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S&T NEWS BULLETIN

THE LATEST IN SCIENCE AND TECHNOLOGY RESEARCH NEWS

Feature Articles

Quantum Algorithm Could Improve Stealth Fighter Design

Science Daily, 20AUG2013

Researchers at the Johns Hopkins University Applied Physics Laboratory have devised a quantum algorithm for solving big linear systems of equations. Furthermore, they say the algorithm could be used to calculate complex measurements such as radar cross sections, an ability integral to the development of radar stealth technology, among many other applications.
TECHNICAL ARTICLE

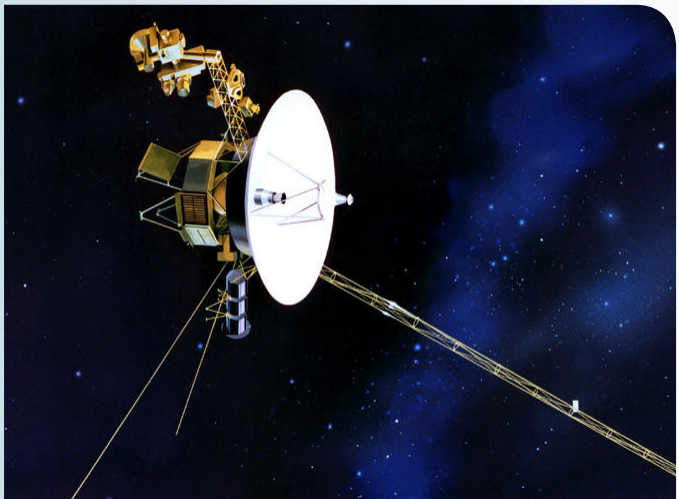
Tags: Quantum science, Featured Article

Voyager 1 Has Left the Solar System

Science Daily, 15AUG2013

NASA's Voyager 1 has traveled farther from Earth than any other human-made object. And now, these researchers say, it has begun the first exploration of our galaxy beyond the Sun's influence.
NASA Voyager site | TECHNICAL ARTICLE

Tags: Science without borders, Featured Article



Voyager 1 appears to have at long last left our solar system and entered interstellar space, says a University of Maryland-led team of researchers. (Credit: NASA)

Teleported by Electronic Circuit: Physicists 'Beam' Information

Science Daily, 14AUG2013

Researchers in Germany have for the first time successfully teleported information in a so-called solid state system. The researchers did it by using a device similar to a conventional computer chip. Information is not stored and processed based on the laws of classical physics, but on those of quantum physics. TECHNICAL ARTICLE

Tags: Quantum science, S&T Germany, Featured Article

S&T News Articles

ADVANCED MANUFACTURING

KAIST unveils foldable micro electric car, Armadillo-T

EurekAlert, 20AUG2013

Researchers in Korea have developed a foldable, compact electric vehicle that can be utilized either as a personal car or part of the public transit system to connect major transportation routes within a city.

Tags: Advanced manufacturing

OpenFab: A Programmable Pipeline for Multi-Material Fabrication

Next Big Future, 19AUG2013

MIT has developed OpenFab, a programmable pipeline for synthesis of multi-material 3D printed objects that is inspired by RenderMan and modern GPU pipelines. The pipeline supports procedural evaluation of geometric detail and material composition, using shader-like fablets, allowing models to be specified easily and efficiently.

Tags: Advanced manufacturing

continued...

BACK TO TOP

How to make big things out of small pieces

MIT News, 15AUG2013

MIT researchers have developed a lightweight structure whose tiny blocks can be snapped together much like the bricks of a child's construction toy. The new material could revolutionize the assembly of airplanes, spacecraft, and even larger structures, such as dikes and levees. TECHNICAL ARTICLE

Tags: Advanced manufacturing, Advanced materials

ADVANCED MATERIALS

Can 'powdered rain' make drought a thing of the past?

BBC News, 19AUG2013

A litre of water can be absorbed in as little as 10 grams of the material, "Solid Rain", which is a type of absorbent polymer originally pioneered by the US Department of Agriculture. It releases water slowly over a year so that plants can survive and thrive in the middle of a drought.

Tags: Advanced materials, Government S&T, Materials science

Inspired by nature: textured materials to aid industry and military

Nanowerk, 19AUG2013

Researchers at the University of Virginia have developed a method using high-powered lasers and nanotechnology to create a texture that repels water, captures sunlight and prevents the buildup of ice. These textured materials can be used over large areas and potentially could have important applications in aviation, the automobile industry, and the military.

Tags: Advanced materials

Science is harnessing shock waves to create new materials

Nanowerk, 18AUG2013

A meteorite impacting the Earth generates high pressures and temperatures. Researchers at Purdue University are striving to replicate these conditions to create materials able to withstand extreme temperatures and possessing superior strength and unique electromagnetic properties.

Tags: Advanced materials

AUTONOMOUS SYSTEMS & ROBOTICS

Video Friday: Military Robots, Kissing Nao, and Automated Recycling

IEEE Spectrum, 16AUG2013

Report on the White House robotic hangout which took place last week.

Tags: Autonomous systems & robotics

BIOTECHNOLOGY

An organized approach to 3D tissue engineering

Nanowerk, 19AUG2013

Researchers in Singapore have developed a simple method of organizing cells and their microenvironments in hydrogel fibers. Their unique technology provides a feasible template for assembling complex structures, such as liver and fat tissues. TECHNICAL ARTICLE

Tags: Biotechnology, Advanced manufacturing

COMMUNICATIONS TECHNOLOGY

Powering Up Terahertz Sources

American Physical Society, 15AUG2013

Researchers in Germany have demonstrated a laser-based source that emits short THz pulses with the highest peak power ever recorded in a laboratory. Many applications could take advantage of the unique properties of terahertz radiation from wireless communications to imaging of biomolecules or semiconductor wafers. TECHNICAL ARTICLE

Tags: Communications Technology, S&T Germany, Terahertz technology

Wireless Devices Go Battery-Free With New Communication Technique

Science Daily, 13AUG2013

University of Washington engineers have created a new wireless communication system that allows devices to interact with each other without relying on batteries or wires for power. The technology could enable a network of devices and sensors to communicate with no power source or human attention. Smart sensors could be built and placed permanently inside nearly any structure, then set to communicate with each other.

Tags: Communications Technology

ENERGY

New rechargeable flow battery enables cheaper, large-scale energy storage

MIT News, 16AUG2013

MIT researchers have engineered a new rechargeable flow battery that doesn't rely on expensive membranes to generate and store electricity. One day the device may enable cheaper, large-scale energy storage. The palm-sized prototype generates three times as much power per square centimeter as other membraneless systems. TECHNICAL ARTICLE

Tags: Energy, Battery

continued...

"Most institutions demand unqualified faith; but the institution of science makes skepticism a virtue." ROBERT K. MERTON

New technology could revolutionize satellite use

PhysOrg.com, 15AUG2013

Researchers at the University of Maryland have been developing technology that could enable electromagnetic formation flight (EMFF), which means using locally generated electromagnetic forces to position satellites or spacecraft without relying on propellants. It was successfully tested in the spring of 2013.

Tags: Energy, Space technology

ENVIRONMENTAL SCIENCE

Global sea level rise temporarily dampened by 2010-11 Australia floods

NSF News, 19AUG2013

Unlike other continents, the soils and topography of Australia prevent almost all its precipitation from flowing into the ocean. According to a team of researchers at the NCAR in Boulder, CO, the 2010–11 event temporarily halted a long-term trend of rising sea levels caused by higher temperatures and melting ice sheets. Now that the atmosphere's circulation has returned to its previous patterns, the seas are again rising.

Tags: Environmental science, Climatology

Grains colliding in mid-air create stronger sandstorms

Physics World, 12AUG2013

According to researchers from Brazil, China and Switzerland, bouncing along above a moving bed of grains, collisions between particles in mid-air can propel them to greater heights—increasing the overall storm flux. These transport processes are vital to sandstorms and similar phenomena, which act to reshape a variety of geological landscapes.

Tags: Environmental science, S&T China, S&T Switzerland

EXPLOSIVES

Explosive nanotechnology: Highly reactive nanoenergetic formulations based on periodate salts

Nanowerk, 14AUG2013

Researchers at the University of Maryland have developed a new aerosol spray drying method for the generation of periodate nanoparticles that can be used in the formulation of highly reactive explosives. TECHNICAL ARTICLE

Tags: Explosives, Materials science

FORECASTING

Physicists get to grips with complex systems

Physics World, 15AUG2013

Researchers at UC Davis have worked out a scheme for optimal control of complex systems, where one event can lead to another. The researchers have studied how best to intervene in so-called self-organized critical systems, which are constantly poised on the brink of a cascade, so as to suppress or manage "avalanches" and propagating crises. TECHNICAL ARTICLE

Tags: Forecasting

Research Shows Precisely Which Strategies Help Players Win Team-Oriented Video Games

Science Daily, 14AUG2013

North Carolina State University researchers have developed a technique which offers extremely precise information about how a player's actions affect a team's chances of winning, and could be used to develop technology for use by players and developers to improve gameplay experiences.

Tags: Forecasting

IBM Launches Advanced Renewable Forecasting Tool

IEEE Spectrum, 13AUG2013

The Hybrid Renewable Energy Forecasting, or HyRef, incorporates cloud imaging technology, sky-facing cameras, and operational and environmental sensors to build customized models of renewable outputs.

Tags: Forecasting

INFORMATION TECHNOLOGY

Advancing resistive memory to improve portable electronics

Nanowerk, 14AUG2013

Researchers at the University of California have developed memory storage devices for portable electronic devices based on the principles of resistive memory, which can be used to create memory cells that are smaller, operate at a higher speed and offer more storage capacity than flash memory cells, the current industry standard. Terabytes, not gigbytes, will be the norm with resistive memory. TECHNICAL ARTICLE

Tags: Information Technology

continued...

MATERIALS SCIENCE

3-D Graphene: Solar Cells' New Platinum?

Science Daily, 20AUG2013

Researchers at Michigan Technological University have developed a new, 3-D form of graphene made from carbon monoxide and lithium oxide to replace platinum with virtually no loss in electrical generating capacity. TECHNICAL ARTICLE

Tags: Materials science, Solar energy

Wave-Shaping Surfaces

American Physical Society Spotlight, 20AUG2013

Researchers at the University of Michigan, Ann Arbor, report the experimental demonstration, inspired by a three-century-old optical principle, of a new "metasurface": a metamaterial-based thin screen capable of reshaping, in arbitrary ways, a radio-frequency wave transmitted through it, while at the same time minimizing undesired reflections. TECHNICAL ARTICLE

Tags: Materials science

Featured Resource

Science Podcast

These are weekly online audiocasts built around interesting stories in Science and its sister sites.

Newly discovered ocean plume could be major source of iron

PhysOrg.com, 19AUG2013

An international team of scientists has discovered a vast plume of iron and other micronutrients more than 1,000 km long billowing from hydrothermal vents in the South Atlantic Ocean. The finding calls past estimates of iron abundances into question, and may challenge researchers' assumptions about iron sources in the world's seas.

Tags: Materials science

New superconducting wire yields unprecedented performance

Nanowerk, 15AUG2013

Researchers at DOE's Oak Ridge National Laboratory demonstrated that superconducting wires can be tuned to match different operating conditions by introducing small amounts of non-superconducting material that influences how the overall material behaves. TECHNICAL ARTICLE

Tags: Materials science

Super-Fast Quantum Computers? Scientists Find Asymmetry in Topological Insulators

Science Daily, 13AUG2013

Researchers at DOE's National Renewable Energy Laboratory show that a class of materials being eyed for the next generation of computers behaves asymmetrically at the sub-atomic level. This research is a key step toward understanding the topological insulators that may have the potential to be the building blocks of a super-fast quantum computer that could run on almost no electricity. TECHNICAL ARTICLE

Tags: Materials science

MEDICAL SCIENCES

Panel Discusses Future of Synthetic Biology

National Academies, 19AUG2013

On Aug. 16 the National Research Council and the U.S. Department of State panel discussed some of the key science, policy, and societal opportunities and challenges facing the international community with regard to synthetic biology. REPORT

Tags: Medical Sciences, Biology

New Early Warning System for Cholera Epidemics

Science Daily, 15AUG2013

Tufts University School of Engineering researchers have established new techniques for predicting the severity of seasonal cholera epidemics months before they occur and with a greater degree of accuracy than other methods based on remote satellite imaging. TECHNICAL ARTICLE 1, 2

Tags: Medical Sciences, Forecasting

Scientists Reveal How Deadly Ebola Virus Assembles

Science Daily, 15AUG2013

Scientists at the Scripps Research Institute showed that the same molecule that assembles and releases new viruses also rearranges itself into different shapes. Like a 'Transformer', this protein of the Ebola virus adopts different shapes for different functions. It revises a central dogma of molecular biology—that a protein molecule has one shape that predestines one biological function. TECHNICAL ARTICLE

Tags: Medical Sciences, Biology

MICROELECTRONICS

Computer Chip Based on Human Brain Developed

Science Daily, 14AUG2013

Building on recent work from scientists who have derived mathematical algorithms to explain the electrical interaction between brain synapses and neurons in combination with a new device technology that exhibits similar electrical response to the neural synapses, researchers at Boise State University will design entirely new computing chips that mimic how the brain processes information.

Tags: Microelectronics, Neuroscience

continued...

NEUROSCIENCE

Computer Can Read Letters Directly from the Brain

Science Daily, 19AUG2013

Researchers in the Netherlands have shown that by analysing MRI images of the brain with an elegant mathematical model, it is possible to reconstruct thoughts more accurately than ever before. TECHNICAL ARTICLE

Tags: Neuroscience

Understanding how we use the past to predict the future

EU R&D News, 19AUG2013

Recent research has offered strong evidence that the brain, when it is confronted with a specific stimulus, uses 'predictive coding' to create a mental expectation about what is going to happen next. An EU-funded project NEUROINT suggests that medial temporal brain structures, including the hippocampus and parahippocampal cortex, encode statistical features of the recent past and signal whether predictions are warranted.

Tags: Neuroscience

Visualized Heartbeat Can Trigger 'Out-Of-Body Experience'

Science Daily, 19AUG2013

Researchers in the UK and Switzerland show that information about the internal state of the body—in this case, the heartbeat—can be used to change how people experience their own body and self.

Tags: Neuroscience

PHOTONICS

Researchers slow light to a crawl in liquid crystal matrix

EurekAlert, 13AUG2013

Researchers from France and China embedded dye molecules in a liquid crystal matrix to throttle the group velocity of light back to less than one billionth of its top speed. The team says the ability to slow light in this manner may one day lead to new technologies in remote sensing and measurement science. TECHNICAL ARTICLE

Tags: Photonics, S&T China, S&T France

QUANTUM SCIENCE

Molecular Memory for Light

American Physical Society, 19AUG2013

Quantum processors, like their classical counterparts, will need fast and reliable memories to store and retrieve information as superpositions of states. Researchers in Canada have now investigated another kind of storage medium: the vibrational modes of molecules. Their experiments demonstrate that the system can act as a fast and efficient molecular quantum memory. TECHNICAL ARTICLE

Tags: Quantum science, S&T Canada

S&T POLICY

Chinese Government Invested 200 million RMB in Setting up 3D Printing Research Institute

China NOST News, 13AUG2013

The Institute was launched on August 8th, 2013. Research will focus on 3D printing technology, equipment, materials, applications in various fields including medicine, civil aviation, aerospace technology, automotive industry and biological manufacturing. The aim is to build China's 3D printing leading force and foster a group of companies around the industry.

Tags: S&T policy, S&T China

SCIENCE WITHOUT BORDERS

Planes, trains and molecules: Deriving a generic routing algorithm from the physics of interacting polymers

PhysOrg.com, 20AUG2013

Researchers in the UK and Hong Kong used the physics of interacting polymers and disordered systems to analyze macroscopic properties of generic path optimization problems. By doing so, they derived a simple yet global, routing algorithm capable of simultaneously considering all individual path alternatives. They demonstrated the algorithm utility by applying it to Internet-like random graphs, travel on the London Underground, and the global airport network. TECHNICAL ARTICLE

Tags: Science without borders

SENSORS

Mathematician designs event cloaking device without using metamaterials

PhysOrg.com, 15AUG2013

Researchers from Northwestern University describe the design of an event cloaking device using mirrors causing light to travel longer or shorter distances before striking an object. TECHNICAL ARTICLE

Tags: Sensors

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