Center for Nanotechnology in Society

University of California, Santa Barbara

www.cns.ucsb.edu

WEEKLY CLIPS

May 25 - June 7, 2010 (Part 2)

Other (science) issues related to nanotechnology

Quantum transistor crafted atom by atom
Electronic Weekly
May 25, 2010
Steve Bush

"Australian scientist[s] have designed a homogeneous quantum dot transistor for spintronics and quantum computing research, hand doping it an atom at a time.

'A key feature is that the whole device is made in crystalline silicon, the source and drain leads and the gate are all phosphorus doped silicon. There are no interfaces between gate metals and oxides. We believe that this will lead to more stable devices especially as we move to the atomic scale where the presence of traps at these interfaces can disrupt device behaviour,' research head Professor Michelle Simmons told EW."

Cleantech Startups Chasing Funds - and Only the Feds Are Players
BNET
May 25, 2010
Jim Motavalli

"DENVER - Clean energy technologies are in a strange place right now. Interest in batteries for electric cars, solar cells, wind turbines and biofuels has never been higher, but there is very little venture capital funding available to take even the most promising companies through the 'valley of death' from start-up to commercialization."

Indian scientists show how silver nanoparticles 'have a blast' killing bacteria
Sify.com
May 25, 2010

"Scientists at Mangalore University, India, have explained how blasting a silver nitrate solution with an electron beam can generate nanoparticles that are more effective at killing all kinds of bacteria.

Rani Pattabi and colleagues demonstrated the discovery in the International Journal of Nanoparticles."

Also noted by Nanotechwire

Silver Nanoparticles in Consumer Products
The Wealthy Dentist (blog)
May 25, 2010
Jim Du Molin

"Silver ions have been shown to have anti-microbial properties. And so silver has been popping up in all sorts of consumer products, with ions added to everything from tissues to t-shirts, hand sanitizers, socks, children's toys, lotion, fabric softener, pacifiers - as well as toothbrushes and toothpaste.

Before the advent of antibiotics, silver was essential in fighting infections. Even today, many wound dressings are infused with antimicrobial silver ions."

Brown Chemists Develop Longer Lasting Fuel Cell
DailyTech.com
May 25, 2010
Tiffany Kaiser

"The cost and rapid rate of deterioration of pure-platinum catalysts has stalled the advancement of fuel-cell technology until now. Brown University chemists and authors in the *Journal of American Chemical Society* have found a particle that lasts longer and outperforms any commercially available pure-platinum catalyst.

Chemists at Brown University have replaced pure-platinum catalysts with a nanoparticle

consisting of a five-nanometer palladium core and an iron-platinum shell. This new particle uses far less platinum than the former and is much more efficient and long-lasting as far as the cathode end of fuel-cell reactions go."

The technology nobody sees [includes podcast]
Texas A&M Engineering Works
May 26, 2010

"What happens to technology after it's had its 15-minutes of fame? We'll take a look. Nanotechnology. Today, on Engineering Works! Not that long ago, nanotechnology was the hottest thing around. It was going to help us do miraculous things. Medical robots that would slide inside our bodies to fix what's wrong. Ultra-tiny electronics. It's a long list. But these days it's hard to find nanotechnology at all."

The Increased Use Of Nanotechnology In China's Biotech Industry
Life Science Leader
May 26, 2010
Al Scott and Eliza Zhou

"Nanobiotechnology represents the convergence of nanotechnology and biotechnology to produce materials and products that use biological molecules in their construction or are designed to affect biological systems. In general, nanotechnology is the application of techniques to manipulate and study matter at the level of molecules and atoms, typically involving particles in the range of one billionth to 100 billionths of a meter - about 1/80,000 the thickness of a human hair. However, identifying precisely which qualifies as a nanoscale material is still difficult and a subject of substantial discussion in the scientific, regulatory, and standards communities. The high stakes associated with the political, economic, and societal development of nanotechnology have inevitably led it to become an intense field of international competition and cooperation. According to a survey conducted by the European Patent Office, the number of nanobiotechnology-related patent applications in 2003 represented 11% of the total number of nanotechnology-related patents. Nanomaterial research was initiated in China in the late 1980s. At that time, it was also called ultrafine materials research."

UCLA Gold Nanoparticle Superstructure Blows Away Cancer Cells
Daily Tech
May 26, 2010
Levi Beckerson

"Lasers and bombs in the same cancer-killing package!

'Photothermal Effects of Supramolecularly Assembled Gold Nanoparticles for the Targeted Treatment of Cancer Cells' is quite the mouthful. The recently published paper details work by University of California at Los Angeles on another nanoparticle bomb approach to destroying cancer cells."

Instant insight: Quantum dots for painting cells
ChemicalBiology (RSC)
May 28, 2010

"Vasudevanpillai Biju and colleagues at National Institute of Advanced Industrial Science and Technology (AIST) in Japan look at how nanoparticles might light up cells to unravel concealed subcellular structures and biomolecular functions.

The brilliant colours of nanoparticles have attracted biologists and biomedical researchers to unconventional bioimaging since the late 1990s. Nanoparticles have the power to literally light up concealed structures and vital functions in cells, and have replaced organic dyes used for this purpose. In particular, size-dependent tunable photoluminescence colour and exceptional photostability of semiconductor quantum dots (QDs) has brought radical changes to modern biomolecular and cell imaging. As such, QDs are the smartest pigments in the colour box of modern biologists and biomedical researchers."

Markets: Nanotech food struggles to graduate from the lab

FoodProductionDaily.com

May 28, 2010

Guy Montague-Jones

"Nanotechnology has been a buzz word in the food industry for years but that has done little to turn ideas in a lab into commercially viable innovations.

There are a myriad of potential applications in the food sector ranging from emulsions and nano-encapsulations on the formulation side to nano-coatings for processing equipment on the factory floor.

But despite scientific interest and excitement, the size of the 'nano food' market is as

small as the particles it deals with. Unsurprisingly therefore little market research data is available."

Nano-Dispersant Safe and Best To Use on BP Gulf Oil Spill Says Green Earth Technologies CEO

Before It's News.com

May 29, 2010

Alton Parrish

"In a letter to shareholders responding to warnings concerning the use of nanotechnology in the Gulf of Mexico oil spill, Green Earth Technologies Chairman & CEO Jeff Marshall writes, 'It has come to our attention that a group of scientists have written a letter to the EPA discouraging the use of Green Earth Technologies' G-Marine Fuel Spill Clean-Up as a dispersant in the Gulf of Mexico. The letter claims that a nano-dispersant will be harmful to the environment, a false claim that I would like to address with all of you.'

As a means to educate the public and clear up misconceptions, please see below quotes directly taken from the letter and Green Earth Technologies? response. The company is dedicated to sustainable practices and the production of environmentally friendly products and we stand behind our motto 'Save the Earth, Sacrifice Nothing.' "

Is the food processing industry poised to embrace nanocoatings?
Food Production Daily
May 31, 2010
Rory Harrington

"Nanocoatings on food processing equipment hold huge potential for boosting safety and performance but lingering doubts and cost concerns among industry players are hampering take up, said an expert.

But one company that produces a nano-scale coating product said such barriers are 'falling daily' as companies begin to embrace nanotech know-how.

So - while uncertainties still exist - to what extent is the food processing sector readying itself to accept the breakthroughs offered by nanocoatings?"

Taiwanese scientists develop new nanotech approach
Focus Taiwan News Channel
May 31, 2010

"A Taiwanese research team has developed a new approach for investigating the amount of nano-/microparticles taken up by mammalian cells, according to a news release by Taiwan's top research institute Academia Sinica Monday.

'This research brings more efficiency to the measurement and detection of the mass changes of a cell as a result of malignancy or the uptake of nanoparticles,' said the first author of the study, Lin Huan-Chang of the Department of Bio-Industrial Mechatronics Engineering at National Taiwan University."

In nano-optics breakthrough, researchers develop plasmonic amplifier
Nanowerk
May 31, 2010

"Researchers at the University of Iceland, University of Cologne and the Fraunhofer Institute Jena have demonstrated net optical amplification in a plasmonic waveguide. The results of the team, which were published in the journal *Nature Photonics* ('Net optical gain in a plasmonic waveguide embedded in a fluorescent polymer') this week, represent an important breakthrough in the field of plasmonics. Optical amplification is the only feasible strategy to make light travel over sizable distances when it is bound in a plasmonic mode. Achieving such a macroscopic propagation of surface plasma waves is critical for many applications of the emerging plasmonics technology, which range from compact communication devices and optical computing to the detection and characterization of cells, virus particles or even single molecules."

Nano chat: It seems Nanotechnology might one day help revolutionise global communications
Our Future Planet.org
June 1, 2010

"Our Future Planet gets down to the nitty gritty.

Global communications are driven by science. From the days of the earliest telephone, to telegraph wires or the first mobile, scientific innovation more than anything else drives the planetary conversation.

And that conversation controls a whole lot of what we do. Wars are begun, or avoided, or lost and fought on the ability to talk things through. Lifespan and quality of living for billions depends on how they are taught."

Big plans afoot
Construction Week Online.com
June 1, 2010
Selina Denman

"Sustainability is still the key trend when it comes to flooring, according to Angela Schaschen, managing director of the Dubai branch of Deutsche Messe, organiser of Domotex Middle East, the trade fair for carpets and floor coverings, which took place in Dubai from May 10 to 12.

'The 'environmentally-friendly' part of the show is becoming more and more important,' she said.

Looking forward, the flooring industry is all set to be revolutionised by nanotechnology, according to John Alexander Smith, professor and Emeritus chairman of the department of interior design at the American University in Dubai, who gave a presentation entitled ?Flooring - Old Problems, New Materials?, as part of the APID seminar session at Domotex."

The BP Oil Spill?s Lessons for Regulation
Project-Syndicate.org
June 1, 2010
Kenneth Rogoff

"CAMBRIDGE - As the damaged BP oil well continues to spew millions of gallons of crude from the depths of the floor of the Gulf of Mexico, the immediate challenge is how to mitigate an ever-magnifying environmental catastrophe. One can only hope that the spill will be contained soon, and that the ever-darkening worst-case scenarios will not materialize."

The disaster, however, poses a much deeper challenge to how modern societies deal with regulating complex technologies. The accelerating speed of innovation seems to be outstripping government regulators? capacity to deal with risks, much less anticipate them."

Dentists: Is Nano Silver the New Amalgam?

The Wealthy Dentist
June 1, 2010
Jim Du Molin

"Last week we started talking about silver nanoparticles, which are showing up in all sorts of consumer products these days because of their antibacterial properties. But there's still a lot we don't know about this emerging nanotechnology.

What do silver nanoparticles have to do with dentistry?

Over-the-counter dental products are getting in on the silver ion craze. You can buy nano silver toothpaste and nano silver toothbrushes."

Nano risk assessment a work in progress
Bakery and Snacks.com (Food Production Daily)
June 2, 2010
Rory Harrington

"The risk assessment framework for nanotechnology in Europe - like so much else connected to the technology - appears to be in its infancy but developing at a rapid pace.

In its opinion issued in Spring last year, the European Food Safety Authority (EFSA) sought to lay down an overarching system to use as a risk assessment framework for nanotechnology - but was clear that much currently remains unknown about nanomaterials and how they behave in food and packaging."

Nanosponge drug delivery system more effective than direct injection
Eurekalert
June 2, 2010

"When loaded with an anticancer drug, a delivery system based on a novel material called nanosponge is three to five times more effective at reducing tumor growth than direct injection.

That is the conclusion of a paper published in the June 1 issue of the journal *Cancer Research*.

'Effective targeted drug delivery systems have been a dream for a long time now but it has been largely frustrated by the complex chemistry that is involved,' says Eva Harth, assistant professor of chemistry at Vanderbilt, who developed the nanosponge delivery system. "We have taken a significant step toward overcoming these obstacles."

Jamestown Adds Antimicrobial Coatings
Business Journal Daily
June 3, 2010

"Jamestown Coating Technologies has developed SurfaGuard antimicrobial paints and coatings. The products are designed to provide an extra defensive shield against bacteria, molds and

fungi.

The new product, scheduled to go on the market this month, incorporates silver ions via a new nanotechnology, SmartSilver, that is proven to work against microbes, the company said."

Scientists devise part-human, part-machine transistor
SiFy.com
June 3, 2010

"Scientists have implanted a nano-sized transistor inside a cell-like membrane and powered it using the cell's own fuel, paving way for new types of man-machine interactions.

The experiment is believed to be the most intimate linking between man and machine till date.

The technology may help experts learn the inner workings of disease-related proteins inside cell membranes, which would lead to new ways to read and control brain or nerve cells."

Arkema's Nanotubes Get EPA Approval
Alibaba.com
June 4, 2010

"Four years after their market introduction, the company's Graphistrength brand of carbon nanotube fillers now has Environmental Protection Agency (EPA) approval for sale in the U.S. The supplier can look forward to a boost in worldwide sales of its Graphistrength masterbatches, which are already available in Europe and Asia."

Research into inorganic nanoparticles benefits printable electronics sector
Engineering News (New Zealand)
June 4, 2010
Karel Smrcka

"This year's inernational Hanover Fair will go down in history as the 'volcano event'.

Federation of German Industries presi- dent Hans-Peter Keitel remarked: 'The volcanic ash cloud from Iceland could para- lyse international air travel, but not the fair; the organiser, Hanover Messe, made it a success.' "

Are Sunscreens with Nanoparticles of Zinc Oxide Safe?
emaxhealth.com
June 4, 2010
Ramona Bates MD

"Products using nanotechology and materials has become more and more common. Zinc oxide (ZnO) and titanium dioxide (TiO2) are used in nanoparticle size in sunscreens. They provide physical blocks from the harmful UVA and UVB rays, protecting the skin from photo-damage which is known to cause skin cancers."

Antibacterial nanoparticles from bacteria
RSC
June 4, 2010
Manisha Lalloo

"Scientists have found that silver nanoparticles made using bacteria have better antibacterial properties than their chemically synthesised counterparts.

Mitchel Doktycz and colleagues at Oak Ridge National Laboratory and the University of Tennessee in the US incubated S*hewanella oneidensis* bacteria with silver nitrate solution to produce monodispersed silver nanoparticles."

Nanotech blazes biomedical trail
ITWeb.co (New Zealand)
June 7, 2010
Lezette Engelbrecht

"Local researchers are using nanotechnology to pioneer breakthroughs in medical science that could radically change the way diseases such as tuberculosis and type two diabetes are treated, or prevent them from occurring all together.

Professor Viness Pillay, professor of pharmaceutics and NRF research chair in the Department of Pharmacy and Pharmacology, at Wits University, says working at the nanoscale allows researchers to harness new properties of particles, as they behave differently at an atomic level."

Silver Can Mitigate Ethanol Damage in Cell
Softpedia.com
June 7, 2010
Tudor Vieru

"A group of investigators from Spain say that they managed to develop a new method of protecting human cells against ethanol damage. This compound is contained in alcohol, and adding it into the bloodstream can have negative repercussions on the way cells function. But the science team learned that, by adding a very small amount of silver nanoparticles to the mix, the destructive action of ethanol is significantly impaired."

Buckypaper improves fire retardancy of plastic materials
Nanowerk
June 7, 2010

"Flame retardant materials have become a major business for the chemical industry and can be found practically everywhere in modern society. Unfortunately, conventional methods for making plastic flame retardant involve a range of often very toxic chemicals. In a previous Nanowerk Spotlight we have shown how improving the flame retardancy of polymeric materials without the use of toxic chemicals could now become possible thanks to the synergistic effect of nanoclay and carbon nanotubes ('Flame-retardant materials with more nanotechnology and less toxic chemicals').

Researchers have now shown that the use of buckypaper - macroscopic aggregates of intertwined CNTs in which the nanotubes collectively behave as a random web - is more efficient as a fire retardant in polymer composites in comparison to directly mixing carbon nanotubes (CNTs) into the composite matrix"

Chemical Engineers Call On Nanoparticles to Combat Polluted Groundwater
Water World (FARS News Agency)

"Chemical engineers created nanoparticles out of gold and palladium to break down pollutants in groundwater. Adding the particles to groundwater converts dangerous contaminants like trichloroethylene into non-toxic compounds.

We've seen it in the movies - polluted drinking water is a health and environmental concern. In fact, right now, 30 US states need to clean up their groundwater. 'They've been designated by the EPA as being highly contaminated, and they've got to do something about the contaminated water,' Michael Wong, Ph.D., a chemical engineer at Rice University in Houston said. Wong is one of Smithsonian Magazine's America's Young Innovators . . . and for good reason."

The Humorous, Fascinating & Unique

Singularity and ESI's
Geekzone (New Zealand)
May 31, 2010
Luigi Cappel

"It's a bit of a stretch putting this into Consumer Electronics, perhaps more about Science Fiction becoming reality.

I always thought of singularity as being when supercomputers end up being able to match human

intelligence. One of the early science fiction films that influenced me in my youth was 2001 A Space Odyssey. I loved all of Arthur C Clarke?s books,but HAL 9000 was my first introduction to the concept of a computer that thinks, reasons and has emotions. I?ve often thought that if a computer reached that level, it would consider humans to be animals to be eradicated as quickly as possible. The way we humans behave is often totally irrational and inappropriate, we are actively destroying our planet and instead of working together to fix it."

Nanotechnology methods allow to bust the mystery surrounding what happens when bubbles collide
Nanowerk
June 1, 2010

"The mystery surrounding what happens when bubbles collide has finally been busted. And knowing how bubbles bounce apart and fuse together could improve the quality of ice-cream and champagne as well as increase efficiency in the mining industry.

In research led by the University of Melbourne, and published online this week in the *Proceedings of the National Academy of Sciences* (PNAS), a team of chemical engineers, chemists and mathematicians have united to measure the force between bubbles during a collision.

How augmented reality could change the way you watch football: Augmented reality, nanotechnology, and wireless health telemetry could all play a part in football matches of the future
Daily Telegraph (U.K.)
June 3, 2010

"The World Cup is almost upon us, and with it, the inevitable debates over whether the ball really crossed the line and whether the referee should have awarded a penalty

With every World Cup comes new technology - in 2006, we marvelled at Sven-Goran Eriksson in high definition; this time around, we?ll be flocking to cinemas to see Lionel Messi weave his way through the defence in glorious 3D."