STRATFORD ASTRONOMY GROUP

FEBRUARY 4TH, 2025

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 / Talks
- Cosmology Lessons
- Conclusion

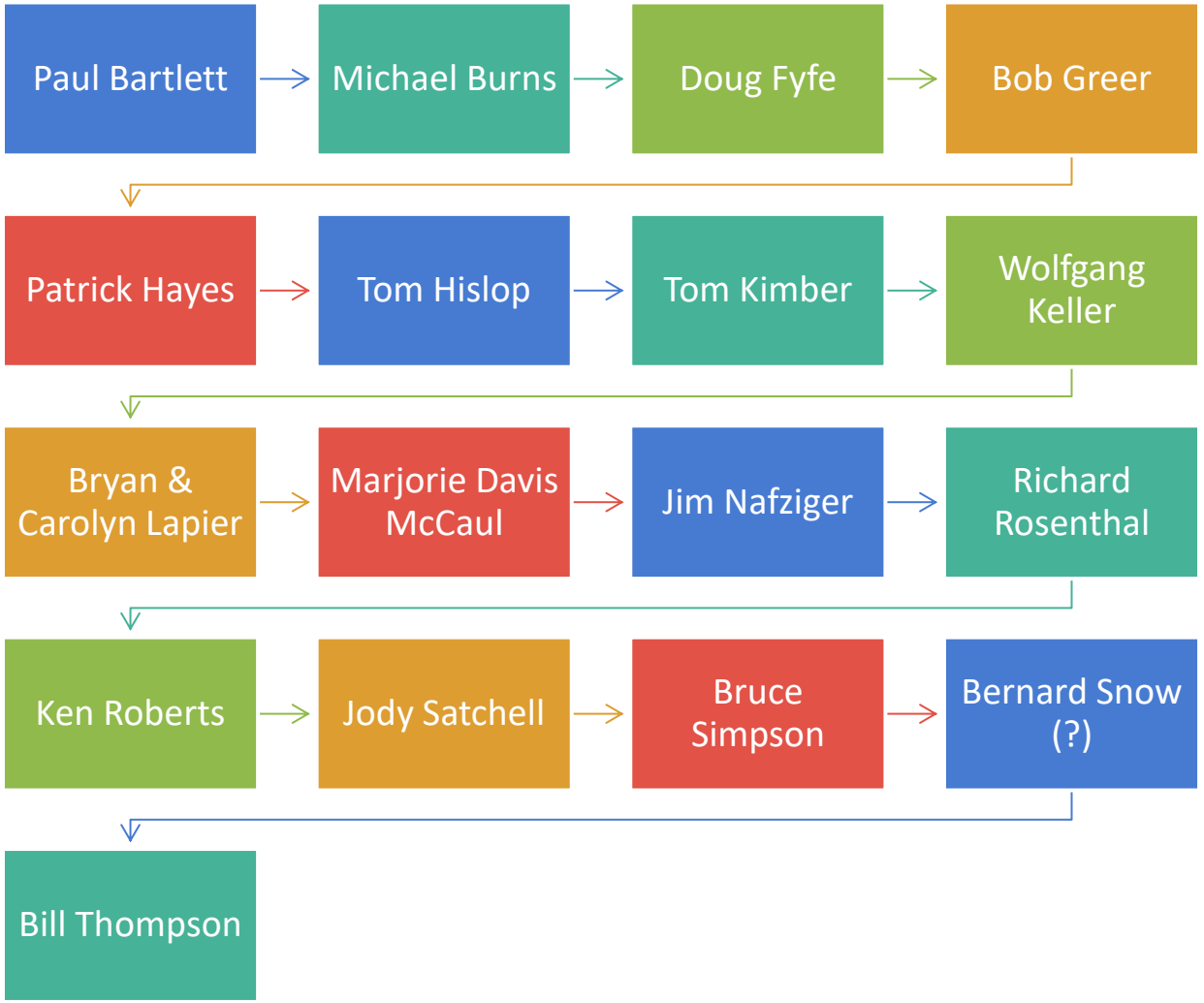
MEET AND GREET

Welcome

New Visitors

Regrets

LAST MEETING



UPCOMING MEETINGS

NEXT MEETING DATES

Date	Room	Location
~~Sept 17th, 2024~~	~~104~~	~~St. Michael's~~
~~Oct 1st, 2024~~	~~104~~	~~St. Michael's~~
~~Nov 5th, 2024~~	~~104~~	~~St. Michael's~~
~~Dec 3rd, 2024~~	~~104~~	~~St. Michael's~~
~~Jan 7th, 2025~~	~~104~~	~~St. Michael's~~
~~Feb 4th, 2025~~	~~104~~	~~St. Michael's~~
March 4th, 2025	104	St. Michael's
April 1st, 2025	104	St. Michael's
May 6th, 2025	104	St. Michael's
June 3rd, 2025	104	St. Michael's

CLUB NEWS AND ACTIVITIES

Group Funds

Total = $1057.70

- 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:

New Equipment Donation: Tim

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

Activities: The museum has placed us between 7pm and 10pm on the 21st of March.

Paul Bartlett - I could give a brief talk on "What's Up". I had written an article about the constellation Leo a few years back for our newspaper and I could expand on that a bit.

Doug Fyfe - I can give one of my presentations. If someone else could present then he would let them.

Patrick Hayes "Star Evolution" presentation.

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

WHAT'S UP

STRATFORD ASTRONOMY GROUP

WHAT'S UP FOR FEBRUARY

HEY, THERE BE A MOON OVERHEAD

MOON PHASES FOR THE MONTH OF FEBRUARY

« FEBRUARY 2025 (LET'S USE THE MOON) »

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Conjunction of the Moon and Venus Close approach of the Moon and Venus The Moon at perigee
2	3 Conjunction of Venus and Neptune	4 Venus at highest altitude in evening sky Jupiter ends retrograde motion	5 Moon at First Quarter	6 Close approach of the Moon and M45 Close approach of the Moon and Jupiter Conjunction of the Moon and Jupiter	7 Lunar occultation of Beta Tauri NGC 2808 is well placed	8 α-Centaurid meteor shower 2025
9 Mercury at superior solar conjunction Conjunction of the Moon and Mars Lunar occultation of Mars	10	11	12 Full Moon Asteroid 29 Amphitrite at opposition	13	14 The Moon at aphelion 1 Ceres at solar conjunction	15
16 Venus at greatest brightness	17 Lunar occultation of Spica The Moon at apogee	18	19 Venus at perihelion Messier 81 is well placed	20 Moon at Last Quarter The cluster NGC 3114 is well placed	21 Lunar occultation of Antares	22
23 Mars ends retrograde motion	24	25 Conjunction of Mercury and Saturn The Moon at perihelion	26	27 The cluster IC 2581 is well placed New Moon	28 Conjunction of the Moon and Mercury Close approach of the Moon and Mercury Lunar occultation of Mercury	

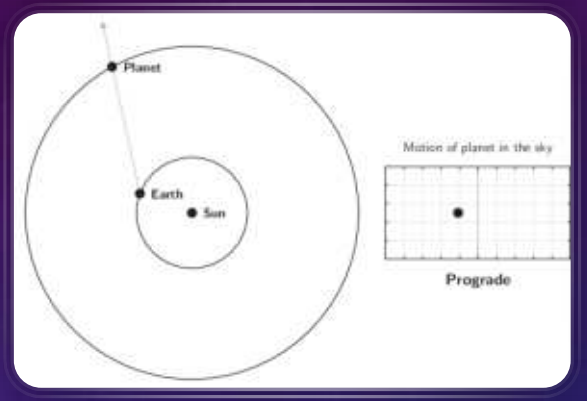
CLOSE APPROACH OF THE MOON AND VENUS
SAT, 01 FEB 2025 AT 17:24 EST (22:24 UTC)

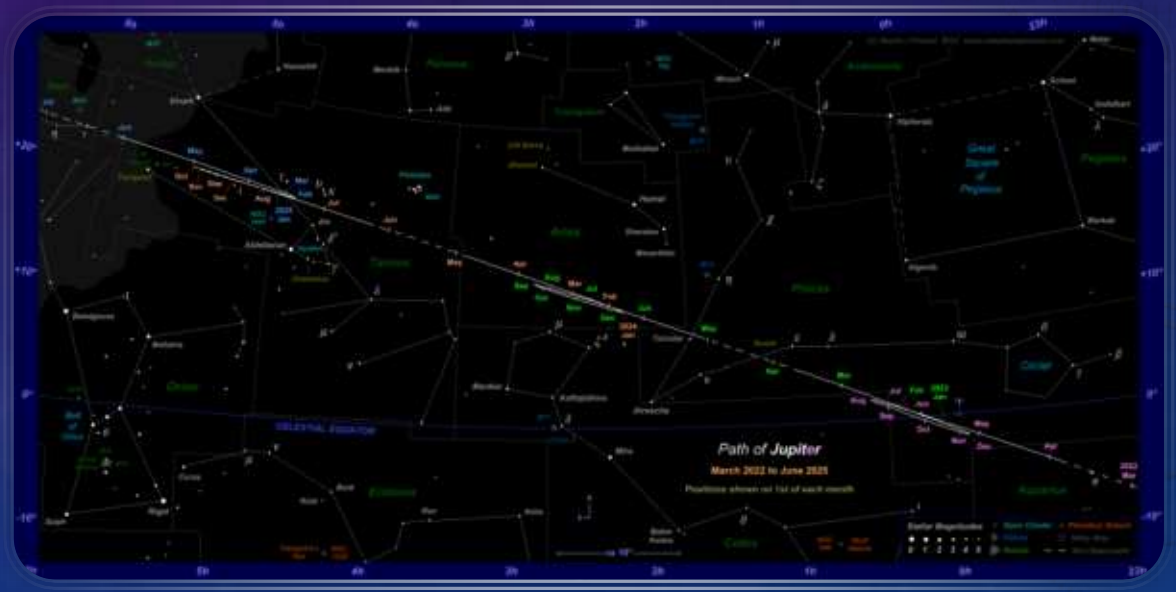
- The Moon and Venus will make a close approach, passing within 2°04' of each other. The Moon will be 3 days old.
- From Stratford, the pair will become visible at around 17:53 (EST), 35° above your south-western horizon, as dusk fades to darkness. They will then sink towards the horizon, setting 3 hours and 56 minutes after the Sun at 21:30.
- The Moon will be at mag -10.7; and Venus will be at mag -4.6. Both objects will lie in the constellation Pisces.
- 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.

JUPITER ENDS RETROGRADE MOTION

TUE, 04 FEB 2025 AT 04:38 EST (09:38 UTC)

- Jupiter will reach the end of its retrograde motion, ending its westward movement through the constellations and returning to more usual eastward motion instead. This reversal of direction is a phenomenon that all the solar system's outerplanets periodically undergo, a few months after they pass opposition.
- The retrograde motion is caused by the Earth's own motion around the Sun. As the Earth circles the Sun, our perspective changes, and this causes the apparent positions of objects to move from side-to-side in the sky with a one-year period. This nodding motion is super-imposed on the planet's long-term eastward motion through the constellations

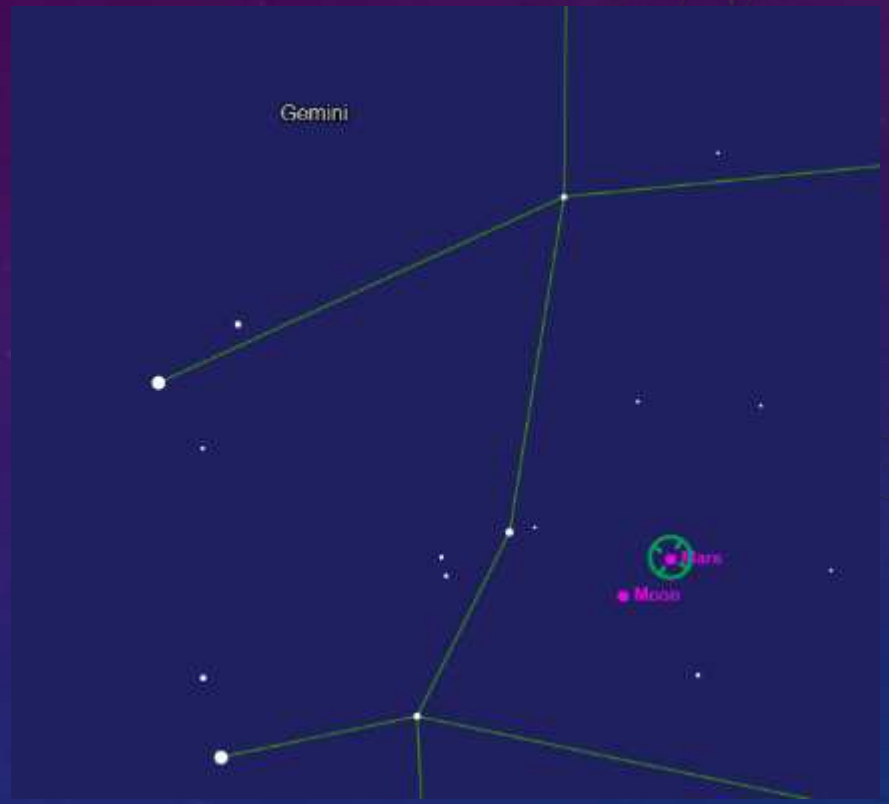




Close approach of the Moon and Mars

SUN, 09 FEB 2025 AT 14:49 EST (19:49 UTC)

1. The Moon and Mars will make a close approach, passing within a mere 46.0 arcminutes of each other. From some parts of the world, the Moon will pass in front of Mars, creating a lunar occultation. The Moon will be 11 days old.
2. From Stratford , the pair will be visible in the evening sky, becoming accessible around 18:06 (EST), 36° above your eastern horizon, as dusk fades to darkness. They will then reach their highest point in the sky at 22:22, 72° above your southern horizon. They will continue to be observable until around 05:18, when they sink below 8° above your north-western
3. The Moon will be at mag -12.6; and Mars will be at mag -0.8. Both objects will lie in the constellation Gemini.
4. They 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.
5. At around the same time, the pair will also share the same right ascension – called a conjunction.



THE SKY ON 9 FEBRUARY 2025

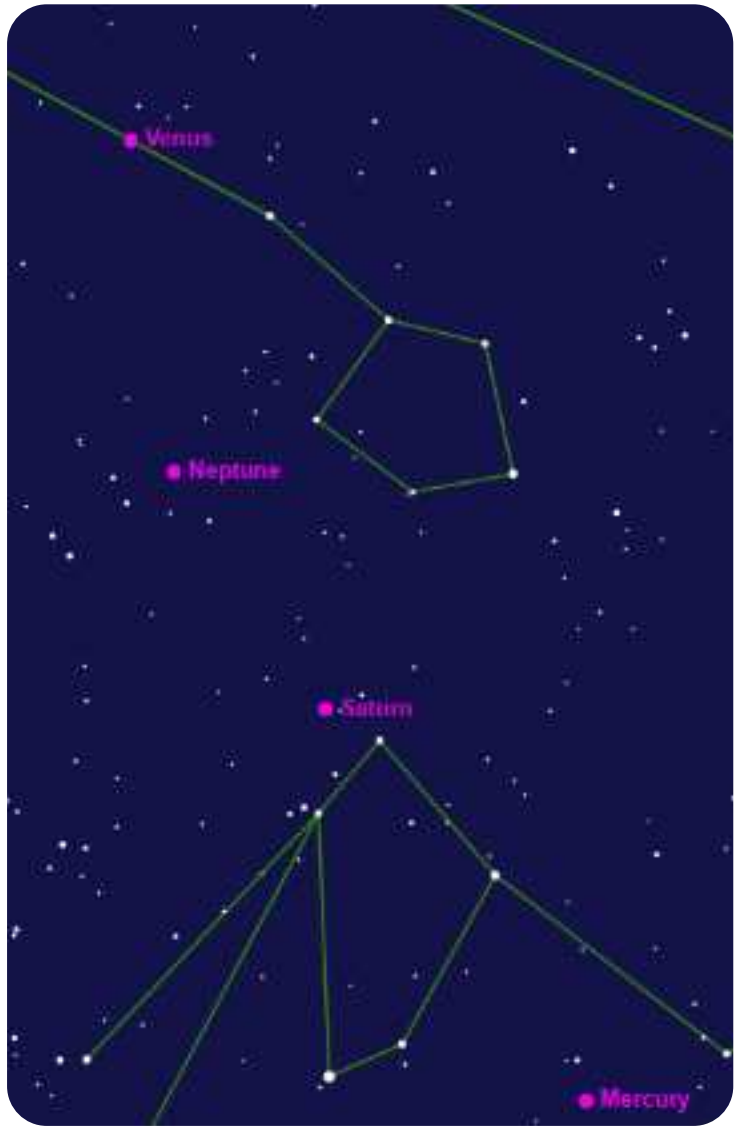
Sunrise 07:27
Sunset 17:45
Twilight ends 19:22
Twilight begins 05:51

Waxing Gibbous
94%
11 days old

Planets

	Rise	Culm.	Set
Mercury	07:41	12:39	17:38
Venus	08:50	15:10	21:29
Moon	14:33	22:41	06:39
Mars	14:27	22:22	06:17
Jupiter	12:08	19:40	03:11
Saturn	08:43	14:22	20:00

All times shown in EST.

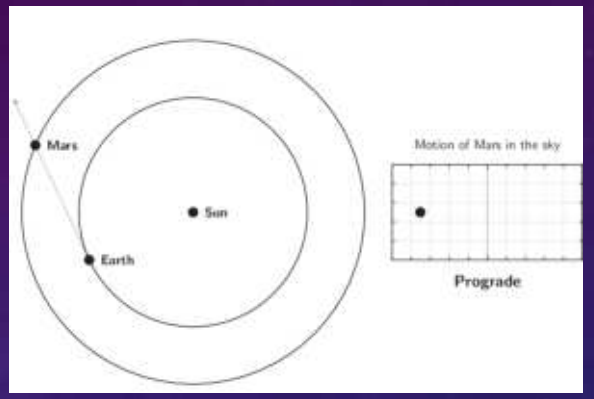


VENUS AT GREATEST BRIGHTNESS

SUN, 16 FEB 2025 AT 03:58 EST (08:58 UTC)

- Venus will reach its greatest brightness in its 2024–2025 evening apparition. It will be shining brightly at mag -4.6.
- From Stratford , this apparition will be well placed and prominent, reaching a peak altitude of 38° above the horizon at sunset on 4 Feb 2025.

MARS ENDS RETROGRADE MOTION
SUN, 23 FEB 2025 AT 21:02 EST (02:02 UTC)



THE SKY ON 23 FEBRUARY 2025

Sunrise 07:07
Sunset 18:04
Twilight ends 19:39
Twilight begins 05:32

Waning Crescent
14%
25 days old

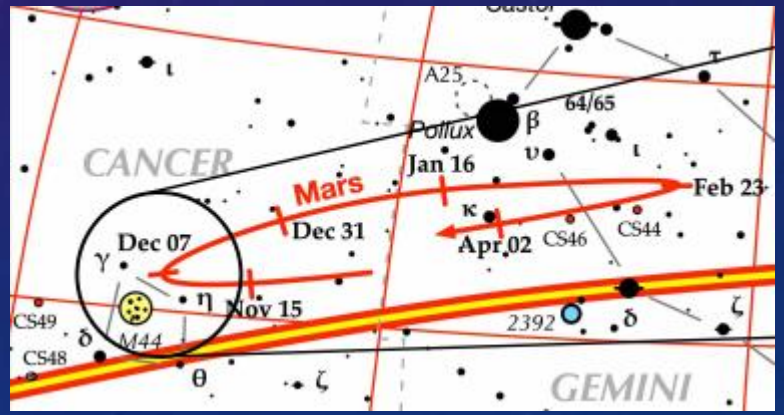
Planets

	Rise	Culm.	Set
Mercury	07:39	13:20	19:00
Venus	07:56	14:34	21:12
Moon	04:44	08:42	12:42
Mars	13:27	21:21	05:15
Jupiter	11:15	18:47	02:19
Saturn	07:52	13:33	19:14

All times shown in EST.

Mars will reach the end of its retrograde motion, ending its westward movement through the constellations and returning to more usual eastward motion instead. This reversal of direction is a phenomenon that all the solar system's outer planets periodically undergo, a few months after they pass opposition.

The retrograde motion is caused by the Earth's own motion around the Sun. As the Earth circles the Sun, our perspective changes, and this causes the apparent positions of objects to move from side-to-side in the sky with a one-year period. This nodding motion is super-imposed on the planet's long-term eastward motion through the constellation



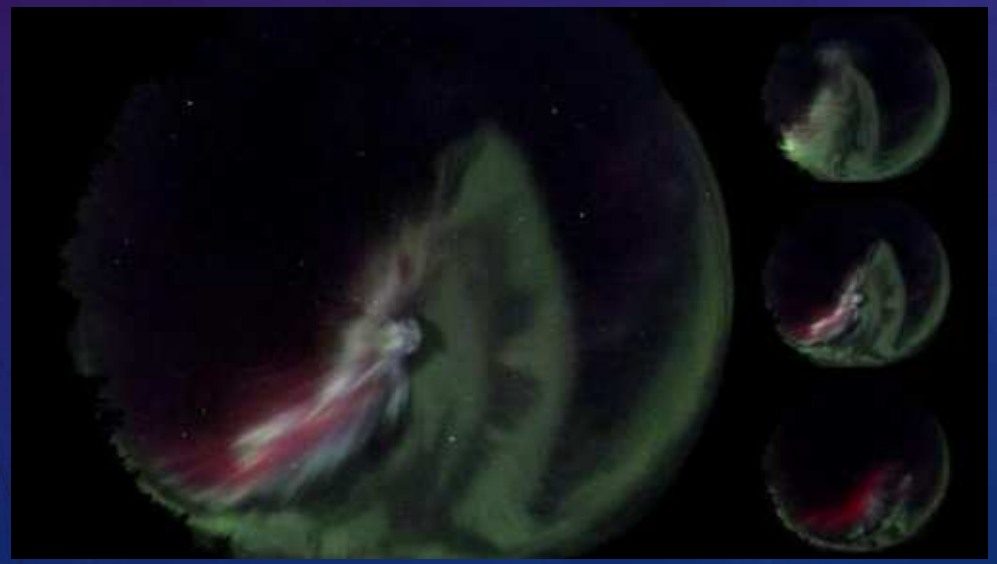
LATEST ASTRONOMY NEWS

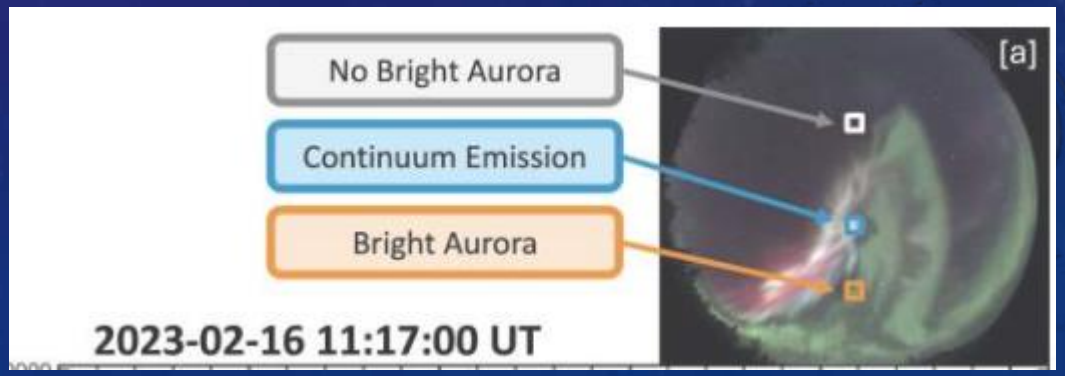
JANUARY

'WHAT IS THAT?' SCIENTISTS EXPLAIN WHITE PATCH THAT APPEARS NEAR NORTHERN LIGHTS - JAN 10TH

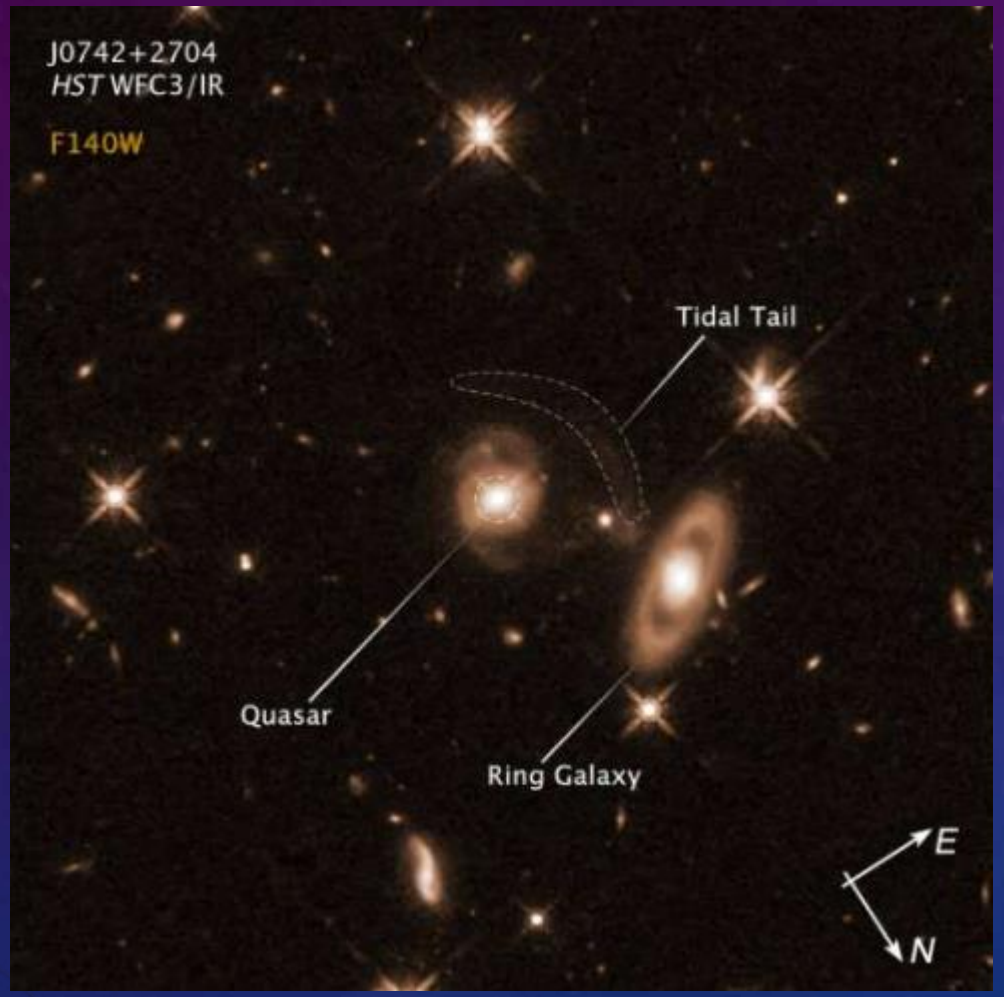
A whitish, gray patch that sometimes appears in the night sky alongside the northern lights has been explained for the first time by researchers at the University of Calgary.
The article, which was published on Dec. 30 in the journal *Nature Communications*, explores a "structured continuum emission" that's associated with aurora borealis.
"You'd see this dynamic green aurora, you'd see some of the red aurora in the background and, all of a sudden, you'd see this structured—almost like a patch—gray-toned or white toned-emission connected to the aurora," says Dr. Emma Spanswick, Ph.D., lead author on the paper and an associate professor with the Department of Physics and Astronomy in the Faculty of Science.

Her team's paper concludes it's "most certainly a heat source" and says it suggests that the aurora borealis are more complex than previously thought.
Spanswick says the discovery was made possible because an advancement in camera technology allows both amateur photographers and scientists to see true color images of the night sky.





HUBBLE REVEALS SURPRISING SPIRAL SHAPE OF GALAXY HOSTING YOUNG JET – JAN 13TH



Following up on the groundbreaking 2020 discovery of newborn jets in a number of quasars, aspiring naval officer Olivia Achenbach of the United States Naval Academy has used NASA's Hubble Space Telescope to reveal surprising properties of one of them, quasar J0742+2704.

"The biggest surprise was seeing the distinct spiral shape in the Hubble Space Telescope images. At first I was worried I had made an error," said Achenbach, who made the discovery during the course of a four-week internship.

"We typically see quasars as older galaxies that have grown very massive, along with their central black holes, after going through messy mergers and have come out with an elliptical shape," said astronomer Kristina Nyland of the Naval Research Laboratory, Achenbach's adviser on the research.

WEBB REVEALS INTRICATE LAYERS OF INTERSTELLAR DUST AND GAS – JAN 14TH

Once upon a time, the core of a massive star collapsed, creating a shockwave that blasted outward, ripping the star apart as it went. When the shockwave reached the star's surface, it punched through, generating a brief, intense pulse of X-rays and ultraviolet light that traveled outward into the surrounding space.
About 350 years later, that pulse of light has reached interstellar material, illuminating it, warming it, and causing it to glow in infrared light.

NASA's James Webb Space Telescope has observed that infrared glow, revealing fine details resembling the knots and whorls of wood grain. These observations are allowing astronomers to map the true 3D structure of this interstellar dust and gas (known as the interstellar medium) for the first time.

NASA CELEBRATES EDWIN HUBBLE'S DISCOVERY OF A NEW UNIVERSE

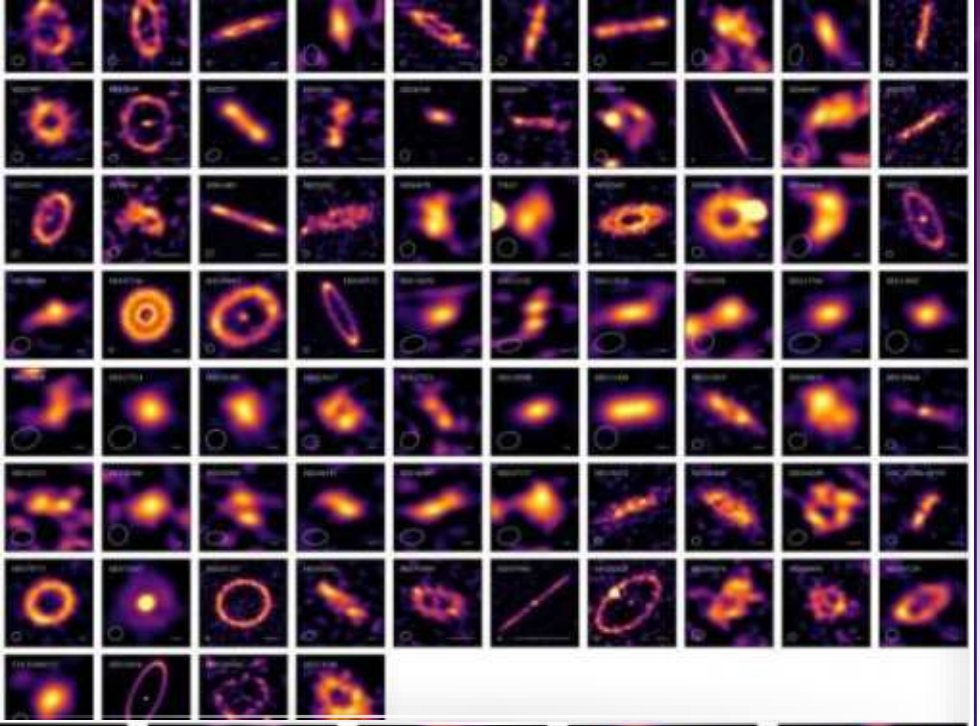
JAN 15TH

For humans, the most important star in the universe is our sun. The second-most important star is nestled inside the Andromeda galaxy. Don't go looking for it—the flickering star is 2.2 million light-years away, and is 1/100,000th the brightness of the faintest star visible to the human eye.

Yet, a century ago, its discovery by Edwin Hubble, then an astronomer at Carnegie Observatories, opened humanity's eyes as to how large the universe really is, and revealed that our Milky Way galaxy is just one of hundreds of billions of galaxies in the universe.

•The seemingly inauspicious star, simply named V1, flung open a Pandora's box full of mysteries about time and space that are still challenging astronomers today. Using the largest telescope in the world at that time, the Carnegie-funded 100-inch Hooker Telescope at Mount Wilson Observatory in California, Hubble discovered the demure star in 1923. This rare type of pulsating star, called a Cepheid variable, is used as milepost markers for distant celestial objects.

•Many astronomers long believed that the edge of the Milky Way marked the edge of the entire universe. But Hubble determined that V1, located inside the Andromeda "nebula," was at a distance that far exceeded anything in our own Milky Way galaxy. This led Hubble to the jaw-dropping realization that the universe extends far beyond our own galaxy.



ASTROPHYSICISTS REVEAL STRUCTURE OF 74 EXOCOMET BELTS ORBITING NEARBY STARS

JAN 17TH

- Astrophysicists led by a team from Trinity College Dublin have—for the first time—imaged a large number of exocomet belts around nearby stars, and the tiny pebbles within them. The crystal-clear images show light being emitted from these millimeter-sized pebbles within the belts that orbit 74 nearby stars of a wide variety of ages—from those that are just emerging from birth to those in more mature systems like our own solar system.
- The REASONS (REsolved ALMA and SMA Observations of Nearby Stars) study marks such a significant milestone in the study of exocometary belts because its images and analyses reveal where the pebbles, and hence the exocomets, are located. They are typically tens to hundreds of au (the distance from Earth to the sun) from their central star.

ASTEROID BENNU CONTAINS BUILDING BLOCKS OF LIFE

JAN 29

- The chemical building blocks of life have been found in the grainy dust of an asteroid called Bennu, an analysis reveals.
- Samples of the space rock, which were scooped up by a Nasa spacecraft and brought to Earth, contain a rich array of minerals and thousands of organic compounds.
- These include amino acids, which are the molecules that make up proteins, as well as nucleobases - the fundamental components of DNA.
- This doesn't mean there was ever life on Bennu, but it supports the theory that asteroids delivered these vital ingredients to Earth when they crashed into our planet billions of years ago.
- Scientists think those same compounds could also have been brought to other worlds in our Solar System.

PUT ON YOUR HARD HATS – THE ASTEROID IS COMING JAN 29

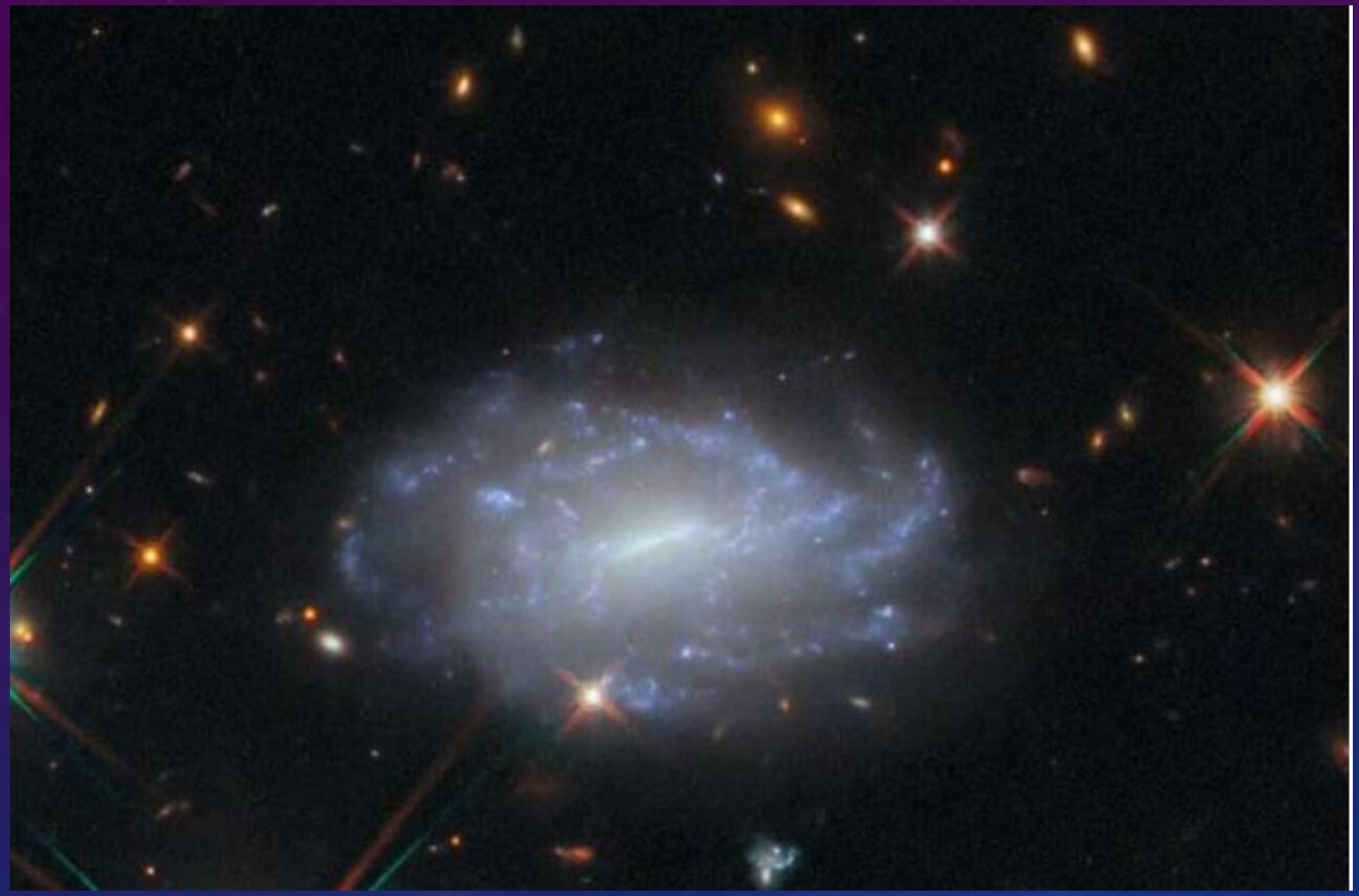
The probability that the asteroid, called 2024 YR4, may impact Earth on 22 December 2032 is currently estimated to be 1.3%.

Shortly after its discovery, automated asteroid warning systems determined that the object had a very small chance of potentially impacting Earth on 22 December 2032. 2024 YR4 is estimated to be between 40 m and 100 m wide. An asteroid this size impacts Earth on average every few thousand years and could cause severe damage to a local region.

As a result, the object rose to the top of ESA's asteroid risk list. Since early January, astronomers have been carrying out priority follow-up observations using telescopes around the world and using the new data to improve our understanding of the asteroid's size and trajectory. SMPAG, chaired by ESA, is responsible for facilitating the international exchange of information, developing opportunities for collaborative research and missions, and conducting near-Earth object threat mitigation planning activities related to asteroid 2024 YR4.
The Group will convene at its existing planned meeting in Vienna next week to determine its next steps. If the asteroid's impact probability remains above the 1% threshold when next observed in 2028, SMPAG will provide recommendations to the UN and may begin to evaluate the different options for a spacecraft-based response to the potential hazard.

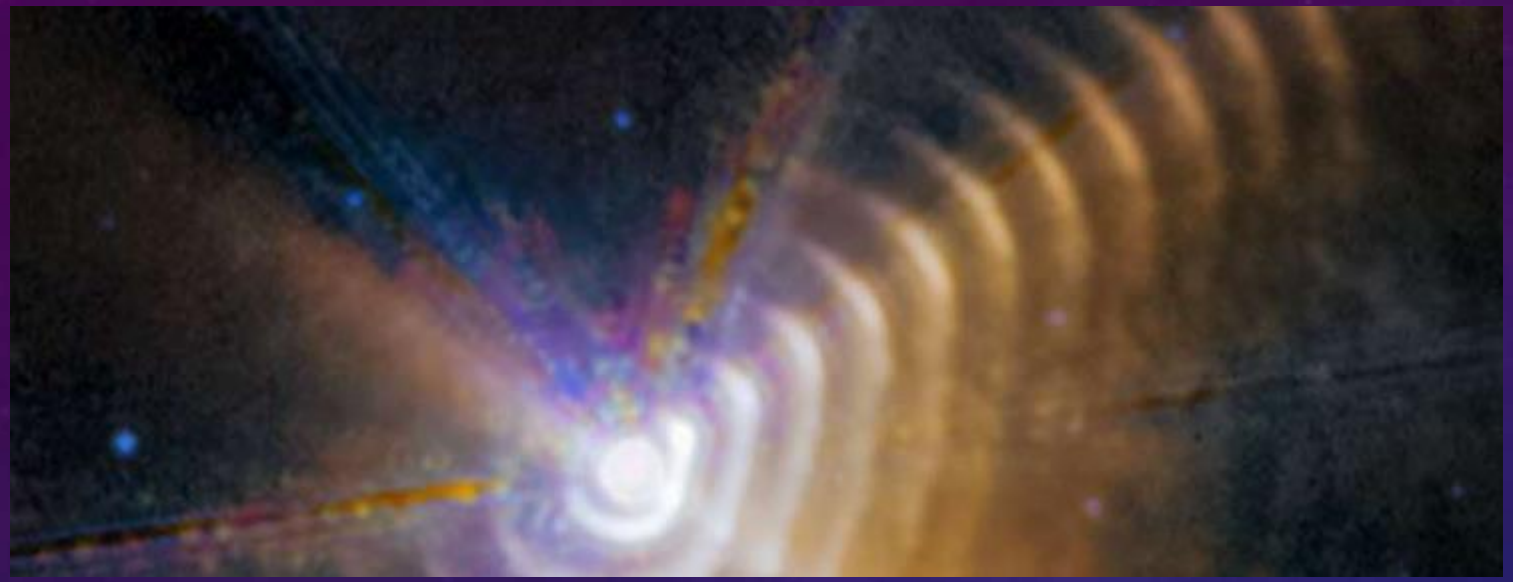
LATEST WEBB/HUBBLE IMAGES

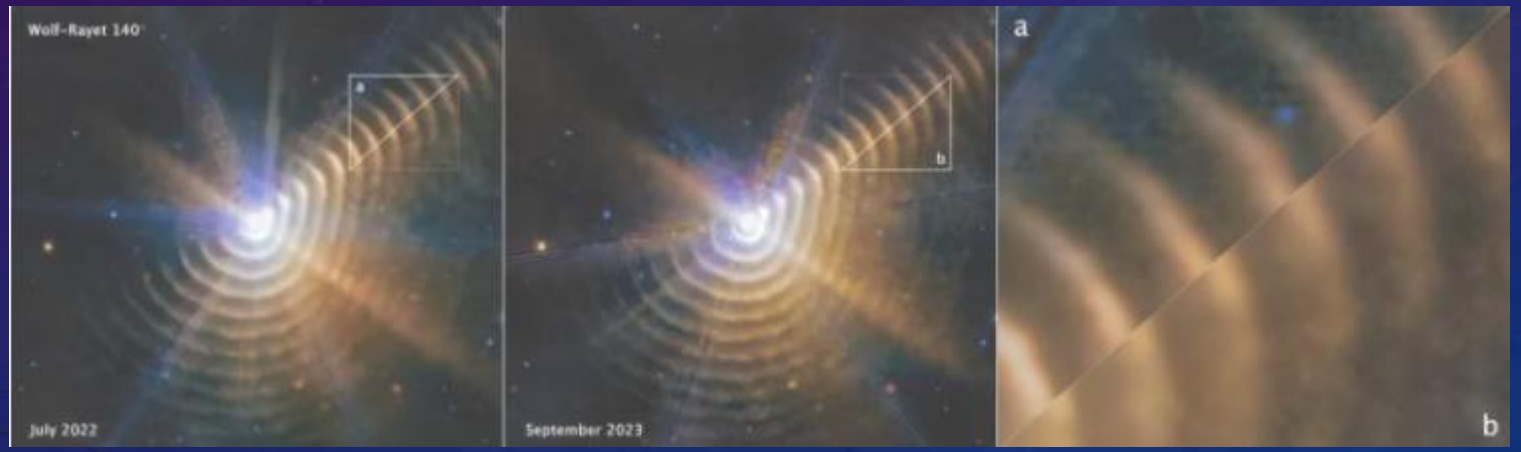
HUBBLE RINGS IN THE NEW YEAR WITH IMAGE OF CONSTELLATION HYDRA – JAN 10TH



This NASA/ESA Hubble Space Telescope image reveals a tiny patch of sky in the constellation Hydra. The stars and galaxies depicted here span a mind-bending range of distances. The objects in this image that are nearest to us are stars within our own Milky Way galaxy.

You can easily spot these stars by their diffraction spikes, lines that radiate from bright light sources, like nearby stars, as a result of how that light interacts with Hubble's secondary mirror supports. The bright star that sits just at the edge of the prominent bluish galaxy is only 3,230 light-years away, as measured by ESA's Gaia space observatory.





WEBB WATCHES CARBON-RICH DUST SHELLS FORM AND EXPAND IN STAR SYSTEM

JAN 13TH

Astronomers have long tried to track down how elements like carbon, which is essential for life, become widely distributed across the universe. Now, NASA's James Webb Space Telescope has examined one ongoing source of carbon-rich dust in our own Milky Way galaxy in greater detail: Wolf-Rayet 140, a system of two massive stars that follow a tight, elongated orbit.

As they swing past one another (within the central white dot in the Webb images), the stellar winds from each star slam together, the material compresses, and carbon-rich dust forms. Webb's latest observations show 17 dust shells shining in mid-infrared light that are expanding at regular intervals into the surrounding space.

IMAGE: HUBBLE REVEALS JUPITER IN ULTRAVIOLET LIGHT JAN 17

- This NASA Hubble Space Telescope image shows the planet Jupiter in a color composite of ultraviolet wavelengths. Released on Nov. 3, 2023, in honor of Jupiter reaching opposition, which occurs when the planet and the sun are in opposite sides of the sky, this view of the gas giant planet includes the iconic, massive storm called the "Great Red Spot."

- Though the storm appears red to the human eye, in this ultraviolet image it appears darker because high altitude haze particles absorb light at these wavelengths. The reddish, wavy polar hazes are absorbing slightly less of this light due to differences in either particle size, composition, or altitude.

WEBB AND A RINGED PLANETS WITH A DASH OF GALAXIES

SHOW AND TELL

COSMOLOGY TALK