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Astronomy & Physics Weekly News

Dept. of Applied Physics & Astronomy - University of Sharjah
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مركز الشارقة لعلوم الفضاء والفلك
Sharjah Center for Astronomy & Space Sciences

Top News

SCASS Organizes a Special Geminids Shower Observations (Dec. 14-15, 2018)

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Watch Comet 46P Wirtanen as it nears Earth

If you have clear skies, preferably away from big city lights, look toward the constellation Taurus, which is just west of Orion. There, Wirtanen's comet will lie between the Pleiades and the Hyades

On Dec. 16, you can get your best look yet at a comet - with a mouthful of a name - that has been hurtling toward Earth all month.

When you do, you'll be taking in the sight of a comet discovered by Kenosha native Carl Wirtanen, a well-regarded hunter of astronomical objects and surveyor of the Milky Way in the 20th century.

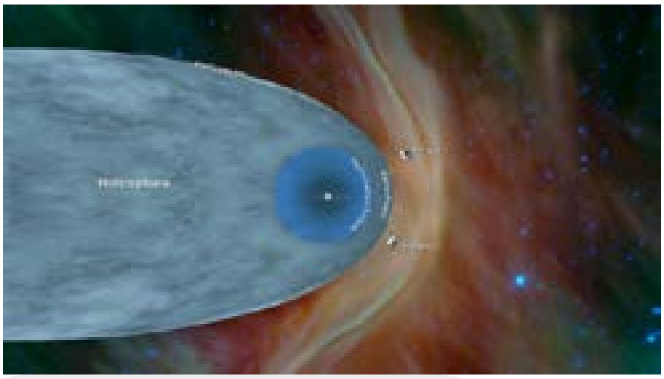
Comet 46P/Wirtanen will make its closest approach to Earth on the 16th, when it will be just over 7 million miles from our planet, about 30 times farther away than the Moon. Although the brightest comet of 2018, and just visible to the naked eye, Wirtanen's comet will be seen best in dark skies through binoculars, says Jim Lattis, director of UW Space Place, the University of Wisconsin-Madison astronomy outreach center.

If you have clear skies, preferably away from big city lights, look toward the constellation Taurus, which is just west of Orion. There, Wirtanen's comet will lie between two bright and well-known star clusters, the Pleiades and the Hyades. The comet will be visible for several days before and after its closest approach, but will likely be brightest around the 16th.

Wirtanen was born on Nov. 11, 1910, in Kenosha, Wisconsin. He discovered 46P/Wirtanen in 1948 while surveying the motions of faint, distant stars using photographs of the night sky. Wirtanen discovered five comets and three asteroids during his long career, which included a stint doing ballistics research during World War II. His colleagues named one of the asteroids he discovered in his honor upon Wirtanen's retirement from astronomy in 1981. Wirtanen died in 1990 at the age of 79.

46P/Wirtanen orbits the Sun every five-and-a-half years - lightning fast, as comets are concerned. Because the comet is not particularly bright, most of its approaches are unlikely to make for an impressive show from Earth, and this month's flyby will be among its best. With the exception of Halley's comet, which returns on ...Read More...

After more than 40 years, Voyager 2 has gone interstellar



This illustration shows where NASA's Voyager 1 and Voyager 2 probes are relative to one another. Both are now outside the heliosphere. NASA/JPL-Caltech

The unmanned probe has sent back measurements indicating it's crossed out of the influence of our Sun's solar wind.

Humanity has another interstellar emissary.

After launching in 1977, NASA's trailblazing spacecraft Voyager 2 has finally escaped the heliosphere, the Sun's protective bubble of charged particles. It follows in the path of its sibling, Voyager 1, which crossed into interstellar space in 2012.

The Sun's solar wind makes up the heliosphere, which surrounds all the planets in our solar system. The boundary where the hot solar winds of the heliosphere end and give way to the cold interstellar medium is known as the heliopause, and it's also the border of interstellar space. On November 5, 2018, instruments aboard NASA's Voyager 2 spacecraft sent back data indicating the craft had crossed the heliopause. The craft is now traveling and collecting data in interstellar space more than 11 billion miles (17 billion kilometers) from Earth.

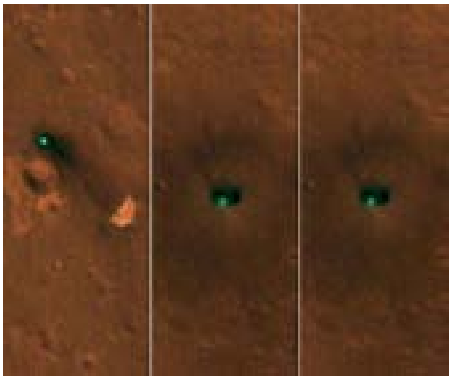
At a news conference Monday at the 2018 fall meeting of the American Geophysical Union (AGU) in Washington, D.C., Ed Stone, project scientist for the unmanned Voyager missions since 1972, explained the three pieces of evidence that led the team to this conclusion.

How You Know You're Interstellar

First, there are intense galactic cosmic rays that permeate interstellar space. Some of these rays get into the heliosphere, but the team expected that spacecraft would detect a slow increase in cosmic rays as it neared the heliopause, and then a sudden increase when it crossed the boundary. And, on November 5, the craft detected just such a sudden and extreme increase in cosmic rays.

Second, the team expected the craft to detect dramatically fewer of the charged particles that make up the heliosphere once the it crossed the heliopause. And, also on November 5, Voyager 2 suddenly registered fewer of these particles. ...Read More...

Planetary scientists assist in capturing image of Insight from orbit



InSight lander seen in first images from space
Pasadena CA (JPL) Dec 14 - On Nov. 26, NASA's InSight mission knew the spacecraft touched down within an 81-mile-long (130-kilometer-long) landing ellipse on Mars. Now, the team has pinpointed InSight's exact location using images from HiRISE, a powerful camera onboard another NASA spacecraft, Mars Reconnaissance Orbiter (MRO). The InSight lander, its heat shield and parachute were spotted by HiRISE (which stands for High Resolution Imaging Science Experiment) in one set of images last week on Dec. 6, and again on Tuesday, Dec. 11. The lander, heat shield and parachute are within 1,000 feet (several hundred meters) of one another on Elysium Planitia, the flat lava plain selected as InSight's landing location.

Houston, there is no problem here. Eric Pilles assisted in capturing - for the first-time ever - extraordinary and highly significant scientific images of the NASA InSight robotic lander using HiRISE (High Resolution Imaging Science Experiment), the camera currently monitoring the Red Planet aboard the Mars Reconnaissance Orbiter.

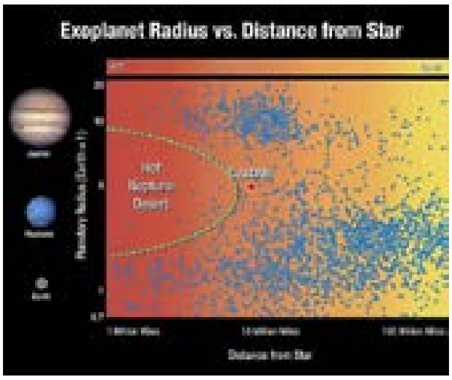
A rising star at Western University's Centre for Planetary Science and Exploration (CPSX), Pilles started his academic career in economic geology but has since transitioned into planetary sciences now as a postdoctoral associate under the supervision of Livio Tornabene and CPSX Director Gordon Osinski.

Tornabene, an Adjunct Professor in Western's Department of Earth Sciences, is a long-time scientific team member of HiRISE, which is based at the University of Arizona's Lunar and Planetary Laboratory.

HiRISE team members take turns leading the scientific planning of image captures and this marks the eighth time Tornabene has supervised a two-week imaging 'cycle' from Western. Tornabene always includes students in the process, allowing new planetary scientists like Pilles an incredible opportunity to collaborate with the very best minds in space exploration while using the very best tools and technology.

"While the knowledge gained on space missions like HiRISE is vital to understanding Earth and its place in the universe, it's equally important for mission veterans like myself to train the next generation of planetary scientists," says Tornabene, who personally ...Read More...

Hubble finds faraway planet vanishing at record speed



This graphic plots exoplanets based on their size and distance from their star. Each dot represents an exoplanet. Planets the size of Jupiter (located at the top of the graphic) and planets the size of Earth and so-called super-Earths (at the bottom) are found both close and far from their star. But planets the size of Neptune (in the middle of the plot) are scarce close to their star. This so-called desert of hot Neptunes shows that such alien worlds are rare, or, they were plentiful at one time, but have since disappeared. The detection that GJ 3470b, a warm Neptune at the border of the desert, is fast losing its atmosphere suggests that hotter Neptunes may have eroded down to smaller, rocky super-Earths.

The speed and distance at which planets orbit their respective blazing stars can determine each planet's fate - whether the planet remains a longstanding part of its solar system or evaporates into the universe's dark graveyard more quickly.

In their quest to learn more about far-away planets beyond our own solar system, astronomers discovered that a medium-sized planet roughly the size of Neptune, GJ 3470b, is evaporating at a rate 100 times faster than a previously discovered planet of similar size, GJ 436b.

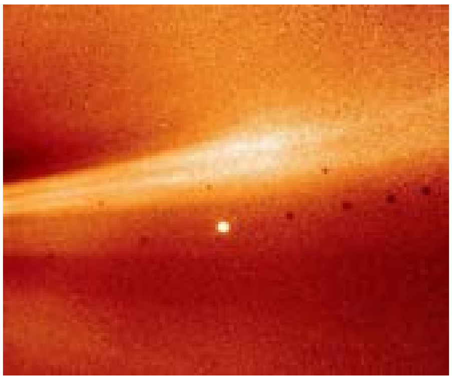
The findings, published in the journal of Astronomy and Astrophysics, advance astronomers' knowledge about how planets evolve.

"This is the smoking gun that planets can lose a significant fraction of their entire mass. GJ 3470b is losing more of its mass than any other planet we seen so far; in only a few billion years from now, half of the planet may be gone," said David Sing, Bloomberg Distinguished Professor at Johns Hopkins and an author on the study.

The study is part of the Panchromatic Comparative Exoplanet Treasury (PanCET) program, led by Sing, which aims to measure the atmospheres of 20 exoplanets in ultraviolet, optical and infrared light, as they orbit their stars. PanCET is the largest exoplanet observation program to be run with NASA's Hubble Space Telescope.

One particular issue of interest to astronomers is how planets lose their mass through evaporation. Planets such as "super" Earths and "hot" Jupiters orbit more closely to their stars and are therefore hotter, causing the outermost layer of their atmospheres to be blown away by evaporation. ...Read More...

Preparing for discovery with NASA's Parker Solar Probe



This image from Parker Solar Probe's WISPR (Wide-field Imager for Solar Probe) instrument shows a coronal streamer, seen over the east limb of the Sun on Nov. 8, 2018, at 1:12 a.m. EST. Coronal streamers are structures of solar material within the Sun's atmosphere, the corona, that usually overlie regions of increased solar activity. The fine structure of the streamer is very clear, with at least two rays visible. Parker Solar Probe was about 16.9 million miles from the Sun's surface when this image was taken. The bright object near the center of the image is Jupiter, and the dark spots are a result of background correction.

Weeks after Parker Solar Probe made the closest-ever approach to a star, the science data from the first solar encounter is just making its way into the hands of the mission's scientists. It's a moment many in the field have been anticipating for years, thinking about what they'll do with such never-before-seen data, which has the potential to shed new light on the physics of our star, the Sun.

On Dec. 12, 2018, four such researchers gathered at the fall meeting of the American Geophysical Union in Washington, D.C., to share what they hope to learn from Parker Solar Probe.

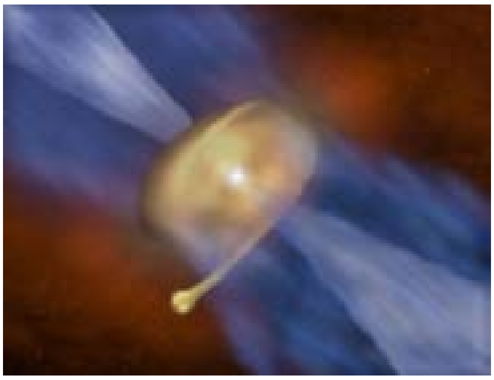
"Heliophysicists have been waiting more than 60 years for a mission like this to be possible," said Nicola Fox, director of the Heliophysics Division at NASA Headquarters in Washington. Heliophysics is the study of the Sun and how it affects space near Earth, around other worlds and throughout the solar system. "The solar mysteries we want to solve are waiting in the corona."

From Oct. 31 to Nov. 11, 2018, Parker Solar Probe completed its first solar encounter phase, speeding through the Sun's outer atmosphere - the corona - and collecting unprecedented data with four suites of cutting-edge instruments.

Parker Solar Probe is named for Eugene Parker, the physicist who first theorized the existence of the solar wind - the Sun's constant outpouring of material - in 1958.

"This is the first NASA mission to be named for a living individual," said Fox. "Gene Parker's revolutionary paper predicted the heating and expansion of the corona and solar wind. Now, with Parker Solar Probe we are able to truly understand what drives that constant flow out to the edge of the heliosphere." ...Read More..

A young star caught forming like a planet



Artist's impression of the disc of dust and gas surrounding the massive protostar MM 1a, with its companion MM 1b forming in the outer regions. Credit: J. D. Ilee / University of Leeds

stronomers have captured one of the most detailed views of a young star taken to date, and revealed an unexpected companion in orbit around it. While observing the young star, astronomers led by Dr. John Ilee from the University of Leeds discovered it was not in fact one star, but two.

The main object, referred to as MM 1a, is a young massive star surrounded by a rotating disc of gas and dust that was the focus of the scientists' original investigation.

A faint object, MM 1b, was detected just beyond the disc in orbit around MM 1a. The team believe this is one of the first examples of a "fragmented" disc to be detected around a massive young star.

"Stars form within large clouds of gas and dust in interstellar space," said Dr. Ilee, from the School of Physics and Astronomy at Leeds.

"When these clouds collapse under gravity, they begin to rotate faster, forming a disc around them. In low mass stars like our Sun, it is in these discs that planets can form."

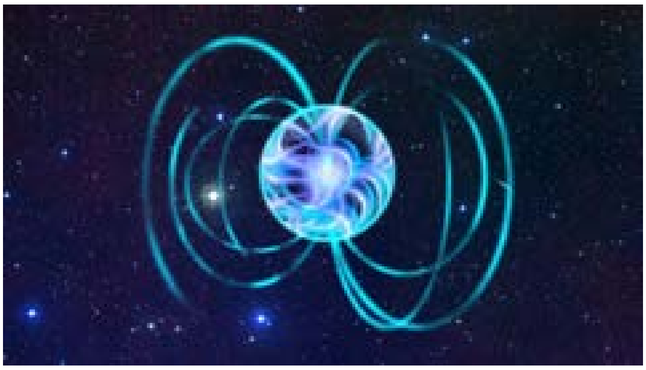
"In this case, the star and disc we have observed is so massive that, rather than witnessing a planet forming in the disc, we are seeing another star being born."

By measuring the amount of radiation emitted by the dust, and subtle shifts in the frequency of light emitted by the gas, the researchers were able to calculate the mass of MM 1a and MM 1b.

Their work, published today in the Astrophysical Journal Letters, found MM 1a weighs 40 times the mass of our Sun. The smaller orbiting star MM 1b was calculated to weigh less than half the mass of our Sun.

"Many older massive stars are found with nearby companions," added Dr. Ilee. "But binary stars are often very equal in mass, and so likely formed together as siblings. Finding a young binary system with a mass ratio of 80:1 is very unusual, and suggests an entirely different formation process for both objects." ...Read More...

Three Surprising Facts About the Physics of Magnets



An artist's interpretation of a magnetar. Credit: ESA - Christophe Carreau.

Magnets and the magnetic force are ubiquitous in our everyday lives, helping to guide us in unfamiliar territory and attach our kids' artwork to the fridge. But other than those common examples, magnetic fields always seem to play second fiddle in the symphony of forces in the universe. Sure, every once in a long while they may get to call the shots — like in the extremely dangerous environments of a magnetar or the extremely useful environments of an NMR scanner — but for the most part they simply exist, getting pushed around by their more powerful cousins.

But despite their relative insignificance, they hold a few secrets.

Magnets only work on motion

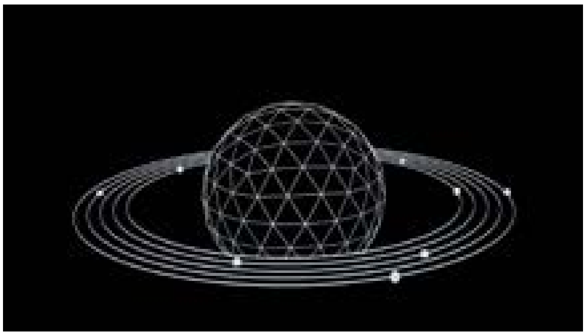
A single particle with electric charge, sitting all by its lonesome, not doing anything interesting, will generate an electric field. This field surrounds the particle on all sides and instructs other charged particles how to move in response. If a similarly charged particle is nearby, it will be pushed away. If an oppositely charged particle is far away, it will be gently tugged closer.

But if you put that electric charge into motion, a surprising thing happens: A new field appears! This strange and exotic field behaves in a strange way: Instead of just pointing straight toward or away from the charge, it twists around it, always perpendicular to the direction of motion. What's more, a nearby charged particle will only feel this new field if that particle, too, is in motion, and the force it feels is again perpendicular to the direction of its motion.

This field, which for the sake of convenience we'll call the magnetic field, is thus both caused by moving charges and only affects moving charges. But your fridge magnet isn't moving, so what gives?

Your magnet itself isn't moving, but the stuff it's made of is. Each and every atom in that magnet has layers and layers of electrons, and electrons are charged particles with a built-in property known as spin. Spin is a fundamentally esoteric and quantum property (and the ....Read More...

Answering the mystery of what atoms do when liquids and gases meet



Credit: CC0 Public Domain

How atoms arrange themselves at the smallest scale was thought to follow a 'drum-skin' rule, but mathematicians have now found a simpler solution.

Atomic arrangements in different materials can provide a lot of information about the properties of materials, and what the potential is for altering what they can be used for.

However, where two materials touch - at their interface - complex interactions arise that make predicting the arrangement of atoms difficult.

Now, in a paper published today in Nature Physics, researchers from Imperial College London and Universidad Carlos III de Madrid have come up with a new model that better predicts how atoms are arranged in relation to each other.

Co-author Professor Andrew Parry, from the Department of Mathematics at Imperial, said: "It's a completely new way of viewing the liquid-gas interface. It can also be applied to other kinds of interfaces: whenever two different materials come together and we want to know how the atoms relate to each other, these ideas can be used."

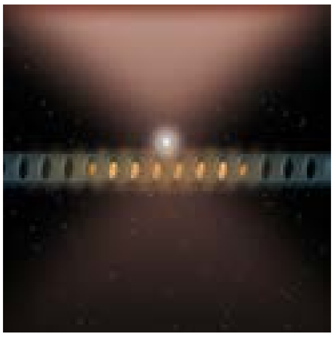
Where gases and liquids meet: a complex situation

When materials are in a solid state, their atoms are arranged in very uniform patterns - like grids, sheets and lattices. This means that knowing the position of one atom can reveal the positions of all its neighbouring atoms.

However, in liquids and gases, the arrangements of atoms can be very different across the volume of the material. Atoms may be 'locally' packed closer together, leading to denser areas, and can change quickly.

One of the most complex of these situations is when liquids and gases meet. Professor Parry said: "If you imagine a glass of water, the upper surface layer of water in contact with air acts differently to the water below; it has surface tension. When you disturb the surface, for example by tapping the glass, the ripples change ...Read More...

New device could help answer fundamental questions about quantum physics



Researchers have used a light-guiding nanoscale device (blue structure) to measure and control position of a nanoparticle (white blur) in an optical trap (red light). This is possible because the light guided in the photonic crystal cavity is influenced by the motion of the particle. Credit: Lorenzo Magrini, University of Vienna

Researchers have developed a new device that can measure and control a nanoparticle trapped in a laser beam with unprecedented sensitivity. The new technology could help scientists study a macroscopic particle's motion with subatomic resolution, a scale governed by the rules of quantum mechanics rather than classical physics.

The researchers from the University of Vienna in Austria and the Delft University of Technology in the Netherlands report their new device in Optica, The Optical Society's journal for high impact research. Although the approach has been used with trapped atoms, the team is the first to use it to precisely measure the motion of an optically trapped nanoparticle made of billions of atoms.

"In the long term, this type of device could help us understand nanoscale materials and their interactions with the environment on a fundamental level," said research team leader Markus Aspelmeyer from the University of Vienna. "This could lead to new ways of tailoring materials by exploiting their nanoscale features.

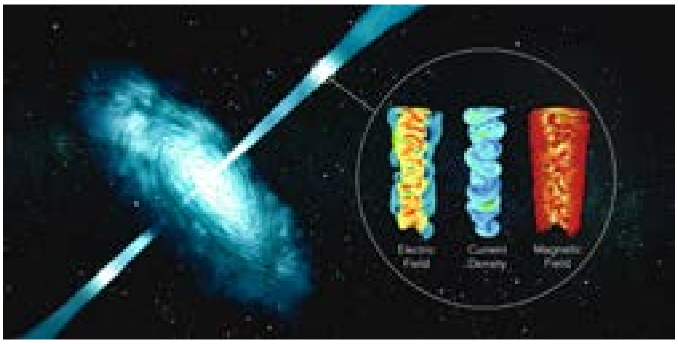
"We are working to improve the device to increase our current sensitivity by four orders of magnitude," Aspelmeyer continued. "This would allow us to use the interaction of the cavity with the particle to probe or even control the quantum state of the particle, which is our ultimate goal."

Making tiny measurements

The new method uses a light-guiding nanoscale device called a photonic crystal cavity to monitor the position of a nanoparticle levitating in a traditional optical trap. Optical trapping uses a focused laser beam to exert a force on an object to hold it in place. The technique was recognized by the award of the 2018 Nobel Prize in Physics to pioneer, Arthur Ashkin.

"We know that the laws of quantum physics apply on the scale of atoms and the scale of molecules, but we don't know how large an object can be and still exhibit quantum physics phenomena," said Aspelmeyer....Read More...

Tangled magnetic fields power cosmic particle accelerators



SLAC researchers have found a new mechanism that could explain how plasma jets emerging from the center of active galaxies, like the one shown in this illustration, accelerate particles to extreme energies. Computer simulations (circled area) showed that tangled magnetic field lines create strong electric fields in the direction of the jets, leading to dense electric currents of high-energy particles streaming away from the galaxy. Credit: Greg Stewart/ SLAC National Accelerator Laboratory

Magnetic field lines tangled like spaghetti in a bowl might be behind the most powerful particle accelerators in the universe. That's the result of a new computational study by researchers from the Department of Energy's SLAC National Accelerator Laboratory, which simulated particle emissions from distant active galaxies.

At the core of these active galaxies, supermassive black holes launch high-speed jets of plasma—a hot, ionized gas—that shoot millions of light years into space. This process may be the source of cosmic rays with energies tens of millions of times higher than the energy unleashed in the most powerful manmade particle accelerator.

"The mechanism that creates these extreme particle energies isn't known yet," said SLAC staff scientist Frederico Fiúza, the principal investigator of a new study that will publish tomorrow in Physical Review Letters. "But based on our simulations, we're able to propose a new mechanism that can potentially explain how these cosmic particle accelerators work."

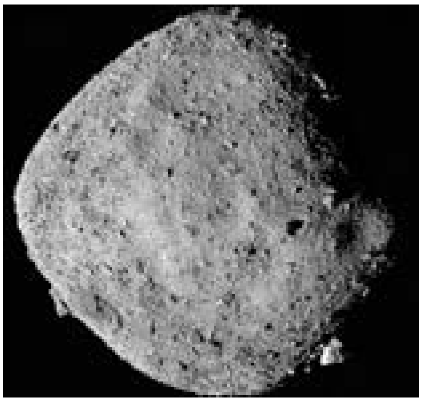
The results could also have implications for plasma and nuclear fusion research and the development of novel high-energy particle accelerators.

Simulating cosmic jets Researchers have long been fascinated by the violent processes that boost the energy of cosmic particles. For example, they've gathered evidence that shock waves from powerful star explosions could bring particles up to speed and send them across the universe.

Scientists have also suggested that the main driving force for cosmic plasma jets could be magnetic energy released when magnetic field lines in plasmas break and reconnect in a different way—a process known as "magnetic reconnection."

However, the new study suggests a different mechanism that's tied to the disruption of the helical magnetic field generated by the supermassive black hole spinning at the center of active galaxies. ...Read More...

OSIRIS-REx discovers water on asteroid, confirms Bennu as excellent mission target



This mosaic image of asteroid Bennu is composed of 12 PolyCam images collected on Dec. 2 by the OSIRIS-REx spacecraft from a range of 15 miles (24 km). Credit: NASA/Goddard/University of Arizona

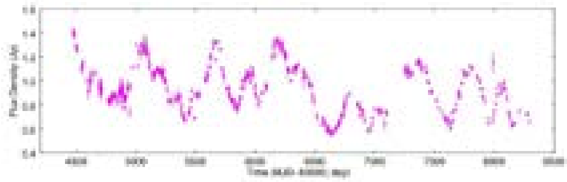
From August through early December, the OSIRIS-REx spacecraft aimed three of its science instruments toward Bennu and began making the mission's first observations of the asteroid. During this period, the spacecraft traveled the last 1.4 million miles (2.2 million km) of its outbound journey to arrive at a spot 12 miles (19 km) from Bennu on Dec. 3. The science obtained from these initial observations confirmed many of the mission team's ground-based observations of Bennu and revealed several new surprises.

Team members of the mission, which is led by the University of Arizona, presented the results at the Annual Fall Meeting of the American Geophysical Union, or AGU, in Washington, D.C. on Dec. 10.

In a key finding for the mission's science investigation, data obtained from the spacecraft's two spectrometers, the OSIRIS-REx Visible and Infrared Spectrometer (OVIRS) and the OSIRIS-REx Thermal Emissions Spectrometer (OTES), reveal the presence of molecules that contain oxygen and hydrogen atoms bonded together, known as "hydroxyls." The team suspects that these hydroxyl groups exist globally across the asteroid in water-bearing clay minerals, meaning that at some point, the rocky material interacted with water. While Bennu itself is too small to have ever hosted liquid water, the finding does indicate that liquid water was present at some time on Bennu's parent body, a much larger asteroid.

"This finding may provide an important link between what we think happened in space with asteroids like Bennu and what we see in the meteorites that scientists study in the lab," said Ellen Howell, senior research scientist at the UA's Lunar and Planetary Laboratory (LPL) and a member of the mission's spectral analysis group. "It is very exciting to see these hydrated minerals distributed across Bennu's surface, because it suggests they are an intrinsic part of Bennu's composition, not just sprinkled on its surface by an impactor." ...Read More...

Periodic radio signal detected from the blazar J1043+2408



About 10.5 years long 15 GHz observations of the blazar J1043+2408 from OVRO. Credit: Bhatta, 2018.

Using Owens Valley Radio Observatory (OVRO), astronomers have detected a periodic signal in the radio light curve of the blazar J1043+2408, which could be helpful in improving our understanding about the nature of blazars in general. The finding was presented in a paper published November 30 on arXiv.org.

Blazars are a class of radio-loud active galactic nuclei (AGN). Their characteristic features are relativistic jets pointed almost exactly toward the Earth. In general, blazars, which are the most energetic sources in the universe, are perceived by astronomers as high-energy engines serving as natural laboratories to study particle acceleration, relativistic plasma processes, magnetic field dynamics and black hole physics.

BL Lacertae objects (BL Lacs) are a type of blazar showcasing lower-power jets and higher Doppler factors than other blazars. J1043+2408 is one of the objects of this type, frequently observed by space telescopes and ground-based observatories.

By monitoring such BL Lacs like J1043+2408 astronomers hope to find quasi-periodic oscillations (QPOs) in the multi-frequency light curves, including radio, optical, X-ray and gamma-ray. For instance, at radio frequencies, QPOs with periods ranging from few hours to few years have been recorded in a number of blazars. These periodic signals could provide essential insights into aspects of blazar studies, including disk-jet connection, magnetic field configuration and strong gravity near supermassive black holes.

Now, in a new study, a group of astronomers led by Gopal Bhatta of Jagiellonian University in Kraków, Poland, reports finding a periodic radio signal in J1043+2408. The detection is the result of long-term observations of this blazar over more than 10 years, using OVRO's 40-m telescope.

"In this work, we report detection of a periodic signal in the radio light curve of the blazar J1043+2408 spanning ~10.5 years. We performed multiple methods of time series analysis, namely, epoch folding, Lomb-Scargle periodogram, and discrete auto-correlation function," the researchers wrote in the paper. ..Read More...

Special Read:

Living on Mars: Team to lead simulation facility mission

Members of last year's Boilers2Mars team exit the Mars Desert Research Station in Utah to conduct experiments. Purdue is sending another team to the facility again this year. Credit: Purdue University photo/Cesare Guariniello

The air may be breathable and the location is on planet Earth, but for two weeks a multidisciplinary team of Purdue students and alumni will eat, sleep, work and live like they're on Mars.

For the second consecutive year, a Purdue team will undergo a mission at the Mars Desert Research Station facility in Utah, conducting a number of experiments and living life as though stationed on the fourth planet from the sun.

Cesare Guariniello, crew geologist on last year's Boilers2Mars team, is team commander this year and an aspiring astronaut. He said improving technical expertise and knowledge is only part of the preparation to travel one day to the red planet.

"It is much more difficult to test oneself in the psychological and social aspects," said Guariniello, a 2016 School of Aeronautics and Astronautics doctoral program alumnus and current research associate. "Participation in at the Mars Desert Research Station gives the team a chance to get as close as possible to an actual mission in space, with a good amount of realism."

The six-member team was selected by Purdue MARS (Mars Activities and Research Society) to take part in the simulation mission. The team, called MartianMakers, will take over control of the research station on the evening of Dec. 30 and pass it on to the next team on Jan. 12.

In addition to Guariniello, the teams consists of:

Alexandra Dukes, crew journalist and AAE master's student.
Denys Bulikhov, executive officer and doctoral student in Industrial Engineering.
Kasey Hilton, crew engineer and senior chemistry major.
Ellen Czaplinski, crew geologist. 2016 Department of Earth, Atmospheric, and Planetary Sciences alumna.
Jake Qiu, health and safety officer and senior agricultural and biological engineering student.

The simulation includes a variety of aspects that combine to make the experience as real as possible. The team cannot break simulation during the mission and must don a flight suit and a heavy air pack with helmet every time they perform extra-vehicular activities. ..Read More...

This Week's Sky at a Glance - Dec. 15-21, 2018

Dec 15	Sa	03:21	Moon-Mars: 3.9° N
		14:59	Mercury Elongation: 21.3° W
		15:49	First Quarter
Dec 21	Fr	11:31	Moon-Aldebaran: 1.7° S
		23:51	Mercury-Jupiter: 0.8° N

SCASS Organizes a Special Geminids Shower Observations (Dec. 14-15, 2018)

A SCASS team composed of Mr. Mohamed Talafha (SCASS Observatory Research Assistant), Ridwan Mohamed Fernini (SCASS Research Assistant), and Abdul Hadi Taqi (SCASS Public Relation Officer) organized a special Geminids shower observation in the Liwa region with a group of 20 students from different schools in Sharjah and Dubai. The Liwa region was chosen for two reasons: (1) its dark skies, and (2) the location of the third UAE Meteor Monitoring Network. On the night of Dec. 14, the team was able to observe more than 100 of meteors. More results will be presented later as the data from both the Sharjah and Liwa towers are reduced.

The Geminids meteor shower peaks on the mornings of December 13 and 14, 2018 – but if you look up any time there's a clear night sky up until December 17, you might just catch a glimpse of a Geminid meteor.
The Geminids shower is unusual as it is one of two meteor showers confirmed to be caused by an asteroid (most meteor showers are caused by comets). The Earth passes through the debris cloud scattered by an asteroid called 3200 Phaethon in December each year. The fiery display is caused as the debris is vapourised by the Earth's atmosphere, having traveled through the solar system for 4.6 billion years.

The Geminids shower is noted for producing 120 or more meteors per hour, which travel at around 35 kilometers per second, and are often brightly colored. The colors indicate the main chemical composition of that particular meteor. An orange or yellow color denotes sodium, yellow signifies iron, blue-green means magnesium and violet indicate calcium. If the meteor appears red, that's nitrogen and oxygen atoms in the atmosphere glowing as they are super heated by the space dust slamming into them at high speed.

About that asteroid

3200 Phaethon has a wildly eccentric orbit, quite different from many other asteroids. At its furthest point from the center of the solar system, 3200 Phaethon enters the asteroid belt between the orbits of Mars and Jupiter, around 360m kilometers from the Sun (for context, Earth is around 150m kilometers from the Sun). At its closest point, it's 21m kilometers away – a mere stone's throw from the Sun, in astronomical terms. Here, the asteroid can bake in temperatures up to 750°C. (...Read More...)