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VerticalNews Nanotechnology

NanoViricides Inc

NanoViricides Presents FluCide(TM) Animal Study Data at Influenza Congress - Now Improved Substantially and Vastly Superior to Current Treatment

2009 DEC 7 - (VerticalNews.com) -- NanoViricides, Inc. (OTC BB: NNVC.OB) (the "Company"), announced that Dr. Eugene Seymour, MD MPH, CEO of the Company, presented lifetime data from the recent FluCide[®] animal study on November 19th at the Influenza Congress USA 2009 in Washington, DC (www.terrapinn.com/usaflu). These data clearly established that the new version of FluCide[®] is superior to the older version. The data also showed extremely large survival lifetime improvement compared to an extended therapy using oseltamivir (Tamiflu[®] Roche).

Separately, Dr. Anil R. Diwan, President of the Company, presented a talk on November 18th at the Nano and Clean Tech 2009 Conference (<http://www.chemshow.com/includes/nano.pdf>) in New York City, held in conjunction and partnership with the Chem Show 2009 (<http://www.chemshow.com>).

Dr. Diwan gave a description of the nanomedicine technology on which the Company's product platform is based. He then went on to discuss the successful development of several drug candidates in a relatively short timeframe and with very small R&D expenditures that NanoViricides Inc. has been able to achieve. "Our achievements have clearly demonstrated that we can develop drug candidates against new virus targets very quickly," he said. He explained that the multi-point binding of a nanoviricide[®], enabled by the underlying TheraCour[®] polymer, results in a nanoscale "velcro" or zipper-like effect. This allows the Company to employ virus-binding ligands with relatively low affinities successfully. "Other drug development approaches require discovery of antibodies or chemicals with very high affinities, sub-micromolar or better, which takes a lot of time and money," he said, adding, "In contrast, our technology allows us to use mimics of the natural and conserved binding sites of the viruses. This allows rapid development. Also, it means that a virus is far less likely to escape a nanoviricide compared to its escape rate against a highly specific drug discovered using a conventional methodology."

The recent animal study of FluCide was conducted using the same total lethality protocol employed in previous influenza studies by the Company. The new version of FluCide drug candidate extended the lifespan of lethally infected mice to 334±11 hrs (or 14 days) on average. In contrast, mice treated with an extended oseltamivir protocol survived for 193±3 hrs (or 8 days) on average. Control infected mice survived for only 121±2 hrs (or 5 days). FluCide was given as an IV injection, on alternate days, for five treatments. Oseltamivir was given as oral, twice daily, each at 20mg/kg through life (or 14 treatments). Previously, oseltamivir given using the customary protocol of oral, twice daily, each at 20mg/kg for 4 days (8 treatments), has produced a survival time of 151±1 hrs (or 6.3 days) in this model. Several additional parameters have been evaluated in this study. The Company expects to analyze the data from these additional parameters as they are received in the near future.

The Company believes that the lifetime data demonstrate an unquestionable superiority of the FluCide drug candidate compared to current drugs, and establish it as a viable therapy against influenza. We believe that FluCide is likely the most effective drug candidate in development against influenza, based on these results.

The studies were conducted by Dr. Krishna Menon, PhD, VMD, MRCS, at KARD Scientific, MA. One million virus particles of Influenza A Strain A/WS/33 (H1N1) were aspirated directly into the lungs of mice. A repeat "booster" infection was performed at 22 hrs. This is a highly lethal model, allowing the survival lifetimes to be directly used for rank ordering of efficacy of drug candidates.

The Company has previously shown that a previous version of the FluCide drug candidate was highly effective against two different clades of the H5N1 bird flu virus, in addition to being highly effective against H1N1 in the mouse model. The Company has recently improved the FluCide drug candidate, creating what it believes to be a single drug candidate against all forms of influenza. The Company believes that the data we presented at the Influenza Conference establish this pan-influenza drug candidate as a leading anti-influenza drug in development. About NanoViricides: NanoViricides, Inc. (www.nanoviricides.com) is a development stage company that is creating special purpose nanomaterials for viral therapy. The Company's novel nanoviricide class of drug candidates are designed to specifically attack enveloped virus particles and to dismantle them. The Company is developing drugs against a number of viral diseases including H1N1 swine flu, H5N1 bird flu, seasonal Influenza, HIV, oral and genital Herpes, viral diseases of the eye including EKC and herpes keratitis, Hepatitis C, Rabies, Dengue fever, and Ebola virus, among others.

Keywords: Chemicals, Chemistry, Health, Infectious Diseases, Nanotechnology, Nanotech, Emerging Technologies, NanoViricides, Nanomaterial, Nanomedicine, Nanoscale, Nanoviricide, Other Health, Pharmaceutical, Technology, NanoViricides Inc.

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NanoMech

NanoMech Receives Navy Contract to Develop Nanolubricant Technology

2009 DEC 28 - (VerticalNews.com) -- The Office of Naval Research has awarded NanoMech, LLC a contract for approximately \$770,000 to complete development of a new, nanostructured lubricant additive called NanoGlide®. The Navy aims to increase durability and improve energy efficiency of naval components and systems through use of this advanced technology. NanoGlide is a unique multi-component, extreme-pressure nanoparticle-based additive that originated from nanomanufacturing research at the University of Arkansas in Fayetteville. NanoMech has an exclusive license to commercialize this patent-pending technology.

Friction is one of the major reasons for failure of vital engineering components and systems used in Navy, aerospace, and industrial applications. The annual cost of friction and wear-related energy and material losses is estimated to be 5% to 7% of the gross national product.

"NanoMech's development of this breakthrough product marks a significant improvement in performance by an environmentally sustainable additive that can save energy," said Neil Canter, a lubricant industry expert and a Contributing Editor to the industry's widely-read Tribology and Lubrication Technology magazine. "The combination of solid lubricant nanoparticles with environmentally friendly organic additives provides a unique set of properties that are not matched by any additive commercially available today."

"NanoMech represents the type of high-tech manufacturing and product development that can increase top-paying jobs in the State of Arkansas, evidenced by this important contract with the U.S. Navy," said James M. Phillips, Chairman of NanoMech. "We are especially grateful to Senator Pryor and Congressman Boozman for supporting NanoMech's efforts to develop innovations that generate knowledge-based jobs and help protect our Armed Forces while driving safer, environmentally sound efficiencies for our naval fleet."

"This award validates the world-class nano science and engineering research going on at the University of Arkansas as it moves into commercialization and creation of breakthrough products and manufacturing processes," added Ajay Malshe, Co-Founder and CTO of NanoMech. About NanoMech NanoMech, a technology company based in Springdale, Ark., is a designer and manufacturer of innovative application-specific nanoparticle additives, nanoparticle-based coatings and coating deposition systems. The company was recently recognized for "Excellence in Innovation" by the U.S. Department of Commerce. For more information, please visit www.nanomech.biz.

Photos/Multimedia Gallery Available:

<http://www.businesswire.com/cgi-bin/mmg.cgi?eid=6119121&lang=en>

Keywords: Aerospace, Armed Forces, Chemicals and Plastics, Conservation, Contracts, Defense, Ecology, Economics, Emerging Technologies, Engineering, Environment, Gross National Product, Manufacturing, Military, NanoMech, Nanomanufacturing, Nanoparticle, Nanostructural, Nanostructure, Nanostructures, Nanotech, Nanotechnology, Science And Engineering, Technology.

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[BioMimetic Therapeutics Inc](#)

BioMimetic Therapeutics Strengthens its Agreement with Novartis for Exclusive Supply of rhPDGF-BB

2010 JAN 18 - (VerticalNews.com) -- BioMimetic Therapeutics, Inc. (NASDAQ: BMTI) announced that effective December 31, 2009, the Company amended and restated its manufacturing and supply agreement with Novartis Vaccines and Diagnostics, Inc. for the supply of bulk rhPDGF-BB to BioMimetic. The agreement sets forth a clear and strengthened mutual exclusivity commitment whereby Novartis shall manufacture rhPDGF-BB exclusively for BioMimetic for therapeutic applications covering bone, cartilage, tendon and ligaments.

Under the revised agreement, the contract was extended by three years with successive three year evergreen extension periods. Further, either company must give a six month termination notice in any extension period if they wish to discontinue the agreement for any reason. In the event that Novartis terminates the agreement, or if BioMimetic terminates the agreement for cause, Novartis is required to support technology transfer by providing to a new manufacturer all Novartis technology and supporting documentation necessary to produce bulk rhPDGF-BB and to supply BioMimetic sufficient bulk rhPDGF-BB to fulfill its needs during the technology transfer process. Finally, the companies reduced certain minimum purchase obligations through 2011, by which time the parties anticipate that BioMimetic's Augment will be FDA approved for orthopedic applications.

"Novartis has been an excellent partner in the supply of our bulk rhPDGF-BB, enabling the successful approval and product launch of our first regenerative product, GEM 21S, and more recently, facilitating our orthopedic development programs for Augment and Augment Injectable," said Dr. Samuel Lynch, president and CEO of BioMimetic Therapeutics. "The conclusion of this amended agreement reaffirms and strengthens the ongoing relationship between our two companies for the future. Our exclusive agreement covering bone, cartilage, tendon and ligaments, combined with our own patent portfolio further raises the already high barrier to entry for development and commercialization of rhPDGF-BB within the orthopedic space." About BioMimetic Therapeutics BioMimetic Therapeutics is a biotechnology company utilizing purified recombinant human platelet-derived growth factor (rhPDGF-BB) in combination with tissue specific matrices as its primary technology platform for promotion of tissue healing and regeneration. rhPDGF-BB is a synthetic form of one of the body's principal agents to stimulate and direct healing and regeneration. The mechanism of action of this platform technology suggests it may be effective in a broad array of musculoskeletal applications, including the repair of bone, ligament, tendon and cartilage. Through the commercialization of this technology, BioMimetic seeks to become the leading company in the field of orthopedic regenerative medicine. BioMimetic received marketing approval from the FDA for its first product, GEM 21S®, as a grafting material for bone and periodontal indications. Additionally, BioMimetic Therapeutics has completed and ongoing clinical trials with its product candidates Augment and Augment Injectable in multiple orthopedic bone healing indications including the treatment of foot and ankle fusions and the stimulation of healing of fractures of the wrist. In November 2009, BioMimetic received approval from Health Canada to begin marketing Augment as an alternative to the use of autograft in foot and ankle fusion indications in Canada. GEM 21S is a trademark of Luitpold Pharmaceuticals, Inc., who now owns this dentally related product and markets it through its Osteohealth Company in the United States and Canada.

Keywords: Advertising, Biomimetics, Biotechnology, Emerging Technologies, Health, Marketing, Medical Devices, Nanotech, Nanotechnology, Pharmaceutical, Technology, BioMimetic Therapeutics Inc.

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Nano Pet Products Llc

Nano Pet Products Partners With Lone Star Pet Supply, Inc. to Distribute Dog Gone Smart Pet Beds Using Proprietary Nanosphere Fabric Technology

2009 DEC 28 - (VerticalNews.com) -- Nano Pet Products, LLC, a Wilton, Connecticut-based company dedicated to bringing cleaner and healthier pet products to pet owners worldwide through nanotechnology, has partnered with TX-based pet products distributor, Lone Star Pet Supply, Inc. to carry its Dog Gone Smart® line of dog beds according to Nano Pet's Chris Onthank. Nano Pet Products, LLC is the worldwide exclusive licensee of NanoSphere®, a revolutionary proprietary fabric finish technology based on nanotechnology from Schoeller® Technologies AG, Switzerland for the pet industry.

"The Dog Gone Smart pet products line is high quality and long lasting which we know our customer base appreciates and demands," said Danny Selman, vice president and general manager of Lone Star Pet Supply, Inc. He added, "We demonstrated the Dog Gone Smart pet beds at our open house and the response was very positive." According to Selman, Lone Star has also offered some of the Dog Gone Smart® pet apparel line and plans to expand it in the near future. Lone Star Pet Supply, Inc. is one of America's leading regional pet products distributors, offering the largest selection and availability of the products pet lovers desire most.

NanoSphere®, a certified nanotechnology, is impregnated into the fabric without altering the fabric texture and feel, producing a non-visible structured textile surface that coat oil, dirt, and liquids cannot stick to. Residue can easily be rinsed off with water or machine washed. The fabric stands up to frequent washing and is highly abrasion resistant.

"As pioneers of nanotechnology in the pet industry, our products have earned the distinction as some of the most environmentally pet safe and durable worldwide," said Chris Onthank, Dog Gone Smart founder." NanoSphere® carries the label "bluesign® approved" which is based on the world's strictest EHS (environment, health and safety) stipulations for textiles and examines all the relevant components from the very beginning of the manufacturing process. Nano Pet Products are also bacteriostatic, which inhibits the spread of bacteria that can cause odor.

The Dog Gone Smart® Bed is available in more than 25 styles and sizes, including round, rectangular (both available with Sherpa top), donut, crate pad, and knife-edge memory foam, each in six different colors. The beds, regular and extra large crate pads are priced from MSRP \$24.95 to \$159.95.

Nano Pet Products can be purchased through retailers like Pet Food Express, Pet People, Joyful Honda in Japan, and Fressnaph in Europe, as well as U.S. and international distributors covering 24 countries on 4 continents. For more information please visit www.doggonessmartbed.com.

* NanoSphere® is registered trademark of Schoeller Technologies AG - Switzerland

Keywords: Asia, Conservation, Ecology, Emerging Technologies, Environment, Food, Japan, Nano Pet Products, Llc, Nanosphere, Nanotech, Nanotechnology, Technology, Nano Pet Products Llc.

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Livingston Securities LLC

Investment and Corporate Leaders to Gather in NYC on Dec. 7 for 5th Annual Livingston Nanotechnology Conference

2009 DEC 7 - (VerticalNews.com) -- Livingston Securities LLC announced that its 5th annual Livingston Nanotechnology Conference will return to New York City, being held at the Lighthouse Center on Monday, December 7th. Since 2005, the Livingston Nanotechnology Conference has been New York's largest gathering for corporations, investors, government and scientific leaders and other stakeholders who understand that fundamental advances at the nanoscale can have a great impact on industry, business and society. Details on registration and an agenda can be found at http://www.livingstonsecurities.com/livingston_conference/schedule.php.

"The Livingston Nanotechnology Conference has garnered recognition over the past four years as the pre-eminent nanotechnology conference created by investment professionals, for investment professionals," said Scott Livingston, CEO, Livingston Securities.

Keywords: Nanotechnology, Nanotech, Emerging Technologies, Nanoscale, Technology, Livingston Securities LLC.

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Fulcrum SP Materials Ltd.

Arkema Inc. and Fulcrum SP Materials Sign a Collaboration Agreement for the Development of Novel Products in the Field of Composite Materials

2010 JAN 4 - (VerticalNews.com) -- Fulcrum SP Materials announced that it has signed a collaboration agreement with Arkema Inc. concerning the development of high performance composite parts with improved damage resistance. Arkema will contribute its multiwall carbon nanotubes (CNTs) technology and Fulcrum will bring its propriety protein base interface and dispersion technology for CNTs. The objective of the project is to develop a technology allowing the grafting of CNTs on 2 dimensional or 3 dimensional woven fabrics such as Carbon fibers. Such reinforced fabrics will be used to produce advanced composite parts for applications in aeronautics or other industrial applications.

Fulcrum's technology was invented by Professor Oded Shoseyov and Professor Arie Altman both from the Robert H. Smith Faculty of Agriculture, Food & Environment at The Hebrew University of Jerusalem, and was licensed to Fulcrum for further development, by Yissum, the technology transfer arm of the Hebrew University.

Advanced composites are advanced structural materials, such as carbon fibers and Kevlar, in a matrix such as epoxy resin. Stronger and lighter than conventional materials such as steel and aluminum, they are being used in aero-space, sports, ballistics and clean-tech applications. The aspiration for higher strength to weight ratio and lightweight, fuel-saving technologies, as well as the search for environment-friendly products, creates a tremendous demand for new technologies in the market of advanced composites. The global market size of for composite materials was \$21.5 Billion and is expected to reach \$53 Billion in 2014.

For the past three years, Arkema has been involved in major development programs designed to assist companies seeking innovation by using nano-structured materials. Arkema, as a world leader in nano-structured materials, and a producer of carbon nanotubes (CNT), has established a large number of partnerships in various sectors for applications requiring enhanced performance in terms of electrical conductivity, thermal conductivity, and mechanical strength.

"Fulcrum's innovative technology of bonding carbon nanotubes directly to the fabric such as carbon fiber, is unique and if successful, could set new standards in advanced composites markets," said Moshe Kelner, President of Arkema in Israel.

"We welcome the agreement with Arkema, this cooperation will enable Fulcrum to reach a wider base of applications and customers with our ground breaking technology," said Nimrod Litvak, Fulcrum's CEO. About Arkema Inc. Arkema, a global chemical company and France's leading chemicals producer, reports sales of \$9 billion and holds leadership positions in its principal markets with internationally recognized brands. Arkema has 15,000 employees in over 40 countries and six research centers located in France, the United States and Japan. For more information, please visit www.arkema-inc.com. About Fulcrum SP Materials Ltd. Fulcrum is a nanotechnology company aiming to commercialize the use of nano-particles in the fast growing market of composite materials. Fulcrum's proprietary platform technology utilizes genetically engineered proteins to create self-assembly nano-structures with ground breaking, innovative properties. The first developed nano-structures include carbon nanotubes (CNT) bound to fabrics such as Carbon fabric and Kevlar and CNT reinforced polymers (epoxy resins). For more information, please visit www.myv.co.il/84/Fulcrum-SP-Materials.

Keywords: Aeronautics, Aerospace, Agricultural, Agriculture, Asia, Chemicals, Chemicals and Plastics, Chemistry, Emerging Technologies, Engineered, Engineering, Food, Fulcrum SP Materials Ltd., Japan, Manufacturing, Multiwalled Carbon Nanotube, Nano Structures, Nanotech, Nanotechnology, Nanotube, Other Manufacturing, Packaging, Sports, Technology, Textiles

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[Luna Innovations Incorporated](#)

Luna Strengthens its Position in Nanomedicine

2010 JAN 11 - (VerticalNews.com) -- Luna Innovations Incorporated (NASDAQ: LUNA) has acquired certain intellectual property assets of Tego Biosciences, its main competitor in developing medicines based on carbon nanomaterials. Tego Biosciences, Inc. is a wholly owned subsidiary of Arrowhead Research Corporation (NASDAQ:ARWR). This acquisition integrates the patent assets of the two leading companies and provides Luna a dominant intellectual property portfolio in carbon nanomaterial-based pharmaceuticals.

"We are pleased to add Tego's portfolio of intellectual property to enhance our exciting program in nanomedicines," stated Dr. Kent Murphy, Chairman and CEO of Luna Innovations. "The acquisition of Tego's fullerene assets for use in pharmaceuticals demonstrates Luna's continued commitment to novel therapeutics using carbon nanomaterials to treat a variety of inflammatory diseases that address significant markets such as arthritis, allergies and asthma. In addition, Luna's technology is being used to improve diagnostic imaging by developing agents targeted to reveal brain cancer and plaque on arterial walls."

With this acquisition, Luna's intellectual property portfolio for carbon nanomaterials now includes seven owned patents, 10 licensed patents and 44 U.S. and foreign applications. In addition, Luna acquired the research programs Tego has sponsored in radiation protection, anti-viral therapies and macular degeneration, the leading cause of blindness in the elderly. Luna also acquired Tego's license to The Bronx Project (TBP), a program for developing new medicines based on carbon nanomaterials for Parkinson's and other neurodegenerative diseases. As a result of this transaction, Luna and Tego will equally share in the net proceeds from activities related to the TBP license.

Luna has had an ongoing program to identify novel therapeutic candidates based on the unique properties of carbon nanospheres since 2003. These nanospheres, called buckminsterfullerenes, must be chemically modified to make them compatible with living tissues. During this work, Luna has made a number of discoveries, funded in part by government contracts and awards. Luna's business strategy for developing pharmaceutical products is to form partnerships with established companies to underwrite the expensive development programs.

Keywords: Bioscience, Biotechnology, Chemicals, Chemistry, Emerging Technologies, Fullerenes, Health, Nanomaterial, Nanomedicine, Nanosphere, Nanotech, Nanotechnology, Pharmaceutical, Technology, Luna Innovations Incorporated.

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Ontario Ministry of Economic Development and Trade

Ontario Government Gives Cleantech Company a Boost

2009 DEC 14 - (VerticalNews.com) -- Ontario, Canada is supporting the development of breakthrough technology that will help create jobs and protect the environment.

The province is supporting Toronto-based Vive Nano, an award-winning company that has developed an environmentally-friendly process for creating products and materials using nanotechnology. Ontario is investing almost \$3.8 million through the Innovation Demonstration Fund to help the company build a pilot plant, refine its processes and come to full production levels. The company expects to create 19 new high-skill jobs over the next two years, including chemists, technicians, engineers, project managers and a controller.

The province's investment supports Ontario's Innovation Agenda, the Ontario government's plan to make innovation a driving force of Ontario's economy.

"When it comes to research and innovation, Ontario means business. Some of today's most exciting scientific breakthroughs and commercial innovations are happening in the field of nanotechnology. That's why we're proud to help emerging companies like Vive Nano bring their technology to market, so that they can create jobs and seize what is already a multi-billion dollar global market opportunity," said John Milloy, Minister of Research and Innovation.

"Ontario is serious about being in the innovation game. Vive Nano has a game-changing nanomaterials process that solves major problems for our global customers including cost, quality, and complexity. I cannot think of a better fit, or a better place to grow this knowledge-based company than Ontario," said Keith Thomas, President and CEO, Vive Nano. QUICK FACTS Each year, the total global investment in nanotechnology is an estimated \$13.9 billion.

The US National Science Foundation has estimated that two million workers will be needed to support nanotechnology industries worldwide within 15 years.

Vive Nano's first product reformulates pesticides so that farmers can better protect their crops while using less chemicals, resulting in reduced emissions and less chemical run-off.

Other nanotechnology applications are expected to lead to significant advances in wastewater treatment, fuel cells, biofuels and solar cells.

Keywords: Agriculture, Alternative Energy, Chemicals, Chemistry, Conservation, Ecology, Economic Development, Economics, Emerging Technologies, Energy, Environment, Fuel Cell, Manufacturing, Nanomaterial, Nanotech, Nanotechnology, Natural Resources, Oil & Gas, Other Manufacturing, Technology, Ontario Ministry of Economic Development and Trade.

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Abakan Inc

Abakan Invests in Nanocomposite Ceramic-Metallic Coatings Technology and Completes Private Placement

2009 DEC 28 - (VerticalNews.com) -- Abakan Inc. (OTCBB: ABKI) is pleased to announce that it has entered into an investment agreement with MesoCoat, Inc., an Ohio based advanced nanocomposite ceramic-metallic (cermet) coatings company ("MesoCoat") and Powdermet, Inc., its majority shareholder.

MesoCoat is building a diversified, patented product platform that consists of environmentally friendly coating compositions and breakthrough methods of applying coatings to large surface areas. MesoCoat was formed in 2007 to develop and commercialize its line of proprietary nanocomposite coating materials, and its fusion application technologies licensed from Oak Ridge National Laboratories. Initially, MesoCoat is focusing on obtaining product certification to introduce its PComP™ nanocomposite cermet chrome replacement materials in the aerospace and oilfield service industries and MesoCoat's CermaClad™ nanostructured metallurgically-bonded claddings into the oil and gas pipeline market. In the longer term, MesoCoat will introduce CermaClad™ into broader infrastructure and heavy industrial markets. MesoCoat's products address both the needs of OEM manufacturers and facility owner-operators, as well as maintenance and repair organizations (MROs) in the infrastructure, transportation, oil and gas, construction, mining, utilities, and agricultural markets.

MesoCoat's suite of nano-enabled coating technologies offers vast performance, economic, and environmental advantages over today's market-leading cladding and coating solutions to combat wear and corrosion in the world's toughest environments. MesoCoat's patented PComp®; nanocomposite cermet materials offer the combined advantages of higher performance, and greater toughness and durability at a lower installed cost than competing and emerging alternatives, and are also substantially less toxic than other options. MesoCoat's patent pending CermaClad®; large area coatings and claddings provide metallurgically bonded coatings that can be applied at a fraction of the cost of the roll-bonded or weld clad products that they replace.

The investment agreement requires a series of investments over time the first of which has caused Abakan to acquire a non-controlling interest in MesoCoat. Additional investment amounts will increase Abakan's holdings to a controlling interest. MesoCoat has previously benefited from investment by JumpStart Ventures, a Cleveland-based non-profit venture development organization.

The first investment amount will be paid from Abakan's recently completed private placement of 4.6 million units at \$0.50 per unit. Each unit is comprised of one (1) share of common stock and one half (1/2) share purchase warrant that entitles the holder to purchase one (1) additional common share in exchange for one (1) share purchase warrant for a period of two (2) years at a purchase price of \$0.75 per share.

Keywords: Abakan Inc., Aerospace, Agricultural, Agriculture, Coatings Technology, Common Stock, Conservation, Ecology, Emerging Technologies, Energy, Environment, Finance, Investing, Investment, Manufacturing, Nanocomposite, Nanostructural, Nanostructure, Nanostructures, Nanotech, Nanotechnology, Oil & Gas, Oil And Gas, Oilfield, Oilfield Service, Other Manufacturing, Stock Market, Technology

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UMass Lowell

UMass Lowell Nanomanufacturing R&D Gains \$4 Million in Defense Bill

2010 JAN 4 - (VerticalNews.com) -- UMass Lowell will receive \$4 million for nanomanufacturing research and development under a defense appropriations bill passed by Congress Saturday and signed by President Obama Monday.

"UMass Lowell is the place to go for nanotech-based products that will work in battlefield conditions," said Chancellor Marty Meehan. "The sensors developed will be the proverbial canary in a coalmine for soldiers - determining whether an area is free of biological or chemical substances. This life-saving work could not continue without support from Sens. John Kerry and Paul Kirk and Rep. Niki Tsongas."

Also under development are mechanisms for detecting structural damage in vehicles like helicopters. Rather than replace helicopter rotors on a scheduled basis, for example, monitors detect when damage begins and replacement should occur, resulting in cost savings for the military.

"Under Chancellor Meehan's leadership, UMass Lowell is leading the nanotech revolution among educational institutions. This investment will help the university continue developing cutting-edge technologies that will keep our state at the forefront of scientific discovery," said Kerry.

"I commend UMass Lowell for its impressive leadership on multifunctional sensors," said Kirk. "Few things are more important than coming up with better ways to ensure that our brave men and women are as safe as possible. This state-of-the-art technology will help protect our soldiers on the battlefield. I couldn't be more pleased that federal funds are going to this worthwhile project."

"This funding for further development of nanotechnology sensors will help better protect our servicemen and women, while simultaneously creating new opportunities for UMass Lowell students," said Tsongas. "Chancellor Meehan should be recognized for pursuing these federal funds and helping to place the university at the forefront of this groundbreaking field."

The Army Research Laboratory in Hyattsville, Md., and Natick Labs are partners on the sensor and health monitoring research. Commercial applications are likely to emerge. Companies that could benefit include Raytheon, Textron and Triton.

Funding will also help equip the university's \$80 million Emerging Technologies and Innovation Center, which breaks ground this spring and is expected to spur about 300 new jobs over the next five years. The facility will house R&D translating the promise of nanotechnology into products.

Keywords: Contracts, Defense, Education, Emerging Technologies, Engineering, Manufacturing, Nanomanufacturing, Nanotech, Nanotechnology, Other Education, Other Manufacturing, Public Policy and Government, Research, Science, State and Local, Technology, UMass Lowell, University, White House and Federal Government.

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MEMSIC Inc

MEMSIC to Present at the 12th Annual Needham Growth Conference

2010 JAN 18 - (VerticalNews.com) -- MEMSIC, Inc. (NasdaqGM: MEMS), a leading MEMS solution provider announced that its President and CEO, Dr. Yang Zhao, will present at the 12th Annual Needham Growth Conference in New York.

The MEMSIC presentation is scheduled for Wednesday, January 13th, at 10:00 a.m. Eastern Time. A live webcast, as well as the replay, will be available at the company's Investor Relations web page at <http://investor.memsic.com/events.cfm>. About MEMSIC, Inc. MEMSIC Inc., headquartered in Andover, Massachusetts, provides advanced semiconductor sensor and system solutions based on integrated micro-electromechanical systems (MEMS) technology and mixed signal circuit design. MEMSIC's unique and proprietary approach combines leading edge sensor technologies, such as magnetic sensors and accelerometers, with mixed signal processing circuitry to produce reliable, high quality, cost effective solutions for automotive, consumer and industrial markets. The company shares are listed on the NASDAQ Stock Exchange (NASDAQ GM: MEMS).

Keywords: Automobiles, Consumer Electronics, Electronics, Emerging Technologies, Hardware, MEMSIC, Manufacturing, Microelectromechanical Systems, Nanotech, Nanotechnology, Other Manufacturing, Other Technology, Semiconductor, Signal Processing, Technology, Transportation, MEMSIC Inc.

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MagForce Nanotechnologies AG

MagForce Nanotechnologies AG Applies for European Regulatory Approval of Its Nano-Cancer(R) Therapy

2009 DEC 14 - (VerticalNews.com) -- MagForce Nanotechnologies AG has submitted the product file for NanoTherm® to Medcert GmbH, the medical certification and testing company which serves as Notified Body for the certification of medical products. With this step, MagForce has now commenced the conformity assessment procedure for its Nano-Cancer® therapy. Following successful completion of this conformity assessment procedure and EC type testing of the magnetic field applicator, MagForce will be able to apply the CE European conformity marking and to market its Nano-Cancer® therapy throughout the European Union.

In early November, the results of a pivotal clinical trial were published demonstrating the efficacy of the new therapy in patients with recurrent glioblastoma, and it is upon these results that the application for European regulatory approval is based. The primary study objective, which was to extend the median survival time following tumor recurrence by three months compared to a historical control group, was significantly exceeded in the actual results. Following treatment with Nano-Cancer® and accompanying radiotherapy, the median survival time following diagnosis of the first tumor recurrence was 13.4 months. Compared to the 6.2-month median survival time following recurrence observed in a recently published EORTC study, the patient survival time was shown to be statistically highly significant longer (p-value < 0.01).

Keywords: Biotechnology, Electronics, Emerging Technologies, Health, Magnetic Field, Medical Devices, Nanotech, Nanotechnology, Oncology, Other Technology, Radiology, Technology, MagForce Nanotechnologies AG.

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Spectrum Blue Steel

Spectrum Blue Steel partners with Famous Chemists for Procuring Profitable Applications from Garbage Using the Biosphere MKV and Electrostatic Precipitators

2009 DEC 14 - (VerticalNews.com) -- Spectrum Blue Steel is emerging as one of the fastest growing green energy companies on the planet. Through the efforts of True Green Energy Group and True Green Planet's President and Recycling Specialist Leroy Johnston, who has been in the recycling business for over 25 years, stated that Spectrum Blue Steel is light years ahead of everyone and is setting the stage for spectacular earnings because of the bi products recovered by using the Biosphere MKV.

In a meeting today, Ronald Flynn, Founder of Spectrum, announced that Dr. Ralph A. Gardner-Chavis became a partner with Spectrum Blue Steel Corporation of the Philippines. Dr. Gardner-Chavis' Biography started in 1943 where he earned a Bachelor's Degree in Chemistry from the University of Illinois. In that same year, he was employed at the Manhattan (Atomic Bomb) Project and finished a course in Quantum Theory by Enrico Fermi, Nobel Laureate. Dr. Gardner also worked with Glenn T. Seaborg's Group, later Nobel Laureate, on development of process used at Hanford Washington to concentrate Plutonium from the first Atomic Pile. In 1949 he was employed at Standard Oil Corporation working in the research laboratory. In 1952 he was awarded his Masters Degree and in 1954 was finally awarded his Ph.D. degree in chemistry from Western Reserve University and was employed as a Professor of chemistry for Cleveland State University.

Ronald Flynn also went on to say, "That the profitable applications using the Biosphere MKV bi products are incredible and we will be opening our laboratories sometime in 2010. At approximately 10:30 Philippines time we received the studies from Dr. Gardner and Mark Murad's testing of carbon black and Zeolite, including fly ash. The swot up that they conducted was fascinating.

Both Dr. Gardner and Mark Murad conducted the study and are both partners of Spectrum Blue Steel. Mark, who holds a Master's of Science in mechanical engineering, as well as a Bachelor of Science in chemical engineering, said in tonight's briefing that the result of the testing and the study is a mind-boggling gold mine of money. Mark Murad said, "because of the MRF system, and the Biosphere MKV, Spectrum Blue Steel will produce a Production rate of 7.5 million metric tons of carbon black per year that they can turn into Buckminster Fullerene molecules which are needed for flat screen televisions from Sony, RCA, Magnavox, etc. The price for the Buckminster Fullerene is \$900 Per Gram.

Moreover he continued by saying, "the most money will be made when SBS opens its new building and cages the metal atoms inside of the Buckyball, which is my specialty." Mark said with the new offices and laboratory, Spectrum Blue Steel can cage the atoms inside the Buckyball and can sell it for Upwards of \$4.4 Million Dollars per gram. Buckyball is used and needed for MRI imaging contrast agents which are made from the carbon black.

In conclusion, Mark said the fly ash from the Electrostatic precipitators of the biomass Power Plants may be sold for a profit of approximately \$1200 dollars per metric ton where companies like Goodyear, BF Goodrich, and Firestone are fetching \$1650 to 1,750 per metric ton - not to mention selling the Zeolite at a huge profit to the oil refinery catalysis industry who produce ZSM-5 and sell it in a range from \$35,274 TO \$110,231 per metric ton.

Spectrum Blue Steel is now transmitting plans for the custom made Van Der graph generator that will produce nanotubes, Buckyball ovens that will produce carbon Nano capsules.

In January, Spectrum is scheduled to move into its new building and will be purchasing certain types of equipment and expanding the facilities in order to maximize the profits for spectrum blue steel's partners. The items will include a Liquid Chromatography separator, High power Lasers, Electron Microscopes, Clean room facilities, and Packaging for hazardous material.

Spectrum Blue Steel's strategy is to "de-carbonize" the electric power generation industry by shifting to non-fossil fuel based energy sources, specifically energy-from-waste. This follows the Energy Policy Act of 2005 which confirmed energy-from-waste is renewable, and the Philippine Renewable Energy Law (RA 9513) of the Philippines.

Spectrum is a domestic corporation duly registered under the laws of the Philippines and holds a license to the Biosphere Technology from Global Environmental Energy Corporation (BULLETIN BOARD: GEECF) . Global is a fully integrated energy company whose interests include electrical power generation, oil and gas exploration and production, clean coal and waste management technologies.

This press release contains forward-looking information within the meaning of Section 27A of the Securities Act of the 1933 and Section 21E of the Securities Exchange Act of 1934, and is subject to the safe harbor created by those sections.

Keywords: Asia, Buckminster Fullerenes, Buckyballs, Chemical Engineering, Chemicals, Chemistry, Clean Coal, Conservation, Ecology, Electric Power, Electrical Power, Electronics, Electrostatic, Emerging Technologies, Energy, Energy Companies, Energy Company, Energy Policy, Engineering, Environment, Finance, Fossil Fuel, Fullerenes, Global Environmental Energy, Green Energy, Investing, Investment, Mechanical Engineering, Nanotech, Nanotechnology, Nanotube, Oil & Gas, Oil And Gas, Oil Refinery, Philippines, Physics, Power Plant, Quantum Physics, Quantum Theory, Renewable Energy, Securities Exchange Act Of 1934, Spectrum Blue Steel, Technology, Television.

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Nanophase Technologies Corporation

Nanophase Announces New Vice President of Operations

2009 DEC 28 - (VerticalNews.com) -- Nanophase Technologies Corporation (NASDAQ:NANX), a technology leader in the development of advanced nanoengineered products, announced the appointment of Glenn Judd to vice president of operations.

In his previous role as assistant vice president of operations and engineering, Judd was instrumental in implementing key operational changes as the company shifted its business strategy to adopt more of a direct sales focus. Judd kept the team positively focused as the operations group went through a major restructuring in the first quarter of this year, which streamlined activities and eliminated redundant job positions. Utilizing resources more effectively and efficiently, he skillfully transitioned the group into a leaner operating unit. Judd joined Nanophase in 2000 after spending eight years with Eastman Kodak.

"Glenn has earned this promotion, and we are pleased we were able to fill the position from within the company," said Nanophase president and chief executive officer Jess Jankowski. "Glenn's leadership and innovative approach have been instrumental in strengthening our gross margins during 2009, with positive expectations heading into 2010. This represents another example of how our new management team, working as a cohesive unit, is positioning our company for sustainable growth in 2010."

Keywords: Emerging Technologies, Engineering, Minerals, Mining, Nanoengineering, Nanophase, Nanophase Technologies, Nanophase Technologies Corp, Nanophase Technologies Corporation, Nanotech, Nanotechnology, Technology.

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Acamp**Alberta companies delivering new products to the health & medical marketplace**

2009 DEC 21 - (VerticalNews.com) -- Today ACAMP hosted a health & medical seminar, explaining how technologies like nanotechnology, biomaterials and microfluidics can play a powerful role in the creation of innovative healthcare products that help promote health and improve the quality, cost and outcomes of patient care, while opening new markets for Alberta companies worldwide.

"Nanotechnology is a platform for innovation in health, and many other industries, and ACAMP offers both technical and business services to move those innovations into the marketplace," said Doug Horner, Minister of Alberta Advanced Education and Technology. "Our government helped to build an accomplished biomedical research community in Alberta, and our renewed innovation system will lead to more biomedical breakthroughs, like Acticoat's silver treated bandages."

"Alberta is well known for innovative conventional energy applications, similarly, substantial investments in the development of health and medical applications have made the province a world leader in a host of medical applications," said Ken Brizel, CEO of ACAMP. "Innovative new products and services for improving the quality of health care within the region and worldwide will expand Alberta's economy."

In addition to health and medical technology solutions, the seminar features discussions by venture capitalists on moving ideas from the laboratory to the marketplace and the various ways to secure investment for entrepreneurs and start-up companies. Future ACAMP seminars will cover MNT (Micro Nano Technologies) for the conventional energy, agriculture & forestry industries and clean technologies. For complete information on the programs go to www.acamp.ca for details.

ACAMP is a not for profit organization that provides specialized technical and business services. ACAMP clients have access to world-class equipment, facilities, expertise and a network of organizations to support the development and manufacturing of micro and nanotechnology based systems and advanced materials for applications worldwide. ACAMP's funding comes from Alberta Advanced Education & Technology, Western Economic Diversification Canada and Industry. Funding for the ACAMP seminar series is provided by the National Research Council's Industrial Research Assistance Program.

Keywords: Agricultural, Agriculture, Emerging Technologies, Energy, Energy Application, Finance, Investing, Investment, Medical Technology, Nanotech, Nanotechnology, Oil & Gas, Technology, Venture Capital, Acamp.

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Business News**BNC Collaborator Wins Prestigious IOP Award**

2009 DEC 21 - (VerticalNews.com) -- Bio Nano Consulting (BNC), the specialist bio-nanotechnology product development consultancy, is delighted to announce that one of their key collaborators has been specifically recognised for her scientific contributions to the field of nanomechanics. The Institute of Physics (IOP) awarded Dr. Rachel McKendry the prestigious Paterson medal and prize in recognition of her international contributions, and in particular for her work developing label-free nanomechanical cantilever sensors.

Dr. McKendry's work with cantilevers has significantly aided the understanding of the origins of surface stress at biomolecular interfaces. The cantilever system works by detecting interactions between ligands attached to one side of the cantilever and receptor molecules via changes in surface stress which cause the cantilever to bend. Being 500 μm long, 100 μm wide and only 900 nm thick, the cantilever has remarkable sensitivity, which enables it to detect very tiny changes in forces at the surface of the cantilever. Dr. McKendry's expertise in this field has enabled BNC to the commercially develop drug-screening technologies to speed up the discovery of new antibiotics.

The Paterson award is given for distinguished research in applied physics and is generally awarded to physicists in the early part of their careers as a mark of recognition. Dr. McKendry commented, "This area of research quantitatively measures molecular recognition forces which are fundamental to virtually every process in the living cell. To have had my contribution to this recognised is a great honour. I am thrilled to have received this award."

Keywords: Applied Physics, Emerging Technologies, Molecular Recognition, Nanomechanical, Nanotech, Nanotechnology, Physics, Business News.

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National Cheng Kung University

Five Outstanding NCKU Alumni Honored With 2009 NCKU Outstanding Alumni Award

2009 DEC 7 - (VerticalNews.com) -- National Cheng Kung University (NCKU) presented its "2009 NCKU Outstanding Alumni Award" to five distinguished alumni in recognition of their remarkable professional achievements and contributions to their alma mater and the community. The award convocation was held at 10am, Nov. 11th, at the Conference Room in the Library of National Cheng Kung University (NCKU), Taiwan. Prof. Yia-Chung Chang, Mr. Hsien-Yung Pai, Academician Shung-Wu Lee, Prof. Wen-Long Chen, and Dr. Yuh-San Liu received the "2009 NCKU Outstanding Alumni Award".

In the ceremony, Academician Michael M.C. Lai, President of NCKU, commented that it is honorable to confer "Outstanding Alumni Award" to these five outstanding alumni, who have remarkable achievements in their specialties as well as become model for younger alumni and students. "I often say that students are the muscle and the blood, faculty, the bones, and alumni the soul of a university. NCKU alumni have brought honor and reputation to NCKU. NCKU graduates possess excellent competence to ensure career success in Taiwan and around the world. Moreover, alumni contribute to the university in various ways. Firstly, by financial donation. NCKU values their annual giving, even if it is a small amount. Regular giving means consistent caring from alumni. Secondly, I often found that many alumni have great life experiences to mentor the students. They inspire students more than academic learning, and they are alternative role models for the students to learn from. Thirdly, many of our alumni are retired or are about to retire, since they are senior professionals who have expertise in their respect fields either in the academia, industry, or business, I invite you to come back to NCKU to interact with the younger generation. Your wisdom and experiences will broad our students' horizon," said President Lai.

"It is an exceptional honor for me to receive the award today. I especially want to dedicate this honor to all my teachers who gave me enormous encouragement and guidance during my college days. I will contribute as much as I can to NCKU. I wish every one of you success in whatever you do and even greater success with NCKU," said Prof. Chang

"In NCKU, the most influential teacher for me is my calculus instructor, Prof. Kuo, who was 50 years old then. Prof. Kuo worked very hard and had high standards for students. I believe many teachers in NCKU today are like Prof. Kuo, so that they can educate excellent students. Actually, there is no Andy Lee without Prof. Kuo. I will give this honor to all the hard-working teachers in NCKU," said Prof. Lee.

"Innovation and divergence are the two key points of industry development in the world. I am proud to have graduated from Department of Industrial Design and be brainstormed and inspired with many innovative ideas. Honestly, I am humbled by accepting this award because there are many other outstanding ones. I really appreciate receiving this award from President Lai. I know NCKU has put much attention on industrial design. I have already accepted many honors in recent years, but the NCKU Outstanding Alumni Award means the most for me," Prof. Chen.

"I really appreciate NCKU, especially for my professors. I have hold on to two principles during the past 40 years while serving in the Executive Yuan. Firstly, to rule by the law. We need practice the measures by law to formulate the most suitable rules to our people. Secondly, professionalism. There are diversified organizations with different functions under the Executive Yuan. Among them, I think urban planning and transportation is very important. Many NCKU alumni are really enthusiastic, helpful and outstanding. I am grateful to all my colleagues, teachers and classmates in NCKU because they are always willing to give me advice. This award is the best honor in my life," said Dr. Liu. About Prof. Yia-Chung Chang Prof. Chang received his BS from NCKU in 1974. His got his MS and PhD from Caltech (California Institute of Technology), U.S.A. He has been appointed as Distinguished Research Fellow and Director of Research Center for Applied Sciences, Academia Sinica, Taiwan and Professor of University of Illinois at Urbana-Champaign, U.S.A.

He worked out on many fields including shallow impurities and excitons, electronic, optical, and transport properties of semiconductors and nanostructures, electronic and optical properties of semiconductor surfaces and interfaces, phonons and electron-phonon couplings in semiconductors and nanostructures, non-linear optical properties, many-body effects in semiconductors, exciton condensation, magnetic multilayers and giant magnetoresistance (GMR), femtosecond pump-and-probe phenomena, photonic crystals, metrology of semiconductor thin films and gratings, infrared and radiation detectors, semiconductor lasers and modulators, resonant tunneling diodes, quantum transport properties, single-photon generators, spintronics, quantum computing, optical metrology, and nano plasmonics. About Mr. Hsien-Yung (Kenneth) Pai Mr. Pai, born in Guilin, China, 1937, studied in Department of Hydraulic and Ocean Engineering, NCKU, for one year. After that, he transferred to NTU and received his B.A. in 1961. After that, he got his M.F.A. from the International Writers' Workshop at the University of Iowa in 1965. From 1965 to 1993 he taught Chinese language and literature in the East Asian Studies Program at University of California, Santa Barbara (UCSB). In addition, he is the Professor Emeritus of UCSB and an internationally recognized Chinese author.

Mr. Pai has authored 34 short stories and many touching novels which have been translated in many languages. He is one of the founders and the main caretaker of the most influential modern Chinese literary magazine, *Modern Literature*. His works have been translated into English, French, Korean, Japanese, and German and other languages. His depiction of characters, according to many critics, has attained a level of literary achievement attained only by a handful of his contemporaries. Some of his best-known publications are available in English, under the title "Wandering in the Garden", "Waking from a Dream: Tales of Taipei Characters", published by Indiana University Press in 1982.

In addition, Mr. Pai is a careful writer. His language, enriched by a solid foundation in Chinese classic literature, is poetic and precise. Few people, however, realize how much time and effort he puts into crafting his works. The novel *Crystal Boy*, published by the Gay Sunshine Press of San Francisco in 1990, was resulted from ten years of hard work. It was completely revised more than five times. *Crystal Boy* and *Wandering in the Garden*, as well as several other works, have been made into movies and plays and a number of his other works are in the process of being adapted for stage and film productions. Moreover, recently he concentrated on the promotion of *Kunqu*, a traditional form of Chinese opera. One of the most well-known works revised by him is the *Peony Pavilion*. About Academician Shung-Wu (Andy) Lee Prof. Lee received his BS from NCKU Department of Electrical Engineering in 1961, and MS as well as PhD Department of Electrical Engineering of University of Illinois, at Urbana-Champaign (UIUC) in 1964 and 1966, respectively. He assumed the duties as an associate professor in UIUC Electrical Engineering Department, a visiting professor at Technische Universiteit Eindhoven (TUE), Netherland, and the University of London, U.K, a professor in UIUC department of Electrical & Computer Engineering, and co-Founder from Demaco, Inc., Champaign, Illinois, later acquired by Science Applications International Corporation (SAIC).

In 1971, Prof. Lee published a paper on the microwave transmission through a periodic dielectric-loaded screen. That was one of the pioneer researches of a useful microwave device, known today as "Frequency Selective Surface (FSS)". From 1978, and for the next ten years, Prof. Lee continued his research on FSS for the famed Skunk Works of the Lockheed Corporation in California. He invented a FSS made of concentric rings, which had an unusual capability in controlling the microwave transmission over a wide frequency band. Without security clearance, Prof. Lee did not know what Lockheed did with his invention. Only many years later, did Prof. Lee become aware that his FSS was used to construct of the F-22 airplane. Such a nose cone was revolutionary at the time, and critical to the radar evading capability of the F-22.

In 1985, Prof. Lee received a "Million Dollar Award" from Lockheed for his FSS "innovation that saved Lockheed more than one million dollars". In 2000, Prof. Lee was elected to the American National Academy of Engineering, because of his contribution to the stealth aircraft technology, "Shooting and bouncing rays," and computer code XPATCH, a very important topic in electromagnetic research is the computation of radar signature of complex targets such as airplanes, tanks, ships, and buildings. By the 1980's, basic theories for such a computation were understood but no good method existed for turning those theories into practical computational tools. Up to that point, radar signature could only be calculated for simple shapes such as spheres and cylinders, not for airplanes and tanks.

That changed in 1988, when Prof. Lee and his two graduate students at the University of Illinois developed a theory called "Shooting and Bouncing Rays (SBR)". The success of SBR relies on the following elements: (i) electromagnetic scattering theories, (ii) ray tracing algorithm in the computer graphics, and (iii) CAD software typically developed by mechanical engineers. SBR combines these three elements and turned the computation of radar signature of realistic targets into a reality.

Keywords: Asia, Asian, China, Taiwan, Computers, Education, Electronics, Electrical Engineering, Electromagnet, Electromagnetic, Microwaves, Photons, Semiconductor, Engineering, Entertainment, Movies, Investment, Finance, Financial, Investing, Mathematics, Calculus, Nanotechnology, Nanotech, Emerging Technologies, Nanostructural, Nanostructures, Nanostructure, Ocean Engineering, Physics, Magnetoresistance, Software, Computational, Technology, University, Urban Planning, Ecology, Conservation, Environment, National Cheng Kung University.

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NSTI

Deadline Approaching for Largest Commercialization Event for Nanotech & Clean Technologies

2009 DEC 14 - (VerticalNews.com) -- TechConnect World, an event bringing together the leaders in technology development and product integration in cleantech, nanotech, biotech and MEMS, announced the December 11th deadline for technology abstracts and business presentations.

Now in its 14th year, TechConnect World, in association with the Nano Science and Technology Institute (NSTI), and the Clean Technology and Sustainable Industries Organization (CTSI), will bring together over 5,000 attendees from industry, research and government June 21-25 at the Anaheim Convention Center in Anaheim, California.

Focused on commercialization, the conference and expo is attended and sponsored by top organizations looking for the latest innovations, best practices, market updates and most promising research trends. Sponsors include: Accenture, Applied Materials, Austin Energy, Belgian Trade Commission, AC-Net/City of Anaheim, Lockheed Martin, National Grid, SDG&E, and the US Department of Energy.

Speakers include participants from most every major technical university, corporate and government lab globally. Additionally meet with our growing list of corporate representatives and exhibitors from BASF, Merck, Dow, Sanyo, Samsung, P&G, Panasonic, Kodak, Honda, GlaxoSmithKline, Omron, bp, Medtronic, Toray, NETZSCH, EnerNOC, Hielscher USA, PANalytical, and many other global firms.

Keywords: Austin Energy, Department Of Energy, Economics, Emerging Technologies, Energy, Lockheed Martin, NSTI, Nanotech, Nanotechnology, National Grid, Oil & Gas, Science And Technology, Technology, Trade Commission.

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DCBureau.org

DCBureau.org Releases Investigation into the Natural Gas Drilling Rush in the Marcellus Shale

2009 DEC 28 - (VerticalNews.com) -- DCBureau.org's investigation into the natural gas drilling rush in the Marcellus Shale reveals for the first time that M-I SWACO, the largest drilling fluids company in the world, is licensing new and controversial nanotechnology for potential use by its drilling clients operating in the Marcellus Shale.

M-I SWACO is working with University of Texas and Rice University to explore the potential application of nanoparticles in its products used in the Marcellus Shale. These nanotechnologies have been tested only in lab conditions and have not been thoroughly vetted and tested in natural gas wells.

The New York Department of Environmental Conservation (DEC) does not yet know all the compounds to be pumped under New York to force gas to the surface. The DEC currently has 17 inspectors in its Division of Mineral Resources who have a wide range of duties beyond monitoring drilling company compliance with state laws. If the 17 inspectors did nothing else, each inspector would have to inspect more than one of the 13,687 existing gas and oil wells every day.

With thousands more drilling permits waiting for the moratorium to be lifted and so few inspectors, the financially pressed New York State finds itself asking very well financed drilling companies to reveal details about compounds to be injected into wells, some of which the companies that supply these products argue are trade secrets. In addition, Congress in 2005 exempted chemicals used in hydraulic fracturing from the Safe Drinking Water Act.

Yancey Roy, the DEC spokesman, told DCBureau.org that they still do not have the breakdown of at least 40 compounds proposed for use by drilling companies in the Marcellus Shale. Roy said the DEC would "demand the information before a permit can be fully evaluated..." But environmentalists are concerned about the DEC's ability to monitor what chemicals are being injected into some of New York's most pristine watershed areas.

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Keywords: Chemicals, Chemistry, Conservation, Ecology, Emerging Technologies, Energy, Environment, Environmental Conservation, Finance, Financial, Gas And Oil, Investing, Investment, Mining and Minerals, Nanoparticle, Nanotech, Nanotechnology, Natural Gas, Natural Resources, Oil & Gas, Oil Well, Oil and Gas, Other Policy Issues, Public Policy, Public Policy and Government, State and Local, DCBureau.org.

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ADA-ES Inc

ADA Carbon Solutions' Subsidiary, Red River Environmental Products, Receives DOE Loan Guarantee

2009 DEC 28 - (VerticalNews.com) -- ADA Carbon Solutions, LLC ("ACS"), the joint venture owned by ADA-ES, Inc. (NASDAQ: ADES) and Energy Capital Partners ("ECP"), announced that the U.S. Department of Energy ("DOE") has offered a loan guarantee to ACS's wholly-owned subsidiary, Red River Environmental Products ("RREP"), under Title XVII of the Energy Policy Act of 2005. Proceeds from the \$245 million loan will be used to finance the construction of RREP's Activated Carbon ("AC") production facility in Coushatta, LA. The RREP facility, which is expected to be the largest and most efficient AC plant in the United States, will sell AC to electricity producers seeking to significantly reduce their mercury emissions from coal-fired power plants.

Michael Durham, President and CEO of ADA-ES, stated, "We are pleased that the Department of Energy, under the leadership of Energy Secretary Stephen Chu, recognizes the value of the Red River project in meeting President Obama's and Congress' goals of energy independence, job creation and a cleaner environment. This important step in the financing of our AC plant will enable the U.S. to utilize its abundant coal resources in a much cleaner way by reducing the emissions of mercury. It will also provide much needed jobs to this region of the country."

RREP will help meet the rapidly growing demand for AC from power plants in 19 states and 4 Canadian provinces which must satisfy existing mercury mitigation regulations by 2010 and thereafter. The plant will have an annual capacity of 150 million pounds of AC, sufficient to capture mercury from up to 40,000 megawatts of coal-fired power generation. The plant will also use advanced pollution control equipment and the conversion of waste heat into electricity to minimize emissions, making it one of the cleanest AC facilities in the world.

Keywords: ADA-ES Inc., Carbon Solutions, Chemicals and Plastics, Coal, Commercial Building and Real Estate, Congressional News and Views, Conservation, Construction and Property, Department Of Energy, Ecology, Emerging Technologies, Energy, Energy Policy, Environment, Environmental Product, Finance, Manufacturing, Nanotech, Nanotechnology, Oil & Gas, Oil and Gas, Other Construction and Property, Other Energy, Other Government, Other Policy Issues, Power Plant, Professional Services, Public Policy and Government, Utilities, White House and Federal Government

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Oerlikon Systems

Oerlikon Systems and Meyer Burger Enter Strategic Cooperation

2009 DEC 14 - (VerticalNews.com) -- Oerlikon Systems and Meyer Burger signed a strategic distribution and cooperation agreement for the SOLARIS thin-film coating equipment. As part of the agreement, Meyer Burger's sales & service organization will represent the SOLARIS for crystalline Silicon PV application in most regions, such as China , Taiwan , Europe, Middle East , India & the Americas . Furthermore, the two high tech companies will work together to further develop anti-reflective coatings and other innovative process steps within the manufacturing process of crystalline solar cells "Meyer Burger's focus, strength and experience in the crystalline silicon PV market will enable us to reach out to cell manufacturers faster & more efficiently. Furthermore, we see significant synergies by leveraging Meyer Burger's capabilities in automation, wafer & cell measurement tools and - last but not least - with Meyer Burger's expertise in wafer surface design." says Andreas Dill, Head of Oerlikon Systems.

"We are very happy to have Oerlikon Systems - a true leader in thin film technology - as our partner. This agreement is in line with our growth strategy to expand our successful model of providing core technologies in photovoltaics - to the benefit of our customers by further reducing cost of ownership while increasing conversion efficiencies and plant output" adds Peter Pauli, CEO of Meyer Burger.

The SOLARIS system is a high speed single wafer sputter system, similar in design to other high performance manufacturing systems from Oerlikon for optical discs and Semiconductors. The system is very flexible in its possible configurations, such as for anti-reflective coatings and back-side passivation & metallization for crystalline solar cells. It excels in its productivity, process quality & stability, lowest energy consumption and space requirements. The recent live demo of the system at the EU PVSEC in Hamburg generated a lot of interest & excitement.

The SOLARIS system is based on advanced nanotechnology. In solar cell or photovoltaic production with SOLARIS, very thin layers of silicon nitride are applied on the front of the cells. However, the flexibility of SOLARIS also allows coating of the backside with various materials. Each wafer is handled and coated separately. With six coating chambers, a special carrier transport mechanism and a wide range of potential layer material, SOLARIS is not only highly flexible but at the same time enjoys unmatched productivity. The machine is able to treat standard wafer formats from 125mm² to 156mm², with an average amounting up to 1,200 wafers per hour. Changing substrate formats, layer materials or processes requires minimum time. A new system at a customer site can be installed and ramped up in less than one week.

"With SOLARIS, we for the first time apply advanced nanotechnology in the production of crystalline solar cells", explains Andreas Dill, Head of Oerlikon Systems - "with enormous advantages for solar cell manufacturing. Firstly, with a size of 2.0 x 3.3 meters, SOLARIS requires 80 % less floor space than competitive solutions. Secondly, the fully automated solution requires minimal maintenance. Thirdly, SOLARIS needs significantly less power (minus 50 percent). Last, but not least, lower maintenance requirements result in a significantly higher uptime.

The benefits of SOLARIS are quite obvious. It's a revolutionary concept for solar cell manufacturing - the first of many 'clean technologies' possible with this new system", says Dill.

The Oerlikon development teams have further, specific applications in mind: Touch panels: These devices are being integrated in a wide range of applications from smart phones to PCs and refrigerators. SOLARIS applies a key conductive layer and anti-reflective coatings on the touch screen panels. Thermoelectrics: These "green energy" devices generate electricity when heated. The thin film layers applied by SOLARIS are efficient at conducting electricity, but not heat, which keeps the device running. Energy storage: Actually a family of applications that includes highly efficient (smaller and lighter) thin film batteries and advanced super capacitors for energy storage; SOLARIS provides thin film processes for all of these.

For further information see www.oerlikon.com/systems/solaris About Oerlikon - Enabling High Technology Oerlikon (SIX: OERL) is one of the world's leading international high-tech industrial groups specializing in machine and plant engineering. The company is a leader in the field of industrial solutions and innovative technologies for textile manufacture, thin-film solar and thin-film coating, drive, precision and vacuum systems. With roots in Switzerland and a long tradition stretching back 100 years, Oerlikon is a global player with a workforce of more than 16000 at 158 locations in 37 different countries. The company's sales amounted to CHF 4.8 billion in 2008 and it ranks either first or second in the respective global markets. About Meyer Burger Technology Ltd www.meyerburger.ch Meyer Burger Technology Ltd is a leading and globally active technology group for innovative systems and processes for cutting and handling crystalline and other high-grade materials. The machines, competences and technologies of the different companies in the group are used in the solar industry (photovoltaics), semi-conductor and optical industry. The thinnest wafers made from silicon, sapphire or other crystals are required in these three markets to manufacture solar modules, switching circuits or high-performance LEDs. The group's core competences are made up of a whole range of production processes, machines and systems that are used within the value chain in the manufacture of high quality wafers. The comprehensive range of products is complemented by a worldwide service network with wear and tear parts, consumables, re-grooving service, process know-how, servicing, after-sales service, training and other services. As a globally active company, the group is represented in Europe, Asia and North America in the respective key markets. Meyer Burger has its headquarters and the production facility of Meyer Burger Ltd in Switzerland. The group companies, Meyer Burger Automation GmbH, Hennecke Systems GmbH and AMB Apparate + Maschinenbau GmbH, have their headquarters and production facilities in Germany. The recently acquired Group Member Diamond Technologies Inc., has its headquarters in Colorado Springs, CO, USA. The group also has subsidiaries and own service centres in Germany, Norway, China and Japan, which all are represented by its own staff on-site. In Taiwan and the USA, Meyer Burger works with independent sales and service partners that are part of Meyer Burger's global service network. In other important countries the company relies on selected independent agents. Meyer Burger achieved net sales of CHF 213.4 million in the first half of 2009 and employed 635 staff worldwide as of 30 June 2009. Photos/Multimedia Gallery Available:
<http://www.businesswire.com/cgi-bin/mmg.cgi?eid=6112408&lang=en>

Keywords: Alternative Energy, Asia, Capacitor, China, Electronics, Emerging Technologies, Energy, Engineering, Green Energy, India, Japan, Manufacturing, Nanotech, Nanotechnology, Oerlikon Systems, Oil & Gas, Other Energy, Other Manufacturing, Other Technology, Photovoltaic, Photovoltaics, Semiconductor, Solar Cell, Taiwan, Technology.

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MEMS

MEMS Industry Group Ends Year on High Note

2009 DEC 28 - (VerticalNews.com) -- The MEMS industry ends 2009 as one of the bright lights in the electronics industry. According to MEMS Industry Group, the trade association representing the MEMS and microstructures industries, OEMs are increasingly using tiny microelectromechanical systems, or MEMS, to make mobile handsets and other portable devices more 'touch-aware,' video games more motion-sensitive, and automobiles both safer and more energy-efficient. What's more, MEMS is gaining ground in bio/medical systems and is emergent in greentech/cleantech technologies, positioning the industry for a rosier 2010.

"We have every reason to be optimistic," commented Karen Lightman, managing director of MEMS Industry Group. "Our industry fared better than many in 2009, even seeing positive growth in markets such as consumer electronics and smartphones. And rather than reduce activity this year, we actually increased our programs and events considerably." MIG's 2009 highlights include: Hosting the first MEMS Industry Panel at Globalpress Electronics Summit, an annual event attended by over 80 international media. METRIC, MIG's annual members-only technical meeting, focused on key short- and long-term growth opportunities for MEMS in a changing economy.

A full slate of activities at SEMICON West: co-sponsoring the premiere of MEMS: Making Micro Machines, a new Silicon Run documentary on MEMS design, fabrication, testing and packaging; offering a MEMS Education Series; short course on MEMS business and management; hosting MIG's annual cocktail party reception for members.

Delivering a keynote address on the state of the U.S. MEMS market to an international audience at Exhibition Micromachines/MEMS 2009 in Tokyo, the world's largest exhibition on MEMS and nanotechnologies.

Launching several new programs benefiting members: MEMS Marketplace, a publicly available online 'matchmaking' portal for MEMS suppliers and business partners; MEMS Best Known Practices white paper series; MEMSblog; MEMS Glossary; and a MIG presence on several popular social media sites: Facebook, Twitter and LinkedIn.

Setting an attendance record at MEMS Executive Congress, the only annual conference specifically dedicated to the exchange of ideas and information among companies both making, and using, MEMS. Held November 4-6 in Sonoma, CA.

Addition of new members: AEPI Grenoble-Isere France Economic Development Agency; Applied Materials; Applied Microstructures; ARRI; Boschman Technologies B.V.; Brewer Science; ChemGroup LLC; DALSA Semiconductor; DHarris Group; Fab Owners Association; Fraunhofer IPMS; Gavin Ho Consulting; IMEC; Intellisense Software; InvenSense; LETI; MEMSCAP; MicroGen Systems; Proteus Biomedical and Semiconductor Support Services. MIG's 2010 featured activities to include: Managing Director Karen Lightman as featured speaker at several upcoming conferences: MicroNanoTec/HANNOVER MESSE 2010's Innovations for Industry Forum, April 19-23, as a guest of IVAM; and

Exhibition Micromachine/MEMS 2010 in Tokyo, July 28-30, as a guest of Micromachine Center Japan. METRIC 2010 annual meeting, Optimizing MEMS Fabrication, in San Jose, CA, May 18-19-for the first time strategically co-located with MEPTEC's MEMS Symposium.

Co-hosting the panel, MEMS is HOT-How MEMS is Fueling Growth in the Post-recession Economy, at the Globalpress Electronics Summit 2010 in Santa Cruz, CA, April 27.

Expansion of MEMS Education Series™: Spotlight on BioMEMS and NanoMedicine-a one-day executive workshop for MIG members at the Department of NanoMedicine and Biomedical Engineering (nBME) in Houston on March 18; and MEMS Reliability short course-offered on the eve of SEMICON West, July 12, 2009.

Members-only annual cocktail party at SEMICON West, July 14 MEMS Executive Congress-Scottsdale, AZ, November 3-4. About MEMS Industry Group MEMS Industry Group is the trade association representing the MEMS and microstructures industries. The Association enables the exchange of non-proprietary information among members; provides reliable industry data that furthers the development of technology; and works toward the greater commercialization of MEMS and MEMS-enabled devices. Nearly 80 companies comprise MIG, including Analog Devices, Applied Microstructures, Bosch, Freescale, GE, Honeywell, Intel, InvenSense, OMRON, STMicroelectronics and Texas Instruments. For more information, contact MIG via phone: 412/390-1644, email: info@memsindustrygroup.org or visit www.memsindustrygroup.org. All product and company names are trademarks or registered trademarks of their respective holders.

Keywords: Analog, Asia, Automobiles, Biomedical Engineering, Consumer Electronics, Economic Development, Economics, Electronics, Emerging Technologies, Engineering, Hardware, Japan, Leisure, MEMS, Nanomedicine, Nanotech, Nanotechnology, Other Technology, Semiconductor, Software, Technology, Transportation, Video Game.

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Hitachi Chemical Co. Ltd.

Hitachi Chemical Commences Mass Production of "SPD Film" Whose Light Transmittance is Controlled by Adjusting AC Voltage

2010 JAN 4 - (VerticalNews.com) -- Hitachi Chemical Co., Ltd. (Head Office: Tokyo; President and CEO: Kazuyuki Tanaka; Paid-in Capital: 15.5 billion yen, hereinafter "Hitachi Chemical") introduced the SPD (Suspended Particle Device) light-control film technology from New York based Research Frontiers Inc. (NASDAQ:REFR), and commercialized a roll-coated, wide-width SPD film whose light transmittance can be freely controlled by simply adjusting AC voltage. The film achieves this by utilizing its proprietary technologies including resin synthesis technology, film coating technology, and size control technology for adjusting the size of light-control particles based on nanotechnology. Hitachi Chemical began mass production of SPD film in July 2009 and is supplying commercially usable film to end-product licensees of Research Frontiers for the automotive, architectural, marine and aircraft markets. With its newly completed coating line dedicated to production of SPD film, Hitachi Chemical has expanded its production capacity of SPD film to 400,000m²/year.

In recent years, the market for light-control glass has expanded due to the increasing demands for energy efficiency and heat and light control, automated shading, privacy, and design and engineering innovation. SPD film is laminated between panes of glass or plastic to produce various dynamic light-control products including windows, doors, skylights, atria and sunroofs. As a durable laminate, it is available in many sizes, fabrications and shapes, and can be used on curved surfaces. Other light-control technologies include liquid crystal and electrochromic devices. However, with liquid crystal technology, it is difficult to tune the level between white and transparent, and typically little shading benefit is offered. Electrochromic devices have problems of relatively slow and inconsistent response speed, difficulty in achieving larger sizes, and limitations to the substrates that it can be used with, and restrictions on the number of available light-control states. For these reasons and others, there is growing demand for "smart" products that can be made in a large size and can enable freedom in quickly controlling light transmittance.

Therefore, Hitachi Chemical has developed the volume production method for SPD film based on its own unique polymer synthesis technologies and resin technologies, which adjusts the size of light-control particles base on nanotechnologies. It has succeeded in commercializing its SPD film to the world market. The SPD film consists of two polyethylene terephthalate (PET) films coated with a transparent conductive layer, and matrix resin dispersed with microcapsules containing orientative particles sandwiched between two films. The principle of light control is that when alternate voltage is applied to the orientative particles, they become oriented and transparent. When the AC voltage is not applied, the particles are not oriented so that their color is dark blue, thus shielding light. The color tone can be changed from dark blue to transparent to freely control the light transmittance. Its power consumption is as low as 1.1 W/m².

A wide range of applications of SPD film are expected, including the application to buildings such as Indiana University in the USA (refer to Reference, an example of application of "SPD film"), and windows of boats and aircrafts, which have been already realized. Future potential applications include automotives, home electric appliances, and partitions.)

Hitachi Chemical will strive to accelerate the use of SPD film, which holds significant potential for growth. SPD film is positioned as one of the key emerging products promoted by Hitachi Chemical to become a future leading product for the company.

Photos/Multimedia Gallery Available:

<http://www.businesswire.com/cgi-bin/mmg.cgi?eid=6120910&lang=en>

Keywords: Architecture, Automobiles, Construction and Property, Electronics, Emerging Technologies, Engineering, Hitachi Chemical Co., Ltd., Interior Design, Landscape, Manufacturing, Nanotech, Nanotechnology, Other Manufacturing, Residential Building and Real Estate, Technology, Transportation, Urban Planning, Voltage, Hitachi Chemical Co. Ltd.

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WBTshowcase**WBTshowcase to Present Emerging and Converging Companies and Technologies at WBT2010**

2010 JAN 11 - (VerticalNews.com) -- Investors and corporate licensees from Fortune 1000 companies will meet once again in Arlington, Texas for the eighth annual WBTshowcase (WBT2010), the world's largest forum offering a prescreened, pre-prepped collection of undiscovered companies and intellectual property emanating from top universities, labs and research institutions from across the country. The event will be held March 15 through 17 at the Sheraton Arlington Hotel and the Arlington Convention Center.

Produced by Development Capital Networks in cooperation with National Nanotechnology Initiative (NNI), National Association of Seed and Venture Funds (NASVF), Federal Laboratory Consortium for Technology Transfer (FLC), and Southeastern Universities Research Association (SURA), WBT2010 will feature 100 vetted and mentored emerging and converging materials science, information technology, energy, life science and nanotechnology companies and technologies.

Attendees include seasoned venture investors and Fortune 1000 licensing scouts representing a variety of industries each looking for early stage cutting edge global innovations.

"WBT2010, like each year before it, will offer an unparalleled forum that is both deal-focused and unbiased with regard to geography, funding source, or originating research institution," said Paul Huleatt, CEO, WBTshowcase. "Attending individuals will represent millions of dollars of investment capital and licensee opportunities." According to Huleatt, WBT is widely recognized for having the highest quality early stage deals. One in three WBT presenters goes on to secure venture funding, license their technology, or sell their IP outright, representing over \$450 million raised to date.

WBTshowcase is accepting online applications from companies and research institutions interested in presenting their break-through technologies until December 14. Leveraging a screening panel of over 80 investors and licensing professionals, presenting companies and technologies are selected solely on the merits of their innovation and the specific investment or licensing opportunity.

An impressive group of sponsors continues year after year to support WBTshowcase. WBT2010 sponsors and supporters include U.S. Department of Defense, Roche, BNSF, Dallas Regional Chamber, The National Science Foundation, Industrial Research Institute, Licensing Executive Society, MRUN, NineSigma, and Penman PR among others..

WBT2010 is hosted by the Center for Innovation at Arlington, and co-hosted by the University of Texas at Arlington. Early registrations are being accepted through January 31, 2010. For additional information, visit www.WBTshowcase.com. ABOUT WBTshowcase The WBTshowcase is the world's premier showcase converging revolutionary new energy, life science and information technologies to seed limitless solutions for current market needs. www.wbtshowcase.com

Keywords: Aerospace, Biotechnology, Data Management, Defense, Department Of Defense, Emerging Technologies, Energy, Health, Information Technologies, Information Technology, Nanotech, Nanotechnology, Other Energy, Research, Science, Technology, WBTshowcase.

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T2 Biosystems Inc

T2 BioSystems Appoints Ken Toso Vice President, Product Development

2010 JAN 18 - (VerticalNews.com) -- T2 Biosystems, Inc., a company developing the first point-of-care medical diagnostic products that enable rapid molecular and immunodiagnostic testing on a single instrument, announced it has appointed Ken Toso as Vice President, Product Development. This appointment and creation of a new position reflects the Company's progress in developing its technology for commercial utility as it moves from an alpha instrument completed in 2009 to beta instrument development during 2010.

T2 Biosystems is developing the next generation of medical diagnostic products through its proprietary technology, which combines nanotechnology and the miniaturization of proven MR technology. T2 Biosystems' magnetic resonance-based diagnostics are poised to offer improved speed, accuracy and efficiency, as well as portability to a broader range of settings including doctor's offices, homes and hospitals.

Mr. Toso brings to T2 BioSystems more than 25 years of industry experience in medical device technologies, spanning product research, development and manufacturing. His innovative product experiences and launches have spanned multiple clinical areas within the fields of in vitro diagnostics and medical devices, including General Surgery, Gynecology, Urology, Cardiology, Oncology and Blood Glucose Monitoring.

"We are delighted to welcome Ken to our leadership team as his expertise will be invaluable as we advance our technology towards the marketplace," said John McDonough, CEO of T2 Biosystems. "Ken is joining T2 at a critical time of our growth and evolution to a commercial- stage company."

Most recently, Mr. Toso served as Sr. Vice President of Engineering at Grove Instruments and as Vice President of Research and Development for the Oncology division of Boston Scientific where he directed the launch of eight new products in one year's time. Prior to Boston Scientific, Mr. Toso served as VP of R&D for ACMI Circon and had directed the launch of 22 new products within his 3-year tenure. Mr. Toso also served as Vice President of Engineering at Xylum and started his career at US Surgical, where he served in a variety of technical and management roles, directing the launch of more than 35 new products. Mr. Toso earned his Bachelor's degree in Mechanical Engineering from SUNY at Stony Brook and M.B.A. from the University of Bridgeport and holds more than 20 US granted patents.

T2 Biosystems' technology has been validated in multiple published journal articles and has shown to accurately analyze viruses, bacteria, proteins, hormones, DNA, small molecules and other diagnostic targets. The Company is developing a pipeline of diagnostic products based on its technology, including devices for hospitals, diagnostic laboratories and medical offices, as well as individual patients. About T2 Biosystems T2 Biosystems is a private biotechnology company developing next-generation medical diagnostic products using its proprietary technology, combining nanotechnology and miniaturized magnetic resonance (MR) technology to provide rapid, accurate and portable diagnostics. T2 Biosystems was founded in 2006 by renowned researchers from the Massachusetts Institute of Technology, Harvard University, Harvard Medical School and Massachusetts General Hospital, and has assembled a world-class team, board of directors and scientific advisory board that collectively have a proven track record of translating technologic innovations into breakthrough products, building significant corporate value. T2 Biosystems is located in Cambridge, Massachusetts. For more information, please visit the company's website at www.t2biosystems.com.

Keywords: Biotechnology, Emerging Technologies, Engineering, General Health, Health, Mechanical Engineering, Nanotech, Nanotechnology, Pharmaceutical, Technology, T2 Biosystems Inc.

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Research and Markets

The World Market for Electron and Scanning Probe Microscopes for the Semiconductors and Date Storage Expected to Grow to \$1252 Million by 2015

2009 DEC 7 - (VerticalNews.com) -- Research and Markets (http://www.researchandmarkets.com/research/ac6bd3/the_world_market_f) has announced the addition of the "The World Market for Electron and Scanning Probe Microscopes" report to their offering.

The electron and scanning probe microscopes market typically services the semiconductors and data storage industry, which in 2008 was worth approximately \$178 billion. The market for electron and scanning probe microscopes for the semiconductors and date storage market was \$793 million in 2008, growing to \$1252 million by 2015. Market drivers include increasing yields, increased demand for more sophisticated failure analysis techniques, increases in the complexity and performance level of devices used in electronic products, reduction of manufacturing costs, increased resolution, increasing device complexity and shrinking geometries. Emerging markets for electron and scanning probe microscopes include bio-medicine and life sciences and nanotechnology and nanomaterials.

Report contents

World and regional markets for Atomic Force Microscopes (AFM), Transmission Electron Microscopes (TEM) and Scanning Electron Microscopes (SEM)

Key market players and market share

Market structures, market drivers and restraints, key areas of growth, key sectors, technical challenges

Key end user markets

Company profiles

Over 125 tables and figures Key Topics Covered: 1 EXECUTIVE SUMMARY

2 REPORT METHODOLOGY

3 MARKET SUMMARY

4 PRODUCTS

5 MARKETS FOR ADVANCED MICROSCOPES

6 ADVANCED MICROSCOPE COMPANIES (23 PROFILES)

TABLES & FIGURES

For more information visit

http://www.researchandmarkets.com/research/ac6bd3/the_world_market_f

Keywords: Data Management, Electronics, Semiconductor, Hardware, Health, Information Technology, Data Storage, Medical Devices, Medical Supplies, Nanotechnology, Nanotech, Emerging Technologies, Nanomaterial, Technology, Research and Markets.

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Applied Materials Inc

Applied Materials Solves Critical Transistor Scaling Challenge with New Millisecond Anneal System

2009 DEC 14 - (VerticalNews.com) -- Applied Materials, Inc., the leader in rapid thermal processing (RTP), announced its new Applied Vantage® Astra#8482; millisecond anneal system, an important breakthrough in transistor fabrication that enables faster, lower power consumption devices. Targeted for creating the sensitive nickel silicide (NiSi) transistor contact layers in 45nm and beyond logic chips, this state-of-the-art laser-based system can enhance drive current and reduce gate leakage by an order of magnitude, helping customers to significantly increase device performance and yield. The Vantage Astra's compact design delivers more than twice the wafer output of competing systems and the lowest available cost of ownership (CoO).

"Applied's millisecond anneal technology will enable us to successfully fabricate our customers' most advanced device designs," said Dr. Shang-Yi Chiang, senior vice president, Taiwan Semiconductor Manufacturing Company Limited (TSMC). "The Vantage Astra system is now TSMC's tool of record for NiSi annealing in our 28nm logic processes."

"We're building on Applied's decade of leadership in single-wafer thermal processing to help our customers address critical transistor scaling challenges," said Steve Ghanayem, corporate vice president and general manager of Applied's Front End Products business unit. "The Vantage Astra system's novel, laser-based architecture sets new standards for production-worthiness and provides a compelling value proposition for advanced anneal applications."

Key to the Vantage Astra system's groundbreaking performance is its novel dynamic surface annealing (DSA) technology, an innovative thermal processing method that abruptly raises the surface temperature of the wafer locally to modify material properties at the atomic level. In less than a millisecond, the Astra system can heat the wafer to over 1,000°C from a low, sub-200°C starting point. This unique capability is essential for customers to create optimum-quality NiSi films without any detrimental effect on the wafer.

The Vantage platform can be configured with two Astra millisecond anneal chambers or one Astra chamber combined with a conventional RTP* RadiancePlus®; or RadOx®; chamber. This unique flexibility allows customers to perform all thermal processing steps - millisecond, spike and soak anneals, plus multiple nitridation and oxidation applications - on the same production-proven Vantage platform. For more information, visit http://www.appliedmaterials.com/products/fep_vantage_astra_dsa_4.html.

Applied Materials, Inc. (Nasdaq:AMAT) is the global leader in Nanomanufacturing Technology®; solutions with a broad portfolio of innovative equipment, service and software products for the fabrication of semiconductor chips, flat panel displays, solar photovoltaic cells, flexible electronics and energy efficient glass. At Applied Materials, we apply Nanomanufacturing Technology to improve the way people live. Learn more at www.appliedmaterials.com.

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<http://www.businesswire.com/cgi-bin/mmg.cgi?eid=6110162&lang=en>

Keywords: Asia, Electronics, Emerging Technologies, Flat Panel Display, Hardware, Leisure, Nanomanufacturing, Nanotech, Nanotechnology, Photovoltaic, Photovoltaic Cells, Semiconductor, Software, Taiwan, Technology, Applied Materials Inc.

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SUSS MicroTec/SEMATECH

SEMATECH and SUSS MicroTec Collaborate on Next-generation Device Testing Solutions

2009 DEC 28 - (VerticalNews.com) -- SUSS MicroTec (FWB:SMH)(GER:SMH), a leading supplier of process and test solutions for the semiconductor industry and related markets, and SEMATECH, a global consortium of chipmakers, announced that SUSS MicroTec will join the Front End Processes (FEP) program of SEMATECH. As a member of the program, SUSS MicroTec will collaborate with SEMATECH's FEP device and reliability experts to investigate complex semiconductor probing and measurement solutions for next-generation semiconductor and emerging technologies.

To enable advances in conventional and emerging semiconductor devices, SEMATECH's FEP program is researching cutting-edge new materials and device structures. The collaborative work between SUSS MicroTec and SEMATECH's FEP research teams will aim to develop new characterization techniques to enable both CMOS scaling and emerging technologies beyond CMOS. Additionally, as a part of this joint effort, advanced emerging memory and MEMS/NEMS technology characterization methods will also be addressed. SEMATECH will use SUSS MicroTec's probe system and control software to characterize new device processes and designs.

"We are excited to be a part of the SEMATECH FEP program, working with the most advanced technologists to develop and characterize new materials and tools for the continued improvement of semiconductor technologies," said Frank P. Averdung, President and CEO of SUSS MicroTec. "This collaboration represents an innovative blend of SUSS' experience in test solutions for probing and characterization applications and SEMATECH's strengths in the development of fundamental materials and advanced device technologies."

"This joint research initiative with SUSS MicroTec reinforces SEMATECH's commitment to develop practical solutions for leading-edge technologies that are increasingly relying on new materials and structures for continued performance improvement," said Raj Jammy, vice president of emerging technologies, SEMATECH. "We look forward to working with SUSS MicroTec as an industry key player on innovative ways to characterize and evaluate new materials and processes, that will benefit our members and the industry." About SUSS MicroTec: SUSS MicroTec (listed in Deutsche Borse AG's Prime Standard) is a leading supplier of process and test solutions for markets such as 3D Integration, Advanced Packaging, MEMS, Nanotechnology and Compound Semiconductor. High-quality solutions enable customers to increase process performance while reducing cost of ownership.

SUSS MicroTec supports more than 8,000 installed mask aligners, coaters, bonders and probe systems with a global infrastructure for applications and service. SUSS MicroTec is headquartered in Garching near Munich, Germany. For more information, please visit <http://www.suss.com>. About SEMATECH: For 20 years, SEMATECH® (www.sematech.org) has set global direction, enabled flexible collaboration, and bridged strategic R&D to manufacturing. Today, we continue accelerating the next technology revolution with our nanoelectronics and emerging technology partners.

Keywords: Data Management, Electronics, Emerging Technologies, Hardware, Nanoelectronic, Nanotech, Nanotechnology, SUSS MicroTec/SEMATECH, Semiconductor, Software, Technology.

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MDV-Mohr Davidow Ventures

Stanford, UC Berkeley and LBL Scientists Thomas Jaramillo, Ali Javey, Nick Melosh, Delia Milliron Named 2010 MDV Innovators Award Winners

2009 DEC 28 - (VerticalNews.com) -- MDV-Mohr Davidow Ventures, an early stage venture capital firm investing in pioneering science and innovation, announced that Stanford Assistant Professor of Materials Science and Engineering Nick Melosh and Assistant Professor of Chemical Engineering Thomas Jaramillo along with Ali Javey, UC Berkeley Assistant Professor of Electrical Engineering and Computer Science and Lawrence Berkeley Lab (LBL) scientist, and Delia Milliron, Facility Director of the Molecular Foundry at LBL are recipients of the 2010 MDV Innovators Award.

Created in 2008, the MDV Innovator's Award recognizes early-career faculty scientists for their ground-breaking research, and provides \$50,000 in unrestricted funding to each recipient for a one-year pilot project to explore a promising research direction that might not readily receive other funding because of its high-risk, early approach.

At Stanford, Melosh will investigate a novel approach to solar energy capture while Jaramillo will design improved electrocatalysts. At UC Berkeley, Javey will pursue low-cost manufacturing of novel nanopillar photovoltaics while Milliron will develop new window technology to improve the energy efficiency of buildings.

"MDV has worked with scientists and entrepreneurs to catalyze ideas and technologies for more than 25 years," said MDV General Partner Erik Straser. "We are passionate about fostering university innovation because we've seen time and again how university research creates the core technologies essential to new industries and markets."

Previous MDV Innovators include UC Berkeley and LBL faculty Jan Liphardt and Rachel Segalman, as well as Associate Professor Mike McGehee and Assistant Professor Yi Cui, both of Stanford Materials Science and Engineering. Combined, these faculty have raised over \$50 million in follow-on research funding since receiving the MDV Innovators Award in 2008.

2008 MDV Innovators Awardee McGehee explained, "It helps to have unrestricted funding like the MDV Innovators Award to start new projects and get the preliminary results that will enable funding from more conventional sources."

UC Berkeley and Stanford faculty were nominated for the 2010 MDV Innovators Award by UC Berkeley Professors Paul Wright, Director of the Center for Information Technology Research in the Interest of Society, and Berkeley and LBL's Paul Alivisatos, Director of Lawrence Berkeley National Lab, and Larry and Diane Bock Professor of Nanotechnology, and Jay Keasling, Director of the Joint BioEnergy Institute; along with Stanford Professors Sally Benson, Director of the Global Climate and Energy Project, and Jeff Koseff, Perry L. McCarty Director of the Woods Institute..

About MDV-Mohr Davidow Ventures

MDV is a leading venture capital firm investing in people and technologies that redefine markets. The firm funds and mentors entrepreneurs, scientists and young companies involved in redefining business, technology and medicine. MDV invests around three major themes: Personalizing Medicine; Powering the Planet; and Driving the Digital World. The firm partners with entrepreneurs seeking an investor who will help guide and grow successful companies. Category-leading companies funded by MDV include: Adamas; Agile (ORCL); AudienceScience; CardioDx; Corventis; FormFactor; Genomatica; IronKey; Nanosolar; ONI Systems (CIEN); Pacific Biosciences; Panasas; ParAllele (AFFX); Proofpoint; RainDance Technologies; Sabrix; Tethys Bioscience; Visible Measures; and ZeaChem. MDV has \$2 billion dollars under management. For more information visit: <http://www.mdv.com/>.

Keywords: Bioscience, Chemical Engineering, Chemicals, Chemistry, Climate Change, Computers, Data Management, Electrical Engineering, Electronics, Emerging Technologies, Energy, Engineering, Finance, Global Climate, Global Warming, Information Technologies, Information Technology, Investing, Investment, MDV-Mohr Davidow Ventures, Nanopillar, Nanotech, Nanotechnology, Oil & Gas, Photovoltaic, Photovoltaics, Science And Engineering, Technology, Venture Capital.

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True Green Energy Group

Spectrum Blue Steel Promises a Very Green Christmas for City of Santa Rosa Nueva Ecija

2009 DEC 28 - (VerticalNews.com) -- Spectrum Blue Steel's global campaign in 2010 is to help Clean up the World by inspiring communities to go green while deploying Biosphere power plants. This Commitment is Held in partnership with the True Green Energy Group in an effort to clean up landfill sights and turn waste into energy.

On December 15, 2009 with more than 350 people in attendance including True Green Energy Group and its affiliates the Ground Breaking ceremony took place in Santa Rosa Nueva Ecija, Philippines.

The Municipal Mayor for Santa Rosa Honorable Josefino M. Angeles finalized the spectrum agreement by purchasing a site, and giving access, with 100% right of way for the immediate deployment of the "MRF" and Biosphere facility to be installed and connected to the grid for twenty five years with the provision that both parties can extend the contract by mutual agreement.

Honorable Josefino M. Angeles said during his speech, "that he would do everything necessary to help Spectrum Blue Steel turn on the Biosphere system. He went on by thanking Ronald Flynn, the founder of Spectrum Blue Steel for his genuine concern for Philippines and for finalizing the agreement to fix the city's serious problem of municipal solid waste."

The new site is located in Barangay Soledad Santa Rosa Nueva Ecija on 2 hectors of land where the city also promised to pay and pave new roads on the site so the Garbage trucks can deliver the MSW (Municipal Solid Wast) to Spectrums material recycling facility and green Biosphere gasification system. Further to the agreement Spectrum will be collecting all the relevant tipping fees for the collection of the MSW in addition to owning the recycling rights and pelletizing the garbage for clean green electricity.

The agreement was established and finalized due to positive testing results paid for by Spectrum Blue Steel. The testing was completed and delivered to the EIA of the Philippines and was approved by the department of energy.

Ronald Flynn made it clear during the ceremony, "that it is his intention to employ Filipinos and give them a clean green future. He stated in the first quarter of 2010 True Green Energy Group would be doing a massive hiring for green energy jobs for Spectrum Blue Steel, in addition to opening their new laboratory, in order to cage and sell the atoms inside the Buckyball that will be sold for Upwards of \$4.4 Million Dollars per gram."

According to Spectrums partners Dr. Gardner and Mark Murad who recently conducted the study said, "That the result of their testing and the study is a mind-boggling gold mine of money. Because the MRF system, and the Biosphere MKV, Spectrum will produce a Production rate of 7.5 million metric tons of carbon black per year that they can turn into Buckminster Fullerene molecules which are needed for flat screen televisions from Sony, RCA, Magnavox, etc."

Mark, also said the fly ash from the Electrostatic precipitators of the biomass Power Plants may be sold for a profit of approximately \$1200 dollars per metric ton where companies like Goodyear, BF Goodrich, and Firestone are fetching \$1650 to 1,750 per metric ton - not to mention selling the Zeolite at a huge profit to the oil refinery catalysis industry who produce ZSM-5 and sell it in a range from \$35,274 TO \$110,231 per metric ton".

The agreement between Spectrum and Santa Rosa was implemented with the city's requirements to comply with the municipal code of 1991 (R.A. No. 7160) and the Ecological Solid Waste Management Act of 2000 (R.A. No. 9003), where as local government units are mandated to establish solid waste disposal systems or environmental management systems, and to set up environmentally sound solid waste management facilities, and accord greater private sector participation in its solid waste management system.

Spectrum Blue Steel first project is now under major construction in the city of San Fernando where they are Building the first Biosphere green energy plant in the Philippines.

In January, Spectrum is scheduled to move into its new building in fort bonifacio global city where it will have its corporate offices and its first fully functional laboratory. The good news for SBS is they will have a 5 year tax holiday according to the new green energy laws under RA 9513.

Spectrum Blue Steel's strategy is to "de-carbonize" the electric power generation industry by shifting to non-fossil fuel based energy sources, specifically energy-from-waste. This follows the Energy Policy Act of 2005 which confirmed energy-from-waste is renewable, and the Philippine Renewable Energy Law (RA 9513) of the Philippines..

Spectrum is a domestic corporation duly registered under the laws of the Philippines and holds a license to the Biosphere Technology from Global Environmental Energy Corporation (BULLETIN BOARD: GEECF - News) . Global is a fully integrated energy company whose interests include electrical power generation, oil and gas exploration and production, clean coal and waste management technologies.

This press release contains forward-looking information within the meaning of Section 27A of the Securities Act of the 1933 and Section 21E of the Securities Exchange Act of 1934, and is subject to the safe harbor created by those sections.

Keywords: Asia, Buckminster Fullerenes, Buckyballs, Clean Coal, Conservation, Department Of Energy, Ecological, Ecology, Electric Power, Electrical Power, Electronics, Electrostatic, Emerging Technologies, Energy, Energy Company, Energy Policy, Environment, Environmental Management, Finance, Fossil Fuel, Fullerenes, Global Environmental Energy, Government, Green Energy, Investing, Investment, Local Government, Nanotech, Nanotechnology, Oil & Gas, Oil And Gas, Oil Refinery, Philippines, Politics, Power Plant, Renewable Energy, Securities Exchange Act Of 1934, Technology, Television, True Green Energy Group, Waste Management.

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Arrowhead Research Corporation

Arrowhead Research Corporation Subsidiary Tego Biosciences Sells IP Portfolio to Luna Innovations

2010 JAN 11 - (VerticalNews.com) -- Arrowhead Research Corporation (NASDAQ: ARWR) announced that its wholly owned subsidiary, Tego Biosciences, has completed a definitive asset purchase agreement for the sale of its non-cash intellectual property (IP) to Luna Innovations, Inc. (Nasdaq: LUNA), a developer and manufacturer of new-generation products that include pharmaceutical nanomedicines. Under the terms of the agreement, Luna paid Tego \$430,000 upfront, will make milestone payments totaling \$4.25 million for each fullerene product it brings to market under Tego IP, and pay royalties on net sales of its products built with the Tego IP.

Also under the terms of the agreement, Tego will receive payments of 10% on revenues from the licensing or resale of Tego's IP and 50% of net proceeds from The Bronx Project products developed using Tego IP. The Tego IP includes a broad portfolio of foreign and domestic patents and patent applications relating to modified fullerenes for use in diagnostics, therapeutic, imaging and other biopharmaceutical-related applications.

Keywords: Bioscience, Chemicals, Chemistry, Emerging Technologies, Fullerenes, Health, Medical Supplies, Nanomedicine, Nanotech, Nanotechnology, Technology, Arrowhead Research Corporation.

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Novellus Systems Inc

Novellus' Ashable Hardmask AHM PECVD Films Enable Sub-32nm Lithographic Patterning

2009 DEC 7 - (VerticalNews.com) -- Novellus Systems (NASDAQ:NVLS) has developed a suite of ashable hardmask (AHM) films that have up to 25 percent greater etch selectivity compared to similar amorphous carbon films in use by the industry today. This highly selective and transparent (HST) AHM family of films has demonstrated die yield improvements as much as 7 percent when coupled with Novellus' patented integrated edge bevel removal (EBR) technology.

Sub-32nm device design rules require high aspect ratio (AR) patterning for both logic and memory devices. At these advanced geometries, plasma-enhanced chemical vapor deposition (PECVD) based amorphous carbon films have higher etch selectivities and superior mechanical properties than traditional photoresists. Additionally, films of this nature enable more accurate pattern transfer from the photoresist to the substrate without complications such as pattern collapse and line bending. These amorphous carbon films are also used for double patterning schemes, enabling cost effective, high density patterning.

Figure 1A contrasts the normalized etch selectivity for a conventional amorphous carbon film deposited at 550°C with a Novellus HST AHM film. While increasing deposition temperature can be used to increase selectivity, it also has the negative effect of decreasing the film's transparency. Less transparent films are more difficult to align during the photo step. With Novellus AHM films, transparency is not sacrificed, and the selectivity required for high AR patterning is maintained. Also shown in Figure 1A are critical dimension uniformity (CDU) maps showing typical etch selectivity performance for conventional amorphous carbon films and Novellus HST AHM films. The high selectivity and low erosion rate of the Novellus films demonstrate better within-wafer CDU performance, which facilitates the patterning of dense, high AR features (Figures 1B and 1C) and is critical to yield enhancement.

The AHM thickness at the wafer's edge impacts the die yield in that region, requiring a narrow transition zone from full AHM thickness to bare silicon (i.e., complete AHM removal). Novellus' VECTOR® PECVD platform features an integrated EBR capability that provides complete removal of the AHM film within a 1mm transition zone. This sharp transition ensures that edge die have the required AHM thickness necessary for excellent CD uniformity control within 2 mm from the wafer's edge (see Figure 2). Because the EBR module is integrated onto the deposition platform, no additional bevel edge cleaning tools are required. And, since the AHM removal is performed outside the deposition chamber, better process and particle control can be achieved as compared to other in-situ edge control techniques.

In addition to enhanced die yield, Novellus' HST AHM films also provide a wider process window in a high volume manufacturing environment. Conventional amorphous carbon films deposited at higher temperatures are prone to moisture absorption at a faster rate. However, the multi-station sequential deposition (MSSD) architecture of the Novellus VECTOR PECVD platform enables superior hermeticity performance by incorporating process interfaces, which help to block moisture uptake. The hermeticity response of both the traditional high temperature amorphous carbon films and the Novellus HST AHM film are shown in Figure 3.

"Novellus' HST AHM films meet the high density, high aspect ratio patterning requirements necessary for sub-32 nm devices," said Kevin Jennings, senior vice president for Novellus' PECVD business unit. "Coupled with the proven productivity of the VECTOR platform, Novellus' HST AHM solution is the low cost, high volume manufacturing choice for these advanced optical films."

For more information on Novellus' optical films, go to www.novellustechnews.com.

Keywords: AT&T, Chemical Vapor Deposition, Emerging Technologies, Nanotech, Nanotechnology, Novellus Systems Inc., Technology, Telecommunications

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[Cavitation Technologies Inc](#)

CaviGulation - Cavitation Technologies' Solution to the Water Crisis, Refining the Desalination Process

2009 DEC 14 - (VerticalNews.com) -- Cavitation Technologies, Inc. (CTI) (OTC Bulletin Board: CVAT; Berlin: WTC) is announcing our latest development the CaviGulation system, designed for physico-chemical reactions used in water treatment. With water well on its way to becoming one of the hottest commodities, an obvious solution is to take the salt out of seawater. Desalination technology has been around for thousands of years. However, until recently seawater desalination was a very expensive water source solution, we believe we have the answer. On average there is roughly 130 grams of salt per gallon in sea water. Desalination can reduce salt levels to below 2 grams per gallon, which is the limit for safe human consumption.

CaviGulation is a complex process with a multitude of mechanisms operating synergistically to remove pollutants from the water. The CaviGulation reactor is a multi stage flow-through electro-cavitation process on the nano molecular level. The effectiveness of CG technology is 1000-fold over conventional systems and allows the complete elimination of all micro-organisms (including spores), viruses and protozoa. The first actual practice of desalination involved collecting the freshwater steam from boiling saltwater. The energy required for this type of process today makes it prohibitively expensive on a large scale. In the last decade, seawater reverse-osmosis has matured into a viable alternative to thermal desalination. But even with membranes, large amounts of energy are required to generate the high pressure that forces the water through the filter. Maintenance costs, addition of additives to prevent periodic buildup and replacement of the fouling membranes are the biggest challenge facing desalination. To produce 1,000 gallons of desalinated seawater it can cost around \$4. Our goal is to cut this cost in half. CaviGulation is CTI's proprietary process and is scalable to virtually any size; we feel it could be a solution for the desalination process utilizing membranes. Currently, between 10 and 13 billion gallons of water are desalinated worldwide per day. That's only about 0.2 percent of global water consumption, but the number is drastically increasing, the demand is rising and the problem needs immediate attention on a large scale while being cost effective at the same time.

For additional information please paste the following link:

www.cavitationtechnologies.com/component/option,com_phocadownload/Itemid,68/id,7/view,category/

Cavitation Technologies, Inc. continues to identify new applications for our nano-reactor technology. All of the applications are in industries where there is a need to solve environmental problems, reduce operating costs and improve profitability. "After years of research CTI's scientists have developed our CaviGulation system. The first prototype unit has been built and delivered to our testing facility in Chatsworth, Ca. It will require several more months of testing in order to be able to establish all of the benefits and savings that could be provided for the desalination industry. We are exceptionally proud of the fact that the technologies we are developing will have a global impact, we strive to come up with a viable solution to the worldwide issues we face with water." indicated Roman Gordon, Cavitation Technologies, Inc., CEO.

Keywords: Cavitation Technologies Inc., Conservation, Ecology, Emerging Technologies, Environment, Environmental Problems, Nanotech, Nanotechnology, Technology

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[CBp Carbon Industries Inc](#)

CBp Carbon Industries, Inc. Announces Agreement With Carbon Green, Inc.

2009 DEC 21 - (VerticalNews.com) -- CBp Carbon Industries, Inc. ("CBp Carbon" or "the Company") is pleased to announce it has entered into a share sale agreement, dated effective November 30, 2009 (the "Agreement"), with Carbon Green Inc. ("Carbon Green") (OTC Bulletin Board: CGNI) for CBp Carbon's wholly-owned subsidiary, Greenwood Commerce Ltd. ("Greenwood"), pursuant to which the Company has agreed to assign all of the issued and outstanding common shares of Greenwood to Carbon Green in exchange for the issuance by Carbon Green to CBp Carbon of one of Carbon Green's common shares for each four CBp Carbon common shares outstanding (a total of approximately 33 million common shares issued at closing) and one share purchase warrant for each four share purchase warrants of CBp Carbon outstanding.

At the closing of the Agreement, Greenwood will hold the worldwide exclusive ownership rights to, among other things, a protected proprietary technology that converts the by-products of tire pyrolysis (heating in the absence of oxygen) into: (i) recovered steel; (ii) a #2 diesel equivalent oil, which can also be employed to generate green electricity in many countries; (iii) a patented nano-particle compound that is a tire industry-tested and accepted competitive substitute for commercial carbon black; and (iv) a clean-burning gas that can be used to provide power to the Greenwood processing plants. In 2007, the CBp Carbon technology was recognized by the European Union as the only tire recycling technology which met the goals of EU legislation. CBp Carbon has recently completed construction in Cyprus of its first commercial scale plant, a state-of-the-art commercial tire pyrolysis plant. Operations have commenced and the plant is currently in pre-production hot tests with production of commercial products. The plant is slated to enter continuous commercial operations in the first quarter of 2010.

The closing of the Agreement is subject to the satisfaction of conditions precedent to closing as set forth in the Agreement, including that: (i) no material adverse effect will have occurred with the business or assets of the Company, CBp Carbon or Greenwood since the effective date of the Agreement; (ii) the Company, CBp Carbon and Greenwood will have received all third-party consents and approvals contemplated by the Agreement; and (iii) Carbon Green will be reasonably satisfied with its due diligence investigation of CBp Carbon and Greenwood. To ensure effective coordination and operations during the period to closing, John Novak has been appointed President and CEO, pro tem, of Carbon Green and Peter Jensen has been appointed President, pro tem, of CBp Carbon.

Due to conditions precedent to closing, including those set out above, and the risk that the conditions precedent will not be satisfied, there is no assurance that the Company will complete the share purchase as contemplated in the Agreement.

The securities of Carbon Green to be issued to CBp Carbon upon the closing of the Agreement will not be registered under the Securities Act of 1933, as amended (the "Act"), or under the securities laws of any state in the United States, and will be issued in reliance upon an exemption from registration under the Act. The securities may not be offered or sold in the United States absent registration under the Act or an applicable exemption from such registration requirements.

On behalf of the Board of Directors,

Keywords: CBp Carbon Industries Inc., Emerging Technologies, Finance, Investing, Investment, Nanotech, Nanotechnology, Securities Act Of 1933, Technology

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zipit Ltd.

zipit Celebrates 'Best Seller' Status on Amazon.com During Holiday Season

2009 DEC 21 - (VerticalNews.com) -- zipit® Ltd. announced that six of its zipper bags have climbed within the Top 100 Products list of Amazon.com, with its zipit Dinky Nano Cellular / Coins Purse maintaining the #1 spot in its category for four weeks.

zipit bags are created from long, formless zippers, which, when zipped, realize their purpose as carry-alls with a wit and personality of their own. Durable, washable and colorful, zipit bags are produced in a wide range of sizes and patterns to suit endless functions and attitudes.

"The popularity of zipit products has spread by word of mouth - not by advertising or promotions," said Menahem Geber, zipit Founder. "People are excited about our zipper bags because they are fun, functional, fashionable, a conversation piece, and particularly important at this season, affordable."

Keywords: Advertising, Emerging Technologies, Nanotechnology, zipit Ltd.

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Walmart

Walmart Announces New Savings on Big Requests in Small Packages in Days Before Christmas

2009 DEC 28 - (VerticalNews.com) -- With only a few days left for holiday shopping, Walmart (NYSE:WMT) announces more big savings plans, now on the smaller and in some cases most requested gift items. Starting Saturday and through next week, stores will have incredible savings on last minute gifts, including a Monday through Wednesday offer of \$8 Zhu Zhu Pets Hamsters.(1) Speaking of \$8 toys, Walmart is also rolling back the price on many perfect stocking-stuffer toys and last-minute gifts to \$8 and adding a special offer with this year's new iPod Nano to last through Christmas Eve.(2)

- Sat., Dec. 19: iPod Nano with \$50 iTunes Gift Card

Walmart will offer the new 8GB iPod Nano for \$145 with a free \$50 iTunes gift card with purchase, while supplies last, starting this Saturday through Dec. 24.

While many parents remember when yo-yos and candy were the typical stocking stuffer, shoppers now say that stocking gifts today are going more hi-tech. Forty percent of moms say they will add in gift cards to stockings this year, and almost 45 percent of moms are planning to purchase music related gifts.(3)

- Sun., Dec. 20: \$8 Toys and More Stocking Stuffers for Kids

Keywords: Emerging Technologies, Nanotechnology, Walmart.

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Misumi USA Inc

Misumi USA to Display at ATX West Show February 9-11, 2010 at Anaheim Convention Center

2010 JAN 4 - (VerticalNews.com) -- Misumi USA, Inc., a subsidiary of Misumi Corporation, part of Misumi Group, Inc. (TOKYO: 9962), (TSE: 9962) announced that it will display its newest products for factory automation at the upcoming ATX West show in Anaheim, CA on February 9-11, 2010 in Booth Number 4411. Misumi is a world leader in supplying fixed and configurable components for all types of motion control, assembly and related factory automation devices.

Highlighted at this year's ATX West show will be Misumi's new Single Axis Robot RS Series Actuators, as well as the company's comprehensive lines of single axis actuators, aluminum extrusions, linear guides, shaft supports, self lubricating linear bushings, metal plates, linear bushings with clamp function, compact square supports and much more. Most Misumi components are configurable, with downloadable CAD files and full specs and pricing available at the company's website.

At the Expo, Misumi will hold its "Go Configure" contest, co-sponsored by Design World Magazine. Contest ballots will be available in the show issue of the magazine as well as at the Misumi and Design World booths.

A daily 3:00 p.m. drawing for a \$50.00 American Express Gift Card will take place at the Misumi booth. In addition to the daily prize, a First Prize of an iPod Nano, Second Prize of a \$200.00 American Express Gift Card and Grand Prize of an HP Mini Netbook will be awarded during the 3:00 p.m. daily drawing on the last day of the show, Thursday, February 11, 2010.

Also during the show, Misumi will conduct its Free Configurable Component Technical Seminar onsite to demonstrate the advantages of configurable components to machine, equipment and assembly system engineers attending the show. Misumi booth personnel will be available to register engineers for the seminar. In addition, the company will register attendees to receive the company's newest catalogs, containing over 500,000 products for the machinery and equipment designer.

For more information on ATX WEST and FREE registration for the show, please visit <http://www.devicelink.com/expo/atxw10/> today.

For more information and full pricing on these unique products, please visit our website at www.misumiusa.com. Application assistance is always available from Misumi engineers. About MISUMI USA, Inc.- Located in Schaumburg, Illinois, MISUMI USA, Inc. was established in 1988 as a Subsidiary of Misumi Corporation, a part of the Misumi Group (TOKYO: 9962), (TSE: 9962). MISUMI USA, Inc. is a leading supplier of fixed and configurable components such as single-axis actuators, linear shafts, aluminum extrusions, linear guides, XY stages and other components for factory automation and various machine builds. For a complete list of available components, please visit www.misumiusa.com.

Keywords: AT&T, Electronic Design Automation, Emerging Technologies, Engineering, Hardware, Machine Learning, Manufacturing, Misumi USA Inc., Nanotechnology, Robot, Robotics, Software, Technology, Telecommunications

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Albany Molecular Research Inc

AMRI CEO to Present at 28th Annual J.P. Morgan Healthcare Conference

2010 JAN 18 - (VerticalNews.com) -- AMRI (NASDAQ: AMRI) announced that AMRI Chairman, President and Chief Executive Officer Thomas E. D'Ambra, Ph.D. will present at the 28th Annual J.P. Morgan Healthcare Conference in San Francisco on Thursday, January 14, 2010 at 1:30 p.m. PT.

An audio webcast of the corporate presentation will be available to investors and interested parties by accessing the company's website at www.amriglobal.com. A replay of the webcast will be available within three hours after the live webcast through February 15, 2010.

Founded in 1991, Albany Molecular Research, Inc. (AMRI) provides scientific services, products and technologies focused on improving the quality of life. AMRI works on drug discovery and development projects and conducts manufacturing of active ingredients and pharmaceutical intermediates for many of the world's leading healthcare companies. As an additional value added service to its customers, the company is also investing in R&D in order to expand its contract services and to identify novel early stage drug candidates with the goal to outlicense to a strategic partner. With locations in the U.S., Europe, and Asia, AMRI provides customers with a wide range of services, technologies and cost models.

Keywords: AT&T, Albany Molecular Research, Albany Molecular Research Inc., Asia, Chemicals and Plastics, China, Emerging Technologies, General Health, Health, Manufacturing, Nanotech, Nanotechnology, Telecommunications

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University of California - Los Angeles

New silicon-germanium nanowires could lead to smaller, more powerful electronic devices

2009 DEC 21 - (VerticalNews.com) -- Microchip manufacturers have long faced challenges miniaturizing transistors, the key active components in nearly every modern electronic device, which are used to amplify or switch electronic signals.

Now, researchers from the UCLA Henry Samueli School of Engineering and Applied Science, Purdue University and IBM have successfully grown silicon-germanium semiconducting nanowires for potential use in next-generation transistors.

These nanowires - which measure from a few tens to a few hundreds of nanometers in diameter and up to several millimeters in length - could help speed the development of smaller, faster and more powerful electronics, according to study co-author Suneel Kodambaka, a UCLA professor of materials science and engineering.

The team's research appears in the Nov. 27 issue of the journal *Science*.

"We are excited for two reasons," said Frances Ross, manager of IBM's Nanoscale Materials Analysis department and corresponding author of the study. "One is that we have extended our knowledge of the fundamental physics of the process by which nanowires grow. The other is the improved prospect of using nanowires in high-performance electronic devices."

"The nanowires are so small you can place them in virtually anything," Kodambaka said. "Because of their small size, they are capable of having distinctly different properties, compared to their bulk counterparts."

The team showed they could create nanowires with layers of different materials, specifically silicon and germanium, that were defect-free and atomically sharp at the junction - critical requirements for making efficient transistors out of the tiny structures. The "sharper" the interface between the material layers - in this case, just one atom, or close to one atom, thick - the better the electronic properties.

"We think this study is significant because it provides a solution to the problem of growing sharp interfaces in nanowires, thereby addressing an important limitation in the growth of nanowires," Ross said.

According to Kodambaka, silicon-germanium nanostructures also have thermoelectric applications, in which heat is converted into electricity.

"The Jet Propulsion Laboratory uses bulk chunks of silicon-germanium to power their satellites, and now there is a lot of interest in using a similar technology in automobiles. These nanowires have great potential in any area involving electronics," Kodambaka said.

To grow the silicon-germanium nanowires, tiny particles of a gold-aluminum alloy are first heated to temperatures above 370 degrees Celsius and melted inside a vacuum chamber. A silicon-containing gas is then introduced into the chamber, causing silicon to precipitate and form wires under the droplets. A germanium-containing gas is used to form the germanium wires.

"Think of it as ice growing from water vapor or the formation of ice crystals during a snow storm. You can get forests of ice wires under the right conditions instead of getting snow flakes or flat films of sleet," Kodambaka said. "But instead of water vapor, we introduced silicon vapor to get the silicon wire."

"The challenge was to create a really sharp interface between the silicon and germanium in each wire," Kodambaka said. "So we cooled the liquid droplets until they solidified. This allowed us to get rid of excess silicon in the alloy. Then, germanium wire segments could be grown on the silicon with the introduction of germanium vapor, and sharp interfaces formed."

The next step for the team is to grow the same structures over larger areas in a conventional growth reactor rather than in a tiny area under the microscope.

"This will allow my colleagues at IBM to process the wires into devices and measure their electronic properties," Ross said. "Of course, we would hope that the properties are improved, compared to conventional nanowires; and if this works out, we will look into new devices and try out different metal alloys to determine which is best for making devices."

Keywords: Automobiles, Electronics, Emerging Technologies, Engineering, Nanoscale, Nanoscale Materials, Nanostructural, Nanostructure, Nanostructures, Nanotech, Nanotechnology, Nanowire, Science And Engineering, Technology, Transportation, University of California - Los Angeles.

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University of Illinois at Chicago

Water droplets shape graphene nanostructures

2009 DEC 28 - (VerticalNews.com) -- A single-atom-thick sheet of carbon, like those seen in pencil marks -- offers great potential for new types of nanoscale devices, if a good way can be found to mold the material into desired shapes.

Chemists at the University of Illinois at Chicago say it's possible, reporting that graphene can become quite pliable using only a nanodroplet of water to do the job.

"Up until now, it wasn't thought we could controllably fold these structures," said Petr Kral, assistant professor of chemistry at UIC. "But now we know how to shape graphene by using weak forces between nanodroplets carefully positioned on graphene sheets."

Kral and two of his graduate students described the process in a recent article in *Nano Letters*, which is highlighted in Nature's "news and views" section Dec. 17.

Engineers already cut graphene into narrow ribbons and other shapes, expanding the set of carbonaceous systems such as fullerenes, carbon nanotubes and nano-diamonds. Using computer simulations, Kral showed that weak molecular interactions called van der Waals forces between water nanodroplets and graphene can shape it into a wide variety of forms, without the water and graphene chemically binding.

"Depending on the size of the water droplet and the shape and size of graphene flake used, we can fold it in different shapes for various applications," said Kral. "It's similar to the way proteins are folded in biological cells with the help of chaperone proteins."

Kral and his students discovered they could use water droplets to roll, bend, slide and shape graphene into different complex structures such as capsules, sandwiches, knots and rings -- all potential building blocks of nanodevices with unique mechanical, electrical or optical properties. By using special techniques like atomic force microscopy and carefully guided microscopic needles, water droplets and other materials can be carefully positioned on graphene to shape it into desired forms, he says.

Kral's laboratory is studying potential uses of nanoscale graphene, such as ways to coat it with phospholipid molecules that would allow it to become part of biological cell membranes where it might perform specific functions. His lab is also designing graphene sheet nanoscale pores that allow the building of novel ion and molecular separation membranes for use in desalination and other applications.

While the materials he works with are inorganic, Kral sees a growing trend to developing hybrid multifunctional systems that combine inorganic nanostructures with biological cellular systems.

"We're trying to detect signals from the biological world or pass signals to the biological world," he said. "In the future, perhaps proteins will evolve to interact with inorganic systems. It's a way of evolution to form a new interface, or hybrid system, working together on novel functions."

Keywords: Chemicals, Chemistry, Computers, Emerging Technologies, Fullerenes, Nanodevices, Nanodrops, Nanoscale, Nanostructural, Nanostructure, Nanostructures, Nanotech, Nanotechnology, Nanotube, University of Illinois at Chicago.

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University of Pittsburgh

First metallic nanoparticles resistant to extreme heat

2009 DEC 28 - (VerticalNews.com) -- A University of Pittsburgh team overcame a major hurdle plaguing the development of nanomaterials such as those that could lead to more efficient catalysts used to produce hydrogen and render car exhaust less toxic. The researchers reported Nov. 29 in Nature Materials the first demonstration of high-temperature stability in metallic nanoparticles, the vaunted next-generation materials hampered by a vulnerability to extreme heat.

Gotz Vesper, an associate professor and CNG Faculty Fellow of chemical and petroleum engineering in Pitt's Swanson School of Engineering, and Anmin Cao, the paper's lead author and a postdoctoral researcher in Vesper's lab, created metal-alloy particles in the range of 4 nanometers that can withstand temperatures of more than 850 degrees Celsius, at least 250 degrees more than typical metallic nanoparticles. Forged from the catalytic metals platinum and rhodium, the highly reactive particles work by dumping their heat-susceptible components as temperatures rise, a quality Cao likened to a gecko shedding its tail in self-defense.

"The natural instability of particles at this scale is an obstacle for many applications, from sensors to fuel production," Vesper said. "The amazing potential of nanoparticles to open up completely new fields and allow for dramatically more efficient processes has been shown in laboratory applications, but very little of it has translated to real life because of such issues as heat sensitivity. For us to reap the benefits of nanoparticles, they must withstand the harsh conditions of actual use."

Vesper and Cao present an original approach to stabilizing metallic catalysts smaller than 5 nanometers. Materials within this size range boast a higher surface area and permit near-total particle utilization, allowing for more efficient reactions. But they also fuse together at around 600 degrees Celsius-lower than usual reaction temperatures for many catalytic processes-and become too large. Attempts to stabilize the metals have involved encasing them in heat-resistant nanostructures, but the most promising methods were only demonstrated in the 10- to 15-nanometer range, Cao wrote. Vesper himself has designed oxide-based nanostructures that stabilized particles as small as 10 nanometers.

For the research in Nature Materials, he and Cao blended platinum and rhodium, which has a high melting point. They tested the alloy via a methane combustion reaction and found that the composite was not only a highly reactive catalyst, but that the particles maintained an average size of 4.3 nanometers, even during extended exposure to 850-degree heat. In fact, small amounts of 4-nanometer particles remained after the temperature topped 950 degrees Celsius, although the majority had ballooned to eight-times that size.

Vesper and Cao were surprised to find that the alloy did not simply endure the heat. It instead sacrificed the low-tolerance platinum then reconstituted itself as a rhodium-rich catalyst to finish the reaction. At around 700 degrees Celsius, the platinum-rhodium alloy began to melt. The platinum "bled" from the particle and formed larger particles with other errant platinum, leaving the more durable alloyed particles to weather on. Vesper and Cao predicted that this self-stabilization would occur for all metal catalysts alloyed with a second, more durable metal.

Keywords: Emerging Technologies, Engineering, Nanomaterial, Nanoparticle, Nanostructural, Nanostructure, Nanostructures, Nanotech, Nanotechnology, University of Pittsburgh.

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Purdue University

Findings show nanomedicine promising for treating spinal cord injuries

2009 DEC 7 - (VerticalNews.com) -- Researchers at Purdue University have discovered a new approach for repairing damaged nerve fibers in spinal cord injuries using nano-spheres that could be injected into the blood shortly after an accident.

The synthetic "copolymer micelles" are drug-delivery spheres about 60 nanometers in diameter, or roughly 100 times smaller than the diameter of a red blood cell.

Researchers have been studying how to deliver drugs for cancer treatment and other therapies using these spheres. Medications might be harbored in the cores and ferried to diseased or damaged tissue.

Purdue researchers have now shown that the micelles themselves repair damaged axons, fibers that transmit electrical impulses in the spinal cord.

"That was a very surprising discovery," said Ji-Xin Cheng, an associate professor in the Weldon School of Biomedical Engineering and Department of Chemistry. "Micelles have been used for 30 years as drug-delivery vehicles in research, but no one has ever used them directly as a medicine."

Findings are detailed in a research paper appearing Sunday (Nov. 8) in the journal *Nature Nanotechnology*.

A critical feature of micelles is that they combine two types of polymers, one being hydrophobic and the other hydrophilic, meaning they are either unable or able to mix with water. The hydrophobic core can be loaded with drugs to treat disease.

The micelles might be used instead of more conventional "membrane sealing agents," including polyethylene glycol, which makes up the outer shell of the micelles. Because of the nanoscale size and the polyethylene glycol shell of the micelles, they are not quickly filtered by the kidney or captured by the liver, enabling them to remain in the bloodstream long enough to circulate to damaged tissues.

In research led by biomedical engineering doctoral student Yunzhou Shi, the micelles also were shown to be non-toxic at the concentrations required.

"With the micelles, you need only about 1/100,000th the concentration of regular polyethylene glycol," Cheng said.

Ongoing research at Purdue has shown the benefits of polyethylene glycol, or PEG, to treat animals with spinal cord injuries. The work is led by Richard Borgens, director of the Center for Paralysis Research and the Mari Hulman George Professor of Neurology in the School of Veterinary Medicine.

Findings have shown that PEG specifically targets damaged cells and seals the injured area, reducing further damage. It also helps restore cell function.

The new findings were made possible by the interdisciplinary nature of the work, which involves Borgens and other Purdue researchers, Cheng said. The collaboration included Borgens; Riyi Shi, an associate professor of biomedical engineering and basic medical sciences; and Kinam Park, Showalter Distinguished Professor of Biomedical Engineering and a professor of pharmaceuticals.

Findings showed that cores made of particular materials work better than others at restoring function to damaged axons, which are slender extensions of nerve cells.

The research also showed that without the micelles treatment about 18 percent of axons recover in a segment of damaged spinal cord tested in a "double sucrose gap recording chamber." The micelles treatment boosted the axon recovery to about 60 percent. The researchers used the chamber to study how well micelles repaired damaged nerve cells by measuring the "compound action potential," or the ability of a spinal cord to transmit signals.

The experiment mimics what happens during a traumatic spinal cord injury. Findings showed that micelles might be used to repair axon membranes damaged by compression injuries, a common type of spine injury.

The researchers also tracked dyed micelles in rats, demonstrating that the nanoparticles were successfully delivered to injury sites. Findings also showed micelles-treated animals recovered the coordinated control of all four limbs, whereas animals treated with conventional polyethylene glycol did not.

Keywords: Biomedical Engineering, Chemicals, Chemistry, Engineering, Nanotechnology, Nanotech, Emerging Technologies, Nanomedicine, Nanoparticle, Nanoscale, Veterinary Research, Purdue University.

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United States Geological Survey

From toxic dust and algae to ill winds from Africa

2009 DEC 21 - (VerticalNews.com) -- Toxins in coal-tar-based sealcoats in parking lots may be the culprit in contaminated house dust, according to a USGS study. PAHs - or polycyclic aromatic hydrocarbons - are large molecules found in oil, coal and tar deposits, and can have toxic effects. It's long been known that PAHs are often found in house dust; however, the specific sources of these PAHs are largely undetermined. Researchers found that dust from indoor areas near parking lots with coal-tar-based sealcoat had substantially elevated concentrations of PAHs. This study, PAHs in house dust and relation to coal-tar-based pavement sealcoat, will be presented on Nov. 20 at 10:20 a.m. in the Belle Chasse Room. For more information, contact Barbara Mahler at bjmahler@usgs.gov or at 512-927-3566.

Eensy-weensy spiders play large role as sentinels of contaminants: Spiders that live near water may be an effective warning system for contaminants in aquatic ecosystems, according to a new USGS and U.S. Environmental Protection Agency study. Scientists examined PCB (polychlorinated biphenyls) levels in shoreline-living spiders at Lake Hartwell, a Superfund site in South Carolina, and used this information to map contaminant concentrations in lake sediment. Future monitoring studies will use the spiders as indicators of ecosystem recovery from PCB contamination. Researchers also made risk maps for a spider-eating bird, the Carolina wren, which could be exposed to PCBs through eating spiders. These spiders rely heavily on adult aquatic insects for food and play a key ecological role in the transfer of contaminants between water and land ecosystems. In spite of this, they are underused as a sentinel species at contaminated sediment sites. This study, using riparian spiders as sentinels of PCB export and risk, will be presented on Nov. 21 at 3:50 p.m. in the Versailles Room. To learn more, contact David Walters at waltersd@usgs.gov or at 970-226-9484.

It's an ill wind that blows: African dust making it across the ocean: Increasing quantities of African dust have blown across the Atlantic Ocean to the Caribbean and Americas over the past few decades. During that time, the dust's composition has changed. In this study, African dust air masses in Africa and the Caribbean were analyzed for persistent organic contaminants and metals. These potentially toxic contaminants can originate from the burning of plastics, biomass and waste; widespread use of pesticides, plastics, and pharmaceuticals; and increased industrialization. Multiple pesticides and other contaminants, including carcinogens, suppressors of immune systems, disruptors of endocrine systems, and nervous system or liver toxins were identified from all sample sites. All are known to persist in the environment, accumulate in organisms, and are toxic at very low concentrations. This study, *Chasing clouds of dust: transoceanic transport of synthetic organic pollutants and trace metals with African dust*, will be presented on Nov. 22 at 11 a.m. in Ballroom D. For more information, contact Ginger Garrison at ginger_garrison@usgs.gov or at 727-803-8747, ext. 3061.

Invasive carp and the secret language of scent: The chemical language of invasive Asian carp may eventually be turned against them in the fight to help eradicate these harmful invaders from the Mississippi River. Asian carp, introduced into the Mississippi River in the 1970s and 80s, are now abundant throughout the lower Missouri, the Mississippi and Ohio rivers, posing a threat to native species. Carp seem to have a chemical language effective for predator defense and reproduction in murky environments, so researchers put this language to the test by subjecting young carp to extracts prepared from the skins of other carp. The result: the young carp, upon detecting the extracts, significantly avoided them by moving from the area, becoming immobile, and schooling. This "alarm substance" may be effective in repelling carp from habitat critical to native species. Young carp were also attracted to the chemical stimuli of schooling carp, which can assist in conventional eradication methods. This study, *Use of pheromones to control invasive Asian carp*, will be presented on Nov. 20 at 10:40 a.m. in the Elmwood Room. To learn more, contact Robin Calfee at rcafee@usgs.gov or at 573-441-2969.

Toxic algae may be harming endangered suckers in Klamath Lake: Preliminary data suggest that algal toxins may be hindering the population growth of endangered Lost River suckers and shortnose suckers in Upper Klamath Lake in southern Oregon. This lake is characterized by high levels of nitrogen and phosphorus, nutrients that promote large, frequent cycles of cyanobacterial or algal blooms from spring through fall. Researchers evaluated the presence and effects of these toxins, specifically microcystins, which are harmful to other aquatic life, in the lake's water and in fish from the lake. Examination of liver tissues from juvenile suckers revealed adverse physiological effects consistent with tissue damage associated with microcystin exposure. Significant concentrations of the toxins were reported from all field sampling stations in the lake. This study, *Cyanobacterial toxins found in Upper Klamath Lake, Oregon: implications for endangered fish*, will be presented on Nov. 22 at 1:10 p.m. in Ballroom C. To learn more, contact Kathy Echols at kechols@usgs.gov or at 573-876-1838.

Wading through the sources of lake contamination: Contamination of urban lakes and streams by polycyclic aromatic hydrocarbons (PAHs) is widespread and has been increasing over the last 40 years in the United States. These PAHs can be toxic to bottom-dwelling organisms, can cause tumors in fish, and several are believed to cause cancer in humans. In this study, researchers examined five sources of PAHs in 40 urban lakes from across the United States, including coal-tar-based pavement sealcoat, coal combustion, oil combustion, vehicle emissions and wood combustion. Of the five sources studied, sealcoat was the strongest contributor to PAH contamination in lake sediment. This research can help those trying to reduce pollution levels in the urban environment by providing them with a better understanding of PAH sources. This study, *Sources of PAHs to urban lakes in the United States*, will be presented on Nov. 23 at 11:20 a.m. in the Jefferson Room. For more information, contact Peter Van Metre at pcvanmet@usgs.gov or at 512-927-3506.

Tiny particles with big effects: Industrially produced nanoparticles are being dispersed into the environment from a range of everyday human activities. Use of consumer nanoproducts, such as sunscreen with zinc oxide or bed sheets and socks containing silver nanoparticles, all have the potential to release metals into the environment. Some of these particles can be toxic, but little is known about how nanoparticles will accumulate in the environment. Interactions between nanoparticles and living organisms are influenced by the unique physico-chemical properties of each kind of nanoparticle. This study introduces a new approach to evaluate the toxicity of nanoparticles with metal as an ingredient, and offers a way to begin to understand potential beneficial uses and potential environmental risks. This study, *Characterizing the bioavailability and toxicity of engineered nanoparticles using enriched isotope tracers and biodynamic modeling*, will be presented on Nov. 22 at 10 a.m. in the Oak Alley Room. For more information, contact Marie-Noele Croteau at mcroteau@usgs.gov or at 650-329-4424.

Cause of feminized male sturgeon remains elusive: The number of male shovelnose sturgeon with female characteristics in the Missouri River has increased from about 3 percent in 1968 to 15 percent in 2001. USGS researchers examined the levels of PCBs (polychlorinated biphenyls) and organochlorine pesticides in normal and intersex fish to see whether these hormone-mimicking compounds were associated with the condition. Although the compounds were all present in sturgeon at levels of concern, no differences in levels between intersex male fish and normal male fish were detected. Still, reproductive development is complex and can depend on many factors, including a fish's age at its first exposure. These fish are also exposed to many other compounds that have not yet been tested. Recent findings of intersex in endangered pallid sturgeon underscore the need to find the cause of this condition. This study, *Intersex gonads in Missouri River shovelnose sturgeon: occurrence, severity, and association with contaminants*, will be presented on Nov. 22 at 8:40 a.m. in Ballroom A. To learn more, contact Diane Papoulias at dpapoulias@usgs.gov or at 573-999-1788.

Keywords: Chemicals, Chemistry, Conservation, Ecological, Ecology, Emerging Technologies, Engineered, Environment, Environmental Protection, Nanoparticle, Nanoproducts, Nanotech, Nanotechnology, Zinc Oxide, United States Geological Survey.

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Cornell University

Small optical force can budge nanoscale objects

2009 DEC 14 - (VerticalNews.com) -- With a bit of leverage, Cornell researchers have used a very tiny beam of light with as little as 1 milliwatt of power to move a silicon structure up to 12 nanometers. That's enough to completely switch the optical properties of the structure from opaque to transparent.

The technology could have applications in the design of micro-electromechanical systems (MEMS) - nanoscale devices with moving parts - and micro-optomechanical systems (MOMS) which combine moving parts with photonic circuits, said Michal Lipson, associate professor of electrical and computer engineering.

The research by postdoctoral researcher Gustavo Wiederhecker, Long Chen Ph.D. '09, Alexander Gondarenko, Ph.D. '10, and Lipson appears in the online edition of the journal *Nature* and will appear in a forthcoming print edition.

Light can be thought of as a stream of particles that can exert a force on whatever they strike. The sun doesn't knock you off your feet because the force is very small, but at the nanoscale it can be significant. "The challenge is that large optical forces are required to change the geometry of photonic structures," Lipson explained.

But the researchers were able to reduce the force required by creating two ring resonators - circular waveguides whose circumference is matched to a multiple of the wavelength of the light used - and exploiting the coupling between beams of light traveling through the two rings.

A beam of light consists of oscillating electric and magnetic fields, and these fields can pull in nearby objects, a microscopic equivalent of the way static electricity on clothes attracts lint. This phenomenon is exploited in "optical tweezers" used by physicists to trap tiny objects. The forces tend to pull anything at the edge of the beam to be pulled toward the center. When light travels through a waveguide whose cross-section is smaller than its wavelength some of the light spills over, and with it the attractive force. So parallel waveguides close together, each carrying a light beam, are drawn even closer, rather like two streams of rainwater on a windowpane that touch and are pulled together by surface tension.

The researchers created a structure consisting of two thin, flat silicon nitride rings about 30 microns (millionths of a meter) in diameter mounted one above the other and connected to a pedestal by thin spokes. Think of two bicycle wheels on a vertical shaft, but each with only four thin, flexible spokes. The ring waveguides are three microns wide and 190 nanometers (nm - billionths of a meter) thick, and the rings are spaced 1 micron apart.

When light at a resonant frequency of the rings, in this case infrared light at 1533.5 nm, is fed into the rings, the force between the rings is enough to deform the rings by up to 12 nm, which the researchers showed was enough to change other resonances and switch other light beams traveling through the rings on and off.

When light in both rings is in phase - the peaks and valleys of the wave match - the two rings are pulled together. When it is out of phase they are repelled. The latter phenomenon might be useful in MEMS, where an ongoing problem is that silicon parts tend to stick together, Lipson said.

An application in photonic circuits might be to create a tunable filter to pass one particular optical wavelength, Wiederhecker suggested.

Keywords: Computers, Electronics, Emerging Technologies, Engineering, Geometry, Magnetic Field, Mathematics, Microelectromechanical Systems, Nanoscale, Nanotech, Nanotechnology, Photons, Technology, Cornell University.

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Agency for Science Technology and Research A*STAR Singapore

Rapid cardiac biomarker testing system developed by Singapore scientists

2009 DEC 21 - (VerticalNews.com) -- Scientists at Singapore's Institute of Microelectronics (IME) have developed a rapid and sensitive integrated system to test simultaneously for specific cardiac biomarkers in finger prick amount of blood.

The silicon-based integrated system's features could help physicians quickly arrive at the right diagnosis for timely medical intervention in patients suspected of having heart attacks -- particularly individuals who do not show obvious signs of chest pains or shortness of breath, according to researchers at IME, one of the research institutes sponsored by Singapore's A*STAR (Agency for Science, Technology and Research).

The IME-developed cardiac biomarker testing system significantly cuts the time needed for sample preparation and analysis to just 45 minutes from the six hours typically required for the conventional testing platform known as ELISA (Enzyme-linked Immunosorbent Assay).

Because of its multiplexing capability - measuring several cardiac biomarkers simultaneously -- the new system contributes to the detail and certainty of diagnosis.

"The key to saving lives in heart attack scenarios is time and the quicker and more accurate the diagnosis can be made, the faster proper care and treatment can be instituted," said Philip Wong, M.D., Senior Consultant at the Singapore National Heart Centre, which worked with IME in developing the new system.

"The test kits can be rapidly deployed, and tests to confirm clinical diagnosis can be completed within short time frames," said Dr. Wong. "As the kits are deployed on-site as opposed to a central laboratory, confirmation of condition is rapid without the need to transport patients' specimens."

The IME-developed system is a label-free technology that uses semiconducting silicon nanowires (SiNWs) as biosensors. The working principle behind the nanowire biosensors is the field-effect transistor, which is responsible for generating a measurable electrical response when specific antibody-antigen interactions occur on the nanowire surface.

Specific antibodies that are immobilized onto the nanowire surface will elicit antibody-antigen interactions when allowed to come into contact with the variety of charged cardiac biomarkers. Released into the blood when the heart is injured, cardiac protein biomarkers such as troponin-T and creatinine kinases, are the basis of medical tests of patients in which a heart attack is suspected.

The IME-developed system is a label-free technology - thus eliminating the tagging step, thereby saving time and reagent consumption costs. In classical biochemical methods, the tagging of a fluorescent dye to the targeted analyte is used to detect and quantify the targeted analyte.

The IME-developed system's parallel detection of several biomarkers is made possible by the integration of the following elements into one single microsystem:

In-built filtration to extract almost instantaneously the test serum from the whole blood sample. An array of SiNW chips coated with different antibodies for simultaneous detection of several biomarkers. A recording microchip for concurrent and immediate signal-readout from multiple SiNW sensors.

The first demonstration of the full system capability revealed impressive sensitivity and speed because it can attain in just under 45 minutes a low detection limit of 1 pg/ml for cardiac biomarkers, troponin-T and creatinine kinases, from 2 (μ l) blood.

Commercially available test kits require more than 1 ng/ml of cardiac biomarkers in order for them to be detected, which is 1000 times less sensitive than the IME-developed system.

The technology and processes used for fabricating this integrated device have yielded two patents to date.

"IME's proprietary nanotechnology behind the new silicon-based integrated system can be extended to other protein-based diagnostics from blood and saliva samples to provide fast, sensitive, accurate and portable solutions for protein-based disease screening," said Kwong Dim-Lee, Ph.D., IME's Executive Director.

Cardiac biomarkers, such as troponin-T and creatinine kinases are proteins used for heart attack diagnosis. Troponin and creatinine are constituents of the cardiac muscle cells that are released into the blood when the cells and tissues are injured after a heart attack. Hence elevated levels of troponin-T or creatinine kinases in the blood alert the doctors that a heart attack has taken place.

Troponin-T is established as a sensitive marker of myocardial injury in the general population. The troponin-T level in the blood increases within 4 to 6 hours after the onset of a heart attack and peaks at about 24 hours. This increase lasts for 10 to 14 days.

Today, the first test performed on a patient who is suspected of having a heart attack would be an electrocardiogram, commonly known as the ECG. However, normal results from an ECG do not rule out the occurrence of a heart attack, because the test is not sensitive enough to detect minute anomalies in the reading, particularly when the anomaly needs to be captured within a narrow time window of 2 - 30 minutes following the onset of a heart attack. When an abnormal ECG reading cannot be established, the patient has to undergo further blood tests to detect the relevant cardiac biomarkers.

ELISA, which is the current method for detecting cardiac biomarkers, uses fluorescent labeling technology. This biochemical technique is laborious and time-consuming; the entire set-up requires specialized personnel and instruments to implement, thereby contributing to the per analysis cost. Hence, ELISA does not favor prompt diagnosis for critical split-second medical decisions.

Keywords: Asia, Biochemical, Biosensor, Chemicals, Chemistry, Electronics, Emerging Technologies, Microelectronics, Nanotech, Nanotechnology, Nanowire, Silicon Nanowires, Singapore, Technology, Agency for Science Technology and Research A*STAR Singapore.

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DOE/Ames Laboratory

Metamaterials could reduce friction in nanomachines

2010 JAN 4 - (VerticalNews.com) -- Nanoscale machines expected to have wide application in industry, energy, medicine and other fields may someday operate far more efficiently thanks to important theoretical discoveries concerning the manipulation of famous Casimir forces that took place at the U.S. Department of Energy's Ames Laboratory.

The groundbreaking research, conducted through mathematical simulations, revealed the possibility of a new class of materials able to exert a repulsive force when they are placed in extremely close proximity to each other. The repulsive force, which harnesses a quantum phenomenon known as the Casimir effect, may someday allow nanoscale machines to overcome mechanical friction.

Though the frictional forces in nanoscale environments are small, they significantly inhibit the function of the tiny devices designed to operate in that realm, explained Costas Soukoulis, a senior physicist at the Ames Lab and Distinguished Professor of physics at Iowa State University, who led the research effort.

Soukoulis and his teammates, including Ames Laboratory assistant scientist Thomas Koschny, were the first to study the use of exotic materials known as chiral metamaterials as a way to harness the Casimir effect. Their efforts have demonstrated that it is indeed possible to manipulate the Casimir force. The findings were published in the Sept. 4, 2009 issue of Physical Review Letters, in an article entitled, "Repulsive Casimir Force in Chiral Metamaterials."

Understanding the importance of their discovery requires a basic understanding of both the Casimir effect and the unique nature of chiral metamaterials.

The Casimir effect was named after Dutch physicist Hendrik Casimir, who postulated its existence in 1948. Using quantum theory, Casimir predicted that energy should exist even in a vacuum, which can give rise to forces acting on the bodies brought into close proximity of each other. For the simple case of two parallel plates, he postulated that the energy density inside the gap should decrease as the size of the gap decreases, also meaning work must be done to pull the plates apart. Alternatively, an attractive force that pushes the plates closer together can be said to exist.

Casimir forces observed experimentally in nature have almost always been attractive and have rendered nanoscale and microscale machines inoperable by causing their moving parts to permanently stick together. This has been a long-standing problem that scientists working on such devices have struggled to overcome.

Remarkably, this new discovery demonstrates that a repulsive Casimir effect is possible using chiral metamaterials. Chiral materials share an interesting characteristic: their molecular structure prevents them from being superimposed over a reverse copy of themselves, in the same way a human hand cannot fit perfectly atop a reverse image of itself. Chiral materials are fairly common in nature. The sugar molecule (sucrose) is one example. However, natural chiral materials are incapable of producing a repulsive Casimir effect that is strong enough to be of practical use.

For that reason, the group turned its attention to chiral metamaterials, so named because they do not exist in nature and must instead be made in the lab. The fact that they are artificial gives them a unique advantage, commented Koschny. "With natural materials you have to take what nature gives you; with metamaterials, you can create a material to exactly meet your requirements," he said.

The chiral metamaterials the researchers focused on have a unique geometric structure that enabled them to change the nature of energy waves, such as those located in the gap between the two closely positioned plates, causing those waves to exert a repulsive Casimir force.

The present study was carried out using mathematical simulations because of the difficulties involved in fabricating these materials with semiconductor lithographic techniques. While more work needs to be done to determine if chiral materials can induce a repulsive Casimir force strong enough to overcome friction in nanoscale devices, practical applications of the Casimir effect are already under close study at other DOE facilities, including Los Alamos and Sandia national laboratories. Both have expressed considerable interest in using the chiral metamaterials designed at Ames Laboratory to fabricate new structures and reduce the attractive Casimir force, and possibly to obtain a repulsive Casimir force.

Keywords: Department Of Energy, Electronics, Emerging Technologies, Energy, Nanomachine, Nanoscale, Nanotech, Nanotechnology, Oil & Gas, Physics, Quantum Physics, Quantum Theory, Semiconductor, DOE/Ames Laboratory.

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California Institute of Technology

Caltech physicists propose quantum entanglement for motion of microscopic objects

2010 JAN 4 - (VerticalNews.com) -- Researchers at the California Institute of Technology (Caltech) have proposed a new paradigm that should allow scientists to observe quantum behavior in small mechanical systems.

Their ideas, described in the latest online issue of the Proceedings of the National Academy of Sciences, offer a new means of addressing one of the most fascinating issues in quantum mechanics: the nature of quantum superposition and entanglement in progressively larger and more complex systems.

A quantum superposition is a state in which a particle, such as a photon or atom, exists simultaneously in two locations. Entanglement, which Albert Einstein called "spooky action at a distance," allows particles to share information even if they are physically separated.

A key challenge in observing quantum behavior in a small mechanical system is suppressing interactions between the system and its noisy environment - i.e., the surrounding material supporting the system or any other external contact. The random thermal vibrations of the system's surroundings, for example, can be transferred to the mechanical object and destroy its fragile quantum properties. To address this issue, a number of groups worldwide have begun to use cryogenic setups in which the immediate environment is cooled down to a very low temperature to reduce the magnitude of these random vibrations.

The Caltech team suggests a fundamentally different approach: using the forces imparted by intense beams of light to "levitate" the entire mechanical object, thereby freeing it from external contact and material supports. This approach, the researchers show, can dramatically reduce environmental noise, to the point where diverse manifestations of quantum behavior should be observable even when the environment is at room temperature.

Among the scientists involved in the work are Darrick Chang, a postdoctoral scholar at Caltech's Institute for Quantum Information; Oskar Painter, associate professor of applied physics; and H. Jeff Kimble, Caltech's William L. Valentine Professor and professor of physics.

The idea of using optical forces to trap or levitate small particles is actually well established. It was pioneered by Arthur Ashkin of Bell Laboratories in the 1970s and 1980s, and has since formed the basis for scientific advances such as the development of "optical tweezers" - which are frequently used to control the motion of small biological objects - and the use of lasers to cool atoms and trap them in space. These techniques provide an extremely versatile toolbox for manipulating atoms, and have been employed to demonstrate a variety of quantum phenomena at the atomic level.

In the new work, Chang and his colleagues demonstrate theoretically that similar success can be achieved when an individual atom is replaced by a much more massive - but still nanoscale - mechanical system. A related scheme has been presented simultaneously by a group at the Max Planck Institute of Quantum Optics in Garching, Germany [<http://arxiv.org/abs/0909.1469>].

The system proposed by the Caltech team consists of a small sphere made out of a highly transparent material such as fused silica. When the sphere comes into contact with a laser beam, optical forces naturally push the sphere toward the point where the intensity of light is greatest, trapping the sphere at that point. The sphere typically spans about 100 nm in diameter, or roughly a thousandth the width of a human hair. Because of its small size, the sphere's remaining interactions with the environment - any that don't involve direct contact with another material, because the sphere is levitating - are sufficiently weak that quantum behavior should easily emerge.

For such behavior to appear, however, the sphere must also be placed inside an optical cavity, which is formed by two mirrors located on either side of the trapped sphere. The light that bounces back and forth between the mirrors both senses the motion of the sphere and is used to manipulate that motion at a quantum-mechanical level.

The researchers describe how this interaction can be used to remove energy from, or cool, the mechanical motion until it reaches its quantum ground state - the lowest energy allowable by quantum mechanics. A fundamental limit to this process is set by the relative strengths of the optical cooling and the rate at which the environment tends to heat (return energy to) the motion, bringing it back to the ambient temperature.

In principle, the motion of the well-isolated sphere can be cooled starting from room temperature down to a final temperature that is ten million times lower; in that super-cooled state, the center of mass of the sphere moves by only the minimum possible amount set by intrinsic quantum fluctuations.

The researchers also propose a scheme to observe a feature known as entanglement, which lies at the heart of quantum mechanics. Two remotely located systems that are quantum entangled share correlations between them that are stronger than classically allowed. In certain circumstances, entanglement can be a very valuable resource; it forms the basis for proposals to realize improved metrology and more powerful (quantum) computers.

The proposed scheme consists of sending a pair of initially entangled beams of light - the production of which was first accomplished by Kimble's group at Caltech in 1992 - into two separate cavities, each containing a levitated sphere. Through a process known as quantum-state transfer, all of the properties of the light - in particular, the entanglement and its associated correlations - can be mapped onto the motion of the two spheres.

While the sizes of these nanomechanical objects are still very far from those we associate with everyday experience, the Caltech researchers believe that their proposal presents an exciting opportunity to realize and control quantum phenomena at unprecedented scales - in this case, for objects containing approximately 10 million atoms.

Keywords: Applied Physics, Computers, Conservation, Ecology, Electronics, Emerging Technologies, Environment, Nanomechanical, Nanoscale, Nanotech, Nanotechnology, Photons, Physics, Quantum Compute, Quantum Fluctuation, Quantum Information, Quantum Mechanics, Quantum Optics, Quantum Physics, Quantum Superposition, Technology, California Institute of Technology.

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Science

Reports from R. Gunawidjaja et al highlight recent research in science

2009 DEC 21 - (VerticalNews.com) -- "It is demonstrated that bimetallic silver-gold anisotropic nanostructures can be easily assembled from various nanoparticle building blocks with well-defined geometries by means of electrostatic interactions. One-dimensional (1D) silver nanowires, two-dimensional (2D) silver nanoplates, and spherical gold nanoparticles are used as representative building blocks for bottom-up assembly," scientists in the United States report.

"The gold nanoparticles are electrostatically bound onto the 1D silver nanowires and the 2D silver nanoplates to give bimetallic nanostructures. The unique feature of the resulting nanostructures is the particle-to-particle interaction that subjects absorbed analytes to an enhanced electromagnetic field with strong polarization dependence. The Raman activity of the bimetallic nanostructures is compared with that of the individual nanoparticle blocks by using rhodamine 6G solution as the model analyte. The Raman intensity of the best-performing silver-gold nanostructure is comparable with the dense array of silver nanowires and silver nanoplates that were prepared by means of the Langmuir-Blodgett technique," wrote R. Gunawidjaja and colleagues.

The researchers concluded: "An optimized design of a single-nanostructure substrate for surface-enhanced Raman spectroscopy (SERS), based on a wet-assembly technique proposed here, can serve as a compact and low-cost alternative to fabricated nanoparticle arrays."

Gunawidjaja and colleagues published their study in *Small* (Bimetallic Nanostructures as Active Raman Markers: Gold-Nanoparticle Assembly on 1D and 2D Silver Nanostructure Surfaces. *Small*, 2009;5(21):2460-2466).

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Publisher contact information for the journal *Small* is: Wiley-V C H Verlag GmbH, PO Box 10 11 61, D-69451 Weinheim, Germany.

Keywords: City:Atlanta, State:GA, Country:United States, Electromagnet, Electromagnetic, Electronics, Electrostatic, Emerging Technologies, Gold Nanoparticles, Nanoparticle, Nanoplates, Nanostructural, Nanostructure, Nanostructures, Nanotech, Nanotechnology, Nanowire.

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Science

Researchers from Henan University provide details of new studies and findings in the area of science

2009 DEC 21 - (VerticalNews.com) -- According to a study from Kaifeng, People's Republic of China, "The self-assembly of guanosine (G) molecules on solid surfaces is investigated by tapping-mode atomic force microscopy (AFM) upon controlling and introducing external factors (stimuli) to the G stock Solution Such as incubation time, presence/absence of metal cations, and mechanical shaking. Surprisingly, at different stages of incubation time at room temperature and in the absence of any metal cation, in the, G lock solution, which are known to be one of the governing factors in forming G-nanostructures, two assembly pathways resulting into two distinct supramolecular nanostructures were revealed."

"Astonishingly, by introducing a mechanical shaking of the tube containing the G stock solution, one-dimensional (1D) wires of G molecules are observed by AFM, and very interestingly, novel "branched" supramolecular nanostructures are formed. We have also observed that the later branched G nanostructures can grow further into a two-dimensional (2D) thin film by increasing the incubation time of the G stock solution at room temperature after it is exposed to the external mechanical stimuli," wrote Y.L. Li and colleagues, Henan University.

The researchers concluded: "The self-assembled nanostructures of G molecules are changed significantly by tuning the assembly conditions, which show that it is indeed possible to grow complex 2D nanostructures from simple nucleoside molecules."

Li and colleagues published the results of their research in *Langmuir* (Influence of Tunable External Stimuli on the Self-Assembly of Guanosine Supramolecular Nanostructures Studied By Atomic Force Microscope. *Langmuir*, 2009;25(23):13432-13437).

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The publisher of the journal *Langmuir* can be contacted at: American Chemical Society, 1155 16th St., NW, Washington, DC 20036, USA.

Keywords: City:Kaifeng, Country:People's Republic of China, Emerging Technologies, Nanostructural, Nanostructure, Nanostructures, Nanotech, Nanotechnology, Supramolecular, Supramolecular Nanostructures, Henan University.

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Nanotechnology

Research in the area of nanotechnology reported from Stanford University

2009 DEC 21 - (VerticalNews.com) -- According to a study from the United States, "This paper discusses a method for the direct patterning of Au electrodes at nanoscale resolution using dip-pen nanolithography, with proof-of-concept demonstrated by creating single-walled carbon nanotube devices. This technique enables insight into three key concepts at the nanoscale: using dip-pen nanolithography as an alternative to electron-beam lithography for writing contacts to carbon nanotubes, understanding the integrity of contacts and devices patterned with this technique, and on a more fundamental level, providing a facile method to compare and understand electrical and Raman spectroscopy data from the same isolated carbon nanotube."

"Electrical contacts to individual and small bundle single-walled carbon nanotubes were masked by an alkylthiol that was deposited via dip-pen nanolithography on a thin film of Au evaporated onto spin-cast, nonpercolating, and highly isolated single-walled carbon nanotubes. A wet Au etching step was used to form the individual devices. The electrical characteristics for three different single-walled carbon nanotube devices are reported: semimetallic, semiconducting, and metallic. Raman analysis on representative devices corroborates the results from AFM imaging and electrical testing. This work demonstrates a technique for making electrical contact to nanostructures of interest and provides a platform for directly corroborating electrical and optical measurements," wrote W.M. Wang and colleagues, Stanford University.

The researchers concluded: "The merits of using dip-pen nanolithography include flexible device configuration (such as varying the channel length and the number, size, and orientation of contacts), targeted patterning of individual devices with imaging and writing conducted in the same instrument under ambient conditions, and negligible damage to single-walled carbon nanotubes during the fabrication process."

Wang and colleagues published their study in *Acs Nano* (Dip-Pen Nanolithography of Electrical Contacts to Single-Walled Carbon Nanotubes. *Acs Nano*, 2009;3(11):3543-3551).

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Publisher contact information for the journal *Acs Nano* is: American Chemical Society, 1155 16th St., NW, Washington, DC 20036, USA.

Keywords: City:Stanford, State:CA, Country:United States, Electrodes, Electron Beam Lithography, Electronics, Emerging Technologies, Nanolithograph, Nanolithography, Nanoscale, Nanostructural, Nanostructure, Nanostructures, Nanotech, Nanotechnology, Nanotube, Single Walled Carbon Nanotubes, Acs Nano, Stanford University.

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Physical Chemistry

Research findings from Korea University update understanding of physical chemistry

2009 DEC 7 - (VerticalNews.com) -- "We synthesized various nanocrystal (e.g., CdS, CdSe, and Cu₂S)-carbon nanotube (NC-CNT) and NC-TiO₂ hybrid nanostructures using the solvothermal method and compared their photocatalytic ability toward the visible-light-driven degradation of methylene blue (MB) dye. The free US NCs exhibited higher degradation efficiency than the CdSe and Cu₂S NCs," researchers in South Korea report.

"The photocatalytic abilities of the NCs were found to determine the relative degradation efficiency of their CNT and TiO₂ hybrid nanostructures. These results suggest that the oxidative N-demethylation degradation involves the transfer of holes from the NCs to MB," wrote K.H. Ji and colleagues, Korea University.

The researchers concluded: "The hybridization of the NCs with the TiO₂ NCs and CNTs enhances the oxidative degradation rate to the same extent, suggesting that the interfacial electron transfer process from the NCs to the attached CNTs (or TiO₂), which retards the recombination of the electrons and holes, is comparable for both hybrid nanostructures."

Ji and colleagues published their study in the *Journal of Physical Chemistry C* (Comparative Photocatalytic Ability of Nanocrystal-Carbon Nanotube and -TiO₂ Nanocrystal Hybrid Nanostructures. *Journal of Physical Chemistry C*, 2009;113(46):19966-19972).

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Publisher contact information for the *Journal of Physical Chemistry C* is: American Chemical Society, 1155 16th St., NW, Washington, DC 20036, USA.

Keywords: Country:South Korea, Emerging Technologies, Nanocrystal, Nanostructural, Nanostructure, Nanostructures, Nanotech, Nanotechnology, Nanotube, Photocatalyst, Photocatalytic, Physical Chemistry

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Applied Surface Science

Studies from Chiang Mai University provide new data on applied surface science

2010 JAN 11 - (VerticalNews.com) -- "Gold colloid: ZnO nanostructures were prepared from Zn powder by using thermal oxidation technique on alumina substrates, then it was impregnated by gold colloid for comparative study. The gold colloid is the solution prepared by chemical reduction technique; it appeared red color for gold nanoparticle solution and yellow color for gold solution," researchers in Chiang Mai, Thailand report.

"The heating temperature and sintering time of thermal oxidation were 700 degrees C and 24 h, respectively under oxygen atmosphere. The structural characteristics of gold colloid: ZnO nanostructures and pure ZnO nanostructures were studied using field emission scanning electron microscope (FE-SEM). From FE-SEM images, the diameter and length of gold colloid: ZnO nanostructures and ZnO nanostructures were in the ranges of 100-500 nm and 2.0-7.0 μ m, respectively. The ethanol sensing characteristics of gold colloid: ZnO nanostructures and ZnO nanostructures were observed from the resistance alteration under ethanol vapor atmosphere at concentrations of 50, 100, 200, 500, and 1000 ppm with the operating temperature of 260-360 degrees C. It was found that the sensitivity of sensor depends on the operating temperature and ethanol vapor concentrations," wrote E. Wongrat and colleagues, Chiang Mai University.

The researchers concluded: "The sensitivity of gold colloid: ZnO nanostructures were improved with comparative pure ZnO nanostructures, while the optimum operating temperature was 300 degrees C. The mechanism analysis of sensor revealed that the oxygen species on the surface was O₂."

Wongrat and colleagues published their study in *Applied Surface Science* (Comparative study of ethanol sensor based on gold nanoparticles: ZnO nanostructure and gold: ZnO nanostructure. *Applied Surface Science*, 2009;256(4):968-971).

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Publisher contact information for the journal *Applied Surface Science* is: Elsevier Science BV, PO Box 211, 1000 AE Amsterdam, Netherlands.

Keywords: City:Chiang Mai, Country:Thailand, Emerging Technologies, Gold Nanoparticles, Nanoparticle, Nanostructural, Nanostructure, Nanostructures, Nanotech, Nanotechnology, Surface Science

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Science

Reports outline science study findings from D. Joseph and colleagues

2009 DEC 7 - (VerticalNews.com) -- According to a study from South Korea, "A facile and effective method for the synthesis of gold nanostructures using beta-cyclodextrin in aqueous alkaline medium is reported. The results demonstrate that leaf-like, rugged, dendritic, and tadpole-shaped gold nanostructures are obtained with high yield for the first time under the same experimental conditions by using four different surfactants."

"To study the effect of surfactant on the shape of the nanoparticles, the experiments were also carried out in the absence of surfactant and in the presence of poly(l-vinyl-2-pyrrolidone). The growth process of the dendritic gold nanostructures formed was investigated by withdrawing samples from the heated solution and examining the intermediate products formed by transmission electron microscopic analysis. The formation mechanism of the anisotropic gold nanostructures is discussed, and it is demonstrated that the cooperative effect of cyclodextrin and the surfactant molecules determines the ultimate morphology of the gold nanostructures obtained. In addition, the effect of the as-prepared nanostructures as an active material in surface-enhanced Raman scattering has been investigated by employing 4-aminothiophenol as a probe molecule," wrote D. Joseph and colleagues.

The researchers concluded: "Thus, different enhancement signals are obtained for the different nanostructures; the dendritic nanostructures showed the strongest intensity of the SERS signals and smallest for the leaf-like nanostructures."

Joseph and colleagues published the results of their research in *Langmuir* (Surfactant-Directed Multiple Anisotropic Gold Nanostructures: Synthesis and Surface-Enhanced Raman Scattering. *Langmuir*, 2009;25(22):13224-13231).

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The publisher of the journal *Langmuir* can be contacted at: American Chemical Society, 1155 16th St., NW, Washington, DC 20036, USA.

Keywords: Country:South Korea, Emerging Technologies, Nanoparticle, Nanostructural, Nanostructure, Nanostructures, Nanotech, Nanotechnology

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Chemical Research

New findings from Shizuoka University in the area of chemical research published

2009 DEC 14 - (VerticalNews.com) -- According to recent research from Hamamatsu, Japan, "Platinum, palladium, gold, rhodium, and silver monometallic nanoparticles protected by poly(N-vinyl-2-pyrrolidone), a water-soluble polymer, were prepared using an alcohol reduction method. Platinum/silver bimetallic nanoparticles were prepared by self-organization from the platinum and silver monometallic nanoparticles."

"Platinum nanoparticles showed the highest catalytic activity for the decomposition of hydrogen peroxide in the monometallic nanoparticles used in this study. Platinum, silver, and platinum/silver nanoparticles effectively catalyzed the decomposition of hydrogen peroxide generated from the autooxidation of hydroquinone, a derivative of carcinogenic benzene. The autooxidation of hydroquinone itself was hardly inhibited by platinum nanoparticles. The platinum nanoparticles in particular showed the highest catalytic activity per unit atom. The activity of a 2 pg platinum nanoparticle was comparable to that of 20 units of catalase. The modification of platinum nanoparticles with silver rather suppressed the activity of hydrogen peroxide decomposition," wrote K. Hirakawa and colleagues, Shizuoka University.

The researchers concluded: "These results suggest that Pt nanoparticles can be used as antioxidants against oxidative chemical compounds."

Hirakawa and colleagues published their study in *Bulletin of the Chemical Society of Japan* (Platinum Nanoparticle Catalyst Scavenges Hydrogen Peroxide Generated from Hydroquinone. *Bulletin of the Chemical Society of Japan*, 2009;82(10):1299-1303).

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Keywords: City:Hamamatsu, Country:Japan, Chemicals, Chemistry, Emerging Technologies, Hydrogen Peroxide, Nanoparticle, Nanotech, Nanotechnology, Platinum Nanoparticles, Chemical Research, Shizuoka University.

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Physical Chemistry

New physical chemistry study results from Y. Jia et al described

2009 DEC 28 - (VerticalNews.com) -- "Iron (Fe)-doped tin oxide/multiwalled carbon nanotube (SnO₂/MWCNT) nanocomposites was prepared by using the SnCl₂ Solution method. SnO₂ nanowires, nanobelts, and nanodendrites were directly synthesized on the surface of Fe-doped SnO₂/MWCNT nanocomposites by calcination of the nanocomposites at 800 degrees C under an Ar atmosphere," scientists in Hefei, People's Republic of China report.

"The Fe-doped SnO₂/MWCNT nanocomposites and the prepared SnO₂ nanomaterials were characterized by field emission scanning electron microscopy, transmission electron microscopy, thermal gravimetric analysis, and X-ray diffraction. A growth mechanism of the SnO₂ nanomaterials was proposed and discussed. The as-prepared SnO₂ nanomaterials exhibited good gas-sensing properties and strong ultraviolet photoluminescence emissions," wrote Y. Jia and colleagues.

The researchers concluded: "This technique provides a general, easy, and convenient approach for in situ preparation of SnO₂ nanomaterials on the desired substrates and nanodevices."

Jia and colleagues published their study in the *Journal of Physical Chemistry C* (In Situ Growth of Tin Oxide Nanowires, Nanobelts, and Nanodendrites On the Surface of Iron-Doped Tin Oxide/Multiwalled Carbon Nanotube Nanocomposites. *Journal of Physical Chemistry C*, 2009;113(48):20583-20588).

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Keywords: City:Hefei, Country:People's Republic of China, Emerging Technologies, Multiwalled Carbon Nanotube, Nanobelt, Nanocomposite, Nanodevices, Nanomaterial, Nanotech, Nanotechnology, Nanotube, Nanowire, Physical Chemistry.

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