Space News

looking back over

March 2019

Is the ESA Rover fit for work on Mars in 2021?

March 1st: Rovers are versatile explorers on the surface of other planets, but they do need some *training* before setting off. A model of the **Rosalind Franklin** rover that will go to Mars in 2021 has been scouting the Atacama Desert, in Chile, following commands sent from mission control in the United Kingdom, over 11,000 km away (Harwell).

The rover is equipped with a set of cameras and proxy instruments, such as a radar, a spectrometer and a drill, to replicate its martian operations.

‘Unmanned’ Dragon visits ISS briefly

Take-off

Docking

“Hello-there”

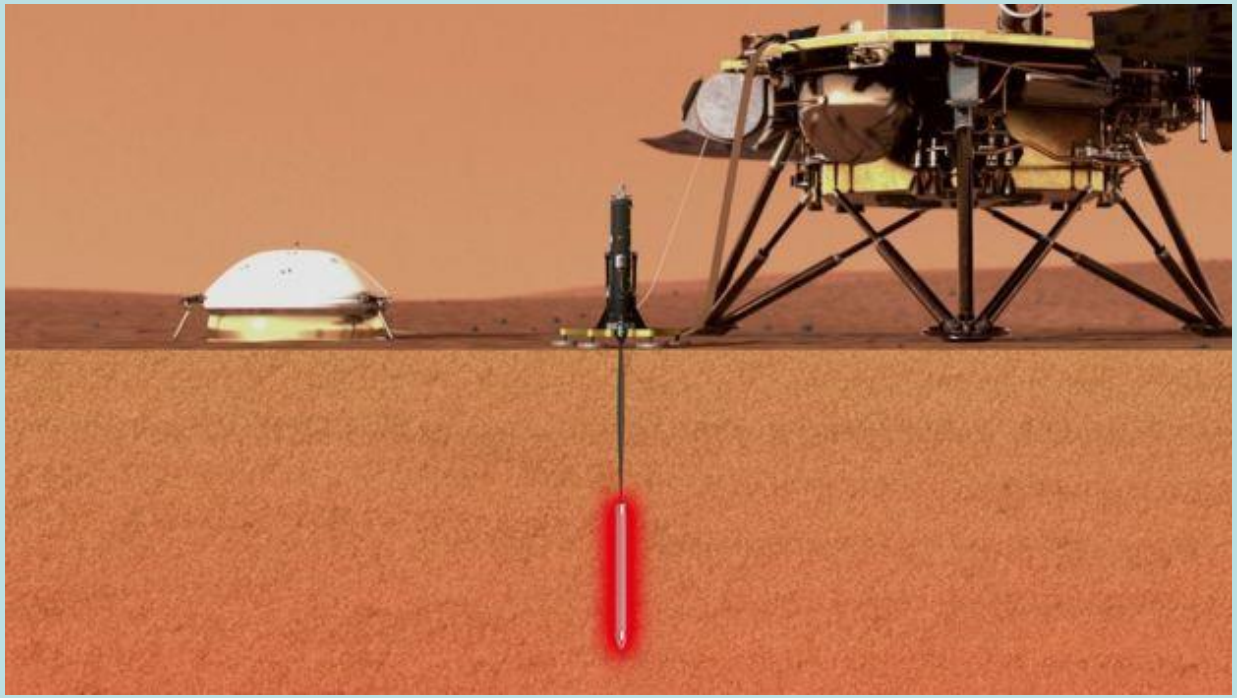
Coming Down…

Recovery

“You’ve left me behind!”

2nd-8th March: The SpaceX **Crew Dragon** capsule made a brief test visit to the ISS. This included automated approach and docking with the space station, with delivery of some 400lbs of equipment. A fluffy ‘earth’ toy was left aboard, but the ‘crash-test-dummy’ called Ripley returned to earth – to show what forces it had to endure during the trip. The first real use of the Crew Dragon may be later in the summer.

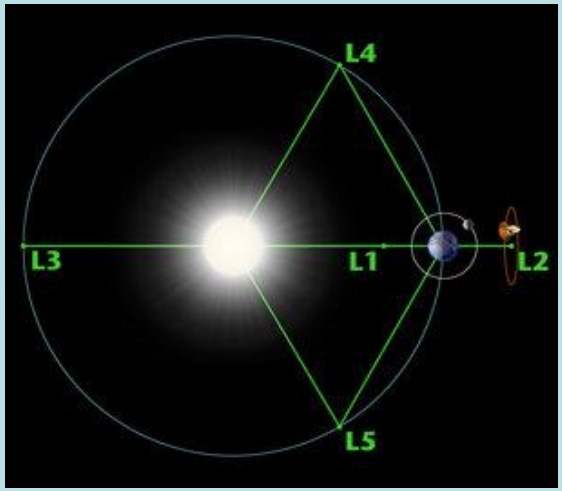
Insight's Mole hits a Stone ??



"Ouch! – My poor little nose!"

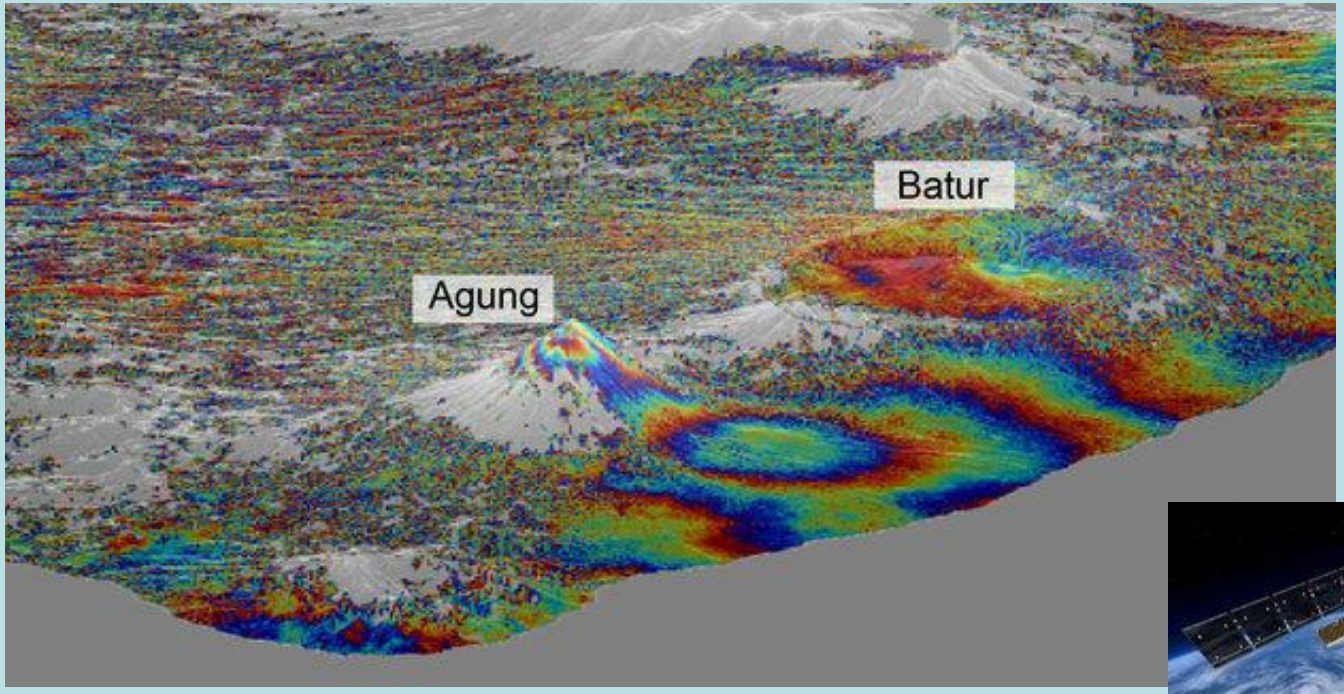
March 5th: The underground probe or 'Mole' was stopped from hammering itself into the martian soil when it appeared to have hit a solid object – some kind of stony obstruction. This caused a tilt of about 15º at less than 50cm below the surface. The target depth is 5m, but a delay of several weeks will be needed to consider the next steps. If it can eventually get to 3m some useful science can be done.

ESA ‘Space-Weather’ mission to Monitor Solar Excesses



5th March: ESA is planning the Earth’s first dedicated space weather observatory to warn of potentially harmful turbulence in our parent star. Like a referee in football, the **Lagrange** spacecraft will be able to observe both the Sun and Earth as well as the space in between. Based in orbit around Lagrange point L5, it will still have to be well-protected from solar coronal mass ejections so that it can keep working from 90m miles away. Today’s solar observer, the ESA-NASA **SOHO** spacecraft is located at L1.

Copernicus Sentinel-1 Radar links Volcano Plumbing



Agung and Batur are linked by 'magma pipes'

When Mount Agung in Indonesia erupted in 2017, the search was on to find out why it had stirred. Thanks to data on surface deformation from the two Copernicus Sentinel-1 orbiters, scientists now have more insight into the volcano's hidden secrets. Sentinel spacecraft use remote sensing technique of interferometric synthetic aperture radar, or InSAR, where two or more radar images over the same area are combined to detect tiny surface changes.

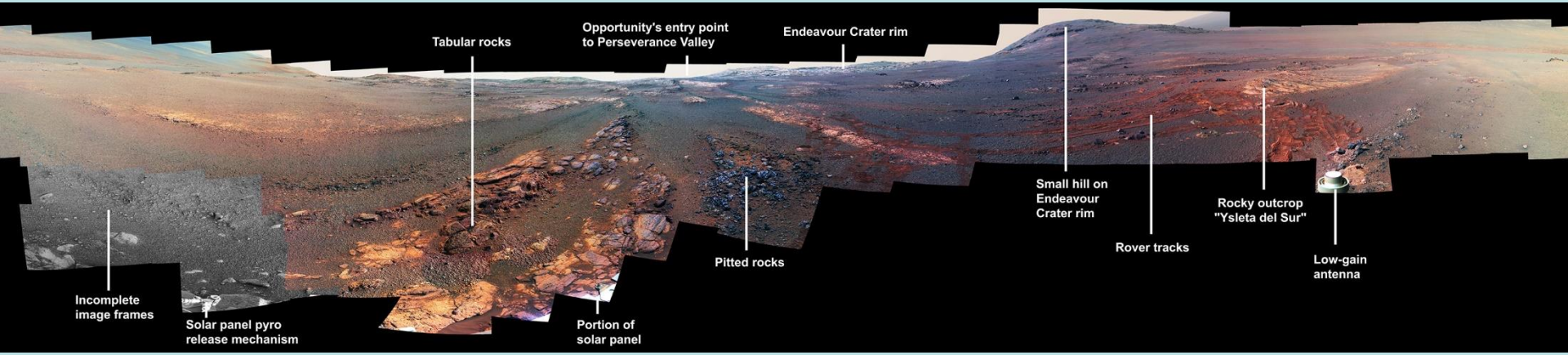
Have you updated your SatNav?

8th March: GPS provides *accurate timing information* to many critical tech systems – for many of us our SatNavs. It also transmits the proper date and time by supplying the receiver with the **week number** and the number of **seconds** into the week. However, the week number is a 10-bit binary number, which limits the range to 0 – 1023, or 1024 total weeks. So every 19.7 years the week number rolls over to Zero. All satnavs need to be aware of this. The 6th April 2019 is the next **Week Zero**. After this you may end up **LOST!!**
See: https://www.labsat.co.uk/index.php/en/gps-time-calculator

UK has a new Air-breathing Rocket Engine!

March 14th: A UK project to develop a **hypersonic** engine that could take a plane from London to Sydney in about 4hr is set for a key demonstration.
The **Sabre** engine is part jet, part rocket, and relies on a novel pre-cooler heat-exchanger technology. Approved by ESA, the central section of Sabre is to begin its own demonstration campaign at *Westcott in Buckinghamshire.*
Sabre (Synergetic Air-Breathing Rocket Engine) is designed to go from take-off to space, from zero to mach5.5 in air and then up to mach25 as a pure rocket.

Opportunity’s Parting Shot



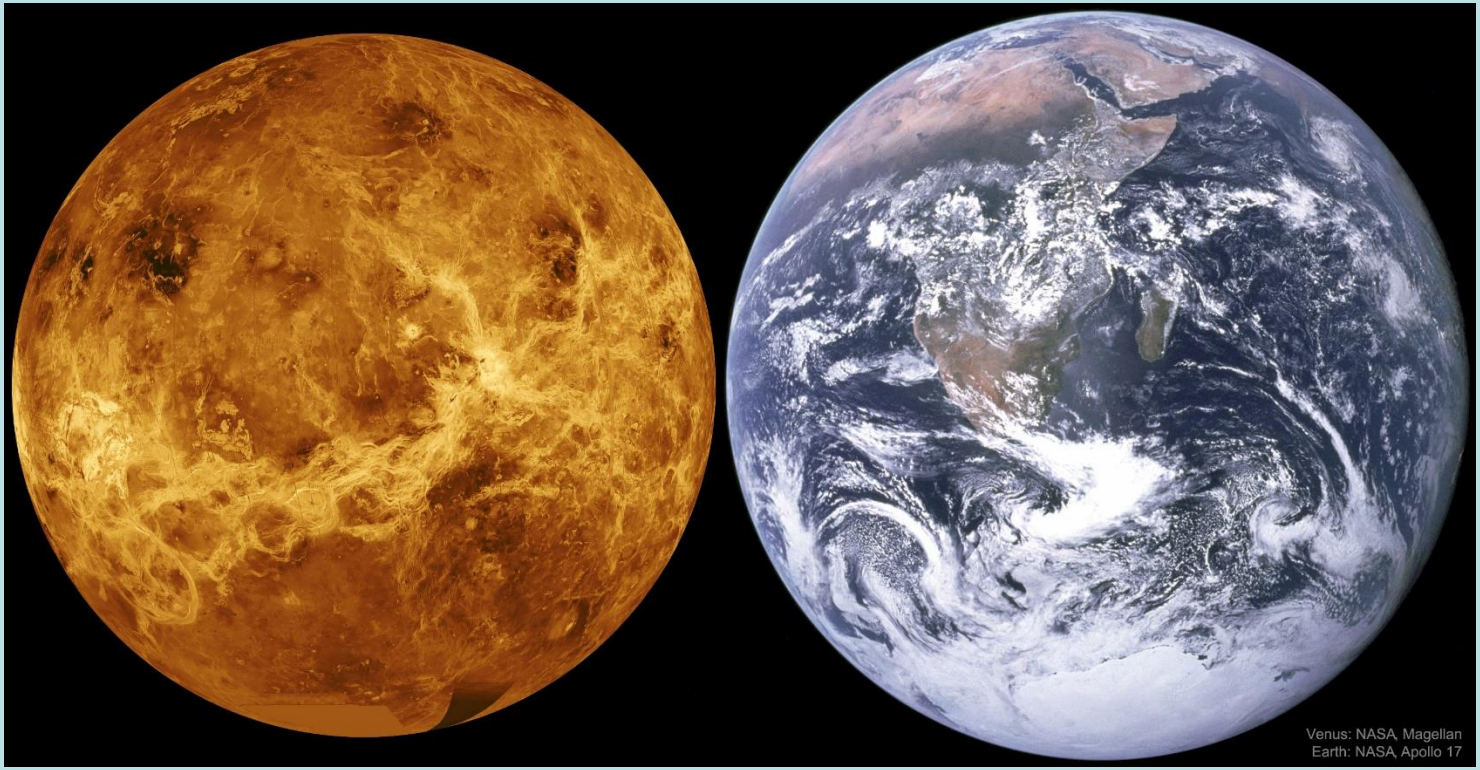
12th March: In spring 2018, NASA's Mars Exploration Rover **Opportunity** documented this 360-degree panorama from multiple images taken at what became its final resting spot in Perseverance Valley.
Located on the inner slope of the western rim of Endeavour Crater, Perseverance Valley is a system of shallow troughs descending eastward about two football fields’ long from the crest of Endeavour's rim to its floor.

ExoMars Components come together in Italy

March 21st: The platform destined to land on the Mars as part of the next ExoMars mission has arrived in Europe for final assembly and testing – and been given the name ‘Kazachok’ by the Russian State Space Corporation Roscosmos.

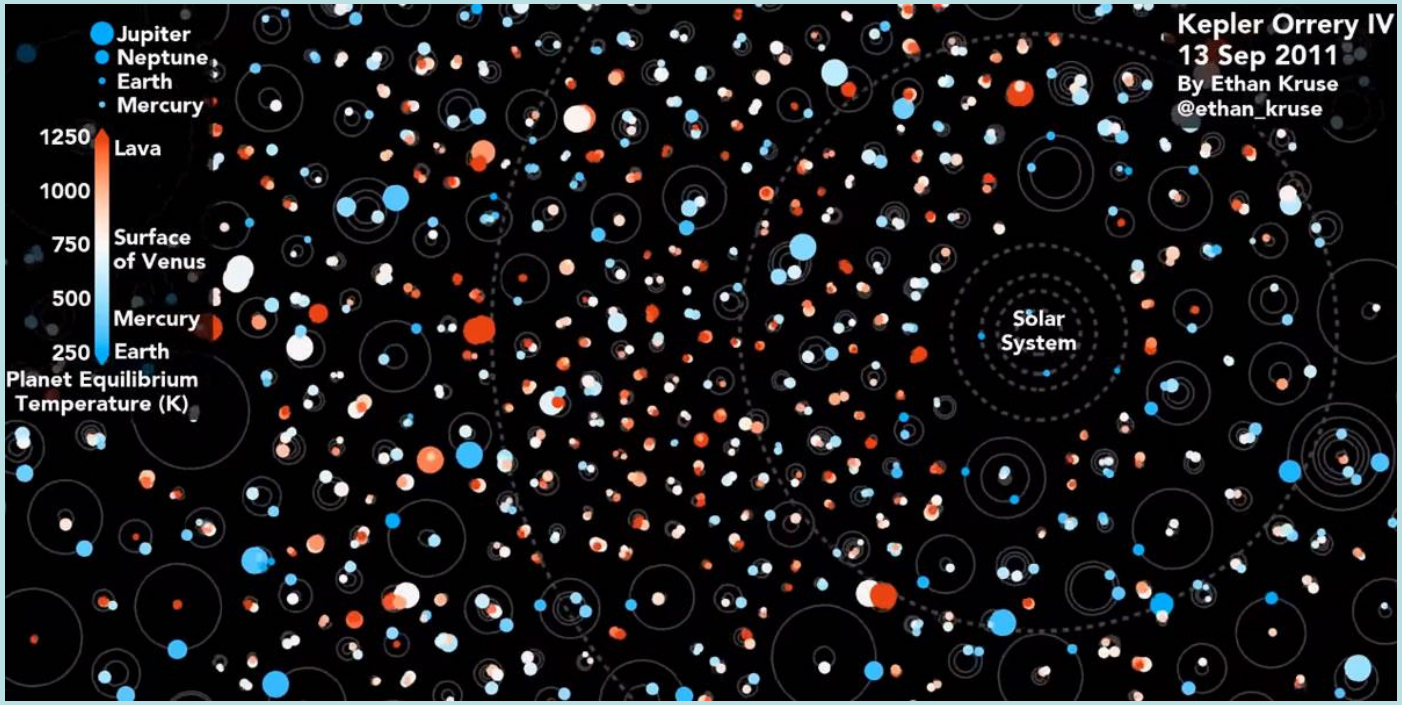
The ExoMars programme is a joint endeavour between ESA and Roscosmos and comprises two missions. The Trace Gas Orbiter is already circling Mars examining the atmosphere, while the second mission – comprising a surface science platform and a rover (Rosalind Franklin) – is due to launch in 2020. More components are due to arrive later in the year…

New Missions to Venus Proposed



March 22nd: Is Venus is geologically dead? New research may be on the verge of ending that perception. Hints of ongoing volcanic and tectonic activity suggest that the planet is very much alive. Now scientists are building new theories to explain the planet's landscape. This includes an idea that proposes the existence of "toffee planets“ – based on the study of exoplanets. ESA is evaluating a Venus mission, called **EnVision**, alongside two astronomy proposals - Theseus and Spica. Other proposals are also being put to NASA.

How many Exoplanets ??



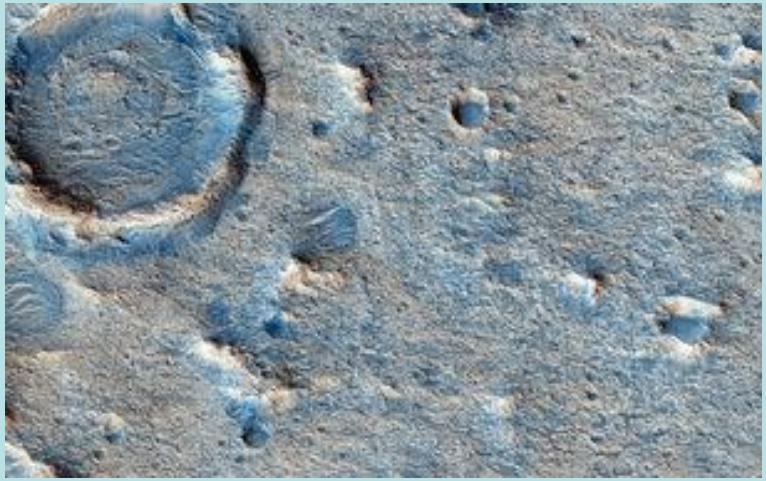
23rd March: The number of exoplanets is close to the **4,000** mark as a result of searches with telescopes on the ground and in space over the last 25 years.
It's also shows how common planets are - with most of the stars in the Milky Way hosting at least one world in orbit around them - something we couldn't be certain of just 30 years ago.
The Extrasolar Planets Encyclopaedia, run by the Observatoire de Paris, has already passed the 4,000 mark. The Nasa Exoplanet Archive is 74 planets away from the milestone. But there are 471 planet candidates detected by Nasa's Tess space telescope awaiting confirmation.

US VP says “Back to the Moon by 2024”…

March 26th: Vice-President Mike Pence, speaking at the the fifth meeting of the USA National Space Council, announced a goal to land astronauts on the moon in the next five years.

"It is the right time for this challenge, and I assured the vice president that we are up to the challenge," said NASA Chief Jim Bridenstine. "We have laid out a clear plan for NASA’s future exploration campaign that cuts across three strategic areas: low-Earth orbit, the Moon, and then Mars and deeper into space."

Get your Sound-Bite sent back from Mars . . .



March 26th: The ExoMars rover and platform will launch to the Red Planet in 2020 and an exciting new **competition** is giving the people of planet Earth the opportunity to get their ‘voices’ to Mars in this next phase of the ESA -Roscosmos’ ExoMars programme.

The Platform component has many functions to perform, such as detecting lightning. It requires a test message to send back to Earth - and **you** can offer a 30-sec soundbite to be used for this.

Submit and/or vote for your favourite offering by April 20th at https://mars.vesmir.cz/

Lunar "Genesis" on April 11th?

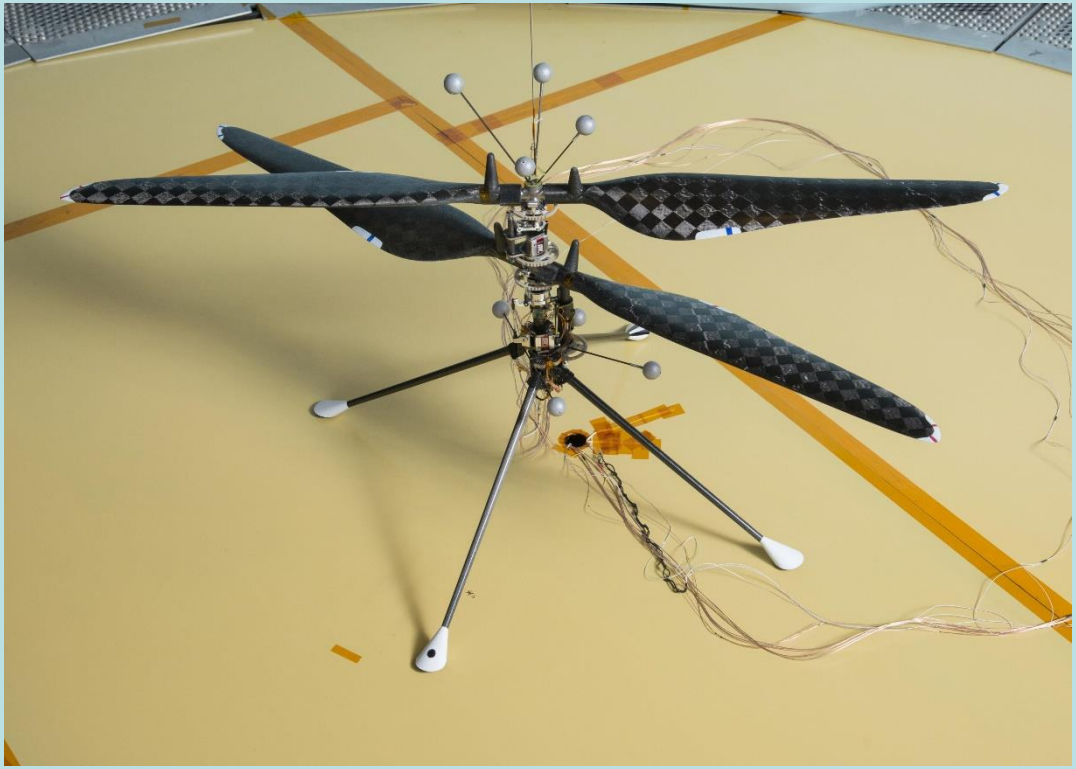
March 27th: The Israeli **Beresheet mission** to the Moon is proceeding on course following a minor delay when an engine did not fire as it should. Now it is widening its Earth orbit until it will be captured by the Moon's gravity on 4th April and enter lunar orbit. This will make it the longest ever route to the Moon!

The mission, which began as part of the Xprize competition, has cost a mere $100m – but the Xprize foundation has said that it will give a $1m award if the lunar landing is successful.

Landing is planned for 11th April if all goes well.

[Beresheet = Beginning in Hebrew]

A Very Remotely-Controlled Helicopter !!



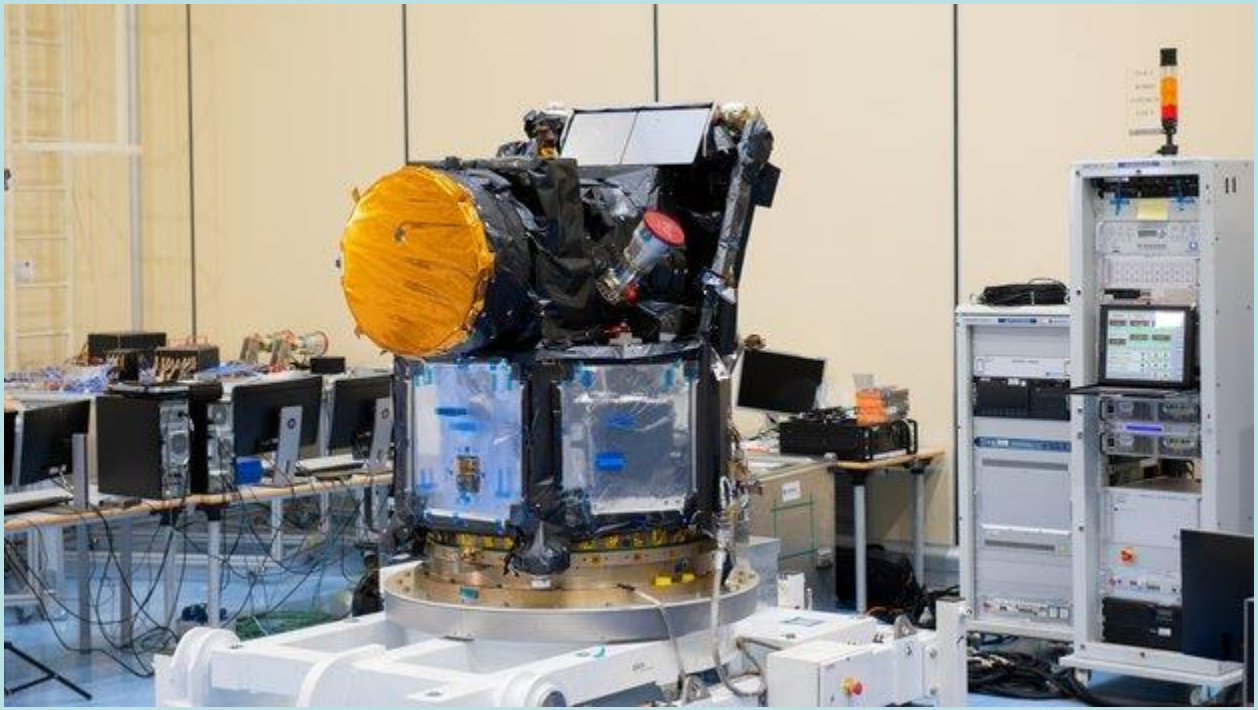
March 28th: NASA's Mars Helicopter Completed Flight Tests. Weighing no more than 4 pounds, the helicopter is a technology demonstration project currently going through the rigorous verification process to certify it for Mars. The majority of the testing is to demonstrate how it can operate on Mars, including temperatures as low as -90ºC. Fortunately NASA has a 25ft-wide vacuum chamber at the JPL in Pasadena. In February 2021 it will arrive on Mars, to begin its first short flights on another world.

Mexican Asteroid washed all the way to Canada

Fossilised fish piled together in the rocks of N Dakota. The rock shows evidence of having been vaporised.

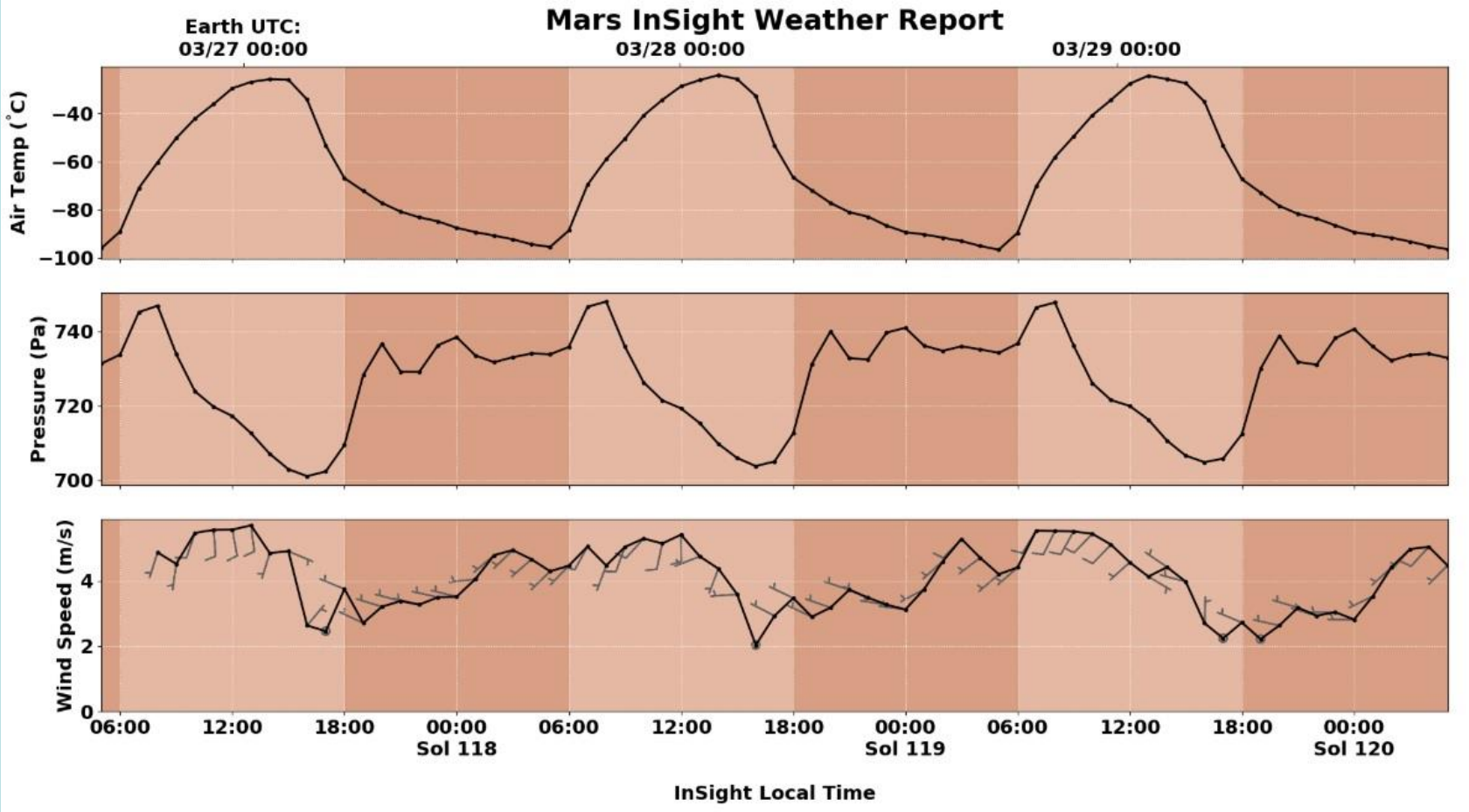
March 29th: The 12km asteroid of 65m years ago that did away with all the dinosaurs and much else on Earth has been recorded as far away as North Dakota. Excavations have revealed the fossils of fish and trees that were sprayed with rocky, glassy fragments that fell from the sky. The deposits also show evidence of having been swamped with water - the consequence of the colossal sea surge (seiche) that was generated by the impact.

‘Cheops’ is ready - well ahead of schedule and budget



March 29th: ESA’s Characterising Exoplanet Satellite, **Cheops**, was recently declared ready to fly after completing a series of final spacecraft tests. Cheops will lift off as a secondary passenger on a Soyuz-Fregat rocket launching from the Spaceport in Kourou, French Guiana. The satellite will be stored at the Airbus facility in Madrid for a few months before being shipped to Kourou, aiming for a launch slot between mid-October and mid-November 2019. Cheops is ESA’s first satellite dedicated to observing transiting exoplanets

InSight Weather Report: (Dry, Breezy and a bit Nippy)



March 29th: The plot shows the latest three **sols** (Martian days) of weather data at InSight's landing site near the equator of Mars. Time runs along the bottom of the plot, with UTC Earth time across the top.

For latest data see - https://mars.nasa.gov/insight/weather/

Send anything interesting you spot during April to:

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