

Stars Over Surrey

Astronomy &

Spaceflight News

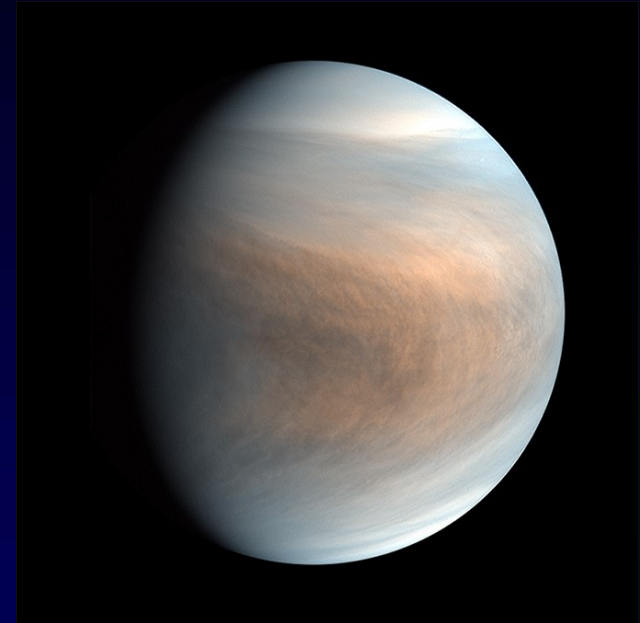
2nd October 2020



Variety | Personality | Companionship

Life on Venus?

- On 14th September it was revealed that possible life signs have been discovered on Venus
- Not on the surface, but 50 K high in the clouds covering Venus.
 - At that height the conditions are almost “shirt sleeve”, apart of course from the Sulphuric Acid in the clouds!
- The Cardiff Uni team used the James Clerk Maxwell radio telescope and found the unmistakable spectrum of Phosphine, and then had this confirmed by the ALMA telescope in Chile
 - Phosphine is a gas that on Earth only exists where it's either produced in factories or produced by anaerobic (non-oxygen breathing) bacteria, such as in the guts of penguins.



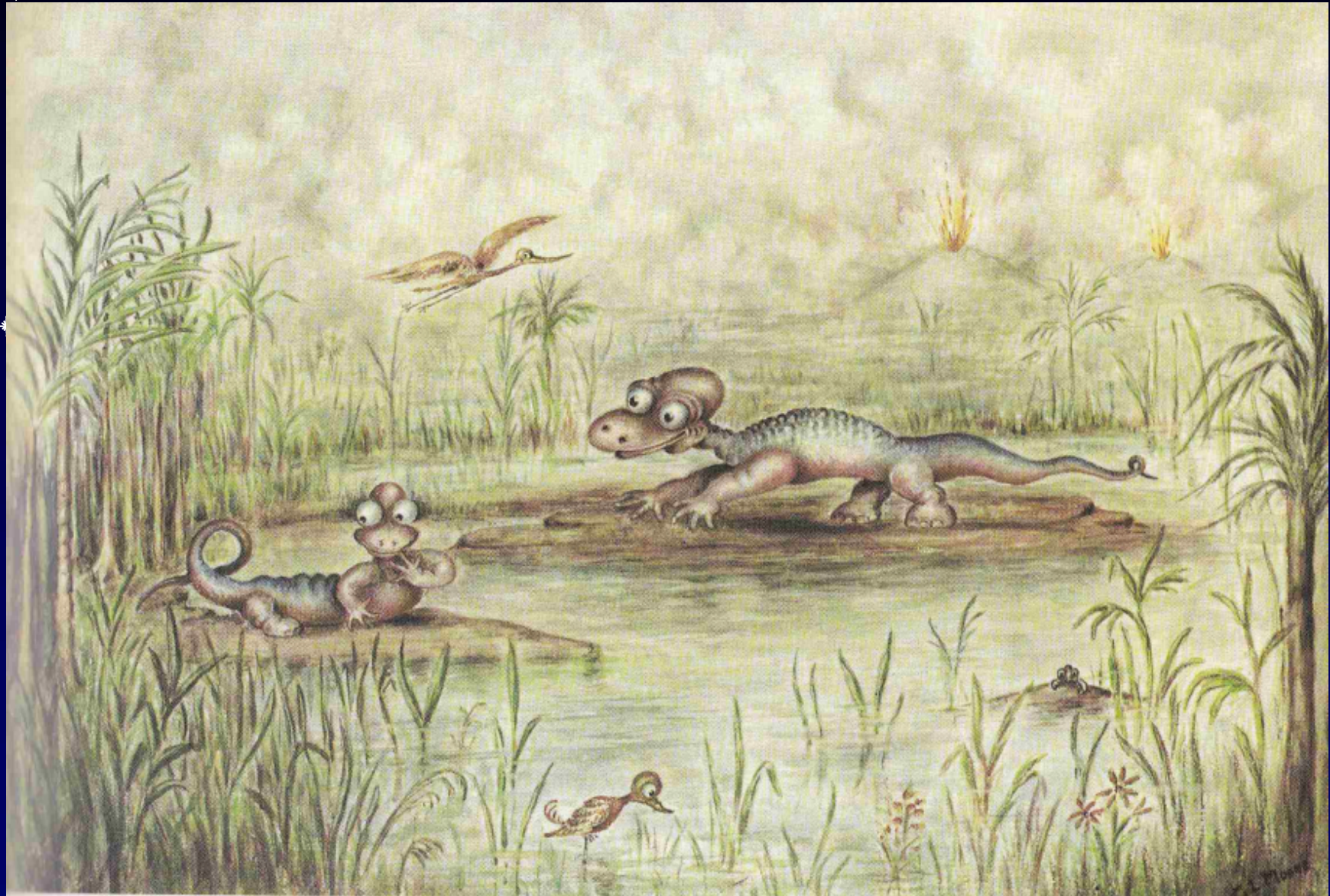
Life on Venus?

- It's known to be a short-lived gas, so in the quantities found on Venus, it must be being replenished by some process, as yet unknown.
 - Researchers have replicated or modelled all possible ways it might be produced under the pressure, temperature and chemical circumstances pertaining, all failed.
- The only cause left is that there's microbes floating in the Venusian clouds, somehow surviving in the toxic environment, i.e. **LIFE!**



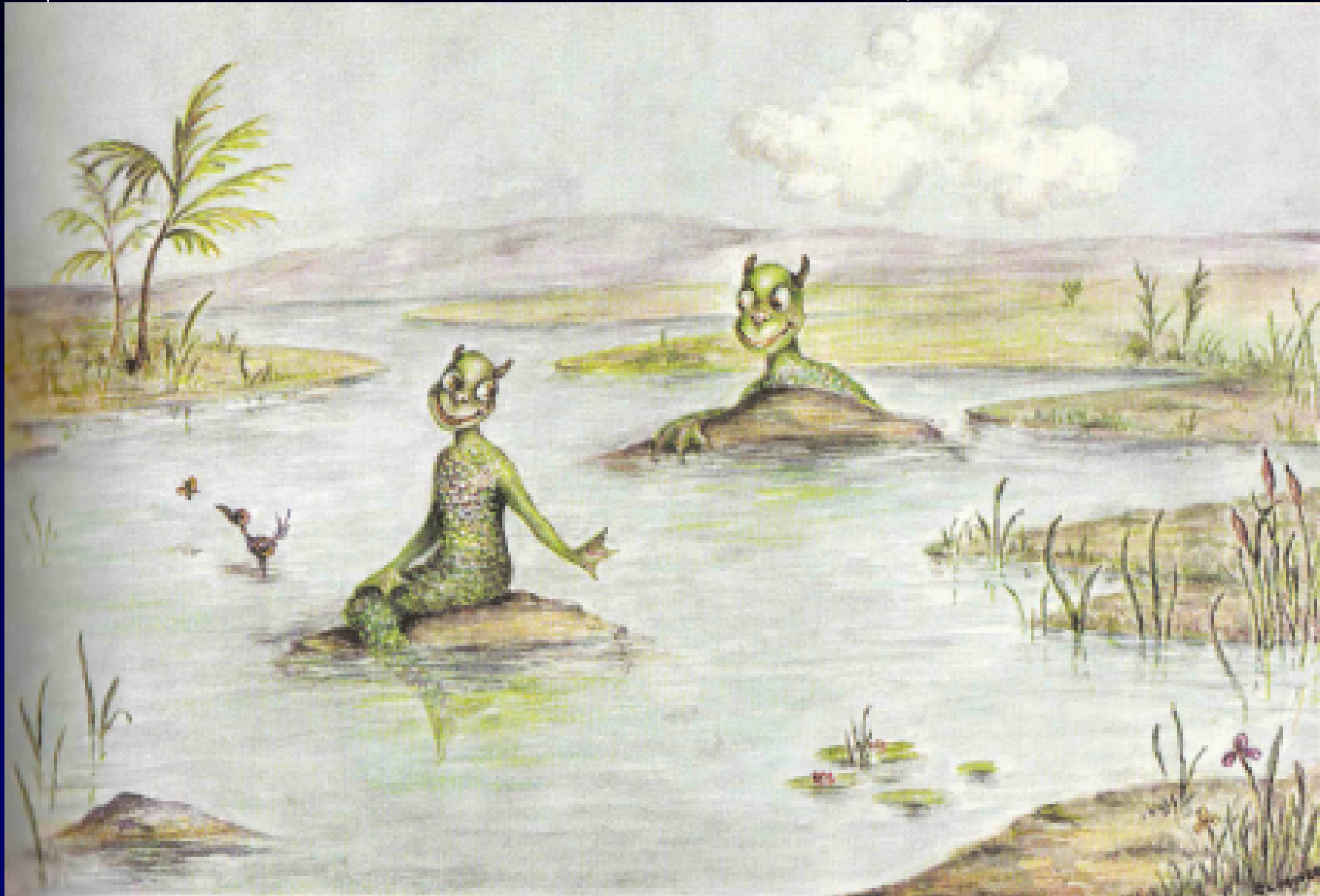
When you have eliminated the impossible, whatever remains, however improbable, must be the truth.

Life on Venus?



Watercolour by Gertrude Moore

Life on Venus?



Watercolour by Gertrude Moore

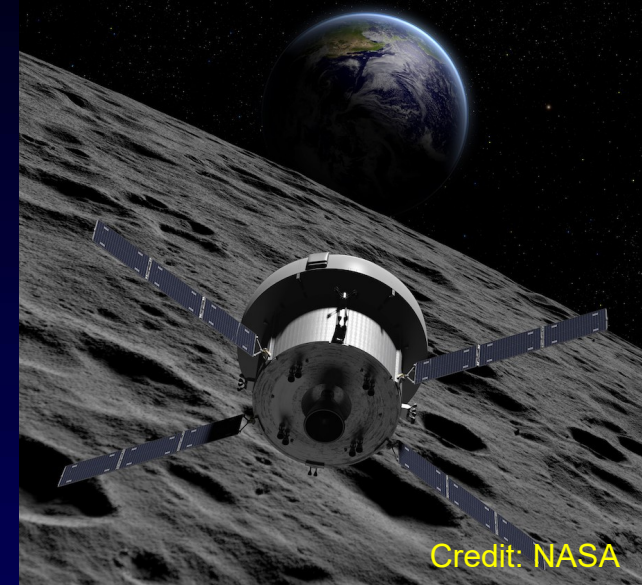
More sub-surface lakes found on Mars

- Two years ago ESA's Mars Express orbiter revealed signs of a large sub-surface lake of liquid water about 1.5k deep under Mars's Southern Polar Ice Cap
- Further studies have now confirmed that lake as being about 30k x 20k and also that it is surrounded by three other smaller bodies of sub-surface water
- For the water to be liquid it has to be exceedingly briny
 - at that depth there couldn't be enough heat from any volcanism to provide sufficient warmth to keep it liquid
- So is there perhaps a network of underground lakes?
- Target for future missions looking for the possibility of life



NASA Publishes Artemis Plan

- NASA has released its plan for the Artemis missions to the Moon
- The cost is \$28 B with \$3.2 B needed over next few months
- Congressional approval required
- Gateway will not be needed for first manned landing but essential for later missions setting up manned base near South Pole
- Artemis I: uncrewed 1 month mission to orbit Moon, 2021
- Artemis II: manned 10-day mission to loop the Moon, 2023
 - free return trajectory round Moon
- Artemis III: manned mission to land on Moon, Oct 2024
 - rendezvous in Lunar Orbit and dock with pre-positioned Lunar Lander then descend for one week stay, one male one female



Misc SpaceX News

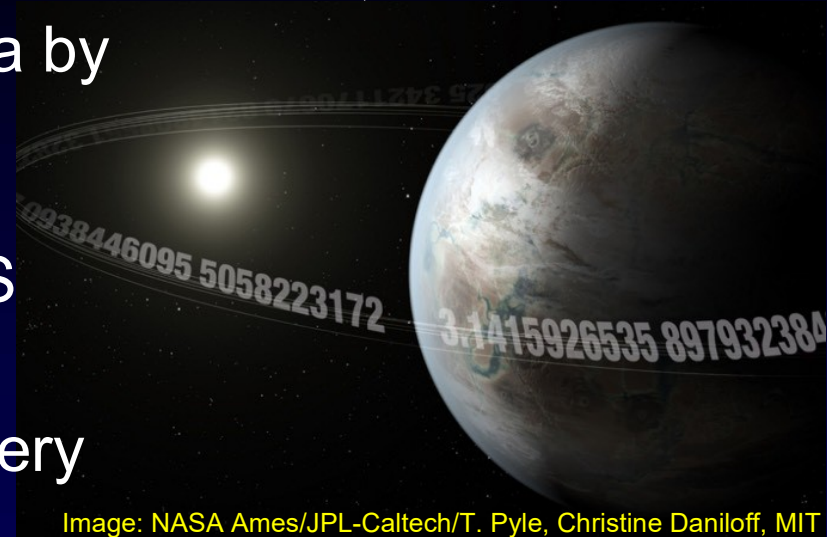
- One more batch of Starlinks launched
 - September 3rd but launch scheduled for 28th was scrubbed just one minute before launch because of bad weather
- Another 150 metre hop by Starship prototype
 - this time by SN6, identical to “flying grain silo” SN5
 - another prototype deliberately “popped” in pressure test
 - Musk states next hop will need nose cone and fins
- Axiom Space announces that first all private mission to ISS will take place in October 2021
 - using SpaceX Falcon 9 and Crew Dragon
 - ex-NASA astronaut Michael Lopez-Alegria will command mission with three fare paying passengers
- NASA announced yesterday that the next Crew Dragon mission to ISS has slipped back 8 days to Halloween

Misc Spaceflight News Items

- One Web are about to resume launching more of their broadband satellites following their acquisition by UK Gov't and an Indian telecomms company
 - 36 satellites will be launched using a Soyuz rocket with Fregat upper stage from Kazakhstan in December under a revised contract with Arianespace
 - the full constellation of 648 One Web satellites should be completed by end of 2022
- China launches mystery 'experimental reusable spacecraft'
 - Launch on Sept 4th was by Long March 2F
 - China's man-rated launcher
 - Secretive nature of launch indicates military aspect
 - thought to be perhaps like USAF's X-37B spaceplane
 - Spent two days in orbit then is believed to have landed at a military airbase

Planet Pi

- Initially discovered in 2017 data by the Kepler Space Telescope and recently confirmed as an exoplanet by the SPECULOOS ground-based network
- K2-315b orbits its star once every 3.14 days at 181,000 mph
- It's believed to be a terrestrial planet with a radius 95% that of Earth
- Its surface temperature is estimated at 176 degrees C
 - hot enough to bake a pie! 😊



✦ Intact Planet Discovered at White Dwarf

- ✦ • For the first time an intact exoplanet has been discovered orbiting a White Dwarf (WD 1856)
 - Discovery by NASA's TESS mission & Spitzer Space Telescope
 - 80 LY away WD 1856b is a Jupiter sized planet which orbits its parent star every 34 hours
 - The planet is seven times bigger than the star which is just 40% larger than the Earth
- A White Dwarf is produced when a Sun-like star swells into a Red Giant, throwing off most of its material then collapses into a compressed dense core, destroying most of its planets in the process. Any surviving planet that later approached its star would be torn to shreds by the intense gravitational field.
- Somehow this one has migrated in safely



Artists impression: Image: NASA Goddard Space Flight Centre

Largest Black Hole Merger

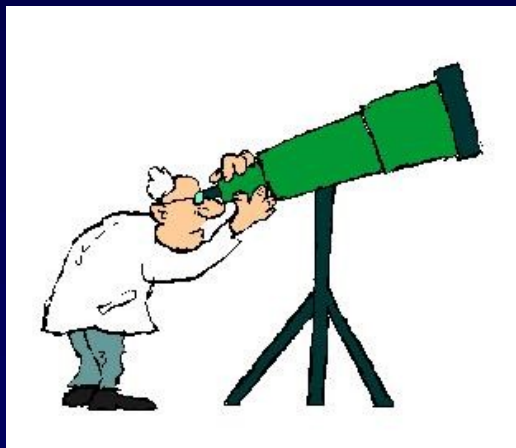
- On 1st Sept it was announced that the LIGO and VIRGO gravitational wave detectors recorded the largest merger yet seen of two black holes
 - the most distant observed
 - 7 billion light years
 - the most massive, at 142 Solar masses
 - components were 85 & 65 Solar masses each
 - 8x mass of our Sun was converted into energy inc. gravitational waves
- Up until now we've known about two classes of black hole, stellar mass (a few 10s Solar mass) and super-massive (millions of Solar mass) and an intermediate-sized black hole had been postulated but not found
- This provides the proof



Image: Mark Myers, ARC Centre of Excellence for Gravitational Wave Discovery (OzGrav).

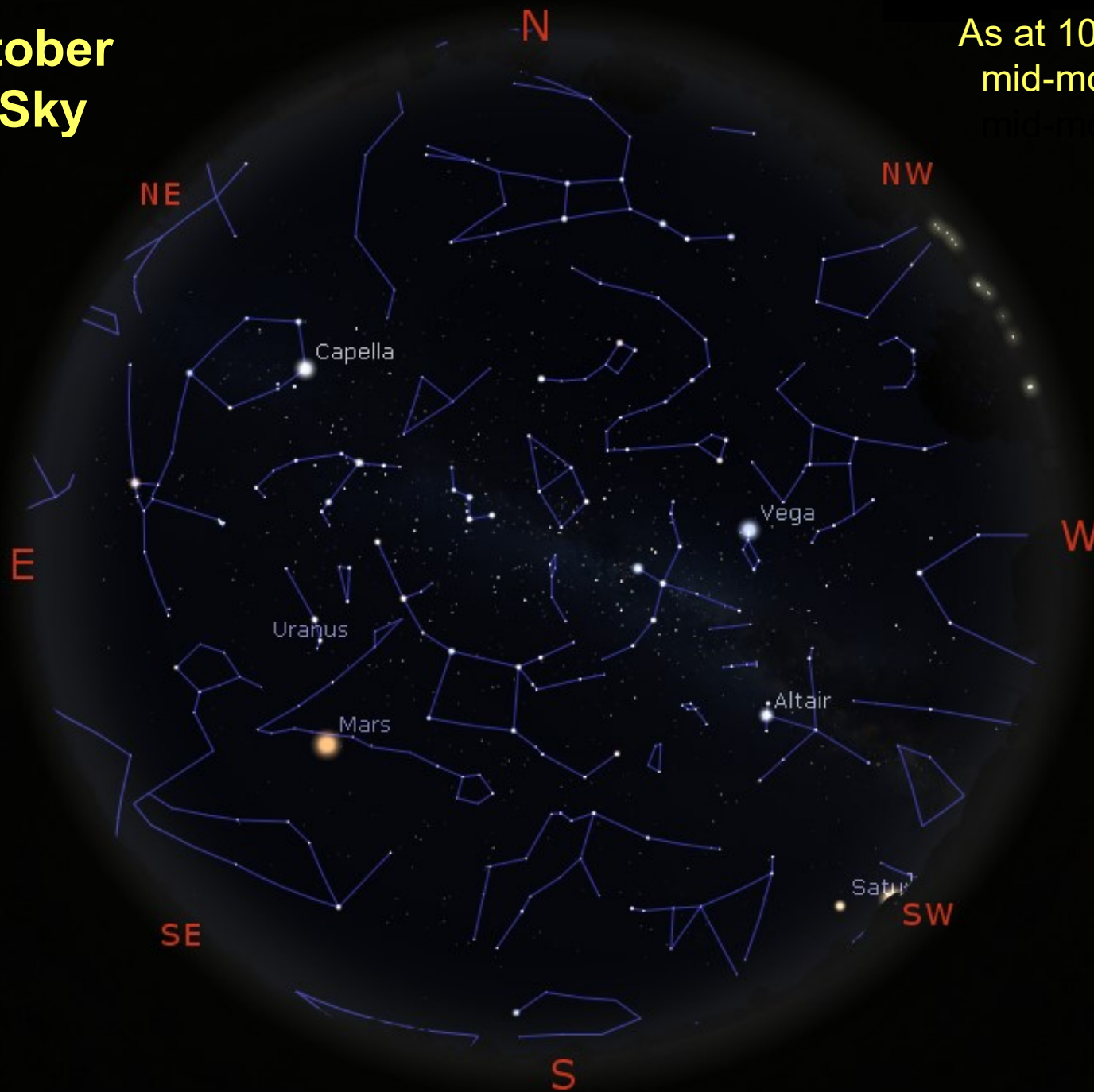
What's Up!

For October 2020



The October Night Sky

As at 10 p.m.
mid-month



Sun & Moon in October

- Full Moon 1st
- Last Quarter 10th
- New Moon 16th
- First Quarter 23rd

		Sun	Moon
1 st	Rise	06.03	19.01
	Set	16.39	07.19
15 th	Rise	07.26	05.05
	Set	18.08	18.04
31 st	Rise	06.54	16.55
	Set	16.36	07.34

What's Up - Planets

- Mercury

- Not visible this month

- Venus

- Venus is a spectacular morning object blazing away at magnitude -4.1 in the East.

- Mars

- At its best this month Mars is best seen when it culminates in the South about midnight. Now brighter than Jupiter at magnitude -2.6

What's Up - Planets

- Jupiter

- Brightest object in the South at nightfall, quite dominant at mag -2.2, low amongst the stars of Sagittarius. It remains in our evening skies all month, but dropping closer to the horizon as the month draws on.

- Saturn

- Following on behind Jupiter, i.e just to its East, low in the South as evening falls, at mag +0.8. Its rings are well presented, nicely open.






- Uranus

- Well positioned in the South

- Neptune

- Visible all night long, well placed.

Astronomical Phenomena in October

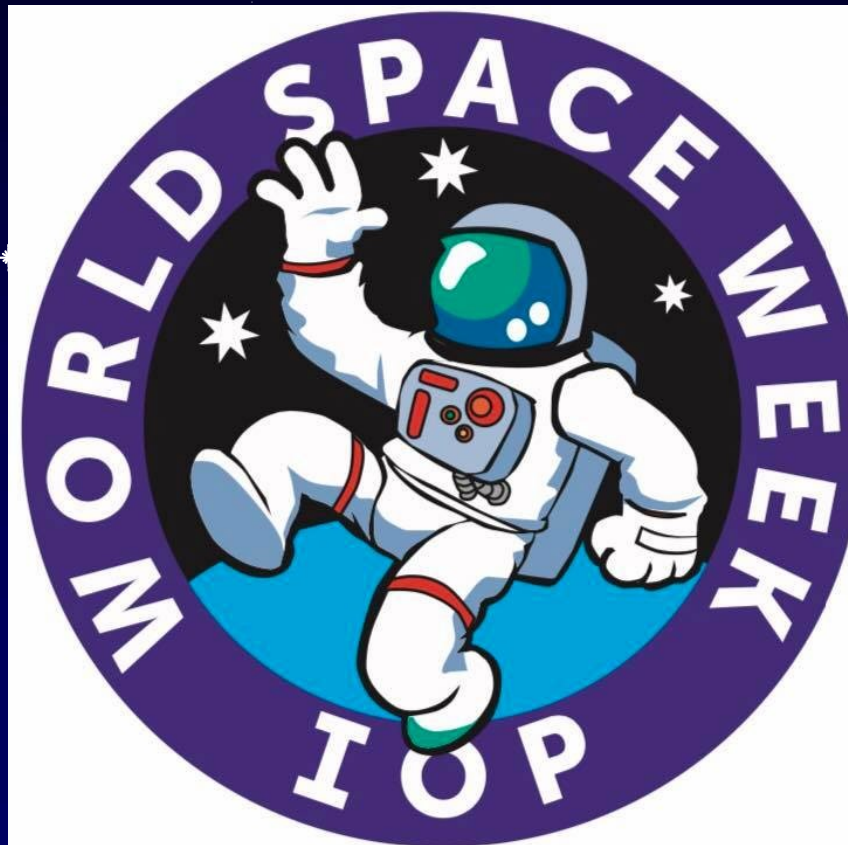
- **3rd** The Moon will be 1° from Mars before sunrise, also Venus is just 11.5' from the 1st magnitude star Regulus when they rise together about 03.30 hrs  
- **8th** Peak of the Draconid Meteor Shower. Theoretical max is only 10 per hour, but these are slow moving meteors so might be easier to spot.
- **14th** Before sunrise the Moon and Venus will make a nice pair, separated by just about 4° before sunrise 
- **20th** Peak of the Orionid Meteor Shower, theoretical max of 25 per hour
- **22nd** The Moon is just 4° from Jupiter 
- **29th** The Moon is just 4° from Mars 

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.waltonastrogroun.co.uk/>

World Space Week Virtual TakeOver

Institute of Physics, South Central Branch



World Space Week: 4th - 10th October

- World Space Week is a UN declared international space event, covering all aspects of spaceflight and astronomy
 - 4th October is the anniversary of the launch of the world's first ever satellite, Sputnik 1, in 1957.
- Last year there were 8,000+ events in 96 countries, including one in Guildford
- This year all the events will have to be on-line, but plenty of interesting things are planned
 - Organised by local branch of Institute of Physics with support from University of Surrey's Physics Dep't, MSSL, Surrey Satellites Ltd, Guildford AS, etc

World Space Week Virtual TakeOver

Institute of Physics, South Central Branch

Date & Time	Talk	By
4th October 1.00 - 2.00 pm	Live Solar Viewing Setting up an astronomical telescope	Members of Guildford Astronomical Society
4th October 3.00 - 4.00 pm	Radiation Protection – how to survive a journey to Mars	Dr Elizabeth Cunningham
4th October 5.00 - 6.00 pm	Sputnik in Context	John Axtell FRAS
8th October 5.00 - 6.00 pm	To c or not to c - Physics in Science Fiction Writing	David Wilkinson

Meetings & talks on-line

- You might find this free Zoom session of interest:
 - *“The Interpretation of Astronomical Images”*
 - Wednesday 14th October at 7.00 - 8.00 pm
 - Adam Block, leading US Astroimager
 - <https://www.britastro.org/node/24215>
 - (This will also be available via BAA's YouTube Channel, as are previous talks)

Meetings & talks on-line

- Another free Zoom session:
 - Royal Astronomical Society: Public Lecture (Zoom webinar)
 - *“ExoMars PanCam and Planetary Protection”*
 - Tuesday 13th October at 1.00 pm
 - Anna Nash, Mullard Space Sciences Centre
 - <https://ras.ac.uk/events-and-meetings/Public-Lectures-and-Events>
 - (book via Eventbrite)

Meetings & talks on-line

- Another free Zoom session:
 - Society for Popular Astronomy: Zoom webinar
 - *“Exploring an Ever-changing Universe”*
 - Saturday 31st October at 2.00 pm
 - Prof Andy Newsam, Liverpool John Moores University
 - https://www.popastro.com/main_spa1/meetings-and-events/forthcoming-meetings/
 - (also be available via SPA's YouTube Channel)

Meetings & talks on-line

- You can also pay £3.00 to watch these on-line talks run by GoSpaceWatch: (book via Eventbrite)
 - **“Persephone: Pluto System Orbiter and Kuiper Belt Explorer”**
 - Dr Carly Howett, (Principle Investigator of Persephone) Southwest Research Institute, Boulder, Colorado. USA
 - Wednesday 7th October, 7.30 - 9.30 pm
 - **“My Journey Into Astrophotography”**
 - Roger Hyman
 - Wednesday 21st October, 7.30 - 10.00 pm
 - www.gospacewatch.co.uk/

Astronomy on TV

The Sky at Night

“Beyond The Visible”

- This month the team find out how astronomers are learning about the Universe by looking beyond visible light. Exploring radio astronomy, the unusual sounds that space missions have captured of the cosmos and the detection of ripples in space-time known as gravitational waves, this episode is about how so much more can be detected by studying the unseen.

Sunday

11th October

BBC 4, 10.00 pm

Thursday

15th October

BBC 4, 7.30 pm (tbc)

NB this episode was originally scheduled for September, but was replaced by the special programme about phosphine on Venus



"That's all Folks!"