

Stars Over Surrey Astronomy & Spaceflight News

6th May 2022



Axiom Space's First ISS Mission

- Ax-1 launched on 8th April
 - Crew Dragon *Endeavour* on its third trip into orbit launched by Falcon 9
 - returned 25th April, much delayed by poor weather
- First private mission to ISS
 - commanded by ex-NASA astronaut
 - Michael López-Alegría, making his 5th mission
 - with three fare-paying crew (American, Canadian, Israeli)
 - each reputed to have paid \$55M (rest underwritten by NASA)
 - Crew conducted research, experiments, performed outreach and educational work
- Axiom Space is planning to build its own module to attach to ISS initially, but be capable of independent operation.



Credit: Axiom Space, SpaceX

Crew-4 Mission Boards ISS

- On 27th April Crew Dragon *Freedom* docked with ISS
- Crew-4 team boarded the ISS and were met by the Crew-3 astronauts
 - Crew-4 comprises:
 - Kjell Lindgren, NASA, (Mission Commander)
 - Bob Hines, NASA, (Mission Pilot)
 - Jessica Watkins, NASA, (Mission Specialist)
 - Christina Foretti, ESA, Italy (Mission specialist)
- Crew-4 will stay for a six month mission, Crew-3 will return in a few days
- ISS currently has 11 people on board, including 3 women
 - 3 Russians, 6 Americans, 1 German, 1 Italian



Credit: NASA/ESA

Dream Chaser Takes Shape

- The construction of the first Dream Chaser spaceplane is well under way at Sierra Space Colorado
- First flight will be via a Vulcan rocket in hopefully Feb 2023



Credit: Sierra Space

- first in a series of cargo launches to ISS under a NASA Commercial Resupply contract
- Sierra Space are also working on a crewed version that could fly as early as 2026, carrying seven astronauts
 - this development is internally funded as NASA did not select it under the Commercial Crew contract which went to SpaceX and Boeing
 - could well be used for passenger flights to Orbital Reef, a commercial space station planned by a consortium led by Blue Origin and including Sierra Nevada Corporation, planned to be operational by 2030
 - apparently also in discussions with US Space Force

Amazon Takes On SpaceX

- Amazon will be operating a Low Earth Orbit broadband satellite service called Project Kuiper which will be in direct competition with SpaceX's Starlink and also the UK/India One Web service

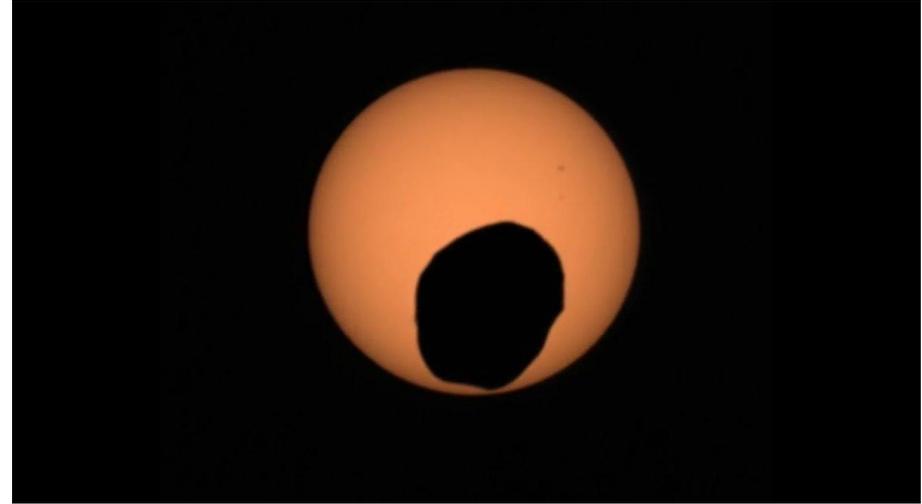


Credit: Amazon/Business Wire

- It has just placed contracts with three different companies to launch 3,236 satellites
 - 18 with Arianespace's Ariane 6
 - 38 with United Launch Alliance's Vulcan Centaur
 - 12 with Blue Origin's New Glenn (with option for 25 more)
- None of these rockets have yet flown
 - Ariane 6 and Vulcan are expected to debut later this year
 - New Glenn expected to fly in 2023

Perseverance Snaps Mars Eclipse

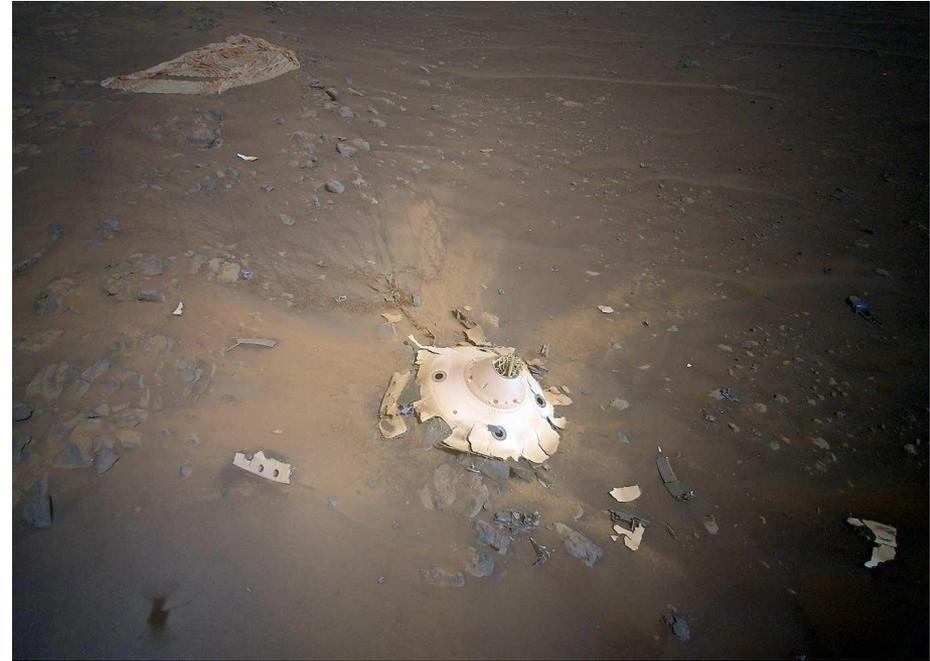
- Perseverance's Mastcam has imaged Mars's moon Phobos transiting across the Sun's disc
 - the transit lasted 40 secs
 - Phobos is the larger of Mars's two moons and measures 27 x 22 x 18 k
 - it orbits Mars about three times every day at a distance of only 6,000 k, the closest of any satellite in the Solar System
- The data collected will help the understanding of the fine details of Phobos's orbit and its likely effect on the crust and mantle of the planet.



Credit: NASA/JPL-Caltech/ASU/MSSS/SSI

Ingenuity Snaps Descent Items

- Cameras on board the Perseverance Mars Rover had spotted the lander's parachute and back shell
 - part of the aeroshell that protected the Rover as it entered Mars atmosphere at 12,500 mph, the jettisoned back shell is estimated to have hit the ground c80mph
- Ingenuity was despatched making its 26th flight on Mars and took 10 colour photographs
 - it's now accrued 49 mins flight time and travelled 3.9 miles
- This was at the request of the Mars Sample Return Mission team so that they can incorporate any lessons learned in the design of their landing system.



Credit: NASA-JPL/Caltech

Misc Spaceflight News

- Blue Origin launched its latest (fourth) sub-orbital mission on March 31st with six passengers aboard
 - 10 minute hop to 60+ miles above West Texas included New Shepard's chief engineer
- China's three cosmonauts landed in Inner Mongolia on 16th April after their record breaking 182 day stint on the Chinese space station Tsiongang
 - A resupply vessel is expected to launch mid-May followed by the next crew of three in June for another 6 month mission
- NASA's SLS Moon rocket is having to be returned to the Vehicle Assembly Building to deal with problems encountered during this month's "wet test rehearsal"
- James Web Space Telescope has now reached -267°C
 - that's just six degrees above absolute zero.

Misc Spaceflight News

- NASA's Osiris Rex spacecraft will visit a 2nd asteroid
 - It's currently returning to Earth from the asteroid Bennu and will drop off its sample return container in September 2023
 - NASA has just approved a mission extension whereby the spacecraft will use an Earth fly-by slingshot to put it on course to rendezvous with asteroid Apophis in 2029
 - 350 metres across, passing just 32,000 km from Earth
 - it will loiter near Apophis for about 18 months, approaching close enough that it can sweep surface rocks and dust away with its thrusters, exposing the bare surface material for study.
- Space X turns a Falcon 9 booster round after landing and relaunches it in 21 days!

Biggest Comet Ever!

- Comet Bernardinelli–Bernstein is 129 kilometres (85 miles) in diameter
 - previous largest known was 60 miles
- Recently discovered from Hubble data taken in 2014
 - hard to spot as its surface is “blacker than coal”
- Currently between the orbits of Neptune and Uranus
 - It will not approach Earth. Although it is hurtling sunward at 35,000 kph its perihelion will be outside the orbit of Saturn
- It’s thought that it originated in the Oort Cloud and began its journey inwards about one million years ago.

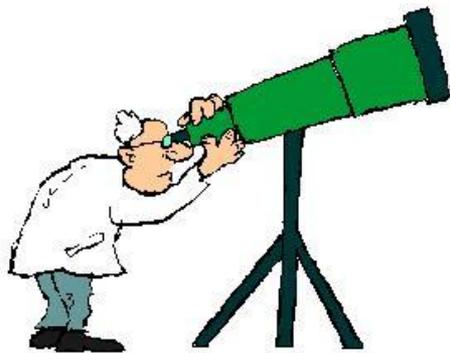


Credit: NOIRLab/NSF/AURA/J. da Silva

Stars Over Surrey

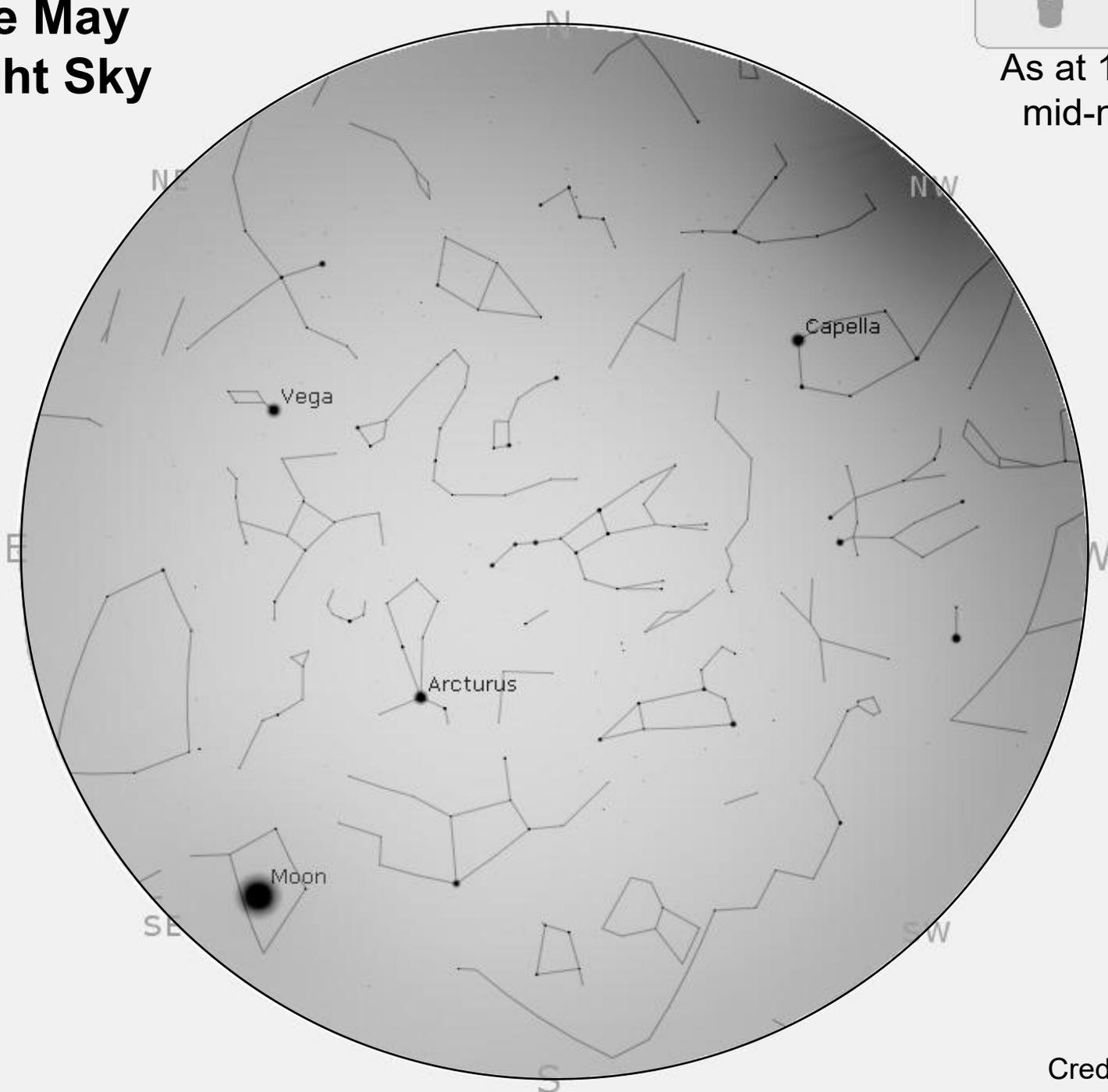
What's Up!

For May 2022



The May Night Sky

As at 10 p.m.
mid-month



Sun & Moon in May

- **(New Moon 30/4)**
- **First Quarter 9th**
- **Full Moon 16th**
- **Third Quarter 23rd**
- **New Moon 29th**

		Sun	Moon
1 st	Rise	05.34	05.55
	Set	20.24	21.02
15 th	Rise	05.11	20.11
	Set	20.46	05.13*
31 st	Rise	4.52	05.09
	Set	21.07	22.38

all times BST

* following day

The Planets in May

Mercury

Best seen in the first few days of the month, well placed 30 mins after sunset in the WNW. It's just 2° from Pleiades and sets 2 hrs after the Sun. Lost in twilight from mid month.

Venus

Venus is a brilliant but low morning object in the East, rising approx one hour before the Sun.

Mars

Another morning object, also low in the East; at start of the month it rises about $1\frac{1}{2}$ hrs before the Sun, 2hrs by month end.

The Planets in May

Jupiter

Yet another morning planet, shining brightly in the East, visible from about 40 mins before sunrise.

Saturn

At 16° above SE horizon by month end Saturn is the highest of the morning planets, but at mag 0.9 it will be affected by the morning twilight.

Uranus

Not visible this month

Neptune

Not visible this month.

Astronomical Phenomena in May

1st	Venus (mag -4.0) and Jupiter (mag -2.0) rise just 22' (arc minutes) apart. Look about 05.00 hrs, low in East.
6th	The max of the Eta Aquarid meteor shower occurs just before dawn
13th	Waxing gibbous Moon occults the 3 rd magnitude star Porrima (Gamma Virginis) between 01.50 hrs to 02.42 hrs.
16th	Total Eclipse of the Moon. The partial phase begins at 02.32 hrs and totality begins at 04.29 hrs. Totality will be at maximum just when the Moon sets at 05.12
27th	The waning crescent Moon and Venus rise together just 1° apart, look about 04.00 hrs
29th	Jupiter and Mars are separated by just ½°, look for them low in the East about 03.00 hrs
	NB 1. All times given are BST 2. Noctilucent Clouds can start to be seen from end of May onwards, 90-120 mins after sunset in NW or same before sunrise in NE



A previous Total Lunar Eclipse, photographed from Ilkely, Yorkshire

Credit: John Axtell

<https://www.timeanddate.com/eclipse/lunar/2022-may-16>

Meetings at Local Societies

- Given the somewhat confused situation in relaxation of restrictions, whilst Covid-19 has not yet gone away, there's a real mixture in terms of how meetings are run. Most are now returning to physical meetings, but one continues just via Zoom.
- You might like however to see their websites for items of interest:
 - **Guildford AS** <http://www.guildfordas.org/>
 - **Farnham AS** <https://www.farnham-as.co.uk/>
 - **Croydon AS** <http://www.croydonastro.org.uk/>
 - **Ewell AS** <https://ewellastronomy.org/>
 - **Walton AG** <http://www.waltonastrogroun.co.uk/>

Meetings at Local Societies

- **Farnham AS** *Aldershot Cricket Club*
 - Hybrid meetings
 - (Physical meeting but Zoom used for some speakers and some members who prefer not yet to attend)
 - Tuesday 10th May, 7.30, Aldershot Cricket Club
 - **The First Cosmic Explosions**
 - Dr Daniel Whalen (Institute of Cosmology & Gravitation,
University of Portsmouth)
-

Meetings at Local Societies

- **Ewell AS** *Nonsuch High School for Girls, Cheam*
 - Friday 13th May, 20.00 hrs
 - ***“It’s Life Jim, But Not As We Know it”***
Mike Maunder FRAS

Meetings at Local Societies

- **Croydon AS** *Trinity School, Croydon*
 - Friday 13th & Friday 27th May, 20.00 hrs
 - *Physical meetings but subjects and speakers not as yet announced*
- **Guildford AS**
 - Zoom only, members only

Meetings at National Societies

- Both the **British Astronomical Association** and the **Society for Popular Astronomy** have returned to physical meetings
- The **British Interplanetary Society** has also restarted physical meetings but also streams them via Crowdcast.

On-line Talks

- You can pay £3.00 to watch these on-line talks run by **GoSpaceWatch**: (book via Eventbrite)
 - ***“Polaris Dawn”***
 - Wednesday 4th May, 7.30 - 9.30 pm
 - Scott Poteet (Mission Pilot, Polaris Dawn,
SpaceX Dragon Mission)
 - ***“James Webb Space Telescope Update”***
 - Wednesday 18th May, 7.30 - 9.30 pm
 - Dr Caroline Harper (Head of Space Science,
UK Space Agency)

Astronomy on TV

The Sky at Night

“Destination Moon”

Fifty years since humans last stood on the Moon, the team look back at the Apollo programme and anticipate NASA’s upcoming Artemis project, which promises to return crew to the lunar surface in 2025. Plus, they’ll reveal how to observe the total lunar eclipse on 16th May, and why the Moon is a great target for astronomy newcomers.

Monday 9th May BBC 4, 10.00 pm

Thursday 12th May BBC 4, 7.30 pm



That's all Folks!