STRATFORD ASTRONOMY GROUP

MARCH 5TH, 2024

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 15:

Paul Bartlett
Michael Burns
John Burtenshaw
Doug Fyfe
Bob Greer
Patrick Hayes
Wolfgang Keller
Tom Kimber
Rick Lyons
Jim Nafziger
David Orr
Jamie Page
Tim Pauli
Richard Rosenthall
Bill Thompson

CLUB NEWS AND ACTIVITIES

Group Funds

Total = $1559.42

- 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

New Equipment Donation: Tim

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.

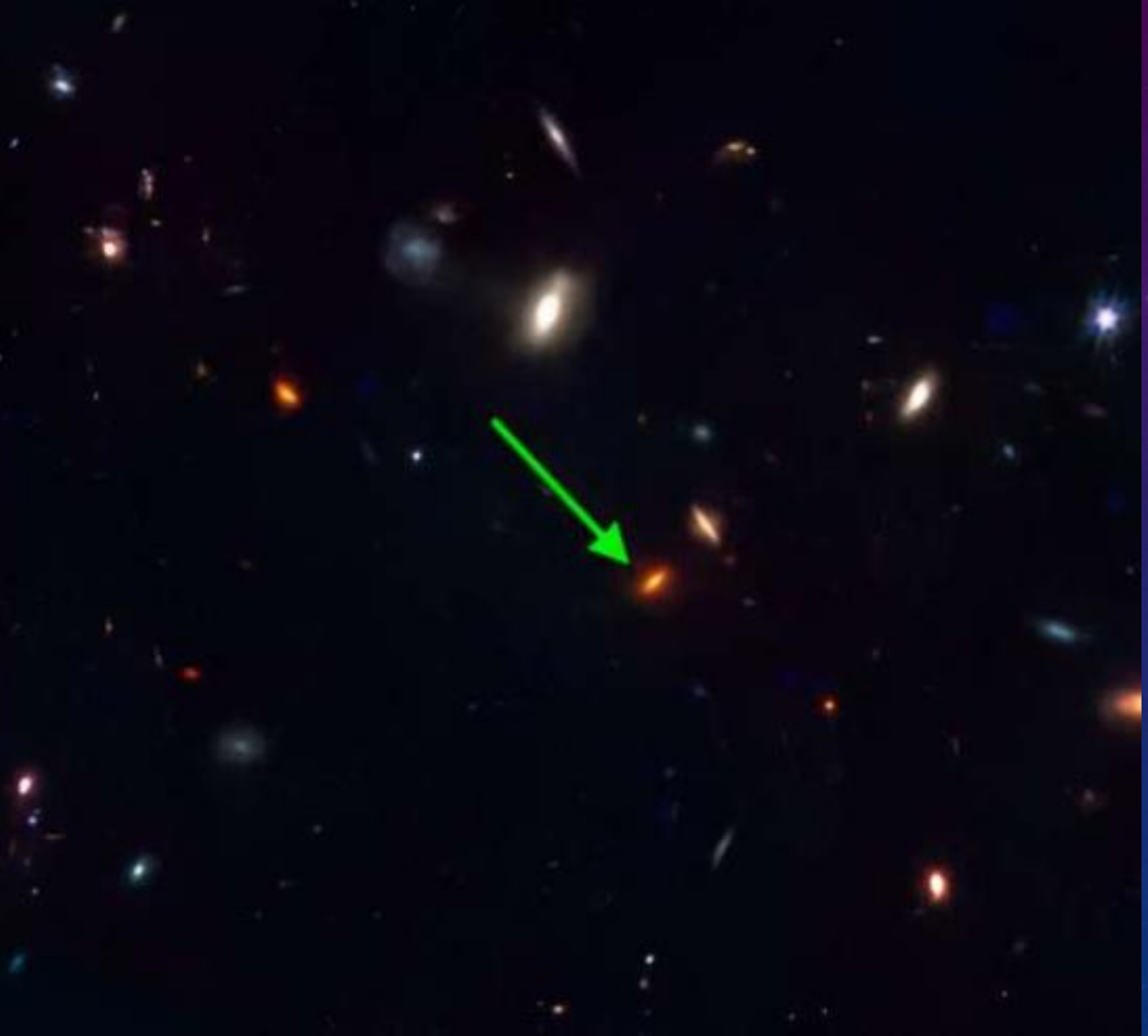
- Post Christmas Get together: Tim

- Museum: Tim

CLUB Q & A

LATEST ASTRONOMY NEWS

MARCH



FEBRUARY 14 – NEW JWST OBSERVATIONS UNEARTH MYSTERIOUS ANCIENT GALAXY

- A paper published today in *Nature* details findings using new data from the James Webb Space Telescope (JWST). The results find that a massive galaxy in the early universe—observed 11.5 billion years ago (a cosmic redshift of 3.2)—has an extremely old population of stars formed much earlier—1.5 billion years earlier in time (a redshift of around 11). The observation upends current modeling, as not enough dark matter has built up in sufficient concentrations to seed their formation.

FEB 20TH: THE BRIGHTEST OBJECT IN THE UNIVERSE IS A BLACK HOLE THAT EATS A STAR A DAY

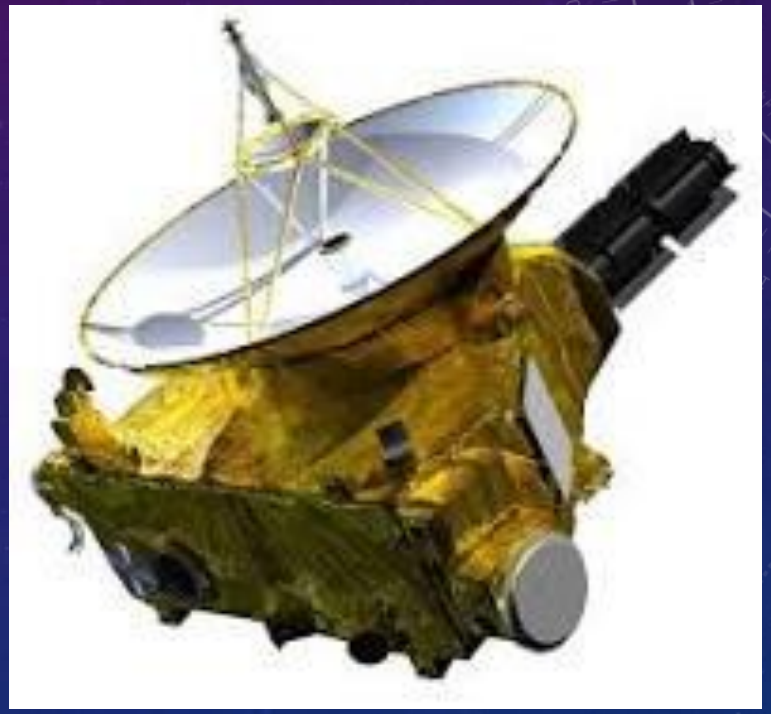
- In a new paper in *Nature Astronomy*, we describe a black hole surrounded by the largest and brightest disk of captive matter ever discovered. The object, called J0529-4351, is therefore also the brightest object found so far in the universe.

FEB 20TH: NASA'S NEW HORIZONS DETECTS DUSTY HINTS OF EXTENDED KUIPER BELT

•New observations from NASA's New Horizons spacecraft hint that the Kuiper Belt—the vast, distant outer zone of our solar system populated by hundreds of thousands of icy, rocky planetary building blocks—might stretch much farther out than we thought.

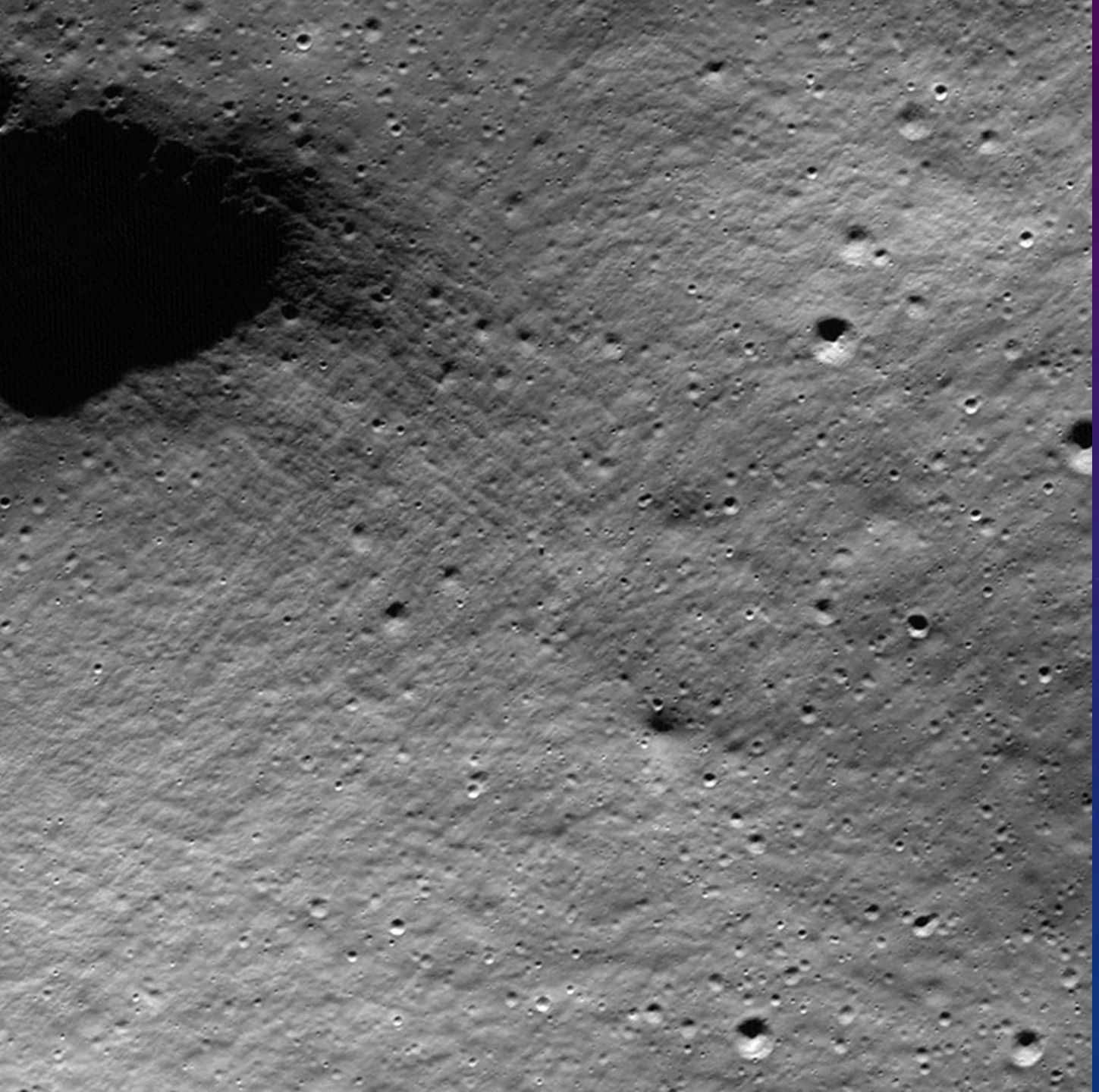
•Speeding through the outer edges of the Kuiper Belt, almost 60 times farther from the sun than Earth, the New Horizons Venetia Burney Student Dust Counter (SDC) instrument is detecting higher than expected levels of dust—the tiny frozen remnants of collisions between larger Kuiper Belt objects (KBOs) and particles kicked up from KBOs being peppered by microscopic dust impactors from outside of the solar system.

•The readings defy scientific models that the KBO population and density of dust should start to decline a billion miles inside that distance and contribute to a growing body of evidence that suggests the outer edge of the main Kuiper Belt could extend billions of miles farther than current estimates—or that there could even be a second belt beyond the one we already know.



FEB 22ND: STUDY DELIVERS DETAILED PHOTOS OF GALAXIES' INNER STRUCTURES

•On Feb. 22, Intuitive Machines' Nova-C lander, called Odysseus, completed a seven-day journey to lunar orbit and softly landed near crater Malapert A in the South Pole region of the Moon at 6:24 p.m. EST. On Feb. 24, NASA's Lunar Reconnaissance Orbiter (LRO) spacecraft passed over the landing site at an altitude of about 56 miles (90 km) and photographed Odysseus.



This image pair shows LRO views of the area surrounding the Odysseus site before (frame M172936310) and after (frame M1463440322L) its landing.

WHAT'S UP

STRATFORD ASTRONOMY GROUP

WHAT'S UP FOR FEBRUARY

<< February | March 2024 | April >>

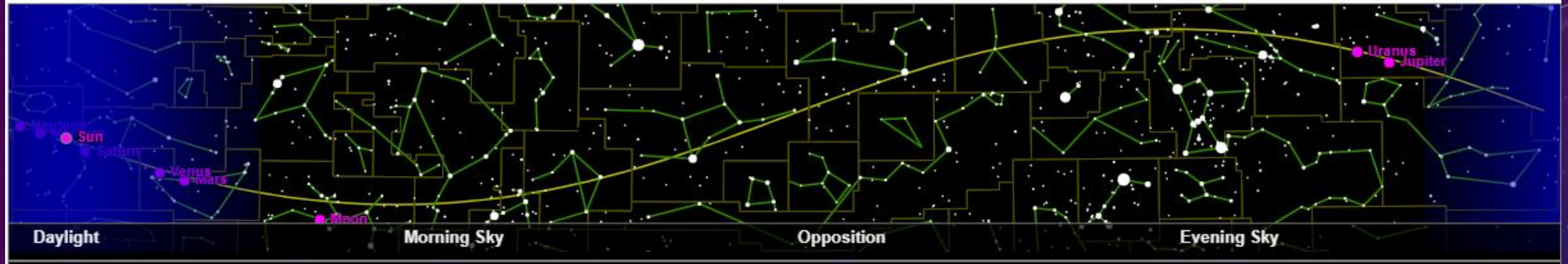
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25	26	27	28	29	1	2
					Waning gibbous Visible: 71% ↓ Age: 20.13 days	Last quarter Visible: 62% ↓ Age: 21.06 days
3	4	5	6	7	8	9
Last quarter Visible: 52% ↓ Age: 22.02 days	Last quarter Visible: 41% ↓ Age: 23.01 days	Waning crescent Visible: 31% ↓ Age: 24.03 days	Waning crescent Visible: 21% ↓ Age: 25.10 days	Waning crescent Visible: 13% ↓ Age: 26.20 days	Waning crescent Visible: 6% ↓ Age: 27.33 days	New Visible: 2% ↓ Age: 28.49 days
10	11	12	13	14	15	16
New Visible: 1% ↑ Age: 0.13 days	New Visible: 2% ↑ Age: 1.30 days	Waxing crescent Visible: 7% ↑ Age: 2.45 days	Waxing crescent Visible: 14% ↑ Age: 3.58 days	Waxing crescent Visible: 23% ↑ Age: 4.66 days	Waxing crescent Visible: 33% ↑ Age: 5.71 days	First quarter Visible: 43% ↑ Age: 6.72 days
17	18	19	20	21	22	23
First quarter Visible: 54% ↑ Age: 7.69 days	First quarter Visible: 64% ↑ Age: 8.64 days	Waxing gibbous Visible: 73% ↑ Age: 9.57 days	Waxing gibbous Visible: 81% ↑ Age: 10.48 days	Waxing gibbous Visible: 88% ↑ Age: 11.38 days	Waxing gibbous Visible: 94% ↑ Age: 12.27 days	Waxing gibbous Visible: 98% ↑ Age: 13.16 days
24	25	26	27	28	29	30
Full moon Visible: 100% ↑ Age: 14.05 days	Full moon Visible: 100% Age: 14.95 days	Full moon Visible: 99% ↓ Age: 15.85 days	Waning gibbous Visible: 96% ↓ Age: 16.75 days	Waning gibbous Visible: 91% ↓ Age: 17.67 days	Waning gibbous Visible: 85% ↓ Age: 18.60 days	Waning gibbous Visible: 77% ↓ Age: 19.55 days
31	1	2	3	4	5	6
Waning gibbous Visible: 68% ↓ Age: 20.52 days						

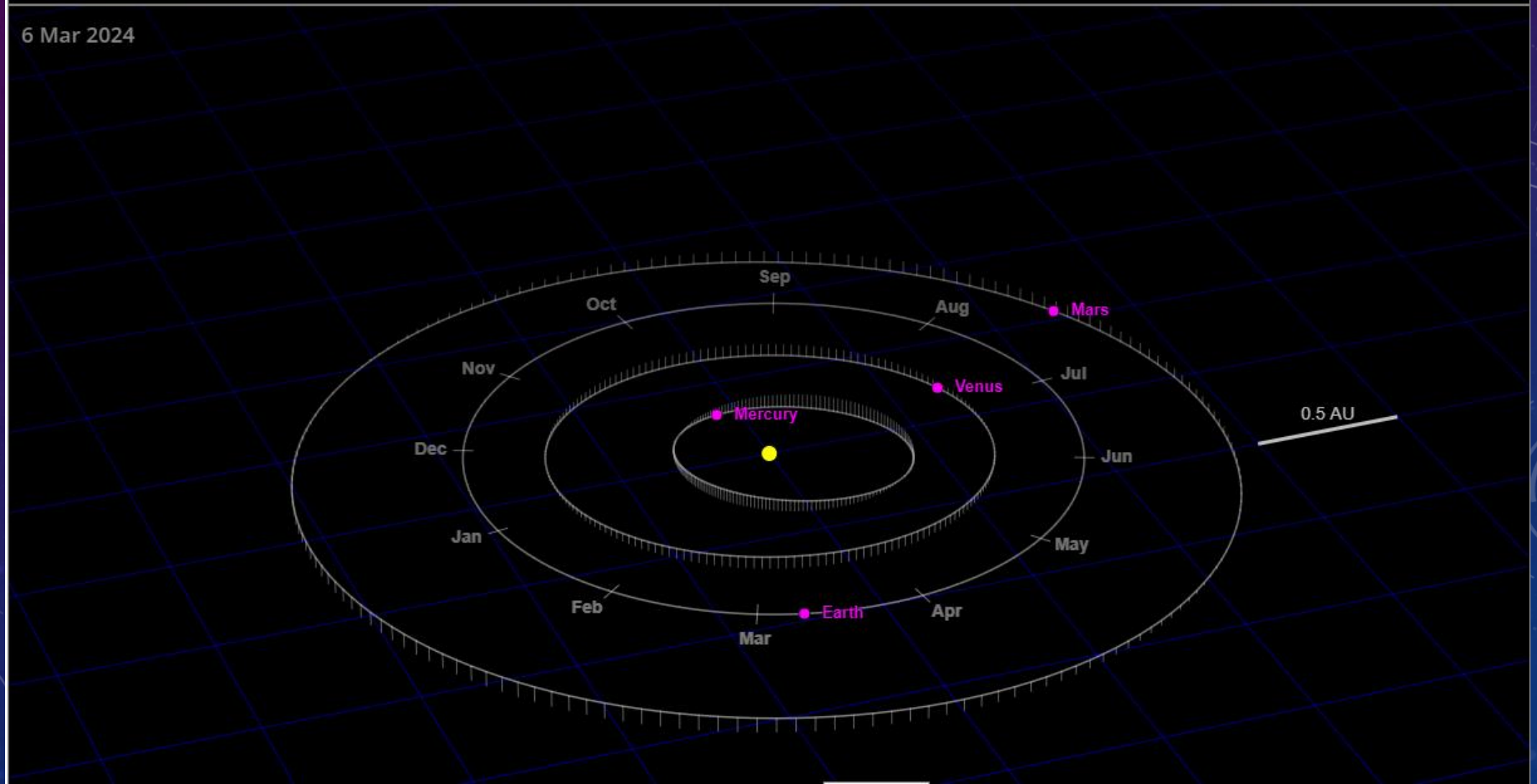
HEY, THERE BE A MOON OVERHEAD

MOON PHASES FOR THE MONTH OF MARCH

« March 2024 »

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2 The Theta Carinae cluster is well placed
3 Lunar occultation of Antares Moon at Last Quarter Asteroid 3 Juno at opposition	4	5	6	7	8 Conjunction of the Moon and Mars The Moon at perihelion Conjunction of the Moon and Venus The Wishing Well cluster is well placed	9
10 The Moon at perigee New Moon	11	12 Asteroid 23 Thalia at opposition	13 Close approach of the Moon and Jupiter Conjunction of the Moon and Jupiter	14 γ-Normid meteor shower 2024 Close approach of the Moon and M45	15	16 Lunar occultation of Beta Tauri
17 Moon at First Quarter Neptune at solar conjunction Mercury at perihelion	18	19 Venus at aphelion March equinox	20	21 Close approach of Venus and Saturn Conjunction of Venus and Saturn	22 Mercury at dichotomy	23 The Moon at apogee
24 Mercury at highest altitude in evening sky Mercury at greatest elongation east	25 Full Moon Penumbral lunar eclipse	26	27 The Moon at aphelion	28	29	30 136472 Makemake at opposition Lunar occultation of Antares
31						

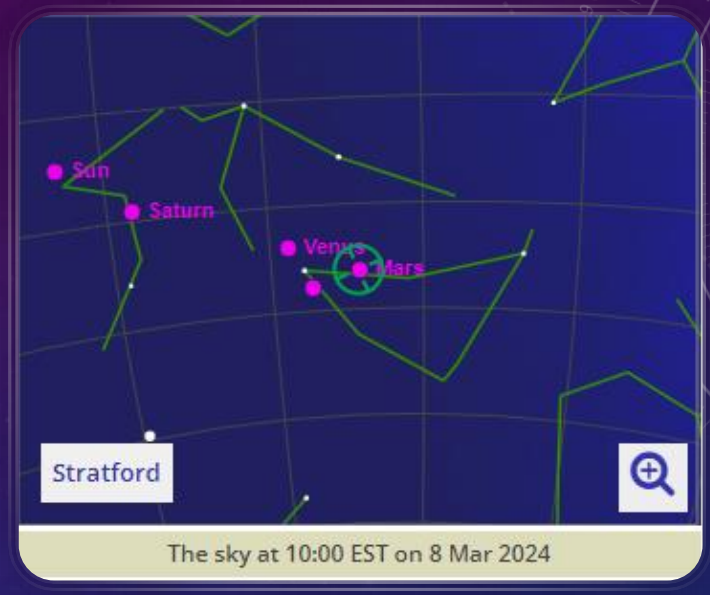

Uranus
Jupiter
Sun
Saturn
Venus
Mars
Moon
Daylight
Morning Sky
Opposition
Evening Sky


6 Mar 2024
Sep
Oct
Aug
Mars
Nov
Jul
Venus
Mercury
0.5 AU
Dec
Jun
Jan
May
Feb
Earth
Apr
Mar

FRI, 08 MAR 2024 AT 00:00 EST

CONJUNCTION OF THE MOON AND MARS

- The Moon and Mars will share the same right ascension, with the Moon passing 3°31' to the south of Mars. 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 3° above the horizon at dawn.
- The Moon will be at mag -9.9, and Mars at mag 1.2, both in the constellation Capricornus.
- 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.



The sky at 10:00 EST on 8 Mar 2024

THE SKY ON 8 MARCH 2024

Sunrise 06:13

Sunset 17:51

Twilight ends 19:23

Twilight begins 04:41

Waning Crescent

4%

28 days old

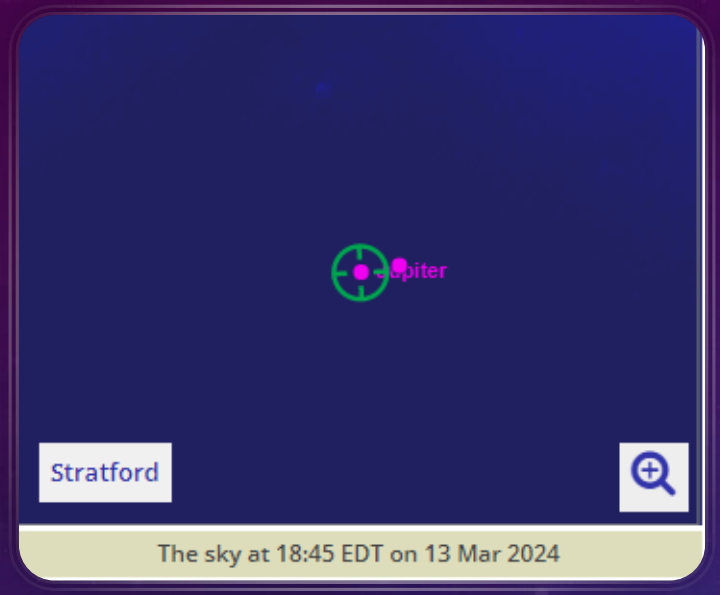
Planets

	Rise	Culm.	Set
Mercury	06:38	12:34	18:30
Venus	05:25	10:38	15:51
Moon	05:32	10:34	15:47
Mars	05:06	10:10	15:14
Jupiter	08:28	15:25	22:21
Saturn	06:04	11:35	17:06

All times shown in EST.

SUNDAY, 10 MAR 2024 AT 02:00 EDT CLOCKS MOVE FORWARD

•Daylight saving time, also referred to as daylight savings time, daylight time, or" summer-time", is the practice of advancing clocks to make better use of the longer daylight available during summer, so that darkness falls at a later clock time.



THE SKY ON 13 MARCH 2024

Sunrise 07:04

Sunset 18:56

Twilight ends 20:29

Twilight begins 05:32

Waxing Crescent

22%

3 days old

Planets

	Rise	Culm.	Set
Mercury	07:35	13:47	20:00
Venus	06:21	11:42	17:03
Moon	08:44	15:57	23:24
Mars	05:57	11:06	16:14
Jupiter	09:11	16:09	23:06
Saturn	06:46	12:18	17:49

All times shown in EDT.

WED, 13 MAR 2024 AT 18:44 EDT CLOSE APPROACH OF THE MOON AND JUPITER

- The Moon and Jupiter will make a close approach, passing within 3°19' of each other. The Moon will be 3 days old.
- From Stratford , the pair will become visible at around 19:13 (EST), 42° above your western horizon, as dusk fades to darkness. They will then sink towards the horizon, setting at 23:06.
- The Moon will be at mag -10.9; and Jupiter will be at mag -2.1. Both objects will lie in the constellation Aries.
- 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.

THU, 21 MAR 2024 AT 19:15 EDT
Close approach of Venus and Saturn

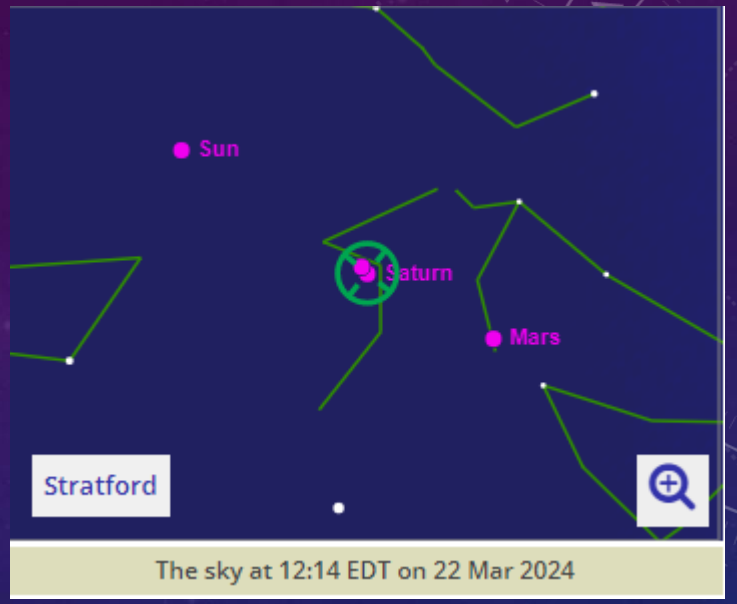
The planets Venus and Saturn will make a close approach, passing within a mere 19.3 arcminutes of each other.

From Stratford however, the pair will not be observable – they will reach their highest point in the sky during daytime and will be 1° below the horizon at dawn.

Venus will be at mag -3.9; and Saturn will be at mag 1.0. Both objects will lie in the constellation Aquarius.

They will be close enough to fit within the field of view of a telescope, but will also 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 at 12:14 EDT on 22 Mar 2024

THE SKY ON 21 MARCH 2024

Sunrise	06:51
Sunset	19:05
Twilight ends	20:38
Twilight begins	05:18

Waxing Gibbous

93%

11 days old

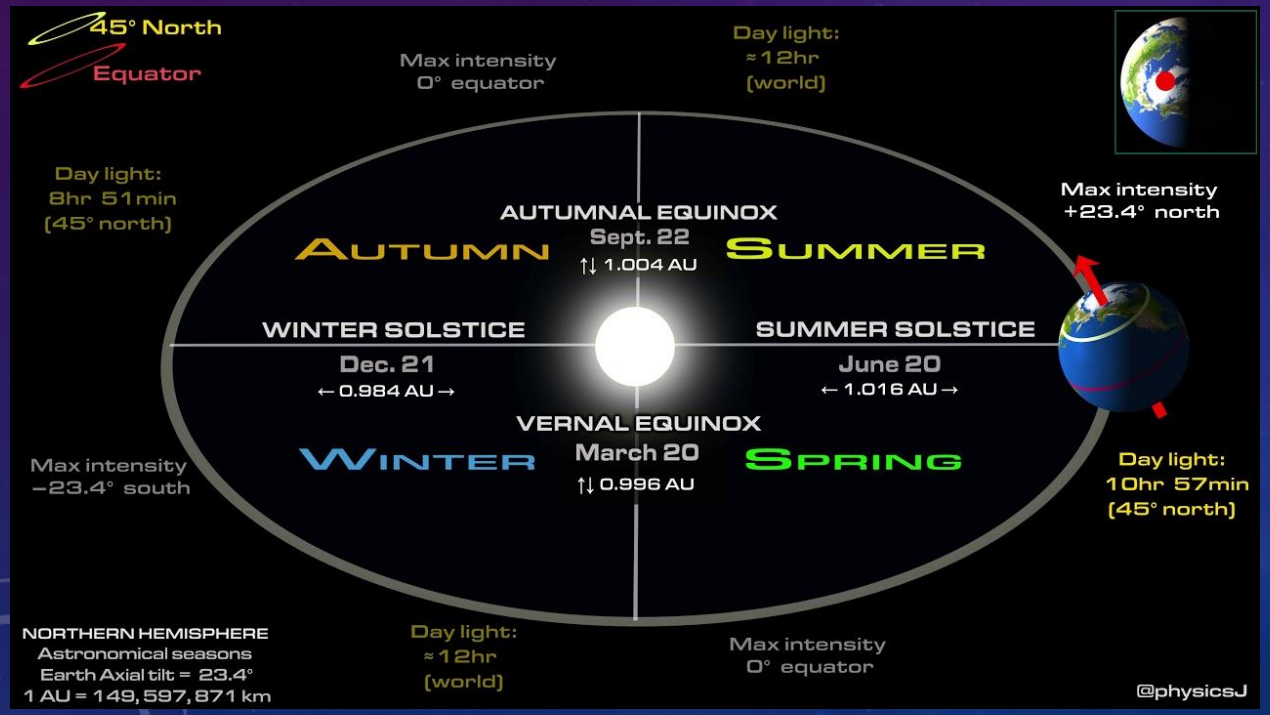
Planets

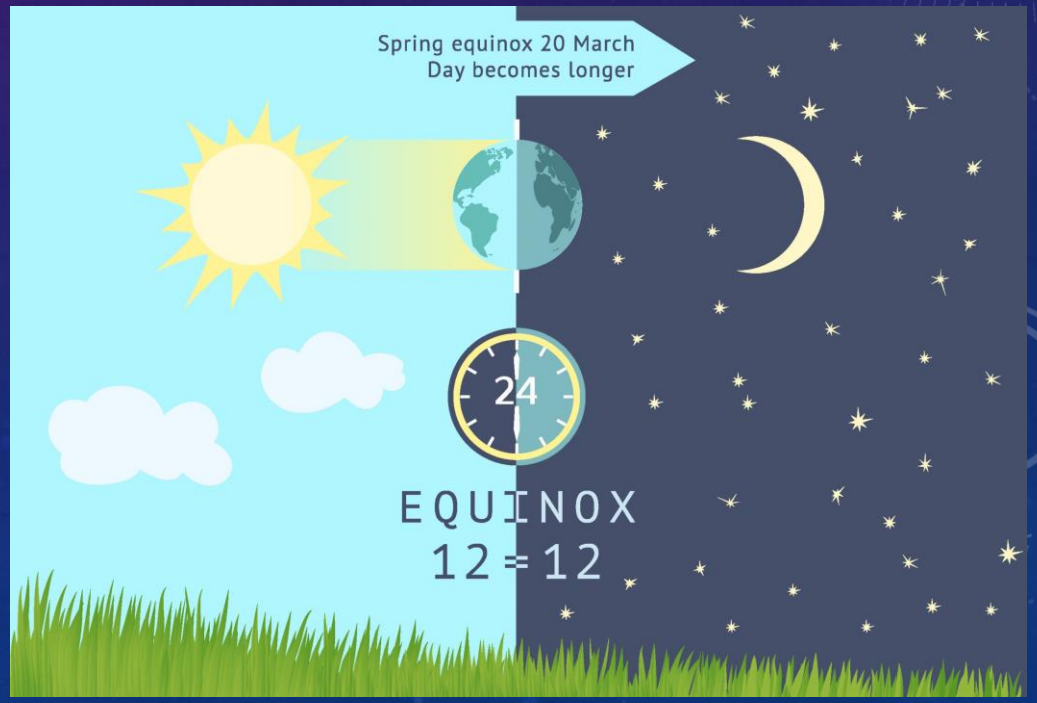
	Rise	Culm.	Set
Mercury	07:26	14:01	20:37
Venus	06:15	11:48	17:21
Moon	15:38	22:55	06:00
Mars	05:42	10:58	16:15
Jupiter	08:44	15:43	22:43
Saturn	06:17	11:50	17:23

All times shown in EDT.

WED, 20 MAR 2024 AT 19:15 EDT
Vernal (Spring Equinox)

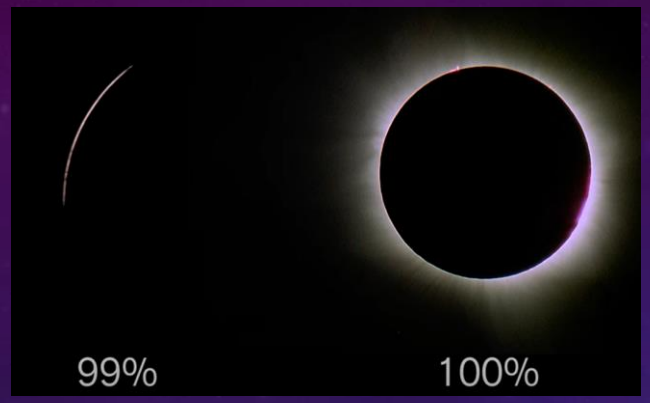
Well, really: Tue, Mar 19, 2024, 11:06 p.m. (early because this is a leap year. So that 1 more day of February moves it earlier)





Stratford

Event	Local Time (UT-5.0)	Safety action
Start of partial Eclipse	2024-04-08 14:02:24	eclipse glasses ON
Maximum Eclipse	2024-04-08 15:17:39 Max coverage 99.1%	watch 2h27m32s of partially covered sun
End of Partial Eclipse	2024-04-08 16:29:56	stop looking at the sun, resume mundane life



At 99% the Sun will be reduced to a small sliver. There are simulations on the internet. It will become notably darker like dusk. However, the Sun is 400,000 times brighter than the full moon, so 1% of the Sun is still 4000 times brighter than the Moon, and so no corona will be visible. You can still damage your eyes looking at that sliver.

Location	Partial eclipse starts	Total eclipse starts	Total eclipse ends	Partial eclipse ends
Brantford, Ont.	2:03:13 p.m.	3:17:50 p.m.	3:19:16 p.m.	4:30:46 p.m.
Hamilton	2:03:56 p.m.	3:18:12 p.m.	3:20:05 p.m.	4:31:12 p.m.
Burlington, Ont.	2:04:05 p.m.	3:18:28 p.m.	3:20:03 p.m.	4:31:16 p.m.
St. Catharines, Ont.	2:04:42 p.m.	3:18:16 p.m.	3:21:30 p.m.	4:31:49 p.m.
Niagara Falls, Ont.	2:04:53 p.m.	3:18:20 p.m.	3:21:50 p.m.	4:32:00 p.m.
Kingston, Ont.	2:09:32 p.m.	3:22:16 p.m.	3:25:17 p.m.	4:34:28 p.m.
Cornwall, Ont.	2:12:35 p.m.	3:25:01 p.m.	3:27:12 p.m.	4:35:58 p.m.

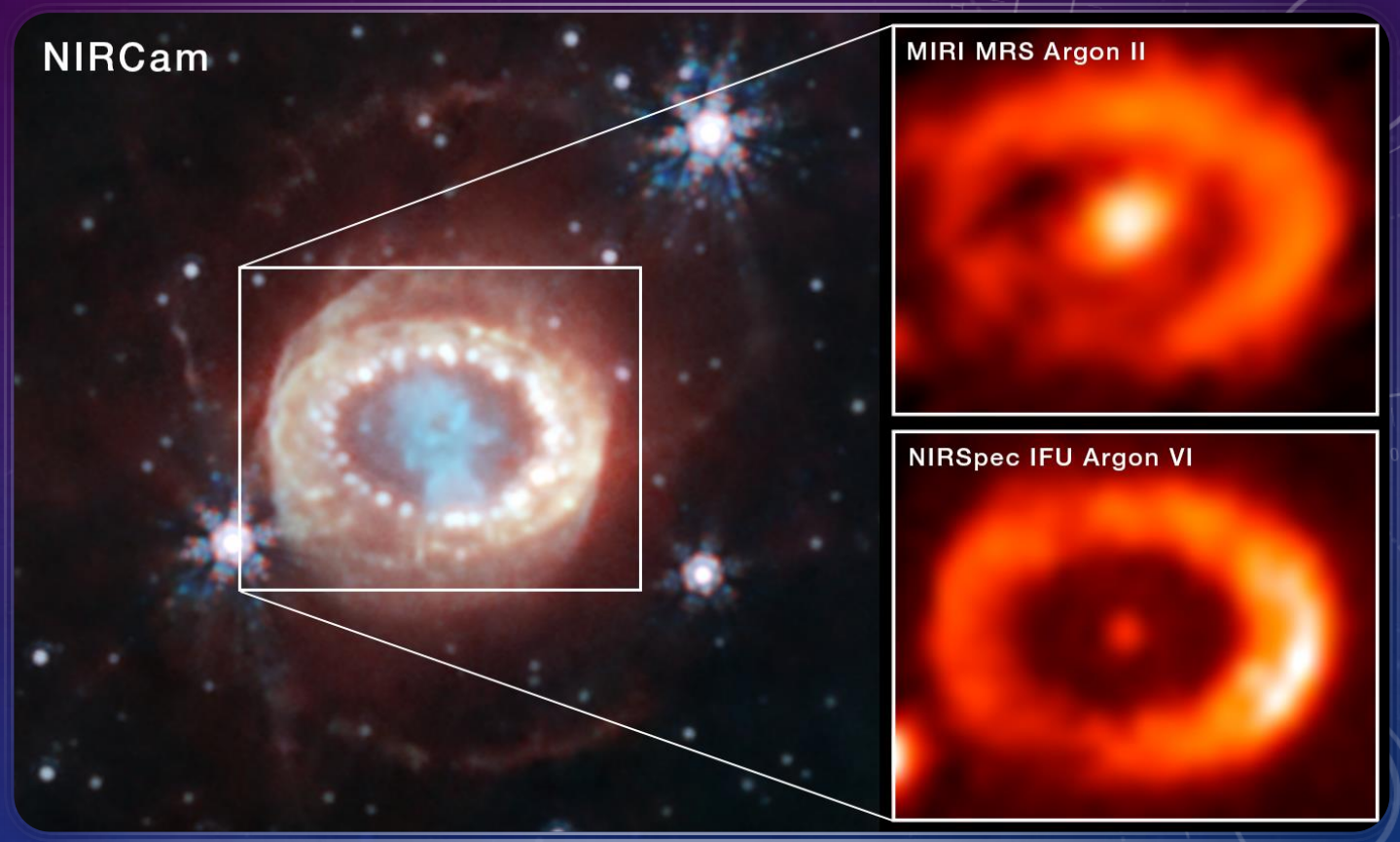
LATEST WEBB/HUBBLE IMAGES

Hubble captures globular cluster NGC 2298

Hubble views a massive star forming

02/22/2024 : WEBB FINDS EVIDENCE FOR NEUTRON STAR AT HEART OF YOUNG SUPERNOVA REMNANT

- NASA's James Webb Space Telescope has found the best evidence yet for emission from a neutron star at the site of a recently observed supernova. The supernova, known as SN 1987A, was a core-collapse supernova, meaning the compacted remains at its core formed either a neutron star or a black hole.
- Evidence for such a compact object has long been sought, and while indirect evidence for the presence of a neutron star has previously been found, this is the first time that the effects of high-energy emission from the probable young neutron star have been detected.



TOM KIMBER AND THE MOON

SHOW AND TELL

COSMOLOGY TALK