"Somewhere, something incredible is waiting to be known" Carl Sagan

SPACE CAMP TURKEY
An ESBAŞ Enterprise

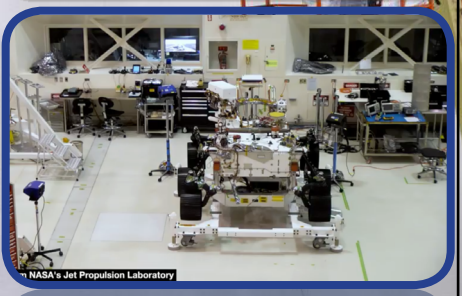
Global Friendship Through Space Education

ASTRO NEWSLETTER

Volume 12, Issue 9

June 18, 2019

CONTENTS



Watch Live as NASA Builds the Mars 2020 Rover

Last week, NASA began a livestream at Jet Propulsion Laboratory (JPL) that shows technicians working on the Agency's next engineering marvel: the Mars 2020 Rover. The camera is trained on the laboratory's cleaning room, where the Rover is slowly taking shape.

As NASA notes, this next-gen Mars Rover still has months of final testing ahead of it before it's ready for launch in July 2020. You can watch the whole process unfold on your laptop (with only minor interruptions for camera maintenance).

Scientists will work on the rover Monday through Friday, starting at 8 a.m. (11 ET), and NASA will be holding daily web chats with JPL's social media team and the Mars 2020 team at 11 a.m. and 4 p.m. PT, Monday through Thursday.

You can read more about the Mars 2020 mission here, as well as the Jezero crater, where the rover will be exploring when it lands on the Martian surface on February 18, 2021.

PopularMechanics.com

Orion Launch Abort System Designed to Pull its Weight for Moon Missions

Orion's tower-like abort structure is specifically built for deep space missions and to ride on a high-powered rocket. It is positioned with motors on top of the Orion crew module and designed to pull the crew module away from a rocket, rather than push it away with motors at the base, as some spacecraft designed for other destinations are built to do. This design offers several benefits for missions to the Moon and beyond.

The LAS consists of two parts: the fairing assembly, which is a shell composed of a lightweight composite material that protects the capsule from the heat, air flow and acoustics of the launch, ascent, and abort environments; and the launch abort tower, which includes the abort motor, attitude control motor, and jettison motor. Fully jettisoning the entire LAS once it's no longer needed will free Orion of thousands of pounds that will make it lighter for its trips near the Moon.

NASA.gov

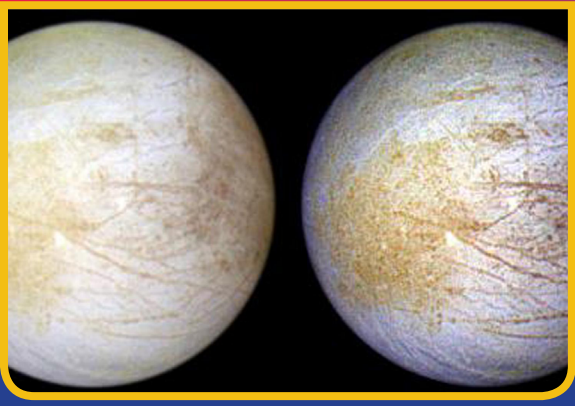


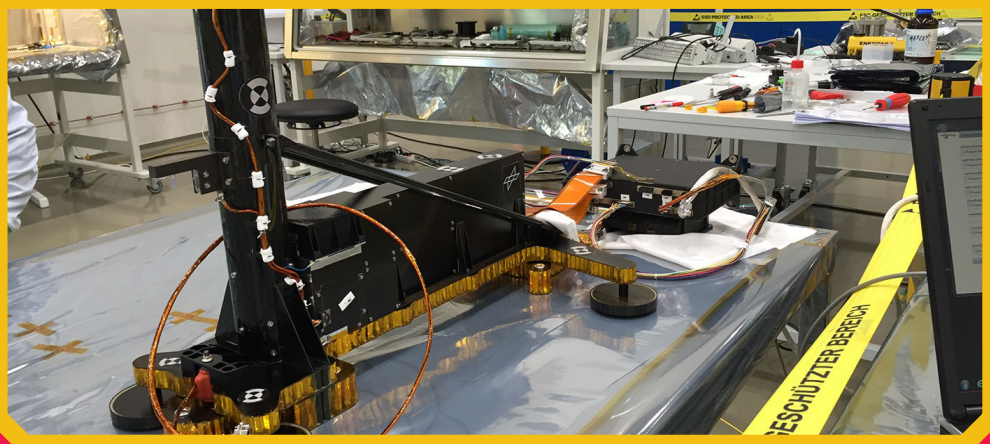
Table Salt Compound Spotted on Europa

A familiar ingredient has been hiding in plain sight on the surface of Jupiter's moon Europa. Using a visible-light spectral analysis, planetary scientists at Caltech and NASA's Jet Propulsion Laboratory in Pasadena, California, have discovered that the yellow color visible on portions of the surface of Europa is actually sodium chloride, a compound known on Earth as table salt, which is also the principal component of sea salt.

The discovery suggests that the salty subsurface ocean of Europa may chemically resemble Earth's oceans more than previously thought, challenging decades of supposition about the composition of those waters. The finding was published by Science Advances on June 12.

Flybys from NASA's Voyager and Galileo spacecraft have led scientists to conclude that Europa is covered by a layer of salty liquid water encased in an icy shell. Galileo carried an infrared spectrometer, an instrument scientists use to examine the composition of a surface they're studying. Galileo's spectrometer found water ice and a substance that appeared to be magnesium sulfate salts (like Epsom salts). Since the icy shell is geologically young and features abundant evidence of past geologic activity, it was suspected that whatever salts exist on the surface may derive from the ocean below.

Technology.org



Robotic Arm Will Raise The Support Structure And Help The Mole Hammer

There is a new plan to support the German Aerospace Center (Deutsches Zentrum fur Luft- und Raumfahrt; DLR) Mars 'Mole' that is part of NASA's InSight mission. The Heat Flow and Physical Properties Package (HP3) Mole is a self-driving penetrator that has hammered itself into the Martian subsurface to a depth of approximately 30 centimetres. Since 28 February 2019, it has no longer been able to move deeper beneath the surface.

Tests with the Mole on Mars and replicas of the instrument located at DLR in Germany and at NASA's Jet Propulsion Laboratory in Pasadena, California, have provided insights about the possible causes of this situation. It is likely that the Mole is experiencing insufficient friction from the surrounding soil under the lower gravity on Mars, and that small, slot-shaped cavities may have formed between the penetrator and the soil.

The scientists and engineers working on the InSight mission are now planning to use the lander's robotic arm to lift away the support structure situated above the Mole. With the support structure removed, the situation can be examined more closely, and it will become possible to assist the penetrator directly with the robotic arm as it hammers further into the subsurface.

The lifting process is expected to be commanded in several stages, starting at the end of June. First, the support structure will be gripped. In the course of a week, the arm will then lift the structure in three steps and acquire images. With this careful procedure, the engineers will ensure that the Mole, which is about three quarters into the surface, is not pulled out.

Tests carried out at the DLR Institute of Space Systems in Bremen have confirmed that this can happen under certain circumstances. Lateral support and friction are important for the Mole, because the recoil from each hammer blow must be absorbed using resistance provided by contact with the surrounding soil.

There is also a possibility that the Mole has encountered a rock. The Mole was certainly designed in such a way that it is able to push small rocks out of its way. However, it could currently be trapped between a rock and the surrounding supporting structure. If this is the case, moving the support structure could allow it to bypass the obstacle and dig deeper.

MarsDaily.com

NASA's Mars Helicopter Whirls Through Tests on Way to 2020 Launch

NASA's first Mars helicopter is getting close to final approval for launch after passing several key tests.

The Mars Helicopter flight demonstration project will launch next summer with the Mars 2020 rover and touch down on the Red Planet in February 2021.

While the rover searches for signs of past life on the Red Planet and caches samples for future return to Earth, the helicopter will soar above Mars in a series of demonstration flights. Future missions could see such helicopters scouting ahead for where rovers could go next.
"Nobody's built a Mars helicopter before, so we are continuously entering new territory," MiMi Aung, project manager for the Mars Helicopter at NASA's Jet Propulsion Laboratory (JPL) in Pasadena, California, said in a statement.

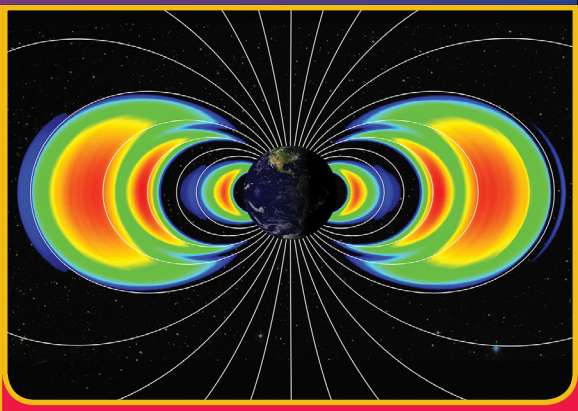
Back in January, the flight model flew in a simulated Martian environment at JPL's Space Simulator, a vacuum chamber that has a diameter of 25 feet (roughly 8 meters). Then it was moved to a Lockheed Martin Space facility in Denver.

At its new location, the helicopter was tested for compatibility with the Mars Helicopter Delivery System. This system will carry the helicopter under the Mars 2020 rover's belly during launch and cruise to Mars. The helicopter will separate from the rover after landing.

In Denver, the connections and mechanisms between the delivery system and helicopter were tested to make sure they fit together. The mated system experienced vibrations similar to what happens during launch and cruise. Also, the helicopter and delivery system were put into a thermal vacuum chamber to see how they performed in cold temperatures (minus 200 degrees Fahrenheit, or minus 129 degrees Celsius), similar to the conditions they'll experience in deep space and on the Martian surface.

With these tests complete, the helicopter went back to JPL on May 11 for several more procedures, including spinning up the rotor blades and installing a new solar panel. More testing is ahead, but the end is in sight — at least for work here on Earth.

Space.com



How NASA Prepares Spacecraft for the Harsh Radiation of Space

Each part of every NASA instrument destined for spaceflight goes through radiationtesting to ensure it can survive in space. It's not easy being a spacecraft; invisible, energetic particles zip throughout space—and while there are so few that space is considered a vacuum, what's there packs a punch. Tiny particles can wreak havoc with the electronics we send up into space.

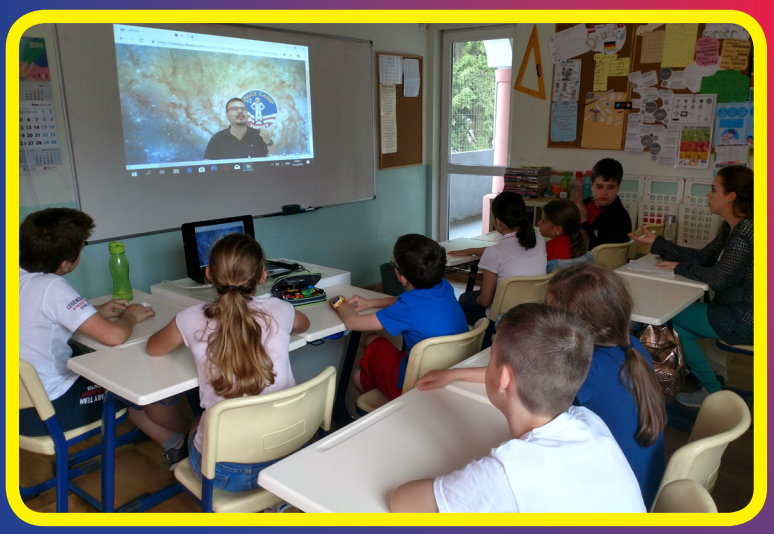
As NASA explores the solar system, radiation testing becomes ever more crucial. The Radiation Effects Facility, housed at NASA's Goddard Space Flight Center in Greenbelt, Maryland, helps inspect the hardware that enables NASA's exploration of the Moon, the Sun and our solar system—from missions seeking to understand the beginnings of the universe to the Artemis program's journey to the Moon much closer to home.

The exact conditions a spacecraft encounters depends on where it's headed, so engineers carefully test and select parts catered to each spacecraft's destination. Earth's magnetic field, for example, traps swarms of particles in two doughnut-shaped bands called the radiation belts. Other planets have radiation belts too, like Jupiter, whose belts are 10,000 times stronger than Earth's. Generally, the closer to the Sun, the harsher the wash of solar particles known as the solar wind. And galactic cosmic rays—particle fragments from exploded stars far outside the solar system—can be encountered anywhere.

Phys.org

Schools in Action

This week's photos are from the land of roses, Bulgaria!
In a very short amount of time, our friends in the photo were informed about great subjects and put forward extraordinary projects.
Congratulations to them!
We are really excited about our E-pal week which will take place at the end of this month!
Almost all the preparations are done and we are waiting for you!



Thomas Edison Private School - Sofia, BULGARIA

Astronomy Picture of the Day

Jupiter Abyss

Image Process & Copyright: *Gerald Eichstädt & Sean Doran*

What's that black spot on Jupiter? No one is sure. During the latest pass of NASA's Juno around Jupiter, the robotic spacecraft imaged an usually dark cloud feature informally dubbed the Abyss. Surrounding cloud patterns show the Abyss to be at the center of a vortex. Since dark features on Jupiter's atmosphere tend to run deeper than light features, the Abyss may really be the deep hole that it appears -- but without more evidence that remains conjecture. The Abyss is surrounded by a complex of meandering clouds and other swirling storm systems, some of which are topped by light colored, high-altitude clouds. The featured image was captured last month while Juno passed only about 15,000 kilometers above Jupiter's cloud tops. The next close pass of Juno near Jupiter will be in July.

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