

Stars Over Surrey Astronomy & Spaceflight News

1st April 2022



War in Ukraine - Effects (1)

- **International Space Station**

- Initial tirade from head of Roscosmos seems to have died down
- However a Roscosmos-produced video showed the Russian segments of the ISS separating and floating away. A threat?
 - later described as a “joke”
- NASA responded with a seven point statement detailing which partner is responsible for what operational procedures and demonstrating that the US and Russian segments just could not operate independently.
- In 2014 Russia annexed Crimea and since then relations between the two governments have been strained, yet co-operation between the scientists and engineers in NASA and Roscosmos continued as per normal.
 - maybe politicians could take a leaf from their book?

War in Ukraine - Effects (2)

- **International Space Station (continued)**
 - No sign of any strained relations on board
 - five Russian Cosmonauts, four US Astronauts, one German Astronaut
 - three of the Russians arrived on 18th March
 - » in yellow flight suits with blue piping! (significant colours?)
 - 30th March: as per schedule, one NASA astronaut plus two Russians returned to Earth in a Soyuz, landing in Kazakhstan
 - Roscosmos chief had earlier apparently threatened this departure, but later called the report about this as “hysterical”
 - NASA’s Mark Vande Hei & Pyotr Dubrov had spent 355 days on ISS
 - Anton Shkaplerov was one of the returning cosmonauts and he had been ISS Commander. During a handover ceremony on board he said "We worked very hard, like one crew, and we didn't have problemsPeople have problems on Earth. On orbit, we are like - no, we are not like, we are one crew- and I think the ISS is a symbol of the friendship and cooperation and a symbol of future exploration of space"

Other ISS News

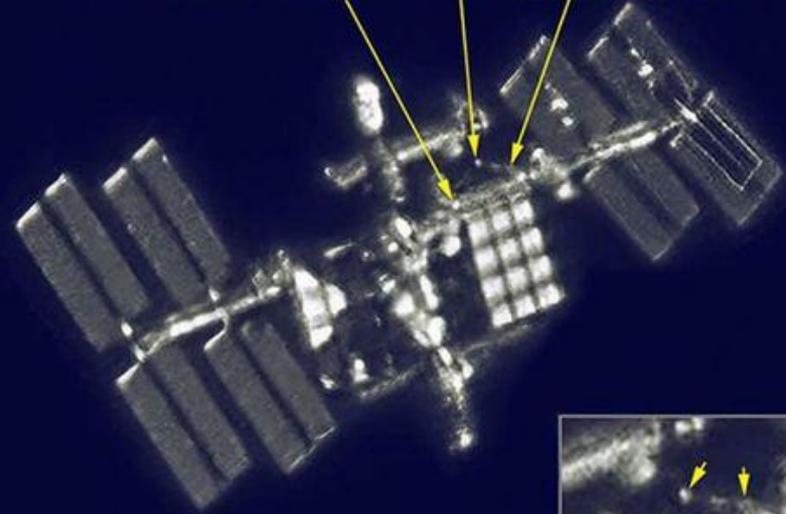
- **Two astronauts (NASA & ESA) conducted a spacewalk last week**
 - Their EVA was imaged by a German amateur astronomer and shows both astronauts
- **6th April: Axiom Space private mission will launch a crew of four to the ISS**
 - Falcon 9 from Kennedy
 - the new (fourth) SpaceX Crew Dragon has just been named “Freedom”

Spacewalker Astronauts Raja Chari & Matthias Maurer
Outside the International Space Station



Matthias Maurer

New Camera Installed



Ground based image
March 23, 2022
© Sebastian Voltmer
Composition by Philip Smith

Gaia snaps James Webb Telescope

- Gaia has imaged a star field in which JWST appeared
- Surrey's MSSL contributed to the build and operation of both missions



James Webb Telescope Focused

- The primary mirror has now been correctly focused
- Results are as good, if not better, than NASA's most optimistic predictions
- Still plenty to be done before it goes operational



Credit: NASA/ESA/CSA/STSCI

NASA's SLS at Pad for 1st Time

- **NASA's new massive rocket Space Launch System plus Orion capsule reaches the launch pad for 1st time**
 - 4 mile journey to Pad 39B from Vehicle Assembly Building took 11 hours, at 0.8mph, using the same giant crawler that carried the Saturn V rockets during the Apollo missions
- **Rocket and capsule will be flown uncrewed round the Moon as Artemis 1, hopefully in May**
 - This visit is the final milestone before launch, a “wet-test rehearsal” lasting two days, ground crews practising loading cryogenic fuel into the rocket, and unloading it again
 - Following the test SLS will return to VAB for final checks



Credit: NASA/Aubrey Gemignani

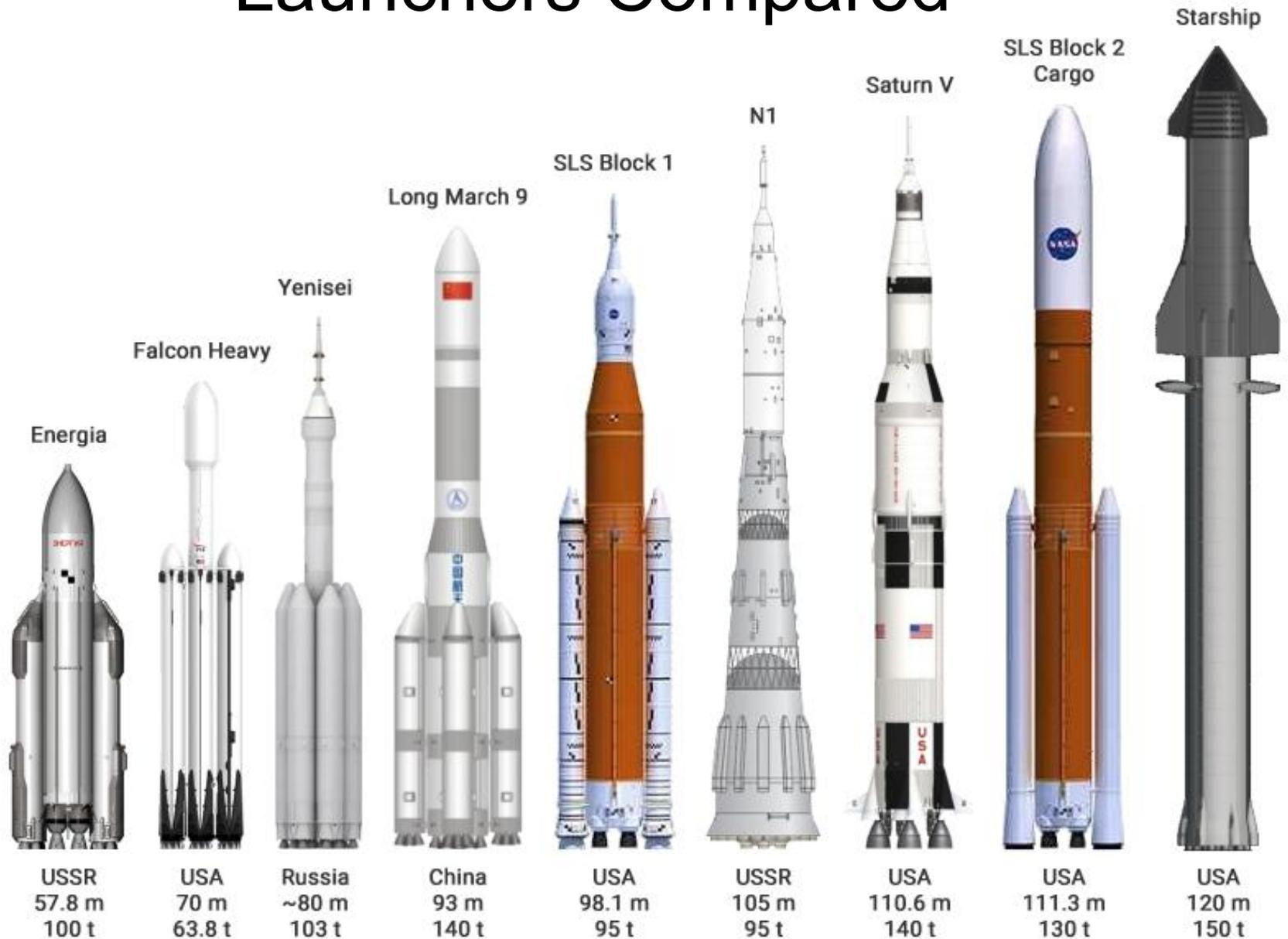
Other Big Rocket News

- **Elon Musk tweeted yesterday that the giant SpaceX Starship will make its first orbital test flight also in May**
- **He says it will need to be powered by upgraded Raptor engines called Raptor 2, “much more capable and reliable, 230 ton or ~500k lb thrust at sea level”**
 - “We’ll have 39 flightworthy engines built by next month, then another month to integrate, so hopefully May for orbital flight test.”
- **SLS v Starship**
 - Thrust: 39,440 kN v 72,000 kN
 - LEO: 95 tons v 100+ tons
 - Price: c\$1B (expendable) v c\$12M (reusable and refuelable in orbit)



Credit: SpaceX

Launchers Compared



Misc Spaceflight News

- Boeing's Starliner crew capsule will hopefully launch via Atlas 5 rocket to the ISS in May, an uncrewed test flight
 - long delayed, the latest problem was stuck valves in its propulsion system.
 - A postponement of a US Space Force surveillance satellite launch has enabled the Starliner launch to be moved forward in the Atlas launch schedule
- 8th March: Iran's military has successfully launched a small reconnaissance satellite (Noor 2)
 - launched on a Qased three stage rocket, the first stage is based on an upgraded ballistic missile
- NASA is in the process of opening 50 year old sealed lunar samples taken on Apollo 17
 - these were deliberately vacuum sealed and stored so that more advanced techniques could be used to examine the samples.

Misc Spaceflight News

- NASA's *Perseverance* rover on Mars has now collected its eighth surface sample
 - safely stored away in a sealed tube that will eventually be deposited with others in a cache for later collection and return to Earth by a joint NASA/ESA mission.
 - The little helicopter *Ingenuity* is still acting as a scout for *Perseverance*, and has now made 21 flights.
 - *Perseverance* is now heading for an ancient river delta for its next investigations.
- Latest deep solar system survey finds no trace of Planet 9
 - A large planet was theorised to exist, accounting for some unexplained gravitational effects on some bodies in the Kuiper Belt.
 - Scientists used the 6-metre Atacama Cosmology Telescope for this survey, with null results
 - "able to exclude with 95% confidence" a world with the supposed properties of Planet 9 (i.e. 5x-10x Earth mass, 400-800 AU)

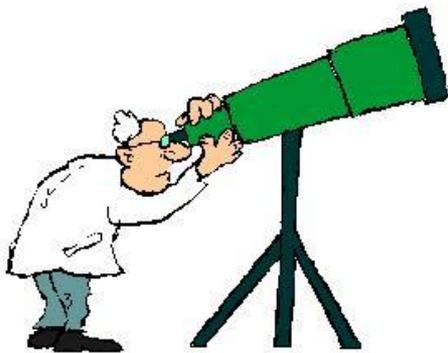
Hubble Spots Most Distant Star

- There's a technique called "Gravitational Lensing". This is when a huge mass sits between a distant object and Earth. The gravitational pull of this mass has the effect of bending the light coming from the more distant object and magnifying it. Usually the target object is a galaxy and this intervening magnifying mass is itself a galaxy or sometimes a cluster of galaxies.
- In this particular instance a galaxy cluster has magnified a distant star, which just by chance sat within the "sweet spot" of the gravitational lensing
- It's been named "Earendel" (Rising Light in Old English), is 12.9 billion light years distant, maybe 50x Solar mass
- It would be one of the very first stars, occurring only 900 million years after the Big Bang

Stars Over Surrey

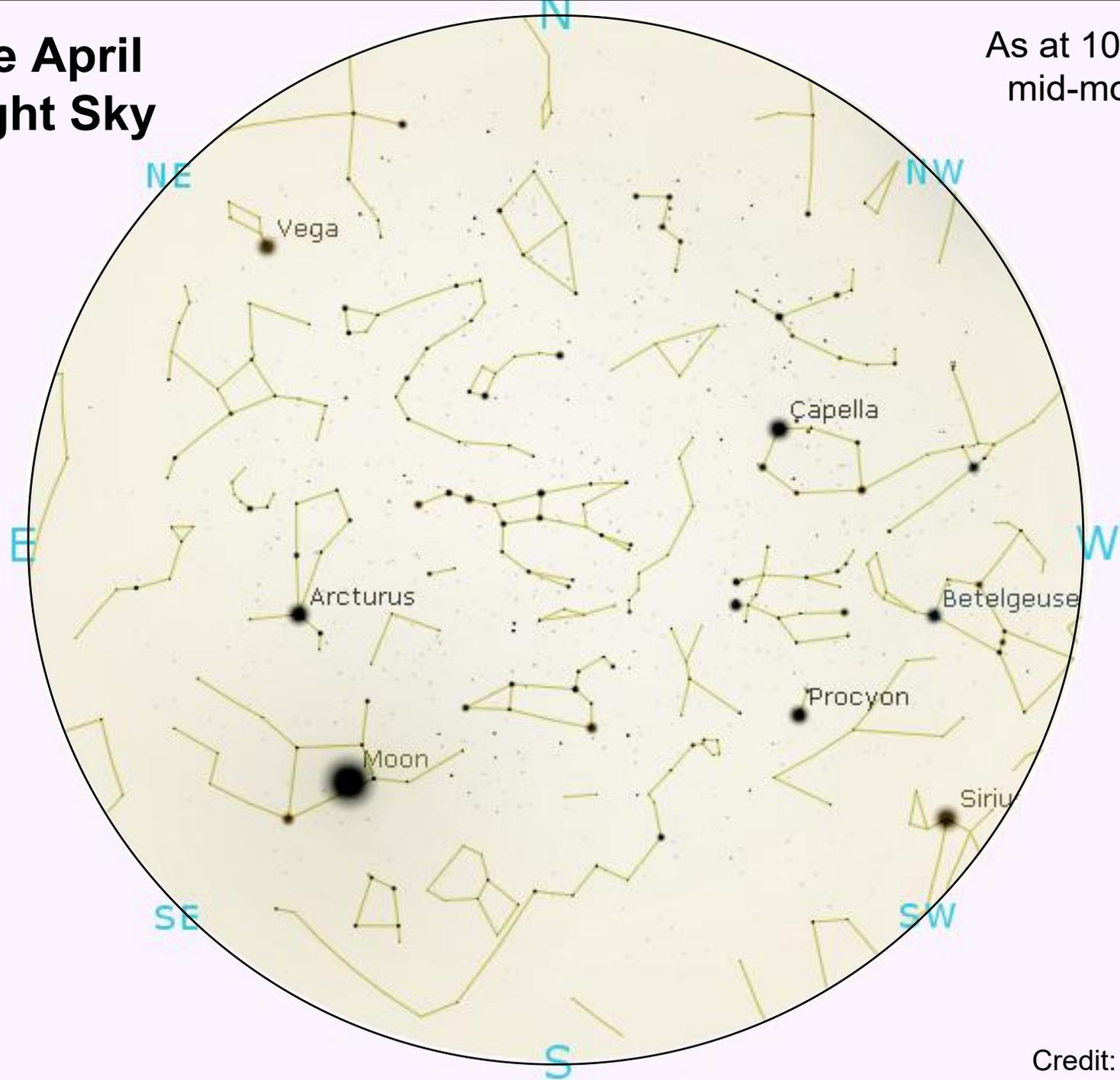
What's Up!

For April 2022



The April Night Sky

As at 10 p.m.
mid-month



Credit: Stellarium

Sun & Moon in April

- **New Moon** **1st**
- **First Quarter** **9th**
- **Full Moon** **16th**
- **Third Quarter** **23rd**
- **New Moon** **30th**

		Sun	Moon
1 st	Rise	06.38	07.05
	Set	19.35	19.55
15 th	Rise	06.07	18.24
	Set	19.58	06.14*
30 th	Rise	05.37	05.39
	Set	20.23	20.08

* following day

The Planets in April

Mercury

It's best apparition of the year occurs this month, but only from the third week. Find it due West and about 10° high, about 9 pm.

Venus

Venus is a brilliant but low morning object in the SE, throughout the month, but low in the ESE. Through a telescope it will show as a gibbous disc

Mars

Another morning object but low in the SE; it rises a little over 1 hr before the Sun. However it is slowly beginning to brighten and will improve.

The Planets in April

Jupiter

Becomes visible once again towards the end of the month, before dawn and low in the SE.

Saturn

An improving morning object, low in SE but gradually climbing higher as month progresses.

Uranus

Only visible for first few days of the month in the WSW about 8° high, becoming lost in the evening twilight

Neptune

Not visible this month.

Astronomical Phenomena in April

3rd	Crescent Moon will be just 1° (below and to left) from Uranus
5th	Saturn and Mars will be just 0.5° apart before dawn
8th	Lunar X and Lunar V, fully formed at 21.53 BST.
22nd	Peak of the Lyrid meteor shower.
24- 27th	Saturn, Mars, Venus and Jupiter form a line before dawn. The Moon passes nearby over the next few days.
30th	Jupiter and Venus make a fine sight as they rise less than 1° apart in the East, both shining at about magnitude -4. Try at 05.00hrs BST

Meetings at Local Societies

- Given the current Covid-19 situation, most physical meetings at our local astronomical societies have been cancelled until further notice, some continue via Zoom for paid-up members, but some are now returning to physical meetings.
- 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

- **Ewell AS** *Nonsuch High School for Girls, Cheam*
 - Friday 8th April, 20.00 hrs
 - *“Using Binoculars for Astronomy”*
John Axtell FRAS

Meetings & Talks On-line

- **British Interplanetary Society:**
 - *“Exploring the Highlands of the Moon”*
 - Jerry Stone FRAS FBIS via CrowdCast
 - free to members, otherwise £10.00
 - Wednesday 20th April, 19.00 to 20.30:

<https://www.bis-space.com/events//>



Meetings & talks on-line

- You can also pay £3.00 to watch these on-line talks run by **GoSpaceWatch**: (book via Eventbrite)
 - *“B2Space.”*
 - Wednesday 6th April, 7.30 - 9.30 pm
 - David Johnson (Principal Engineer, B2Space)
 - *“To the Mountains of the Moon
- The voyage of Apollo 16 (50th Anniversary)”*
 - Wednesday 20th April, 7.30 - 9.30 pm
 - Ben Evans

www.gospacewatch.co.uk

Astronomy on TV

The Sky at Night

“Welcome Back”

In April’s episode Maggie and Chris look at the astronomy and spaceflight stories that have made the news since the show has been off the air, including a look at how the James Webb Space Telescope is faring since its launch. Pete Lawrence reveals what to see in the night sky this month and the team discuss the big stories for the rest of 2022.

Sunday 10th April BBC 4, 10.00 pm

Thursday 14th April BBC 4, 7.30 pm



That's all Folks!