

Stars Over Surrey

Astronomy &

Spaceflight News

26th March 2021



Variety | Personality | Companionship

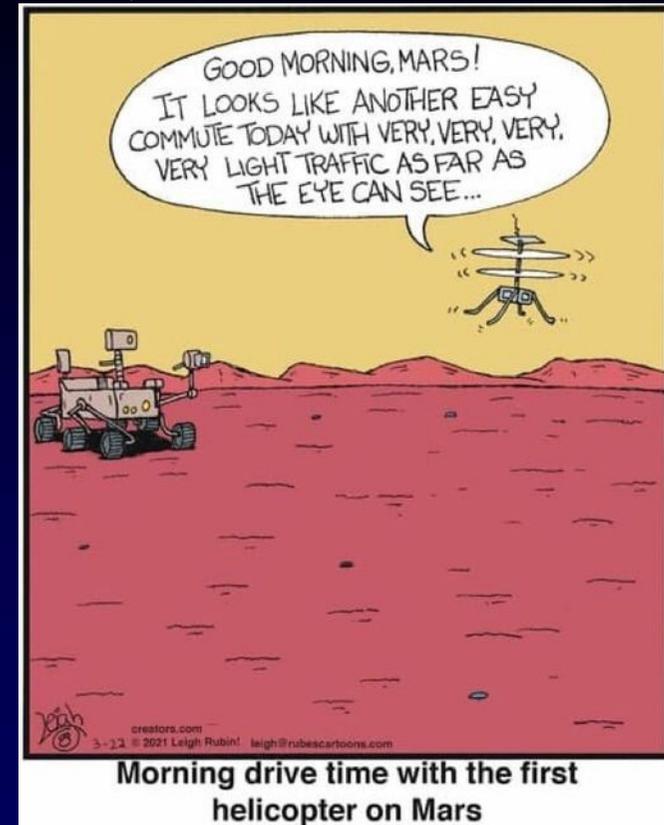
Perseverance Takes Its First Stroll

- NASA's Perseverance Rover has been on Mars for a month now and has begun to move around on the surface
- Its microphone has recorded the sounds of wind gusts, its laser operating, and of its wheels
 - the six 20" wheels are noisy, made of metal
- The microphone will help identify hardness of surface materials when drilling samples
 - 43 tubes of samples will be deposited for later collection
- “Airport” for *Ingenuity* identified for mid-April flight



Ingenuity

- Perseverance has now dropped the debris shield from under its belly that was protecting Ingenuity
- It will take two days to drive to the selected 'helipad' area
- Six days needed to deploy the rotor-craft from the rover
- A postage stamp sized piece of fabric from the Wright Brothers' Flyer is incorporated into Ingenuity.
- Five flights planned to demonstrate the technology
 - 4 lb craft, no scientific instruments but two cameras
 - contra-rotating rotors at 2,500 rpm
 - $\frac{1}{3}$ Earth's gravity but 1% atmospheric density
 - first flight will be to hover for 30 seconds at 3 metres



SpaceX Loses Third Starship Prototype

- Starship SN10 at least landed successfully, touching down vertically under the power of one Raptor engine then shutting that engine down
- The giant rocket stood for a few minutes after what seemed to have been a 100% successful mission, except that flames could be seen licking around its base
- Then Ka-Boom! Presumably a fuel valve had failed or a fuel line ruptured, leading to the huge explosion.
- It's still progress, and that's how SpaceX works
- SN11 is on the pad and launch is expected before long



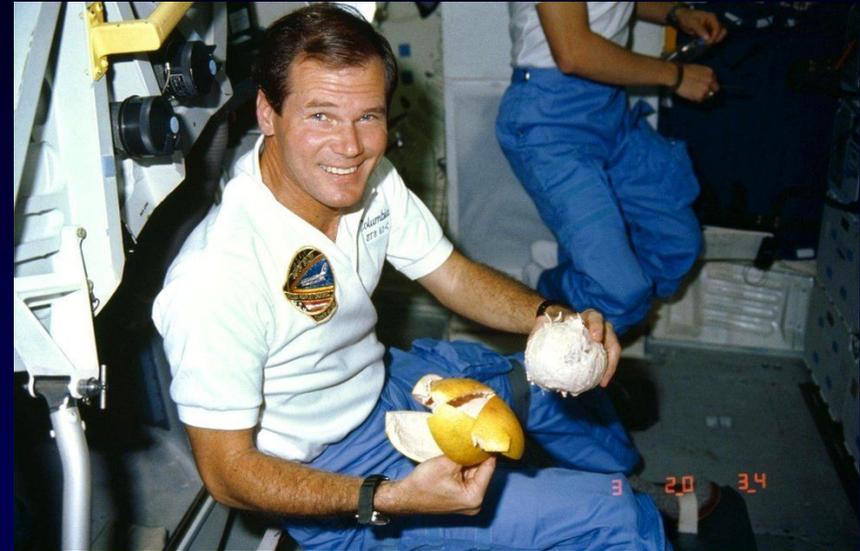
Credit: [Space.com](https://www.space.com)

Misc SpaceX News

- Japanese entrepreneur invites passengers to apply for his dearMoon mission in Starship
 - Initially flight was to take just “creatives” but now Yusaku Maezawa has announced he’ll pay for some of the public to join the entirely private mission
 - 10-12 passengers on flight round Moon in 2023
- SpaceX launches four batches of 60 Starlinks!
 - 4th March - sticks Falcon 9 booster’s 8th landing
 - big relief after last mission’s failed landing attempt
 - then again on 11th, 14th & 23rd March
 - beats own record with 9th flight and landing of Falcon 9 booster
 - 1,385 Starlink satellites now orbited

Ex-astronaut nominated as NASA head

- President Biden has nominated Bill Nelson as next NASA Administrator
- Nelson flew as a payload specialist on space shuttle Columbia in 1986
 - he was a Congressman at the time
- Served as Senator for Florida, 2000 until 2019
- Was heavily involved in supporting NASA's SLS
- Regarded as a moderate Democrat, his nomination has drawn bi-partisan support
- Thought likely to adhere to current Artemis targets



Credit: NASA

NASA's SLS Engine Test

- NASA tests the SLS (Space Launch System) core section's engines
- The engines fired for the full eight mins planned
 - two months ago the previous test had to abort after just one minute
 - significant milestone for SLS
- Aerojet Rocketdyne RS-25 engines generated 1.6 million lbs thrust
- Unmanned lunar launch this year



Credit: NASA

Russia and China Team-up for Moon



Credit: CNSA

- China and Russia have signed a Memorandum of Agreement to jointly set up a Lunar Research base
 - likely to be near South Lunar Pole
- Joint science platform in Lunar orbit also likely
- Disappointment for NASA which had invited Russia to participate in Gateway

Brief ISS News

- Two Russian cosmonauts and one US astronaut moved their Soyuz capsule from one module to another
 - Undocked from Russian Rassvet module, flew around ISS, then redocked at Poisk module
 - flown manually by Russian Soyuz commander
 - To make room for next Soyuz crew arriving on 9th April
 - They will return on 17th April
 - Poisk module will be removed by the next Progress resupply vessel to make room for the new Nauka laboratory
- Next Soyuz arrival now includes an American astronaut
 - deal only just signed, on quid-pro-quo basis
- The four Crew Dragon crew will similarly all enter and relocate from one docking port to another on 5th April, leaving room for next Crew Dragon arriving on 23rd April

Cotswolds Meteorite Recovered

- Fireball tracked by UK Meteor Network and landing area postulated
- Strewn field
 - some fragments fell in farmer's field
 - large chunk impacted on suburban driveway
- Only 51 meteorites known of Carbonaceous Chondrite
 - 1st ever in UK
 - 1st meteorite recovered in UK for 30 years

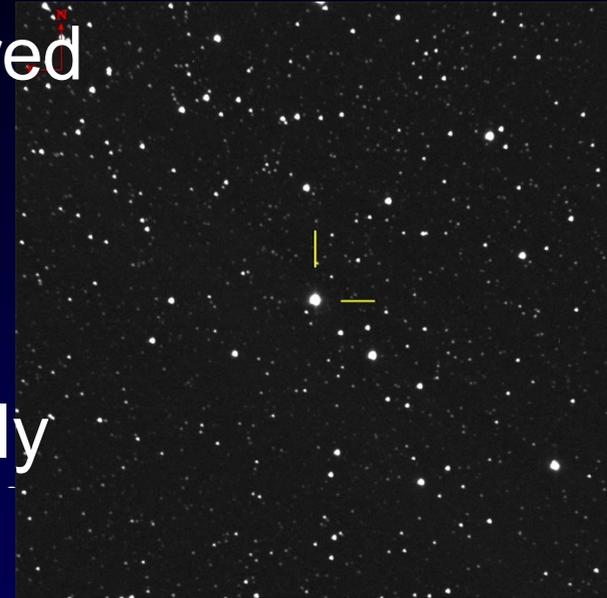


Cotswolds Meteorite Recovered

- “Fresh” means recovered within three months
 - only thin surface area contaminated by atmosphere
 - 4.6 billion years old, origin tracked to outer asteroid belt
 - likely to contain amino acids
 - came in relatively slowly, 13 km/sec
- Total amount collected approx 500 grams
 - 4.5 gms returned to Earth on Hyabusa 2 from Ryugu
 - 60 gms on way back on Osiris-Rex from Bennu

Nova Discovered in Cassiopeia

- A Nova (“new” star) has occurred in Cassiopeia, discovered in Japan on 18th March
- Initially Nova Cas 2021 was at mag +9.6 but brightened quickly to +7.5 by following day.
 - Should be visible in 10x50 binoculars or small telescope
 - not far from M52 & Bubble nebula
- Novas occur in binary star systems when one star dumps material onto the other, resulting in a cataclysmic surface explosion



Credit: Astronomy Now

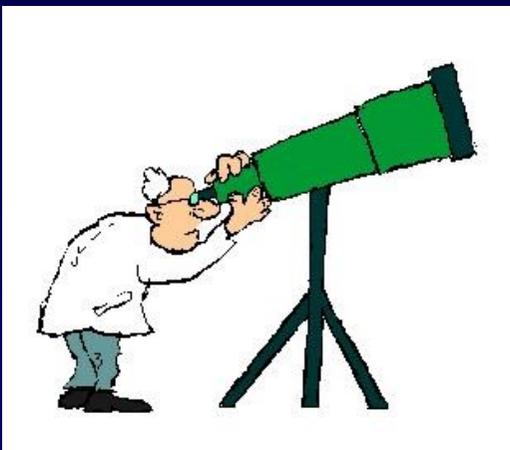
Hubble Monitoring Saturn's Seasons

- Hubble Space Telescope is helping researchers monitor the changes in Saturn's upper atmosphere as it moves from its N. hemisphere's summer to autumn
 - This animations shows the changes between 2018-20
- each season lasts seven years
- The equator brightened by 10% and the winds dropped from 1,000 mph to 800 mph
- HST has just recovered into partial operation after a software problem took it off-line into safe mode
 - another problem has become apparent about closing the aperture which protects the main mirror and instrumentation.



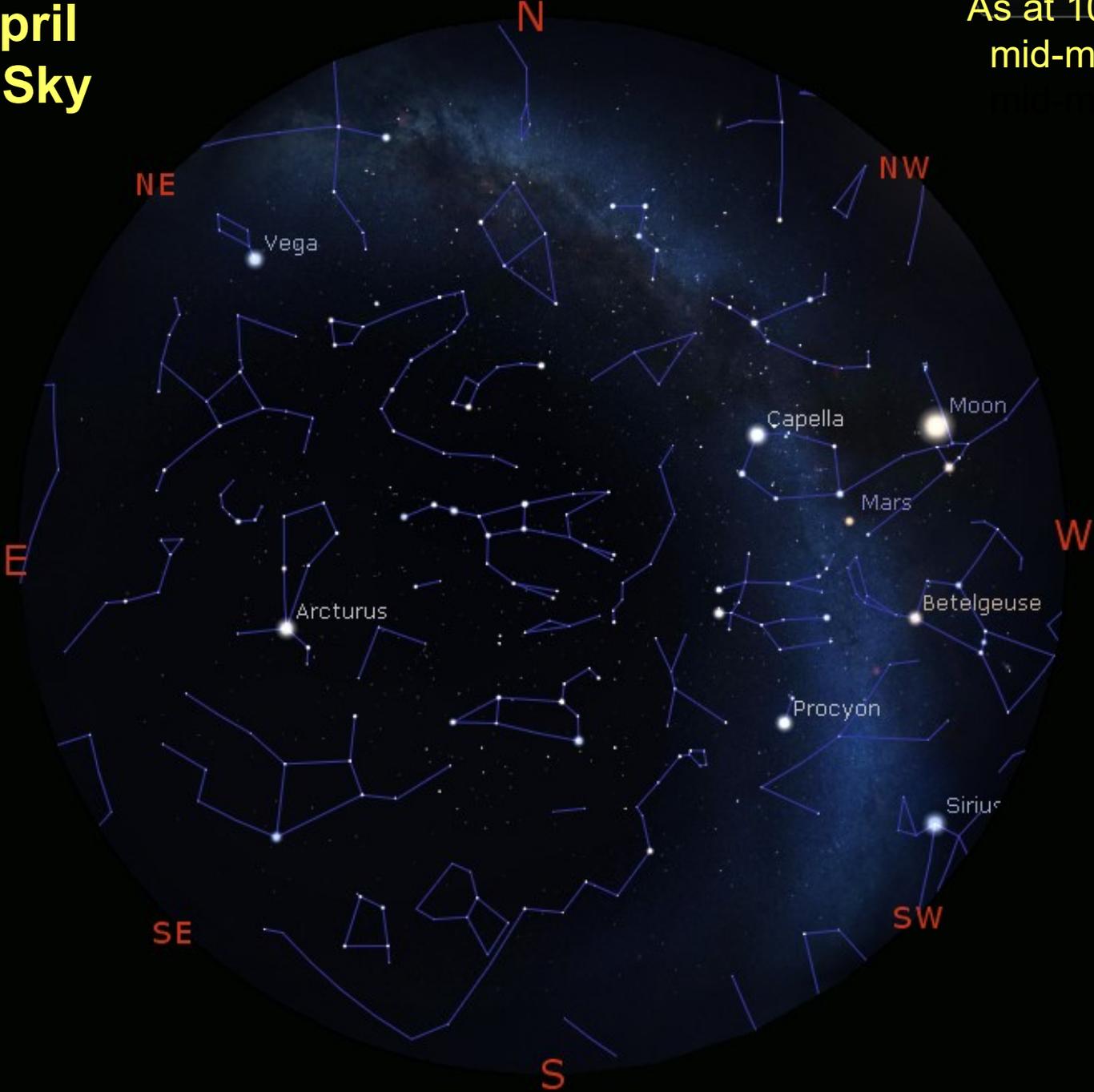
What's Up!

For April 2021



The April Night Sky

As at 10 p.m.
mid-month



Sun & Moon in April

- Third Quarter **4th**
- New Moon **12th**
- First Quarter **20st**
- Full Moon **27th**

		Sun	Moon
1 st	Rise	06.37	23.33 [^]
	Set	19.35	08.33
15 th	Rise	06.06	07.37
	Set	19.58	23.45
31 st	Rise	05.36	23.58
	Set	20.23	07.42 [^]
			[^] previous day

All times are BST

The Planets in April

- Mercury

- Starting off the month as a poorly placed morning object, Mercury transitions to evening and is best seen at the end of the month, low in WNW, 30 mins after sunset.

- Venus

- Venus becomes visible again this month as an evening object, improving as the month draws on and can be seen shining at mag -3.8 in WNW from 20 mins after sunset

- Mars

- Continues to deteriorate but still visible all this month high in the West, dimming to magnitude +1.5 by month end.

The Planets in April

- Jupiter

- Still poorly placed throughout the month, visible as a morning object, low in the ESE, about 70 mins before Sunrise

- Saturn

- Like Jupiter Saturn is also a morning object, low in the SE, rising about two hours before the Sun

- Uranus

- Not visible this month

- Neptune

- Not visible this month

Astronomical Phenomena in April

- **6th** Waning crescent Moon sits close to Saturn one hour before sunrise; in the South-East
- **7th** Waning moon now close to Jupiter before Sunrise, again in the South East 
- **15th** In the early evening the waxing crescent Moon sits between Pleiades and Hyades star clusters in Taurus 
- **18th** The Moon occults the opens star cluster M35 in Gemini starting at 01.15 a.m. 
- **21/22nd** The peak of the Lyrids meteor shower occurs in daytime on 22nd, so the meteors are best observed the nights before and after.
- **25th** The planets Mercury and Venus will be just over 1° apart, low in the WNW about 40 mins after sunset 
- **26th** Mars sits just under 2° above M35 cluster in Gemini

Meetings at Local Societies

- Given the current Covid-19 situation, all physical meetings at our local astronomical societies have been cancelled until further notice, some continue via Zoom for paid-up members.
- 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.waltonastrogrouop.co.uk/>

Free Meetings & Talks On-line

- **British Astronomical Association: Zoom webinars**
 - *Winchester Webinar*
 - Saturday 10th April, 2.00 - 4.30 & 7.30 - 8.30 p.m.
 - full list of speakers and talks on BAA website
 - *“The Great Debate”*
 - Wednesday 14th April at 7.00 - 8.00 p.m.
 - Dr Nick Hewitt

<https://www.britastro.org/meetings>

(will also be viewable via BAA's YouTube Channel)

Free Meetings & Talks On-line

- **Society for Popular Astronomy:**
 - *“The Comet Interceptor Mission”*
 - Saturday 24th April, 2.00 - 3.30 p.m.
 - Prof Geraint H Jones, UCL-MSSL
 - *Friday Night Live with Vicky Video*
 - Weekly on SPA's FaceBook page at 8.00 - 9.00 p.m.
 - Chat show rather than meeting

https://www.popastro.com/main_spa1/meetings-and-events/forthcoming-meetings/

(will also be viewable via SPA's YouTube Channel)

Free Meetings & Talks On-line

- **British Interplanetary Society:**
 - *“Skyrora Launch Vehicle Development”*
 - Saturday 17th April at 2.00-3.15 p.m. via Crowdcast
 - Robin Hague, Head of Launch Operations, Skyrora
 - also a full day event, £10 BIS members, £50 non-members
 - *Symposium: “Beyond The Moon”*
 - Saturday 10th April at 10.00 - 19.00 p.m. via Zoom
 - full list of speakers & talks on BIS website

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

Meetings & talks on-line

- You can also pay £3.00 to watch these on-line talk run by **GoSpaceWatch**: (book via Eventbrite)
 - *“The Once and Future Moon”*
 - Wednesday 31st March, 7.30 - 9.30 pm
 - Dr James Carpenter (European Space Agency)
 - *“The Sticky Issue of Space Debris.”*
 - Wednesday 7th April 7.30 - 9.30 pm
 - James Blake (University of Warwick)
 - *“ESA’s proposed JUICE Mission to Jupiter’s Icy Moons.”*
 - Wednesday 21st April 7.30 - 9.30 pm
 - Dr Leigh Fletcher (University of Leicester)

www.gospacewatch.co.uk/

Astronomy on TV

The Sky at Night

Returns from its recent break

After a well-earned break the programme is back on our screens with more of the latest discoveries in space science and with practical astronomy guides. In this episode Maggie, Chris and the rest of the team look at the big stories from the last few months, including the successful landing of Perseverance on the surface of Mars.

Sunday	11 th April	BBC 4, 10.00 pm
Thursday	15 th April	BBC 4, 7.30 pm



"That's all Folks!"