

STRATFORD ASTRONOMY GROUP

JUNE 2ND, 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 = \$1096.88

- 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

Bookings

Status: **Approved**

Total hours: 20

Status	Date	Start	End	Facility and spaces
Approved	Tue, Sep 06, 2022	7:00pm	9:00pm	St. Michael CSS in Classroom 2 Room 104
Approved	Tue, Oct 04, 2022	7:00pm	9:00pm	St. Michael CSS in Classroom 2 Room 104
Approved	Tue, Nov 01, 2022	7:00pm	9:00pm	St. Michael CSS in Classroom 2 Room 104
Approved	Tue, Dec 06, 2022	7:00pm	9:00pm	St. Michael CSS in Classroom 2 Room 104
Approved	Tue, Jan 10, 2023	7:00pm	9:00pm	St. Michael CSS in Classroom 2 Room 104
Approved	Tue, Feb 07, 2023	7:00pm	9:00pm	St. Michael CSS in Classroom 2 Room 104

Approved	Tue, Mar 07, 2023	7:00pm	9:00pm	St. Michael CSS in Classroom 2 Room 104
Approved	Tue, Apr 04, 2023	7:00pm	9:00pm	St. Michael CSS in Classroom 2 Room 104
Approved	Tue, May 02, 2023	7:00pm	9:00pm	St. Michael CSS in Classroom 2 Room 104
Approved	Tue, Jun 06, 2023	7:00pm	9:00pm	St. Michael CSS in Classroom 2 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**
 - June 23 8:30 p.m. is the date of the event at the museum. Please bring along a scope if possible and arrive between 7:30 -8:00 p.m.
 - Rain Date: June 30th at 8:30 pm
 - A Rain date of June 30th at 8:30 has been set
- **Tim and Canadensys**
 - Review

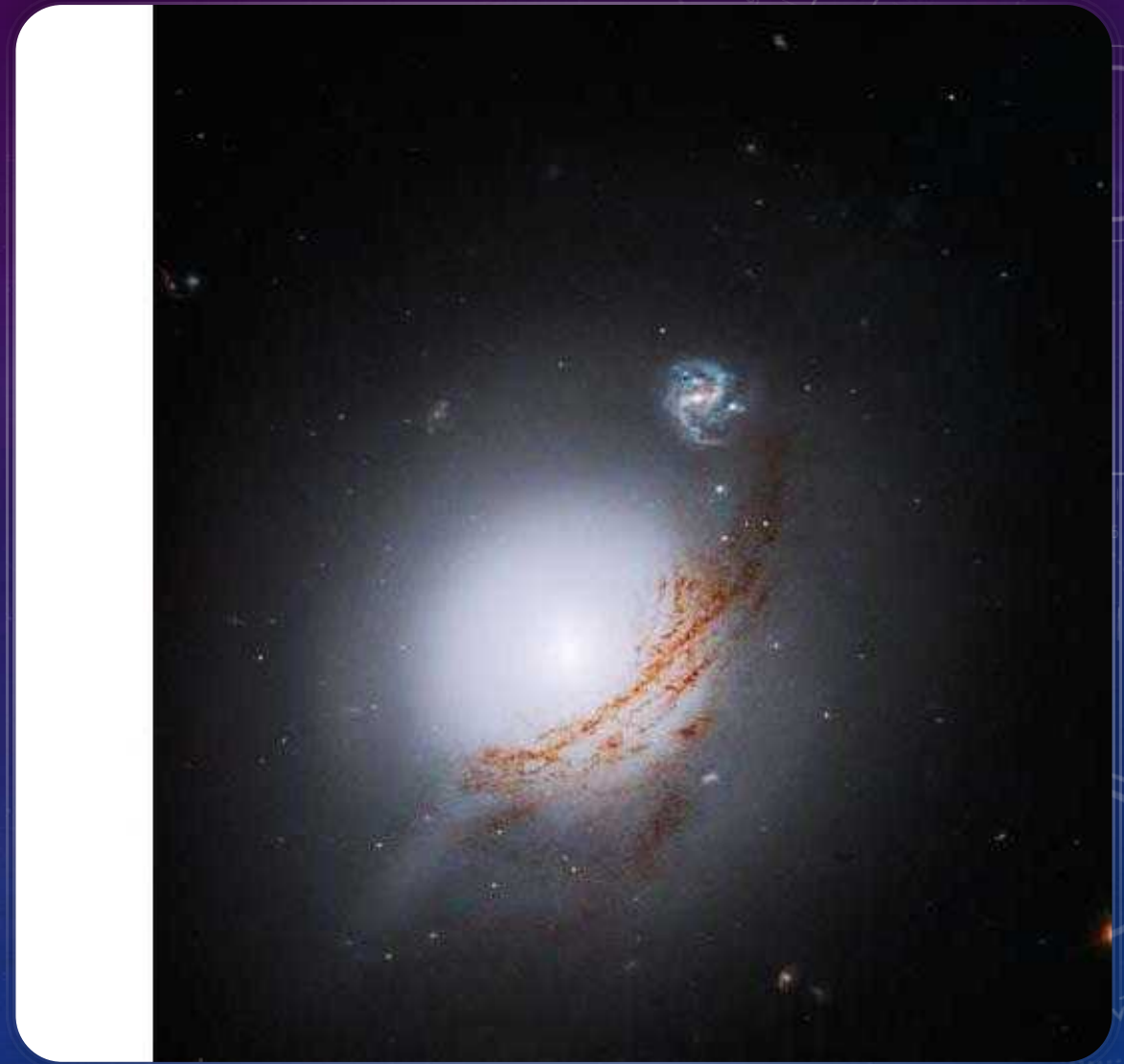
LATEST ASTRONOMY NEWS

MAY-JUNE



MAY 8TH: HUBBLE VIEWS LENTICULAR GALAXY NGC 5283

- The lenticular galaxy NGC 5283 is the subject of this NASA Hubble Space Telescope image. NGC 5283 contains an active galactic nucleus, or AGN. An AGN is an extremely bright region at the heart of a galaxy where a supermassive black hole exists. When dust and gas fall into the black hole, the matter heats up and emits light across the electromagnetic spectrum.



MAY 8TH: WEBB LOOKS FOR FOMALHAUT'S ASTEROID BELT AND FINDS MUCH MORE

- Astronomers used NASA's James Webb Space Telescope to image the warm dust around a nearby young star, [Fomalhaut](#), in order to study the first asteroid belt ever seen outside of our solar system in infrared light. But to their surprise, the dusty structures are much more complex than the asteroid and Kuiper dust belts of our solar system. Overall, there are three nested belts extending out to 14 billion miles (23 billion kilometers) from the star; that's 150 times the distance of Earth from the Sun. The scale of the outermost belt is roughly twice the scale of our solar system's Kuiper Belt of small bodies and cold dust beyond Neptune. The inner belts—which had never been seen before—were revealed by Webb for the first time.



MAY 12TH: STUCK ANTENNA FREED ON JUPITER-BOUND SPACECRAFT

- A crucial radar antenna on a European spacecraft bound for Jupiter is no longer jammed.
- Flight controllers in Germany freed the 52-foot (16-meter) antenna Friday after nearly a month of effort.
- The European Space Agency's Jupiter Icy Moons Explorer, nicknamed Juice, blasted off in April on a decade-long voyage. Soon after launch, a tiny pin refused to budge and prevented the antenna from fully opening.
- Controllers tried shaking and warming the spacecraft to get the pin to move by just millimeters. Back-to-back jolts finally did the trick.
- Juice will attempt to go into orbit around Ganymede. No spacecraft has ever orbited a moon other than our own.

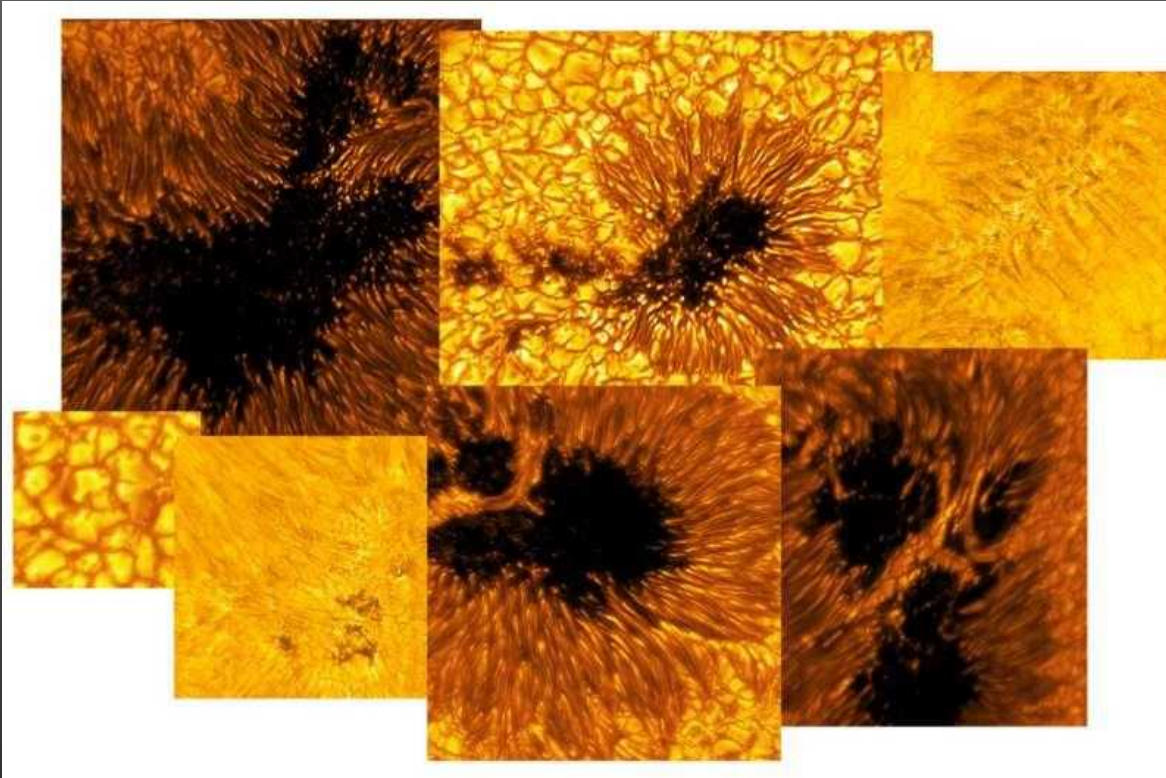


MAY 12TH :ASTRONOMERS REVEAL THE LARGEST COSMIC EXPLOSION EVER SEEN



- A team of astronomers led by the University of Southampton have uncovered the largest cosmic explosion ever witnessed.
- The explosion is more than ten times brighter than any known supernova (exploding star) and three times brighter than the brightest tidal disruption event, where a star falls into a supermassive black hole.
- The explosion, known as AT2021lwx, has currently lasted over three years, compared to most supernovae which are only visibly bright for a few months. It took place nearly 8 billion light years away, when the universe was around 6 billion years old, and is still being detected by a network of telescopes.

MAY 19TH: New images released by Daniel K. Inouye Solar Telescope



The National Science Foundation's (NSF) Daniel K. Inouye Solar Telescope released eight new images of the sun, previewing the exciting science underway at the world's most powerful ground-based solar telescope. The images feature a variety of sunspots and quiet regions of the sun obtained by the Visible-Broadband Imager (VBI), one of the telescope's first-generation instruments.

The Inouye Solar Telescope's unique ability to capture data in unprecedented detail will help solar scientists better understand the sun's magnetic field and drivers behind solar storms.



MAY 19ST: SUPERNOVA IN M101

- The supernova, dubbed SN 2023ixf, was discovered by Japanese astronomer Koichi Itagaki three days ago and subsequently located on automated images from the Zwicky Transient Facility two days earlier. SN 2023ixf occurred in the photogenic Pinwheel Galaxy M101, which, being only about 21 million light years away, makes it the closest supernova seen in the past five years, the second closest in the past 10 years, and the second supernova found in M101 in the past 15 years.

MAY 24TH: NASA'S CHANDRA, WEBB TELESCOPES COMBINE FOR ARRESTING VIEWS

•Four composite images deliver dazzling views from NASA's Chandra X-ray Observatory and James Webb Space Telescope of two galaxies, a nebula, and a star cluster. Each image combines Chandra's X-rays—a form of high-energy light—with infrared data from previously released Webb images, both of which are invisible to the unaided eye. Data from NASA's Hubble Space Telescope (optical light) and retired Spitzer Space Telescope (infrared), plus the European Space Agency's XMM-Newton (X-ray) and the European Southern Observatory's New Technology Telescope (optical) is also used. These cosmic wonders and details are made available by mapping the data to colors that humans can perceive.



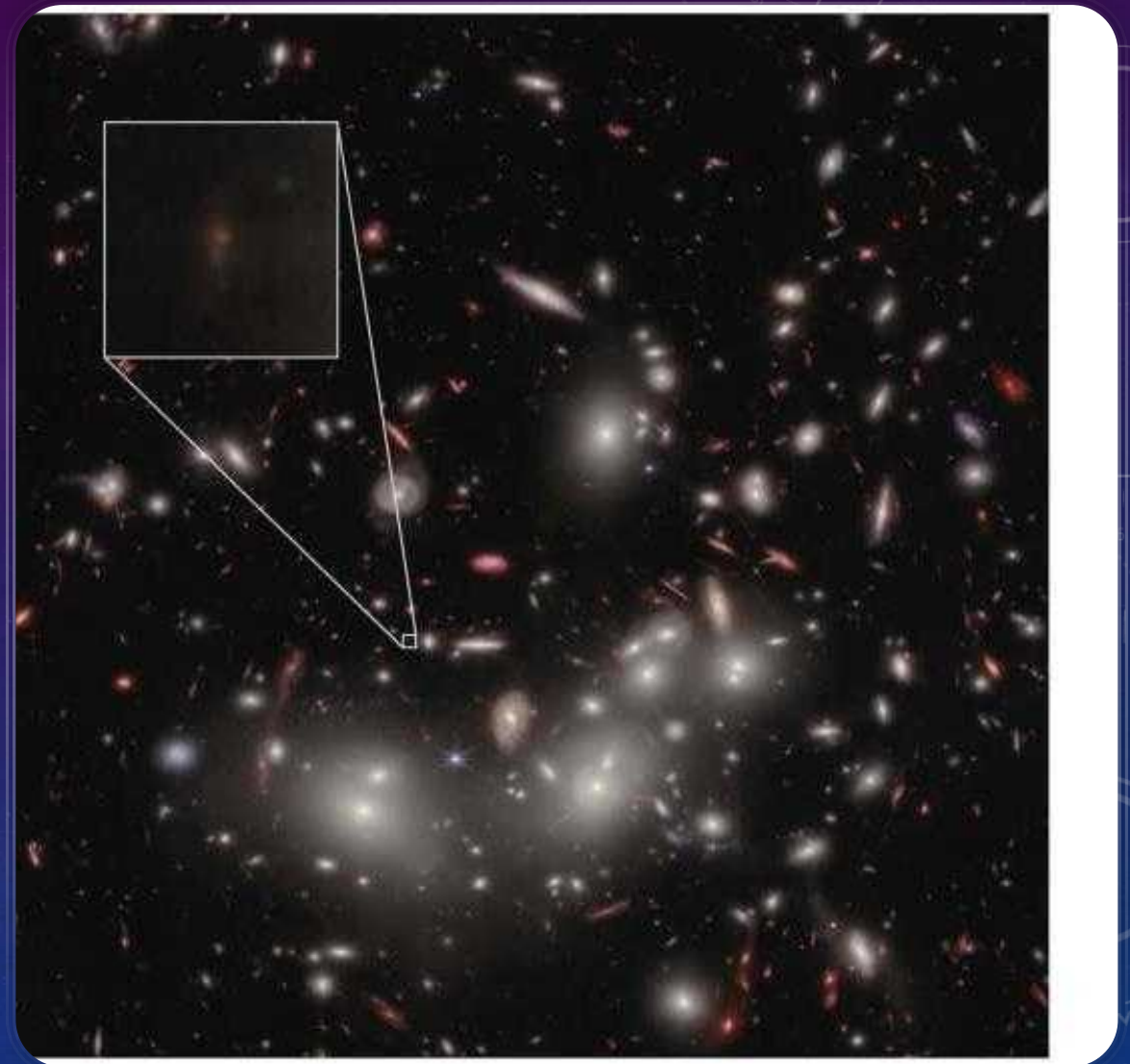
MAY 29TH: CHINA PLANS TO LAND ASTRONAUTS ON MOON BEFORE 2030

- China's burgeoning space program plans to place astronauts on the moon before 2030 and expand the country's orbiting space station, officials said Monday.
- Monday's announcement comes amid against the background of a rivalry with the U.S. for reaching new milestones in outer space, reflecting their competition for influence on global events.



JUNE 1ST: ASTROPHYSICISTS CONFIRM THE FAINTEST GALAXY EVER SEEN IN THE EARLY UNIVERSE

- An international research team led by UCLA astrophysicists has confirmed the existence of the faintest galaxy ever seen in the early universe. The galaxy, called JD1, is one of the most distant identified to date, and it is typical of the kinds of galaxies that burned through the fog of hydrogen atoms left over from the Big Bang, letting light shine through the universe and shaping it into what exists today.
- The discovery was made using NASA's James Webb Space Telescope, and the findings are published in the journal *Nature*
- Determining the types of galaxies that dominated that era—dubbed the Epoch of Reionization—is a major goal in astronomy today, but until the development of the Webb telescope, scientists lacked the sensitive infrared instruments required to study the first generation of galaxies.
- The team used the new data to trace JD1's light back to its original source and shape, revealing a compact galaxy just a fraction of the size
- Because light takes time to travel to Earth, JD1 is seen as it was approximately 13.3 billion years ago, when the universe was only about 4% of its present age.





JUNE 2ND: FIRST-OF-ITS-KIND MARS LIVESTREAM BY ESA SPACECRAFT INTERRUPTED AT TIMES BY RAIN ON EARTH

- European spacecraft around Mars sent its first livestream from the red planet to Earth on Friday to mark the 20th anniversary of its launch, but rain in Spain interfered at times.
- The European Space Agency broadcast the livestream with views courtesy of its Mars Express, launched by a Russian rocket from Kazakhstan in 2003.
- It took nearly 17 minutes for each picture to reach Earth, nearly 200 million miles (300 million kilometers) away, and another minute to get through the ground stations.



JUNE 4TH: THREE CHINESE ASTRONAUTS RETURN SAFELY TO EARTH

- Three Chinese astronauts working at the country's space station have returned safely to Earth, state media reported Sunday, hailing the mission as a "complete success".
- The return capsule of the Shenzhou-15 spaceship touched down at a landing site in northern China's Inner Mongolia region, according to state news agency Xinhua.
- Astronauts Fei Junlong, Deng Qingming and Zhang Lu emerged from the capsule in "good physical condition", Xinhua reported.
- The trio had spent six months at the Tiangong space station, conducting spacewalks and a variety of scientific experiments.
- "The mission... was a complete success," it said.

WHAT'S UP

STRATFORD ASTRONOMY GROUP

WHAT'S UP FOR JUNE



This is a month of "Almost for us"

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28 	29 	30 	31 	1  Waxing gibbous Visible: 92% ↑ Age: 11.97 days	2  Waxing gibbous Visible: 97% ↑ Age: 13.00 days	3  Full moon Visible: 100% ↑ Age: 14.06 days
4  Full moon Visible: 100% Age: 15.16 days	5  Waning gibbous Visible: 98% ↓ Age: 16.27 days	6  Waning gibbous Visible: 93% ↓ Age: 17.39 days	7  Waning gibbous Visible: 85% ↓ Age: 18.51 days	8  Waning gibbous Visible: 76% ↓ Age: 19.62 days	9  Last quarter Visible: 65% ↓ Age: 20.72 days	10  Last quarter Visible: 54% ↓ Age: 21.80 days
11  Last quarter Visible: 43% ↓ Age: 22.86 days	12  Waning crescent Visible: 32% ↓ Age: 23.91 days	13  Waning crescent Visible: 23% ↓ Age: 24.94 days	14  Waning crescent Visible: 14% ↓ Age: 25.95 days	15  Waning crescent Visible: 8% ↓ Age: 26.95 days	16  Waning crescent Visible: 3% ↓ Age: 27.92 days	17  New Visible: 1% ↓ Age: 28.89 days
18  New Visible: 1% ↑ Age: 0.30 days	19  New Visible: 2% ↑ Age: 1.23 days	20  Waxing crescent Visible: 6% ↑ Age: 2.15 days	21  Waxing crescent Visible: 11% ↑ Age: 3.05 days	22  Waxing crescent Visible: 17% ↑ Age: 3.95 days	23  Waxing crescent Visible: 25% ↑ Age: 4.84 days	24  Waxing crescent Visible: 33% ↑ Age: 5.73 days
25  First quarter Visible: 43% ↑ Age: 6.63 days	26  First quarter Visible: 52% ↑ Age: 7.55 days	27  First quarter Visible: 62% ↑ Age: 8.48 days	28  Waxing gibbous Visible: 72% ↑ Age: 9.44 days	29  Waxing gibbous Visible: 81% ↑ Age: 10.44 days	30  Waxing gibbous Visible: 89% ↑ Age: 11.47 days	1  Waxing gibbous Visible: 89% ↑ Age: 11.47 days

HEY, THERE BE A MOON OVERHEAD

MOON PHASES FOR THE
MONTH OF JUNE


June 2023

« June 2023 »

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2 Close approach of Mars and M44 The Great Globular Cluster in Hercules is well placed	3 Lunar occultation of Delta Scorpil Messier 12 is well placed Venus at dichotomy
4 Full Moon Conjunction of Mercury and Uranus Mercury at dichotomy Venus at greatest elongation east The Moon at aphelion	5	6 Asteroid 11 Parthenope at opposition The Moon at perigee Messier 10 is well placed	7 Mercury at highest altitude in morning sky Messier 62 is well placed	8	9 Conjunction of the Moon and Saturn Close approach of the Moon and Saturn	10 Moon at Last Quarter
11 Daytime Arietid meteor shower 2023 Messier 92 is well placed	12	13 Close approach of Venus and M44	14 Close approach of the Moon and Jupiter Conjunction of the Moon and Jupiter	15	16 Conjunction of the Moon and Mercury NGC 6388 is well placed	17 The Moon at perihelion Saturn enters retrograde motion The Butterfly cluster is well placed NGC 6397 is well placed
18 New Moon The cluster IC 4665 is well placed	19	20 The Ptolemy cluster is well placed	21 June solstice Conjunction of the Moon and Venus	22 Close approach of the Moon and Venus Conjunction of the Moon and Mars Close approach of the Moon and Mars The Moon at apogee	23 The Lagoon Nebula is well placed	24 NGC 6541 is well placed
25	26 Moon at First Quarter	27 Mercury at perihelion June Bootid meteor shower 2023	28	29 The cluster NGC 6633 is well placed	30 Neptune enters retrograde motion Lunar occultation of Delta Scorpil	



THE SKY ON 06 JUNE 2023

Sunrise	05:41		Planets			
Sunset	21:00		Rise	Culm.	Set	
Twilight ends	23:18	Waning Gibbous	Mercury	04:43	11:48	18:52
Twilight begins	03:24	85%	Venus	09:02	16:37	00:13
		18 days old	Moon	23:18	03:29	07:43
			Mars	09:52	17:13	00:33
			Jupiter	03:45	10:34	17:23
			Saturn	01:38	07:01	12:24
			All times shown in EDT.			

JUNE 6 – MOON AT PERIGEE

- As The Moon will reach the closest point along its orbit to the Earth and will appear slightly larger than at other times.
- The Moon's distance from the Earth varies because its orbit is not perfectly circular – it is slightly oval-shaped, tracing out a path called an ellipse.
- As the Moon traverses this elliptical path around the Earth each month, its distance varies by 14%, between 356,500 km at perigee (closest approach to the Earth) and 406,700 km at apogee (furthest from the Earth).

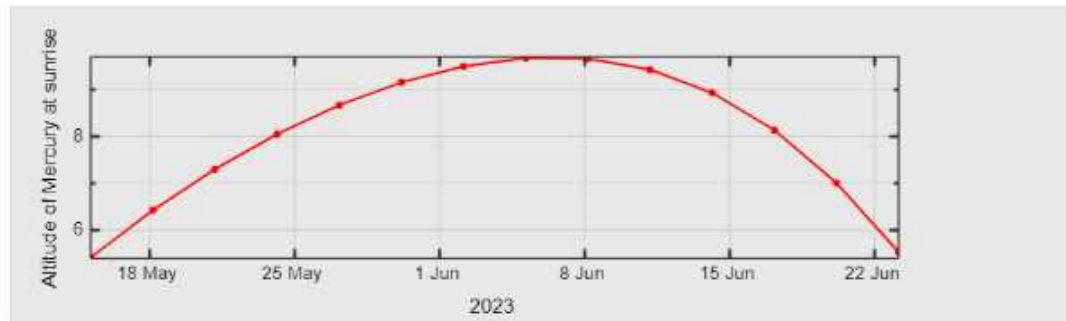




JUNE 7 – MERCURY AT HIGHEST ALTITUDE IN SKY

- As seen from Stratford , Mercury will reach its highest point in the sky in its May–Jun 2023 morning apparition. It will be shining brightly at mag 0.4.
- From Stratford, this apparition will not be one of the most prominent and very difficult to observe, reaching a peak altitude of 10° above the horizon at sunrise on 7 Jun 2023.

Altitude of Mercury at sunrise



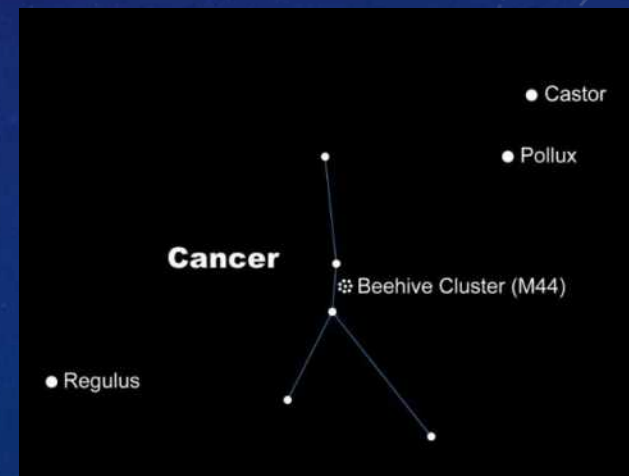
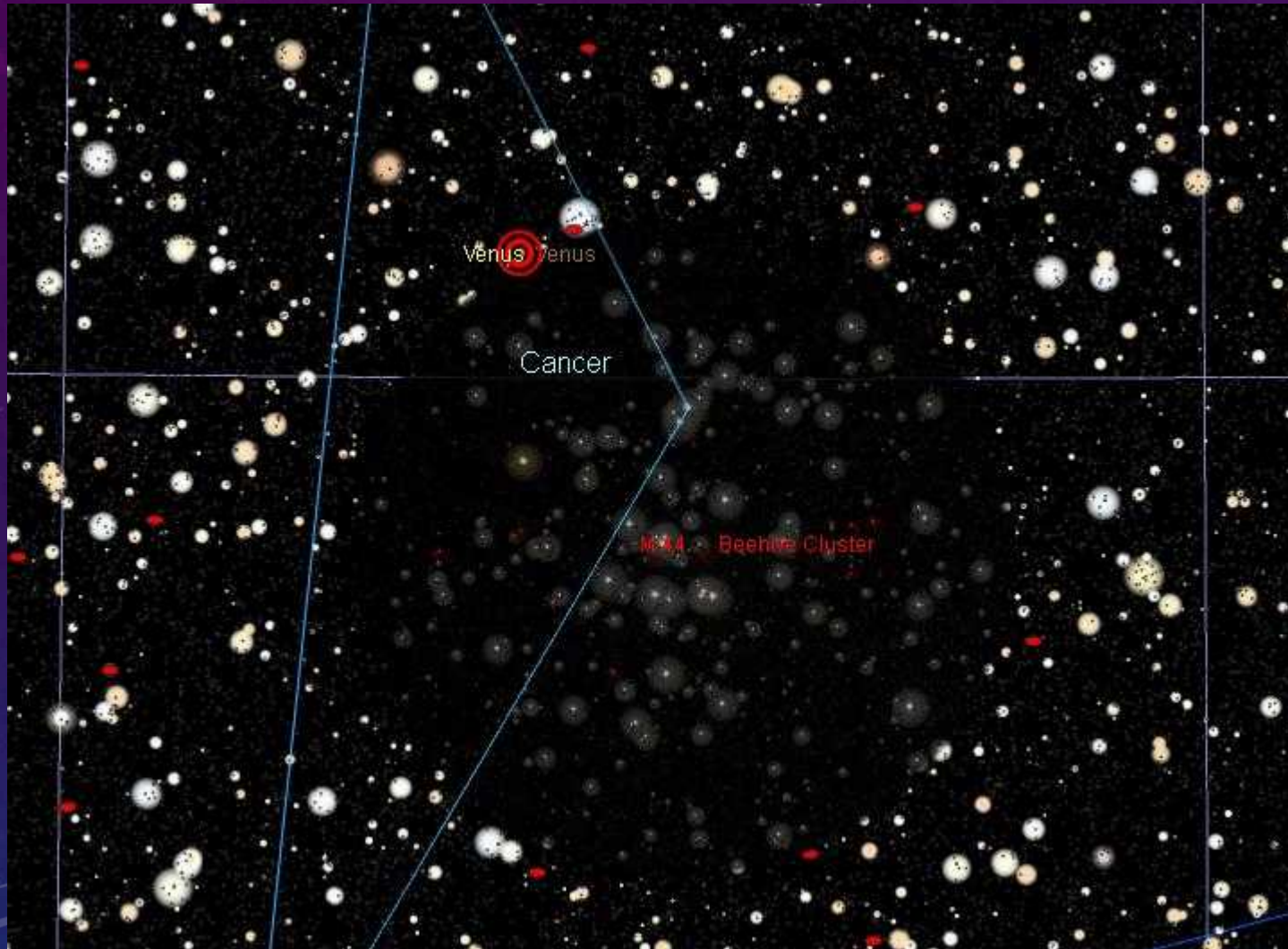
JUNE 09 – CONJUNCTION OF THE MOON AND SATURN

- The Moon and Saturn will share the same right ascension, with the Moon passing $2^{\circ}58'$ to the south of Saturn. The Moon will be 21 days old.
- At around the same time, the two objects will also make a close approach, technically called an appulse.
- From Stratford however, the pair will be visible from soon after it rises, at 01:27, until soon before it sets at 12:13.
- The Moon will be at mag -12.2, and Saturn at mag 0.7, both in the constellation Aquarius.
- The pair 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.



JUNE 13 – CLOSE APPROACH OF VENUS AND M44

- Venus and M44 will make a close approach, passing within a mere 47.9 arcminutes of each other.
- From Stratford, the pair will become visible around 21:26 (EDT), 25° above your western horizon, as dusk fades to darkness. They will then sink towards the horizon, setting 2 hours and 55 minutes after the Sun at 23:59.
- Venus will be at mag -4.4; and M44 will be at mag 3.1. Both objects will lie in the constellation Cancer.
- They will be a little too widely separated to fit comfortably within the field of view of a telescope, but will be visible through a pair of binoculars.



JUNE 14 – CONJUNCTION OF THE MOON AND JUPITER



- The Moon and Jupiter will share the same right ascension, with the Moon passing $1^{\circ}30'$ to the north of Jupiter. The Moon will be 26 days old.
- At around the same time, the two objects will also make a close approach, technically called an appulse.
- From Stratford however, the pair will be visible from soon after it rises, at 03:17, until soon before it sets at 17:00.
- The Moon will be at mag -10.6, and Jupiter at mag -2.2, both in the constellation Aries.
- The pair 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.

JUNE 16 – CONJUNCTION OF THE MOON AND MERCURY



- The Moon and Mercury will share the same right ascension, with the Moon passing $4^{\circ}18'$ to the north of Mercury. The Moon will be 28 days old.
- From Stratford however, the pair will be visible from soon after it rises, at 04:48, until soon before it sets at 19:42. 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 -8.3, and Mercury at mag -0.8, both in the constellation Taurus.

JUNE 21 – SUMMER SOLSTICE (04:24 UTC)

- 21 June will be the longest day of 2023 in the northern hemisphere, midsummer day.
- This is the day when the Sun's annual journey through the constellations of the zodiac carries it to its most northerly point in the sky, in the constellation of Cancer at a declination of 23.5°N. This day is counted by astronomers to be the first day of summer in the northern hemisphere.
- In the southern hemisphere, the Sun is above the horizon for less time than on any other day of the year, and astronomers define this to be the first day of winter.

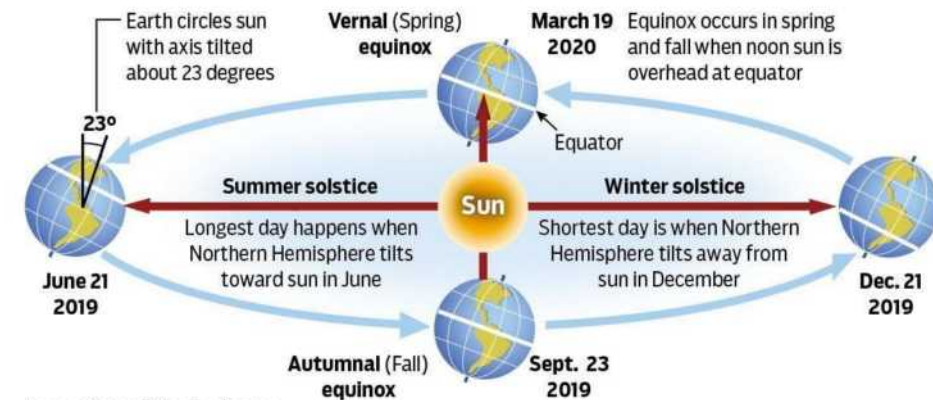
Date	Sunrise	Noon	Sunset
24 May	05:49	13:19	20:49
28 May	05:46	13:19	20:53
01 Jun	05:43	13:20	20:57
05 Jun	05:42	13:20	21:00
09 Jun	05:40	13:21	21:02
13 Jun	05:40	13:22	21:04
17 Jun	05:40	13:23	21:06
21 Jun	05:40	13:24	21:07
25 Jun	05:41	13:25	21:08
29 Jun	05:43	13:25	21:08
03 Jul	05:45	13:26	21:07
07 Jul	05:47	13:27	21:06
11 Jul	05:50	13:27	21:04
15 Jul	05:54	13:28	21:02

Sunrise and sunset times for Stratford
See more...



When a solstice or equinox occurs

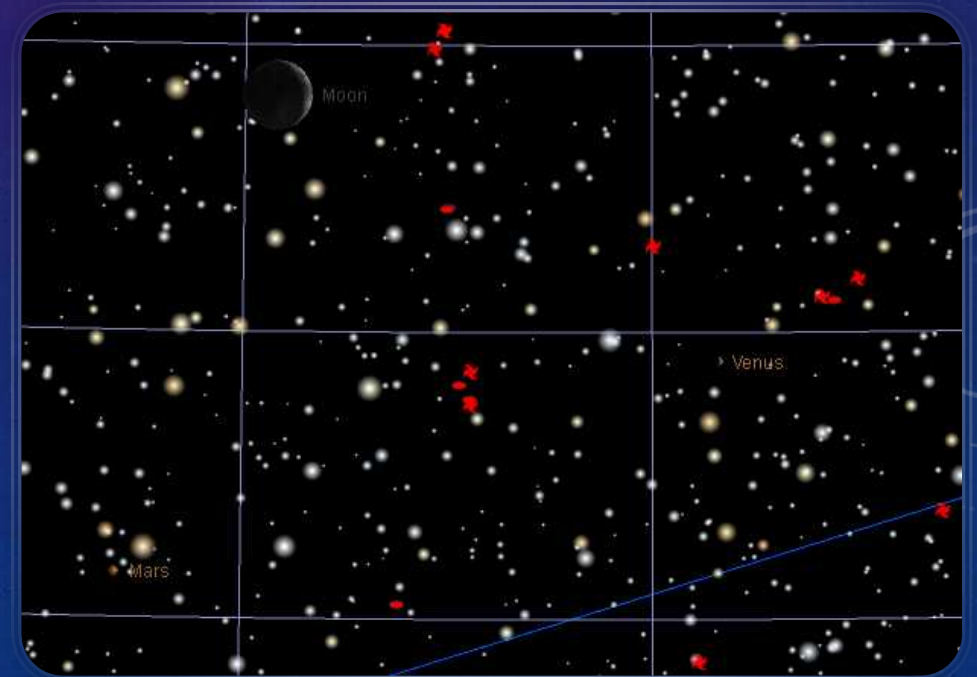
A guide to the astronomical events in the coming year



Source: National Weather Service.

JUNE 22 – CLOSE APPROACH OF THE MOON AND MARS

- The Moon and Mars will make a close approach, passing within $3^{\circ}34'$ of each other. The Moon will be 4 days old.
- From Stratford however, the pair will be visible from soon after it rises, at 09:39, until soon before it sets at 23:55.
- The Moon will be at mag -10.6; and Mars will be at mag 1.7. Both objects will lie in the constellation Leo.
- 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

The background is a dark blue gradient with a subtle pattern of white stars and technical diagrams. On the right side, there are several circular diagrams resembling gauges or dials with numerical scales (e.g., 100, 120, 140, 160, 180, 200) and arrows. Some diagrams have dashed lines, while others have solid lines. The overall aesthetic is futuristic and technical.