"When something is important enough, you do it even if the odds are not in your favor." Elon Musk

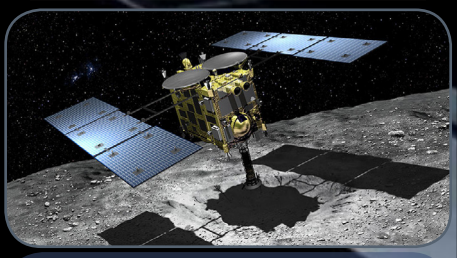
SPACE CAMP TURKEY
An ESBAŞ Enterprise
Global Friendship Through Space Education

ASTRO NEWSLETTER

Volume 12, Issue 2

March 4, 2019

CONTENTS



Japan's Hayabusa 2 shot an asteroid Ryugu

Far from Earth, a tiny spacecraft punched an asteroid Ryugu.
Hayabusa 2 swooped close to Ryugu to collect asteroid dust. The JAXA spacecraft had spent the previous day leaving its usual orbit around the asteroid to zoom in close. After just a few hours, it flew in low enough to touch Ryugu before darting away again.

It didn't stay long. The touchdown was more of a quick tag, and Hayabusa2 stayed just long enough to fire a tiny bullet into the asteroid's surface, in order to stir up material. Because Ryugu is so tiny (less than half a mile across), with hardly any gravity, even this small blow should have kicked up enough space dust for Hayabusa2 to collect – hopefully – about 0.4 ounce (10 grams) of material into the horn that hangs from its underside.

Astronomy.com

SpaceX's Crew Dragon Docks at Space Station for First Time

SpaceX's new astronaut taxi just checked off another huge milestone on its maiden orbital flight.

The Crew Dragon capsule successfully docked with the International Space Station this morning (March 3) at 5:51 a.m. EST (1051 GMT), about 27 hours after launching into orbit from NASA's Kennedy Space Center (KSC) on Florida's Space Coast. Dragon linked up with a docking port on the station's Harmony module as the two craft sailed 250 miles (402 kilometers) over the Pacific Ocean, just north of New Zealand.

Space.com

Virgin Galactic Reaches the Edge of Space—This Time with a Passenger in Tow

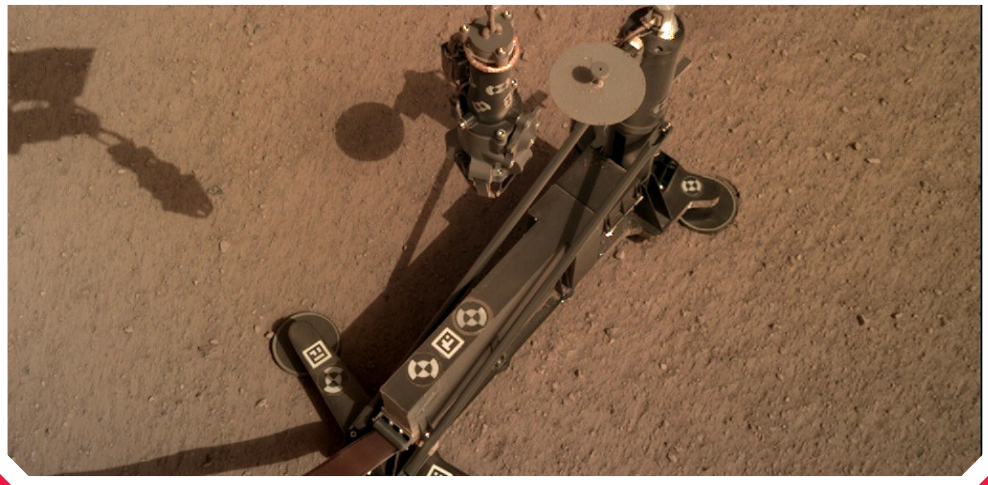
The era of space tourism is drawing closer. Virgin Galactic, on its fifth supersonic, rocket-powered test flight, successfully sent passenger Beth Moses, the company's chief astronaut instructor, to the edge of space, the first non-pilot to ever fly on a commercial aircraft. The flight marks the second time the company has reached the landmark height.

According to the standards set by the U.S. military and NASA, the crew of three becomes the 569th to 571st people to enter space, with Moses also becoming the first woman to do so on a commercial spaceflight.

Of course the boundaries of space differ, depending on who's defining space. Virgin Galactic considers space to begin at a 50-mile (80.5-kilometer) altitude, the height at which NASA and the U.S. military present astronaut wings. Other organizations, including the body governing astronautic records Fédération Aéronautique Internationale (FIA), consider the 100-kilometer-high Kármán line, an imagined border, to be where space begins. Today's flight went 89.9 kilometers, or 55.8 miles, high.

The crew experienced several minutes of weightlessness as Moses performed a "live evaluation of cabin dynamics," which, according to Virgin's press statement, is "fundamental to the provision of a safe but enjoyable customer experience."

Popularmechanics.com



InSight's "Mole" Starts Hammering into the Martian Soil

On 28 February 2019, the German Aerospace Center (Deutsches Zentrum fuer Luft- und Raumfahrt; DLR) 'Mole' fully automatically hammered its way into the Martian subsurface for the first time. In a first step, it penetrated to a depth between 18 and 50 centimetres into the Martian soil with 4,000 hammer blows over a period of four hours.

After a cooling-off period, the researchers will command a second four-hour hammering sequence. In the following weeks, with further intervals, they want to reach a target depth of three to five metres on sufficiently porous ground. The Mole will pull a five-metre-long tether equipped with temperature sensors into the Martian soil behind it.

The cable is equipped with 14 temperature sensors in order to measure the temperature distribution with depth and its change with time after reaching the target depth and thus the heat flow from the interior of Mars.

Millimetre Precision with a Worm Gear

The rod-shaped penetrometer uses a fully automatic, electrically powered hammer mechanism to drive itself into the subsurface. A rotating worm gear repeatedly stretches the main spring, which then produces a hammer blow. A second spring absorbs the recoil. "You can imagine the Mars Mole functioning like a large nail that has a built-in hammer," says Torben Wippermann from the DLR Institute of Space Systems, explaining the technology.

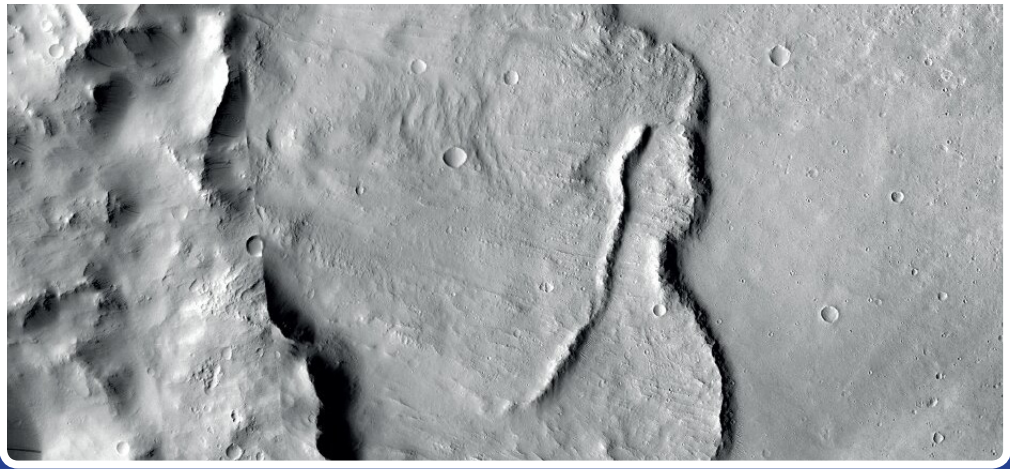
Hammering, Cooling, Heating, Measuring

The probe pauses after each step for about three Mars days (sols). It cools down for about two days after several hours of hammering, which causes friction and generates heat. Then, it measures the thermal conductivity of the soil at a sufficient depth for one day.

"For this purpose, a piece of foil in the shell of the Mole is heated for several hours with a known electrical power," says DLR planetary researcher Matthias Grott. "The simultaneously measured increase in the temperature of the foil then gives us a measure of the thermal conductivity of the soil in its immediate surroundings."

In addition, the radiometer mounted on the InSight lander measures the temperature of the Martian soil on the surface, which fluctuates from some degrees above zero degrees Celsius to almost -100 degrees Celsius. Later on, once the target depth has been reached, the data from the temperature and thermal conductivity measurements, along with the radiometer data, is received at the DLR control centre in Cologne, processed and then evaluated by scientists at the DLR Institute of Planetary Research.

Marsdaily.com



First Evidence of Planet-Wide Groundwater System on Mars

Mars Express has revealed the first geological evidence of a system of ancient interconnected lakes that once lay deep beneath the Red Planet's surface, five of which may contain minerals crucial to life.

Mars appears to be an arid world, but its surface shows compelling signs that large amounts of water once existed across the planet. We see features that would have needed water to form – branching flow channels and valleys, for example – and just last year Mars Express detected a pool of liquid water beneath the planet's south pole.

A new study now reveals the extent of underground water on ancient Mars that was previously only predicted by models.

"Early Mars was a watery world, but as the planet's climate changed this water retreated below the surface to form pools and 'groundwater,'" says lead author Francesco Salese of Utrecht University, the Netherlands.

"We traced this water in our study, as its scale and role is a matter of debate, and we found the first geological evidence of a planet-wide groundwater system on Mars."
Salese and colleagues explored 24 deep, enclosed craters in the northern hemisphere of Mars, with floors lying roughly 4000 m below martian 'sea level' (a level that, given the planet's lack of seas, is arbitrarily defined on Mars based on elevation and atmospheric pressure).

They found features on the floors of these craters that could only have formed in the presence of water. Many craters contain multiple features, all at depths of 4000 to 4500 m – indicating that these craters once contained pools and flows of water that changed and receded over time.

Features include channels etched into crater walls, valleys carved out by sapping groundwater, dark, curved deltas thought to have formed as water levels rose and fell, ridged terraces within crater walls formed by standing water, and fan-shaped deposits of sediment associated with flowing water.

The water level aligns with the proposed shorelines of a putative martian ocean thought to have existed on Mars between three and four billion years ago. Mars Express was launched on 2 June 2003, and reached 15 years in space last year.

This study used observations from the High Resolution Stereo Camera (HRSC) on ESA's Mars Express, from NASA's High Resolution Imaging Science Experiment (HiRISE), and from the Context Camera aboard NASA's Mars Reconnaissance Orbiter. A digital terrain model was used based on data from the HRSC and NASA's Mars Orbiter Laser Altimeter.

Phys.org

NASA Unlikely to Return Mars Samples in the 2020s

Despite a new emphasis on a streamlined, "lean" sample return architecture, a NASA official says it's unlikely that suite of missions will be able to return Martian rock and soil samples to the Earth before the end of the 2020s.

Speaking at a virtual meeting of the Mars Exploration Program Analysis Group (MEPAG) Feb. 15, Michael Meyer, lead scientist for NASA's Mars Exploration Program, said that planning for the series of missions that will return samples to Earth is still in its early stages.

"Our hopes are that the 2020 budget will increase so that we can actually start serious planning and moving towards doing missions for a sample return," he said. The White House is expected to release its fiscal year 2020 budget proposal in mid-March. Asked at the MEPAG meeting if NASA has a planning date for when those future missions would return samples, Meyer didn't rule out getting them back in 2029, but sounded skeptical that would be possible.

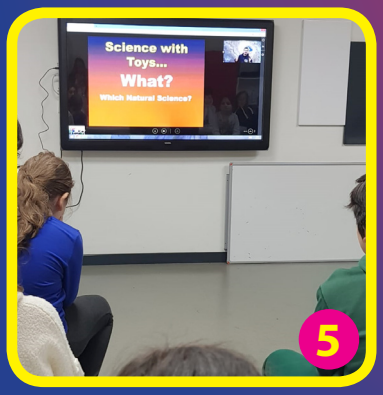
Meyer said that NASA also plans to start working soon on a strategic plan for Mars exploration, which will support planning for the next decadal survey in planetary sciences in the early 2020s. The goal, he said, is "to have a program that isn't just sample return but also what else we should be doing at Mars in the coming decade or two."

Space.com

Schools in Action

Dear Followers,

As some of our schools complete their 4th project, we have new schools joining us. Our latest addition is Jordan Ammam Academy. We would like to collectively welcome our newest friends. During this month, most of the schools completed or took on new projects. Our students presented their projects in the fields of art and engineering. We expect to see great, upcoming projects as the month continues and wish everyone a happy spring.



1- Hristo Botev School, BULGARIA 2- Little Prince Private School, BULGARIA 3- Final Okulları, SAMSUN 4- Dr. Petar Beron School of Mathematics, BULGARIA 5- Maltepe Yönder College, ISTANBUL 6- SEV Schools, IZMIR 7-Rota College, IZMIR 8- FMV Nişantaşı, ISTANBUL

Astronomy Picture of the Day

Celestial Alignment over Sicilian Shore

This was a sunrise to remember. About a month ago, just before the dawn of the Sun, an impressive alignment of celestial objects was on display to the east. Pictured, brightest and closest to the horizon, is the Moon. The Moon's orange glow is caused by the scattering away of blue light by the intervening atmosphere. Next brightest and next closest to the horizon is the planet Venus. Compared to the Moon, Venus appears more blue -- as can (also) be seen in its reflection from the water. Next up is Jupiter, while the bright object above Jupiter is the star Antares. Although this display was visible from almost anywhere on planet Earth, the featured image was taken along a picturesque seashore near the city of Syracuse, on the island of Sicily, in the country of Italy. This month Saturn appears between Venus and Jupiter before sunrise, while Mars is visible just after sunset.

apod.nasa.gov

Space Camp Turkey, Aegean Free Zone 35410 Gaziemir, Izmir / Turkey
Phone : +90 232 252 35 00 Fax : +90 232 252 36 00
Email: info@spacecampturkey.com