Texas Nano Letter

A Newsletter of the Nanotechnology Foundation of Texas

Issue 35: April 2005

Your source for news on Texas Nanotechnology research, breakthroughs, activities and the way Nanotechnology is shaping your world.

NFT Newsletter

Welcome to the NFT Newsletter. We work hard to provide the latest in Nanotechnology developments in Texas. We hope you enjoy receiving credible, substantiated information and our newsletter becomes a valuable tool to your exploration of the emerging Nanotechnology economy in Texas. Our close ties to the Texas academic research institutions and early-stage companies enable us to provide insight into this important driver of the third industrial revolution.

We invite your participation by joining NFT today! Your membership contribution enables NFT to promote and recognize nanotechnology research in Texas.

We also welcome your feedback to further improve our monthly newsletter.

> Donate via our web site
> Download a donation form
> Give feedback
> Join our Mailing List
> Register for the 2005 Nano Summit

2005 Nano Summit

Planning for the 2005 Summit has started. Watch for details. Dr. James Heath of Caltech will be the kickoff speaker addressing his work on nanosystems biology and cancer. Other invitations to speakers are in process.

Special thanks to the Financial Sponsors of the 2004 Nano Summit:

> RGK Foundation
> PricewaterhouseCoopers
> Page Southland Page
> Frost National Bank
> Pearland Economic Development
> RoadShow Media
> Fulbright & Jaworski

Nano Summit Archive

Each year the Nanotechnology Foundation holds a conference to showcase research in Texas universities.

What's in This Issue

National News
> Presidential Panel Says NNI is Sound
> Systems Biology and Nanotechnology
> 2005 Nano Summit Advanced Registration Available
State News
> Governor Perry Highlights Need for Emerging Technology Fund
> Small Times Rankings: Texas Shares Fifth-Place with Michigan
University News
> Two UT Nano-Researchers Awarded NSF CAREER Award

Early-Stage Company News
> CNI Begins Shipping Product from New Commercial Plant
> Zyvex and South Dakota School of Mines and Technology Announce Their Cooperative Agreement

Other News
> West Texas Nanotechnology Forum to Highlight Region's Newest Technologies
> Lux Nanotech Index(TM) Launches on American Stock Exchange
> Oklahoma EPSCoR Annual Conference

Should you have interest in volunteering with NFT, please contact us.

We encourage you to forward any relevant information regarding nanotechnology research or early-stage commercialization to our news desk.

This one-day conference includes presentations form leading researchers in the medical, natural science and engineering schools. Archives of the 2002, 2003 and 2004 Nano Summit can be found here.

Texas Nano Calendar
There are numerous nanotechnology meetings open to the general public. Brief descriptions and registration information can be found in our Calendar.

Research and Corporate Directories
We have two comprehensive nanotechnology directories. The Research Directory includes a searchable list of nanotechnology researchers while the Corporate Directory lists all nanotechnology companies in Texas. For more information click here.

Articles this Month

Presidential Panel Says NNI is Sound

A government advisory panel outlined a draft report on the state of nanotechnology in the United States and found while the U.S. is a leader – if not the leader – in nanotechnology worldwide, continued support is needed to help the nation maintain its edge. The draft report examined four issues: the current state of the program; how federal money is being spent and the program managed; whether the program adequately addresses societal concerns and potential risks related to nanotech; and how the program can be improved.

In terms of government support at the federal, regional and state level, the United States is on par with Asia and Europe . The United States provides about a third of the $4.6 billion in public money spent on nanotech. President Bush's fiscal year 2006 budget proposed spending $1.05 billion on nanotech activities at the 10 agencies that receive funding under the NNI. This amount is slightly less than what Congress appropriated for fiscal year 2005.

The report noted that the United States is leading the world in the number of nano-related patents and about 50 percent of nano-related journal articles are from the U.S. The report also outlined areas of nano research that show the most progress in the next five years with breakthroughs expected in nanocomposites, nanomembranes and filters, medical diagnostic devices, and chemical and biological sensors.

Source: www.smalltimes.com/document_display.cfm?document_id=8969

Back to Top

Systems Biology and Nanotechnology

You will begin seeing references to Systems Biology or Nanosystems Biology in the future. The Alliance for NanoHealth (see previous newsletters) will have this as one of its areas of emphasis. The 2005 Nano Summit will have this as a topic of focus. Other researchers, particularly Leroy Hood at the University of Washington and Jim Heath (kickoff speaker at the 2005 Nano Summit -- see www.nanotechfoundation.org/summit.html) are gaining recognition for their work in this area.

Nanosystems Biology may be the next Big Thing in science and medicine. The following article, written by NFT volunteer Munim Hussain at Texas Tech, will give you some background.

Systems biology is the broad-spectrum view of biological network structures. It reveals the types of digitized biological information of DNA, RNA, protein, protein interactions, other biomolecules, cells, tissues, etc. and the relationships of these with respect to one another. The ultimate goal is to integrate this information to form a testable hypothesis of how a biological organism functions as a system. The intracellular components and the networks of cells are all genetically programmed networks and they are the key components of systems biology establishing the organization and function of individual cells and tissues in response to environmental signals such as cell-to-cell communication within organ systems and whole organisms. It is projected that the next hundred years are going to be the century of biology within pharmaceutical discovery and systems biology is expected to have a large impact in ADME/Tox (adsorption, distribution, metabolism, excretion and toxicity) evaluations.

Smaller pharmaceuticals companies are moving forward with systems biology in ADME/Tox and they are establishing data bases on

human biological pathways, which serve as the backbone for generating networks and maps of the connections between system components. They are also developing software having the ability to make theoretical predictions of metabolism and toxicity as well as to incorporate experimental measurements of metabolites to visualize preclinical and clinical data in the context of the complete biological system.

One of the ultimate goals of systems biology is to formulate personalized medicines. This becomes possible when information about individuals and ethnic groups in the models generated through systems biology is available. Systems biology can also be used to evaluate the synergistic effects of drugs and can definitely aid in the selection of doses of the prescribed agents. One aspect of systems biology is the emergence of potential large-scale hypothesis-driven experimentation. This integrated systems biology approach makes it possible to go full circle back to hypothesis-driven biology and drug development. However the hardest part of systems biology is the development of specific testable hypotheses, something that is relatively straightforward in single gene or protein experiments. Looking at thousands of proteins simultaneously makes it almost impossible to develop rational hypotheses in the absence of models.

Since clinical trial costs make up approximately eighty percent of total costs, scientists are trying to apply systems biology to predict whether a drug product is efficacious. Appropriate biomarkers and new tools are highly desired to accomplish this. Nanotechnology can play roles in the large-scale multiparameter analysis, high sensitivity, and temporal resolution as the systems biology approach requires the simultaneous measurement of many signatures of gene and protein expression in real time. Single wall carbon nanotube can be used as nanowire sensors that are chemically encoded with a probe molecule to sense a particular signature of gene or protein expression and therefore can contribute as a key tool of systems biology.

Nanotechnologies have the potential to vastly increase the efficiency of a systems analysis at every stages and it will be then possible to analysis of systems biology automatically within a few seconds or minutes without requiring a significant amount of cells. Therefore, ultra-rapid disease diagnostics will be turned into a reality and it will profoundly impact on drugs, vaccines and other pharmaceuticals in terms of their development and applications.

References:
Chemical & Engineering News (Cover Story, February 14, 2005) and Review Articles on Nanosystems Biology by Heath J. et.al.

Back to Top

2005 Nano Summit Advanced Registration Available

Each year the Nanotechnology Foundation of Texas holds a one-day research conference to showcase nanotechnology research and to encourage collaboration among engineering, natural science and medical research professionals in industry and academia.

Dr. James Heath, Caltech, will be this year's Keynote Speaker, speaking on nanosystems biology (see February issue of *MIT Technology Review* for a very readable article on Dr. Heath's research). After lunch, Dr Ferid Murad, Nobel Laureate with the University of Texas Health Sciences Center, will speak on cell signaling – Nitric Oxide in Drug Development - How Can Nanotechnology Be Involved? The other 16 speakers at this one-day conference will present their research in the fields of materials science, life science, energy and electronics/semiconductors. (More details, including other speakers and their topics can be found on the Foundation's web site at www.nanotechfoundation.org/summit.html).

On first blush, you might think there is little in common with these fields of investigation. We have found that nanotechnology is such a naturally multidiscipline field of work that presumably unrelated researchers often make discoveries with many potentially overlapping applications.

The most important time of the conference can sometimes be the lunch, breaks and poster session when attendees have a chance to discuss details that cannot be covered in the short Question & Answer period following each speaker.

Students interested in submitting a poster should send a 100 word abstract to poster@nanotechfoundation.org.

Advanced registration for the general public is $200 and increases to $400 after July 1. Special registration prices of $25 and $50 apply to students, university researchers and corporate researchers to allow them to attend on their limited travel funds.

Back to Top

Governor Perry Highlights Need for Emerging Technology Fund

Governor Rick Perry illustrated how the proposed $300 million Emerging Technology Fund has the potential to foster technology innovation and create new jobs in high-tech sectors of the economy during his visit to the NASA Johnson Space Center.

Under Perry's proposal, the Texas Emerging Technology Fund (TETF) would have three components.

First, half of the funding, or $150 million, would be dedicated to creating collaborative efforts between institutions of higher education and the private sector to create “Regional Centers of Innovation and Commercialization” that will become hotbeds of research and development activities, incubate start-up firms and lure existing companies that can market new innovations.

Second, one-fourth, or $75 million of the TETF, would be used to match research grants awarded by federal or private sponsors, thereby helping Texas researchers better compete for grants from sponsors who want their funds to have double or more the impact.

Third, one-fourth of the funds, or $75 million, would be used to help make Texas public universities world leaders in technology research by attracting more renowned research teams from other universities.

It is to be expected that the emerging technologies will generate $3 trillion in revenue worldwide and it is extremely important to find out the appropriate high-tech investments so that our people can reap the benefits out of them. As many states are pumping billion of dollars into high-tech research and development, Texas should take necessary actions without any delay.

We encourage our readers to send a letter expressing their support to their legislator. This is important to the economic development of Texas. THe following Senators and Representatives are members of the Conference Committee working on the bill. Call or fax them asking for their support for at least $300 million in funding.

Senator Steve Ogden (R - College Station)
Phone: (512) 463-0105
Fax: (512) 463-5713

Senator Robert Duncan (R - Lubbock)
Phone: (512) 463-0128
Fax: (512) 463-2424

Senator John Whitmire (D - Houston)
Phone: (512) 463-0115
Fax: (512) 475-3737

Senator Judith Zaffirini (D - Laredo)
Phone: (512) 463-0121
Fax: (512) 475-3738

Senator Kip Averitt (R - Waco)
Phone: (512) 463-0122
Fax: (512) 475-3729

Representative Jim Pitts (R - Waxahachie)
Phone: (512) 463-0516
Fax: (512) 463-1051

Representative Vilma Luna (D - Corpus Christi)
Phone: (512) 463-0484
Fax: (512) 463-8090

Representative Sylvester Turner (D - Houston)
Phone: (512) 463-0554
Fax: (512) 463-8380

Representative Dan Gattis (R - Georgetown)
Phone: (512) 463-0309
Fax: (512) 499-8354

Representative Lois Kolkhorst (R - Brenham)
Phone: (512) 463-0600
Fax: (512) 463-5240

Source: www.governor.state.tx.us/divisions/press/pressrelease/PressRelease.2005-02-23.3716

Back to Top

Small Times Rankings: Texas Shares Fifth-Place with Michigan

Small Times magazine is the most respected source of business information about micro and nanotechnology. Their rankings follow a standard economic model for tracking technology development in states by measuring activities in six categories: research, industry, venture capital, innovation, workforce and costs. States get a score in each category. The categories are then weighted and added for a final score. Texas shares its fifth-place title after losing ground as a research and industry leader. Some venture capital success nudged it back. It may be a case of other states doing more rather than Texas doing less. Texas slipped in the research category as states like North Carolina apparently stepped up their efforts to win lucrative micro and nanotech research grants. Like many states, it saw an increase in its number of micro and nanotech companies, but other states had bigger increases. But Texas racked up enough venture capital to make the top 10 list in that category and improved its workforce standing significantly. Its category placements are: Research (9), Industry (7), Venture capital (4), Innovation (4), Workforce (18), Costs (23).

The top ten states are: California, Massachusetts, New Mexico, New York, Michigan, Texas, Illinois, Maryland, North Carolina and Ohio.

Source: Small Times

Back to Top

Two UT Nano-Researchers Awarded NSF CAREER Award

CAREER grants are the NSF's most prestigious awards in support of early career-development activities by scholars who are most likely to become the academic leaders of the 21st century.

Clarifying how and why materials undergo sometimes dramatic changes when confined to nanoscale dimensions is the focus of a $400,000 National Science Foundation Early Career Development (CAREER) award received by Thomas Truskett, a chemical engineer at The University of Texas at Austin.

The National Science Foundation has awarded a $400,000, five-year Faculty Early Career Development (CAREER) grant to Dr. Seong Jin Koh of the Materials Science and Engineering Program and the Nanotechnology Research & Teaching Facility at The University of Texas at Arlington . The grant will allow Dr. Koh to develop a new method of nanoscale device fabrication that will be based on controlled positioning of nanoscale objects in parallel processing.

Source: Press Release UTA College of Engineering and UT Engineering News

Back to Top

CNI Begins Shipping Product from New Commercial Plant

CNI, the Houston-based firm, recently established a 100-pound per day nameplate capacity unit and has begun shipping out the first product from the company's new commercial demonstration plant. The plant is located in west Houston's Park 10 and it has more than five hundred customers who have purchased CNI' nanotubes.

"This is the first demonstration plant ever in the small diameter carbon nanotube space," says CNI President and CEO Bob Gower, who at one time served as CEO and chairman of Lyondell Petrochemical Co. "Everyone else is operating at a very small scale."

Gower says the material CNI was shipping to customers prior to the unit's opening was enough to work with in a lab, but not enough to conduct a commercial demonstration. The next step is to send sufficient amounts of material for commercial use to develop products.

After its first full-blown commercial sale, it is expected that CNI will be cash-flow positive within 12 to 18 months. The three areas that the firm is focusing on are the aerospace and national defense industries; energy, specifically the fuel cells arena; and electronics, such as the development of flat panel televisions.

Source: Houston Business Journal

Back to Top

Zyvex and South Dakota School of Mines and Technology Announce Their Cooperative Agreement

Zyvex and South Dakota School of Mines and Technology (SDSMT) announced their cooperative agreement in an effort to designate SDSMT as the exclusive provider of integrated circuit (IC) failure analysis services to the semi-conductor industry.

The agreement between the world's leading supplier of molecular nanotechnology tools, products and services and SDSMT will help bring new high-tech research, development and commercialization opportunities in future.

Source: http://www.nanoinvestornews.com/

Back to Top

West Texas Nanotechnology Forum to Highlight Region's Newest Technologies

The Office of Technology Transfer and Intellectual Property of the Texas Tech University System, along with Texas Nanotechnology Initiative, Texas Tech University College of Engineering, Lubbock Regional BioScience Initiative, Texas Healthcare and Bioscience Institute and Technopolis Xchange, will host a nanotechnology forum to showcase the region's most promising available technologies for commercialization.

The West Texas Nanotechnology Forum, to be held April 19 at Texas Tech University, United Spirit Arena, will feature eight of the region's best nanotechnology prospects for venture capital investment. The technology, ranging from bulk explosives production and controllability to semiconductor nanowires development, extends through several colleges and departments and is coordinated primarily through the Nano Tech Center through the College of Engineering . Other areas include a focus on bioengineering and the

application of nanotechnology in the healthcare industries.

For more information, please visit http://www.ttip.ttu.edu/ or contact Lance Anderson at 806.742.4105.

Back to Top

Lux Nanotech Index(TM) Launches on American Stock Exchange

New Index designed to track how financial markets value applications of emerging nanotechnology. Lux Research today announced the launch of the Lux Nanotech Index (TM) in conjunction with the American Stock Exchange. The Lux Nanotech Index(TM) is a modified equal weight index comprised of 26 publicly traded companies, which seeks to measure the performance of securities in the nanotechnology field. The Lux Nanotech Index(TM) is not currently an investable product. It is quoted intraday on the American Stock Exchange under the symbol "LUXNI".

Source: www.luxresearchinc.com/luxni.html

Back to Top

Oklahoma EPSCoR Annual Conference

Oklahoma is holding its annual EPSCoR research conference on May 19 in Stillwater, Oklahoma. This year's focus is on Nanotechnology, Functional Genomics, and Plant Biodiversity and Ecology. Paul Barbara from UT Austin, Skip Garner of UT Southwestern, and Norman Schumaker of Molecular Imprints are among the speakers. Deadline for early registration is May 2. Details can be found at http://www.okepscor.org/.

Back to Top

The Nanotechnology Foundation of Texas
3307 Virginia St.
Houston, TX 77098

P: 713.521.0992
F: 713.521.0993

Copyright © 2004 NFT Inc. All rights reserved.