May 12, 2018 Shaaban 26, 1439 AH Volume 8, Issue 19

Astronomy & Physics Weekly News

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Top News

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This bold experiment aims to solve one of the biggest mysteries in science

The protoDUNE experimental program is designed to test and validate the technologies and design that will be applied to the construction of the DUNE experiment at the Sanford Underground Research Facility.CERN

More than 1,000 scientists from 30 countries are gearing up for an ambitious multi-year experiment to see if a close look at the smallest subatomic particle known to exist — the neutrino — can help answer some of science's biggest unresolved questions.

The Deep Underground Neutrino Experiment (DUNE) will involve shooting beams of neutrinos from a particle accelerator in suburban Chicago through the Earth to a neutrino detector set up in an abandoned mine 800 miles away in South Dakota. Though DUNE won't get going for several years, its scientists are already working on necessary modifications to the accelerator, and building smaller, prototype versions of the vast detector — and feeling amped about what they might learn from the experiment.

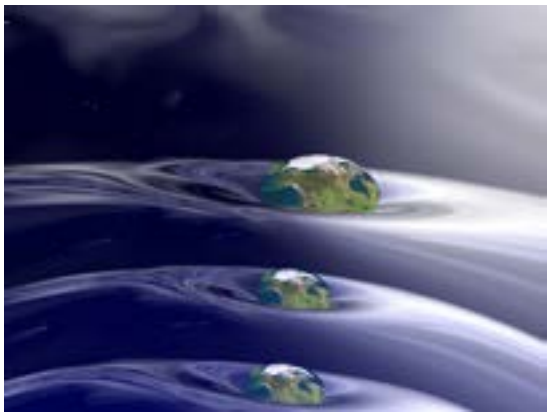
"You can live a happy life without knowing much about neutrinos, but they're one of the real keys to the way our universe developed after the Big Bang, and why it works the way it does," says University of Chicago physicist Edward Blucher, one of DUNE's two co-leaders. "Right now scientists guess that the most plausible explanation is that neutrinos played a key role in what happened early in the universe, but DUNE is going to give us some real hints as to what actually happened."
A century-old mystery

The main question that scientists hope DUNE will help answer is this: Why is there matter in the universe?

What sounds like a silly question is actually one that has bedevilled physicists since the late 1920s, when the Belgian physicist Georges Lemaitre came up with the idea that the universe began with a colossal outpouring of energy — the Big Bang.

Physicists have long believed that the Big Bang produced equal amounts of matter and an identical but oppositely charged substance known as antimatter. But if this belief is correct, why is antimatter all but ..Read More...

Parallel Universes: Theories & Evidence



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

Is our universe unique? From science fiction to science fact, there is a concept that suggests that there could be other universes besides our own, where all the choices you made in this life played out in alternate realities. The concept is known as a "parallel universe," and is a facet of the astronomical theory of the multiverse.

The idea is pervasive in comic books, video games, television and movies. Franchises ranging from "Buffy the Vampire Slayer" to "Star Trek" to "Doctor Who" to "Digemon" use the idea to extend plotlines. (A fuller list of parallel universes in fiction is at the bottom of the article.)

There actually is quite a bit of evidence out there for a multiverse. First, it is useful to understand how our universe is believed to have come to be.

Arguing for a multiverse

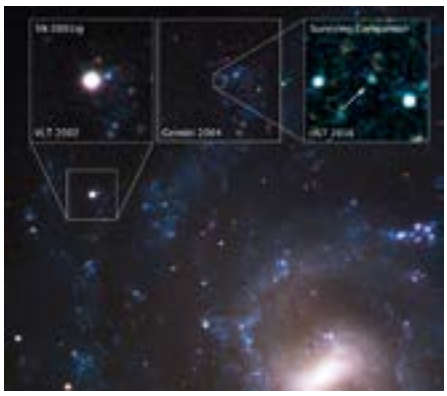
Around 13.7 billion years ago, simply speaking, everything we know of in the cosmos was an infinitesimal singularity. Then, according to the Big Bang theory, some unknown trigger caused it to expand and inflate in three-dimensional space. As the immense energy of this initial expansion cooled, light began to shine through. Eventually, the small particles began to form into the larger pieces of matter we know today, such as galaxies, stars and planets.

One big question with this theory is: are we the only universe out there? With our current technology, we are limited to observations within this universe because the universe is curved and we are inside the fishbowl, unable to see the outside of it (if there is an outside.)

There are at least five theories why a multiverse is possible, as a 2012 Space.com article explained:

1. Infinite universes. We don't know what the shape of space-time is exactly. One prominent theory is that it is flat and goes on forever. This would present the possibility of many universes being out there. ...Read More...

Hubble captures first image of surviving companion to a supernova



The first image of a surviving companion to a supernova. Thanks to Hubble's high resolution and exquisite ultraviolet sensitivity, astronomers now know that some supernovae likely have roots in double-star systems. NASA/ESA/S.Ryder (Australian Astronomical Observatory)/O. Fox (STScI)

Though the Hubble Space Telescope celebrated its 28th year in space earlier this week, the orbiting observatory is apparently far from finished. According to a new study published March 28 in the Astrophysical Journal, astronomers using NASA's Hubble Space Telescope (HST) have taken the first-ever photograph of a surviving companion to a supernova.

The image of the companion star, which was seen in the fading afterglow of a supernova that exploded some 40 million light-years away in the galaxy NGC 7424, provides the most compelling evidence yet that some supernovae originate in double-star systems. Furthermore, according to the study, the supernova's companion star was not just an innocent bystander to the explosion. Instead, it was most likely the instigator.

The supernova in question, SN 2001ig, is considered a Type IIb stripped-envelope supernova. This unusual type of supernova occurs when the majority of a massive star's hydrogen is stripped away prior to exploding. In 1987, astronomer Alex Filippenko from the University of California, Berkeley, became the first person to identify this rare breed of supernovae. And since then, astronomers have struggled to explain exactly how stripped-envelope supernovae actually lose their outer envelopes.

Originally, astronomers believed that the progenitor stars to these supernovae lost their outer shells due to incredibly strong and fast stellar winds. However, this theory seems to be incomplete, as observers have not found enough progenitor stars to make it the only feasible scenario. "That was especially bizarre, because astronomers expected that they would be the most massive and the brightest progenitor stars," said co-author Ori Fox, an astronomer at the Space Telescope Science Institute in Baltimore, in a press release. "Also, the sheer number of stripped-envelope supernovas is greater than predicted."
...Read More...

NASA satellite duo will track Earth's distribution of water and ice

This illustration of the GRACE-FO mission shows two satellites orbiting Earth together. When the satellites' orbit takes them over a massive object, such as a mountain or aquifer, the object's gravitational pull will change the distance between the satellites. By tracking these variations, researchers will be able to study how the distribution of Earth's water changes over time.
NASA/JPL-Caltech

A huge amount of time and energy is spent observing the cosmos for signs of distant habitability, with a major component being the presence of water. While the search for oceanic exoplanets is in full swing, rest assured that researchers aren't flushing away investigations into our own planet's water.

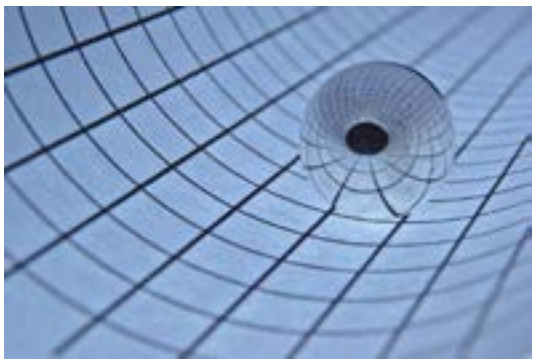
NASA and the German Research Centre for Geosciences (GFZ) have teamed up to launch the Gravity Recovery and Climate Experiment Follow-On (GRACE-FO) mission, a paired spacecraft duo that will monitor the ever-changing distribution of Earth's water and ice. The mission, which is currently in its final stages of preparation, is set to launch from Vandenberg Air Force Base on a SpaceX Falcon 9 rocket as early as May 19.

GRACE-FO is following in the footsteps of its parent mission, GRACE, which spent 15 years tracking the distribution of mass within our oceans, ice sheets, atmosphere, and below Earth's surface. By continuing to monitor changes in water allocation, researchers will gain additional insight into climate trends, the impact of certain human activities, and water resource management.

"Water is critical to every aspect of life on Earth – for health, for agriculture, for maintaining our way of living," said the director of NASA's Jet Propulsion Laboratory (JPL) and GRACE-FO science lead, Michael Watkins, in a press release. "You can't manage it well until you can measure it. GRACE-FO provides a unique way to measure water in many of its phases, allowing us to manage water resources more effectively."

Like GRACE, GRACE-FO is made up of two identical satellites that will orbit Earth in tandem at an altitude of about 305 miles (490 kilometers). With 137 miles (220 kilometers) between the two satellites, they will continuously send microwave signals back and forth to keep an extremely accurate log of the distances between them. Since the massive weight of Earth's water ..Read More...

The case against dark matter



Zoltán Vörös (flickr)

Albert Einstein's theory of general relativity is just over 100 years old, and so far it has predicted the interaction between celestial objects and the space-time field very well. There are a few troublesome spots, however, in which the theory of general relativity doesn't agree with quantum mechanics. These gaps have confounded researchers for decades, and have sprouted a handful of hypotheses attempting to explain the dissonance.

Dark matter and dark energy are the prevailing stand-in answers for this problem, but they are, as of yet, merely stand-ins. And there are some physicists that do not buy into these explanations. Erik Verlinde, a professor of science mathematics, and informatics at the University of Amsterdam, is one of them. He's developing a theory that takes another look at the mechanics of gravity, and it seems to have struck a nerve in the world of physics.

"Emergent gravity," as Verlinde calls it, is the idea that gravity is not a fundamental governance of our universe, but instead a reaction to the makeup of a given environment. Rather than thinking of gravity as a fundamental force, something that "just is," is it possible that gravity is actually the result of the positions of quantum bodies, similar to the way temperature is derived from the motions of individual particles?

"Einstein's theory can be viewed as being derived from a more microscopic picture," Verlinde says. "In particular what we learned about black holes is that Einstein's theory looked more like the laws of thermodynamics, and the laws of thermodynamics we know can be derived by thinking about the microscopic constituents that are describing matter."

Verlinde focuses on quantum interactions to explain the dissonance between general relativity and quantum theories. His theory has a long way to go before completion, but so far it has held up well and has made some strong arguments, particularly against the idea of dark matter.

The galaxy rotation problem
Physicists are painfully aware of the fact that spiral galaxies are spinning faster than they should be, given the amount of matter — and therefore, gravity — they contain. At the speed that some of them are spinning, current theory says that the stars, planets ...Read More...

What's a safe distance between us and a supernova?

Artist's concept of a supernova, or exploding star, via SmithsonianScience.org.

A supernova is a star explosion – destructive on a scale almost beyond human imagining. If our sun exploded as a supernova, the resulting shock wave probably wouldn't destroy the whole Earth, but the side of Earth facing the sun would boil away. Scientists estimate that the planet as a whole would increase in temperature to roughly 15 times hotter than our normal sun's surface. What's more, Earth wouldn't stay put in orbit. The sudden decrease in the sun's mass might free the planet to wander off into space. Clearly, the sun's distance – 8 light-minutes away – isn't safe. Fortunately, our sun isn't the sort of star destined to explode as a supernova. But other stars, beyond our solar system, will. What is the closest safe distance? Scientific literature cites 50 to 100 light-years as the closest safe distance between Earth and a supernova.

What would happen if a supernova exploded near Earth? Let's consider the explosion of a star besides our sun, but still at an unsafe distance. Say, the supernova is 30 light-years away. Dr. Mark Reid, a senior astronomer at the Harvard-Smithsonian Center for Astrophysics, has said:

... were a supernova to go off within about 30 light-years of us, that would lead to major effects on the Earth, possibly mass extinctions. X-rays and more energetic gamma-rays from the supernova could destroy the ozone layer that protects us from solar ultraviolet rays. It also could ionize nitrogen and oxygen in the atmosphere, leading to the formation of large amounts of smog-like nitrous oxide in the atmosphere.

What's more, if a supernova exploded within 30 light-years, phytoplankton and reef communities would be particularly affected. Such an event would severely deplete the base of the ocean food chain.

Suppose the explosion were slightly more distant. An explosion of a nearby star might leave Earth and its surface and ocean life relatively intact. But any relatively nearby explosion would still shower us with gamma rays and other high-energy radiation. This radiation could cause mutations in earthly life. Also, the radiation ...Read More...

What will happen when our sun dies?

Artist's concept of our sun as a red giant. Image via Chandra X-ray Observatory.

What does death mean, for the sun? It means our sun will run out of fuel in its interior. It'll cease the internal thermonuclear reactions that enable stars to shine. It'll swell into a red giant, whose outer layers will engulf Mercury and Venus and likely reach the Earth. Life on Earth will end. If the sun were more massive – estimates vary, but at least several times more massive – it would explode as a supernova. So ... no supernova. But what? What happens next? An international team of astronomers recently used a new stellar data-model that predicts the life cycle of stars to answer this question.

Their research is published in the peer-reviewed journal Nature Astronomy. It suggests that the sun is almost exactly the lowest mass star that – at the end of its life – produces a visible, though faint, planetary nebula.

The name planetary nebula has nothing to do with planets. It describes a massive sphere of luminous gas and dust, material sloughed off an aging star. In the 1780s, William Herschel called these spherical clouds planetary nebulae because, through his early telescope, planetary nebulae looked round, like the planets in our solar system.

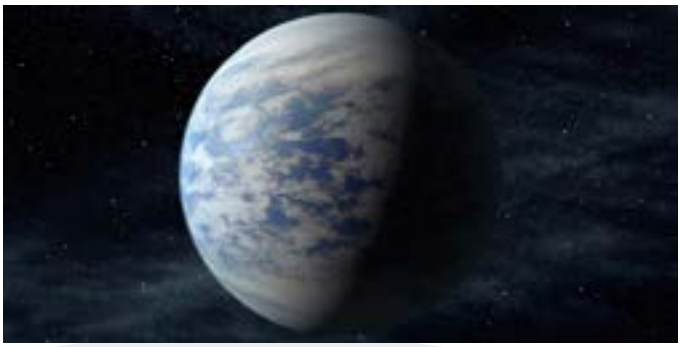
Astronomers already knew that 90 percent of all stars end their active lives as planetary nebulae. They were reasonably sure our sun would meet this fate. The key word here is visible. For years, scientists thought the sun has too low mass to create a visible planetary nebula.

Albert Zijlstra of the University of Manchester in England is a co-author of the study. He said in a statement:

When a star dies it ejects a mass of gas and dust – known as its envelope – into space. The envelope can be as much as half the star's mass. This reveals the star's core, which by this point in the star's life is running out of fuel, eventually turning off and before finally dying.

It is only then the hot core makes the ejected envelope shine brightly for around 10,000 years – a brief period in astronomy. This is what makes the planetary nebula visible. Some are so bright that they ..Read More...

Could space aliens on hefty super-Earths be trapped by their own gravity?



This artist's concept depicts Kepler-69c, a super-Earth-size planet in the habitable zone of a star like our sun, located about 2,700 light-years from Earth, in the constellation Cygnus.T. Pyle / JPL-Caltech-NASA Ames

Here's a problem that probably hasn't occurred to you: A lot of space aliens might have difficulty becoming a space-faring species.

Michael Hippke, an affiliate at Germany's Sonnenberg Observatory, explains the problem in a new paper. It's because most of the exoplanets we think would be suitable for spawning intelligent beings are larger than Earth. They're "super-Earths," with diameters that are typically 1.2 to 2 times that of our own world. Such porky planets are 50 percent more common than Earth-sized worlds, at least among the exoplanets we've found so far.

What does this have to do with alien space programs? As Hippke notes, aliens using chemical rockets like ours would have a hard time launching anything into space from such worlds, simply because the gravity there is stronger.

Well, that's true. On a planet whose diameter is twice that of Earth, you'd weigh twice as much as you do on terra firma. Lamentable. But if you assume that sending a spacecraft into the void from such a planet would require a rocket twice the size of its terrestrial counterpart, you're wrong. At least you're wrong if you're talking about a rocket of the type we use.
Rockets like airplanes

Our rockets are like airplanes: They take their fuel with them. The faster you want to go, the more kerosene and liquid oxygen you have to take along. Escaping the gravity of a super-Earth would require rockets that dwarf those we've built. And so Hippke argues that the challenge of building such massive missiles might discourage the denizens of a super-Earth from venturing beyond their home world.

That's a strong statement, and it seems off target. It would be harder for the super-Earth citizenry to boldly go, but it wouldn't be that much harder. ...Read More...

Energy quantization enhances the performance of single-atom heat machines

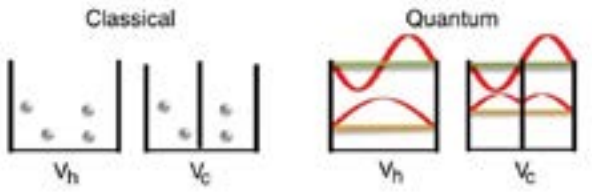


Illustration of a situation in which work cannot be extracted from a classical ideal gas, but can be extracted from a quantum one. Credit: Gelbwaser-Klimovsky et al. ©2018 American Physical Society

Physicists have demonstrated that energy quantization can improve the efficiency of a single-atom heat engine to exceed the performance of its classical counterpart. Energy quantization, in which the energy levels of a system occur only in discrete values, is a quintessential feature of quantum systems and differs from the continuous energy levels that occur in classical systems.

The physicists, David Gelbwaser-Klimovsky at Harvard University and coauthors, have published a paper on using energy quantization to improve the performance of heat machines in a recent issue of Physical Review Letters.

In their work, the researchers compared the performance of classical and quantum heat machines, which convert heat into work. In the classical version, a compressible working substance (usually a gas) is required for operation. When the working substance is heated, it expands and drives the engine's mechanical motion. In practice, it can be experimentally challenging to reach the large compression ratios needed for high performance. However, in the quantum version with quantized energy levels, the heat engine does not require a compressible working substance, but instead can function with incompressible working substances.

So overall, when considering energy quantization in a heat engine, the classical paradigms break down and large compression ratios are no longer needed to obtain highly efficient heat engines. As the scientists demonstrated, the appropriate manipulation of energy levels leads to higher efficiencies and opens the doors to realizing heat machines that are classically inconceivable.

The physicists also showed that, although energy quantization can improve heat engine efficiency, the efficiency is still subject to the Carnot limit—the fundamental limit on the efficiency of any heat engine. In addition, the performance improvement only occurs when the quantized energy levels are inhomogenously scaled, which is a regime that so far has received little attention. ..Read More...

Light could make semiconductor computers a million times faster or even go quantum

An illustration showing the "up" and "down" pseudospin states, a light pulse and the hilly energy landscape experienced by the electrons. Credit: Stefan Schlauderer, University of Regensburg

A technique to manipulate electrons with light could bring quantum computing up to room temperature.

A team of researchers in Germany and at the University of Michigan have demonstrated how infrared laser pulses can shift electrons between two different states, the classic 1 and 0, in a thin sheet of semiconductor.

"Ordinary electronics are in the range of gigahertz, one billion operations per second. This method is a million times faster," said Mackillo Kira, U-M professor of electrical engineering and computer science.

He led the theoretical part of the study, to be published in the journal Nature, collaborating with physicists at the University of Marburg in Germany. The experiment was done at the University of Regensburg in Germany.

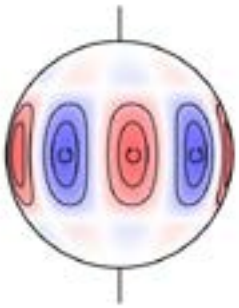
Quantum computing could solve problems that take too long on conventional computers, advancing areas such as artificial intelligence, weather forecasting and drug design. Quantum computers get their power from the way that their quantum-mechanical bits, or qubits, aren't merely 1s or 0s, but they can be mixtures— known as superpositions—of these states.

"In a classical computer, each bit configuration must be stored and processed one by one while a set of qubits can ideally store and process all configurations with one run," Kira said.

This means that when you want to look at a bunch of possible solutions to a problem and find the best fit, quantum computing can get you there a lot faster.

But qubits are hard to make because quantum states are extremely fragile. The main commercial route, pursued by companies such as Intel, IBM, Microsoft and D-Wave, uses superconducting circuits—loops of wire cooled to extremely cold temperatures (-321°F or less), at which the electrons stop colliding with each other ...Read More...

Waves similar to those controlling weather on Earth have now been found on the Sun



Solar Rossby waves are waves of vorticity that move in the direction opposite to rotation. They have maximum amplitudes in the Sun's equatorial regions. Credit: © MPS

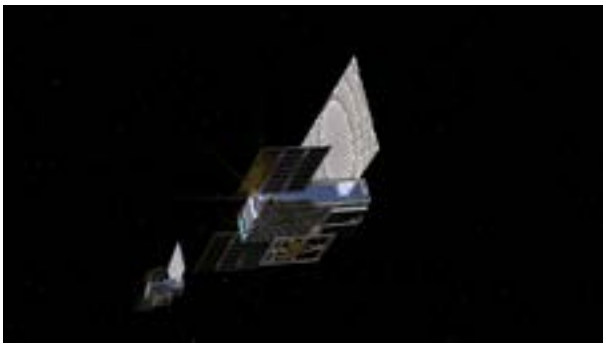
A team of scientists led by the Max Planck Institute for Solar System Research (MPS) and the University of Göttingen has discovered new waves of vorticity on the Sun. As described in today's issue of Nature Astronomy, these Rossby waves propagate in the direction opposite to rotation, have lifetimes of several months, and maximum amplitudes at the Sun's equator. For forty years scientists had speculated about the existence of such waves on the Sun, which should be present in every rotating fluid system. Now, they have been unambiguously detected and characterized for the first time. The solar Rossby waves are close relatives of the Rossby waves known to occur in the Earth's atmosphere and oceans.

In almost every weather map of the Earth's northern hemisphere atmospheric Rossby waves are a prominent feature. They appear as meanders in the jet stream separating cold polar air in the north from warmer subtropical air farther to the south. Sometimes these waves reach the equatorial regions and can even affect weather in Australia. In principle, waves of this type (often referred to as planetary waves) arise on every rotating sphere due to the Coriolis force. Saturn's hexagon, a stable cloud pattern at the planet's north pole, may also be an expression of these waves.

The existence of Rossby waves in stars was predicted about forty years ago. "Solar Rossby waves have very small amplitudes and periods of several months, thus they are extremely difficult to detect", says Prof. Dr. Laurent Gizon, coordinator of the team that made the discovery and director at the MPS. The study required high-precision observations of the Sun over many years. The scientists from MPS analyzed a six-year dataset from the Heliospheric and Magnetic Imager (HMI) onboard NASA's Solar Dynamics Observatory (SDO), in operation since 2010.

"The HMI images have sufficiently high spatial resolution to allow us to follow the movement of photospheric granules on the Sun's visible surface", says Dr. Björn Löptien, scientist at the MPS and first author of ...Read More...

NASA's first deep-space CubeSats say: 'Polo!'



An artist's rendering of the twin Mars Cube One (MarCO) spacecraft as they fly through deep space. The MarCOs will be the first CubeSats -- a kind of modular, mini-satellite -- attempting to fly to another planet. They're designed to fly along behind NASA's InSight lander on its cruise to Mars. If they make the journey, they will test a relay of data about InSight's entry, descent and landing back to Earth. Though InSight's mission will not depend on the success of the MarCOs, they will be a test of how CubeSats can be used in deep space. The MarCO and InSight projects are managed for NASA's Science Mission Directorate, Washington, by JPL, a division of the California Institute of Technology, Pasadena. Credit: NASA/JPL-Caltech

NASA has received radio signals indicating that the first-ever CubeSats headed to deep space are alive and well. The first signal was received at 12:15 p.m. PST (3:15 p.m. EST) yesterday; the second at 1:58 p.m. PST (4:58 p.m. EST). Engineers will now be performing a series of checks before both CubeSats enter their cruise to deep space.

Mars Cube One, or MarCO, is a pair of briefcase-sized spacecraft that launched along with NASA's InSight Mars lander at 4:05 a.m. PDT (7:05 a.m. EDT) today from Vandenberg Air Force Base in Central California. InSight is a scientific mission that will probe the Red Planet's deep interior for the first time; the name stands for Interior Exploration using Seismic Investigations, Geodesy and Heat Transport.

The twin MarCO CubeSats are on their own separate mission: rather than collecting science, they will follow the InSight lander on its cruise to Mars, testing out miniature spacecraft technology along the way.

Both were programmed to unfold their solar panels soon after launch, followed by several opportunities to radio back their health.

"Both MarCO-A and B say 'Polo!' It's a sign that the little sats are alive and well," said Andy Klesh, chief engineer for the MarCO mission at NASA's Jet Propulsion Laboratory in Pasadena, California, which built the twin spacecraft.

The computers inside each MarCO CubeSat haven't been turned on since being tested at California Polytechnic State University, San Luis Obispo, ...Read More...

Special Read:

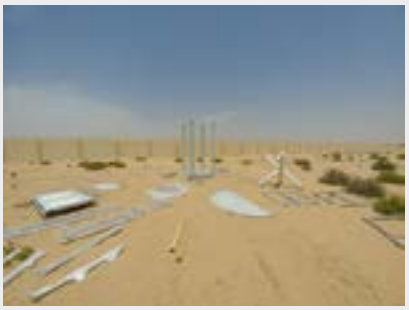
SCASS Inaugurates 1st UAE Meteor Monitoring Tower

On May 10, 2018, the Sharjah Center for Astronomy and Space Sciences with the UAE Space Agency have inaugurated the first tower of the UAE Meteor Monitoring Network. Eng. Khaled Al-Hashimi, the UAE Space Agency Director of Space Missions, has attended the ceremony along with other officials from the agency. Delegates from other universities have also attended the opening.

This is part of a network of three towers that will observe the UAE Sky for any space debris from sunset to sunset. The other two towers will be installed in the emirates of Abu-Dhabi. Each tower is loaded with 17 cameras (ten 8 mm cameras, six 6 mm cameras, and one all-sky camera). The project is financed by the UAE Space Agency for a period of three years. A large team of students from the University of Sharjah will operate the system. The team will do thorough simulations in case the system detects a space debris. If the space debris is meteorite and falls within the UAE territory, a drone system will be used to find the meteorite.

This is a pilot project for future towers to be implemented all over the UAE. Besides the detection of space debris, the three towers will also be used for meteorological and ionospheric research applications.

The design of the tower was done at SCASS and engineered by the University of Sharjah. A local steel company was given the contract to build and mount the tower. SCASS employees Issam Abu-Jami, Mohamed Talafha, and Ridwan Fernini mounted the system of cameras and all cords extension.



SCASS Attends the 12th UoS Research Forum
May 07, 2018

SCASS has participated in the 12th UoS Research Forum held at the University of Sharjah on May 07, 2018. SCASS researchers are active in several areas such as CubeSat development, Ionopshere studies, Space Debris observations, Radio Astronomy, Meteorties Analysis, and Astronomical observations of various celestial objects. SCASS has showcased its latest prize winning experiment that won the first prize at the 6th UAE Undergraduate Research Competition that was organized at Abu-Dhabi University on Apr. 30, 2018. The experiment consisted of building a CanSat and loading it with special sensors to measure the level of CO_2 and CO in the Sharjah district. His Highness Dr. Sheikh Sultan Bin Mohammed Al Qasimi, Supreme Council Member and Ruler of Sharjah and President of the University of Sharjah was very pleased with the experiment and its contribution to the clean air in the Emirates of Sharjah.

SCASS Hosts the 6th ESIG Meeting of the UAE Space Agency on May 10, 2018

SCASS hosted the 6th Emirates Space Innovation Group (ESIG) on May 10, 2018 as promoted by the UAE Space Agency. Eng. Khaled Al-Hashmi, the Director of Space Missions at the UAE Space Agency chaired the meeting along with his HE Prof. Hamid Al-Naimiy, the Chancellor of the University of Sharjah and General Director of SCASS. Several other UAE Space Agency officials attended the meeting. Several univesities delegates from all over the UAE presented an update on their research proposals that were sponsored by the UAE Space Agency.

Eng. Khaled gave an update about the forthcoming wave of proposals that fall within the vision of the UAESA for the coming years. Collaboration with international partners (NASA, CNES, JAXA...) was discussed and local universities were urged to incubate some of the UAESA programs. A thorough discussion was engaged by universities delegates to know better understand how the UAESA operates when it comes to research proposals attribution.

The 7th ESIG meeting will be during the second week of September and the University of Dubai has kindly accepted to host it.

Ramadhan 1439 AH Crescent Report

Here are some astronomical details about the observation of the crescent for the month of Ramadhan 1439 AH:

	May 15, 2018 Sun/Moon Data	May 16, 2018 Sun/Moon Data
New Moon	15:48	--
Sunset (Azimuth)	18:56 (291°)	18:56 (292°)
Moonset (Azimuth)	18:54 (286°)	19:59 (290°)
Moon's Altitude	-0.4°	12.4°
Lag Time (Minutes)	--	63
Age (Hours, Min)	--	28h 12m

Summary:

An impossible setting for the crescent to be observed on Tuesday, May 15 with the naked eye or the telescope since the Moon sets before sunset. We should expect the first day of Ramadhan 1439 AH to be on Thursday May 17, 2018.

This is the case for almost all of the Muslim world from Indonesia to Morocco. This is why this year Ramadhan must start the same day for all Muslims worldwide.

A special observation of the crescent will be done on **May 16** starting from sunset at the Sharjah Observatory. All are welcome at SCASS.

This Week's Sky at a Glance
May 12 - 18, 2018

May 13	Su	21:21	Moon-Mercury: 2.5° N
May 15	Tu	15:48	New Moon
May 17	Th	22:11	Moon-Venus: 4.8° N
May 18	Fr	01:06	Moon Perigee: 363800 km
		19:02	Moon North Dec.: 20.7° N