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S&T NEWS BULLETIN

THE LATEST IN SCIENCE AND TECHNOLOGY RESEARCH NEWS

Feature Articles

Researcher Controls Colleague's Motions in First Human Brain-To-Brain Interface

Science Daily, 27AUG2013

Using electrical brain recordings and a form of magnetic stimulation, researchers at the University of Washington sent a brain signal to another researcher on the other side of the UW campus, causing the second researcher's finger to move on a keyboard. VIDEO

Tags: Neuroscience, Breakthrough technology, Featured Article

35 Innovators Under 35

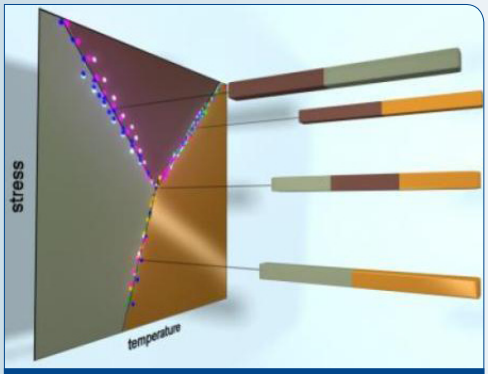
MIT Technology Review, 26AUG2013

For our 13th annual celebration of people who are driving the next generation of technological breakthroughs, we're presenting the stories in a new way. We've grouped them by categories that reflect the variety of approaches that people can take to big problems.

Tags: Science without borders, Featured Article

Physicists Pinpoint Key Property of Material That Both Conducts and Insulates

Science Daily, 21AUG2013



The lines of data points are where two of the three solid-state phases of vanadium dioxide can exist stably together, and the point where the three lines meet—the triple point—is where all three phases can exist together. (Credit: David Cobden/University of Washington)

Researchers at the University of Washington have made the first-ever accurate determination of a solid-state triple point in vanadium dioxide, which is known for switching rapidly—in as little as one 10-trillionth of a second—from an electrical insulator to a conductor, and thus could be useful in various technologies. TECHNICAL ARTICLE

Tags: Materials science, Featured Article

S&T News Articles

ADVANCED MATERIALS

Shape-shifting alloys hold promise

PhysOrg.com, 27AUG2013

Sandia National Laboratories' researchers think shape-memory alloys could be used to improve safety in weapons components in a fire or other accident. A thermal device made from a high-temperature shape-memory alloy might, for example, close or open a switch or lock a gear to prevent it from turning.

Tags: Advanced materials, Government S&T

Researchers Figure out How to 'Grow' Carbon Nanotubes With Specific Atomic Structures

Science Daily, 26AUG2013

In a breakthrough in the quest for the next generation of computers and materials, researchers at USC have solved a longstanding challenge with carbon nanotubes: how to actually build them with specific, predictable atomic structures. TECHNICAL ARTICLE

Tags: Advanced materials, Materials science

Realization of an all-dielectric zero-index optical metamaterial

Nature Photonics, 25AUG2013

Researchers in the US experimentally demonstrate an impedance-matched zero-index metamaterial at optical frequencies based on purely dielectric constituents. Formed from stacked silicon-rod unit cells, the metamaterial has a nearly isotropic low-index response for transverse-magnetic polarized light, leading to angular selectivity of transmission and directive emission from quantum dots placed within the material.

Tags: Advanced materials

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BACK TO TOP

Breakthrough advances nanomaterials for printable solar cells

PhysOrg.com, 23AUG2013

Nanocrystal films developed by researchers from Austraila and Japan could be fabricated on an electrode and applied to photovoltaic devices, thin-film thermoelectrics and transistors at a comparatively low cost compared with other methods.

Tags: Advanced materials, S&T Australia, S&T Japan, Solar energy

Lab-Made Complexes Are 'Sun Sponges'

Science Daily, 21AUG2013

Researchers at Washington University in St. Louis have built antennas which consist of protein scaffolding that holds pigment molecules in ideal positions to capture and transfer the sun's energy. The number and variety of the pigment molecules determines how much of the sun's energy the antennas can grab and dump into an energy trap. TECHNICAL ARTICLE

Tags: Advanced materials, Energy

AUTONOMOUS SYSTEMS & ROBOTICS

Researchers Design and Build the World's Smallest Autopilot for Micro Aircraft

Science Daily, 26AUG2013

Researchers in the Netherlands built the world's smallest autopilot for micro aerial vehicles, small flying robots that can be used in safety and rescue operations. It is called Lisa/S. It weighs 1.9 grams, more than 30 grams less than its predecessor. The autopilot measures 2 cm by 2 cm. VIDEO

Tags: Autonomous systems & robotics

Video Friday: Atlas Unboxing, RHex Plays Fetch, and Terminators Get Real

IEEE Spectrum, 23AUG2013

In this week's Rover Report, Curiosity is making tracks towards Mount Sharp while getting mooned.

Tags: Autonomous systems & robotics

A glimpse into the future of robotic technology

EU R&D News, 22AUG2013

By simulating human learning mechanisms, the EU-funded project EYESHOTS successfully built a prototype robot capable of achieving awareness of its surroundings and using its memory to reach smoothly for objects.

Tags: Autonomous systems & robotics

BIOTECHNOLOGY

'Shapeshifting' Computer Program Will Open Up Drug Discovery for Tricky Disease Targets

Science Daily, 26AUG2013

A unique computer technology invented by researchers in the UK's Shapeshifting Inspired Discovery (SID) program decodes the structures of proteins in our cells that scientists suspect may hold the key to new treatments. The program can rapidly analyse the complicated shapes and identify how the proteins might be "shapeshifted" by drugs.

Tags: Biotechnology, S&T UK

Creating plants that make their own fertilizer

EurekAlert, 22AUG2013

Scientists at Washington University are undertaking an ambitious project to engineer tiny nitrogen-fixing devices within photosynthetic cells. If they succeed, the chemical apparatus for nitrogen fixation will be miniaturized, automated and relocated within the plant so nitrogen is available when and where it is needed.

Tags: Biotechnology, Biology

BREAKTHROUGH TECHNOLOGY

Explanation for Strange Magnetic Behavior at Semiconductor Interfaces

Science Daily, 25AUG2013

Researchers at Ohio State University showed how the elemental units of magnetism, called "local moments," are formed at the interface of the two materials. They then showed how these moments interact with the conducting electrons to give rise to a magnetic state in which the moments are arranged in an unusual spiral pattern. The discovery could lead to a different kind of material—one that provides a single platform for computation and data storage. TECHNICAL ARTICLE

Tags: Breakthrough technology

COMMUNICATIONS TECHNOLOGY

Creating a Secure, Private Internet and Cloud at the Tactical Edge

DARPA News, 21AUG2013

DARPA's Content-Based Mobile Edge Networking (CBMEN) program aims to provide an alternative approach to the top down focus of most military networks. CBMEN starts the content sharing at the individual soldier or marine level.

Tags: Communications Technology

ENVIRONMENTAL SCIENCE

Japan seeds clouds to boost Tokyo rain

PhysOrg.com, 23AUG2013

Using a piece of equipment nearly half a century old, the Bureau of Waterworks sent a plume of silver iodide up through a chimney over an area outside of Tokyo. Around 17.5 millimetres (two thirds of an inch) of rain was recorded over the following two hours.

Tags: Environmental science, S&T Japan

continued...

"The important thing in science is not so much to obtain new facts as to discover new ways of thinking about them." SIR WILLIAM BRAGG

A layer of sunscreen on the street might fight smog

The Conversation, 22AUG2013

Researchers in the Netherlands replaced the normal concrete paving in a street with slabs designed to remove pollutants from the air, specifically nitrogen oxides (NOx). The magic ingredient of the new slabs was titanium dioxide, which absorbs ultraviolet light from the sun. NOx in the air gets converted to nitrates which is absorbed by the concrete and locked away.

Tags: Environmental science, Materials science

EXPLOSIVES

Can New X-Ray Vision Technology Defeat the Staying Power of IEDs?

Wired, 21AUG2013

Unveiled last month in London, Raytheon UK's Soteria vehicle-mounted system provides high-definition IED detection, which allows personnel to remain in the safety of their vehicle while being able to detect, confirm and diagnose threats from a significant stand-off distance.

Tags: Explosives, Military technology

FORECASTING

Predicting when lightning will strike

EU R&D News, 21AUG2013

An EU-funded LOLIGHT (Lightning Mapping and Supercell Tracking System) project is developing a low-cost system capable of detecting lightning to an accuracy of 100 metres. The accurate and quick location of strikes can help reduce costs associated with lightning, such as forest fires. Power distribution companies also stand to benefit from this service. PROJECT WEBSITE

Tags: Forecasting, Climatology, S&T EU

INFORMATION TECHNOLOGY

Linguistics Researcher Develops New System to Help Computers 'Learn' Natural Language

Science Daily, 23AUG2013

Instead of hard-coding human logic or deciphering dictionaries to try to teach computers language, researchers at the University of Texas, Austin, decided to try a different tactic: feed computers a vast body of texts and use the implicit connections between the words to create a map of relationships.

Tags: Information Technology

MATERIALS SCIENCE

Ultra-high-speed nanomaterial synthesis process developed using laser beams

PhysOrg.com, 26AUG2013

Researchers in Korea have successfully developed a process enabling the location-determinable, ultra high speed synthesis of nanomaterials using concentrated laser beams. Unlike conventional nanomaterial synthesis processes, it is simple enough to enable mass production and commercialization. TECHNICAL ARTICLE

Tags: Materials science

Study finds rattling ions limit heat flow in materials used to reduce carbon emissions

Nanowerk, 25AUG2013

A new study by researchers in the UK has found a way to suppress the thermal conductivity in sodium cobaltate so that it can be used to harvest waste energy. TECHNICAL ARTICLE

Tags: Materials science, Energy

Graphene Nanoscrolls Are Formed by Decoration of Magnetic Nanoparticles

Science Daily, 15AUG2013

Researchers in Sweden have modified graphene by replacing some of the carbon atoms by nitrogen atoms. By this method they obtain anchoring sites for the iron oxide nanoparticles that are decorated onto the graphene sheets in a solution process. The new material may have very good properties for application as electrodes. TECHNICAL ARTICLE

Tags: Materials science

Raising the IQ of Smart Windows: Embedded Nanocrystals Provide Selective Control Over Visible Light and Heat-Producing Near-Infrared Light

Science Daily, 14AUG2013

The material designed by researchers at Berkeley Lab is a thin coating of nanocrystals embedded in glass that can dynamically modify sunlight as it passes through a window and provides selective control over visible light and heat-producing near-infrared (NIR) light, so windows can maximize both energy savings and occupant comfort in a wide range of climates. TECHNICAL ARTICLE

Tags: Materials science

continued...

NEUROSCIENCE

How does complex behavior spontaneously emerge in the brain?

PhysOrg.com, 26AUG2013

Researchers in Spain have shown that emergence of complex behavior out of simple interactions in neuronal networks can be explained as a noise-driven phenomenon that is controlled by the interplay between network topology and intrinsic neuronal dynamics. In this scenario, a randomly fired pulse propagates through the network and is amplified by noise focusing, which the researchers describe as an implosive concentration of spontaneous activity. TECHNICAL ARTICLE

Tags: Neuroscience

Researchers Discover How Inhibitory Neurons Behave During Critical Periods of Learning

Science Daily, 25AUG2013

Researchers at UCLA used new techniques to record the activity of inhibitory neurons during critical learning periods. They found that, during heightened periods of learning, the inhibitory neurons didn't fire more as had been expected. They fired much less frequently—up to half as often. TECHNICAL ARTICLE

Tags: Neuroscience

How Sleep Helps Brain Learn Motor Task

Science Daily, 20AUG2013

Researchers at Brown University have shown that sleep improves many kinds of learning, including the kind of sequential finger-tapping motor tasks addressed in their study. It's an intensive activity for the brain to consolidate learning, so the brain may benefit from sleep perhaps because more energy is available or because distractions and new inputs are fewer.

Tags: Neuroscience

Featured Resource

Science Seeker

ScienceSeeker is a project of ScienceOnline designed to fill that void. We have collected over 1,200 blogs and other science news sources in one place.

QUANTUM SCIENCE

Quantum Inverted Pendulum: Control Scheme Dynamically Maintains Unstable Quantum System

Science Daily, 27AUG2013

Researchers at the Georgia Institute of Technology have demonstrated a way to maintain an unstable quantum system by applying bursts of microwave radiation—a quantum analog to vibrating the inverted pendulum. This could lead to developments in quantum computing, quantum simulations and improved measurements. TECHNICAL ARTICLE

Tags: Quantum science

Physicist Disentangles 'Schrodinger's Cat' Debate

Science Daily, 26AUG2013

University of Arkansas researchers write that the cat's quantum state is "entangled" with the atom's state, implying that there is an important "nonlocal relation," or instantaneous action-at-a-distance, between the two. Their experiments performed in 1990 involving nonlocal observation of entangled pairs of photons support their analysis. TECHNICAL ARTICLE

Tags: Quantum science

Teleportation just got easier—but not for you, unfortunately

PhysOrg.com, 21AUG2013

Two recent experiments show deterministic quantum teleportation in two different systems so that the process is no longer probabilistic. Instead it can, in principle, work every time a photon is ready to be teleported.

Tags: Quantum science, S&T Australia, S&T Germany, S&T Japan, S&T Switzerland

SCIENCE WITHOUT BORDERS

A giant telescope 80 feet in diameter to capture the Universe

KurzweilAI, 26AUG2013

The Steward Observatory Mirror Lab (SOML) at the University of Arizona is spin-casting the world's largest telescope mirror: the Giant Magellan Telescope (GMT), which will be more than 80 feet in diameter. Images will be 10 times sharper than the Hubble telescope.

Tags: Science without borders, Space technology

Seven over 70

MIT Technology Review, 22AUG2013

To complement our list of young innovators, here are several who have been at it for decades. We meet extraordinary older innovators all the time, who after a lifetime of creativity are still solving big problems, generating wealth, or expanding our conception of what it means to be human.

Tags: Science without borders

UK & USA scientists collaborate to design crops of the future

EurekAlert, 21AUG2013

Three teams of UK and USA researchers will begin three highly innovative projects which include: searching the planet for a lost bacterium with special, sought-after properties; using synthetic biology to create a new intracellular machine allowing plants to produce fertilizer

continued...

themselves; and engineering beneficial relationships between plants and microbes.

Tags: Science without borders, Biology

The 10 Hottest Fields of Science Research

Wired, 20AUG2013

To find today's hottest research fields, only core papers published between 2007-2012 were considered; the number of citations of those papers and their average publication date were compiled. As the report notes, "a research front with many core papers of recent vintage often indicates a fast-moving or hot specialty." RELATED DOCUMENT: 100 Key Scientific Research Fronts

Tags: Science without borders, Bibliometrics

The city of 2050

BBC News, 20AUG2013

Experts predict that by 2050 three-quarters of the world's population will live in cities. For part of its Tomorrow's Cities season the BBC takes a look through the crystal ball to imagine what city life might be like in 40 years' time.

Tags: Science without borders

SENSORS

First laser-like X-ray light from a solid

EurekAlert, 22AUG2013

The method developed by researchers in Germany at DESY's (Deutsches Elektronen-Synchrotron) free-electron laser FLASH opens up new avenues of investigation in materials research. This technology makes it possible to analyse sensitive samples that otherwise are quickly destroyed by intense X-ray light. TECHNICAL ARTICLE

Tags: Sensors

New Detectors Could Turn Smartphones into Explosive Detectors

Defense Update, 20AUG2013

The detector developed by researchers at NRL employs a new silicon fabrication technique called 'Silicon Nanowires in a Vertical Array with a Porous Electrode' (SiN-VAPOR); this technology has demonstrated detection capability on the parts-per-billion (PPB), and even parts-per-trillion level of sensitivity.

Tags: Sensors, Explosives

Study Advances Iris Images as a Long-Term Form of Identification

Science Daily, 20AUG2013

A new report by NIST uses data from thousands of frequent travelers enrolled in an iris recognition program to determine that no consistent change occurs in the distinguishing texture of their irises for at least a decade. These findings inform identity program administrators on how often iris images need to be recaptured to maintain accuracy.

Tags: Sensors ■

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