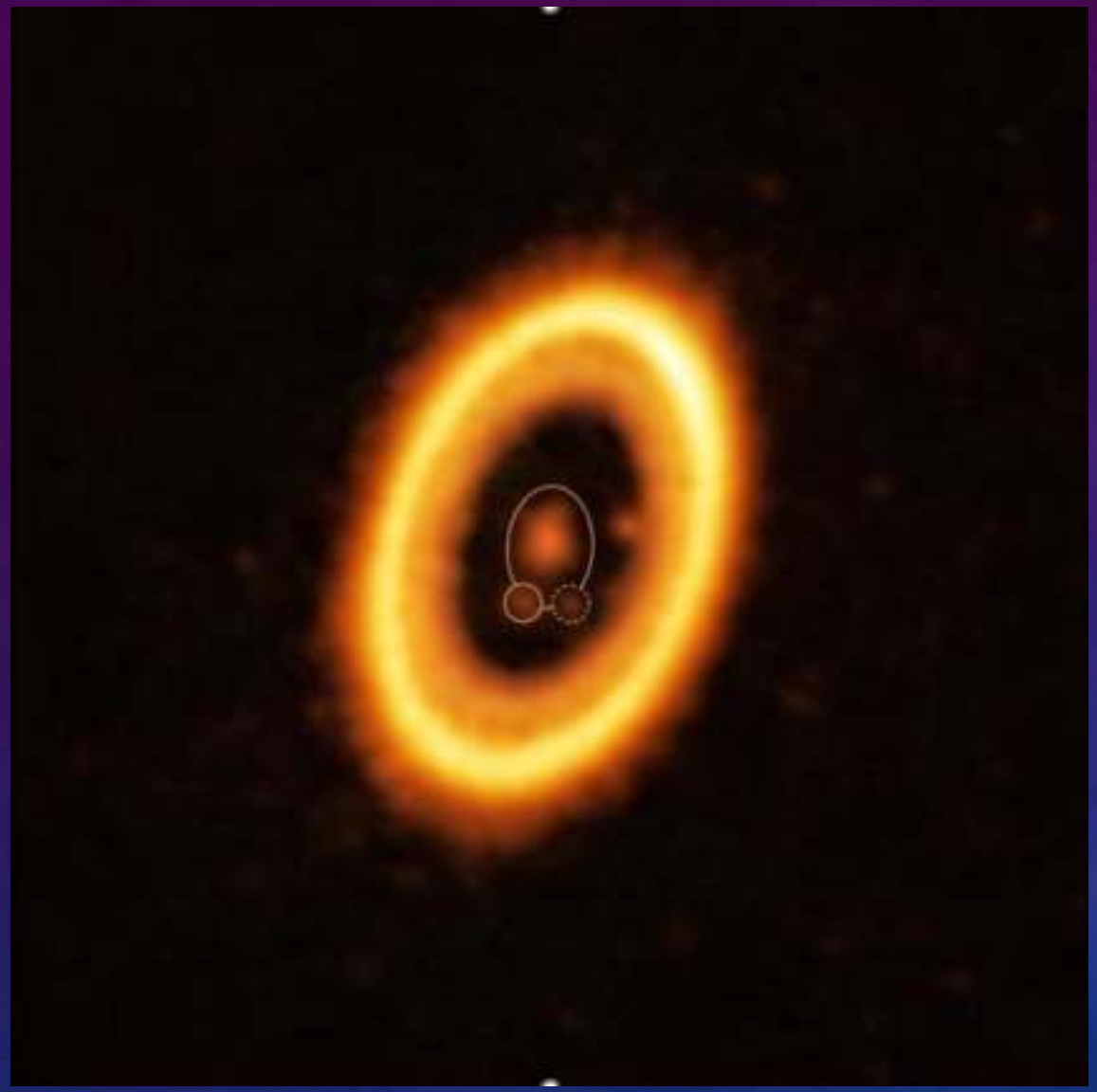
JULY 10TH: NEW 3D VISUALIZATION HIGHLIGHTS 5,000 GALAXIES REVEALED BY WEBB IN CEERS SURVEY

- The Space Telescope Science Institute's Office of Public Outreach has released a new scientific visualization of data from the CEERS (Cosmic Evolution Early Release Science) Survey.
- The video represents Webb's exploration of the region known as the Extended Groth Strip, revealing many galaxies that have never been seen before. It displays a wealth of galaxies across the universe and concludes on Maisie's Galaxy, which resides 13.4 billion light-years away from Earth.
- The visualization's farthest galaxy, known as Maisie's Galaxy, is a target of great interest to astronomers. It formed about 390 million years after the big bang, or about 13.4 billion years ago

JULY 19TH: VOLUNTEERS INVITED TO PLAY 'SPOT THE DIFFERENCE' TO HELP SCIENTISTS IDENTIFY COSMIC EXPLOSIONS

- Members of the public are invited to take part in a brand new citizen science project to identify cosmic explosions in real-time.
- "Kilonova Seekers" aims to find kilonovae—the cosmic explosions of neutron stars and black holes colliding in distant galaxies.
- Volunteers will be asked to play "spot the difference" using data from the two Gravitational-wave Optical Transient Observer (GOTO) telescopes.
- To participate in Kilonova Seekers, simply visit the Zooniverse platform and join a community of passionate individuals eager to contribute to the advancement of astrophysics.





JULY 19TH: DOES THIS EXOPLANET HAVE A 'SIBLING' SHARING THE SAME ORBIT?

- Using the Atacama Large Millimeter/submillimeter Array (ALMA), astronomers have found the possible "sibling" of a planet orbiting a distant star. The team has detected a cloud of debris that might be sharing this planet's orbit, which they believe could be the building blocks of a new planet or the remnants of one already formed. If confirmed, this discovery would be the strongest evidence yet that two exoplanets can share one orbit.
- In the PDS 70 system. This young star is known to host two giant Jupiter-like planets, PDS 70b and PDS 70c.

JULY 23TH: HUBBLE SEES BOULDERS ESCAPING FROM ASTEROID DIMORPHOS

•NASA did an experiment to smash into an asteroid to see how it is perturbed. The DART (Double Asteroid Redirection Test) spacecraft impact on asteroid Dimorphos happened on September 26, 2022. Astronomers using the Hubble Space Telescope continue following the aftermath of the cosmic collision.

•A surprise is the discovery of several dozen boulders lifted off the asteroid after the smashup. In Hubble pictures they look like a swarm of bees very slowly moving away from the asteroid. This might mean that smacking an Earth-approaching asteroid might result in a cluster of threatening boulders heading in our direction.

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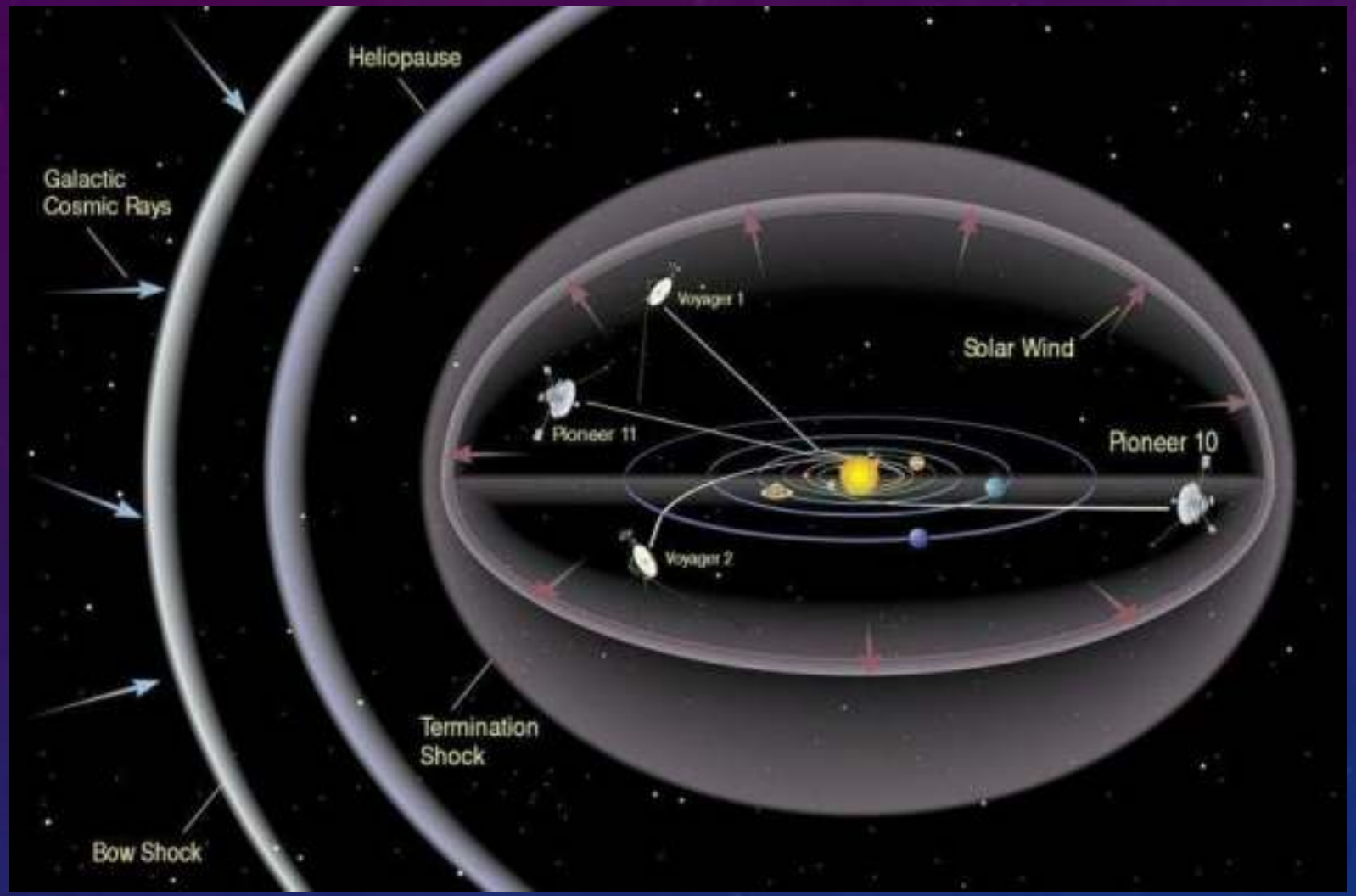


JULY 31ST : NASA LISTENS FOR VOYAGER 2 SPACECRAFT AFTER WRONG COMMAND CUTS CONTACT

NASA is listening for any peep from Voyager 2 after losing contact with the spacecraft billions of miles away.

Hurtling ever deeper into interstellar space, Voyager 2 has been out of touch ever since flight controllers accidentally sent a wrong command more than a week ago that tilted its antenna away from Earth.

The spacecraft's antenna shifted a mere 2%, but it was enough to cut communications.

Although it's considered a long shot, NASA said Monday that its huge dish antenna in Canberra, Australia, is on the lookout for any stray signals from Voyager 2, currently more than 12 billion miles (19 billion kilometers) distant. It takes more than 18 hours for a signal to reach Earth from so far away.

Aug : A command dubbed an “interstellar shout” and beamed across billions of miles has restored contact with the spacecraft after two weeks of silence

AUG 3RD: NASA'S TRIO OF MINI ROVERS WILL TEAM UP TO EXPLORE THE MOON

Four Working together without direct human input, three rovers each the size of a carry-on bag will map the lunar surface in 3D, using cameras and ground-penetrating radar.
NASA is sending a trio of miniature rovers to the moon to see how well they can cooperate with one another without direct input from mission controllers back on Earth.

A teamwork-minded experiment to demonstrate new technology, the CADRE (Cooperative Autonomous Distributed Robotic Exploration) project marks another step the agency is taking toward developing robots that, by operating autonomously, can boost the efficiency of future missions. And, by taking simultaneous measurements from multiple locations, the rovers are meant to show how multirobot missions could potentially enable new science or support astronauts.

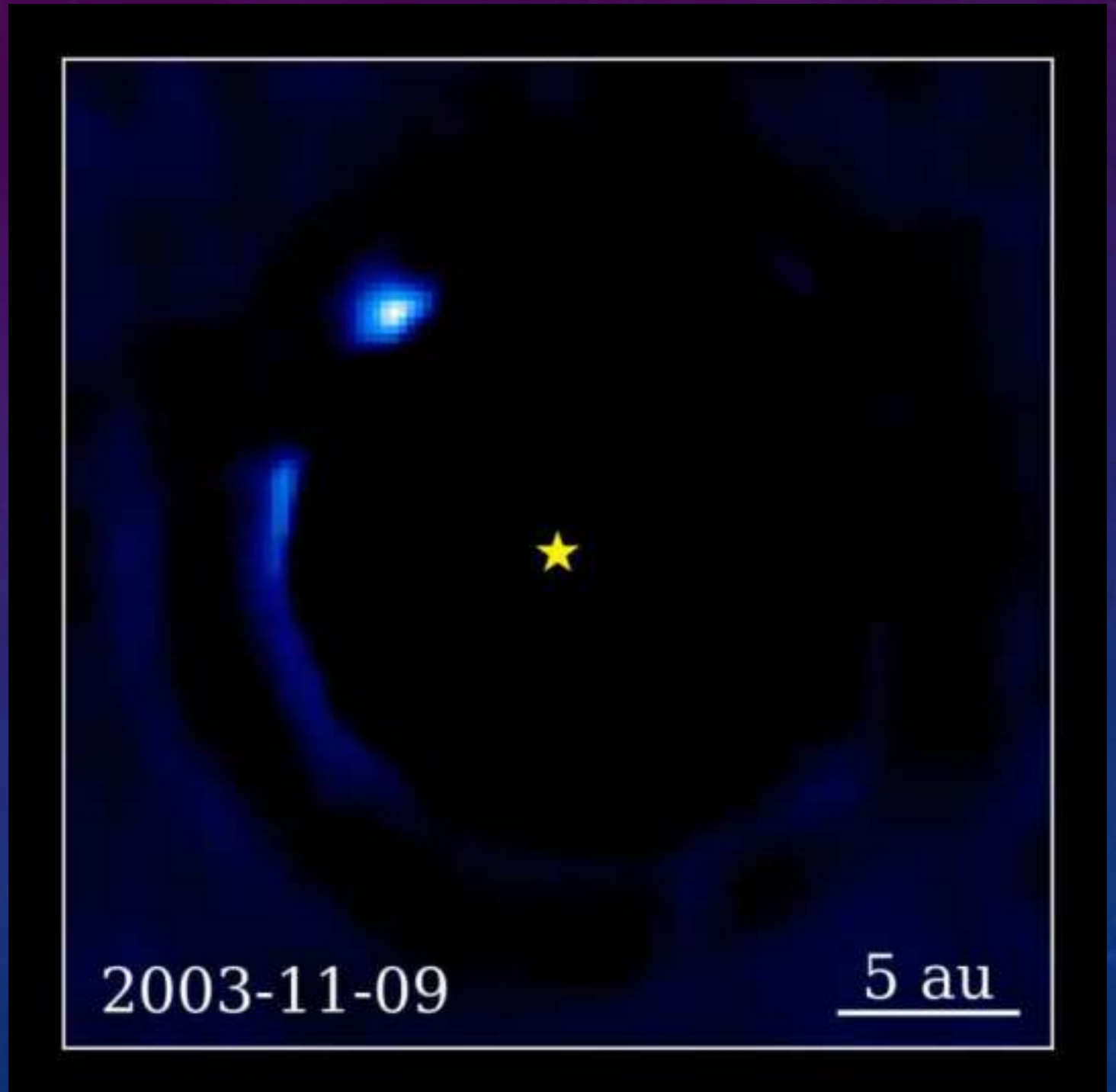
Currently slated to arrive aboard a lander in 2024 as part of NASA's CLPS (Commercial Lunar Payload Services) initiative, CADRE's three small rovers will be lowered onto the Reiner Gamma region of the moon via tethers. Each about the size of a carry-on suitcase, the four-wheeled rovers will drive to find a sunbathing spot, where they'll open their solar panels and charge up. Then they'll spend a full lunar day—about 14 Earth days—conducting experiments designed to test their capabilities.

AUG 10TH: LONGEST TIME-LAPSE FOOTAGE OF AN EXOPLANET TO DATE ASSEMBLED FROM REAL DATA

A Northwestern University astrophysicist has created the longest time-lapse video of an exoplanet to date.

Constructed from real data, the footage shows Beta Pictoris b—a planet 12 times the mass of Jupiter—sailing around its star in a tilted orbit. The time-lapse video condenses 17 years of footage (collected between 2003 and 2020) into 10 seconds. Within those seconds, viewers can watch the planet make about 75% of one full orbit.

"We need another six years of data before we can see one whole orbit," said Northwestern astrophysicist Jason Wang, who led the work. "We're almost there. Patience is key."



AUG 23RD: INDIA LANDS A SPACECRAFT NEAR THE MOON'S SOUTH POLE, A FIRST FOR THE WORLD AS IT JOINS ELITE CLUB

•India became the first country to land a spacecraft near the moon's south pole on Wednesday—a historic voyage to uncharted territory that scientists believe could hold vital reserves of frozen water, and a technological triumph for the world's most populous nation.

•After a failed attempt to land on the moon in 2019, India now

•joins the United States, the Soviet Union and China as only the fourth country to achieve this milestone. A lander with a rover inside touched down on the lunar surface at 6:04 p.m. local time, sparking celebrations across India, including in the southern Indian city of Bengaluru, where space scientists watching the landing erupted in cheers and applause.

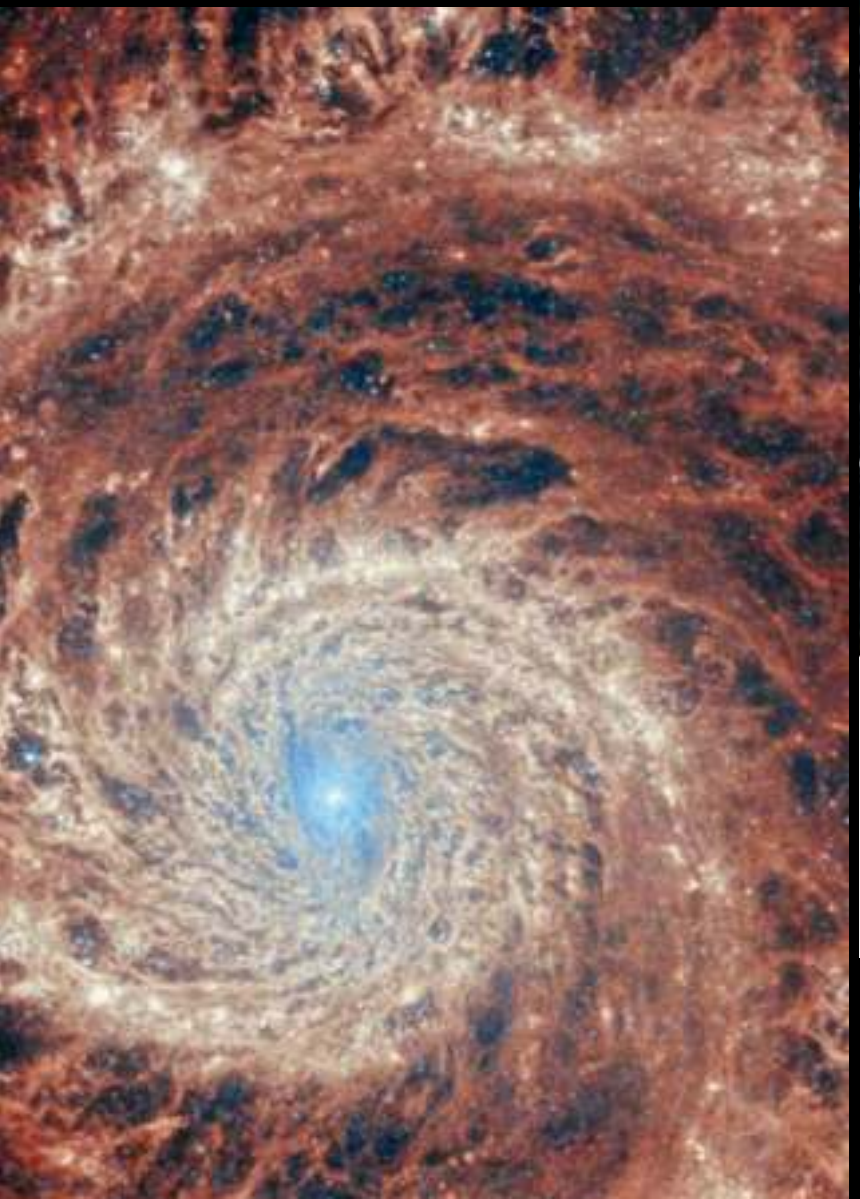
LATEST WEBB IMAGES

Herbig-Haro 46/47 (NIRCam Image)

Ring Nebula (MIRI image)

Supernova 1987A (NIRCam Image)

M 51



WR 124 (NIRCam and MIRI Composite Image)

Rho Ophiuchi (NIRCam Image)

WHAT'S UP

STRATFORD ASTRONOMY GROUP

WHAT'S UP FOR SEPTEMBER

This is a month of "Almost for us"

HEY, THERE BE A MOON OVERHEAD

MOON PHASES FOR THE MONTH OF SEPTEMBER

« September 2023 »

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 Lunar occultation of Neptune Aurigid meteor shower 2023	**2**
3	**4** Jupiter enters retrograde motion Close approach of the Moon and Jupiter Conjunction of the Moon and Jupiter	**5** Close approach of the Moon and M45	**6** Mercury at inferior solar conjunction Moon at Last Quarter	**7** Lunar occultation of Beta Tauri	**8**	**9** September ε-Perseid meteor shower 2023
10	**11**	**12** Comet C/2023 P1 (Nishimura) passes perigee The Moon at apogee	**13** Conjunction of the Moon and Mercury	**14** New Moon	**15**	**16** Conjunction of the Moon and Mars
17 Comet C/2023 P1 (Nishimura) passes perihelion The Moon at perihelion	**18** Venus at greatest brightness	**19** Neptune at opposition	**20**	**21** Lunar occultation of Antares	**22** Mercury at greatest elongation west Mercury at dichotomy Moon at First Quarter	**23** September equinox Mercury at highest altitude in morning sky Mercury at perihelion
24	**25** NGC 55 is well placed	**26** Conjunction of the Moon and Saturn Close approach of the Moon and Saturn	**27** The Moon at aphelion 47 Tuc is well placed The Moon at perigee	**28** Daytime Sextantid meteor shower 2023	**29** Full Moon	**30**

SEPTEMBER 13 – CONJUNCTION OF THE MOON AND MERCURY

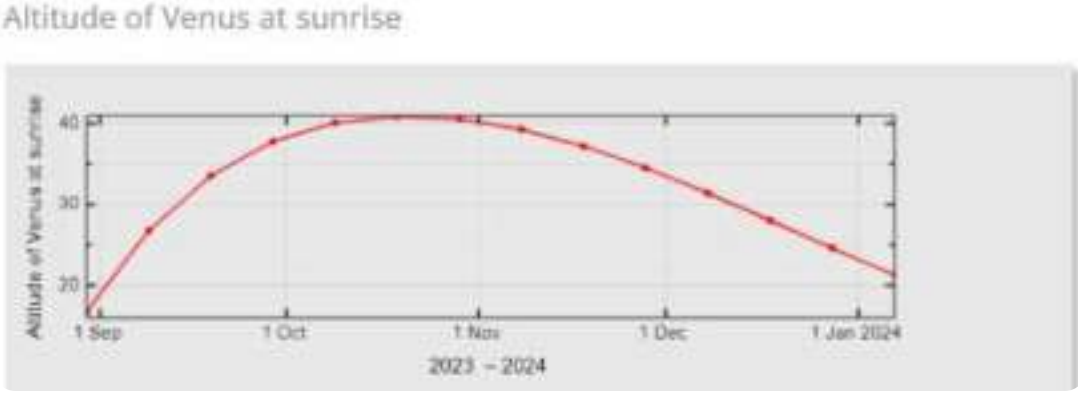
- The Moon and Mercury will share the same right ascension, with the Moon passing 5°59' to the north of Mercury. The Moon will be 28 days old.
- From Stratford however, the pair will not be observable – they will reach their highest point in the sky during daytime and will be no higher than 6° above the horizon at dawn.
- The Moon will be at mag -8.1, and Mercury at mag 2.0, both in the constellation Leo.

SEPTEMBER 16 7– CONJUNCTION OF THE MOON AND MARS

- The Moon and Mars will share the same right ascension, with the Moon passing 39' to the north of Mars. The Moon will be 1 days old.
- From Stratford , the pair will be visible from soon after it rises, at 08:44, until soon before it sets at 20:15. Always take extreme caution when trying to make daytime observations of the Moon while the Sun is above the horizon.
- The Moon will be at mag -8.7, and Mars at mag 1.7, both in the constellation Virgo.
- The pair will be a little too widely separated to fit comfortably within the field of view of a telescope, but will be visible to the naked eye or through a pair of binoculars.

SEPTEMBER 18 – VENUS AT GREATEST BRIGHTNESS

- Venus will reach its greatest brightness in its 2023–2024 morning apparition. It will be shining brightly at mag -4.5.



SEPTEMBER 23 – SEPTEMBER EQUINOX (2:46)

- The September equinox marks the first day of autumn for anybody living in the northern hemisphere, and the first day of spring for anybody living in the southern hemisphere.
- On the day of the equinox, everywhere on Earth has almost exactly 12 hours of day and night, as the Sun's annual journey through the constellations of the zodiac carries it across the celestial equator. The word equinox is derived from the Latin words aequus (equal) and nox (night)
- Wherever you live on Earth, on the day of the equinox the Sun will rise from the point on the horizon which lies due east, and set beneath the point which lies due west.

Year	Time of equinox
2019	23 Sep 03:43 EDT
2020	22 Sep 09:23 EDT
2021	22 Sep 15:14 EDT
2022	22 Sep 20:58 EDT
2023	23 Sep 02:46 EDT
2024	22 Sep 08:42 EDT
2025	22 Sep 14:20 EDT
2026	22 Sep 20:08 EDT
2027	23 Sep 02:06 EDT

The date of the equinox

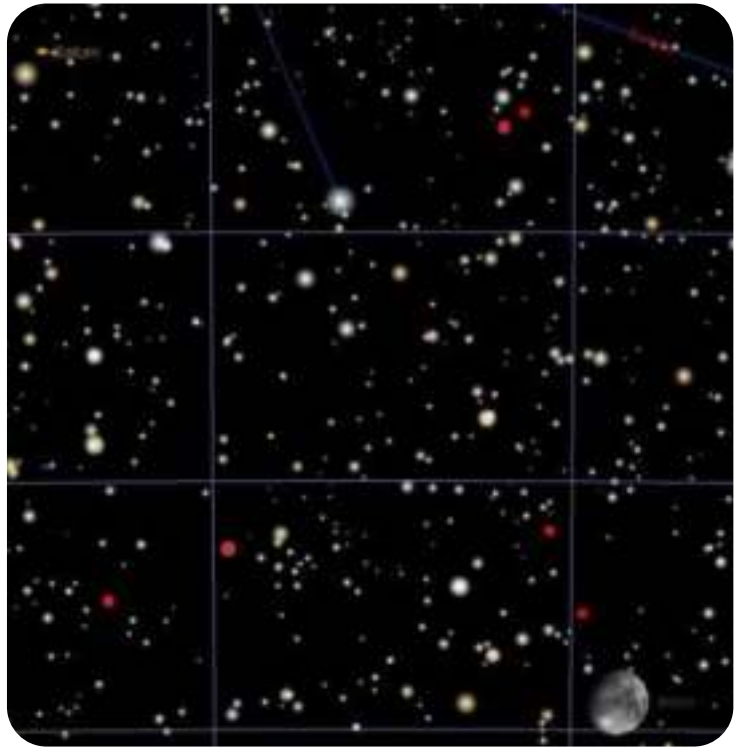
The Earth orbits the Sun once every 365.242 days, and this is the time period over which the cycle of solstices and equinoxes, and consequently all the Earth's seasons, repeat from one year to the next.

In any year which is not a leap year, the equinoxes occur roughly 5 hours and 49 minutes – just under a quarter of a day – later from one year to the next.

This is why the seasons would drift later in the year if it was not for an additional day being inserted inserted into every fourth year on 29 February.

SEPTEMBER 23 – MERCURY AT HIGHEST ALTITUDE IN MORNING SKY

- As seen from Stratford , Mercury will reach its highest point in the sky in its Sep–Oct 2023 morning apparition. It will be shining brightly at mag -0.5.
- From Stratford, this apparition will be reasonably placed but nonetheless tricky to observe, reaching a peak altitude of 16° above the horizon at sunrise on 24 Sep 2023.



SEPTEMBER 26 – CLOSE APPROACH OF THE MOON AND SATURN

- The Moon and Saturn will make a close approach, passing within 2°25' of each other. The Moon will be 12 days old.
- From Stratford , the pair will be visible from soon after it rises, at 18:02, until soon before it sets at 04:31.
- The Moon will be at mag -12.7; and Saturn will be at mag 0.4. Both objects will lie in the constellation Aquarius.
- They will be too widely separated to fit within the field of view of a telescope, but will be visible to the naked eye or through a pair of binoculars.
- At around the same time, the pair will also share the same right ascension – called a conjunction.

SHOW AND TELL

COSMOLOGY TALK