"By going to Mars one day, we will make things better for us here on Earth." Scott Kelly

SPACE CAMP TURKEY
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Global Friendship Through Space Education

ASTRO NEWSLETTER

Volume 11, Issue 12

June 4, 2018

CONTENTS

Why we won't get to Mars without teamwork

If humanity hopes to make it to Mars anytime soon, we need to understand not just technology, but the psychological dynamic of a small group of astronauts trapped in a confined space for months with no escape, according to a paper published in American Psychologist, the flagship journal of the American Psychological Association.

"Teamwork and collaboration are critical components of all space flights and will be even more important for astronauts during long-duration missions, such as to Mars. The astronauts will be months away from home, confined to a vehicle no larger than a mid-sized RV for two to three years and there will be an up to 45-minute lag on communications to and from Earth," said Lauren Blackwell Landon, PhD, lead author of "Teamwork and Collaboration in Long-Duration Space Missions: Going to Extremes."

marsdaily.com

The History of Space Suits

Ever since Alan Shepard's history-making flight in 1961, NASA astronauts have relied on spacesuits to help them work and keep them safe. From the shiny silver of the Mercury suit to the orange "pumpkin suits" of shuttle crew, the suits have served as personal spacecraft, protecting explorers during launch and entry, while working on the International Space Station, or walking on the moon.

Mercury Suit

This is Gordon Cooper, one of NASA's original seven astronauts chosen in 1959, posing in his flight suit. When NASA's Mercury program began in 1959, the spacesuits kept the designs of earlier pressurized flight suits used in high altitude aircraft. However, NASA added a material called Mylar which gave the suit strength, and the ability to withstand extreme temperatures. ,

Gemini Suit

When Project Gemini came along, Astronauts found it difficult to move in the Mercury spacesuit when it was pressurized; the suit itself was not designed for space walking so some changes had to be made. Unlike the "soft" Mercury suit, the whole Gemini suit was made to be flexible when pressurized.

Apollo Suit

With the Apollo program, NASA knew that astronauts would have to walk on the Moon. So space suit designers came up with some creative solutions based on information they collected from the Gemini program. Spacesuits used by the Apollo astronauts were no longer air-cooled. A nylon undergarment mesh allowed the astronaut's body to be cooled with water, similar to the way a radiator cools a car's engine. Additional layers of fabric allowed for better pressurization and additional heat protection.

Future Suit Designs

Astronauts, engineers and scientists wearing prototype spacesuits, driving prototype lunar rovers and simulating scientific work as part of NASA's demonstration of concepts for living and working on the lunar surface.

thoughtco.com

Beijing welcomes use of Chinese space station by all UN Nations

Beijing is open to other UN nations using the Chinese space station on an equal basis, Shi Zhongjun, China's ambassador to the United Nations and other international organizations in Vienna, said Monday.

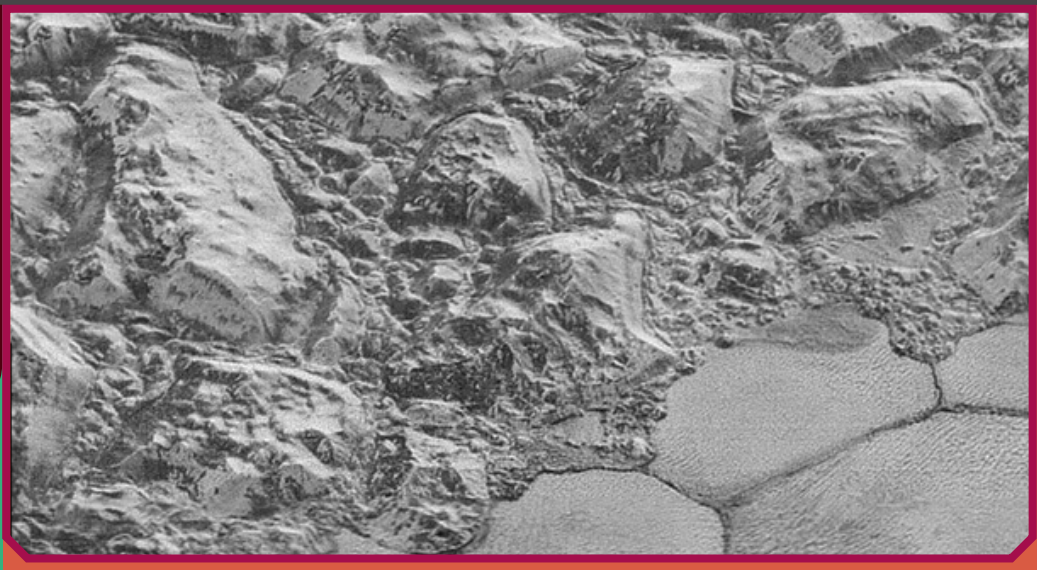
"CSS belongs not only to China, but also to the world ... All [UN] countries, regardless of their size and level of development, can participate in the cooperation on an equal footing," Shi said, as quoted by the Xinhua news agency.

According to the ambassador, public and private organizations alike can suggest their cooperation projects.

China is planning to launch the main module of the station in 2019 to test all the necessary technologies. The station is expected to become fully functional in 2022.

Earlier, China Central Television reported that the core module of China's space station wais being tested in a factory of the Space City of North China's Tianjin Municipality.

spacedaily.com



How did Pluto form its mysterious dunes?

Despite its puny atmosphere, Pluto still musters enough wind to create dunes like those found on Earth. Of course, the dunes are made of methane, not sand. When NASA's New Horizons spacecraft zipped by Pluto at 31,000 miles (50,000 kilometers) per hour in July 2015, it captured a plethora of breathtaking photos of the distant dwarf planet's surface. Within these highly detailed images, researchers noticed what looked to be an extensive system of strange dunes stretching 75 miles along the boundary of Pluto's massive Al-Idrisi Montes mountain range and Sputnik Planitia – a nitrogen-ice plain that forms the left lobe of the planet's famous "heart." According to the study, published May 31 in the journal Science, despite the vast differences between Pluto and Earth, the two worlds apparently form dunes in a very similar way. Specifically, Pluto's atmosphere captures small particles of methane (instead of sand) from the base of a nearby mountain range before relatively strong winds carry the particles away. These particles eventually settle with a little help from gravity, ultimately forming wind-swept dunes comparable to those found on Earth.

"When we first saw the New Horizons images, we thought instantly that these were dunes, but it was really surprising because we know there is not much of an atmosphere," said co-author Jani Radebaugh. "However, despite being 30 times farther away from the Sun as the Earth, it turns out Pluto still has Earth-like characteristics."

To determine exactly how a frozen planet with an atmosphere just 1/1,000th as thick as Earth's (and with 1/100,000th the pressure) could form wind-swept dunes, Telfer and his team carried out a detailed spatial analysis of the dunes, finding orthogonal wind streaks similar to those found seen in sand dunes on Earth. Furthermore, spectral and numerical models showed that Pluto's dunes may form from a thin layer of methane that gets released into the air due to nitrogen ice below it sublimating – or turning directly from a solid to a gas. Alternatively, the methane may come directly from the bottom of the nearby mountain range, getting swept up in the winds that flow down the mountainous slopes at roughly 22 miles per hour (35 kilometers per hour). "On Earth, you need a certain strength of wind to maintain transport," said co-author Eric Parteli. "The considerably lower gravity of Pluto, and the extremely low atmospheric pressure, means the winds needed to maintain sediment transport can be a hundred times lower." In other words, Pluto's winds are more than strong enough to carry tiny particles through a thin atmosphere on a world where gravity is 12 times weaker than it is on Earth.

Though New Horizons is now too far from Pluto to gather any more useful information about the dwarf planet, its mission is still far from complete. In just six short months, on New Year's Day 2019, New Horizons will fly past the tiny trans-Neptunian object 2014 MU69, located about a billion miles (1.6 billion km) beyond Pluto. This will make 2014 MU69 the most distant object in the solar system ever visited by a spacecraft.

astronomy.com

The Moons of Some Giant Alien Planets Could Host Life

Researchers have identified more than 100 giant exoplanets that may have potentially life-hosting moons. The new analysis could change the way scientists search for life in the cosmos, study team members said.

That search has generally focused on places more or less like Earth — rocky planets in the "habitable zone" of their host star, that just-right range of distances where liquid water could exist on a world's surface. Jupiter-like planets don't seem like good candidates in this regard, because they have no discernible surface. But the rocky moons of such gas giants may be a different story, study team members said.

"There are currently 175 known moons orbiting the eight planets in our solar system," study co-author Stephen Kane, an associate professor of planetary astrophysics at UCR and a member of UCR's Alternative Earths Astrobiology Center, said in a statement.

"While most of these moons orbit Saturn and Jupiter, which are outside the sun's habitable zone, that may not be the case in other solar systems," Kane added. "Including rocky exomoons in our search for life in space will greatly expand the places we can look."

The research team pored through the databases of NASA's Kepler space telescope, which has discovered about 70 percent of the 3,700 known exoplanets to date. They flagged 121 gas giants that appear to orbit in the habitable zone.

No exomoons have yet been confirmed. But if any of those huge exoplanets have natural satellites — which seems likely, given how common moons are in our own solar system — they could be especially promising abodes for life, study team members said. For example, potential lifeforms on their surfaces could tap energy coming directly from their star, and light reflected off their parent planet as well.

"Now that we have created a database of the known giant planets in the habitable zone of their star, observations of the best candidates for hosting potential exomoons will be made to help refine the expected exomoon properties," study lead author Michelle Hill, an undergraduate student at the University of Southern Queensland who is working with Kane, said in the statement.
"Our follow-up studies will help inform future telescope design so that we can detect these moons, study their properties, and look for signs of life," added Hill, who will join UCR's graduate program in the fall.

space.com

Dawn mission: new orbit, new opportunities

In early June, Dawn will reach its new, final orbit above Ceres. Soon after, it will begin collecting images and other science data from an unprecedented vantage point. This orbit will be less than 30 miles (50 kilometers) above the surface of Ceres—10 times closer than the spacecraft has ever been.
Dawn will collect gamma ray and neutron spectra, which help scientists understand variations in the chemical makeup of Ceres' uppermost layer. That very low orbit also will garner some of Dawn's closest images yet.

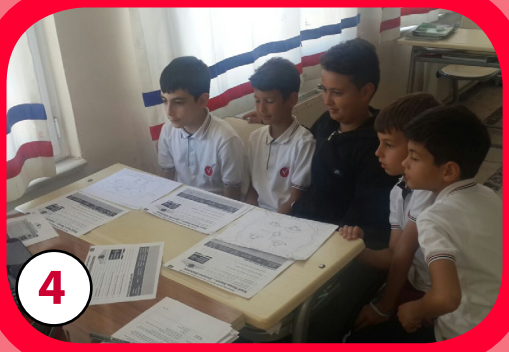
The transfer from Dawn's previous orbit to its final one is not as simple as making a lane change. Dawn's operations team worked for months to plot the course for this second extended mission of the veteran spacecraft, which is propelled by an ion engine. Engineers mapped out more than 45,000 possible trajectories before devising a plan that will allow the best science observations.
Dawn was launched in 2007 and has been exploring the two largest bodies in the main asteroid belt, Vesta and Ceres, to uncover new insights into our solar system. It entered Ceres' orbit in March 2015.

"The team is eagerly awaiting the detailed composition and high-resolution imaging from the new, up-close examination," said Dawn's Principal Investigator Carol Raymond of NASA's Jet Propulsion Laboratory, Pasadena, California. "These new high-resolution data allow us to test theories formulated from the previous data sets and discover new features of this fascinating dwarf planet."

phys.org

Schools in Action

Lots of schools have completed the educational packages that we have sent them but some of them still want to learn more about the mysteries of space and work on many more interesting projects. While some of these students work like engineers, others are role-playing as environmental scientists.



1, 2 - Velzys Gymnasium - LITHUANIA, 3- Ismail Kaymak Schools - ÇANAKKALE, 4- Fen Bilimleri College - KIRKLARELİ 5- FMV Schools - ISTANBUL, 6- Yönder Schools - IZMIR

Astronomy Picture of the Day

NGC 6744 Close Up

Beautiful spiral galaxy NGC 6744 is nearly 175,000 light-years across, larger than our own Milky Way. It lies some 30 million light-years distant in the southern constellation Pavo, its galactic disk tilted towards our line of sight. This Hubble close-up of the nearby island universe spans about 24,000 light-years across NGC 6744's central region in a detailed portrait that combines visible light and ultraviolet image data. The giant galaxy's yellowish core is dominated by the visible light from old, cool stars. Beyond the core are pinkish star forming regions and young star clusters scattered along the inner spiral arms. The young star clusters are bright at ultraviolet wavelengths, shown in blue and magenta hues.

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