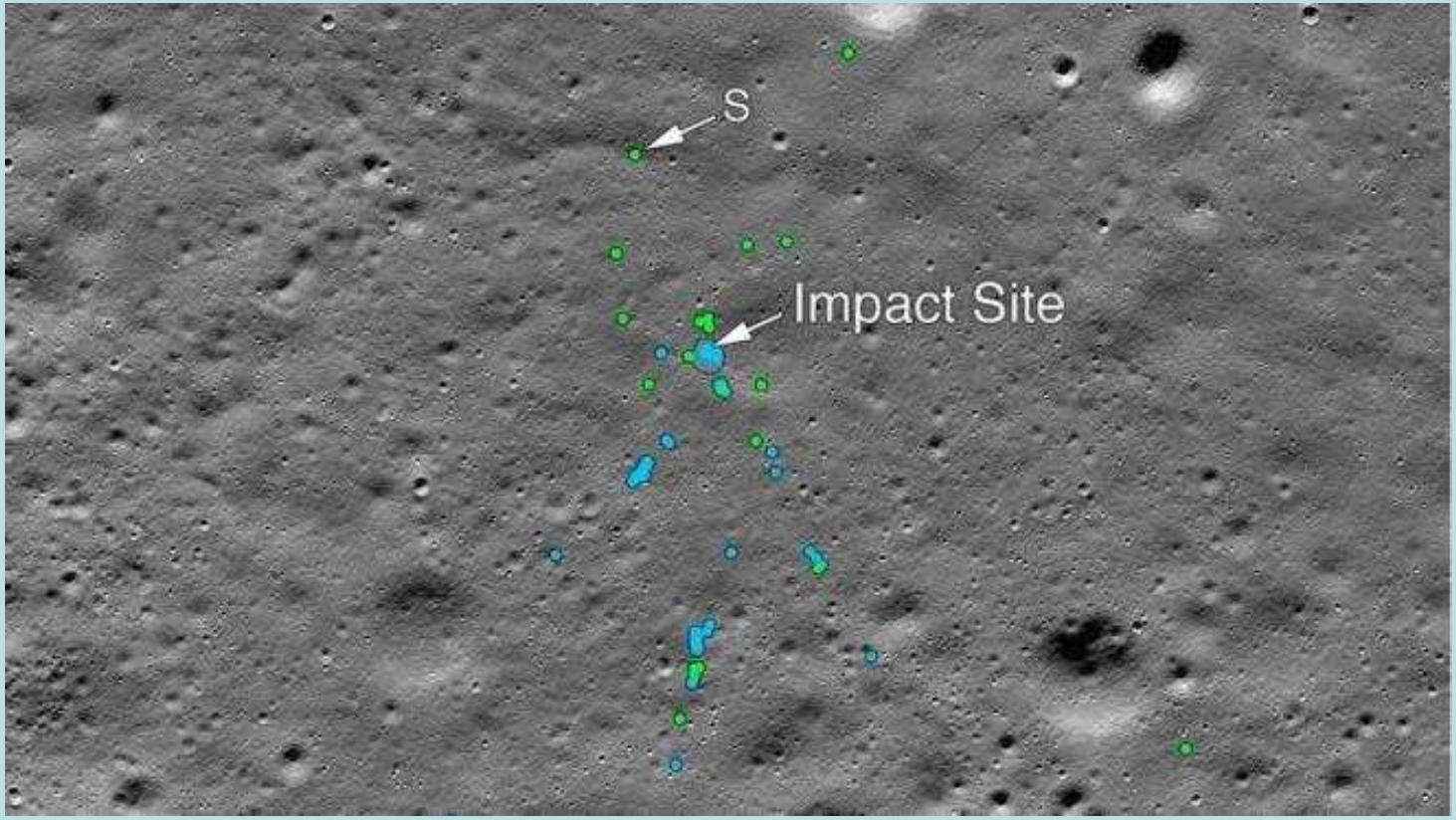
Space News

looking back over

December 2019

Chandrayaan-2: Debris found



3rd Dec: NASA says one of its satellites has found the debris of India's Moon rover which crashed on the lunar surface in September. They released a picture showing the site of the rover's impact and the "associated debris field".

Nasa has credited an Indian engineer, Shanmuga Subramanian, with helping locate the site of the debris. See BLUE marks above…

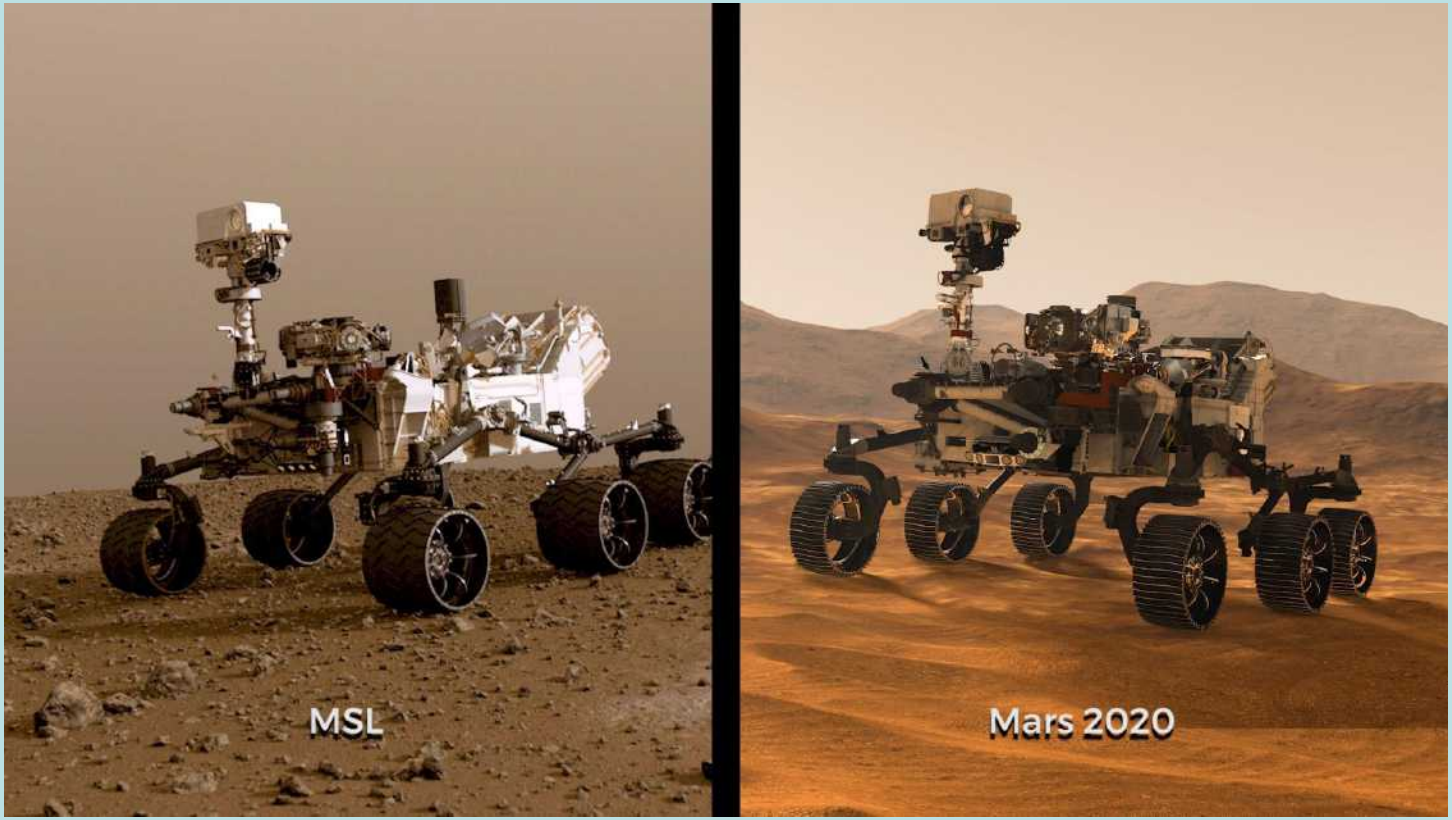
How Bright is the Moon?

6th Dec: It is difficult to measure the absolute brightness of the Moon as the reflected sunlight varies with the surface and phase. Our atmosphere also gets in the way. A flying telescope recently captured some of the most accurate measurements ever. Our best measurements are accurate to only 3% to 5% but researchers would prefer to see that uncertainty reduced to less than 1% as a reference used by earth-observing satellites.

PSP Approaches the Sun

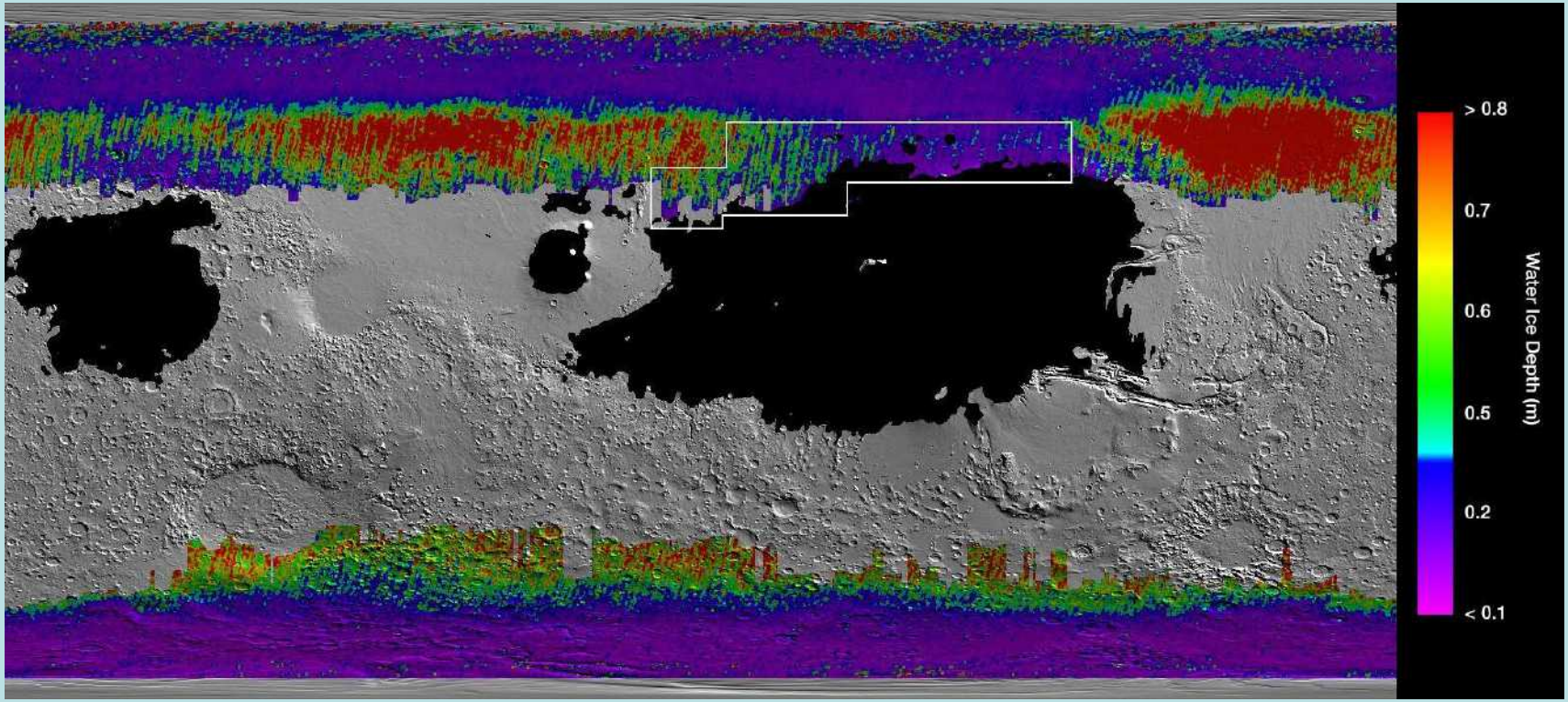
9th Dec: NASA launched the “Parker Solar Probe” in 2018. It is looping its way towards the Sun and is now within the orbit of Mercury. Its instruments are producing fascinating results, showing that the region near the Sun is very complex – both magnetically and energetically with a variable solar wind. The YouTube video here is a view looking ‘sideways’, with the corona on the left.
https://www.youtube.com/watch?v=7w8szZ4TxCk

New Year – New model



10th Dec: Curiosity won't be NASA's only active Mars rover for much longer. Next summer, **Mars 2020** will be headed for the Red Planet. Although the newest rover borrows from Curiosity's design, they aren't twins, each has its own role in the ongoing exploration of Mars and the search for ancient life. The new model is heavier by ~125kg, with 23 cameras versus 17, most using colour. Its wheels are improved and stronger to cope with sharp rocks.

Where to Land a Human mission on Mars?

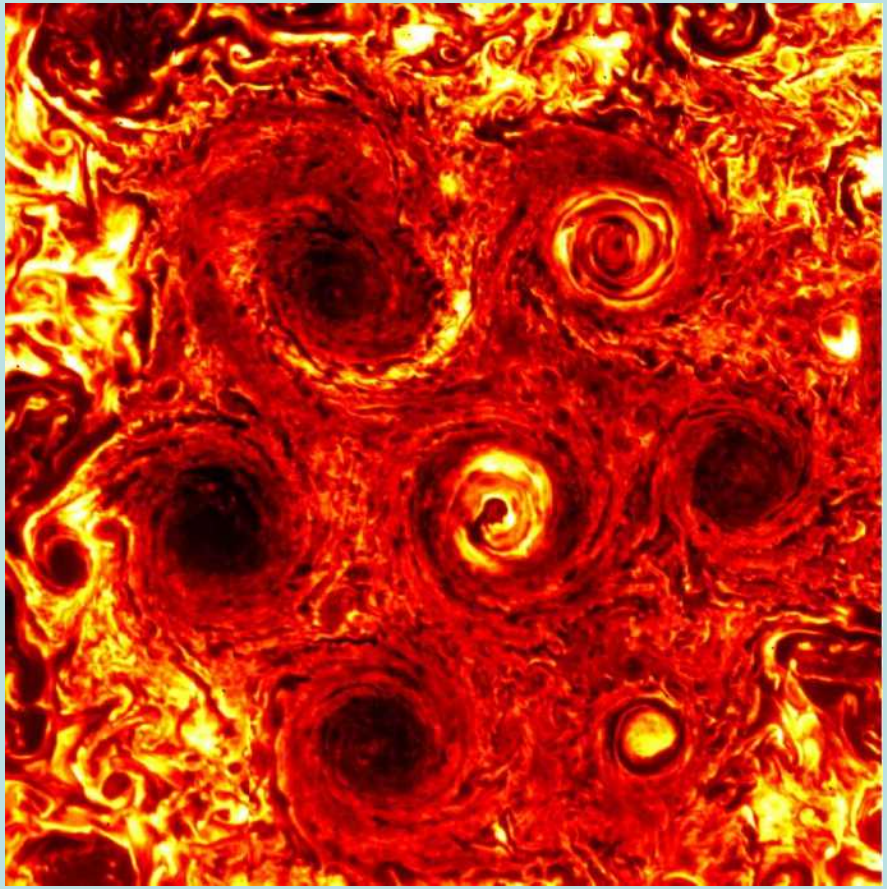


10th Dec: This coloured map shows underground water ice on Mars. Cool colours represent ice less than one foot below the surface; warm colours are over two feet deep. Black zones on the map represent areas where a landing spacecraft could sink into fine dust. The outlined box represents the <u>ideal region</u> to send astronauts for them to be able to dig up water ice.
They'll have to take their own champagne…

What secrets could Venus reveal?

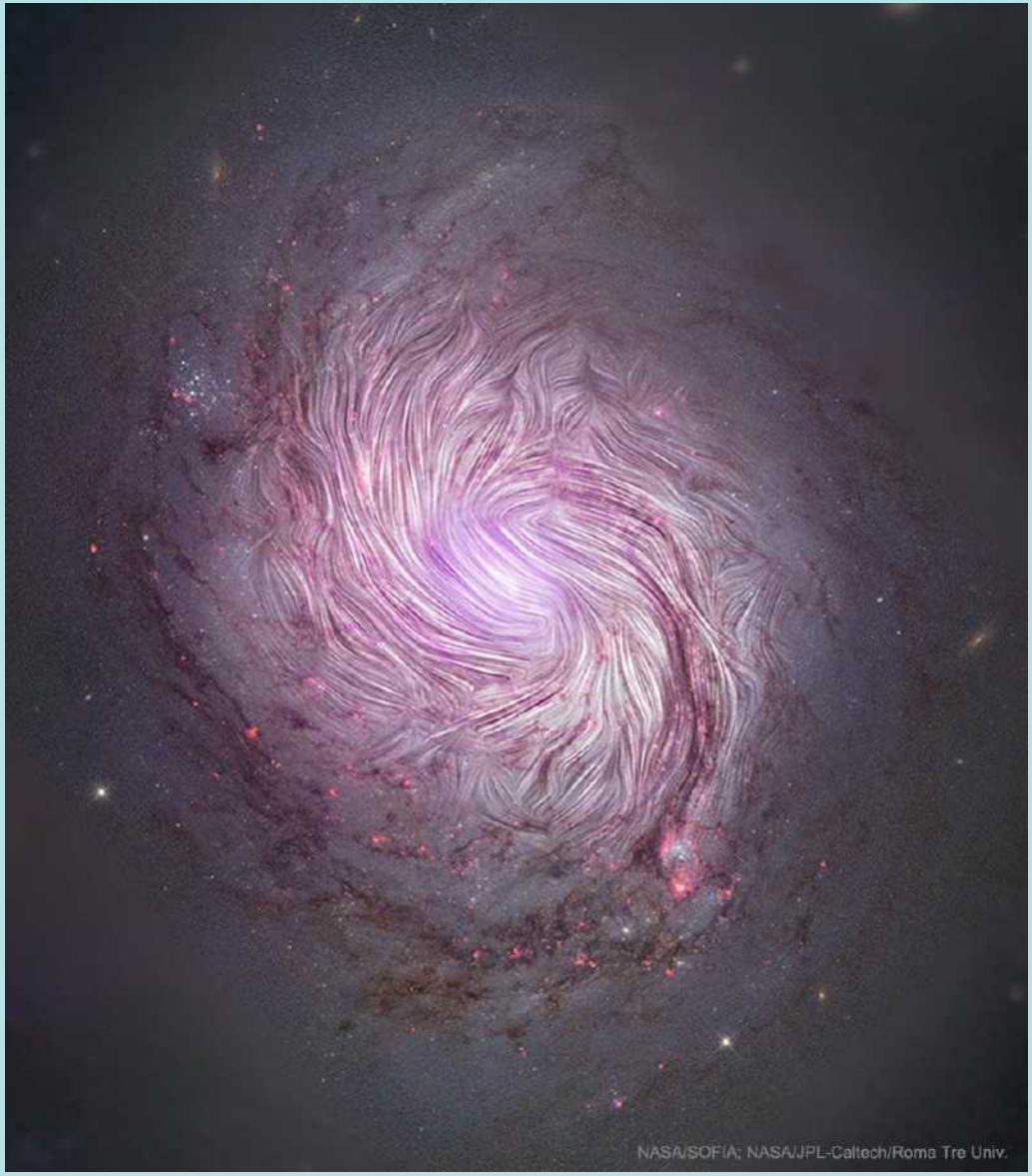
11th Dec: Venus has not been visited since the **Magellan** spacecraft of 20yrs ago. This revealed a hellish landscape: a young surface with more volcanoes than any other body in the solar system, gigantic rifts, towering mountain belts and temperatures hot enough to melt lead. Now superheated by greenhouse gases, Venus' climate was once similar to Earth's, with a shallow ocean's worth of water. How did it get this way?

Jupiter’s new Cyclones monitored by Juno



12th Dec: A new, smaller cyclone can be seen at the lower right of this infrared image of Jupiter's **south** pole taken on Nov 4th during the 23rd science pass of the planet by NASA's Juno spacecraft. This image was captured by Juno's Jovian Infrared Auroral Mapper (JIRAM) instrument, which measures heat radiated from the planet at an IR wavelength of around 5μm.

The Magnetic Fields of Spiral Galaxy M77



16th Dec: NASA's SOFIA flying observatory has a new telescope which can observe polarised light from distant objects.

The lines here show how dust grains in galaxy M77 are aligned with the local magnetic field. The spiral arms of the inner galaxy can be seen here, where dust and gas are pulled in by gravity.

The image is superposed over a diffuse X-ray image from NUSTAR and visible images from Hubble and the Sloan Sky Survey.

CHEOPS spacecraft launched to study exoplanets

18th Dec: The ESA **Cheops** space telescope was launched to study planets outside our Solar System. The observatory will follow up the discoveries of previous missions, endeavouring to reveal fresh insights on the nature of distant worlds: What are they made of? How did they form? And how have they changed through time? The telescope was put into orbit from French Guiana by a Russian Soyuz rocket.

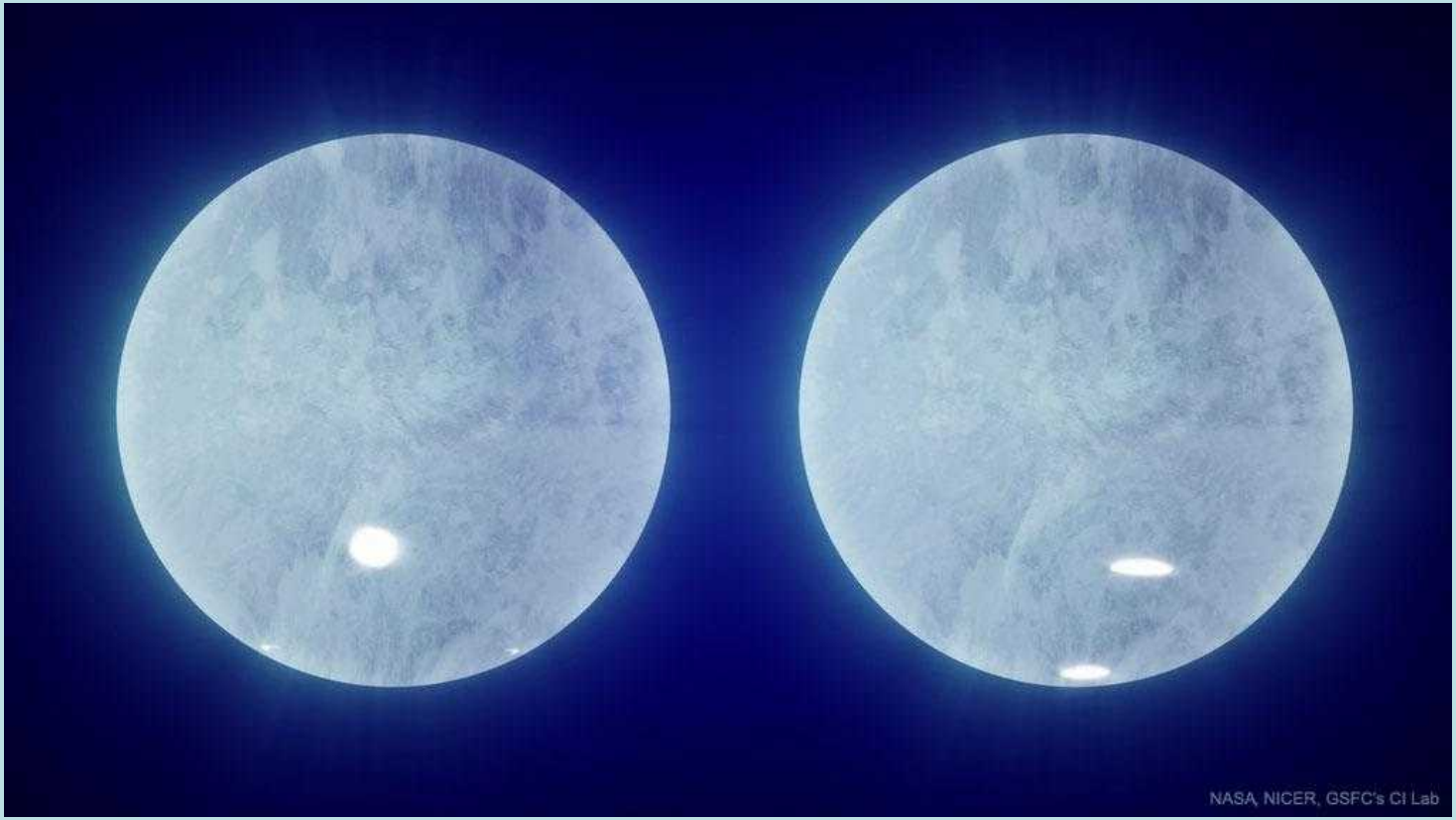
Young IoM Astronomers get to name star and planet

17th Dec: A star and planet will be given **Manx Gaelic** names for the first time after being chosen in an international competition.

The star WASP-13 in *Lynx* will be known as **Gloas** (which means 'to shine') and the planet WASP-13b as **Cruinlagh** ('to orbit').

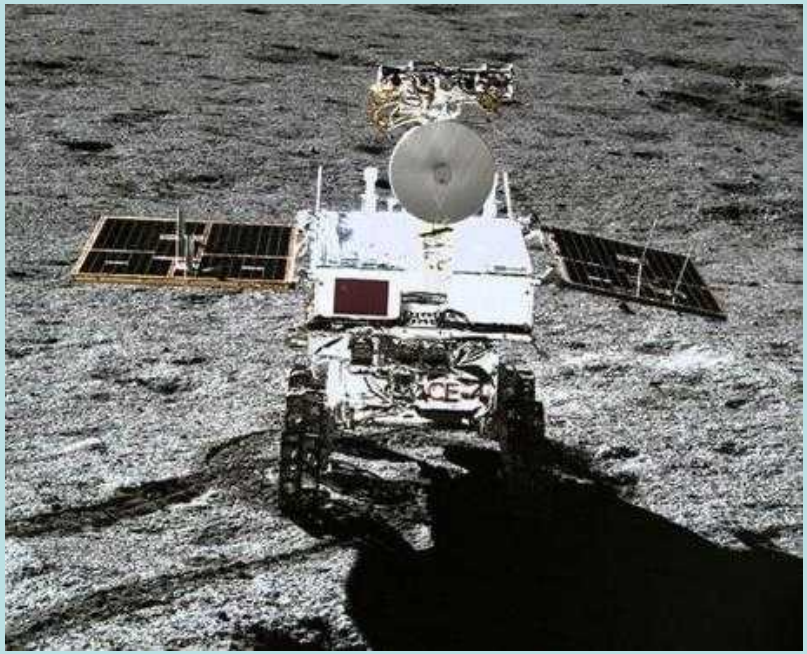
A class of Manx eight and nine-year-olds came up with the names for a competition run by the International Astronomical Union (IAU).

Neutron stars now ‘imaged’

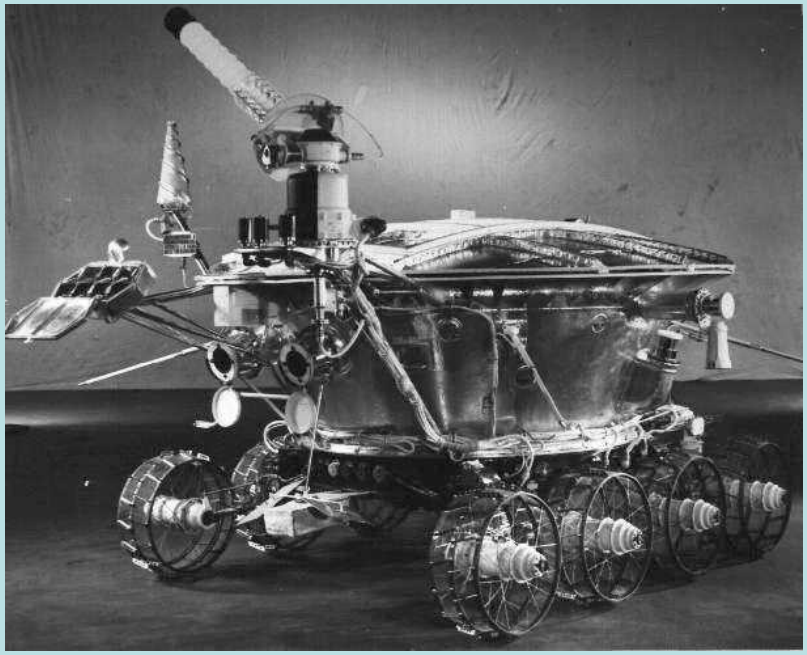


18th Dec: The first maps of the locations and sizes of hotspots on a neutron star's surface have been made by carefully modelling how the rapid spin makes the star's X-ray brightness rise and fall. An illustrative map of pulsar J0030+0451's hotspots is pictured, with the rest of the surface filled in with false patchy blue. J0030 spins once every 0.0049 seconds and is located about 1000 light years away.

China’s Lunar rover sets new record



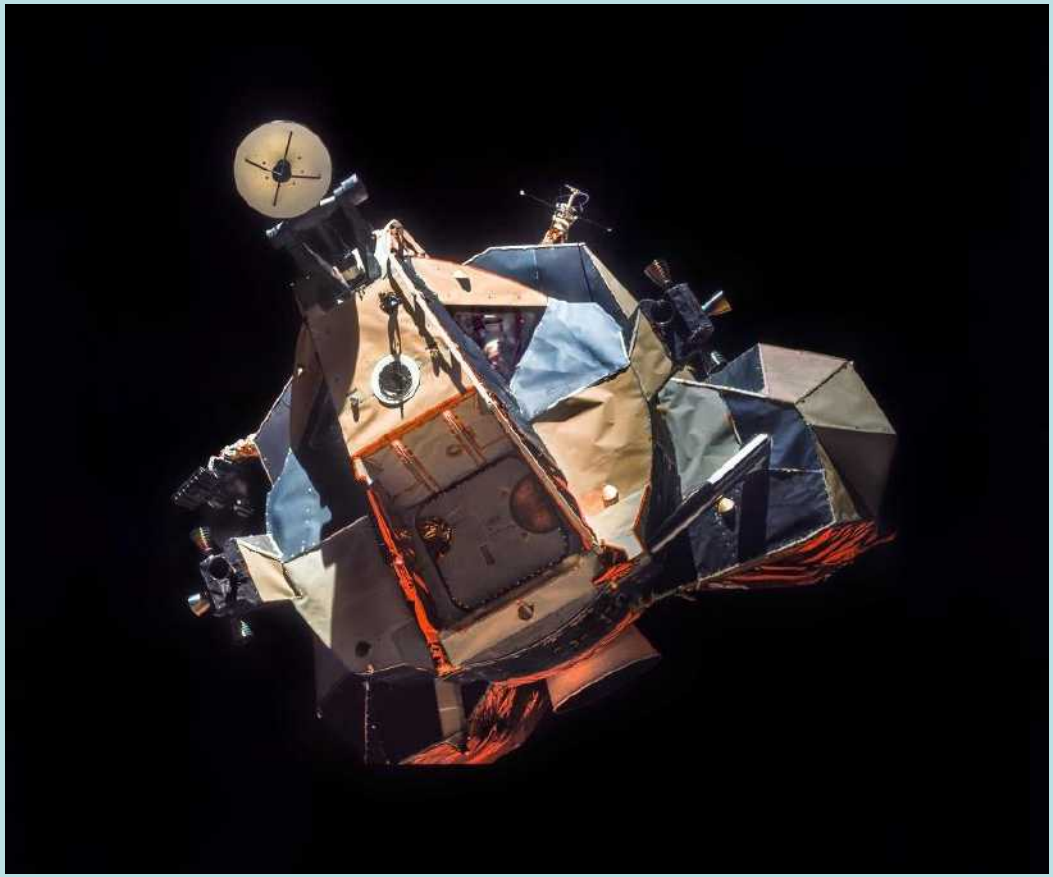
Yutu 2



Lunokhod 1

18th Dec: China’s farside lunar rover Yutu 2 has set a new record for working on the surface of the moon. It has just passed the previous record set by the Soviet Union's Lunokhod 1 rover. Lunokhod 1 was the first roving remote-controlled robot to land on another world, operating in the Sea of Rains starting on Nov 17th 1970. Lunokhod 1 operations officially ceased about 10½ months later. So far Yutu 2 has covered over 1,132 feet on the surface.

47 years ago – the last Apollo

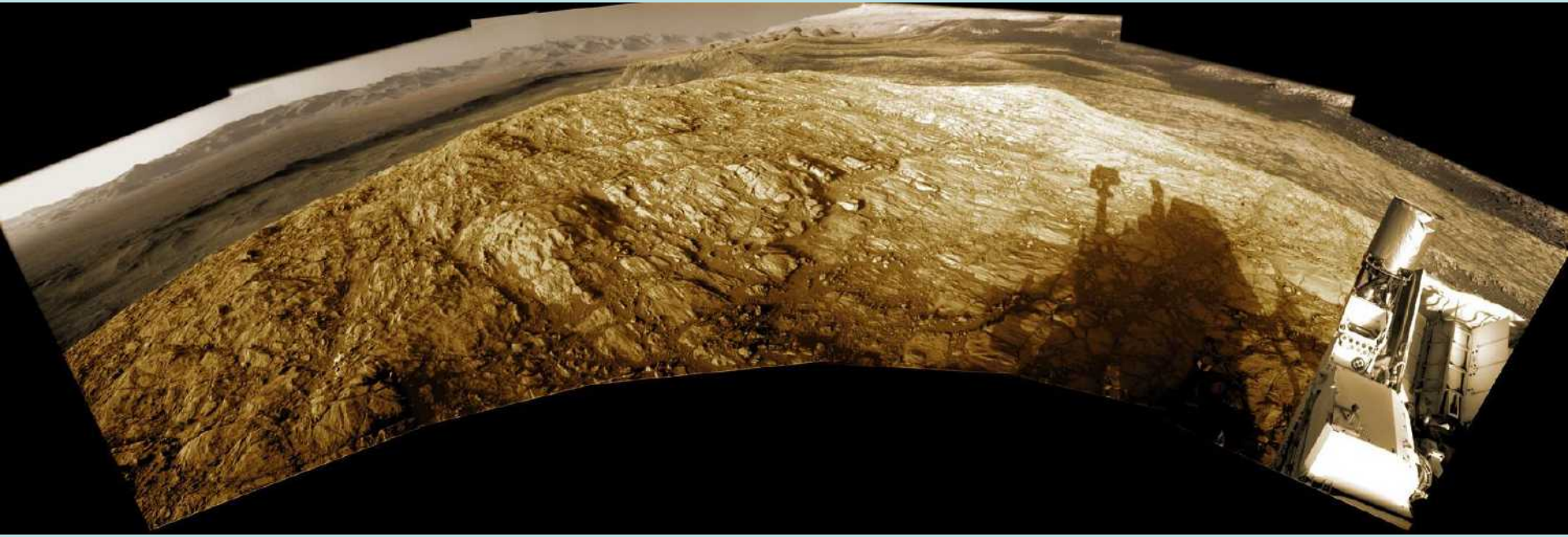


19th Dec: Here is “Challenger” the last of the Apollo lunar modules from the **Apollo 17** mission approaching the command/service module in lunar orbit on 15th December 1972. After the transfer of the last 2 astronauts to walk on the moon and their rock samples, it was fired into the moon’s surface close to the landing site. Mission commander Gene Cernan can be seen through the triangular window.

Boeing Starliner capsule fails to complete mission

20th Dec: The Boeing company had to cut short the unmanned demonstration flight of its new astronaut capsule. The Starliner launched successfully on its Atlas rocket from Florida, but then suffered technical problems. It appears the capsule burnt too much fuel as it fired its thrusters, leaving an insufficient supply to complete its planned mission. Starliner returned to Earth on Sunday 22nd.

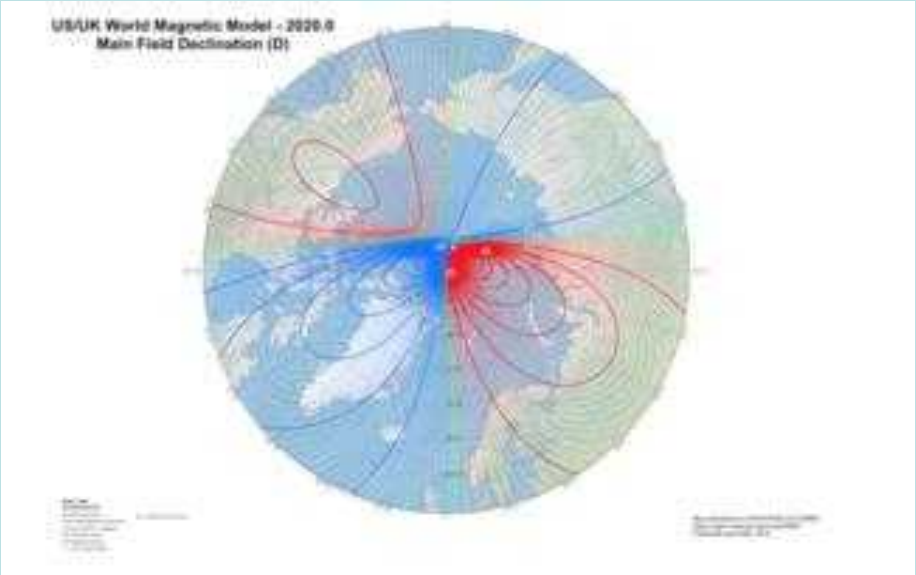
Late afternoon on Mars – Teatime?



North East South

16th Dec: This panorama covers 200 degrees of view from Curiosity's navcam. This was **sol 2616** in mission time. The peak of Mount Sharp lies to the south-east.

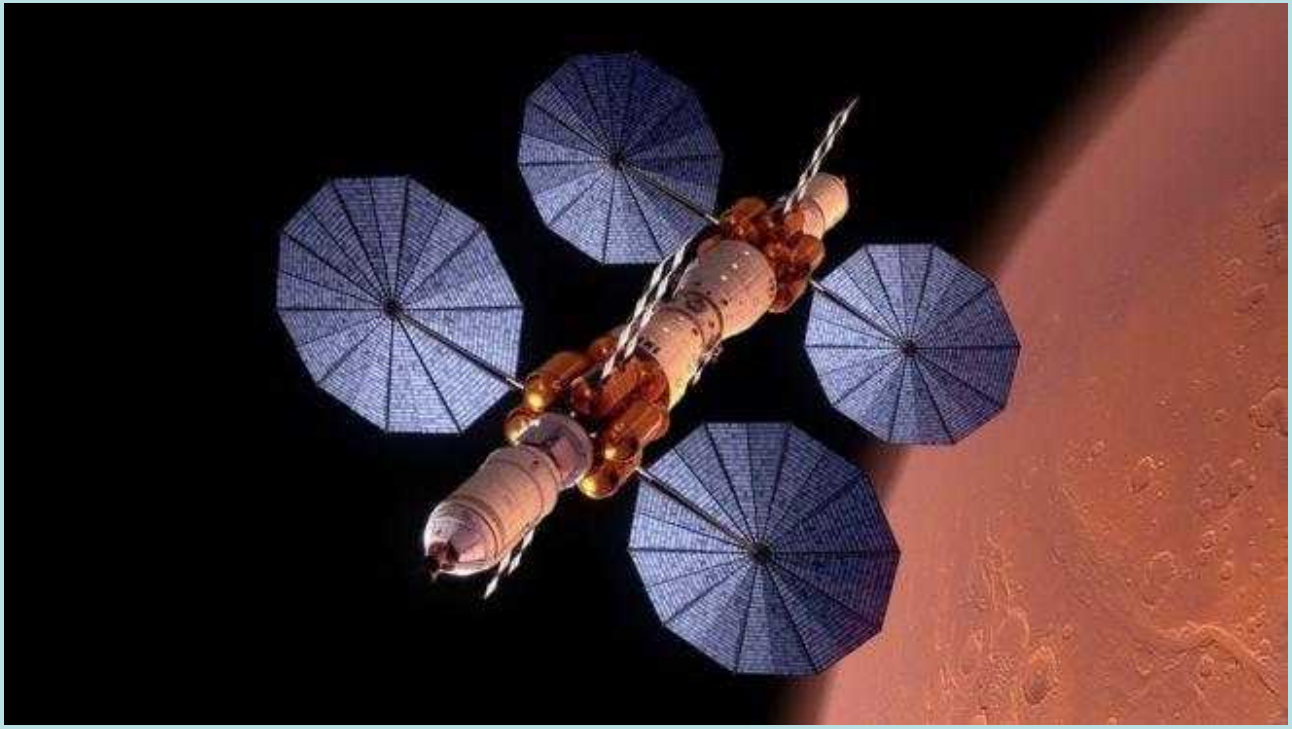
Magnetic Pole continues to move ‘east’…



23rd Dec: A new version of the World Magnetic Model (WMM) has been released. Developed by NCEI and the British Geological Survey, with support from CIRES, the WMM is a representation of the planet’s magnetic field to give compasses dependable accuracy.

Smartphone and consumer electronics companies rely on the WMM to provide consumers with accurate compass apps, maps, and GPS services for location and navigation.

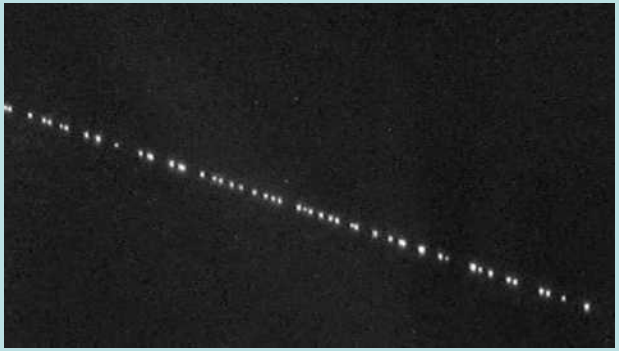
Regular Mars trips will need SPEED

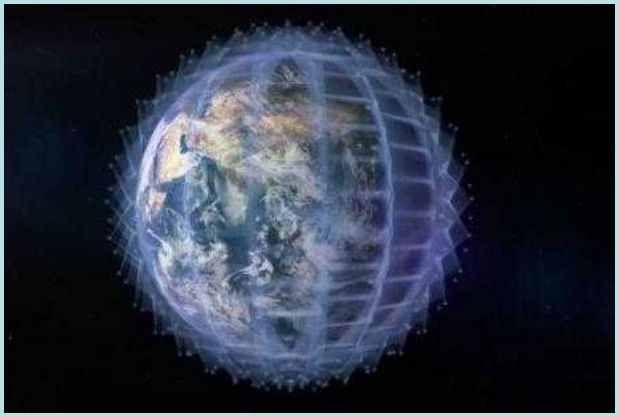


Proposed Mars orbiting base station

25th Dec: The distance to Mars ranges between 54 - 400 million km. At present the chemical engines we have take a minimum of 9 months. Regular trips will need to have engines that go much faster or astronauts will waste 1½yrs in transit doing nothing (or very little). Proposals include solar electric, nuclear thermal electric or electric ion propulsion. Several companies are experimenting with these technologies. *(No wormholes?)*

Satellite constellations polluting our skies





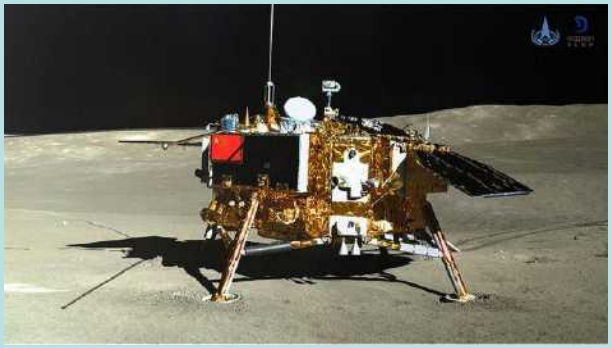
Starlink Trails over Brazil (+ Meteor)

27th Dec: Astronomers are warning that their view of the Universe could be under threat. From this month a campaign to launch <u>thousands</u> of new satellites will begin in earnest, offering high-speed internet access from space.

The first fleets of these spacecraft, which have already been sent into orbit by SpaceX, are affecting images of the night sky. They are appearing as bright white streaks, competing with the stars. Other companies will launch more…

Some of the best space images of 2019







30th Dec: These are some of the popular images of the year. You may have your own favourites.

For the year ahead, download the APOD Calendar 2020
https://apod.nasa.gov/apod/image/1912/ApodCalendar2020v5.pdf
For best quality, print at ‘best’ on A3 or A4.

Send anything interesting you spot during January to:

michael@held.org.uk