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S&T NEWS BULLETIN

THE LATEST IN SCIENCE AND TECHNOLOGY RESEARCH NEWS

Feature Articles

Disney researchers reconstruct detailed 3D scenes from hundreds of high-resolution 2D images

EurekAlert, 19JUL2013

Building 3D models from multiple 2D images captured from a variety of viewing positions is nothing new, but doing so for highly detailed or cluttered environments at high resolution has proved difficult because of the large amounts of data involved. The Disney Research, Zürich team, however, developed an algorithm that can effectively leverage these amounts of data, and process them efficiently without the need to keep all of the input data in memory at one time. VIDEO, MORE INFORMATION

Tags: Imaging technology, S&T Germany, Featured Article

Researchers make droplets dance (w/videos)

Nanowerk, 19JUL2013

Researchers in France have placed water droplets containing magnetic nanoparticles on strong water repellent surfaces and have made them align in various static and dynamic structures using periodically oscillating magnetic fields. This model system paves the way towards even more versatile dynamic materials, wherein the structures are formed by feeding energy. TECHNICAL ARTICLE

Tags: Advanced materials, Materials science, S&T France, Featured Article

When GPS fails, this speck of an electronic device could step in

Nanowerk, 14JUL2013

In a pellet of glass the size of an apple seed, University of Michigan engineering researchers have packed seven devices that together could potentially provide navigation in the absence of GPS. They developed special fabrication processes that allows them to stack and bond the seven different devices in layers. To make their unit more robust, they built it out of fused silica. TECHNICAL ARTICLE

Tags: Sensors, Featured Article

S&T News Articles

ADVANCED MANUFACTURING

Researchers demonstrate internal tagging technique for 3D-printed objects

Nanowerk, 21JUL2013

Internal tags, dubbed InfraStructs, developed by researchers at Carnegie Mellon University can be read with an imaging system using terahertz (THz) radiation, which can safely penetrate many common materials. In proof-of-concept experiments, researchers have demonstrated several possible tag designs and THz imaging and data processing steps necessary to read them.

Tags: Advanced manufacturing

continued...

BACK TO TOP

Desktop Printing at the Nano Level

Science Daily, 19JUL2013

Researchers at Northwestern University have developed a desktop printing tool poised to prototype a diverse range of functional structures, from gene chips to protein arrays to building patterns that control how stem cells differentiate to making electronic circuits without requiring millions of dollars in instrumentation costs. TECHNICAL ARTICLE

Tags: Advanced manufacturing

ADVANCED MATERIALS

Paper-thin e-skin holds promise for robotics (w/video)

Nanowerk, 21JUL2013

Researchers at UC Berkeley have created the first user-interactive sensor network on flexible plastic. The new electronic skin, or e-skin, responds to touch by instantly lighting up. The more intense the pressure, the brighter the light it emits. The new e-skin technology gives robots a finer sense of touch, can be used to create things like wallpapers that double as touchscreen displays and dashboard laminates. TECHNICAL ARTICLE

Tags: Advanced materials, Sensors

Ferromagnetic and antiferromagnetic – at the same time

PhysOrg.com, 19JUL2013

Researchers in Switzerland have made thin, crystalline layers of the material LuMnO3 that are both ferromagnetic and antiferromagnetic. The development could be of great technical importance for highly compact digital storage media or sensor technology. TECHNICAL ARTICLE

Tags: Advanced materials, S&T Switzerland

Graphene 'Onion Rings' Have Delicious Potential

Science Daily, 18JUL2013

Concentric hexagons of graphene grown in a furnace at Rice University represent the first time anyone has synthesized graphene nanoribbons on metal from the bottom up—atom by atom. The width of the rings, which ranged from 10 to 450 nanometers, also affects their electronic properties, so finding a way to control it will be one focus of continued research. TECHNICAL ARTICLE

Tags: Advanced materials

Unusual material expands dramatically under pressure

EurekAlert, 18JUL2013

If you squeeze a normal object in all directions, it shrinks in all directions. A team of chemists at Oxford University has now discovered a structure that takes this property to a new level, expanding more dramatically under pressure than any other known material. The finding could lead to new kinds of pressure sensors and artificial muscles.

Tags: Advanced materials, S&T UK

A novel material with world record breaking surface area and water adsorption abilities

Nanowerk, 17JUL2013

The magnesium carbonate material that has been given the name Upsalite, which was synthesized by researchers in Sweden, is foreseen to reduce the amount of energy needed to control environmental moisture in the electronics and drug formulation industry as well as in hockey rinks and ware houses. It can also be used for collection of toxic waste, chemicals or oil spill and in drug delivery systems, for odor control and sanitation after fire. TECHNICAL ARTICLE

Tags: Advanced materials

Flexible electronics: Stretchable gold conductor grows its own wires (w/video)

Nanowerk, 17JUL2013

Researchers at the University of Michigan have discovered that networks of spherical nanoparticles embedded in elastic materials may make the best stretchy conductors yet. TECHNICAL ARTICLE

Tags: Advanced materials, Flexible electronics

AUTONOMOUS SYSTEMS & ROBOTICS

Video Friday: KAIRO Can Rescue You, Remote Control Humans, and Roboboat 2013

IEEE Spectrum, 19JUL2013

Insects navigate using a simplistic vision system called optical flow, which is based on the apparent relative motion of very basic shapes. It works robustly with very simple sensors and not a lot of bandwidth, making it ideal for tiny robots. Harvard University has been working on implementing it on their flapping-wing microrobot. It's just one dimension right now, but it's still cool to see how well it works.

Tags: Autonomous systems & robotics

BIOTECHNOLOGY

Silicon chips inserted into living cells can feel the pressure (w/video)

Nanowerk, 18JUL2013

A team of researchers in Spain has demonstrated a nanomechanical chip that can be internalized to detect intracellular pressure changes within living cells, enabling an interrogation method based on confocal laser scanning microscopy. TECHNICAL ARTICLE

Tags: Biotechnology, Biology

Detecting DNA in space

MIT News, 09JUL2013

In a step toward analyzing Mars for signs of life, researchers from MIT, Harvard and Massachusetts General Hospital are working on a DNA-sequencing microchip that can survive radiation doses similar to those found on Mars. TECHNICAL ARTICLE

Tags: Biotechnology

continued...

"No one wants to learn by mistakes, but we cannot learn enough from successes to go beyond the state of the art" HENRY PETROSKI

BREAKTHROUGH TECHNOLOGY

Imaging hits noise barrier

Nature, 10JUL2013

Plans for the next generation of electron microscopes have been dealt a blow by the discovery of an unexpected source of noise that could frustrate efforts to improve resolution to well below the size of an atom. Researchers in Germany realized that it must be caused by thermal vibrations jiggling electrons in the materials and producing magnetic fields that jostle electrons in the microscope's beam.

Tags: Breakthrough technology

CYBER SECURITY

Ministry of Defence joins firms to tackle cyber threat

BBC News, 04JUL2013

The UK's defences against cyber attacks are to be strengthened under new plans that will see the Ministry of Defence working with its biggest contractors. In March, the government launched the Cyber Security Information Sharing Partnership to help businesses and government share information on cyber threats, including a secure web portal to allow information to be shared in real-time.

Tags: Cyber security, S&T Policy

ENERGY

Scientists Break Record for Thinnest Light-Absorber: May Lead to More Efficient, Cheaper Solar Cells

Science Daily, 18JUL2013

Stanford University scientists have created the thinnest, most efficient absorber of visible light on record. The nanosize structure, thousands of times thinner than an ordinary sheet of paper, could lower the cost and improve the efficiency of solar cells, according to the scientists. TECHNICAL ARTICLE

Tags: Energy, Advanced materials, Solar energy

INFORMATION TECHNOLOGY

Internet's Backbone Can Readily Be Made More Sustainable, Experts Say

Science Daily, 19JUL2013

Researchers at Stanford University report that the processors in most server farms perform computations at just 3 percent to 5 percent of their maximum capacity. Server virtualization, consolidation and better software can increase utilization to greater than 30 percent, and in some cases to be as high as 80 percent. TECHNICAL ARTICLE

Tags: Information Technology

MATERIALS SCIENCE

A scientific experiment is able to create a wave that is frozen in time

PhysOrg.com, 22JUL2013

A wave is a deformation in the surface of a liquid that moves at a speed that is independent of that liquid. But in an experiment researchers in the US and Spain have shown that what occurs is actually the opposite: the water moves very rapidly (at several meters per second), but the wave moves at a speed of zero. Understanding how these waves are formed has implications for improvements in naval hydrodynamics. TECHNICAL ARTICLE

Tags: Materials science

Mirror, Mirror On the Wall, Who Has the Lowest Noise of Them All

Science Daily, 21JUL2013

An international collaboration of scientists (USA, Austria) has demonstrated a novel technology for producing mirrors with a tenfold reduction in mechanical loss. The finding provides an entirely new approach for generating high-quality optical coatings. TECHNICAL ARTICLE

Tags: Materials science

World's slowest-moving drop caught on camera at last (w/ Video)

Nature News, 18JUL2013

The pitch drop experiment was set up at Trinity College in 1944 to demonstrate that pitch is a material that flows extremely slow. A drop falls roughly only once in a decade. Also known as asphalt or bitumen, pitch appears to be solid at room temperature. On July 11th, the drop dripped.

Tags: Materials science, S&T UK

Ironing out the Origins of Wrinkles, Creases and Folds

Science Daily, 17JUL2013

Engineers from Brown University have mapped out the amounts of compression required to cause wrinkles, creases, and folds to form in rubbery materials. The findings could help engineers control the formation of these structures, which can be useful in designing nanostructured materials for flexible electronic devices or surfaces that require variable adhesion. TECHNICAL ARTICLE

Tags: Materials science

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Yale Engineers Alter the Microanatomy of Glass

Science Daily, 17JUL2013

Engineers at Yale University have developed a method that allows them to vary one aspect of a material's microstructure while holding all other features constant, resulting in metallic glass composites that are optimized for tensile ductility. TECHNICAL ARTICLE

Tags: Materials science

Finding the Keys to Boiling Heat Transfer

Science Daily, 16JUL2013

A team of MIT researchers has succeeded in carrying out the first systematic investigation of the factors that control boiling heat transfer from a surface to a liquid. This process is crucial to the efficiency of power plants and the cooling of high-power electronics, and could even lead to improvements in how vehicles travel through water. TECHNICAL ARTICLE

Tags: Materials science

Unlikely Competitor for Diamond as Best Thermal Conductor: Boron Arsenide Potential for Cooling Applications

Science Daily, 08JUL2013

Researchers at the Naval Research Laboratory in Boston found that the calculated thermal conductivity of cubic boron arsenide is remarkably high, more than 2000 Watts per meter per Kelvin at room temperature and exceeding that of diamond at higher temperatures. It may open new opportunities for passive cooling applications using boron arsenide. TECHNICAL ARTICLE

Tags: Materials science

Featured Resource

Science News

Biweekly news magazine covers important and emerging research in all fields of science; publishes concise, accurate, timely articles that appeal to both general readers and scientists. RSS

NEUROSCIENCE

Novel Microchips Imitate the Brain's Information Processing in Real Time

Science Daily, 22JUL2013

Researchers from Germany, the EU and US demonstrate how complex cognitive abilities can be incorporated into electronic systems made with so-called neuromorphic chips. They show how to assemble and configure these electronic systems to function in a way similar to an actual brain. TECHNICAL ARTICLE

Tags: Neuroscience

If You're Not Looking for It, You Probably Won't See It

Science Daily, 21JUL2013

When engaged in a demanding task, attention can act like a set of blinders, making it possible for stimuli to pass, undetected, right in front of our eyes. Researchers at Brigham and Women's Hospital, Boston, found that even experts are vulnerable to this phenomenon, called inattentional blindness (IB). TECHNICAL ARTICLE

Tags: Neuroscience

PHOTONICS

Broadband Photodetector for Polarized Light

Science Daily, 16JUL2013

Using carpets of aligned carbon nanotubes, researchers from Rice University and Sandia National Laboratories have created a solid-state electronic device that is hardwired to detect polarized light across a broad swath of the visible and infrared spectrum. The work provides a new path for the realization of polarization-sensitive photodetectors that could be enabled on flexible or nonplanar surfaces. TECHNICAL ARTICLE

Tags: Photonics, Sensors

QUANTUM SCIENCE

"Valleytronics"—a new type of electronics in diamond

PhysOrg.com, 22JUL2013

At low temperatures, electrons will reside in these valleys of minimum energy, of which there are six in diamond. Researchers in Switzerland propose using this valley degree of freedom in diamond to enable valleytronic information processing or as a new route to quantum computing. TECHNICAL ARTICLE

Tags: Quantum science, S&T Switzerland

Making big 'Schroedinger cats'

Nanowerk, 21JUL2013

Researchers in Canada recently made a significant step forward in this direction by creating a large system that is in two substantially different states at the same time. Until this point, scientists had only managed to recreate quantum effects on much smaller scales. TECHNICAL ARTICLE

Tags: Quantum science

Quieter Quantum Amplifiers

PhysOrg.com, 18JUL2013

Researchers in China describe an experiment in which they leverage the weirdness of quantum mechanics to significantly reduce amplifier noise. TECHNICAL ARTICLE

Tags: Quantum science, S&T China

continued...

SCIENCE WITHOUT BORDERS

Maxwell's Refrigerator, Powered by Information

American Physical Society, 19JUL2013

Researchers at the University of Maryland, College Park, outline a scheme to construct a physical device that acts like Maxwell's demon. It doesn't violate the second law because it generates entropy by manipulating digital information. Even though it requires no energy input, the device can act like a refrigerator. If it can be built, the device could test the current understanding of the relationship between information and entropy. TECHNICAL ARTICLE

Tags: Science without borders ■

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