

# The Nanogirl News~

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The Nanogirl News

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How to Build a Biobot. Synthetic-biology researchers are creating a tool kit to build biobots, autonomous, special-purpose nanorobots the size of cells, with applications in medicine, national security, environmental protection, and many other fields. Too simple to replicate, biobots will be put together like Legos from a catalogue of biological and artificial parts.

(ScienceBeat 8/27/04)

[http://www.lbl.gov/Science-Articles/Archive/sb/Aug-2004/2\\_biobots.html](http://www.lbl.gov/Science-Articles/Archive/sb/Aug-2004/2_biobots.html)

Nanoscale parts get binding aid. Nanoscale particles that are easy to manufacture piecemeal – but hard to assemble – may benefit from a new "sticky patch" technology that researchers at the University of Michigan say enables nanoscale self-assembly. "By mimicking biological assembly, we are exploring ways to nanoengineer materials that are self-assembling, self-sensing, self-healing and self-regulating," said Sharon Glotzer, an associate professor of chemical engineering on the Ann Arbor campus.

(EETimes 8/23/04)

<http://www.eetimes.com/at/news/showArticle.jhtml?articleId=29116670>

View an image here:

<http://www.sciencedaily.com/releases/2004/08/040819082902.htm>

Spotlight on Nanotubes. Think of it as track lighting on the smallest possible scale. Physicists recently discovered that a tiny tube-like molecule of carbon can produce light when electricity passes through it. Now, the same team has captured images of the precise spot from which the light shines, and by varying the applied voltages, the researchers have even moved the spot back and forth along the 3-nanometer-wide molecule. Described in the 13 August PRL, the effect provides a new tool for studying the inner workings of nanotubes, which might someday serve as the building blocks for molecular electronic circuits. (PRL 8/19/04)

<http://focus.aps.org/story/v14/st8>

Tiny Writing: Researchers Develop Improved Method to Produce Nanometer-scale Patterns. Researchers from the Georgia Institute of Technology and the Naval Research Laboratory (NRL) have developed an improved method for directly

writing nanometer-scale patterns onto a variety of surfaces. The new writing method, dubbed "thermal dip pen nanolithography," represents an important extension for dip pen nanolithography (DPN), an increasingly popular technique that uses atomic force microscopy (AFM) probes as pens to produce nanometer-scale patterns. (Georgia Tech 8/30/04)

<http://gtresearchnews.gatech.edu/newsrelease/tdpn.htm>

Zyvex Offers New Nanoprobng/Nanomanipulation Analytical Services. Zyvex Corporation today (25th) announced that it will provide IC probing, electrical characterization of nanomaterials, TEM sample lift-out, nanomanipulation, and other analytical services to both potential and existing customers. These services allow customers to test, measure, and characterize their samples at Zyvex's state-of-the-art facilities. (Yahoo 8/25/04) [http://biz.yahoo.com/prnews/040825/daw004\\_1.html](http://biz.yahoo.com/prnews/040825/daw004_1.html)

A Push-Pull Approach to Proteins. Researchers learn the biophysical properties of bacterial condensin. By stretching a poorly understood protein like a rubber band, a team of Berkeley Lab and University of California at Berkeley scientists is learning how the protein and its cousins perform some of life's most fundamental tasks. Their work, published in the journal Science, is the first look at the biophysical properties of a condensin. (Science Beat 8/27/04)

(Science Beat 8/27/04)

[http://www.lbl.gov/Science-Articles/Archive/sb/Aug-2004/1\\_condensin.html](http://www.lbl.gov/Science-Articles/Archive/sb/Aug-2004/1_condensin.html)

Nanotubes may have no 'temperature'. Could quantum effects plague miniature devices? Physicists have made a bizarre discovery: the concept of temperature is meaningless in some tiny objects. Although the concept of temperature is known to break down on the scale of individual atoms, research now suggests that it may also fail to apply in rather larger entities, such as carbon nanotubes. (Nature 8/17/04)

<http://www.nature.com/news/2004/040816/full/040816-4.html>

(UK) Nanotechnology projects win 15 million funding from DTI. The Department of Trade and Industry has given a major boost to Nanotechnology projects throughout the UK. Twenty five projects are to receive 15 million worth of funding for projects ranging from anti-corrosion coatings and electronics to water purification and printing. This new investment will provide up to a maximum of 50% of each project's total value. A further 3 million will be given to INEX, a microsystems and nanotechnology facility for industry based at Newcastle. These grants are the first to be allocated from the Government's 90 million micro and nanotechnology manufacturing initiative in support of both nanotechnology applied research programmes and for the creation of new nanotechnology facilities across the country.

Further grants will be made available over the next five years to complete the initiative.

(PublicTechnology 8/24/04)

<http://www.publictechnology.net/modules.php?op=modload&name=News&file=article&sid=1635&mode=thread&or>

RNA shapes up for "nano-scaffolding". Researchers at Purdue University, US, have made a variety of shapes from molecules of packaging ribonucleic acid (pRNA). The forms included twins, tetramers, triangles, rods and

three-dimensional arrays. "Our work shows that we can control the construction of three-dimensional arrays made from RNA blocks of different shapes and sizes," said Peixuan Guo of Purdue. "With further research, RNA could form the superstructures for tomorrow's nanomachines." (Nanotechweb 8/25/04) <http://nanotechweb.org/articles/news/3/8/7/1>

Now, nanotechnology to help surf the Internet 100 times faster! University of Toronto's Edward S. Rogers Sr. Department of Electrical and Computer Engineering have claimed that in the future nanotechnology could be used to surf on the Internet through light. The findings published in the journal Nano Letters states that nano technology can make the networks work as much as 100 times faster compared to present day's technology. (Yahoo 8/30/04) <http://in.tech.yahoo.com/040830/139/2frrh.html>

Scientists Reinvent DNA As Template To Produce Organic Molecules. By piggybacking small organic molecules onto short strands of DNA, chemists at Harvard University have developed an innovative new method of using DNA as a blueprint not for proteins but for collections of complex synthetic molecules. The researchers will report on the prolific technique, dubbed "DNA-templated library synthesis," this week on the web site of the journal Science. (Bio.com 8/20/04) <http://www.bio.com/realm/research.jhtml?realmId=5&cid=3500012>

Nanotube Dynamos. Two scientists in India have produced a tiny voltage in a small electrical circuit by blowing gas across a mat of carbon nanotubes and doped semiconductors. This result arises from two physical effects. First, in the Bernoulli effect, gas rushing past a surface produces pressure differences along streamlines, which in turn can produce a temperature gradient along a material sample. (Physics News Update 8/19/04) <http://www.aip.org/pnu/2004/split/697-3.html>

Nanowires take directions from substrate. For the first time, scientists have been able to control the growth direction of a gallium nitride nanowire. The researchers, from the University of California, Berkeley and the Lawrence Berkeley National Laboratory, US, tailored the growth by altering the substrate on which they grew the wires. (nanotechweb 8/4/04) <http://nanotechweb.org/articles/news/3/8/2/1>

Holographix Finds Replication Niche in Nano Industry. Call it the art of making cheap knockoffs, at the nanoscale. Holographix LLC, a 10-person startup in suburban Boston, knows it has neither the resources nor the expertise to fabricate nanoscale components. So the team has put its efforts in another valuable niche of nanoscale manufacturing: making inexpensive replicas of components that others have fabricated already. (8/23/04) [http://www.smalltimes.com/document\\_display.cfm?document\\_id=8237](http://www.smalltimes.com/document_display.cfm?document_id=8237)

Smooth operators: New fabrics fight off wrinkles and stains. We may soon be listening to music emitted by the fabric of our clothing or watching our shirts change color as we heat up. But the hottest thing in fabric for the moment is only a little less remarkable, able to fight off dirt and wrinkles like something out of Superman's closet. That's the view from Eva Snopek,

fashion design instructor at the Illinois Institute of Art in Chicago.

"There is a lot of new technology out there," she said, citing nanotechnology as the superstar of the day. And our testing backed her up. (Fortwayne 8/31/04) <http://www.fortwayne.com/mld/newssentinel/9545951.htm>

Grad's Breakthrough Artificial Pancreas May Help Diabetics. Even though her colleagues told her it was impossible to create an artificial pancreas that could alleviate diabetes, and that she would never finish it in time to graduate from UC Berkeley, Tejal Desai finished what she set out to do...Desai, 31, built an implantable device—containing live pancreas cells—that could be used in place of daily insulin injections for diabetics to control their blood sugar levels...This combination of biology and nanotechnology was unknown when Desai began her research, but bioengineering breakthroughs such as her own are making it a quickly growing field. (DailyCal 8/31/04) <http://www.dailycal.org/article.php?id=15896>

Professor Ken Donaldson, a lung toxicology expert and Professor of Respiratory Medicine at the University, calls for a new discipline—nanotoxicology—to be built up, to address knowledge gaps and to help develop a safe nanotechnology. He wants guidelines to be developed to test all materials in the nanoscale where human health could be involved. (Physorg 8/30/04) <http://www.physorg.com/news995.html>

Hope for Alzheimer's patients: Virus that cures. Scientists here have found method which uses virus to deliver DNA to damaged brain cells and help mend them in patients. Researchers at the Institute of Bioengineering and Nanotechnology (IBN) are relying on the prowess of viruses to get into cells and deliver healthy genes in order to reverse the effects of these debilitating diseases.

(StraitsTimes 8/28/04)

<http://straitstimes.asia1.com.sg/techscience/story/0.4386.269719.00.html>

The future of nanotech. Students at new college proud and excited to be in 1st class...When Garg started her doctoral program, she was a graduate student at UAlbany's School of NanoScience and NanoEngineering. Beginning Aug. 30, she'll be a charter member of the new College of Nanoscale Science and Engineering, which absorbed the school...One of the main purposes of the college is to make computer chips smaller and more powerful. It already has been recognized by Phil Bond, President Bush's chief technology expert, as the first in the country to focus exclusively on nanotechnology. (MSNBC 8/29/04) <http://msnbc.msn.com/id/5843618/>

Little particles make cars, profits shine. Keith Matthews knows his car wax. A car detailer at International Motor Car Co., 2111 Dana Ave., he puts a shine on two or three vehicles a day for the luxury-car dealership. "Nanowax is the best thing I've used, and I've been doing this for 15 years," he said. Eagle One Nanowax, produced by Ashland Inc.'s Lexington-based Valvoline unit, is easier to apply, leaves less residue and does a better job of handling swirls and defects in car finishes, he says. (Enquirer 8/27/04) [http://www.enquirer.com/editions/2004/08/27/biz\\_nanowax27.html](http://www.enquirer.com/editions/2004/08/27/biz_nanowax27.html)

Big Minds Gather to Discuss Ultra-Small Technology at NASA. Experts from NASA, academia and industry will meet this week to learn the latest developments in nanotechnology and provide input to guide the fledgling industry. The National Nanotechnology Initiative (NNI) Grand Challenge workshop, hosted by NASA Ames Research Center, located in California's Silicon Valley, will be held Aug. 24-26, 2004 at Rickey's Hyatt Hotel in Palo Alto, Calif. The workshop will focus on six themes: nanomaterials, microcraft, nanorobots, nano-micro-macro integration, nanosensors and instrumentation and astronaut health management. During the workshop, participants will attend a series of 'breakout' sessions with guest experts. (SpaceRef 8/24/04) <http://www.spaceref.com/news/viewpr.html?pid=14876>

Chemical Sensors Made from Nanomaterials. New types of chemical sensors for environmental monitoring, food safety or security applications could be based on nanotechnology, according to Frank Osterloh, an assistant professor of chemistry at UC Davis. "Nanomaterials are very well suited for chemical sensor applications, because their physical properties often vary considerably in response to changes of the chemical environment," Osterloh said.

(azom 8/24/04) <http://www.azom.com/news.asp?newsID=1873>

Trapped Single Atom Presages New Technology. Once thought impossible to catch, scientists have now snared a single atom. A report from the Department of Energys Oak Ridge National Laboratory (ORNL) in Tennessee says that collaborating Indian-American researchers have accomplished the feat, which could lead to a whole new technology. ORNL scientists Thomas Thundat and Adosh Mehta have collaborated with Ramesh Bhargava of Nanocrystals Technology in Briarcliff, N.Y., to cage single atoms in nanocrystals not much larger than the atoms themselves. Previous attempts to catch atoms have been difficult because of the unpredictable nature of atoms, as dictated by the rules of quantum mechanics. (Indolink 8/20/04) <http://www.indolink.com/SciTech/fr082004-035406.php>

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