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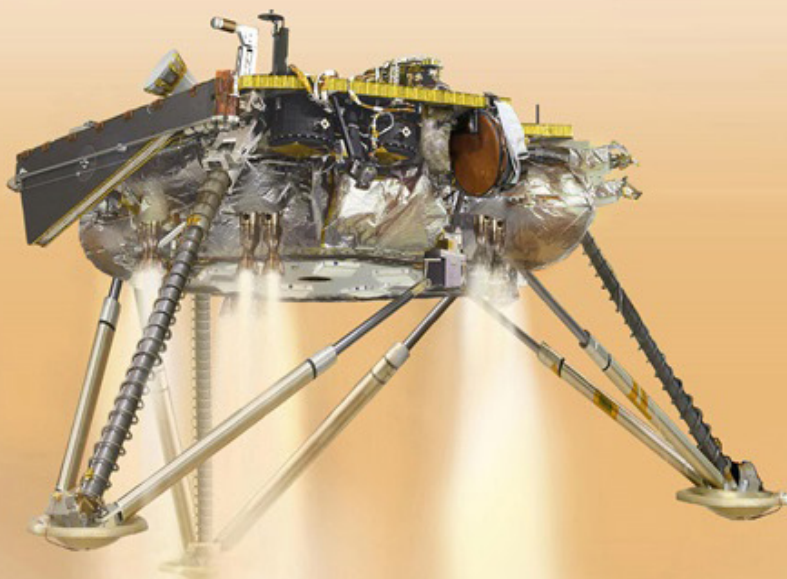
NEWSLETTER

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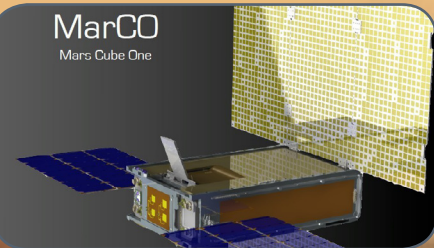
NASA InSight Has Landed!

InSight touched down on Mars at 11:52:59 a.m. PT (2:52:59 p.m. ET) on Nov. 26, 2018. The lander plunged through the thin Martian atmosphere, heatshield first, and used a parachute to slow down. It fired its retro rockets to slowly descend to the surface of Mars, and land on the smooth plains of Elysium Planitia.

Why is InSight Landing at Elysium Planitia?

InSight’s goal is to study the interior of Mars and take the planet’s vital signs, its pulse, and temperature. To look deep into Mars, the lander must be at a place where it can stay still and quiet for its entire mission. That’s why scientists chose Elysium Planitia as InSight’s home.

mars.nasa.gov



NASA Hears MarCO CubeSats Loud and Clear

The new study began with the discovery by NASA’s Curiosity Mars rover of manganese oxides, which are chemical compounds that can only be produced with a lot of oxygen. Curiosity, along with Mars orbiters, also established the presence of brine deposits, with notable variations in the elements they contained. A high salt content allows for water to remain liquid -- a necessary condition for oxygen to be dissolved -- at much lower temperatures, making brines a happy place for microbes. Depending on the region, season and time of day, temperatures on the Red Planet can vary between minus 195 and 20 degrees Celsius (minus 319 to 68 degrees Fahrenheit). The researchers devised a first model to describe how oxygen dissolves in salty water at temperatures below freezing. A second model estimated climate changes on Mars over the last 20 million years, and over the next 10 million years.



First Manned Space Mission to Launch Since Soyuz Failure

The first manned space mission to the International Space Station since an unprecedented accident in October, which raised concerns about Moscow's Soviet-designed spacecraft, will launch on Monday.

Oleg Kononenko of the Russian space agency Roscosmos, Anne McClain of NASA and David Saint-Jacques of the Canadian Space Agency brushed aside any possible safety concerns, saying risk was just part of the job.

They are set to launch at 1131 GMT Monday aboard a Soyuz from Baikonur in Kazakhstan for a six-and-a-half month mission.

The launch comes after a Soyuz rocket carrying Russia's Aleksey Ovchinin and US astronaut Nick Hague failed on October 11 just minutes after blast-off, forcing the pair to make an emergency landing.

They escaped unharmed but the failed launch was the first such incident in Russia's post-Soviet history and a new setback for the country's once proud space industry.

spacedaily.com

NASA Chooses Nine Companies to Bid on Flying to Moon

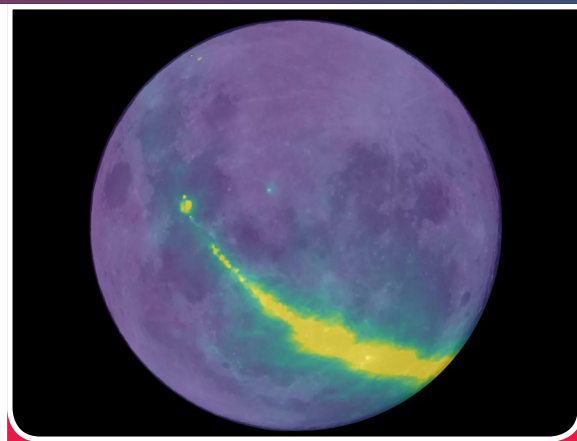
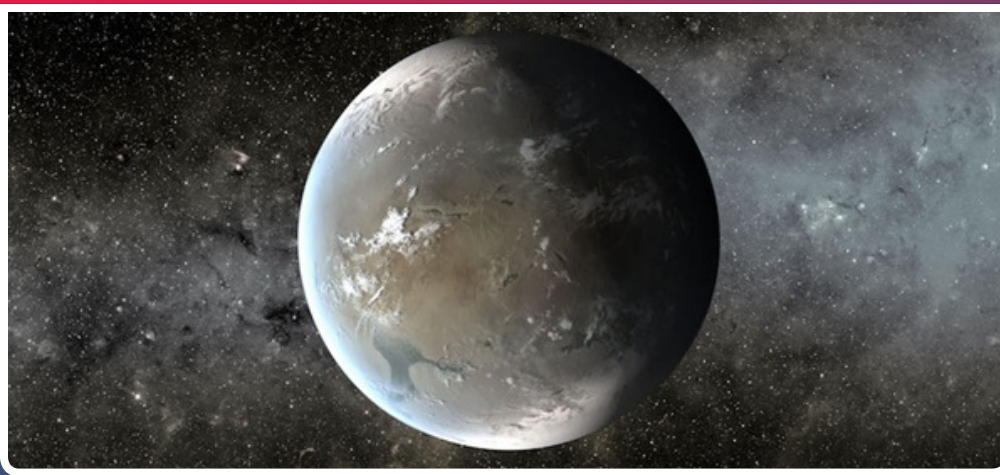
The US space agency on Thursday announced nine private companies, mostly start-ups, that will bid on \$2.6 billion in contracts to build spacecraft to carry payloads to the Moon as early as 2019. The move is part of NASA's goal of sending people to the Moon in the next decade, for the first time since the Apollo era of the 1960s and '70s. NASA Administrator Jim Bridenstine described the announcement as "tangible progress in America's return to the Moon's surface to stay." Of the group, the only well-known name is aerospace giant Lockheed Martin, which has a long track record of success with NASA and built the InSight lander that touched down Monday on Mars.

The others are Astrobotic Technology, Inc.; Deep Space Systems; Draper; Firefly Aerospace, Inc.; Intuitive Machines, LLC; Masten Space Systems, Inc.; Moon Express; and Orbit Beyond. "The Commercial Lunar Payload Services contracts are indefinite delivery, indefinite quantity contracts with a combined maximum contract value of \$2.6 billion during the next 10 years," said a NASA statement. NASA has not given any specifics for the bidding process, other than to say it will "look at a number of factors when comparing the bids, such as technical feasibility, price and schedule." The decision marks a stark change in NASA's mode of operation when it

comes to America's Moon aspirations -- though private companies have been used for years to ferry gear to the International Space Station, and SpaceX and Boeing are working on spacecraft to carry astronauts to the Moon as early as 2019. Instead of running a government-funded space program, like Apollo, the US space agency will buy services, essentially becoming a customer to private businesses that build their own spacecraft. The approach will allow NASA to cut costs, Bridenstine said. Earlier this year, NASA canceled its only robotic vehicle under development to explore the surface of the Moon, known as the Resource Prospector (RP) mission.

The vehicle had been in development for about a decade to explore a polar region of the Moon. In 2017, President Donald Trump announced the United States would once again send people to the lunar surface, as a step on the path to shipping people to Mars by the 2030s. NASA's current plan is to start by sending gear to the Moon, and build an orbiting lunar station beginning in 2022. By 2023, the first rocket would carry astronauts around the Moon, in an even more distant orbit than the Apollo missions. Landing actual astronauts on the Moon probably won't happen until the end of the 2020s, NASA has said.

moondaily.com



What's the maximum gravity we could survive?

If we wish to colonize another world, finding a planet with a gravitational field that humans can survive and thrive under will be crucial. If its gravity is too strong our blood will be pulled down into our legs, our bones might break, and we could even be pinned helplessly to the ground.

Finding the gravitational limit of the human body is something that's better done before we land on a massive new planet. Now, in a paper published on the pre-print server arXiv, three physicists, claim that the maximum gravitational field humans could survive long-term is four-and-a-half times the gravity on Earth. Or, at least you could if you are an Icelandic strongman – and Game of Thrones monster – who can walk with more than half a metric ton on your back. For mere mortals, the researchers say, it would need to be a little weaker.

Human Limits

To work out the largest gravitational force a human could function in, Nikola Poljak from the University of Zagreb in Croatia, and his colleagues first calculated the compressive strength of a human bone. Based on an average mammal bone, they estimated that a human skeleton could support a gravitational force more than 90 times Earth gravity. But this is its strength when standing still. Once we start running, the stress on our bones – as they flex and bend – increases by a factor of ten.

This means we could run on a planet with a gravitational field around ten times that of Earth's before our bones started to crack.

Don't Hold Us Down

Poljak and his colleagues estimate that aiming for an exoplanet with 3 to 4 times Earth's gravity would be more realistic for an average person – and they would still need rigorous training to get their muscle strength up that of an elite athlete.

Poljak hopes this work will help focus our search for a habitable exoplanet. "Now we know that there is no point in hoping to settle planets with high g-values," he says.

Many of the rocky exoplanets we've found are a good deal bigger than our own planet. Astronomers call them super-Earths. It's difficult to tell what the gravity on another world is for sure without going there, as density can vary between worlds, but it doesn't take much to begin adding the pounds.

Volume increases as a cube and surface area as a square, so even a slightly bigger planet would have much stronger gravity. Currently there are 3605 confirmed exoplanets, 594 of which have the known radii and masses needed to determine their gravity. According to Poljak's calculations, 422 of these have a gravitational field equal to or below 3.5 times Earth's.

astronomy.com

The Milky Way's Reflection Shines on Surface of the Moon

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.

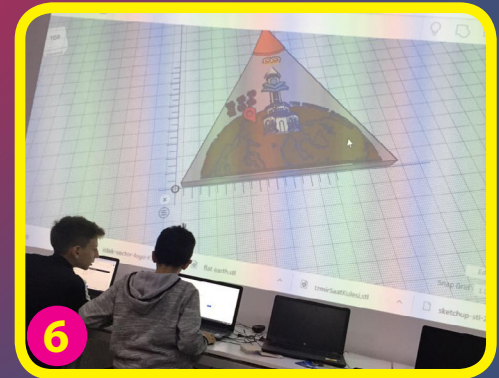
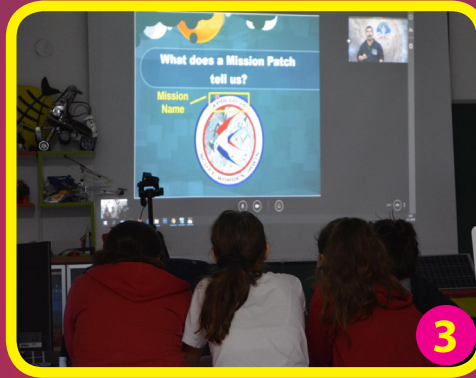
"Before there were stars and galaxies, the universe was pretty much just hydrogen, floating around in space," Benjamin McKinley, lead astronomer of the study from the International Centre for Radio Astronomy Research (ICRAR), said in the statement. "Since there are no sources of the optical light visible 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.

space.com

Schools in Action

This week, many schools worked on their "Toys in Space" project. The students invested their time, energy, and built spectacular space toys. While some students accomplished this, some other students used 3D-modelling to make their own "Mission Patch", and they had their designs come to life by using a 3D printer and Arduino.



1- Bahçeşehir 50.YIL Campus, IZMIR 2- FMV Nişantaşı, ISTANBUL 3- İsmail Kaymak Collage, ÇANAKKALE
4- Rota Collage, IZMIR 5,6- İstek Mavişehir Collage, IZMIR

Astronomy Picture of the Day

Across Corona Australis

Cosmic dust clouds are draped across a rich field of stars in this broad telescopic panorama near the northern boundary of Corona Australis, the Southern Crown. Less than 500 light-years away the denser clouds effectively block light from more distant background stars in the Milky Way. The entire vista spans about 5 degrees or nearly 45 light-years at the clouds' estimated distance. Toward the right lies a group of bluish reflection nebulae cataloged as NGC 6726, 6727, 6729 and IC 4812. The characteristic blue color is produced as light from hot stars is reflected by the cosmic dust. The dust also obscures from view stars in the region still in the process of formation. Smaller yellowish nebula NGC 6729 surrounds young variable star R Coronae Australis. Below it are arcs and loops identified as Herbig Haro (HH) objects associated with energetic newborn stars. Magnificent globular star cluster NGC 6723 is above and right of the nebulae. Though NGC 6723 appears to be part of the group, its ancient stars actually lie nearly 30,000 light-years away, far beyond the young stars of the Corona Australis dust clouds.



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