

“The universe seems neither benign nor hostile, merely indifferent.” – Carl Sagan



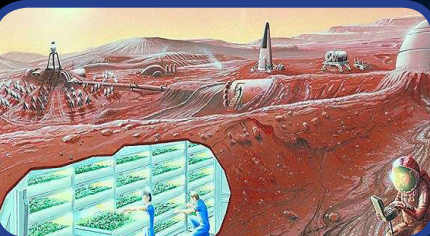
# Astro

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### Soil on Moon and Mars Likely to Support Crops

Researchers at Wageningen University and Research in the Netherlands have produced crops in Mars and Moon soil simulant developed by NASA. The research supports the idea that it would not only be possible to grow food on Mars and the Moon to feed future settlers, but also to obtain viable seed from crops grown there.

Wieger Wamelink and his colleagues at Wageningen University and Research, cultivated ten different crops: garden cress, rocket, tomato, radish, rye, quinoa, spinach, chives, peas and leek. The researchers simulated the properties of Lunar and Martian regolith and “normal” soil (potting soil from Earth) as a control.

[SpaceDaily.com](http://SpaceDaily.com)



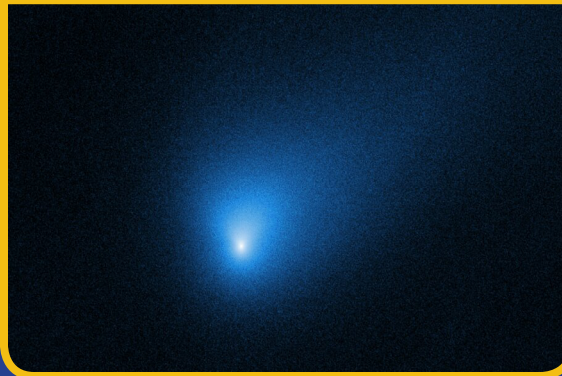
### A New Spacesuit for Artemis Generation Astronauts

In an event at the space agency’s headquarters here, NASA chief Jim Bridenstine and spacesuit engineers share the first up-close look at two next-generation spacesuits designed for for the agency’s Artemis program, which aims to land the first woman and the next man on the moon by 2024.

“We are going to the moon by 2024 and we want it to be sustainable,” NASA Administrator Jim Bridenstine said at the event, adding that the the moon will be a testing ground to propel astronauts to an even farther destination.

“Ultimately the goal is this: e’re going to Mars,” Bridenstine said. “And in order to go to Mars, we need to use the moon as a proving ground.”

[Space.com](http://Space.com)



### Hubble Telescope Zooms in on Interstellar Visitor

The Hubble Space Telescope has captured the best pictures yet of our newest interstellar visitor. This comet from outside our solar system is zooming by us at a blistering 110,000 mph (177,000 kph). Hubble caught some glam shots over the weekend from a distance of 260 million miles (420 million kilometers). The photos were released Wednesday.

It's the second known interstellar visitor to swoop through our solar system. An amateur astronomer from Crimea, Gennady Borisov, discovered the comet in August, two years after the first alien guest, a cigar-shaped rock known as Oumuamua, popped up.

"It's a puzzle why these two are so different," David Jewitt of the University of California, Los Angeles, who led the Hubble observation team, said in a statement.

Polish astronomers using ground telescopes, meanwhile, have reported the comet—called Comet 2I/Borisov—looks to be reddish with a nucleus about 1 mile (2 kilometers) across. The comet will make its closest approach to the sun in December and reach Jupiter's distance by mid-2020, before heading back toward interstellar space. Hubble—along with other telescopes—will be on the lookout into next year.



### Robotic Spiders to Explore the Moon? Yes, Please!

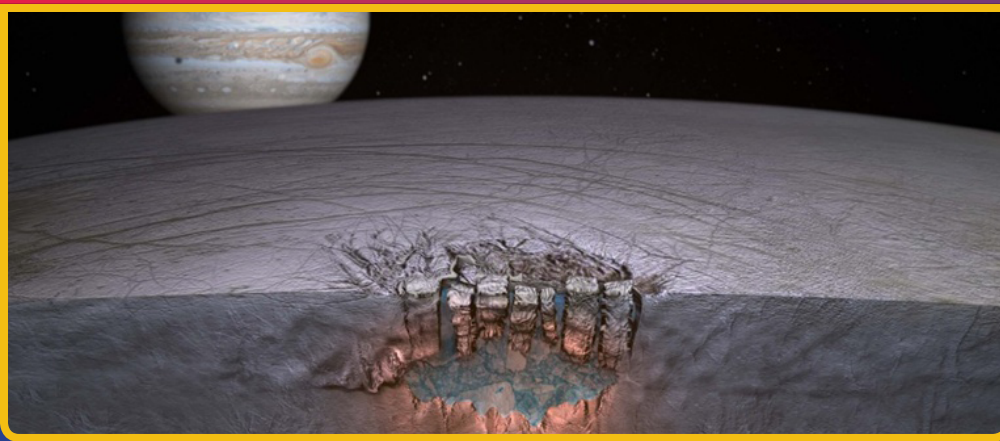
There is no doubt that one of the hallmarks of the modern space age is the way it is becoming increasingly democratic. In addition to more space agencies entering the fray, private aerospace companies are contributing like never before. It is no surprise then that there are innovators and entrepreneurs that want to increase public access and participation in space exploration.

This is what UK startup Spacebit and its founder, Pavlo Tanasyuk, hope to accomplish with their decentralized aerospace company. Central to their vision is the Walking Rover, a four-legged robotic explorer that they plan to deploy to the lunar surface in the coming years. This rover will represent a number of firsts for space exploration, which includes being the first commercial lunar mission sent by the UK.

First of all, it will be the first lunar robotic explorer to rely on four legs rather than wheels to get around. These legs will

allow the rover to explore lunar lava tubes, something that has never before been possible. With a sensor and two cameras, the rover will be able to gather exploration data and measurements on these tubes and other features on the lunar surface. The Walking Rover's design calls for a lightweight vehicle that weighs between 1 and 1.3 kg (2.2 – 2.85 lbs), relies on a combination of solar and battery power, and is operated by swarm intelligence. It will also be built to withstand the massive temperature variations that regularly occur on the lunar surface – from 130 °C during the day to -130 °C at night.

The mission will make the UK the fourth nation to deploy a rover to the Moon, behind China, Russia, and the USA. Best of all, the data it gathers will be made available for public, commercial, or scientific purposes. The rover is scheduled to be launched to the Moon in the summer of 2021 as part of a three-step process that relies on multiple commercial partnerships.



## Jupiter Shields Europa From Cosmic Rays That Could Erase Evidence of Life

Europa, one of Jupiter's four largest moons, has an ocean of liquid water beneath its icy crust. In the coming years, scientists hope to send probes to the world to study the chemistry of its ocean and look for possible signs of alien life. One challenge is figuring out whether radiation hitting Europa would tamper with potential chemical evidence of life.

Luckily, it seems scientists won't have to worry too much about this. Jupiter's presence shields Europa from many of the energetic particles that stream through space, researchers found using a computer model. Though some of these particles, called cosmic rays, will hit Europa, the radiation dosage from them is not significant, the researchers report in *The Astrophysical Journal Letters*. This means that chemicals in Europa's ocean, and signs of life they might contain, would be intact for future study. In 2018, planetary scientist Tom Nordheim of NASA's Jet Propulsion Laboratory looked into radiation on Europa from Jupiter itself. He and his team found that energetic particles from Jupiter's magnetosphere,

a region marked by the planet's magnetic fields, don't reach more than a few inches below Europa's surface. But the gas giant isn't the only source of energetic particles that shower onto the moon. Particles with even higher energies, called galactic cosmic rays, stream through the galaxy from the remains of dying stars.

So, to find out how cosmic rays might affect Europa's ocean chemistry, Nordheim and his collaborators created a computer model. The model simulated how cosmic rays would collide into the atoms on Europa and react, destroying these atoms and releasing further showers of particles. These collisions and reactions continue further into Europa until the particles no longer have enough energy for these reactions. This is one advantage of searching for signs of life on Europa compared to searching on Mars, Nordheim said. Mars doesn't have a strong magnetic field to protect its surface from energetic particles, so cosmic rays probably heavily affect its surface. Europa, on the other hand, enjoys the protection of our solar system's largest gas giant.



## Watch 1<sup>st</sup> All-Female Spacewalk

Watch 2 NASA astronauts aboard the International Space Station (ISS) make history by performing the 1st ever all-female spacewalk on Friday. Two NASA astronauts aboard the International Space Station (ISS) will make history this week by performing the first ever all-female spacewalk, currently scheduled for Friday, October 18, 2019. Astronauts Christina Koch and Jessica Meir will venture outside the station to replace a power controller that failed over the weekend. This will be Koch's fourth spacewalk and Meir's first.

NASA TV's live coverage of the spacewalk will begin on Friday at 10:30 UTC (6:30 a.m. EDT), and the spacewalk itself is scheduled to start at 11:50 UTC (7:50 a.m. EDT). Translate UTC to your time.

The spacewalk had been scheduled for October 21. But NASA announced on Tuesday that it would be pushed forward to late this week, and as of this writing, the agency has the spacewalk scheduled for Friday morning. What would have been the first all-woman spacewalk was controversially postponed in March 2019 because there were not enough medium-sized space suits on the ISS to fit both women.

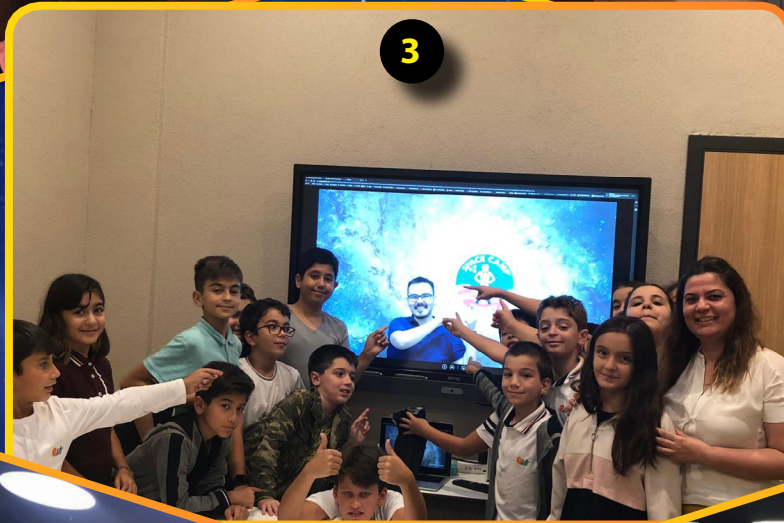
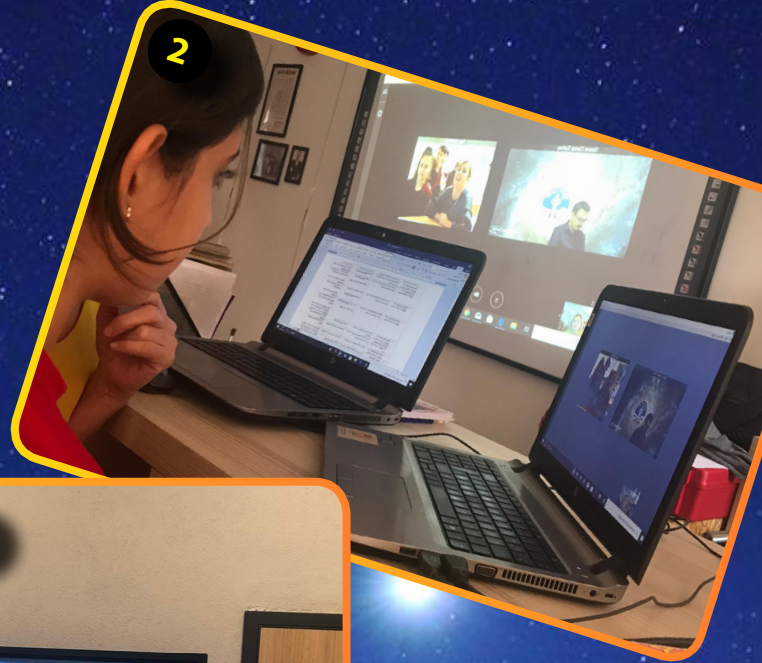


Global Friendship Through Space Education

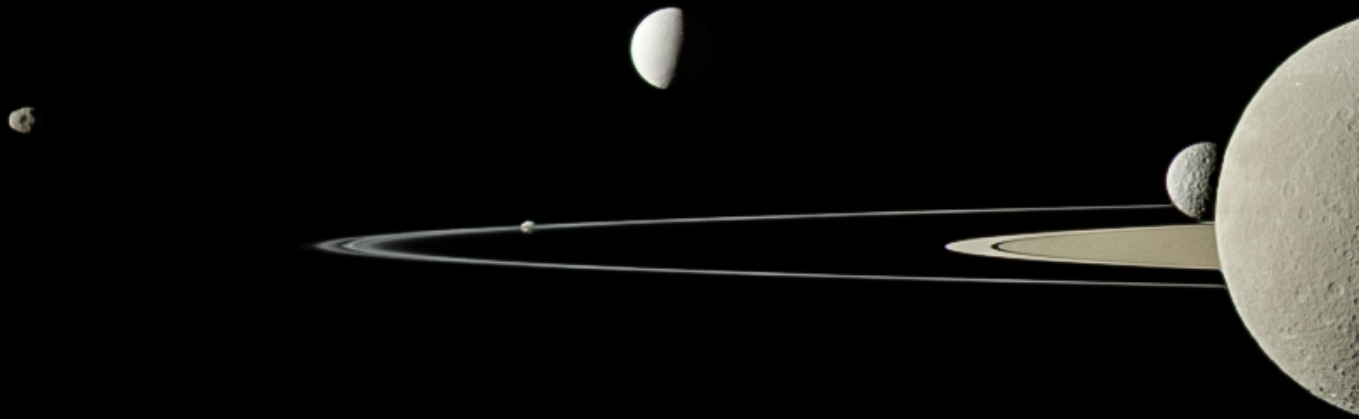
# SCHOOLS In ACTION!

Dear followers,

The photographs, which you can see below, are the ones that were taken during the projects and presentations of the students that participated in PSSP (Partner School Science Program) and FEP (Future Explorers Program). We are happy and proud to share the projects that were created with brilliant ideas.



1, 2- UKEB Schools(PSSP), IZMIR 3- Palet Schools (FEP), ISTANBUL 4, 5- Rota College, IZMIR



# Astronomy Picture of the Day

## Moons of Saturn

**Image Credit & Copyright:** Cassini Imaging Team, SSI, JPL, NASA

On July 29, 2011 the Cassini spacecraft's narrow-angle camera took this snapshot and captured 5 of Saturn's moons, from just above the ringplane. Left to right are small moons Janus and Pandora respectively 179 and 81 kilometers across, shiny 504 kilometer diameter Enceladus, and Mimas, 396 kilometers across, seen just next to Rhea. Cut off by the right edge of the frame, Rhea is Saturn's second largest moon at 1,528 kilometers across. So how many moons does Saturn have? Twenty new found outer satellites bring its total to 82 known moons, and since Jupiter's moon total stands at 79, Saturn is the Solar System's new moon king. The newly announced Saturnian satellites are all very small, 5 kilometers or so in diameter, and most are in retrograde orbits inclined to Saturn's ringplane. You can help name Saturn's new moons, but you should understand the rules. Hint: A knowledge of Norse, Inuit, and Gallic mythology will help.

[apod.nasa.gov](http://apod.nasa.gov)



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