STRATFORD ASTRONOMY GROUP

SEPT 16TH, 2025

AGENDA

- Meet and Greet
- Club NEWS and Activities
- Club Q & A
- Equipment Lessons
- Software and Imaging Information: Ken & Patrick and SOG
- Latest Astronomy NEWS
- What's UP this Month
- Show and Tell
- Astronomy Lessons / Talks Doug Fyfe and Asteroids
- Cosmology Lessons
- Conclusion

MEET AND GREET

Welcome

New Visitors

Regrets

UPCOMING MEETINGS

NEXT MEETING DATES

Tuesday - September 16, 2025

October 07, 2025

November 04, 2025

December 02, 2025

January 06, 2026

February 03, 2026

March 03,2026

April 07, 2026

May 05, 2026

June 02, 2026

CLUB NEWS AND ACTIVITIES

Group Funds

Total = $1257.82

- 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

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 SEPTEMBER

HEY, THERE BE A MOON OVERHEAD

MOON PHASES FOR THE MONTH OF SEPTEMBER

« September 2025 »

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 Aurigid meteor shower 2025	2	3	4	5 The Moon at aphelion	6 Uranus enters retrograde motion
7 Full Moon Total lunar eclipse	8 Close approach of the Moon, Saturn and Neptune Conjunction of the Moon and Saturn	9 September ε-Perseid meteor shower 2025	10 The Moon at perigee	11	12 Close approach of the Moon and M45	13 Mercury at superior solar conjunction
14 Moon at Last Quarter Lunar occultation of Beta Tauri	15	16 Conjunction of the Moon and Jupiter Close approach of the Moon and Jupiter	17	18	19 Conjunction of the Moon and Venus Close approach of the Moon and Venus Lunar occultation of Venus	20
21 Saturn at opposition Partial solar eclipse New Moon	22 September equinox	23 Neptune at opposition	24 Conjunction of the Moon and Mars The Moon at perihelion NGC 55 is well placed	25	26 The Moon at apogee	27 Daytime Sextantid meteor shower 2025 Lunar occultation of Antares 47 Tuc is well placed
28	29 Moon at First Quarter	30				

CLOSE APPROACH OF THE MOON AND JUPITER

TUE, 16 SEP 2025 AT 08:42 EDT (12:42 UTC)

The Moon and Jupiter will make a close approach, passing within 4°28' of each other. The Moon will be 24 days old. From Stratford , the pair will be visible in the dawn sky, rising at 01:34 (EDT) and reaching an altitude of 53° above the south-eastern horizon before fading from view as dawn breaks at around 06:44.

The Moon will be at mag -11.3; and Jupiter will be at mag -2.1. Both objects will lie in the constellation Gemini.

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.

THE SKY ON 16 SEPTEMBER 2025

Sunrise 07:01

Sunset 19:31

Twilight ends 21:09

Twilight begins 05:24

Waning Crescent

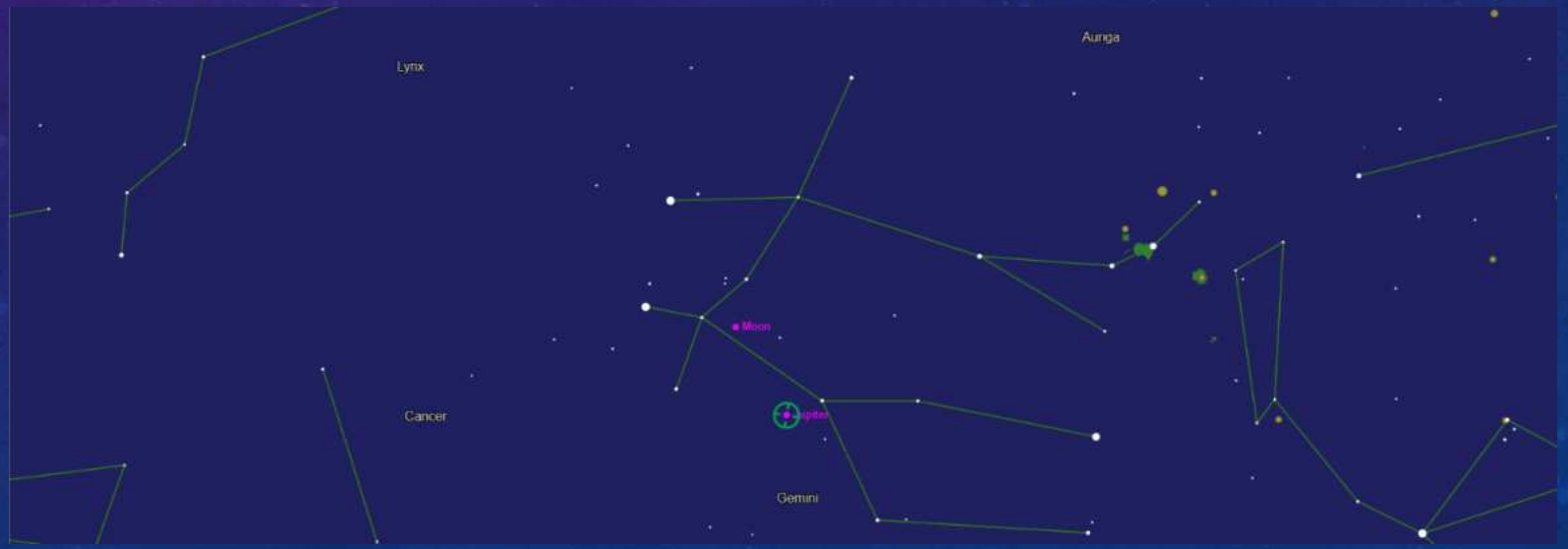
22%

24 days old

Planets

	Rise	Culm.	Set
Mercury	07:16	13:29	19:42
Venus	04:39	11:35	18:31
Moon	01:04	09:12	17:10
Mars	09:50	15:15	20:41
Jupiter	01:34	09:07	16:40
Saturn	19:48	01:40	07:32

All times shown in EDT.



CLOSE APPROACH OF THE MOON AND VENUS

FRI, 19 SEP 2025 AT 08:30 EDT (12:30 UTC)

The Moon and Venus will make a close approach, passing within a mere 43.6 arcminutes of each other. From some parts of the world, the Moon will pass in front of Venus, creating a lunar occultation. The Moon will be 27 days old.

From Stratford , the pair will be visible in the dawn sky, rising at 04:45 (EDT) – 2 hours and 20 minutes before the Sun – and reaching an altitude of 21° above the eastern horizon before fading from view as dawn breaks at around 06:47.

The Moon will be at mag -9.4; and Venus will be at mag -3.9. Both objects will lie in the constellation Leo.

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.

At around the same time, the pair will also share the same right ascension – called a conjunction.

THE SKY ON 19 SEPTEMBER 2025

Sunrise 07:05

Sunset 19:26

Twilight ends 21:02

Twilight begins 05:28

Waning Crescent

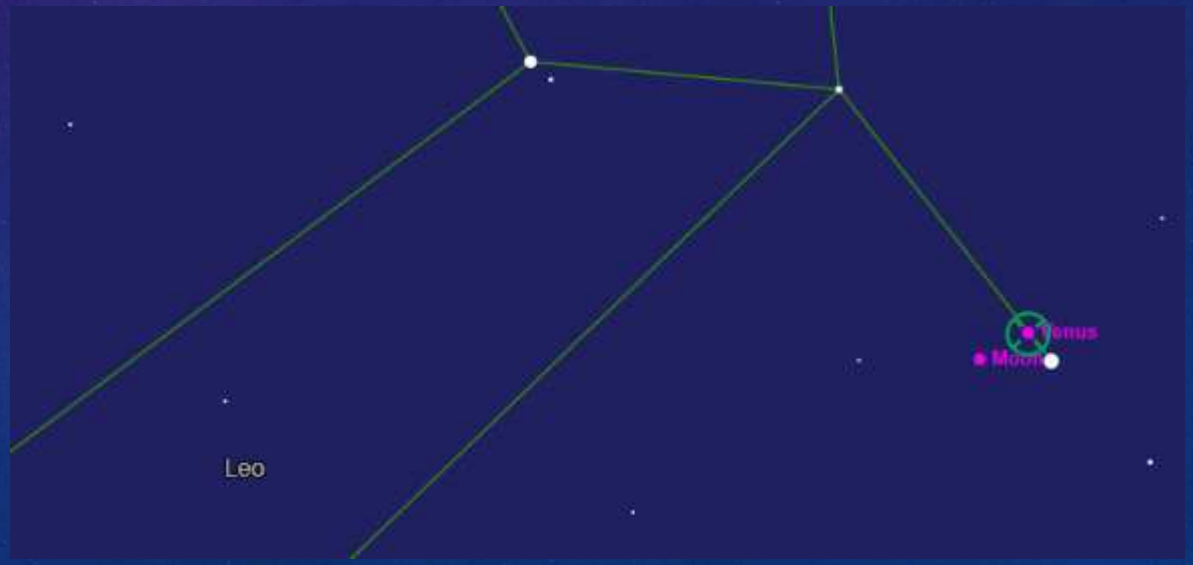
3%

27 days old

Planets

	Rise	Culm.	Set
Mercury	07:32	13:36	19:41
Venus	04:46	11:37	18:28
Moon	04:41	11:44	18:33
Mars	09:49	15:11	20:33
Jupiter	01:25	08:58	16:30
Saturn	19:36	01:27	07:19

All times shown in EDT.



SEPTEMBER EQUINOX

MON, 22 SEP 2025 AT 14:20 EDT (18:20 UTC)

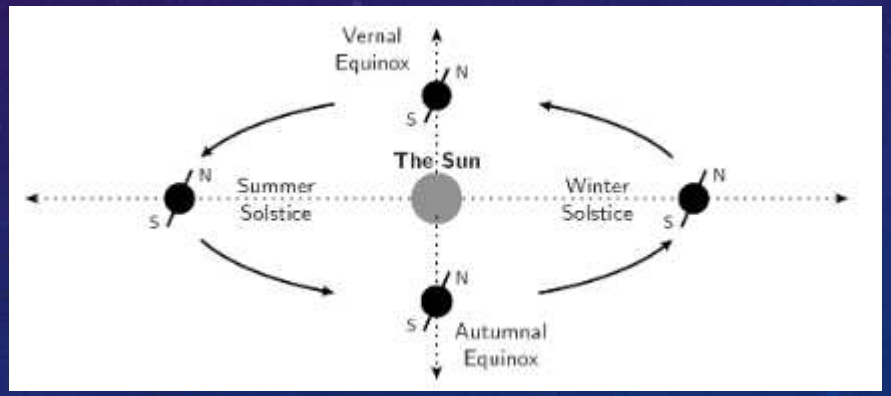
The September equinox marks the first day of autumn for anybody living in the northern hemisphere, and the first day of spring for anybody living in the southern hemisphere.

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.

Equinox geometry

Equinoxes occur because the axis of the Earth's spin – its polar axis – is tilted at an angle of 23.5° to the plane of its orbit around the Sun. The direction of the Earth's spin axis remains fixed in space as it circles around the Sun, while the Earth's sight line to the Sun moves through the constellations of the zodiac. As a result, sometimes the Earth's north pole is tilted towards the Sun (in June), and sometimes it is tilted away from it (in December). This gives rise to the Earth's seasons:



Year	Time of equinox
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
2028	22 Sep 07:51 EDT
2029	22 Sep 13:45 EDT

LATEST ASTRONOMY NEWS

JULY-SEPT

LARGEST SUPERNOVA DATASET HINTS DARK ENERGY MAY BE CHANGING OVER TIME

-JULY 21ST

•It took about 50 exploding stars to upend cosmology. Researchers mapped and measured light from Type Ia supernovae, the dramatic explosion of a particular kind of white dwarf. In 1998, they announced their surprising results: Instead of slowing down or staying constant, our universe was expanding faster and faster. The discovery of "dark energy," the unknown ingredient driving the accelerated expansion, was awarded a Nobel Prize.

•Since the late '90s, dozens of experiments using different telescopes and techniques have captured and published more than 2,000 Type Ia (pronounced "one A") supernovae. But without correcting for those differences, using supernovae from separate experiments is often a case of comparing apples and oranges.

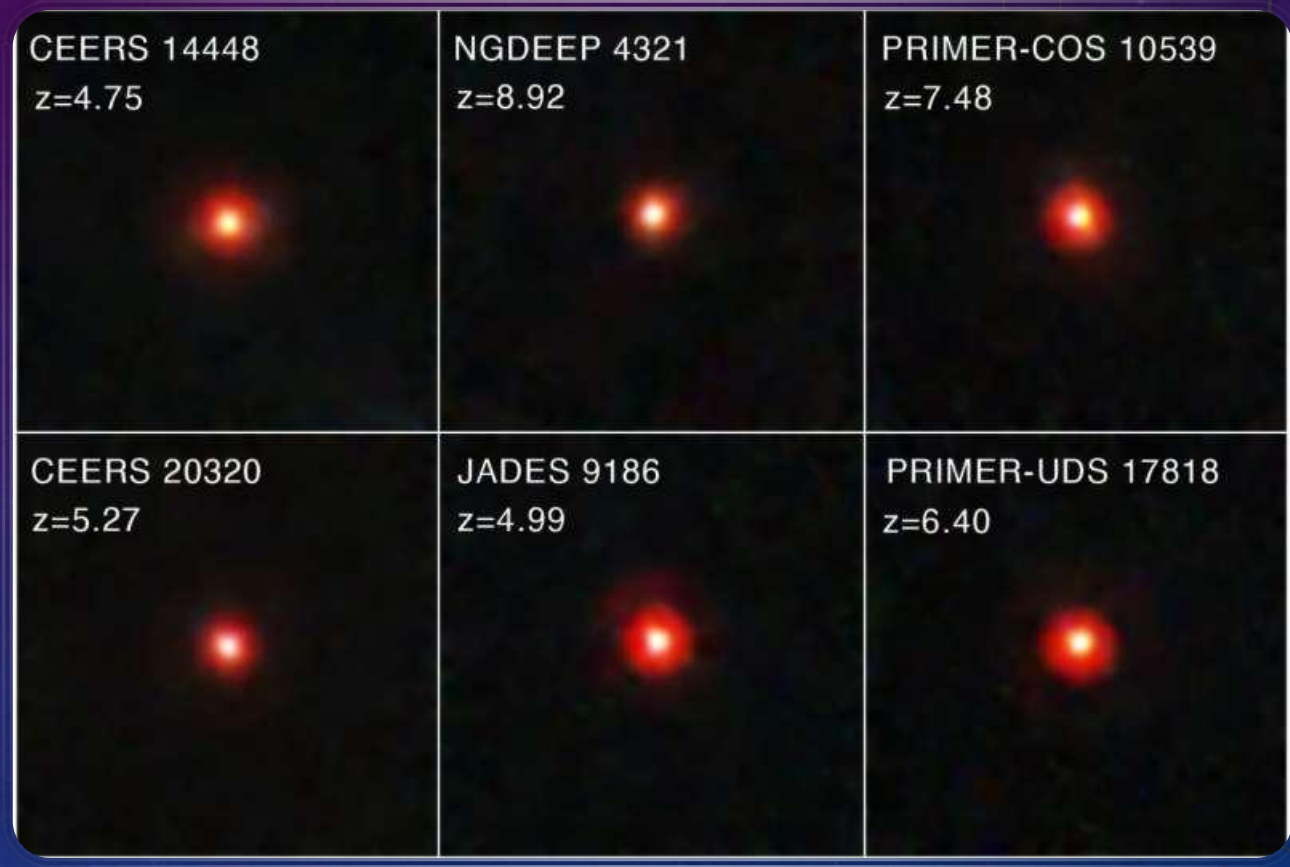
•To unite the supernovae and more precisely measure dark energy's role in our universe, scientists built the largest standardized dataset of Type Ia supernovae ever made. The compilation is called Union3 and was built by the international Supernova Cosmology Project (SCP), which is led by the Department of Energy's Lawrence Berkeley National Laboratory (Berkeley Lab).

•Analysis of this supernova set hints that dark energy might be evolving over time. The findings, recently published in *The Astrophysical Journal*, are not strong enough to conclusively say that dark energy has started weakening. But they do point in the same direction as separate analyses by the Dark Energy Spectroscopic Instrument.

•The two complementary approaches seeing similar results have researchers intrigued. Moreover, a partially independent result from another supernova analysis (including supernovae from the DOE-led Dark Energy Survey) also appears to support the conclusion.

ARE THE JWST'S LITTLE RED DOTS ACTUALLY SUPERMASSIVE BLACK HOLE SEEDS? JULY 22ND

- When the JWST began science observations in July 2022, it flung open a whole new window on the universe. The JWST looked further back in time than any other telescope, and it revealed several surprises. One of them was the Little Red Dots (LRD), ancient, faint objects that the powerful space telescope detected as far back as only 600 million years after the Big Bang.
- New research suggests that the LRDs are not actually galaxies, but instead a type of hypothesized star called supermassive stars (SMS). Astronomers think that SMS are critical intermediate stages in the formation of SMBH seeds. These SMBHs power the quasars that scientists have observed in the early universe.
- The research is titled "Supermassive Stars Match the Spectral Signatures of JWST's Little Red Dots." The authors are Devesh Nandal from the Department of Astronomy at the University of Virginia, and Abraham Loeb from the Harvard and Smithsonian Center for Astrophysics. The research is available on the arXiv preprint server.



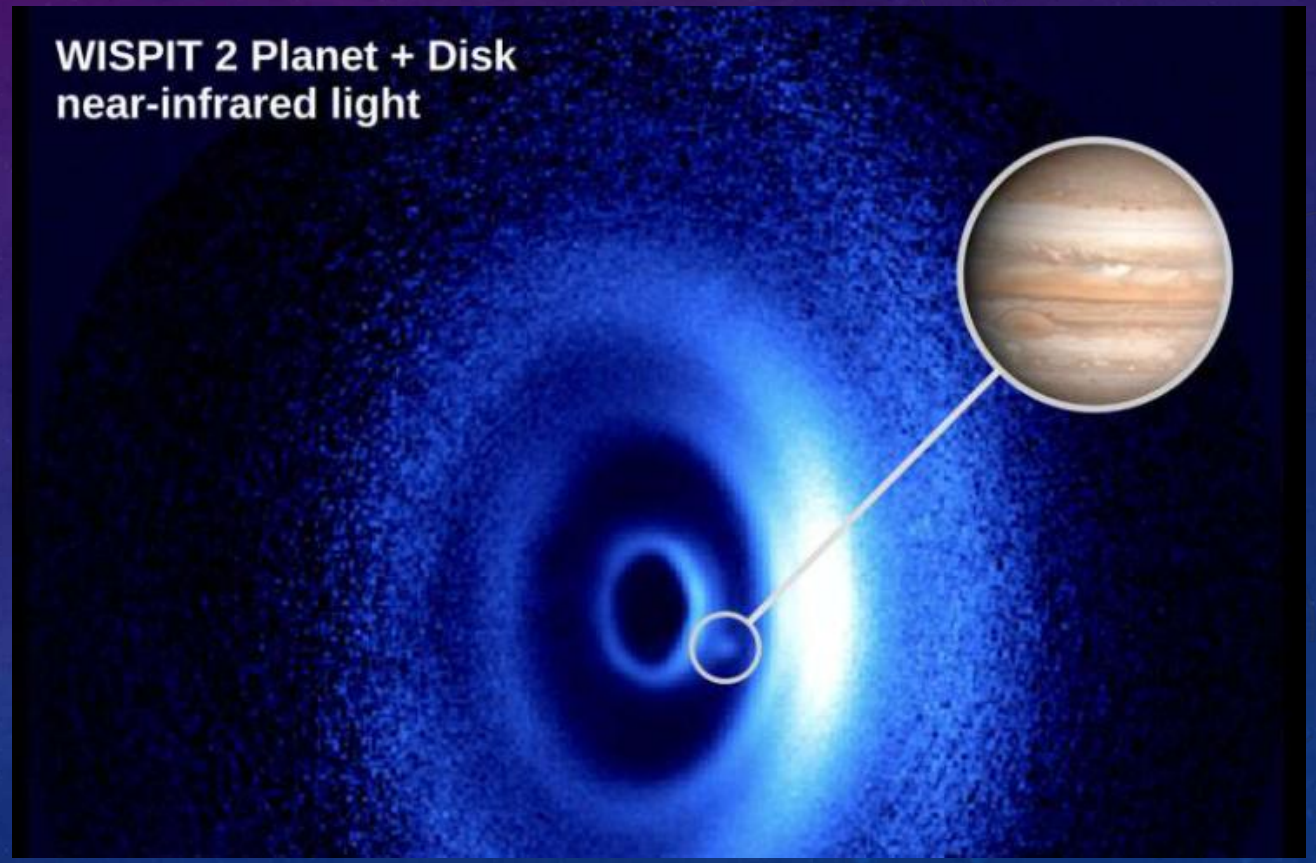
ASTRONOMERS MAKE UNEXPECTED DISCOVERY OF PLANET IN FORMATION AROUND A YOUNG STAR AUG 26TH

An international team of astronomers, co-led by researchers at the University of Galway, has made the unexpected discovery of a new planet.

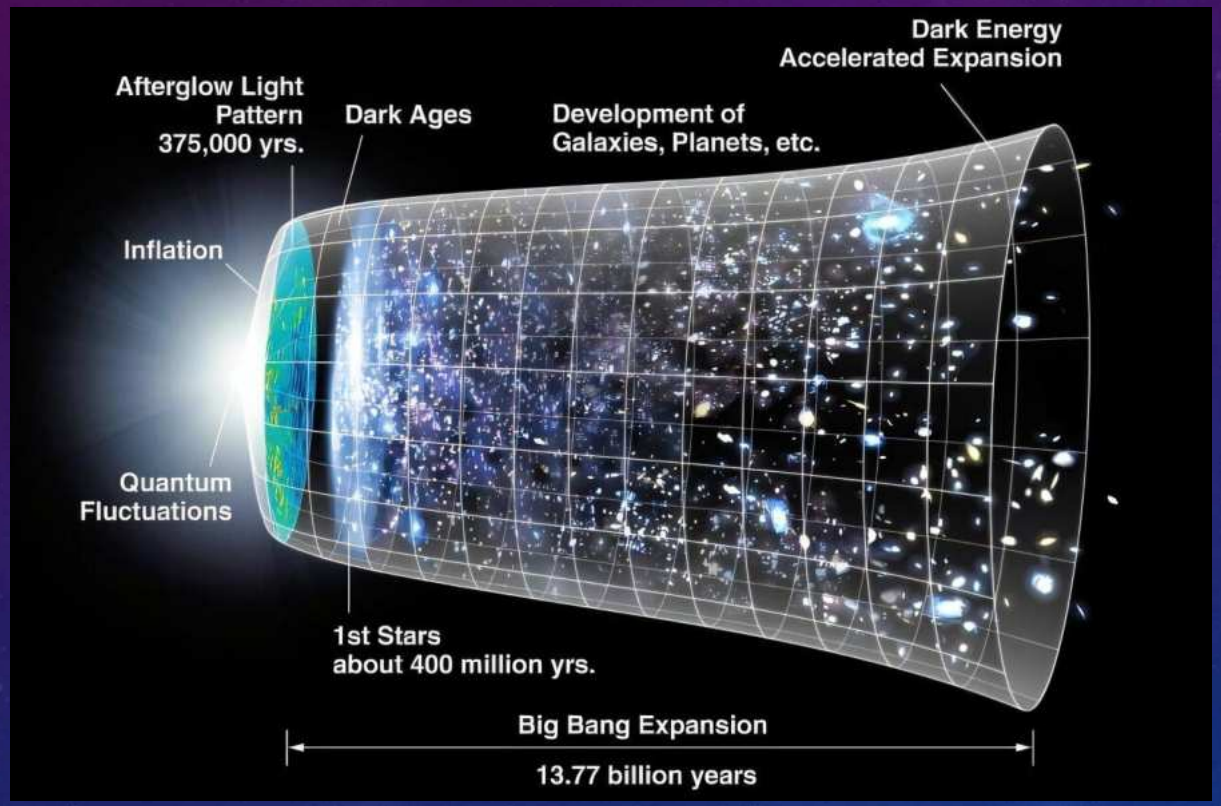
Detected at an early stage of formation around a young analog of our own sun, the planet is estimated to be about 5 million years old and most likely a gas giant of similar size to Jupiter.

The study, which was led by Leiden University, the University of Galway and the University of Arizona, has been published in Astrophysical Journal Letters.

The ground-breaking discovery was made using one of the world's most advanced observatories—the European Southern Observatory's Very Large Telescope (ESO's VLT) in the Atacama Desert in Chile. The new planet has been named WISPIT 2b.



A NEW THEORY OF THE UNIVERSE'S ORIGINS WITHOUT INFLATION AUG 28TH



How exactly did the universe start and how did these processes determine its formation and evolution? This is what a study published in Physical Review Research hopes to address as a team of researchers from Spain and Italy proposed a new model for the events that transpired immediately after the birth of the universe.

This new model suggests that a longstanding phenomenon of general relativity called gravitational waves are responsible for the universe and all its components, including galaxies, stars, planets, and life on Earth. The team proposes these gravitational waves are part of a longstanding mathematical model called De Sitter space, which is named after the Dutch mathematician Willem De Sitter, who worked with Albert Einstein regarding the universe's structure throughout the 1920s.

Hawking and Kerr black hole theories confirmed by gravitational wave - Sept 10th

Scientists have confirmed two long-standing theories relating to black holes—thanks to the detection of the most clearly recorded gravitational wave signal to date.

Ten years after detecting the first gravitational wave, the LIGO-Virgo-KAGRA Collaboration has (10 Sep) announced the detection of GW250114—a ripple in spacetime which offers unprecedented insights into the nature of black holes and the fundamental laws of physics.

The study confirms Professor Stephen Hawking's 1971 prediction that when black holes collide, the total event horizon area of the resulting black hole is bigger than the sum of individual black holes—it cannot shrink.

Research also confirmed the Kerr nature of black holes—a set of equations developed in 1963 by New Zealand mathematician Roy Kerr elegantly explaining what space and time look like near a spinning black hole. The Kerr metric predicts effects such as space being 'dragged' around and light looping to make multiple copies of objects.

Publishing their findings in Physical Review Letters, the international group of researchers—including experts from the University of Birmingham—note that GW250114 was detected with a signal-to-noise ratio of 80. This clarity enabled precise tests of general relativity and black hole thermodynamics.

https://journals.aps.org/prl/abstract/10.1103/kw5g-d732

New images reveal unexpected polarization flips near M87's supermassive black hole: Today

For the first time in EHT data, scientists have also detected signatures of extended jet emission near the jet base, where it connects to the ring around the black hole. Located about 55 million light-years from Earth, M87 harbors a supermassive black hole more than 6 billion times the mass of the sun.

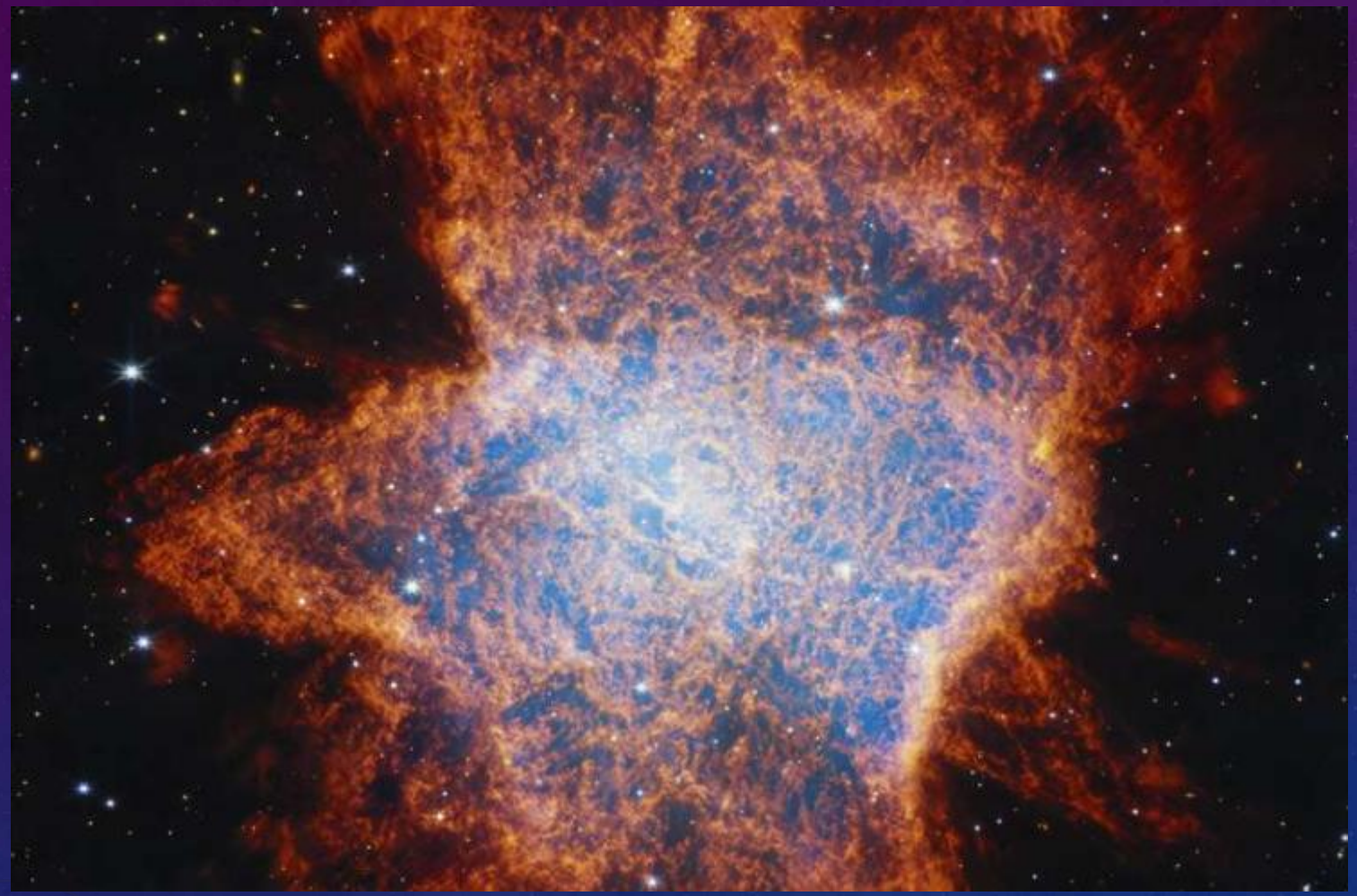
The EHT—a global network of radio telescopes acting as an Earth-sized observatory—first captured the iconic image of M87's black hole shadow in 2019, adding polarization maps in 2021.

Between 2017 and 2021, the polarization pattern unexpectedly flipped direction. In 2017, the magnetic fields appeared to spiral one way; by 2018, they had stabilized, and in 2021, they reversed, spiraling the opposite way. Such changes may result from both the black hole's own magnetic structure and intervening matter that twists the light's polarization on its journey to Earth.

LATEST WEBB/HUBBLE/S50 IMAGES

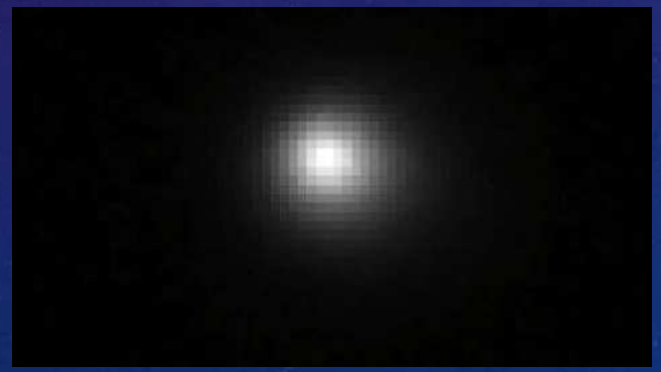
- Swirling nebula of two dying stars revealed in spectacular detail in new Webb telescope image

Hubble spies swirling spiral NGC 3285B



WEBB REVEALS MORE THAN ONE STAR CONTRIBUTES TO THE IRREGULAR SHAPE OF PLANETARY NEBULA NGC 6072

Hubble Space Telescope takes best picture yet of the comet visiting from another solar system



NASA and the European Space Agency released the latest photos Thursday.

Discovered last month by a telescope in Chile, the comet known as 3I-Atlas is only the third known interstellar object to pass our way and poses no threat to Earth.

Astronomers originally estimated the size of its icy core at several miles (tens of kilometers) across, but Hubble's observations have narrowed it down to no more than 3.5 miles (5.6 kilometers). It could even be as small as 1,000 feet (320 meters), according to scientists.

The comet is hurtling our way at 130,000 mph (209,000 kph), but will veer closer to Mars than Earth, keeping a safe distance from both. It was 277 million miles (446 million kilometers) away when photographed by Hubble a couple weeks ago. The orbiting telescope revealed a teardrop-shaped plume of dust around the nucleus as well as traces of a dusty tail.

Vera Rubin telescope captured the comet on July 3rd during a test run.

This Summer’s S50 Images

S50
Michael Burns
Pluto

Processed via PixInsight

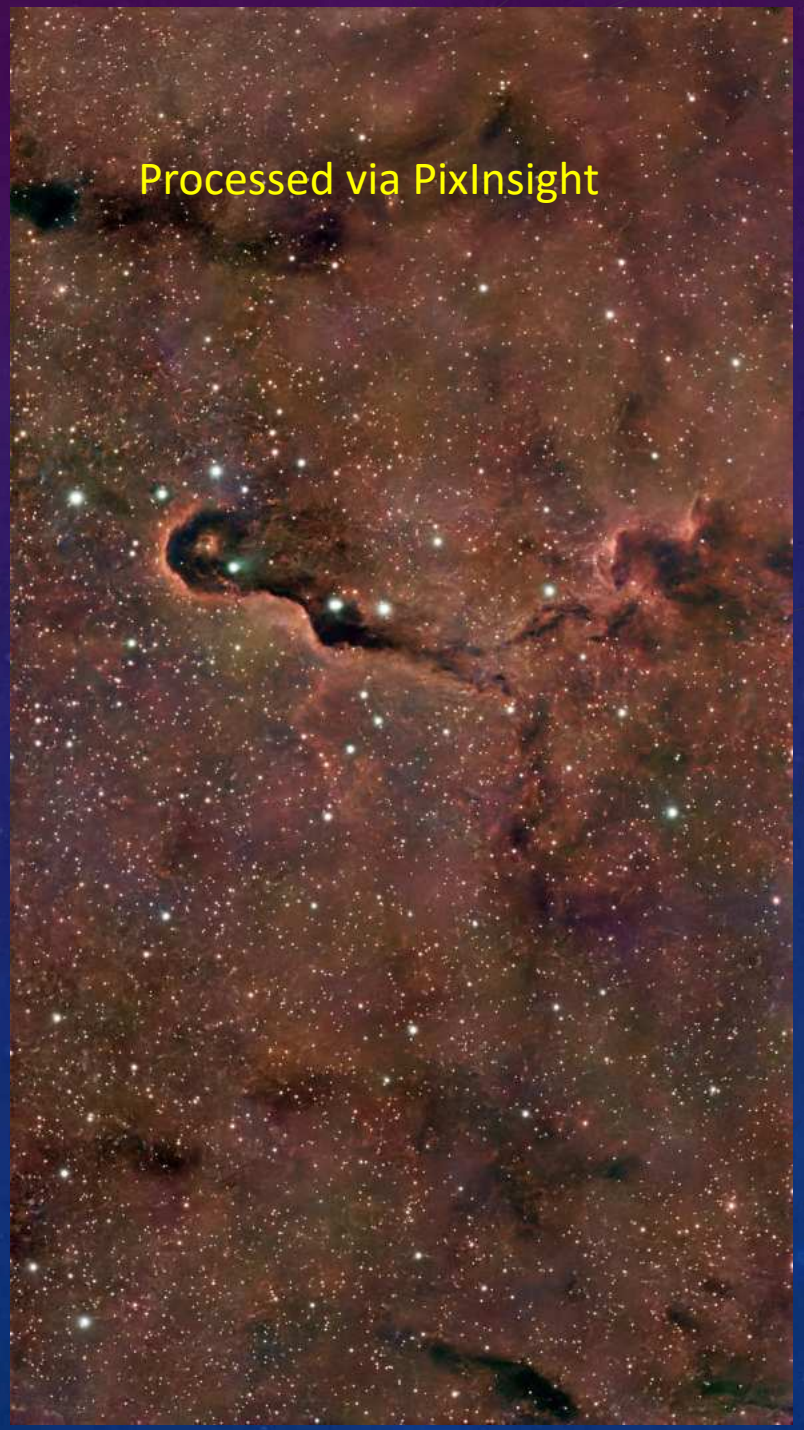
S50
Michael Burns
Bubble

Processed via PixInsight in both natural and Hubble Pallet

S50
Michael Burns
Cressent

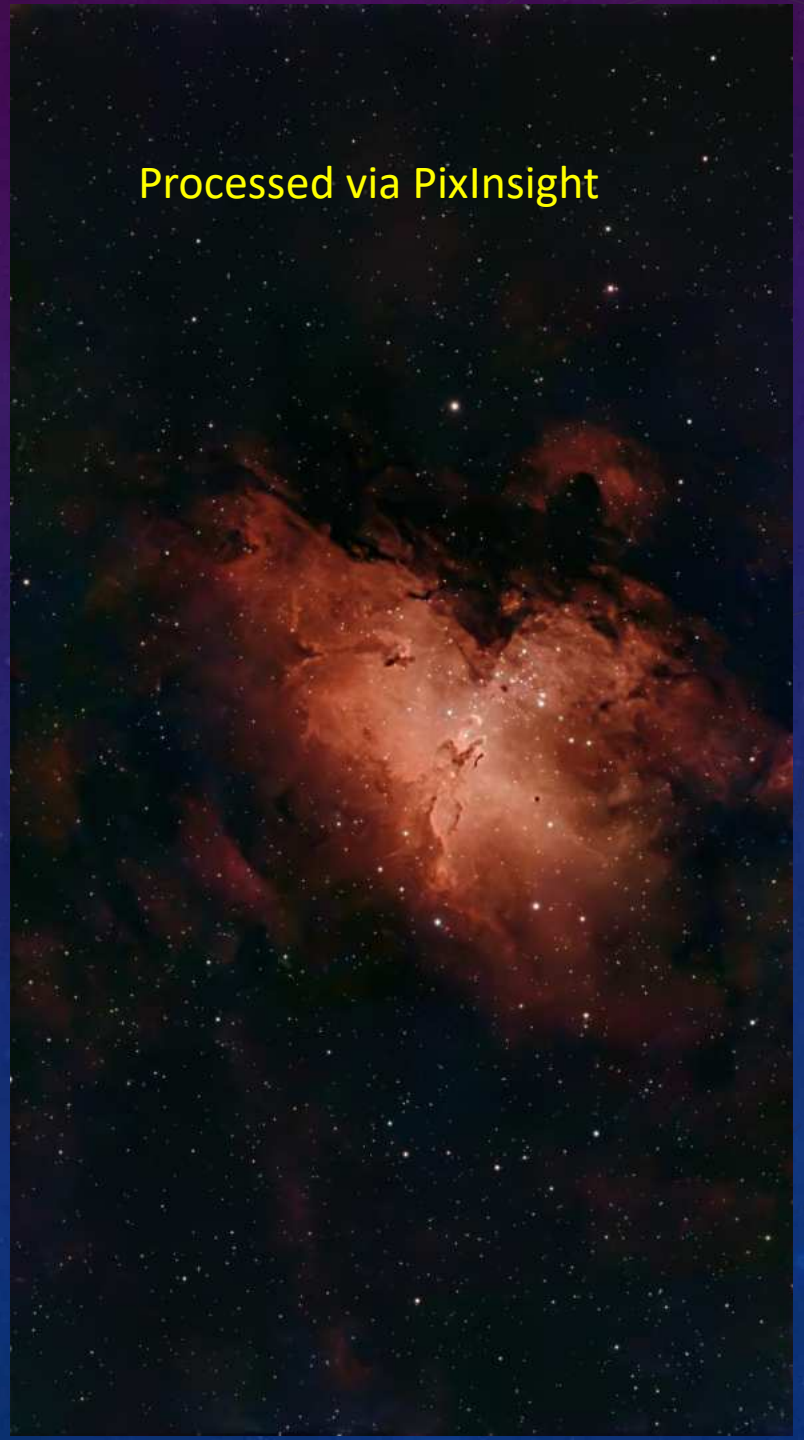
S50
Michael Burns
Dumbell

S50
Michael Burns
Elephant Trunk



S50
Michael Burns
Helix

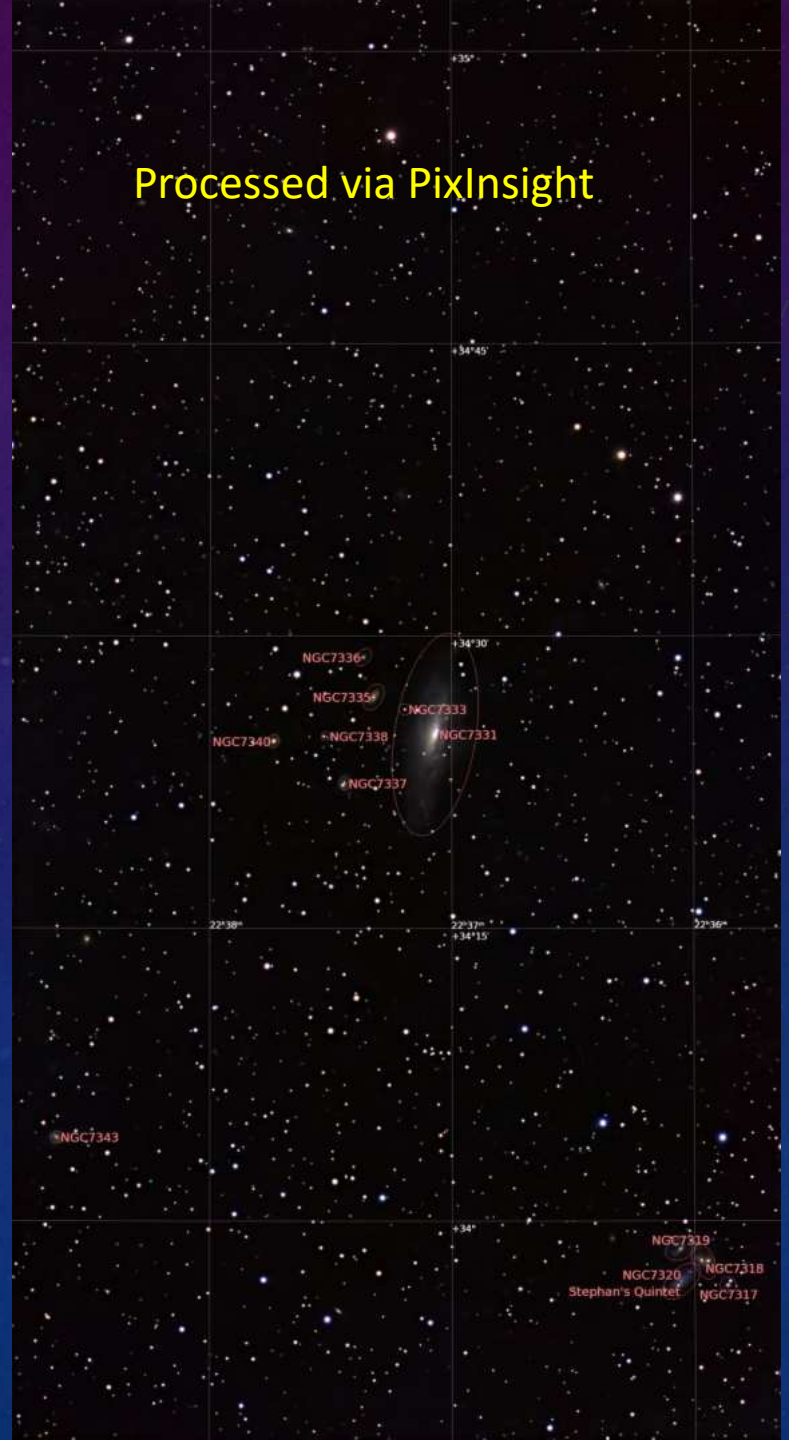
S50
Michael Burns
Eagle



S50
Michael Burns
Trifid

S50
Michael Burns
Super Nova

Processed via PixInsight



S50
Michael Burns
Andromeda (Mosaic)

SHOW AND TELL

DOUG

COSMOLOGY TALK