

Stars Over Surrey

Astronomy &

Spaceflight News

27th March 2020



Variety | Personality | Companionship

Covid-19 Hits Space Missions!

- The planned Moon landing by NASA in 2024 might well be impacted by the Coronavirus
 - NASA has closed 2 facilities because of instances of Covid-19
 - The Stennis Space Centre in Mississippi was preparing to test the core stage of the Space Launch System
 - The Michoud Assembly Facility in Louisiana was building the SLS core stages and also working on the Orion spacecraft
- NASA & Northrop Grumman have suspended integration and testing work on the James Webb Space Telescope
 - This is likely to impact the planned launch date in March 2021. JWST is already six years late.
- Bigelow Aerospace lays off entire workforce on Weds 25th
 - Builders of inflatable habitat attached to ISS

Covid-19 Hits Space Missions (cont'd)

- The next launch to the ISS will still go ahead on April 9th, but without the usual attendance by families and media.
 - NASA astronaut Chris Cassidy will launch with two Russian cosmonauts for the six month mission
 - Families and media usually watch from Mission control but travel and social distancing restrictions dictate otherwise
 - The astronauts are already in quarantine, standard protocol
- ESA's launch complex at Kourou, French Guiana has suspended two launches, in March and April
 - This is so they can properly implement the French Government's measures to restrict the pandemic
 - An Italian-made Vega would have launched late March and a Russian-made Soyuz in April.

Mars Miscellanea

- Testing delays mean that the ESA-Roscosmos Exo Mars mission can't now be launched this year, and must wait until the next launch window, in 2022
- NASA reported mid-month that their new approach of using the Insight lander's robotic arm to push down on the probe's top seems to be working. They will continue trialling this approach over the coming weeks.
- NASA's Mars 2020 naming competition has produced a winner. The lander will be called Perseverance.

Both Space X & OneWeb launch more broadband satellites

- Space X launched 60 more Starlink satellites, 18th March
 - That's 360 now in orbit
 - Falcon 9 used was launching for the 5th time and suffered a premature engine shut-down. The other eight Merlin engines fired a little longer to compensate.
 - The Falcon missed its landing on the recovery ship
- OneWeb launched 34 of their satellites from Baikonur, Kazakhstan using a Soyuz on 21st March
 - Their total is now 74
 - One Web is rumoured to be considering filing for bankruptcy protection, stemming from Coronavirus restrictions.

Other Space X Missions:

The Last Dragon & 'Golden' Asteroid

- Space X launched its final Dragon resupply vessel to the ISS, 6th March
 - The Dragon was captured by the ISS crew operating the manipulator arm two days later
- Future resupply missions will use Dragon 2, a variant of Crew Dragon which will dock automatically.
 - The Falcon 9 rocket landed successfully at Cape Canaveral
 - This was the 20th Dragon visit to ISS and the 3rd for this particular capsule
 - Over the 20 missions Dragon has ferried 43 metric tons of cargo to the ISS and returned 33 metric tons back to Earth

Other Space X Missions:

The Last Dragon & 'Golden' Asteroid

- Space X has been contracted by NASA to launch its Discovery mission to the asteroid Psyche 16
 - The launch is the first contract by NASA for the Falcon Heavy
 - It will launch in 2022 and arrive at the asteroid in 2026
- Psyche is a metal-rich asteroid (some estimates put it at 90% metal) mostly composed of Nickel-iron
 - It also contains some platinum and gold
 - Its nickname derives from the sheer amount of metal. At today's prices that amount of metal is worth £8000 quadrillion!
 - Enough to swamp the commodity markets and crash the world's economy!
 - For it to have that much metal it's believed to be the core of a protoplanet that never properly formed or got fragmented
- This mission isn't a mining one, merely scientific exploration.

Starship Fails then Passes

- Early in March Space X tested one of its Starship Prototypes, filling its cryogenic fuel tanks under pressure
- The tank failed and it exploded, wrecking prototype SN1
- Only a fortnight later they'd rectified what they identified as the problem and tried again with prototype SN2, and it passed.
 - problem believed to be with the “thrust puck”, the structure on which the Raptor engines are mounted.
- Space X believes Starship could be launching satellites by next year
 - the next versions are likely to use a different alloy of stainless steel from the 301 alloy currently used.

Space X announces ISS tourism

- Last month Space X announced its arrangement with Space Adventures to fly private citizens on commercial orbital flights on Crew Dragon
 - Four at a time, no additional professional astronauts
 - Not visiting ISS, but in higher orbit for 4 or 5 days
- Now they've announced an arrangement with Houston-based company Axiom Space to make visits to the ISS for three paying customers plus one trained astronaut.
- Axiom is building a habitat module to be attached to the ISS and has plans for further ISS extensions
- Such visits would be for about 8 days and the earliest could be in Q2 2021

Iron Rain

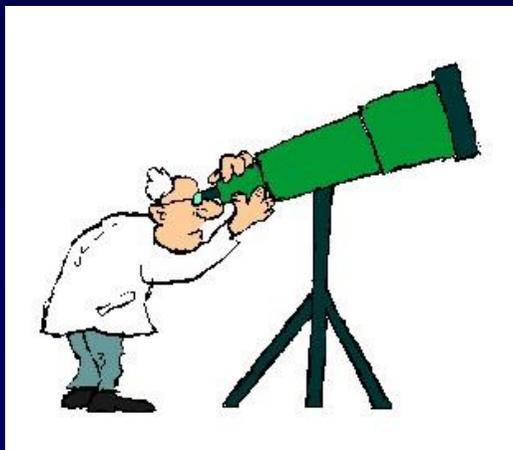
- WASP-76b is a tidally locked exoplanet some 640 light years away
- It orbits so close to its star that it experiences day-side temperatures of $2,400^{\circ}$ C, hot enough to vaporise metals like lead. The night-side temperatures are about 900° C cooler
- Scientists using the European Southern Observatory's Very Large Telescope have detected very strong signature of iron at the terminator (day/night transition line).
- An amount of the iron vapour travels into the night side because of high winds and planetary rotation. It encounters the cooler atmosphere, condenses and falls like rain.

New Moon

- Earth has a new, temporary Moon
- This mini-moon is a car-sized asteroid that has been captured by Earth's gravitational field.
- The object is known as 2020 CD3 and is believed to have been captured about three years ago but has only just been discovered by the Catalina Sky Survey Team in Arizona
- Its orbit is elliptical, going out well beyond the Moon, and is unstable. We'll probably lose it in April
- Elon Musk has tweeted "It's not mine!"

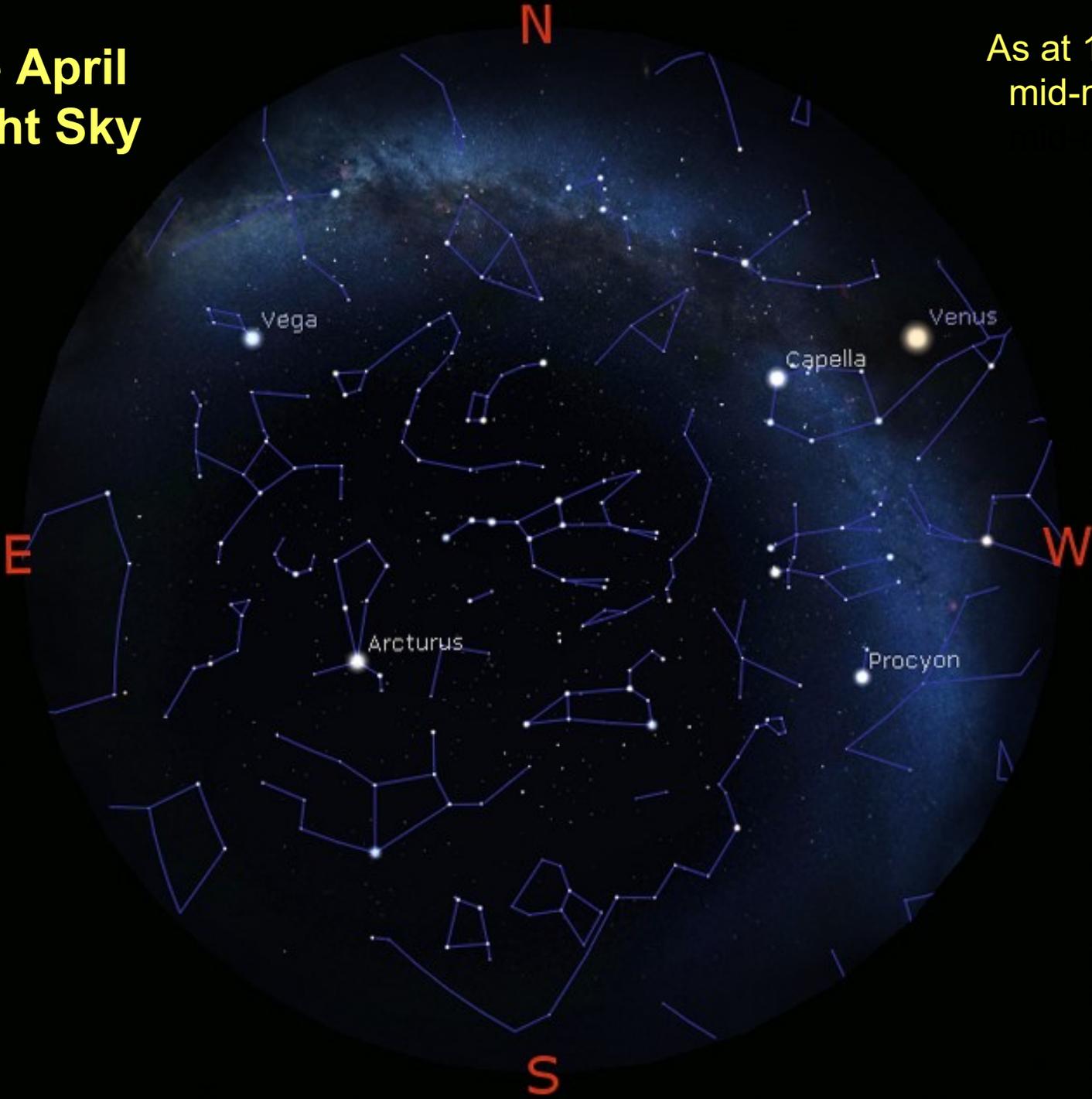
What's Up!

For April 2020



The April Night Sky

As at 10 p.m.
mid-month



Sun & Moon in April

- **First Quarter** **1st**
- **Full Moon** **8th**
- **Last Quarter** **14th**
- **New Moon** **23rd**

		Sun	Moon
1 st	Rise	06.36	11.01
	Set	19.36	03.07
15 th	Rise	06.06	03.34
	Set	19.59	11.39
30 th	Rise	05.35	11.00
	Set	20.23	02.45

What's Up - Planets

- Mercury

- A morning object, very low in the East South East, but to all practical purposes not spotable this month

- Venus

- A brilliant evening object shining at mag -4.7 in the West. Visible for most of the evening, it shows a crescent phase through a small telescope.

- Mars

- A morning object in the South East, the planet slowly improves as draws closer to us as the month draws on, brightening to magnitude +0.4.

What's Up - Planets

- Jupiter

- Visible as a morning object in the South East pre-dawn skies, brightening to mag -2.4 and rising 3 hours before sunrise by month end.

- Saturn

- A low morning object at mag +0.6, low in the South East, between Mars & Jupiter.

- Uranus

- Not visible this month

- Neptune

- Not visible this month

Phenomena in March

- **2nd** 1st quarter Moon close to Hyades cluster in Taurus 
- **6th** Gibbous Moon sits across top of M44 Beehive cluster 
- **8th** Uranus lies approx 2° below and to left of Venus 
- **19th** Saturn lies 4° NW of waning crescent Moon 
- **26th** Saturn, Mars & Jupiter form a triangle low in SE before dawn
- **28th** Thin crescent Moon, Venus and M45 Pleiades close together in Western evening 
- **29th** Start of British Summer Time, clocks go forward

Phenomena in April

- **1st** Saturn and Mars are just 1° apart low in South East  before dawn. Both are approx the same magnitude, Mars an orange-red colour whilst Saturn is yellowish white.
- **3rd** Venus passes across The Pleiades cluster, M45 
- **15th** The waning gibbous Moon forms a triangle with Jupiter and Saturn at 4.30a.m. 
- **19th** Saturn lies 4° NW of waning crescent Moon 
- **21st** The peak of the Lyrid meteor shower occurs overnight. Theoretical max is 18 per hour but it can sometimes reach 90. No Moon, so favourable conditions.
- **26th** Thin crescent Moon and Venus are just 7° apart in the Western evening sky, making a fine sight and a great photo opportunity.
- **27th** Moon very close, 1.5° or 3 Moon-widths, south from the open cluster M35 in Gemini

Meetings at Local Societies

- Given the current Covid-19 situation, all meetings at our local astronomical societies have been cancelled until further notice.
- 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/>

Astronomy on TV

The Sky at Night “Here Comes The Sun”

In February ESA's Solar Orbiter launched on its journey to the Sun. Armed with a suite of instruments, the orbiter will study how the Solar Wind, i.e. the stream of charged particles emanating from the Sun, affects and influences the planets and other bodies of the Solar System. The team goes behind the scenes to learn more about the spacecraft and this exciting mission.

Sunday 12th April BBC 4, 10.00 pm

Thursday 16th April BBC 4, 7.30 pm

*for exact times please check www.radiotimes.com
or www.bbc.co.uk/skyatnight*



"That's all Folks!"