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Astronomy & Physics Weekly News

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Scientists shocked as NASA cuts only moon rover

A NASA picture taken by US crew commander Eugene A. Cernan during the Apollo 17 mission on December 13, 1972 shows astronaut and geologist Harrison H. Schmitt seated in the Lunar Roving Vehicle on the surface of the moon

In a move that shocked lunar scientists, NASA has cancelled the only robotic vehicle under development to explore the surface of the Moon, despite President Donald Trump's vow to return people there.

Scientists working on the Resource Prospector (RP) mission, a robotic rover that had been in development for about a decade to explore a polar region of the Moon, expressed astonishment at the decision.

"We now understand RP was cancelled on 23 April 2018 and the project has been asked to close down by the end of May," said the letter dated April 26 by the Lunar Exploration Analysis Group, addressed to NASA chief Jim Bridenstine and posted on the website NASAWatch.com.

"This action is viewed with both incredulity and dismay by our community," particularly because Trump's space policy "directs NASA to go to the lunar surface," the letter said.

The robotic rover was being built as the world's only vehicle aimed at exploring the polar region of the Moon, and was expected to undergo a design review next year ahead of launching in 2022.

It would have been the first US lunar lander since Apollo 17 in 1972, and the first ever US robotic rover on the surface of the Moon.

RP was intended to be the first mission to mine the surface of the Moon, in search of volatile compounds like hydrogen, oxygen and water.

NASA responded with a statement posted online Friday which said some of the instruments aboard RP would be flown on future missions.

"NASA is developing an exploration strategy to meet the agency's expanded lunar exploration goals," said the statement. ..Read More...

New proof reveals fundamental limits of scientific knowledge

A correct prediction (left), and an incorrect prediction (right). Illustration by Joerael Elliott, based on a diagram by David Wolpert. Credit: Santa Fe Institute

A new proof by SFI Professor David Wolpert sends a humbling message to would-be super intelligences: you can't know everything all the time.

The proof starts by mathematically formalizing the way an "inference device," say, a scientist armed with a supercomputer, fabulous experimental equipment, etc., can have knowledge about the state of the universe around them. Whether that scientist's knowledge is acquired by observing their universe, controlling it, predicting what will happen next, or inferring what happened in the past, there's a mathematical structure that restricts that knowledge. The key is that the inference device, their knowledge, and the physical variable that they (may) know something about, are all subsystems of the same universe. That coupling restricts what the device can know. In particular, Wolpert proves that there is always something that the inference device cannot predict, and something that they cannot remember, and something that they cannot observe.

"In some ways this formalism can be viewed as many different extensions of [Donald MacKay's] statement that 'a prediction concerning the narrator's future cannot account for the effect of the narrator's learning that prediction,'" Wolpert explains. "Perhaps the simplest extension is that, when we formalize [inference devices] mathematically, we notice that the same impossibility results that hold for predictions of the future—MacKay's concern—also hold for memories of the past. Time is an arbitrary variable—it plays no role in terms of differing states of the universe."

Not everyone can be right

What happens if we don't require that an inference device know everything about their universe, but only that it knows the most that could be known? Wolpert's mathematical framework shows that no two inference devices who both have free will (appropriately defined) and have maximal knowledge about the universe can co-exist in that universe. There may ..Read More...

InSight spacecraft will soon peer deep into the interior of Mars

Inner Space Explorer - The InSight Lander will land on Mars on November 26 of this year. Once there, it will spend approximately two Earth years gathering data on the interior of the Red Planet.
NASA/JPL-Caltec

As early as 4:05 a.m. PDT on May 5th, those on the West Coast of the United States will have the chance to witness an interplanetary launch for the first time. The United Launch Alliance Atlas V rocket will carry NASA's InSight spacecraft into orbit from Vandenberg Air Force Base, near Lompoc, California.

InSight, which stands for Interior Exploration Using Seismic Investigations, Geodesy and Heat Transport, is a lander bound for the Elysium Planitia region in Mars's Northern hemisphere. There, it will gather data on the crust, mantle and core of Mars. It will also listen for tectonic activity and meteorite impacts.

Though the launch represents the beginning of InSight's expedition, in another way, it is the end of a long journey. NASA delayed the lander's original launch in 2016 after discovering a problem with a key instrument. This second chance at the mission gives planetary scientists another opportunity to snatch victory from the jaws of defeat.

A Look Inside Mars

As the date of the launch approaches, planetary scientists are gearing up for a wealth of new information that will provide clues into how rocky planets form, show how Mars evolved over time, and provide one of the most complete records of regional weather on Mars that we've ever had. These experiments could shed light on the history of the Earth and other rocky planets in the cosmos, as well as lay groundwork for future human exploration of the Red Planet.

Scientists are looking to gather information on the basic structure of Mars—for example, the thickness of its crust and the composition of its mantle and core. These discoveries will give insight into the formation of rocky planets in general because, unlike Earth, the underlying crust of Mars appears to have been stable for the ...Read More...

Chandrayaan-2 will now launch in October 2018

Artist's concept showing the lunar rover from Chandrayaan-2, India's second Moon mission, stationed on the Moon.
ISRO/YouTube

India's first attempt at landing a semi-autonomous rover near the lunar south pole, originally set to launch this April, will have to wait for at least six more months, thanks to additional tests suggested by experts. "Being a very complex mission with a lander, rover, and an orbiter, more critical tests are planned," said Dr. Arun Sinha, former senior scientist at the Indian Space Research Organisation (ISRO). This delay, however, is not the first for Chandrayaan-2.

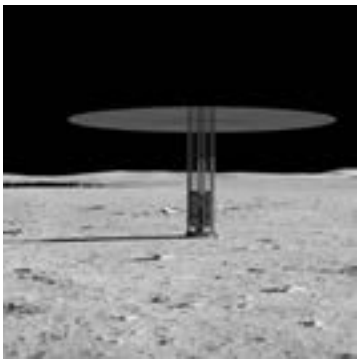
Back in 2007, ISRO and Russia's federal space agency, Roscosmos, signed an agreement for a joint lunar mission. At the time, ISRO took up responsibility for the orbiter, while Roscosmos planned to oversee the lander and rover. The initial launch of Chandrayaan-2, which was originally slated for 2015, was delayed due to the failure of the Phobos-Grunt mission in 2011.

Phobos-Grunt was an attempted Russian mission that aimed to return a sample from Phobos (one of Mars' moons), but ultimately ended up in the Pacific. Soon after the crash landing, it came to light that Roscosmos had used similar technical aspects in both its martian and lunar missions, resulting in a predictably high risk of failure for Chandrayaan-2. Russia's withdrawal from the agreement put the Chandrayaan-2 mission in stasis for a few years until India could build its own rover and lander.

Dr. Sivan, ISRO's chairperson, recently told the Times of India that this year's launch, which was originally scheduled for April 23, had to be put off once again due to ongoing tests that would require at least 20 more days to finish. Unfortunately, unlike launching a spacecraft into orbit around Earth, deferred lunar missions have to wait quite a while for their next ideal launch period.

"Launch date is only once a month. [But] if ISRO launches the mission during May through September, [the] full lunar day (14 Earth days) cannot be utilized for experiments on the Moon due to eclipses. Hence the mission will launch in October first week," said Dr. Sinha. Both the delays have already led to a gap of 10 years between the two Chandrayaan missions. The first, Chandrayaan-1, was launched in October 2008, and included a lunar orbiter and an impactor – a probe intended to crash into the lunar surface to eject sub-surface soil for analysis. ...Read More...

A Nuclear Reactor for Space Missions Passes Final Major Ground Tests



An artist's rendering of a Kilopower nuclear power plant on the surface of the moon. The prominent heat radiator makes it look like a beach umbrella. The actual unit will have cables carrying electricity away from the reactor.
Credit: NASA

Scientists, engineers and reporters gathered at NASA's Glenn Research Center in Cleveland on May 2 for a news conference announcing the latest results of the Kilopower nuclear power plant project: It has finished all of its major ground tests and met or surpassed the development team's expectations.

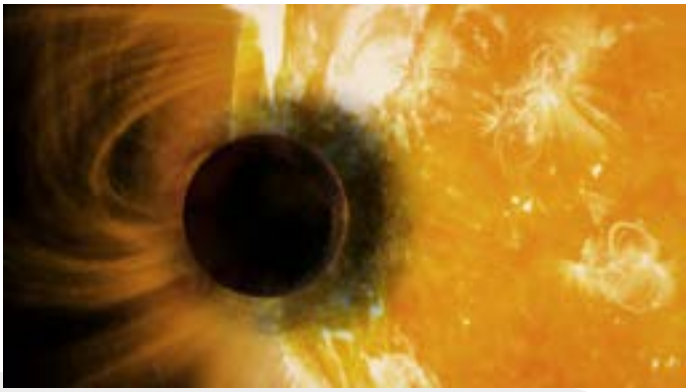
NASA is developing the experimental reactor to provide reliable energy for long-duration crewed missions to the moon, Mars and destinations beyond.

For decades, spacecraft have relied on nuclear power as a compact, reliable source of electricity, especially on missions for which solar power is not feasible, like expeditions to the moon's polar regions. The Voyager 1 and 2 spacecraft, which are now billions of miles from the sun, still have enough nuclear energy after more than 40 years to transmit signals back to Earth. Meanwhile, the Curiosity rover has been driving around the Red Planet for nearly six years courtesy of a trunk full of plutonium.

In spacecraft like the Voyagers and Curiosity, a device called a radioisotope thermoelectric generator (RTG) converts heat energy from passive radioactive decay directly into electricity. The decay causes a temperature difference across plates of two kinds of metal — one connected to the reactor, and the other attached to a radiator, thereby producing a voltage. This component, called a thermocouple, is commonly used in thermometers and temperature sensors. Although RTGs are not particularly efficient, they are simple and have no moving parts, making them perfect for applications in which repair is not an option.

But many future missions, especially those involving human crews, will require much more power than the RTGs can produce. That's why NASA and the U.S. Department of Energy (DOE) are collaborating to create a space-ready nuclear reactor, which harvests energy from active nuclear fission, or atom splitting. ...Read More...

An Exoplanet First! Helium Spotted on Bizarre Comet-Like World



Artist's illustration of the alien planet WASP-107b, whose atmosphere is being stripped by radiation from its host star.
Credit: Engine House VFX

For the first time, astronomers have detected helium in the atmosphere of an alien world, a new study reports. The discovery shows that it's possible to probe the air of at least some exoplanets without launching a new space telescope dedicated to this endeavor, the researchers said.

"This is a new method to probe the upper parts of an exoplanet atmosphere, where high-energy radiation is observed," study lead author Jessica Spake, an exoplanet hunter at the University of Exeter in England, told Space.com via email. "Hopefully, we'll be able to study many more upper planetary atmospheres this way."

Revealing the unseen

To study the atmosphere of a faraway planet, scientists must wait for it to pass between its host star and Earth. Just before and after the bulk of the planet blocks some of the light streaming from the star, some of that light passes through the world's atmosphere. By studying how the light from the star changes as it passes through that alien air, scientists are able to characterize the atmosphere's composition.

The process is difficult, and scientists have probed only a handful of worlds' atmospheres in this manner to date. So far, the study of exoplanet air has focused on hydrogen, the most abundant element in the universe and one of the main constituents of the solar system's gas giants. Early theoretical models predicted that helium should be among the most easily spotted elements in exoplanet atmospheres, but until now, it has remained unseen.

Enter WASP-107b, a super-Neptune world that lies 200 light-years from Earth in the constellation of Virgo. Discovered in 2017, the gas giant is comparable in diameter to Jupiter but has just one-eighth of Jupiter's mass, making it one of the lowest-density worlds known. ...Read More...

The Milky Way's supermassive black hole may have a dozen nomadic siblings

Like most galaxies, the Andromeda galaxy (pictured above) is thought to house a supermassive black hole at its core. According to new research, galaxies roughly the mass of the Milky Way also likely contain about a dozen more 'wandering' supermassive black holes. NASA/JPL-Caltech

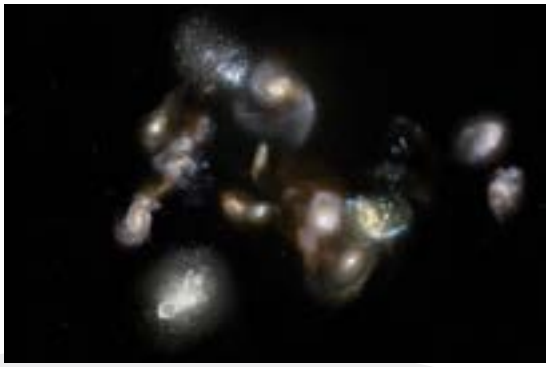
At the center of the Milky Way sits a dark and dangerous beast: Sagittarius A*. Located about 26,000 light-years from Earth, our galaxy's only known supermassive black hole is roughly 4 million times as massive as the Sun, and its immense gravitational pull can nonchalantly annihilate any object that strays too close. Fortunately for us, Sagittarius A* is like a troll under a bridge — it does not leave its post.

This tends to be the case for most supermassive black holes (SMBHs) found throughout the universe. However, sometimes a SMBH can be forced from the center of its host galaxy, particularly if it's involved in a galactic merger with a bigger counterpart. For example, if a small galaxy merges with a larger one, the smaller galaxy's SMBH will likely be thrown into a wide orbit around the newly formed galaxy, therefore becoming a 'wandering' supermassive black hole. Though astronomers have previously found evidence of these nomadic SMBHs on the outskirts of other galaxies, their overall prevalence is still largely unknown.

But according to a new study published April 24 in The Astrophysical Journal Letters, wandering supermassive black holes may be quite common (and even observable) within many different types of galaxies — including the Milky Way.

To carry out the study, the researchers took advantage of a new, state-of-the-art cosmological simulation called ROMULUS25. This N-body simulation uses an advanced supercomputer called Blue Waters to model how billions of individual particles interact and evolve over time. Though the ROMULUS25 simulation encompasses an astounding volume of over 15,000 cubic Megaparsecs (1 Megaparsec = 3 million light-years), it is still able to resolve the internal structure of galaxies and dwarf galaxies, as well as capture the orbital evolution of SMBHs following galactic mergers. ..Read More...

Massive galaxies began merging just 1.5 billions years after the Big Bang



Shown is an artist's impression of SPT2349-56, an ancient group of colliding galaxies. It was originally thought that starburst galaxies began merging when the universe was 3 billion years old, but recently, researchers observed massive galaxies fusing together when the universe was just half that age.
ESO/M. Kornmesser

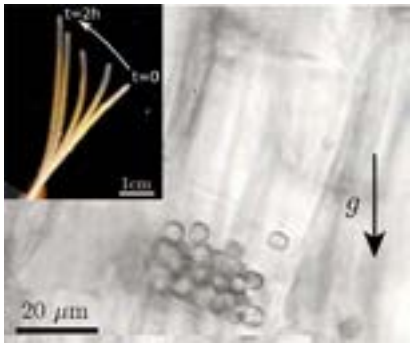
Housing thousands of galaxies and an absurd amount of stars, galaxy clusters are the most massive known objects in the universe. It was previously believed that these clusters formed when young starburst galaxies collided about 3 billion years after the Big Bang, but now, two teams of international researchers think that the pileup occurred much earlier. By peering into the universe's ancient past, they saw the collisions beginning just 1.5 billion years after the Big Bang, drastically increasing the age of some of our oldest cosmic residents.

The research teams, led by Iván Oteo of the University of Edinburgh and Tim Miller of Yale University and Dalhousie University in Nova Scotia, used the Atacama Large Millimeter/submillimeter Array (ALMA) and the Atacama Pathfinder Experiment (APEX) telescopes to study the merging starburst galaxies. Both Oteo's and Miller's findings were published in the Astrophysical Journal.

Starburst galaxies produce stars at freakishly fast rates, popping out thousands each year, whereas the Milky Way produces roughly one per year. These galaxies were prominent after the Big Bang and are located a fair distance from Earth, with their light taking billions of years to reach us. By the time it finally does, we're seeing these galaxies as they appeared billions of years ago.

Discovered while observing our 1.5-billion-year-old universe, the South Pole Telescope and the Herschel Space Observatory found two objects that appeared as indistinct smudges of light. Further observations by ALMA and APEX revealed them to be two extremely dense packs of galaxies, one made up of fourteen galaxies and the other made up of ten. They're the most active regions of star formation ever witnessed in the infant universe — and the galaxies within them are on the brink of collision. These cosmic mash-ups, which were originally thought to have begun when the universe was 3 billion years ...Read More...

Why plants are so sensitive to gravity: The lowdown



Inset: Wheat coleoptile growing upward after being inclined. Closeup of cell showing pile of statoliths (microscopic starch-filled grains) that enables the plant to detect gravity.

If you tilt a plant, it will alter its growth to bend back upwards. But how does it detect the inclination? With cellular clinometers: cells filled with microscopic grains of starch called statoliths.

In each of these cells, the pile of statoliths settles to the bottom. This provides a point of reference to guide growth - by modifying the distribution of a growth hormone - so that the plant may return to an upright position.

The mystery of plants is what makes them so extremely responsive to gravity, at even the tiniest deviation from the vertical. But a heap of grains would seem to be a lousy clinometer. Normally, friction and interparticle locking would limit the flow of the grains, making the granular system ineffective below a threshold angle of inclination. However, plant statoliths are astonishingly precise.

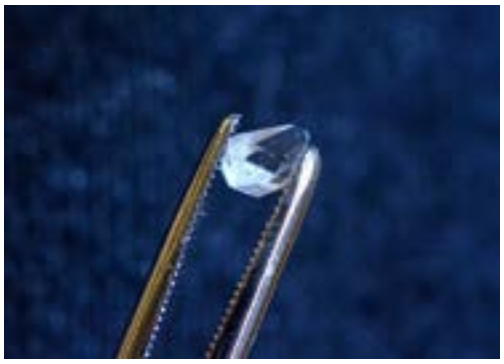
Researchers from the Institut Universitaire des Systemes Thermiques Industriels (CNRS/Aix-Marseille University) and the Physique et Physiologie Integratives de l'Arbre en Environnement Fluctuant laboratory (INRA/Universite Clermont Auvergne) teamed up to solve this puzzle.

First, they directly observed the movement of statoliths in response to tilting, discovering they did not behave like a standard granular system. Statoliths move and flow no matter how the cell is angled. The surface of the statolith piles always settles into a horizontal plane, just like a liquid. But how do cells make these piles so fluid?

To elucidate the origin of this property, the team continued their study by developing a model of plant statoliths: microbeads in artificial cells sized like real ones. Comparison of the two systems allowed them to conclude that the collective fluidity of statoliths emerges from the independent movement of each.

The molecular "motors" of the cell are constantly stirring them about. As a result, they don't jam together, and over a sufficiently long timescale, the pile of statoliths as a whole exhibits properties similar to those of liquids. This behavior is essential to the plant. It means ...Read More...

Physicists find signs of a time crystal



Yale physicists looked for a signature of a discrete time crystal within a crystal of monoammonium phosphate. Credit: Michael Marsland/Yale University

Yale physicists have uncovered hints of a time crystal—a form of matter that "ticks" when exposed to an electromagnetic pulse—in the last place they expected: a crystal you might find in a child's toy.

he discovery means there are now new puzzles to solve, in terms of how time crystals form in the first place.

Ordinary crystals such as salt or quartz are examples of three-dimensional, ordered spatial crystals. Their atoms are arranged in a repeating system, something scientists have known for a century.

Time crystals, first identified in 2016, are different. Their atoms spin periodically, first in one direction and then in another, as a pulsating force is used to flip them. That's the "ticking." In addition, the ticking in a time crystal is locked at a particular frequency, even when the pulse flips are imperfect.

Scientists say that understanding time crystals may lead to improvements in atomic clocks, gyroscopes, and magnetometers, as well as aid in building potential quantum technologies. The U.S. Department of Defense recently announced a program to fund more research into time crystal systems.

Yale's new findings are described in a pair of studies, one in Physical Review Letters and the other in Physical Review B. The studies represent the second known experiment observing a telltale signature for a discrete time crystal (DTC) in a solid. Previous experiments led to a flurry of media attention in the past year.

"We decided to try searching for the DTC signature ourselves," said Yale physics professor Sean Barrett, principal investigator for the two new studies. "My student Jared Rovny had grown monoammonium phosphate (MAP) crystals for a completely different experiment, so we happened to have one in our lab."

MAP crystals are considered so easy to grow that they are sometimes included in crystal ...Read More...

Research casts doubt on theories of star formation

illustration only

The birth of stars from dense clouds of gas and dust may be happening in a completely unexpected way in our own galaxy and beyond.

This is according to an international team of researchers, including scientists from Cardiff University, who have found that long-held assumptions about the relationship between the mass of star-forming clouds of dust and gas and the eventual mass of the star itself may not be as straightforward as we think.

The underlying reasons as to why a star eventually grows to a specific mass has puzzled scientists for some time.

It has been assumed that a star's mass mostly depends on the original structure - known as a star-forming core - from which stars are born.

Within stellar nurseries all across the Universe giant molecular clouds, made up from dense dust and gas, begin to collapse and clump together under the influence of gravity to create star-forming cores.

It is within these extremely dense cores that material begins to collapse and heat up to a temperature hot enough to sustain nuclear fusion, from which the star begins to grow.

Observations from within our galaxy, the Milky Way, have shown that there is a link between the mass of the star-forming cores and the mass of the stars that they eventually spawn, and that there is a distribution pattern that is common throughout.

For instance, observations show relatively few stars that are more massive than the Sun, and that solar-mass stars are comparatively abundant. This distribution also shows that stars somewhat smaller than the Sun are even more common, but stars with a much smaller mass are less common. A lingering question among scientists has been whether or not we would see exactly the same distribution of star masses in other stellar clusters ...Read More...

New technology offers to broaden vision for radio astronomy

The 19-element phased array feed developed by the NRAO CDL.

To accelerate the pace of discovery and exploration of the cosmos, a multi-institution team of astronomers and engineers has developed a new and improved version of an unconventional radio-astronomy imaging system known as a Phased Array Feed (PAF). This remarkable instrument can survey vast swaths of the sky and generate multiple views of astronomical objects with unparalleled efficiency.

Looking nothing like a camera or other traditional imaging technologies - like CCDs in optical telescopes or single receivers in radio telescopes - this new Phased Array Feed design resembles a forest of miniature tree-like antennas evenly arranged on a meter-wide metal plate. When mounted on a single-dish radio telescope, specialized computers and signal processors are able to combine the signals among the antennas to create a virtual multi-pixel camera.

This type of instrument is particularly useful in a number of important areas of astronomical research, including the study of hydrogen gas raining in on our galaxy and in searches for enigmatic Fast Radio Bursts.

Over the years, various other radio astronomy research facilities have developed phased array receiver designs. Most, however, have not achieved the efficiency necessary to compete with classical radio receiver designs, which process one signal from one spot on the sky at a time. The value of the new PAF is that it can form multiple views (or "beams on the sky," in radio astronomy terms) with the same efficiency as a classical receiver, which can enable faster scans of multiple astronomical targets.

This newly developed system helps take Phased Array Feed technology from a curious area of research to a highly efficient, multipurpose tool for exploring the universe. Commissioning observations with the National Science Foundation's Green Bank Telescope (GBT) using this new design show that this ...Read More...

Special Read:

NASA's Mars InSight Lander: 10 Surprising Facts

Illustration only. Photo Credit: NASA/JPL-Caltech

Introduction

NASA's Mars InSight lander is designed to probe deep into the Red Planet in search of marsquakes, secrets about the planet's core and much more. This isn't the first lander to Mars, but it will be the first to dig so deep in search of scientific answers.

But there are some details about InSight that might surprise you. Here are 10 unexpected facts about NASA's InSight Mars lander to ponder.

It's the first to peer inside Mars.

Our knowledge of Mars is mostly skin-deep. From the ground, NASA's Curiosity and Opportunity rovers take pictures of the surroundings; sometimes, Curiosity collected samples for further analysis. Curiosity can also drill holes, but it can do so only on the topsoil of Mars. Meanwhile, the Red Planet is under constant scrutiny by spacecraft above, with orbiters taking high-resolution pictures of its surface or looking at its atmosphere.

The goal of InSight isn't to roam around the planet, but to stay still. That's so it can carefully measure properties of the Martian interior. This includes seismic activity (from marsquakes and meteorite strikes), temperature (through a heat flow experiment) and the size and shape of its core (through analyzing wobbles in the planet as it orbits the sun.) It's all in InSight's name. The moniker is short for Interior Exploration using Seismic Investigations, Geodesy and Heat Transport.

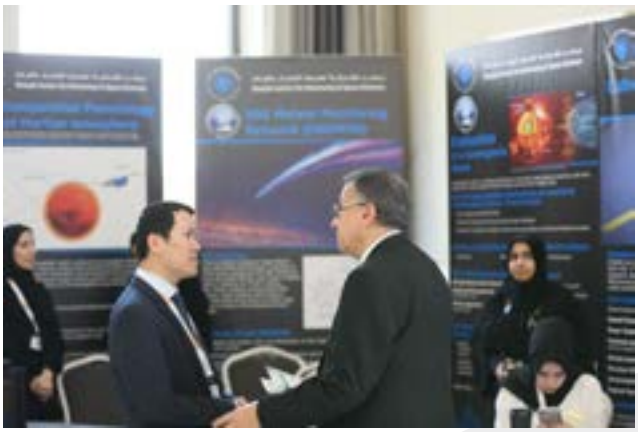
It will teach us about other planets.

The Kepler space telescope showed us that terrestrial planets (such as Earths or slightly larger "super-Earths") are common in the universe. It's hard to study these planets from so far away, so looking at Mars helps us makes predictions about their composition and atmosphere. Even in our own solar system, looking at terrestrial planets helps us understand why they all turned out so different. For example, why does Earth have so much water on it, while the Martian water has disappeared?

"When it comes to rocky planets, we've only studied one in great detail: Earth. By comparing Earth's interior to that of Mars, InSight's team hopes to better understand our solar system," NASA said in a statement. "What they learn might even aid the search for Earth-like exoplanets, narrowing down which ones might be able to support life. So while InSight is a Mars mission, it's also more than a Mars mission." ...Read More...

Global Aerospace Summit:
Abu-Dhabi: Apr. 30 - May 02, 2018

SCASS Participation in Pictures



This Week's Sky at a Glance
May 05 - 11, 2018

May 05	Sa	00:31	Moon-Saturn: 1.9° S
		03:00	Moon South Dec.: 20.6° S
		11:03	Eta Aquarid Shower: Zenith Hour Rate = 60
May 06	Su	04:35	Moon Apogee: 404500 km
		11:24	Moon-Mars: 3° S
May 07	Mo	14:24	Moon Descending Node
May 08	Tu	06:09	Last Quarter
May 09	We	04:10	Jupiter Opposition

SCASS Wins the First Prize at the 6th UAE Undergraduate Research Competition 2018

A SCASS team composed of the students Yousuf Faroukh, Ali Al-Hammadi, Aisha Al Ali, Ameera Faroukh, Anas Omar Adwan has won the first prize at the 6th UAE Undergraduate Research Competition that was held at Abu-Dhabi University, Khalifa City on April 30, 2018. The team faculty mentors were Dr. Mubasshir Shaikh and Dr. Ilias Fernini - The prize was under the category "Chemistry and Environmental Health." All five students are members of the SCASS CubeSat Laboratory.

The 6th UAE Undergraduate Research Competition 2018 has seen a record participation of students. A 257 research projects were selected among a pool of more than 350 submissions in 14 different fields. Abu-Dhabi University has been the host of this competition for the sixth time in a row. The contest was very well organized in light of the large number of students participating. Mentors and parents were also present to encourage their teams. Prof. Waqar Ahmad, Provost & Interim Chancellor of the Abu-Dhabi University, in his introductory remarks, stressed the importance of the competition to enhance education in the UAE and encourage the young minds to excel in research from their early university years.

Each students team was given about 10 minutes to present their work with a 5 minutes questions period from the jury and the audience. For each category, there were in general three winners: first prize (5,000 Dhs), second prize (2,500 Dhs), and third prize (1,500 Dhs). The only category that had only one winner is the "Physics & Mathematics." This was the only negative point about the competition. The jury of this category may have forgotten that the purpose of the competition is to encourage students. The prize money is just a tool, but the feeling of winning even the second or third prize will long be felt by the students.

In total, 30 prizes were distributed:

- University of Sharjah – 8 prizes (four 1st prize, and four 2nd prize)
- New York University Abu-Dhabi - 4 prizes (two 1st prize and two 2nd prize)
- Abu-Dhabi University – 4 prizes (one 2nd prize, and three 3rd prize)
- Khalifa University of Science and Technology - 3 prizes (two 1st prize, and one 2nd prize)
- United Arab Emirates University - 3 prizes (three 1st prize)
- Birla Institute of Technology and Science – 2 prizes (one 1st prize, and one 2nd prize)
- City University College of Ajman – 1 prize (2nd prize)
- Rochester Institute of Technology Dubai – 1 prize (1st prize)
- Middlesex University Dubai – 1 prize (2nd prize)
- American University of Dubai – 1 prize (1st prize)
- American University of Sharjah – 1 prize (2nd prize)
- Zayed University Abu-Dhabi – 1 prize (2nd prize)

SCASS Team presentation in the 6th UAE Undergraduate Research Competition "Environmental Monitoring Using CanSat" - Yousuf Faroukh, Ali Al-Hammadi, Aisha Al Ali, Ameera Faroukh, Anas Omar Adwan - Faculty mentors: Mubasshir Shaikh / Ilias Fernini - The team won the first prize in the "Chemistry and Environmental Health" category.