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## Center for Nanotechnology in Society University of California, Santa Barbara

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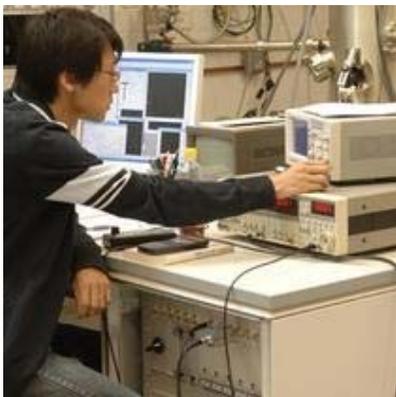
### WEEKLY CLIPS

May 26 – June 1, 2009



#### [UCL Offering Cutting-Edge Course in Nanotechnology and Regenerative Medicine](#)

**[UCL](#) is offering a cutting-edge course in the rapidly expanding field of nanotechnology and regenerative medicine. The MSc in Nanotechnology and Regenerative Medicine will give students a robust scientific understanding and equip them with research and transferable tools.**



The course, based within UCL's Division of Surgery and Interventional Science, includes mandatory modules on nanotechnology, stem cells technology and tissue engineering.

It also features a hands-on module in molecular and bionanotechnology techniques and a workshop-based module in statistics in biomedical research.

A laboratory-based research project is a fundamental part of the course and opens up opportunities for further research and possible publications.

The course is designed to be accessible to students from a range of disciplines, including medicine, biology, physics, chemistry, engineering

A researcher performs a nanotechnology experiment.

and other science subjects.

Course leader Professor Alexander Seifalian said: "When we were designing this course, we looked at what was on offer at other universities in the UK and Europe and, to our knowledge, this is the first that focuses on nanotechnology as applied to regenerative medicine. There's nothing else like it. The course is 50% taught and 50% cutting-edge research. It is ideal for students who want to follow it up with a PhD or get a job in academia or industry."

The MSc course, which starts in September 2009, lasts one year full-time or two years part-time.

For more information contact [Professor Seifalian](#).

Posted June 1st, 2009



When can we expect to see nano phones hitting the market - and will the recession slow innovation down?

By Richard Goodwin, 1 Jun 2009 at 12:16



In the competitive market place of [mobile phones](#), new technologies come out over night, change everything, and then become simply "ordinary" a week later.

The entire industry centres on a form of technological Darwinism, where only the strongest and most visible products survive. Despite this, is it possible to accurately make predictions about what the future holds for mobile phones?

In 2005, [Nokia](#) released its Communicator 888 concept phone. The device featured a liquid battery, was completely flexible and capable of morphing shape - showing what was potentially possible with nanotechnology.

But, has there been any progress since, and, if so, could nanotechnology become the next technology to revolutionise the mobile phone industry?

### **From dream to touchscreen**

Not so long ago, touch screen phones were merely a pipe dream, now they account for 20 per cent of the entire mobile phone market – largely thanks to [Apple's groundbreaking iPhone](#), which illustrated profoundly the effect technology can have on an industry in a short period of time.

However, touch screen along with 3G capabilities, picture and video projectors, as well as social GPS are all small potatoes compared to what Nokia is supposedly cooking up.

The Finnish phone giant recently announced its plans to create a transformable mobile phone, by using nanotechnology to produce flexible electronic components that would allow the handset to morph between shapes, develop artificial intelligence, and even clean itself.

Known as [Morph](#), the joint venture between Nokia and Cambridge University, seeks to build on the 888 concept, and eventually implement nanotechnology into mobile devices.

Dr. Bob Iannucci, chief technology officer (CTO), at Nokia said in a statement: "Nokia Research Centre is looking at ways to reinvent the form and function of mobile devices; the Morph concept shows what might be possible."

<http://www.itpro.co.uk/611182/nanotechnology-the-future-of-mobile-phones>



Posted: May 28, 2009

### **Ethical discussions concerning nanotechnology are often too futuristic**

*(Nanowerk News)* Ethical debates regarding new developments in nanotechnology are often too speculative and imaginative. This can cast technological developments in an unnecessarily bad light when in fact they are far from fully developed. There is also a tendency to play along with the grand visions of the proponents of new technology rather than ask critical questions. We need to question the veracity of the promises made and shift the focus to developments that are already underway – that is the case made by the philosophers Professor Arie Rip of University of Twente and Professor Alfred Nordmann of TU Darmstadt in their comments in the May edition of Nature Nanotechnology.

Nano-implants that make it possible to ‘read your mind’ naturally raise ethical questions and may also conjure up all kinds of doomsday visions, but such a scenario is actually based on a whole series of assumptions. This has led Rip and Nordmann to speak of a ‘new divide’ opening up. The ‘old divide’ came about through rapid progress in nanotechnology while ethical reflection on these developments lagged behind. The old divide has now been bridged by numerous publications and conferences. However, this has led to a new divide: ethical discussions are now so speculative that they miss the real point.

‘Instead of leading to a better understanding of how we should evaluate current developments,’ says Rip, ‘ethical debates are more concerned with morally interesting thought experiments involving human enhancement. Together with Tsjalling Swierstra, my colleague at the UT, I have argued that we need to re-evaluate the relevance of the moral concerns that are currently being aired on the subject of nanotechnology.’

### **Too many assumptions**

Just because nano-brain implants may be technically possible, to then say that we will be able to ‘read minds’ is too large an assumption. For example, little is known about how the brain may react to the implant and about how to locate ‘thoughts’ in the brain. Technological developments are not moving at the same pace as developments in psychology or our knowledge of the human brain. But this does not stop ethicists from running wild with their fantastic scenarios. They make too many assumptions, according to Rip and Nordmann, and that undermines the relevance of their analysis.

<http://www.nanowerk.com/news/newsid=10875.php>

# PRODUCT DESIGN & DEVELOPMENT

## Ark. governor sees nanotech providing big boost, AR

By The Associated Press

Saturday, May 30, 2009

SPRINGDALE, Ark. (AP) — Gov. Mike Beebe says nanotechnology research at the University of Arkansas could provide a major boost to the state's economy.

Beebe spoke Friday at the dedication of a plant that will produce extremely hard coatings engineered at the molecular level.

The Duralor plant will produce TuffTek coatings developed at the University of Arkansas and licensed to Duralor's parent company, NanoMech LLC of Fayetteville. NanoMech designs and makes application-specific nanoparticle-based coatings and coating deposition systems, according to the company's web site.

"Diamonds are the only cutting surface harder" than products treated with Duralor coatings, according to a company news release.

The 8,500-square-foot building dedicated Friday could have 300 people working there in the next five years, the company said — 100 employed by Duralor, another 200 by NanoMech.

Beebe said the university's decision years ago to put talent, time and money into nanotechnology research and development made the NanoMech and Duralor operations possible. The governor said the cooperation between the university, Duralor and NanoMech is a "living, breathing example" of the marriage of education and economic development. "This type of innovation is tomorrow's Wal-Mart, tomorrow's J.B. Hunt, tomorrow's Tyson," Beebe said, citing other major companies with headquarters in northwest Arkansas.

Northwest Arkansans know "you can't sit still without losing ground and this is an example of not sitting still," he said.

Steve Voorhies, chief spokesman for the Fayetteville campus who attended the ribbon-cutting, said he was pleased with Beebe's remarks.

"I was not expecting that kind of recognition," Voorhies said. "We know that we've helped projects like this from research to producing a product, but to hear it was really gratifying."

<http://www.pddnet.com/news-ap-ark-governor-sees-nanotech-providing-big-boost-053009/>



### NanoVentures Australia Reaches Important Milestone in Development of Pulmonary Drug Delivery Technology

**Australian nanotechnology firm [NanoVentures Australia \(NVA\)](#) has reached an important milestone in technical development of its pulmonary drug delivery technology.**

NVA's predecessor, Nanotechnology Victoria Ltd ("NanoVic") invested nearly \$500,000 with Monash University's Micro NanoPhysics Research Laboratory to develop and demonstrate a novel mechanism for generation of liquid aerosol drugs. The proprietary SAW (Surface Acoustic Wave) generated mechanism allows fluids to be atomised as precisely controlled droplets, making them ideal for a new generation of inhaler devices. These inhalers are likely to be very low cost, as they require very few moving parts.

Further, the SAW technology means that drugs like insulin can be delivered in fluid droplet form from an inhaler. Previous attempts to deliver insulin from an inhaler have used dry powders, which are more difficult to control, and may cause new issues for certain groups of patients.

Last month, NVA and Monash University filed for the protection of new intellectual property around their proprietary pulmonary drug delivery device. The parties hold the Australian provisional patent application 2009902063 Microfluidics apparatus for the atomisation of a liquid. In particular the team has demonstrated in vitro results with maintenance of insulin structure and function after aerosolisation, and over 70% delivery to the lungs using the test protein insulin.

There has been growing interest in the potential for the systematic delivery of drugs and therapeutic agents (e.g. peptides and proteins) via inhalation. Pulmonary drug delivery is an attractive option compared to oral administration or other invasive delivery techniques, and is particularly suited to a number of frequent-application drugs. The surface acoustic atomisation technology developed by Monash University provides for the controlled generation of aerosol particles, and is ideal for drug delivery to the deep regions of the lungs.

NVA has exclusive rights to the exploitation of the technology for potential applications in the administration of insulin and erythropoietin, as well as for the treatment of Cystic Fibrosis and Multiple Sclerosis.

The delivery device R&D program, led by Associate Professor James Friend at the Monash University Micro NanoPhysics Research Laboratory, commenced in January 2007 and is due for completion in October 2009. Dr Friend is internationally known for his leadership in the application of nanotechnology to medical devices.

NVA commercialises nanotechnologies developed by Nanotechnology Victoria Ltd ("NanoVic"), the Victorian Government funded nanotechnology accelerator which operated from 2002 to 2009. NVA has a portfolio of other technologies being positioned for commercial development, in medical therapeutics, diagnostics, advanced materials and water analysis and purification. NVA commercialises nanotechnologies developed by Nanotechnology Victoria Ltd ("NanoVic"), the Victorian Government funded nanotechnology accelerator which operated from 2002 to 2009.

For further information, contact Dr Michelle Critchley on [michelle.critchley@nvaustralia.com.au](mailto:michelle.critchley@nvaustralia.com.au)

Posted May 31st, 2009

<http://www.azonano.com/news.asp?newsID=11798>



May 27, 2009

## Measuring mercury with nanotechnology

RMIT's research on mercury monitoring through nano-engineered gold surfaces recently featured on the cover of the prestigious journal, Physical Chemistry and Chemical Physics, a publication of the Royal Society of Chemistry.

The research team behind the publication was led by Professor Suresh Bhargava and included Dr Prashant Sawant, Dr Vipul Bansal, Dr Samuel Ippolito and Dr Ylias Sabri.

RMIT University researchers have used breakthrough nanotechnology to create a pioneering sensor that can precisely measure one of the world's most poisonous substances, mercury.

The mercury sensor developed by RMIT's Industrial Chemistry Group uses tiny flecks of gold that are nano-engineered to make them irresistible to mercury molecules.

In the effort to reduce mercury contamination in the environment and the associated health risks, accurately measuring the toxin has become a priority for mercury-emitting industries like coal-burning power generators and alumina refineries.

Professor Suresh Bhargava, Dean of the School of Applied Sciences, said traditional mercury sensors used by industry could be unreliable.

"Industrial chimneys release a complex concoction of volatile organic compounds, ammonia and water vapour that can interfere with the monitoring systems of mercury sensors," Professor Bhargava said.

"We wanted a sensor that would be robust enough to cope with that kind of industrial environment but also sensitive enough to give precise readings of the amount of mercury vapour in these emissions."

<http://www.rmit.edu.au/browse;ID=xwzx3dxlgxzi>

## **Harnessing India's Technological Potential**

By [RAJEEV MANTRI](#)

Over the last decade, clean technology and nanotechnology have emerged as prominent investment themes in venture capital.

Rajeev Mantri

According to New York-based research firm Lux Research, venture capital investment in cleantech and nanotech has grown at about 40% annually since 1997. Rapid advances in the physical sciences and materials engineering have ushered in everything from hybrid-electric cars and lighter airplanes with substantially enhanced fuel efficiency to eco-friendly specialty chemicals and stain-resistant apparel.

As China and India industrialize, there is a glaring need for such innovation to ensure that limited natural resources are consumed with high efficiency. Venture capitalists have a key role to play in fostering that innovation.

VCs typically consider India to be just a technology deployment market. That view is too narrow: India has not just the entrepreneurial competence but also the scientific talent to invent and lead in science-driven innovation.

"Profit is still a dirty word in India's academic circles."

The American model for technology commercialization has proven to be highly successful. Corporate giants such as Hewlett-Packard, Genentech and Google took root at universities.

More recently, President Barack Obama unveiled the government's biggest infrastructure investment plan since the creation of the U.S. highway system with energy efficiency as its cornerstone.

Prof. C. N. R. Rao, chairman of the Prime Minister's Scientific Advisory Council and one of India's most distinguished scientists, has worked tirelessly for the cause of science education and research, recently obtaining a grant of over \$200 million from the central government for fundamental research in materials science and nanotechnology. When I met him in July last year, he lamented the lack of enthusiasm for science and technology in India, and commended China's nationalist zeal for building prowess in high-technology.

There is no dearth of scientific ability in India, but Indians prefer to work in laboratories abroad thanks to the lack of cutting-edge infrastructure in their home country. What's missing here are incentives for innovation and entrepreneurship.

The Indian government has promoted investment in renewable energy sources such as solar and wind, and these

sectors are beginning to see some traction. However, India is still way behind both the U.S. and China.

[http://online.wsj.com/article/SB124356990579365637.html?mod=googlenews\\_wsj](http://online.wsj.com/article/SB124356990579365637.html?mod=googlenews_wsj)



### 18 Students Completed This Year's NanoHigh Program

**Eighteen Albany High School ("AHS") students received certificates today for successful completion of the pioneering "NanoHigh" program - including the first students to participate in the advanced nanoscience course introduced this year - as part of the groundbreaking initiative developed jointly by the City School District of Albany ("CSDA") and the [University at Albany's College of Nanoscale Science and Engineering \("CNSE"\)](#).**

Believed to be the first initiative of its kind at a public school anywhere in the country, the program was designed by CSDA and CNSE to enhance students' opportunities to take advantage of new nanotechnology-related careers being developed in the Capital Region, across New York State and around the globe. Nanotechnology, which involves the manipulation of matter at the molecular level, holds the key to current advances in electronics, health care, energy, environmental science and a host of critical fields.

This year, in addition to the introductory course, the unique NanoHigh program was expanded to include an advanced nanoscience course. Of the students presented with certificates, 10 completed the introductory course, five completed the advanced course, and three fulfilled the requirements of both courses.

Students tackled a variety of cutting-edge facets of nanotechnology, including nanoscale patterning and fabrication, principles of self-assembly, nanobiomedical applications, fuel cell exploration and nanoeconomics, among others. The courses were taught both at AHS and through hands-on, interactive laboratory activities at CNSE's world-class Albany NanoTech Complex.

Dr. Alain E. Kaloyeros, Senior Vice President and Chief Executive Officer of CNSE, said, "It is a pleasure to congratulate this year's class of Albany High School students who have demonstrated dedication, enthusiasm and superb efforts in successfully completing the groundbreaking NanoHigh program. The UAlbany NanoCollege is delighted to build on this pioneering program in partnership with the visionary leaders in the City School District of Albany to provide students with an unmatched look into the exciting world of nanotechnology, which will define their careers in the 21st century workplace."

"We are pleased to continue to build on our unique partnership with CNSE through the introduction of the advanced nanoscience course as part of this year's pioneering NanoHigh program," said CSDA Superintendent

Eva C. Joseph, Ed.D. "The ability to collaborate with theNanoCollege, which is truly recognized as the global leader in nanotechnology education and research, is providing Albany High students with an invaluable opportunity to explore the ever-growing world of nanotechnology and preparing them to take their places in the future high-tech workforce."

The success of NanoHigh also led CSDA and CNSE to host the "Nanotechnology Explorations for Educators" event on April 29 and 30, at which more than 40 educators from 16 Capital Region school districts discussed the development of new educational initiatives for K-12 students, with a focus on nanotechnology, which has been described by the National Nanotechnology Initiative as "leading to the next Industrial Revolution."

<http://www.azonano.com/news.asp?newsID=11726>

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