SPACE CAMP TURKEY
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ASTRO NEWSLETTER

Volume 11, Issue 20

December 27, 2018

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How Fast Is Earth Moving?

Earth's spin is constant, but the speed depends on what latitude you are located at. Here's an example. The circumference (distance around the largest part of the Earth) is roughly 24,898 miles (40,070 kilometers), according to NASA. (This area is also called the equator.) If you estimate that a day is 24 hours long, you divide the circumference by the length of the day. This produces a speed at the equator of about 1,037 mph (1,670 km/h). You won't be moving quite as fast at other latitudes, however. If we move halfway up the globe to 45 degrees in latitude (either north or south), you calculate the speed by using the cosine (a trigonometric function) of the latitude. A good scientific calculator should have a cosine function available if you don't know how to calculate it. *Space.com*

NASA's 1st Flight to Moon, Apollo 8, Marks 50th Anniversary

Fifty years ago on Christmas Eve, a tumultuous year of assassinations, riots and war drew to a close in heroic and hopeful fashion with the three Apollo 8 astronauts reading from the Book of Genesis on live TV as they orbited the moon.

To this day, that 1968 mission is considered to be NASA's boldest and perhaps most dangerous undertaking. That first voyage by humans to another world set the stage for the still grander Apollo 11 moon landing seven months later. There was unprecedented and unfathomable risk to putting three men atop a monstrous new rocket for the first time and sending them all the way to the moon.

There was the Old Testament reading by commander Frank Borman, Jim Lovell and Bill Anders.

Lastly, there was the photo named "Earthrise," showing our blue and white ball—humanity's home—rising above the bleak, gray lunar landscape and 240,000 miles (386 million kilometers) in the distance. *Phys.org*

NASA's InSight Takes Its First Selfie

NASA's InSight lander isn't camera-shy. The spacecraft used a camera on its robotic arm to take its first selfie - a mosaic made up of 11 images. This is the same imaging process used by NASA's Curiosity rover mission, in which many overlapping pictures are taken and later stitched together. Visible in the selfie are the lander's solar panel and its entire deck, including its science instruments.

Mission team members have also received their first complete look at InSight's "workspace" - the approximately 14-by-7-foot (4-by-2-meter) crescent of terrain directly in front of the spacecraft. This image is also a mosaic composed of 52 individual photos.

InSight's landing team deliberately chose a landing region in Elysium Planitia that is relatively free of rocks. Even so, the landing spot turned out even better than they hoped. The spacecraft sits in what appears to be a nearly rock-free "hollow" - a depression created by a meteor impact that later filled with sand. That should make it easier for one of InSight's instruments, the heat-flow probe, to bore down to its goal of 16 feet (5 meters) below the surface.

Marsdaily.com

Finding Ways to Protect Crews From the Effects of Space Radiation

In the near future, crews will embark on multi-month missions to the Moon, and eventually Mars and beyond. All incredible adventures, however, have their hazards, and a major one for crews on long-duration spaceflights is the space radiation they will be exposed to during their missions. A new experiment aboard the International Space Station, The Growth of Large, Perfect Protein Crystals for Neutron Crystallography (Perfect Crystals) study, aims to help scientists find a way to deal with the problem using a protein that is already at work in our bodies.

The Perfect Crystals experiment flew to the orbiting laboratory on SpaceX's 16th commercial resupply mission (CRS-16).

Shedding Light on the Problem

Exposure to space radiation can create dangerous chemical compounds in the body called reactive oxygen species (ROS).

"Radiation from space is a big problem - especially for crew members," said Azadmanesh. "ROS damages our DNA and contributes to the development of many diseases here on Earth, including heart disease and cancer."

This serious health threat means NASA must devise ways to protect astronauts from radiation. Figuring out how to deal with the damage from ROS could also help scientists treat and prevent cancers back on our planet. The answer may come from the way our bodies already deal with the low-level radiation that sneaks through our atmosphere and reaches us on Earth.

The protection is provided by a naturally-occurring protein in our cells called manganese superoxide dismutase (MnSOD), which breaks ROS down into more benign substances the body can safely process. The first step is finding out how MnSOD works - all the way down to its atoms. The method the team wants to use to study the atomic structure of MnSOD is a very powerful technique called crystallography.

To use crystallography, researchers must employ liquid chemistry to get molecules of MnSOD to stack themselves in a very uniform way, like bricks in a wall, until they form crystals that are similar to a grain of salt. They can then take the crystals into a special laboratory, where they expose them to intense blasts of neutrons and track how the neutrons bounce off them using surrounding detectors.

The way the crystals diffract the neutrons could tell researchers a lot about the shape and position of atoms in the stacks of MnSOD, providing clues about how it functions.

Spacedaily.com

InSight Places First Instrument on Mars

NASA's InSight lander has deployed its first instrument onto the surface of Mars, completing a major mission milestone. New images from the lander show the seismometer on the ground, its copper-colored covering faintly illuminated in the Martian dusk. It looks as if all is calm and all is bright for InSight, heading into the end of the year.

"InSight's timetable of activities on Mars has gone better than we hoped," said InSight Project Manager Tom Hoffman, who is based at NASA's Jet Propulsion Laboratory in Pasadena, California. "Getting the seismometer safely on the ground is an awesome Christmas present."

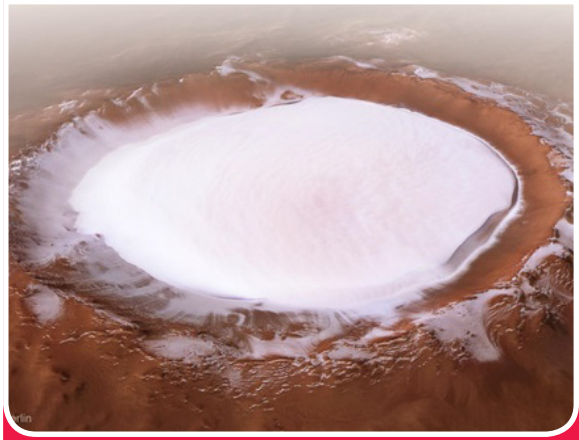
The InSight team has been working carefully toward deploying its two dedicated science instruments onto Martian soil since landing on Mars on Nov. 26. Meanwhile, the Rotation and Interior Structure Experiment (RISE), which does not have its own separate instrument, has already begun using InSight's radio connection with Earth to collect preliminary data on the planet's core. Not enough time has elapsed for scientists to deduce what they want to know—scientists estimate they might have some results starting in about a year.

To deploy the seismometer (also known as the Seismic Experiment for Interior Structure, or SEIS) and the heat probe (also known as the Heat Flow and Physical Properties Probe, or HP3), engineers first had to verify the robotic arm that picks up and places InSight's instruments onto the Martian surface was working properly. Engineers tested the commands for the lander, making sure a model in the test bed at JPL deployed the instruments exactly as intended. Scientists also had to analyze images of the Martian terrain around the lander to figure out the best places to deploy the instruments.

On Tuesday, Dec. 18, InSight engineers sent up the commands to the spacecraft. On Wednesday, Dec. 19, the seismometer was gently placed onto the ground directly in front of the lander, about as far away as the arm can reach—5.367 feet, or 1.636 meters, away).

"Seismometer deployment is as important as landing InSight on Mars," said InSight Principal Investigator Bruce Banerdt, also based at JPL. "The seismometer is the highest-priority instrument on InSight: We need it in order to complete about three-quarters of our science objectives."The seismometer allows scientists to peer into the Martian interior by studying ground motion—also known as marsquakes. Each marsquake acts as a kind of flashbulb that illuminates the structure of the planet's interior. By analyzing how seismic waves pass through the layers of the planet, scientists can deduce the depth and composition of these layers.

Phys.org



Mars' Korolev Crater: A Massive Reservoir of Water Ice

Radio waves from our Milky Way galaxy are reflected across the surface of the moon in a stunning new image.

Using the Murchison Widefield Array (MWA) radio telescope in the Western Australian desert, astronomers modeled this stunning view of the Milky Way's radio waves cast across the moon. Researchers will use this measurement to very precisely measure the patch of sky covered by the moon, which will let them eventually detect extremely faint emissions from hydrogen atoms to help see how the first stars and galaxies of the early universe evolved, the research team said in a statement.

"Before there were stars and galaxies, the universe was pretty much just hydrogen, floating around in space," Benjamin McKinley, lead astronomer of the study from the International Centre for Radio Astronomy Research (ICRAR), said in the statement. "Since there are no sources of the optical light visible to our eyes, this early stage of the universe is known as the 'cosmic dark ages.'"

The new image is actually comprised of measurements from the MWA's lunar observations, as well as the Global Sky Model — a map of diffuse galactic radio emission published in 2008. Using computer modeling, the Global Sky Model was mapped onto the face of the moon, allowing astronomers to calculate the average brightness from the Milky Way that would reflect off its surface.

Astronomy.com

Schools in Action

Dear Followers,

As this New Year marks a new beginning in our life, we would like to take this opportunity to thank each one of you for your excellent performances last year.

You have a huge number of projects coming up in next year, and we are sure that with all your dedication and determination we will be able to complete those also in time. We thank you all for your support and hope this relationship continues and we achieve success together.

Happy holiday season and a happy new year!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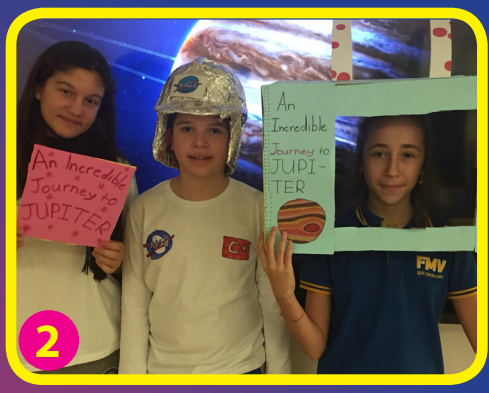

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1,2- FMV Nişantaşı, ISTANBUL 3,4- Maltepe Yönder Collage, ISTANBUL 5,6- İstek Mavişehir Collage, IZMIR

Astronomy Picture of the Day

NGC 6357: The Lobster Nebula

Why is the Lobster Nebula forming some of the most massive stars known? No one is yet sure. Cataloged as NGC 6357, the Lobster Nebula houses the open star cluster Pismis 24 near its center -- a home to unusually bright and massive stars. The overall blue glow near the inner star forming region results from the emission of ionized hydrogen gas. The surrounding nebula, featured here, holds a complex tapestry of gas, dark dust, stars still forming, and newly born stars. The intricate patterns are caused by complex interactions between interstellar winds, radiation pressures, magnetic fields, and gravity. NGC 6357 spans about 400 light years and lies about 8,000 light years away toward the constellation of the Scorpion.

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