

Putting Science to Work

ISSUE 2 2007

Newsletter



Thom Mason

THOM MASON NAMED ORNL DIRECTOR

Thom Mason has been named ORNL's new director, effective July 1. The choice was announced in late May by UT-Battelle Board of Governors Chair Carl Kohrt and Vice Chair John Petersen.

Mason's most recent role has been associate laboratory director for Neutron Sciences. As head of the Spallation Neutron Source project, he led a consortium of six DOE labs in the design and construction of the \$1.4 billion neutron accelerator. Completed on time, on budget, and on scope with an outstanding safety record, the SNS will restore American leadership in the field of neutron scattering and materials research. Mason and his colleagues at the SNS have helped achieve a great milestone for ORNL and for the Department of Energy.

"We are genuinely excited to have a person of Thom's talent and experience to lead ORNL," Kohrt and Petersen said in the announcement. "He is a world-class scientist who has already made a mark in the research community. We believe Thom represents the future of ORNL, and will be an asset to the research agendas of both Battelle and the University of Tennessee."

Mason was an Alfred P. Sloan Research Fellow, an associate of the Canadian Institute for Advanced Research, an associate professor at the University of Toronto, a senior scientist at Riso National Laboratory in Denmark, and a postdoctoral fellow with Bell Laboratories.

Now an American citizen, Mason is a native of Halifax, Nova Scotia. He received degrees from Dalhousie University and McMaster University in Canada. He lives with his wife, Jennifer, and two sons in Oak Ridge. Mason serves as chair of the Oak Ridge Public Schools Foundation, which has helped raise \$55 million to renovate Oak Ridge High School.



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BUILDING

NANOTECHNOLOGY DEVELOPMENT

S&T Park News: Infrastructure Grant, Nanotechnology Commercialization Activities

It's been a busy spring for those involved in the development of the Oak Ridge Science and Technology Park, with the approval of a major infrastructure grant, progress toward the establishment of a Nanotechnology Commercialization Center, and the announcement of a new nanotechnology tenant.

(continued on page 3)

Accompanying Congressman Wamp (at lectern) during the grant announcement are, from left, Oak Ridge City Councilwoman Lou Dunlap; Tom Ballard, ORNL director of Economic Development and Partnerships; and Gerald Boyd, manager, DOE Oak Ridge Office.



MESSAGE FROM THE DIRECTOR



Alex Fischer

I recently read a great quote which suggested that we are living in “exponential” times, a reference to the increasing frequency and velocity of change all around us. I’ve consistently written in this newsletter about the constant of change, and I am reminded of this as I personally prepare to embark on a new adventure. Effective August 1, I will transition full-time to the Battelle Memorial Institute, and my family and I will be relocating to Columbus, Ohio, home to Battelle’s corporate headquarters.

For the past year, I’ve been splitting time between Oak Ridge and Columbus, coordinating the commercialization activities at the five national laboratories that we manage for the Department of Energy. I’ll assume this activity full-time and will be assisting Jeff Wadsworth as he assumes the leadership for Battelle’s Laboratory Operations sector. It is sure to be an exciting time as we seek to manage with distinction our current holdings of laboratories, win new labs into our portfolio, and aggressively expand our commercial activities. Commercialization has been at the heart of the Battelle organization since its inception, and I look forward to being a part of our new strategies designed to aggressively move technologies into the marketplace.

As I leave Oak Ridge, I am reminded of how far we have progressed under UT-Battelle’s superior leadership. It’s hard to recognize the place from what I first saw five years ago when I joined our ORNL team. We have a spirit throughout the region that totally embraces ORNL as an economic engine. The University of Tennessee is

completely engaged in our strategies. Our partnerships throughout the south are bringing to life our “Lab of the South” motto. New sources of debt and equity capital are in place. Our entrepreneurial efforts, Nano Alliance, and Southern Bio-Energy activities are all well-positioned. Dirt is moving at the new Science and Technology Park in the heart of the ORNL campus. And most importantly, our commercialization efforts are not only producing record incomes, they are linked to almost every part of the ORNL research agenda.

At the end of the day, however, I am most proud of our team – our staff within TTED, the leadership of ORNL, our research partners throughout the lab, and our community partners. They are all working each and every day to leverage the great work at ORNL and throughout the region. I am confident that I leave with a team in place that will “dust” the past five years during the next five and beyond. And of course, in my new role, I’ll have the opportunity to continue to work with many of you, and I certainly plan to stay engaged with Battelle’s efforts in Oak Ridge.

On a more personal note, I’d add that Battelle is an extraordinarily special organization. It presents a unique opportunity to pursue my passions of business, economic development, and community philanthropic activities all rolled into one. It’s such an organization that has pulled this Tennessean out of the South! But, as a Tennessean first and foremost, I’ll always have the best interests of the Oak Ridge/Knoxville region and our State in my heart. I am grateful for the many opportunities that I have had to serve our state and community, and I’ll take the Volunteer spirit with me to Buckeye country.

See you all very soon!



SAFETY REMINDER

The following warm-weather tips are from the U.S. Consumer Product Safety Commission, which warns that summer is the season Americans are most likely to be injured.

Wear a helmet and other safety gear when biking, skating, and skateboarding, and when riding scooters, all-terrain vehicles, and horses.

Place barriers completely around your swimming pool to prevent access, use door and pool alarms, closely supervise all children, and be prepared for emergencies.

Use softer-than-standard baseballs, safety-release bases, and batting helmets with face guards to reduce injuries to children.

Be aware that movable soccer goals can fall and injure children. Make sure the goal is anchored securely and never allow anyone to climb on the net or framework or hang from the cross bar. Remove nets when goals are not in use.

When mowing, keep small children out of the area. If your lawn slopes, mow across the slope with a walk-behind rotary mower, never up and down. With a riding mower, drive up and down the slope, not across it. Never carry children on a riding mower.

ORNL Tech Transfer and Economic Development staff wish you a safe and enjoyable summer.



(BUILDING NANOTECHNOLOGY DEVELOPMENT continued from page 1)

S&T Park News (cont.)

As part of his focus on improving technology within the Tennessee Valley Corridor, Congressman Zach Wamp announced in April the approval of a Federal Economic Development Administration (EDA) Grant for the park, which is located on the ORNL campus. The grant will provide \$1.7 million to help with the design and layout of the park's infrastructure.

"Oak Ridge National Laboratory is leading the nation's scientific development in so many fields. This park will allow even greater success and keep it local," Wamp said. "The potential to grow businesses out of the laboratory is greatly enhanced and will leave a tremendous legacy for our children and grandchildren," he added.

Community impact. "The City of Oak Ridge is pleased to be awarded the EDA grant for this purpose and greatly appreciates Congressman Wamp's help in making this possible," said Lou Dunlap, Oak Ridge city councilwoman. "We expect the Oak Ridge Science and Technology Park to have a tremendous impact on the community, not only through the generation of jobs and revenue for the city, but also because it continues the focus on Oak Ridge as a leader in the Tennessee Valley Corridor."



In addition to the EDA grant, the community has also applied for and received a Fast Track

Infrastructure Development Program grant from the State of Tennessee's Department of Economic and Community Development. This \$750,000 grant will support the provision of storm-water drainage/site improvements for Pro2Serve's \$15 million, 100,000-ft² National Security Engineering Center and corporate headquarters. The

Oak Ridge S&T Park is located on land leased by the U. S. Depart-



ment of Energy to the Community Reuse Organization of East Tennessee (CROET).

Nanotechnology update. In the nanotechnology arena, ORNL's Center for Nanophase Materials Sciences is complete and in full operation. To complement these superb nanoscience capabilities, the laboratory is assembling a nanomanufacturing initiative of equal stature. Nanotechnology development work is progressing in multiple-application areas and is producing unique processing capabilities and exciting new nano-enabled products with applications in energy, national defense, and environmental health.

Completion of the science-to-marketplace cycle will be realized through Technology 2020's plans to establish a Nanotechnology Commercialization Center within the Science & Technology Park. The new center is to be housed in an existing 31,000-ft² facility at ORNL that



Planned Technology 2020 Nano Commercialization Center on the campus of ORNL.

DOE expects to transfer to CROET for lease to Technology 2020. Objectives of the center are to provide low-cost access and centralized support to small nanotechnology companies; to create an environment for success by allowing researchers and entrepreneurs to collaborate; and to support the growth of regional nanotechnology companies by facilitating rapid startup with minimal financial and technical risk.

New tenant. C3 International LLC, a nanotechnology company based in Alpharetta, Ga., has already announced plans to open a branch office within the Nanotechnology Commercialization Center. Company founder Mark Deininger said that Arvid Pasto, who recently retired as director of ORNL's High Temperature Materials Laboratory, will direct C3's Oak Ridge operations.



The company – which makes ultrathin coatings that extend the life of various materials – has had a collaborative relationship with the laboratory for five years. In 2002, when the company was a three-employee business, Deininger made his first presentation at ORNL. The laboratory has since provided significant technical assistance in the development of C3, which has 20 staff members and is expected to be worth some \$2 billion in five years.

C3 Oak Ridge plans to rent office space offsite until the center is open. Company officials said C3 will test applications with ORNL scientists, obtain patents, and license technologies to other companies.

The Oak Ridge Science and Technology Park, which ultimately will encompass a 40-acre footprint, is the nation's first technology park located on the campus of a national laboratory. The Oak Ridge park is available to private-sector companies as well as to companies established from technologies developed at ORNL.

AWARDS AND REWARDS

GFTT Program		
Title	Submitted by	Division
"Apparatus and Method for Detecting Tampering in Flexible Structures"	L. Curt Maxey Howard D. Haynes	Engineering Science and Technology
"Demonstration of Hybrid Spread Spectrum Signaling for Robust, Secure Industrial Wireless Applications"	S. F. Smith W. W. Manges M. Bobrek	Engineering Science and Technology
"Application of ORNL's Spatial Heterodyne Interferometry to Advanced MEMS Inspection and Metrology"	Kenneth W. Tobin Philip R. Bingham	Engineering Science and Technology
"Ultrasonically Assisted Argon Degassing of Molten Metals"	Qingyou Han	Materials Science and Technology
"Development of a Versatile Process and Engineering Model for CFCMS/ESA Gas Separation Systems"	Frederick S. Baker Cristian I. Contescu Nidia S. Gallego Timothy D. Burchell	Materials Science and Technology
"Commercializable Weigh-In-Motion Prototype"	Lee M. Hively	Computational Sciences and Engineering
"Chemical Recognition in Scanning Probe Acoustic Holography"	Thomas G. Thundat	Biosciences
"New Nano-Sized Precipitate-Strengthened Martensitic Steels"	Ronald L. Klueh Neal D. Evans	Metals and Ceramics
PFTT Program		
"Versatile Solar Tracker Controller for Concentrator Photovoltaic Systems"	Melissa Lapsa Christina Ward Wes Wysor	Engineering Science and Technology
"Flash Bonding Superhydrophobic Powder"	John Simpson	Engineering Science and Technology
	Craig Blue Jim Kiggans	Materials Science and Technology

ORNL research projects chosen this year for funding through the GFTT and PFTT programs.

Final Sprint to Market: 2007 Maturation Funding

However compelling the technology, a gap often exists between government-funded research and its transfer into the marketplace. As a project nears completion, federal dollars often dry up before an invention has progressed enough to be an attractive commercial product. Enter "technology maturation funds." Unlike other sources of funding available to Oak Ridge National Laboratory researchers, maturation funds can help overcome the last hurdle to commercialization – significantly increasing the likelihood of ORNL intellectual property (IP) finding its way into the marketplace.

Two sources of maturation funding are available to ORNL researchers: government-funded technology transfer (GFTT) dollars – generated by revenues ORNL receives from previously licensed technologies, including royalties – and privately funded technology transfer (PFTT), funded by UT-Battelle. The latter can be supplemented by Battelle corporate dollars and matching investments from the University of Tennessee.

For government-funded tech maturation, proposals are reviewed by the laboratory's Invention Disclosure Review Committee, which selects the recipients. Awards average

about \$50,000. Proposals must come from ORNL researchers who have had interactions with TTED via the invention disclosure process for the maturation of their already-disclosed IP.

Projects are evaluated on their demonstrated path to commercialization, relationship to existing intellectual property, and technical merit. "Demonstrated path to commercialization" means requested funding should be sufficient to achieve a measurable commercialization milestone. Activities selected are those that advance the IP or technology so that it will be able to be licensed to a commercial entity. This funding usually is the last resource expended, resulting in a license to an outside entity that could not otherwise have been achieved. Activities might include prototype development, field testing, and generation of data or samples. Preference goes to proposals for which a commercial company has expressed licensing interest pending successful completion of proposed activities.

"Relationship to existing intellectual property" means projects should involve IP that has already resulted in a patent, patent application, or copyright. "Technical merit" is the distinctive competitive advantage achieved through the technical approach and focuses on market and commercialization outcomes.

Pinnacle Award Winners Named

One individual and one company – both with start-up ties to ORNL – were among the seven winners in the Knoxville Area Chamber Partnership's recent Pinnacle Awards.

Chuck Witkowski, president of Knoxville-based Protein Discovery, won the "Young Entrepreneur Award," which is given to a professional age 40 or younger who is on track to be a top business and community leader. The 30-year-old Witkowski was one of the participants in an experimental "Technopreneurial Program" in 2001 that allowed University of Tennessee MBA students to try to build a company around an ORNL technology. Witkowski oversees a cutting-edge scientific com-

pany that develops advanced diagnostic tools to detect cancer before a tumor begins to grow.

ORNL licensee NuSAFE, which is headquartered in Oak Ridge, won the "Innovator of the Year Award," which recognizes a business that has developed a technology, innovative product, or service or applied a business system or service in an innovative way. NuSAFE manufactures radiation-measurement systems for the homeland security market.



Chuck Witkowski



TTED | **EDUCATIONAL OUTREACH**

Regional Firms Meet with NSF Director

Executives from some 20 high-tech firms from across the Tennessee Valley region gathered at ORNL recently to meet National Science Foundation Director Arden Bement and discuss ways that the agency can assist start-up and established companies.

The forum, which included leaders of companies from as far away as Franklin and Huntsville, Ala., was hosted by the laboratory, Technology 2020, and the Tennessee Valley Corridor.

“Forum attendees had a rare opportunity to exchange ideas with top NSF decision-makers who wanted to hear from established technology leaders and entrepreneurs about how federal dollars can be better directed to help propel new discovery, invention and commercial application,” said Tom Ballard, ORNL director of Economic Development and Partnerships. “We are pleased that Dr. Bement and his colleagues selected our region as a location to hear from business leaders.”

Arden Bement (l), director of the National Science Foundation, confers with Henry Paris of Steward Advanced Materials & Environmental Solutions at the forum.

The National Science Foundation is an independent federal agency that supports fundamental research and education across all fields of science and engineering, with an annual budget of \$5.91 billion. The NSF funds reach all 50 states through grants to nearly 1,700 universities and institutions.

Forum participants ranged from Bio-Mimetic Therapeutics, a now well-established Middle Tennessee biotech firm, to Clinton’s Remotec Inc., a robotics company. Both have been recipients of NSF funding.



BUILDING A | **TECHNOLOGY-BASED ECONOMY**

Automotive Research Alliance Unveiled at Spring Event



May 16-18, 2007 in Nashville, Tennessee

A two-year effort to build a Southern consortium of research institutions focused on automotive R&D reached a major milestone with the unveiling of the entity at a major automotive event in Nashville. The newly named “Automotive Research Alliance” was announced on the eve of the *Automotive News* Manufacturing Conference held in mid-May.

Founding ARA members are ORNL, the Tennessee Valley Authority, and seven Southern universities – Alabama-Birmingham, Alabama-Tuscaloosa, Auburn, Clemson, Kentucky, Mississippi State, and Tennessee. The Knoxville-based National Transportation Research Center will serve as administrative agency.

The *Automotive News* conference provided a natural venue, because it attracted more than 300

automotive executives, many from the supplier community, a key focus for alliance members.

TTED’s Tom Ballard and TVA’s Amy Bunton led the effort to create the alliance. From an initial Nashville meeting in 2005, the effort has unfolded through a series of gatherings in Birmingham and Tuscaloosa, Ala.; Lexington, Ky.; Jackson and Starkville, Miss.; and Chattanooga and Knoxville. ORNL leadership was so strongly committed to the concept that it engaged Ben Ritchey, vice president of the Transportation Sector for Battelle Memorial Institute, to help develop the strategy and stand up the alliance.

The ARA will focus on using its members’ strengths in a collaborative way to secure more automotive R&D work for the South. In addition, centers of excellence will be launched by two alliance members. The University of Tennessee will establish a center in the critically important area of logistics, while the University of Kentucky will establish one in painting. Additional centers will be established later.



Representing the founding members of the Automotive Research Alliance are, from left, Larry Holloway, UK; John Bradley, TVA; Thomas Jackson (partially hidden), UAB; Ben Ritchey, Battelle; Fred Thompkins, UT; Ralph Zee, Auburn; Dana Christensen (partially hidden), ORNL; Kirk Schulz, MSU; Chris Przirembel, Clemson; Marianne Woods, UA; and Tony Metler, NTRCI.

PEOPLE IN TTED NEWS

BUILDING ECONOMIC DEVELOPMENT



Terry Payne

Payne Leaves TTED

Long-time TTED staffer Terry Payne has accepted a position with the ORNL Engineering Science and Technology Division supporting the Hydrogen Program of the DOE Energy Efficiency and Renewable Energy Program. Beginning this summer Payne, who has served as an economic development manager,

will be involved in the

development of a Hydrogen Program technology roadmap that leads to successful commercialization of hydrogen technologies.

Most recently Payne has helped match private firms seeking research partners with ORNL researchers. Particularly noteworthy has been Payne's promotion of research partnerships between ORNL and small businesses pursuing Federal Small Business Innovation Research funding, in which he put to use his extensive knowledge of the SBIR and STTR program. He received the Small Business Administration's National Tibbetts Award for these efforts.



Leigha Stewart

Stewart Named ORNL Protocol Officer

Leigha Stewart has left the Technology Transfer and Economic Development directorate to become the Oak Ridge National Laboratory protocol officer. In her new role, she serves as ORNL's principal point of contact for the coordination of arrangements and the

efficient conduct of visits, tours, and briefings for elected officials, DOE customers, and other dignitaries. The position is part of the laboratory's Communications and External Relations organization.

Stewart most recently was an economic development associate in TTED. She is a graduate of the University of Tennessee and is active in a variety of groups in the Oak Ridge community.

ORNL Promotes Entrepreneurialism among Staff

Technology Transfer and Economic Development, in cooperation with Tech 2020 and the Center for Entrepreneurial Growth (CEG), is sponsoring entrepreneurship luncheons for ORNL staff to highlight venture creation. The series – aimed at researchers and other employees interested in starting a company based on ORNL technology – showcases successes and covers issues facing start-ups.

The first session featured Mike Paulus of Siemens. Paulus, along with Shaun Gleason, took advantage of ORNL's Entrepreneurial Leave Policy to start ImTek, a CT/PET imaging company focused on imaging laboratory test animals. He shared "war stories" of ImTek's beginning, dramatic growth, and exit, which included eventual acquisition by Siemens.



CEG's Shawn Carson (standing) discusses trends on shaping new technology companies with brown-bag lunch attendees.

A second session looked at trends shaping a favorable environment for new technology companies and covered the entrepreneurial support program for ORNL licensees and employees. Topics included community support of technology start-ups, funding sources, and CEG's Client Development Model, which helps guide small companies through transitions toward commercial success.

A spring luncheon, "Funding Sources for Entrepreneurial Start-ups," focused on the range of funding available to new ventures. It explored grant opportunities and looked at forming a plan using different funding types at various stages of company development. Plans are to draw from CEG's library to include future sessions on business models, market research, and milestone-driven strategic plans.

Interns Look at Viability of Russian Technologies

Technology Transfer and Economic Development routinely employs University of Tennessee MBA students to provide preliminary market studies of invention disclosures submitted by ORNL researchers. Recently, however, three interns – Pasquale Ferrari, Karen Genung, and Dan Miller – analyzed three invention disclosures from Russian scientists working under project agreements of the International Science and Technology Center (ISTC). This opportunity stemmed from the connection that TTED's Jud Hightower has with the Science Centers Program within the Department of State. He provides intellectual property support to the program through a Work for Others agreement between UT-Battelle and the Department of State.

The Science Centers Program includes the ISTC in Moscow and the Science and Technology Center in Ukraine (STCU) in Kiev. The ISTC and the STCU provide project agreements for research and development to various institutes in the former Soviet Union that employ former weapons scientists. The ISTC was founded in 1992 by the European Union, Japan, Russia,

TTED HAPPENINGS



Interns Pasquale Ferrari, Dan Miller, and Karen Genung (l to r) discuss their analyses of invention disclosures from Russian scientists.

and the United States and has funded more than 67,000 scientists from Russia and the Commonwealth of Independent States.

The Department of Energy reviews all inventions that come from ISTC projects funded by the U.S. government and decides whether or not to pursue patenting based on commercial potential. Because DOE does not have the resources to make a completely informed decision on every ISTC disclosure, Hightower recommended to the Department of State that interns analyze a few disclosures to determine if TTED can aid the ISTC commercialization process. Completed analyses were sent to DOE, the Department of State, and the ISTC, where they were well received. In fact, the ISTC hopes to establish its own group to provide commercial analysis and to use the ORNL analyses as models. For more on the ISTC, see www.istc.ru. – Dan Miller, TTED intern

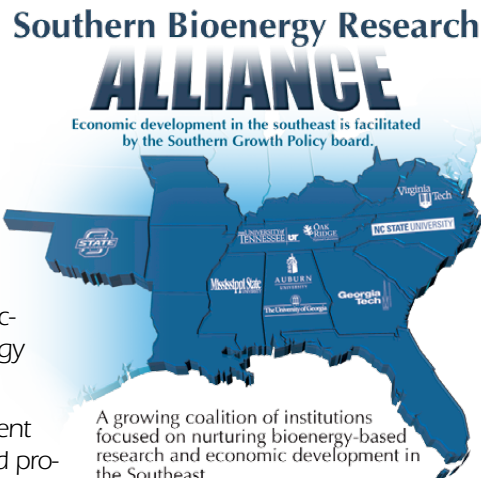
Efforts Under Way to Create Bioenergy Research Alliance

Technology Transfer and Economic Development staff members are collaborating with the Southern Technology Council to help ORNL's Biological and Environmental Sciences directorate create a Southern Bioenergy Research Alliance.

While the initiative will complement activities outlined in the ORNL-led proposal to establish one of three Department of Energy bioenergy centers, it will also go forward regardless of the outcome of the highly competitive RFP process.

STC is the technology-focused subsidiary of the Southern Growth Policies Board, a compact established more than 20 years ago by the governors of 13 states and Puerto Rico. It champions a variety of initiatives that strengthen the region through science and technology. The effort is another of the "Lab of the South" initiatives to better connect the region and ORNL.

STC and ORNL co-sponsored a Southern Bioenergy Summit in September 2006 that was attended by more than 75 individuals involved in bioenergy research, biomass production, and policymaking. The interest in collaboration was so great that the two organizations decided to hold a follow-up event after the proposal deadline passed. The two-day, invitation-only event will be held during the summer in Oak Ridge. ORNL's Brian Davison and STC's Charity Pennock are leading a planning effort that includes representatives from the Georgia Research Alliance and five universities (Auburn, North Carolina State, Mississippi State, Tennessee, and Virginia Tech).



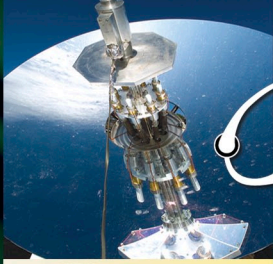
The Tennessee Pavilion at the Bio Show 2007 in Boston spotlighted ORNL's bioenergy research program as well as many other areas of strength across the State of Tennessee. ORNL played a key role in the development of the overall pavilion concept as well as its design.



TTED hosted a meeting of the East Tennessee members of the Tennessee Industrial Development Council in the spring. Following an overview of ORNL by Tom Ballard, the group toured several of the lab's world-leading assets including the National Center for Computational Sciences (top) and the Everest visualization wall.

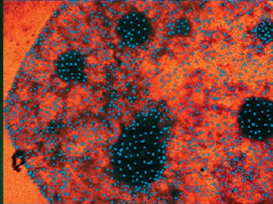
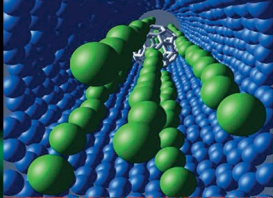


Jack Cook, subcontractor to the ORNL TTED Organization, chats with Ralph Hulseman of Michelin Tires at the Innoventure 2007 Conference in Greenville, S.C.



TECHNOLOGY TRANSFER

AND ECONOMIC DEVELOPMENT



UPCOMING EVENTS

- September 26–27 Tennessee Valley Venture Forum, Knoxville Convention Center. For more information: www.tvvf.biz
- September 26–28 Tennessee Biotechnology Association Annual Meeting, Franklin. For more information: www.tnbio.org
- October 18–19 SSTI Annual Conference, Baltimore. For more information: www.ssti.org/conference07.htm
- October 24–25 Tennessee Industrial Development Council Fall Conference, Franklin. For more information: www.tidc-ecdev.org/
- November 19 Tennessee Valley Corridor Mini-Summit, Greenville, S.C. For more information: www.tennvalleycorridor.org/



TECHNOLOGY TRANSFER
AND ECONOMIC DEVELOPMENT

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Nano...

Oak Ridge Wows Crowd at Nano Nexus Event

How do you kick a region's nanotechnology development initiative into high gear?

Simple: Corral a bevy of investors worth \$5 billion in venture capital; put bright student entrepreneurs in front of them pitching the next nano-goldmine; add savvy economic developers, brilliant scientists, and successful industrialists; and do it all at one of the world's premier national laboratories. In the scenic foothills of East Tennessee. In the springtime.

OK, so maybe it's not so simple. But it works. Just ask Doug Jamison, president of New York-based Harris & Harris, and John Chen, senior associate at Battery Ventures in Menlo Park, Calif. The two venture capitalists, whose companies represent nearly \$2 billion in investment funds, had their doubts about the recent Nano Nexus 2007 at Oak Ridge National Laboratory. On the eve of the event, they questioned whether the new Spallation Neutron Source merited the acclaim they had heard, Jamison said.

"There's always some skepticism when we leave New York or Silicon Valley," said Jamison. "So we headed south with a bit of hubris. John's father [Sow-Hsin Chen] is a renowned researcher at MIT. So John said 'If the SNS were really the premier place to be, my father would be the first to use it.' He called his dad to tell him we were in Oak Ridge, and his father said 'Oh yes, I'm first in line to use the Spallation Neutron Source. Researchers around the world are very excited by it.'" The \$1.4 billion SNS, completed in last May, begins its first round of users in July. Sure enough, Sow-Hsin Chen's name is at the top of the list. "All of a sudden," Jamison said, "our eyes were opened."

Their eyes weren't alone. Judging by reactions of the 250 or so Nano Nexus attendees, the region is poised, primed, and positioned to make major progress in nanotechnology development soon.

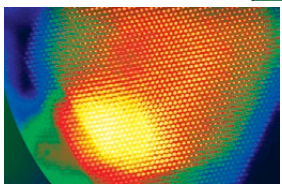
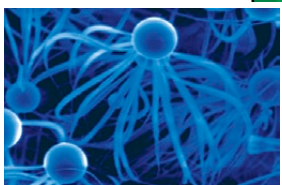
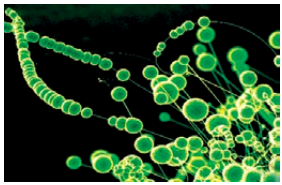
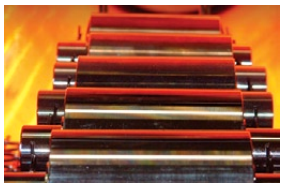
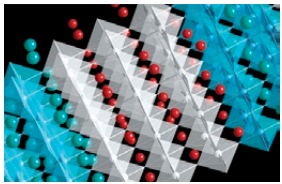
Nano Nexus featured an innovation business competition among 15 graduate stu-

dent teams, a showcase for companies to present their business plans to venture capitalists representing more than \$5 billion in investment funds, and presentations by speakers from research firms, government, industry, and lab leadership.

When Pat Richardson, TTED's director of Strategy and Business Development, came

(continued on next page)

Registration at
Nano Nexus 2007.

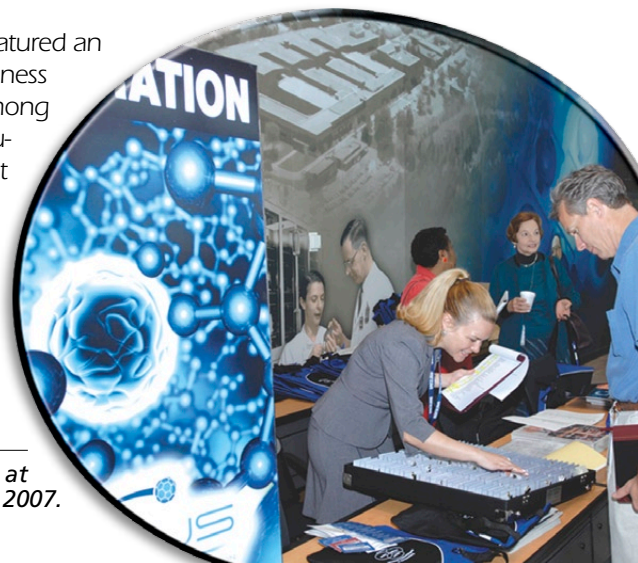


Nano at
Oak Ridge National Laboratory

DISCOVER
Center for Nanophase
Materials Sciences

DEVELOP
NanoApplications Center

DELIVER
Technology Transfer and
Economic Development



Nano Nexus 2007 was held at the Conference and Visitors Center at Oak Ridge National Laboratory.



up with the concept for a business competition at ORNL, he envisioned attracting some of America's most entrepreneurial graduate students to the region to compete. "Many people start their first businesses before they turn 30, and this would be a unique opportunity to encourage their entrepreneurial and intrapreneurial development while showcasing our strong start-up business support systems, including access to ORNL resources," he said.

The appeal of the Nano I2P® competition was the way it encourages the early process an entrepreneur goes through, talking with a friend about an idea for a business, thinking about what the product might be, and who the first customer would be. It is that first step when you have a fragile idea and are learning to describe it, Richardson explained.

"We developed a profile for a hypothetical winning team: It would include a university faculty researcher in nano-biology, a graduate student assisting with research, another grad student from the entrepreneurial track in the MBA program, and an experienced local entrepreneur. We wanted to encourage cross-functional teams coming together as it occurs in real businesses, and that's what happened," Richardson said.

Major Nano Nexus sponsors include the Department of Energy, ORNL, the Kauffman Foundation, RTI International, Innovation Valley Nano

NANO I2P®

Idea to Product Competition

Oak Ridge National Laboratory

Student Camaraderie Plays

Product ideas, market need, and development plans were among the strict criteria used to judge teams in the Nano Nexus Idea to Product competition. But in the end, warm fuzzy factors like friends, fun, and a sense of humor may have provided a winning edge.

Nicholas Rojeski said camaraderie played a major role in helping his University of Texas team win the \$25,000 first prize. "At first you're really stressed," Rojeski said of his team's experience, "but then you get to be pretty good friends. We really wanted to do well, but we also wanted to enjoy the process, meet people, and have a sense of humor. I think that showed in our team bonding, presentation, and networking abilities. Having a sense of humor was a big plus."

The winning concept was an intelligent, nano-sized drug-delivery device that can target tumor cells and release an FDA-approved drug only in the presence of a cancer-specific enzyme. The technology, NANOTaxi, is patent-pending and consists of a nanocontainer with a disease-responsive lid that dissolves only in response to a cancer-specific signal within a cancer cell, allowing for more effective delivery of the drug and a potential reduction in side effects.

Formed in a New Venture Creation class, the team included Cristal Glangchai, PhD candidate in biomedical engineering and co-inventor of NANOTaxi; Abiola Ajetunmobi, who is earning an MS in mechanical engineering; Jakub Felkl, who is seeking an MA in physics; and MBA candidate Rojeski. "At first you're sort of feeling each other out," Rojeski said, "but you spend so much time together that you start to get along great, and our team has been very close."

Ken Kahn, professor at the University of Tennessee College of Business Administration, was faculty advisor for two teams: Acadia, whose smart-nanotex fabric is an electronic network of silver nanoparticles and carbon nanotubes that monitor vital signs and help rehab injured joints; and



Alliance, Technology 2020, and Oak Ridge Associated Universities. The event focused on commercialization of products utilizing nanotechnology, which has industrial applications in health care, energy, information technology, and other fields.

"We committed to an event that would jump start the region's nanotechnology industry, and we have delivered," said Tom Rogers, president and CEO of Tech 2020. "The program was a success on all fronts, but its true measure will be seen with the advent of new venture capital investment, commercialization of ORNL technologies, increases in local technology startups, and the arrival of new companies. I believe this is just the beginning," Rogers said.

Joy Fisher, managing director of Nano Nexus 2007, said first-time visitors to Oak Ridge were impressed and pleasantly surprised. "I think people were surprised at the depth and breadth of the entrepreneurial talent of students from across the South," Fisher said. "Venture capitalists were also surprised at the capabilities of the lab and the desire to commercialize technologies – and at the success of companies that have been formed."

Karen Kerr of Agile Equities in New York described Nano Nexus as a "win-win-win" event. "I was impressed by the leadership of the laboratory. The campus renovation is spectacular, and it was

(continued on next page)



Nano Nexus attendees in the Conference Center lobby.

Role in I2P Competition

Apacell, a gel-like material developed at ORNL that has excellent potential as a synthetic bone-repair material.

"Our teams had phenomenal rapport. They really 'gelled' – no pun intended," said Kahn. "Both teams were very supportive, and the Acadia group is doing an independent study that gives them the potential to eventually file for an LLC. The fact that they may move this forward shows the rapport they built and the possible impact of this competition."

A major Nano Nexus sponsor was Oak Ridge Associated Universities, a consortium of 86 research institutions committed to advancing science and education by partnering with national labs, government agencies, and industry. Cathy Fore, director of ORAU's Historically Black Colleges and Universities/Minority Educational Institutions Partnerships, said the event not only showed the importance of team chemistry, but also demonstrated the value of membership in the ORAU consortium.

"All 12 semifinalist teams were ORAU members, and this 'door of opportunity' that we opened for them takes us another step forward in achieving our strategic partnership development goals," Fore said. "Our objective – to create a collaborative environment for students and faculty to share research interests and needs – was met, if not exceeded."

Minority institutions in the competition were Tuskegee University and Florida International University. Fore said she hopes to see participation of HBCU/MEIs expand at Nano Nexus and similar events. "All teams were extremely professional and represented their institutions well," Fore said. "Some were more experienced in business plan competitions, and it showed in the finals. However, they all contributed to the event's success, and they all left with unique educational experiences that will benefit them throughout their careers."

L to R: Cristal Glangchai, Jakub Felkl, Abiola Ajetunmobi, ORNL Director Jeff Wadsworth, Nano Nexus Managing Director Joy Fisher, and Nicholas Rojas.





Tom Rogers, president and CEO of Tech 2020.

creatively financed. From a venture perspective, I had a chance to interact with ORNL scientists, and some of them already have followed up with me about commercializing technical work. That's what you want when you try to bring venture capitalists to Oak Ridge," she said.

Visiting venture capitalists weren't the only ones to benefit. The VCs also spent a day judging the college student competition. The \$25,000 grand prize went to a team from the University of Texas, which presented a commercialization plan for a drug delivery system called NanoTaxi. Team member Nicholas Rojeski said the learning experience was more valuable than the money.

"We were able to have in-depth conversations with the venture capitalists," Rojeski said. "They helped us understand what we needed to do to achieve our next milestones – how to pitch better to VCs and speak their language, and other details. The access was great. The VCs are looking for new technologies and for what's coming out of academia, and that's exciting."

The competition was modeled after the "Idea to Product" concept developed by Steven Nichols, former associate vice president for research and director of the Clint Murchison Chair of Free Enterprise at the University of Texas. He also has initiated multidisciplinary research and classroom activities that encourage collaborative learning environments for students, faculty, and staff. Nichols' concept has spurred, inspired, and served as a foundation for programs at seventeen universities on three continents. Now you can add one national laboratory.

"Oak Ridge is the first and only national lab to do anything like Nano Nexus," Nichols said. "They are stepping out in the lead, and that is exciting. This is a need whose time has come to be addressed, and Oak Ridge prepared a fantastic program. I can't imagine it having been done better anywhere else."

Other competing universities were Duke, Emory, Florida International, Florida State, Georgia Tech, Imperial College in the United Kingdom, Louisiana Tech, Tuskegee, Tennessee, Virginia, and Vanderbilt.

While the championship trophy went to Texas, there were no losing teams, said Alex Fischer, ORNL associate lab director for Technology Transfer and Economic Development. "You're all winners," Fischer told the teams. "And to those of you who did not make the finals, the most satisfying thing you can do is to make your product successful and prove the judges wrong." – Mike Bradley, ORNL Communications and External Relations

Attendees meet at the Joint Institute for Computational Sciences on the ORNL campus.



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