

TECHNOLOGY ROUNDUP

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Tech News

De-Bugging of Food by a Vacuum Alternative to Pesticides



A physical chemist has developed a new technique for ridding harvested produce of insect pests and microorganisms without using pesticides such as methyl bromide. Post-harvest fruits and vegetables are typically loaded into a large chamber filled with methyl bromide gas for about eight hours. Methyl bromide kills most of the pests (insects and their larvae), but is costly and time-consuming. Five-million pounds of pesticides a year are used to zap bugs and insects that burrow down on fruits and veggies. But these colorless, odorless gasses pose a threat to the environment. It is also scheduled for a worldwide ban, because it is classified as an ozone-depleting substance. The new technology developed by physical chemist Manuel Lagunas Solar is creating a new pest control system called MSDD (Metabolic Stress Disinfection and Disinfestations). This method doesn't use chemicals but uses forces and controls the air to achieve the same objective and is

more reliable and cost-effective, and is also non-toxic to humans and safe for the environment. MSDD kills pests using carbon dioxide, a vacuum pump, and a little alcohol. Insects need oxygen, like all living creatures and MSDD eliminates their oxygen supply. The produce is put into a chamber, and a vacuum is then applied, reducing the interior air pressure by about 90 percent, after a few minutes, the chamber is filled with pure carbon dioxide for several more minutes. The process repeats several times, periodically augmented with ethanol vapor to make sure the bugs are dead. The method has been successfully tested on table grapes, oranges, grapefruit, stone fruit, kiwi, and bananas.

www.microbeworld.org

Computer Scientists attach Images to Passwords to Prevent Fraud

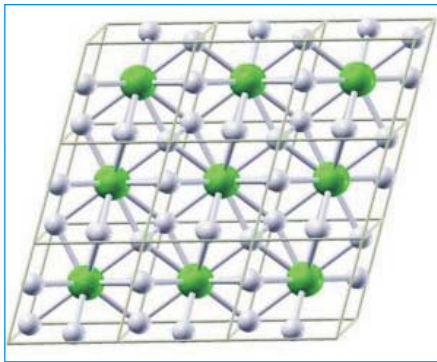
A computer scientist at Indiana University School of Informatics in Bloomington, is working to find out what the next computer crime will be? They have devised a new cryptographic security scheme to protect individual passwords from prying eyes. Web sites that visualize images while the user enters a password could help prevent impostors from stealing personal data or money. The user would see a familiar image for every letter typed, thus being warned if they see a different one. This could prevent phishing, the cyber crime practice of masquerading, as a commonly used Web site to have users type in the passwords that they would use on the real site. The strongest evidence that you are being phished is that you are getting an e-mail from a bank that you do not have a banking relationship. The new solution is delayed password disclosure. It not only uses a password, but also pictures. Each letter or number in your password would correspond to a picture. If there is even one image that you do not recognize, that means you are being attacked. Existing security protocols concentrate on securing the link between two machines, but any hacker can use a computer as a fake access point, stealing information secretly. Delayed password disclosure counters this by allowing both parties to use a pre-arranged password or PIN for authentication that is not revealed during communications. Whenever a user initiates a wireless link, the agreed code is turned into a string of incoherent bits by a mathematical algorithm, while at the other end of the link; another algorithm is applied to the string and sent back to the user. In this way, the code can be checked mathematically to confirm that the person at the other end of the link shares the same secret password or PIN.

www.aip.org



Combination of Lithium and Hydrogen for Future Superconductors

A team of scientists from Cornell University and the State University of New York at Stony Brook announce a theoretical study that predicts the metallization of hydrogen-rich mixtures at significantly lower pressures. Metallic hydrogen is predicted to be a high-temperature superconductor (a state of matter where electrons, and thus electricity, can flow indefinitely and without resistance). By adding small amounts of lithium to hydrogen, the study predicts that the resulting system may be metalized at pressure required to metalize pure hydrogen. Hydrogen reacts with each other to form a stable compound. This compound, or LiH, is not metallic. One of the by the team contains one lithium atom for every six hydrogen atoms or LiH₆ compound the Li atom is distributed over the three forms stable and predict that LiH₆ could compound is predicted percent of the pressure required to metalize hydrogen by it. Another hypothetical compounds studied by the team was composed of one lithium atom and two hydrogen atoms or LiH₂.



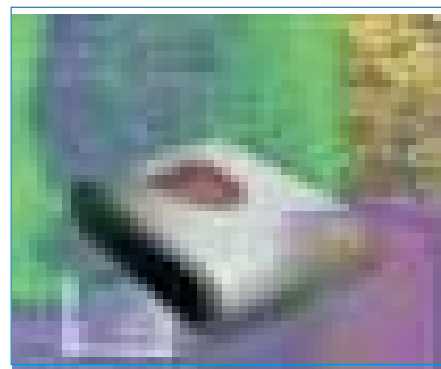
The theoretical study opens the exciting possibility that non-traditional combinations of light elements under high pressure can produce metallic hydrogen under experimentally accessible pressures and lead to the discovery of new materials and new states of matter.

www.nsf.gov

Electrical Engineers develop Pocket-size Fingerprint recognition Device

An electrical engineer at Privaris, Inc., in Fairfax, Va. has developed a new security device that uses a one-of-a-kind access code i.e your fingerprint. The new pocket device reads fingerprints and validates them by wireless access to a computer. With this biometrics system, users can avoid using passwords, and get simpler and more secure access to bank balances, credit cards, and even buildings. It becomes a personal identification device that you carry with you, and the device only works for you since the fingerprint, being something that you will not forget. Once you scan your finger, the device compares the scan to your fingerprint data, or biometrics already stored in the device. The ability to not only stores the fingerprint on the device but to do that securely is a unique feature of the device. The new device can work with existing security systems and also works for access into buildings. Digits from cadavers and fake fingers molded from plastic, or even play dough or gelatin, can potentially be misread as authentic by biometric security systems. Electrical and computer engineers are addressing this issue by trying to "spoof" (the process by which individuals test a biometric security system by introducing a fake sample) such systems in hopes of designing more effective safeguards and countermeasures. The goal is to make the authentication process as accurate and reliable as possible. One such study found a 90 percent false verification rate; the scanning machines could not distinguish between a live sample and a fake one. This system was modified to detect the pattern of perspiration from a live finger, which reduced the false verification rate to less than 10 percent.

www.ieceusa.org

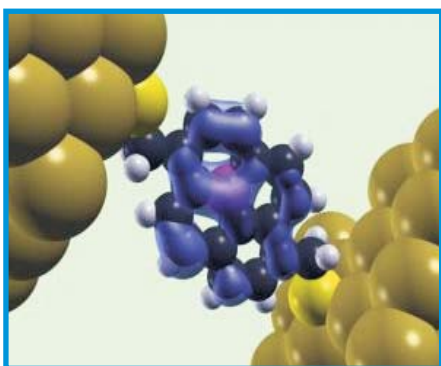


Smaller and Efficient Nuclear Battery

Electrical and computer engineers at University of Missouri Columbia are developing a nuclear energy source that is smaller, lighter and more efficient. These small nuclear batteries, currently the size and thickness of a penny, intended to power various micro/nanoelectromechanical systems (M/NEMS). Although nuclear power sources have already been safely powering a variety of devices, such as pace-makers, space satellites and underwater systems. This innovation is not only in the battery's size, but also in its semiconductor, that uses a liquid semiconductor rather than a solid semiconductor. In the future, they hope to increase the battery's power, shrink its size and try with various other materials. The battery could be thinner than the thickness of human hair.

www.missouri.edu

Single Molecules as Electric Conductors



Researchers from Graz University of Technology, Humboldt University in Berlin, M.I.T., Montan University in Leoben and Georgia Institute of Technology reported an important advance in the understanding of electrical conduction through single molecules with minimum size and maximum efficiency. The use of molecules as elements in electronic circuits shows great potential. The research team has shown that molecules containing an odd number of electrons are much more conductive at low bias voltages. These fundamental findings in the highly dynamic research field of nanotechnology open up a diverse array of possible applications. More efficient microchips and components with considerably increased storage densities are conceivable. Most stable molecules have a closed shell configuration with an even number of

electrons. Molecules with an odd number of electrons tend to be harder for chemists to synthesize but they conduct much better at low bias voltages. Although using an odd rather than an even number of electrons may seem simple, it is a fundamental realization in the field of nanotechnology because as a result of this, metal elements in molecular electronic circuits can now be replaced by single molecules. This brings a considerable step closer to the ultimate miniaturization of electronic components. The motivation for this basic research is the vision of circuits that only consist of a few molecules. This would open up a wide array of possible applications, the full potential of which will only become apparent over time. Specific new perspectives are opened up in the field of molecular electronics, sensor technology or the development of bio-compatible interfaces between inorganic and organic materials. The latter refers to the contact with biological systems such as human cells, for instance, which can be connected to electronic circuits in a bio-compatible fashion via the conductive molecules.

www.portaltugraz.at

Thief-Proofing your Laptop with Motion Sensors

Electrical and computer engineers at Carnegie Mellon University have developed a dime-sized motion sensor that can track lost or stolen laptops and cell phones, and can also be used to help with personal navigation. It is a nightmare that can happen in the blink of an eye that your laptop is stolen, and chances are, it is not coming back. More than 700,000 laptops are stolen each year, but now a new, tiny motion sensor can track your laptop's every move. The sensor is housed in a cube-shaped casing, and can be embedded in any commercial product. These small motion sensors can fit inside a laptop computer or even a handheld device, where they can transmit data back wirelessly. New software uses the data to reconstruct a laptop's path and its new location, so it can be recovered in case of theft. Moreover this tiny motion sensor tracks your



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laptop's every move and automatically senses any movement and how fast it is moving. This alert is sent by a wireless signal to another computer or cell phone you designate. Researchers are also working on adding precise location information of the laptop to the alerts owner's would receive.

www.aip.org

Biochemists and Engineers create fast-acting Pathogen Sensor

Scientists and engineers at Massachusetts Institute of Technology's (MIT) Lincoln Laboratory have invented an innovative biosensor a device to bring air samples into contact with genetically engineered biosensors in the effort to detect dangerous biological agents. The technology uses multiple collections of altered cell antibodies, each collection designed to respond to a specific pathogen by releasing photons of a unique wavelength upon finding it then detectors measure the photons wavelengths and interpret the pathogens they represent. This device can identify harmful bacteria or viruses in the air in less than two minutes. It is at least ten times faster than any other automated sensor. Operation is as simple as loading your DVD player. Disks containing sixteen chambers are loaded into the PANTHER; the device uses immune cells altered to act as detectors of dangerous biological agents. It takes in air, runs it past the cells, which are gathered into groups, each designed to react to specific agent. The cells, which are engineered to respond to a specific pathogen, release photons of light when they detect their target. The machine pulls air through the disk to collect and test any pathogen that might be in the air. The disk contains the cells that are the key to the canary technology; it releases those cells into the collected particles and looks for the resulting light, and gives you a sense of what is detected. If a dangerous pathogen is detected, the sensor goes off alerting anyone who could be in harm's way. The technology can eventually be used for medical diagnostics to test patient samples. It may even be used in food processing plants to identify contaminants like E. coli or salmonella. The technology is now licensed commercially.

www.sciencedaily.com

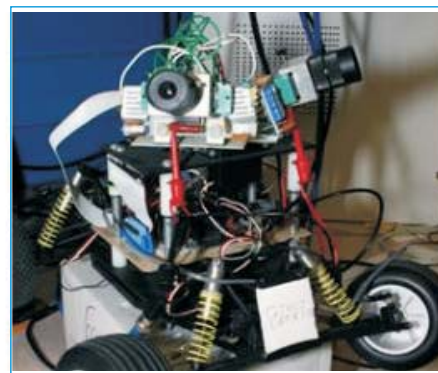
Robot with a Vision

Researcher in the field of Electrical and Computer Engineering (ECE) at University of Arizona are working to make robots more physical by giving them sight and an ability to react to what they see. Right now, robots in general are just pitiful in terms of visual interaction, true, a few of today's robots can see in some sense, but they are not mobile. These vision systems are connected to large computers, which precludes their use in small, mobile robots.

Researchers are developing an airborne visual navigation system by creating electronic clones of insect vision processing systems in analog integrated circuits. The circuits create insect-like self-motion estimation, obstacle avoidance; target tracking and other visual behaviors on two model blimps. These circuits do not use standard microprocessors, instead, they are based on what is called "parallel processing" a bunch of slower, simpler analog processors working simultaneously on a problem. In traditional digital computers, problems are solved in serial fashion, where a single fast digital processor flashes through a series of steps to solve the problem sequentially because most computers are designed around a single, powerful processor does not mean that is the way they have to be designed. The human eye, for instance, processes information at the equivalent of about 100 frames per second (fps) much faster than a movie camera, which trundles along at 24 fps or a video camera that runs at 30 fps.

The wants to develop a microchip-based vision system that could follow a moving object, or a chip that would recognize different objects a sidewalk crack it could roll over, for instance, from a ditch that it could not. The key to all this is packing a huge amount of highly efficient processing in a small space and then the possibilities would be endless

www.arizona.edu



Booze to Biofuels: Fuel for the Future

Cars in the future could be running on fuel made from the by-products of brewing and distilling, thanks to a new research project at the University of Abertay Dundee. The supply of fossil fuels is finite, some estimates suggest that around half of the world's oil reserves have been used up in the last 200 years and the race is on to find more environmental friendly alternatives. So the scientists all over the world are trying to find a simple and cost effective way to produce more biofuels from waste or low value products. Brazil and the USA have both been very successful in creating bioethanol from sugarcane and maize starch respectively. These countries produce over 70% of global supplies. However the methods used in these countries are open to criticism since they create an increased demand for land for growing energy crops. The recent research will be looking at the far more complicated process of turning waste products from industry into bioethanol as an example of a second-generation biofuel. These products are currently disposed of or processed for animal feed and turning them into fuel would be an attractive use of the resource. The main advantages of bioethanol over traditional fuels are that it is CO2 neutral, it produces 65% less greenhouse gas emissions because it burns at a higher temperature is better for fire safety.

www.abertay.ac.uk

Forthcoming Tech Events

Drink Tech Asia, Exhibition

Drink Tech Asia will showcase the latest innovations in Advanced Equipment and Technologies for Drink Tech industry.

06-08 February, 2010

Karachi Expo Center, Pakistan.

www.biztradeshows.com

Agritech Asia, Exhibition

Agritech Asia is a professionally organized exhibition of International standards that will showcase all related products from around the world. Discover the latest innovations in Advanced Equipment and Technologies, Agroindustry Startups, Cost Saving Production and many more.

06-08 February, 2010

Karachi Expo Center, Pakistan.

www.biztradeshows.com

Metal & Steel Asia, Exhibition

The exhibition would serve as a comprehensive showcase of the latest in technology, equipment and machinery as well as allied services.

27- 29 March, 2010,

Karachi Expo Center, Pakistan.

www.themagnetguide.com

Power & Alternative Energy Asia, Exhibition

Power & Alternative Energy Asia will be the biggest specialized exhibition in Pakistan, covering power generation, transmission and distribution, as well as energy saving technologies and renewable energy development.

27- 29 March, 2010

Karachi Expo Center, Pakistan.

CWEE China International Wind Energy Exhibition and Conference

27-29 April, 2010

Shanghai, China

www.cwee.com.cn

16th International Energy & Environment Conference

12-14 May, 2010

Istanbul, Turkey.

www.icci.com.

The 9th Annual Biological Production Forum 2010

21-23 June, 2010

Frankfurt, Germany.

www.biologicalproduction.com

Tech & Trade Offers

WirelessCom/ G10



Teltonika WirelessCom/ G10 are devices designed for communication with remote device which have RS232 ports. RS232 interface is one of the industries leading standard. This interface can be found in a large variety of devices like, data loggers, POS terminals, vending machines, PLCs, control panels, various meters, switches, routers and the list goes on.

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www.teltonika.pk

Windmill

Windmills are ideal for both rural and urban applications including roof top installations. Depending on the shape of the roof, the wind flow over the roof may be concentrated leading to an increased energy output. Simple to install and maintain



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