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Astronomy & Physics Weekly News

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Top News

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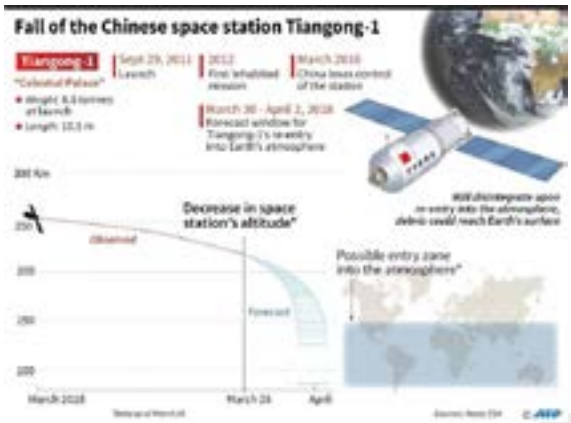
China says Earth-bound space lab to offer 'splendid' show (Update)



Factfile on the Chinese space station Tiangong-1, due to plunge into the Earth's atmosphere sometime between March 30 and April 2.

A defunct space laboratory that will plunge back to Earth in the coming days is unlikely to cause any damage, Chinese authorities say, but will offer instead a "splendid" show akin to a meteor shower.

China's space agency said Thursday that the roughly eight-tonne Tiangong-1 will re-enter the atmosphere some time between Saturday and Monday. The European Space Agency on Friday gave smaller window between Saturday night and late Sunday evening GMT.

But there is "no need for people to worry", the China Manned Space Engineering Office (CMSEO) said on its WeChat social media account.

Such falling spacecraft do "not crash into the Earth fiercely like in sci-fi movies, but turn into a splendid (meteor shower) and move across the beautiful starry sky as they race towards the Earth", it said.

The lab was placed in orbit in September 2011 and had been slated for a controlled re-entry, but it ceased functioning in March 2016 and space enthusiasts have been bracing for its fiery return.

The ESA said the lab will make an "uncontrolled re-entry" as ground teams are no longer able to fire its engines or thrusters, though a Chinese spaceflight engineer denied earlier this year that it was out of control.

The updated re-entry estimate by ESA is slightly later than its previous calculations. The agency said in a blog post that calmer space weather was now expected as a high-speed stream of solar particles did not cause an increase in the density of the upper atmosphere, as previously expected.

Such an increase in density would have pulled the spacecraft down sooner, it said, adding that the new re-entry window is still uncertain and "highly ...Read More...

Research enhances performance of Germany's new fusion device

Five superimposed images of W7-X magnetic surfaces displaced by changes in application of trim coil currents. Credit: Max Planck Institute of Plasma Physics

A team of U.S. and German scientists has used a system of large magnetic "trim" coils designed and delivered by the U.S. Department of Energy's (DOE) Princeton Plasma Physics Laboratory (PPPL) to achieve high performance in the latest round of experiments on the Wendelstein 7-X (W7-X) stellarator. The German machine, the world's largest and most advanced stellarator, is being used to explore the scientific basis for fusion energy and test the suitability of the stellarator design for future fusion power plants. Such plants would use fusion reactions such as those that power the sun to create an unlimited energy source on Earth.

The new experiments amply demonstrated the ability of the five copper trim coils and their sophisticated control system, whose operation is led on-site by PPPL physicist Samuel Lazerson, to improve the overall performance of the W7-X. "What's exciting about this is that the trim coils and Sam's leadership are producing scientific understanding that will help to optimize future stellarators," said PPPL physicist Hutch Neilson, who oversees the laboratory's collaboration on the W7-X with the Max Planck Institute of Plasma Physics, which built the machine and now hosts the international team investigating the behavior of plasmas confined in its unique magnetic configuration.

Stellarators are twisty, doughnut-shaped facilities whose configuration contrasts with the smoothly doughnut-shaped facilities called tokamaks that are more widely used. A major advantage of stellarators is their ability to operate continuously with low input power to sustain the plasma without plasma disruptions—a risk that tokamaks face—enabling the facilities to operate efficiently in steady state. A disadvantage is that the twisting stellarator geometry is more complex to design and build.

The W7-X completed its second round of experiments in December with improved heating and measurement capabilities. A special feature of the second round was its use of an "island divertor" to exhaust ..Read More...

CHIME begins its cosmic search

A prototype for the CHIME instrument sits against a backdrop of starry skies. CHIME is a new type of radio telescope that will help to unravel many of the most pressing mysteries about our universe. Keith Vanderlinde; Dunlap Institut

CHIME, the Canadian Hydrogen Intensity Mapping Experiment, is up and running in the mountains of southern British Columbia. A ceremony on September 7, 2017, inaugurated the telescope and its pioneering approach to studying the universe.

"This telescope is radically different from other telescopes," says Matt Dobbs, Associate Professor of Physics at McGill University and a CHIME investigator. "CHIME is really a stepping stone to a new way of doing radio astronomy."

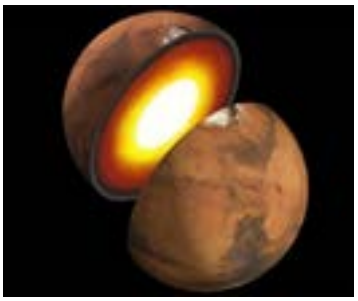
A new approach
The radio telescope – Canada's biggest – is a joint venture co-led by the University of British Columbia, the University of Toronto, McGill University and the Dominion Radio Astrophysical Observatory (DRAO). Participating institutions come from across North America.

CHIME is a digital telescope, which means all of its "imaging" is done digitally by software. It accomplishes this with commercial components: Amplifiers developed for cell phones and graphics cards developed for video game systems power an instrument that cost only $13 million USD ($16 million CAD) to build. General-purpose, programmable computing hardware like this also gives CHIME the flexibility to explore three frontiers of modern astronomy: dark energy, pulsars, and fast radio bursts (FRBs)

"All the heavy lifting happens in the signal processing," says Keith Vanderlinde, Professor with the Dunlap Institute for Astronomy and Astrophysics at the University of Toronto and another CHIME investigator.

CHIME is also a drift scan telescope with no moving parts. The instrument passively scans the entire Northern Hemisphere sky each day as Earth rotates. Its sensors consist of four 66 x 328-foot (20 x 100 meters) mesh reflectors, each shaped like a snowboard halfpipe. The focal axis of each reflector is lined with 256 dual-polarization antennas. Inputs from all of these antennas are combined, making CHIME the largest custom correlator...Read More...

Marsquakes could shake up planetary science



Artist's rendition showing the inner structure of Mars. The topmost layer is known as the crust, underneath it is the mantle, which rests on an inner core. Image Credit: NASA/JPL-Caltech.

Starting next year, scientists will get their first look deep below the surface of Mars.

That's when NASA will send the first robotic lander dedicated to exploring the planet's subsurface. InSight, which stands for Interior Exploration using Seismic Investigations, will study marsquakes to learn about the Martian crust, mantle and core.

Doing so could help answer a big question: how are planets born?

Seismology, the study of quakes, has already revealed some of the answers here on Earth, said Bruce Banerdt, Insight's principal investigator at NASA's Jet Propulsion Laboratory, Pasadena, California. But Earth has been churning its geologic record for billions of years, hiding its most ancient history. Mars, at half the size of Earth, churns far less: it's a fossil planet, preserving the history of its early birth.

"During formation, this ball of featureless rock metamorphosed into a diverse and fascinating planet, almost like caterpillar to a butterfly," Banerdt said. "We want to use seismology to learn why Mars formed the way it did, and how planets take shape in general."

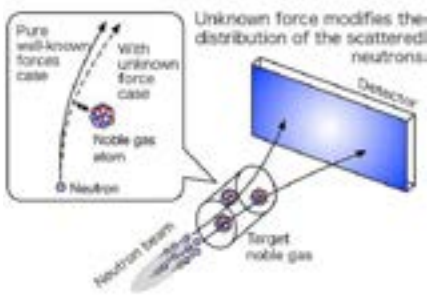
A Planetary CT Scan
When rocks crack or shift, they give off seismic waves that bounce throughout a planet. These waves, better known as quakes, travel at different speeds depending on the geologic material they travel through.

Seismometers, like InSight's SEIS instrument, measure the size, frequency and speed of these quakes, offering scientists a snapshot of the material they pass through.

"A seismometer is like a camera that takes an image of a planet's interior," Banerdt said. "It's a bit like taking a CT scan of a planet."

Mars' geologic record includes lighter rocks and minerals - which rose from the planet's interior to form the Martian crust - and heavier rocks and minerals that sank to form the Martian mantle and core. ..Read More...

Understanding gravity: The nanoscale search for extra dimensions



Principle of the experimental test of the inverse-square law of the gravity in nano-meter scale via neutron scattering. Deviation from the inverse-square law will be observed as the modification in the angular distribution of the scattered neutrons.

Often, practical limits control the experimental measurements that can be made, governing the difference between what we expect to be true based on the most likely predictions of models and calculations, and findings that have been supported by testing.

A team of researchers has now used the world's highest intensity neutron beamline facility, at J-PARC in central Japan, to push the limits of sensitivity for the study of gravitational force. The multicenter work probing the nm range was recently published in Physical Review D.

Most people are familiar with how things around us interact as a result of gravitational interactions. This behavior, known to follow an inverse square law (ISL), has been well explained by experiments down to less than 1 mm.

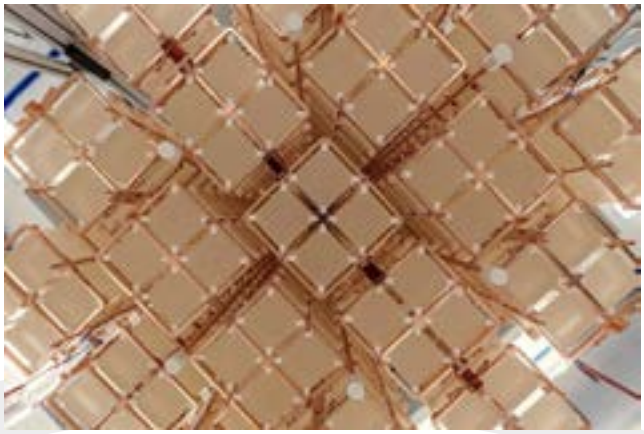
Gravitational interactions over long-distances have also been supported by data collected from astronomy. However, until now, there has been little experimental evidence to support agreement with the ISL when the often-unpredictable quantum level is approached.

"There are numerous effects suggested by accepted theories of gravity over short distance ranges that could be borne out by experiment," study author Tatsushi Shima of Osaka University says.

"By successfully extending the search range of an exotic gravity down to short distances of ~0.1 nm, we have been able to demonstrate the highest sensitivity reported to date, producing experimental data that will help to unravel the proposals."

The statistical sensitivity achieved was made possible using the high intensity pulsed neutron beam at the J-PARC facility. The net electromagnetic neutrality of neutrons means that the experiments were not influenced by the electromagnetic background that hampers other approaches to probing short distance ISL deviations. ...Read More...

Scientists report first results from neutrino mountain experiment



Bottom view of the 19 CUORE towers installed in the cryostat. Credit: CUORE Collaboration

This week, an international team of physicists, including researchers at MIT, is reporting the first results from an underground experiment designed to answer one of physics' most fundamental questions: Why is our universe made mostly of matter?

According to theory, the Big Bang should have produced equal amounts of matter and antimatter—the latter consisting of "antiparticles" that are essentially mirror images of matter, only bearing charges opposite to those of protons, electrons, neutrons, and other particle counterparts. And yet, we live in a decidedly material universe, made mostly of galaxies, stars, planets, and everything we see around us—and very little antimatter.

Physicists posit that some process must have tilted the balance in favor of matter during the first moments following the Big Bang. One such theoretical process involves the neutrino—a particle that, despite having almost no mass and interacting very little with other matter, is thought to permeate the universe, with trillions of the ghostlike particles streaming harmlessly through our bodies every second.

There is a possibility that the neutrino may be its own antiparticle, meaning that it may have the ability to transform between a matter and antimatter version of itself. If that is the case, physicists believe this might explain the universe's imbalance, as heavier neutrinos, produced immediately after the Big Bang, would have decayed asymmetrically, producing more matter, rather than antimatter, versions of themselves.

One way to confirm that the neutrino is its own antiparticle, is to detect an exceedingly rare process known as a "neutrinoless double-beta decay," in which a stable isotope, such as tellurium or xenon, gives off certain particles, including electrons and antineutrinos, as it naturally decays. If the neutrino is indeed its own antiparticle, then according to the rules of physics the antineutrinos should cancel each other out, and this decay ...Read More...

NASA prepares to launch next ExoPlanet mission

The spacecraft will be looking for a phenomenon known as a transit, where a planet passes in front of its star, causing a periodic and regular dip in the star's brightness. NASA's Kepler spacecraft used the same method to spot more than 2,600 confirmed exoplanets, most of them orbiting faint stars 300 to 3,000 light-years away

NASA's Transiting Exoplanet Survey Satellite is undergoing final preparations in Florida for its April 16 launch to find undiscovered worlds around nearby stars, providing targets where future studies will assess their capacity to harbor life.

"One of the biggest questions in exoplanet exploration is: If an astronomer finds a planet in a star's habitable zone, will it be interesting from a biologist's point of view?" said George Ricker, TESS principal investigator at the Massachusetts Institute of Technology (MIT) Kavli Institute for Astrophysics and Space Research in Cambridge, which is leading the mission.

"We expect TESS will discover a number of planets whose atmospheric compositions, which hold potential clues to the presence of life, could be precisely measured by future observers."

On March 15, the spacecraft passed a review that confirmed it was ready for launch. For final launch preparations, the spacecraft will be fueled and encapsulated within the payload fairing of its SpaceX Falcon 9 rocket.

TESS will launch from Space Launch Complex 40 at Cape Canaveral Air Force Station in Florida. With the help of a gravitational assist from the Moon, the spacecraft will settle into a 13.7-day orbit around Earth. Sixty days after launch, and following tests of its instruments, the satellite will begin its initial two-year mission.

Four wide-field cameras will give TESS a field-of-view that covers 85 percent of our entire sky. Within this vast visual perspective, the sky has been divided into 26 sectors that TESS will observe one by one. The first year of observations will map the 13 sectors encompassing the southern sky, and the second year will map the 13 sectors of the northern sky. The spacecraft will be looking for a phenomenon known as a transit, where a planet ..Read More...

Dark matter is MIA in this strange galaxy

DARK DEFICIENCY Dark matter is unexpectedly absent from the galaxy NGC1052-DF2 (central ghostly blob), an ultradiffuse galaxy about 65 million light-years from Earth in the constellation Cetus.

MISSING: Dark matter.

Mass: About 60 billion suns' worth.

Location: The galaxy NGC1052-DF2, about 65 million light-years from Earth.

An unusual galaxy is surprisingly lacking in dark matter, scientists report March 28 in Nature.

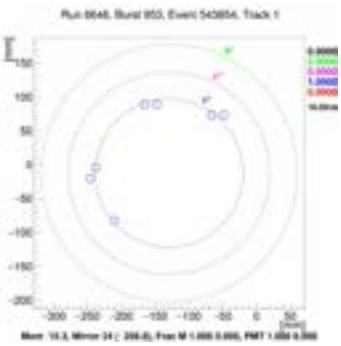
In typical galaxies, normal matter is swamped by dark matter, an unidentified invisible substance that makes up most of the matter in the universe. The existence of dark matter explains the unexpectedly fast speeds at which stars swirl around galaxies, and how galaxies move within clusters.

But one galaxy, NGC1052-DF2, appears to have less dark matter than normal matter, or potentially none at all. Given its mass — it holds stars with about 200 million times the mass of the sun — it would be expected to have about 300 times as much dark matter as normal matter. That adds up to about 60 billion times the sun's mass in missing dark matter.

Using observations from several telescopes, Yale University astronomer Pieter van Dokkum and colleagues studied 10 bright clumps of stars within the galaxy, known as globular clusters, and measured their velocities. The more mass there is in the galaxy, the faster the clusters should move around it. So if dark matter were present, the clusters should cruise at a relatively rapid clip. Instead, the clusters were moving slowly, indicating a dark matter–free zone.

In most galaxies, stars move faster than naïvely expected, which suggests dark matter lurks within them, providing an extra source of mass. Most physicists believe dark matter is an undetected type of particle. But some think that the hint of extra matter might be a ...Read More...

CERN experiment sees hints of a rare kaon decay



CERNNA62's candidate event of a rare kaon decay. Octagons show hits in the RICH detector. Circles show predicted "Cherenkov rings" for positively charged pion (+), positively charged muon (+) and antielectron (e+) decay particles. Credit: NA62/CERN

What if the odds of an event occurring were about one in ten billion? This is the case for the decay of a positively charged particle known as a kaon into another positively charged particle called a pion and a neutrino-antineutrino pair. Yet, such a rare event, which has never been observed with certainty, is something that particle physicists really want to get their hands on. The reason? The Standard Model predicts such one-in-ten-billion odds with an uncertainty of less than ten percent. A deviation from this prediction, revealed by a precise measurement of the decay, could therefore be a clear indicator of physics beyond the Standard Model.

In a seminar taking place today at CERN, the NA62 collaboration reports a candidate event of this ultra-rare kaon decay found using a new "in-flight decay" approach. While this single event cannot be used to probe beyond-Standard-Model physics, it demonstrates that the approach works well and can be applied to catch more events in the next run of data-taking, which kicks off in mid-April. The result was also presented earlier this month at the Rencontres de Moriond conference in La Thuile, Italy.

To look for kaon decays, the NA62 team first makes beams rich in kaons by firing high-energy protons from the Super Proton Synchrotron (SPS) accelerator into a beryllium target. The collision creates a beam of nearly one billion particles per second, only about 6% of which are kaons. Next, the team sends the beam through a Cherenkov detector, which positively identifies the kaons from the Cherenkov radiation that they produce. A silicon-pixel detector then determines the momentum of the kaons with a time resolution of 100 picoseconds. A device called a straw tracker, placed inside the vacuum tank, in turn measures the momentum of the charged daughter particles into which the kaons decay, and another Cherenkov detector called RICH determines the particles' type. Other devices known as calorimeters reject unwanted background events with photons and muons.

In their analysis of data taken over the course of 2016, the NA62 team identified a candidate event of the decay of a positively charged kaon into a positively ...Read More...

New math bridges holography and twistor theory

A diagram depicting a twistor -- an extended entity in space and time that can be thought of as a 2-dimensional light ray. Credit: Penrose, R., & Rindler, W. (1986). Spinors and Space-Time (Cambridge Monographs on Mathematical Physics). Cambridge: Cambridge University Press.

The modern-day theoretical physicist faces a taxing uphill climb. "As we learn more, reality becomes ever more subtle; the absolute becomes relative, the fixed becomes dynamical, the definite is laden with uncertainty," writes physicist Yasha Neiman.

A professor and head of the Quantum Gravity Unit at the Okinawa Institute of Science and Technology Graduate University (OIST), he grapples with this conundrum on a daily basis. Quantum gravity, Neiman's branch of physics, aims to unify quantum mechanics, which describes nature at the scale of atoms and subatomic particles, with Einstein's Theory of General Relativity—the modern theory of gravitation as the curvature of space and time. How, he asks, can physicists write equations when the geometry of space itself becomes subject to quantum uncertainty? Quantum gravity, the current frontier in fundamental theory, has proven more difficult to detangle than previous concepts, according to Neiman.

"With the concept of space slipping between our fingers, we seek out alternative footholds on which to base our description of the world," he writes.

This search for alternative footholds is, in essence, a search for a new language to describe reality—and it is the subject of his most recent work, published in the Journal of High Energy Physics. In the paper, Neiman proposes a new vantage point on the geometry of space and time—one that builds on well-established approaches in physics, like holography and twistor theory, to reach new ground.

Holography is an offshoot of string theory, the theory that the universe is made up of one-dimensional objects called strings, which was developed in the late 1990s. Holography imagines the ends of the universe as the surface of an infinitely large sphere that forms the boundary of space. Even as geometry fluctuates within this sphere, this "boundary at infinity" on the sphere's surface can remain fixed. ...Read More...

Study suggests Earth's water was present before impact that caused creation of the moon

This image shows the far side of the Moon, illuminated by the Sun. Credit: NASA

A team of researchers from the U.K., France and the U.S. has found evidence that suggests that most of the water on Earth was present before the impact that created the moon. In their paper published on the open access site Science Advances, the group describes their study and comparison of moon and Earth rocks, and what they found.

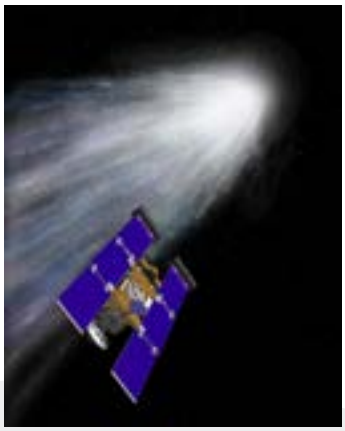
The prevailing theory regarding how the moon's origin is that a Mars-sized protoplanet slammed into protoplanetary Earth, and the ejected material coalesced to form the moon. The prevailing theory regarding how water came to exist on Earth is that most of it was delivered by asteroids and comets. In this new effort, the researchers present evidence that bolsters the first theory but conflicts strongly with the second.

The team studied both moon rocks brought back to Earth by the Apollo astronauts and volcanic rocks retrieved by others from the ocean floor. The researchers looked specifically at oxygen isotopes. Studying isotopes in rocks offers scientists a means for comparing material from different origins such as asteroids, planets or even comets—each tends to have its own unique composition signature.

The researchers report that oxygen isotopes from the moon and Earth are remarkably similar—they found just a three to four ppm difference between them. This finding bolsters the theory that the moon was formed from material from the Earth due to a collision. But it runs counter to the idea that water came from comets or asteroids, because if it had come from such sources, the isotopes would have differed from those found in rocks on the moon. Thus, most of the water that was present in the protoplanetary Earth likely survived the impact, suggesting it did not come from elsewhere.

The idea that water could survive such an impact has implications for the search for life beyond our solar system—exoplanets that are thought to have suffered collisions are typically removed from lists describing ...Read More...

Comet provides rare chance to study solar system's origins



Artist's concept of the Stardust spacecraft flying by Comet 81P/Wild. Credit: NASA/JPL

More samples of comets are urgently required to better understand the early history of the solar system, say researchers analyzing comet dust brought back to Earth by NASA's Stardust mission in 2006.

The dust particles are from Comet 81P/Wild (also known as Wild 2) and date to the beginning of the solar system, containing clues about its earliest history.

"The future of Stardust science", which is a paper published in June 2017 in the journal Meteoritics & Planetary Science, summarizes the roughly 150 scientific publications based on Stardust science. It makes an important point about the limits of our knowledge of the early protosolar disk of gas and dust from which the solar system formed. That is, Wild 2 and other Kuiper Belt comets – those originating from beyond the orbit of Neptune – are poorly represented in our samples of extraterrestrial material.

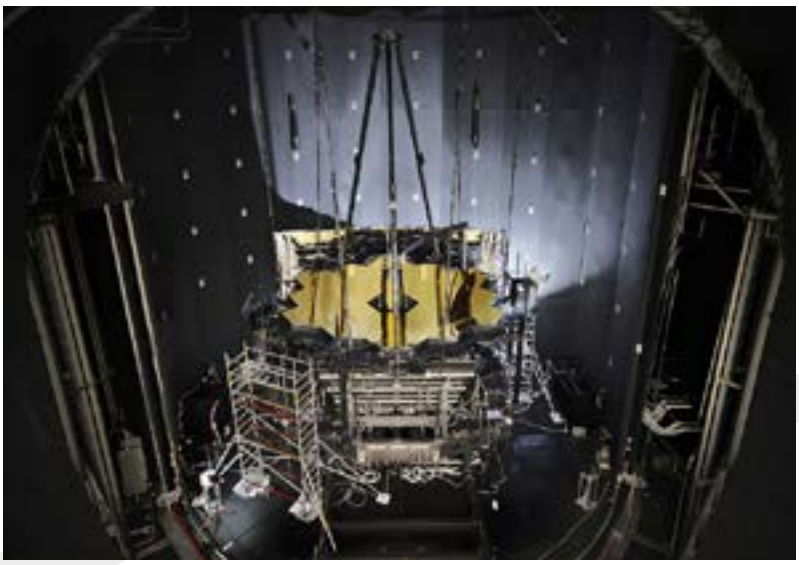
In contrast, asteroids are represented in our collections by meteorites and have been well documented for over a century, while the Moon's material has been collected and brought to scientists for analysis by the Apollo astronauts.

Andrew Westphal, a senior member of the Stardust team and an astrophysicist at the University of California, Berkeley, urged investigators to seek out more Kuiper Belt material to study on Earth because of its unique origins.

"As you sample farther and farther out in the solar system, you sample material that is more and more primitive," says Westphal, the lead author of the paper. "Particularly when you get a sample from a comet, you get a sample [that has been] in deep freeze for 4.6 billion years." Approximately 10 percent of a typical Kuiper Belt comet is unaltered interstellar material. Some of this material consists of pre-solar grains – circumstellar dust grains condensed in the outflows ...Read More...

Special Read:

James Webb will now launch in 2020



The James Webb Space Telescope is a collaborative project backed by NASA, the European Space Agency, and the Canadian Space Agency. In November 2017, the telescope completed cryogenic testing in Houston; it is now in California with the spacecraft's flight components.
NASA/Chris Gun

The James Webb Space Telescope (JWST) is one of the most highly anticipated observatories among astronomers. This infrared space telescope will revolutionize our ability to detect and characterize exoplanets, study the very early universe, and peer deep into the dusty clouds where stars are born. But we'll have to wait just a little longer – JWST's previously updated launch window of early 2019 has now been again revised, based on the need for additional testing and evaluation. The telescope is now slated to launch in May 2020.

Launching a project of this size and scope will be an amazing achievement, but it is not without its challenges. Each part of the observatory must undergo rigorous testing, often both separately and once integrated into the whole, before it can be considered fit for launch. This is the main reason for the additional delay, said acting NASA Administrator Robert Lightfoot in a press release today: "All the observatory's flight hardware is now complete, however, the issues brought to light with the spacecraft element are prompting us to take the necessary steps to refocus our efforts on the completion of this ambitious and complex observatory."

Testing is extremely important for any observatory, but this one perhaps more so than previous projects. Unlike the Hubble Space Telescope, which was placed in Earth orbit and accessible for repairs and upgrades, JWST will share Earth's orbit around the Sun from a point called L2. This position, about 1 million miles (1.5 million kilometers) away, will help to keep the telescope cool, which is vital in infrared astronomy (the Hubble, by comparison, is an optical telescope, so it doesn't face this requirement). Add to that the spacecraft's complex transition from its launch configuration, during which its large sunshield and primary mirror will be folded up, to its final design, with a 6.5-meter primary mirror (Hubble's is just over 2 meters) and a sunshield spanning nearly 70 x 47 feet (21 x 14 meters), and testing the telescope's many components becomes vital.

This delay is, admittedly, one in a long line of additional launch date pushbacks. But such delays ensure that engineers and scientists have the time they need to test and combine components, then test again. In 2011, Congress imposed a cost cap of $8 billion, rather than cancel the project after several prior cost adjustments and schedule changes. Since then, most of the spacecraft's manufacturing and testing has proceeded on schedule, but more recent challenges as the entire project comes together have caused additional delays.

But those delays, engineers stress, are necessary to ensure the massive telescope will work as expected – as needed – the first time. Just because elements work perfectly when separate doesn't mean they'll do the same when combined, which is why extra testing is needed. "Considering the investment NASA and our international partners have made, we want to proceed systematically through these last tests, with the additional time necessary, to be ready for a May 2020 launch," stressed Thomas Zurbuchen, who serves as associate administrator for NASA's Science Mission Directorate. ...Read More...

This Week's Sky at a Glance
Mar. 31 - Apr. 06, 2018

Mar 31	Sa	16:37	Full Moon
Apr 01	Su	21:47	Mercury Inferior Conj.
Apr 02	Mo	23:00	Mars-Saturn: 1.3° N
Apr 03	Tu	18:14	Moon-Jupiter: 4.2° S

SCASS Participation at the 4th Arab Gulf Teachers Forum April 01-05, 2018

The Arab Gulf Teachers Forum has been promoting global opportunities in teacher's professional development for over 3 years. Participants are expected from all over the world, including exhibitors, to gather to share knowledge, skills and practices and innovate creative solutions for the teaching and learning challenges. The 4th Arab Gulf Teachers Forum 2018, focuses his year on IMPROVING STEM\STrEaM EDUCATION & SKILLS: Increasing Participation to Build UAE Innovation. The conference is an ideal opportunity to collaborate and learn from other school education professionals within STEM\STrEaM disciplines and to share best practice.

This five-day conference, featuring a mix of workshops, presentations and respected keynotes will provide a forum for each of the individual STEM\STrEaM disciplines as well as opportunities to learn from cross-disciplinary practice. The 4th Arab Gulf Forum for teachers 2018 Strands are:

1. The role of educational leadership in promoting STEM\STrEaM education in schools.
2. STEM\STrEaM education is the key for preparing students in the era of the Industrial Revolution.
3. The role STEM\STrEaM education in inspiring students as a scientist.
4. The role of STEM\STrEaM in supporting students innovative and entrepreneurial skills.
5. Strategies for integrating subjects into the curriculum within STEM\STrEaM approach.
6. A framework for STEM\STrEaM -based schools: preparing students for tertiary education and work market.
7. STEM\STrEaM as Innovative practices in teaching astronomy and space science.

The Sharjah Center for Astronomy and Space Sciences will be a main participant in this program. Both the "Research Laboratories and Observatory" and "Planetarium" departments are participating as per the program below:

Day	Date	One-Session Program (2 hours) – 09:00 – 11:00 & 12:00 – 14:00 (Repeat)			
		Lectures (1 hour)		Hands-On (1 hour)	
		Lecturer	Topic	Lecturer	Topic
Sun	01/04/2018	Dr. Ilias Fernini	SCASS	Mr. Marwan Shwaiki Mr. Amr Ansary	STEM in Astronomy and Space Sciences for school students (Ideas in the Class Room)
Mon	02/04/2018	Ms. Salma Subhi	Natural Space Debris	Mr. Marwan Shwaiki Mr. Mohamed Rihan	
Tue	03/04/2018	Mr. Mohamed Talafha	Solar Observation with SCASS Telescope	Mr. Mohamed Rihan Mr. Ahmad Salalhudin	
Wed	04/04/2018	Mr. Marwan Shwaiki	Creating Special Educational Materials for Astronomy & Space Sciences	Mr. Marwan Shwaiki Mr. Mohamed Hani	
Thu	05/04/2018	Dr. Mubasshir Shaikh	Ionosphere	Mr. Marwan Shwaiki Mr. Ahmad Salalhudin	

Prof. Suleiman Baraka's Visit to the University of Sharjah and SCASS Mar. 27-29, 2018

The University of Sharjah and the Sharjah Center for Astronomy and Space Sciences have received the visit of the well-known Palestinian astrophysicist Prof. Suleiman Baraka from the Aqsa University (Palestine) during the period of Mar. 27-29, 2018. Prof. Suleiman is a space physicist studying plasma effects as related to Earth's magnetosphere and the solar wind. His HE Prof. Hamid Al-Naimiy, the Chancellor of the University of Sharjah received Prof. Suleiman and discussed common research interests in the field.

Prof. Suleiman gave several lectures during his short stay to the University of Sharjah's faculty members as well as students. He also visited the Sharjah Center for Astronomy and Space Sciences and was very impressed by all of the center's accomplishements. Prof. Suleiman had a special meeting with all the "Research Laboratories and Observatory" research assistants as well as with Drs. Ilias Fernini and Mubasshir Shaikh to discuss future research areas, especially in installing a geomagnetic station at SCASS.

Prof. Suleiman holds the UNESCO Chair in Astronomy, Astrophysics and Space Sciences, established in 2012 at The Islamic University of Gaza (Palestine).