

Putting Science to Work

SUMMER 2004

Newsletter

BUILDING

ECONOMIC DEVELOPMENT

TVA, ORNL Sign Deal to Give Universities Faster Computer Access

Researchers and scientists at Tennessee Valley colleges and universities will soon be able to link to ORNL's supercomputers and other national research networks at a much higher rate of speed, thanks to a recent TVA-ORNL agreement that gives them access via a TVA fiber optic telecommunications network. TVA Director Bill Baxter and ORNL Director Jeff Wadsworth announced the partnership on June 1 at the Tennessee Valley Corridor Summit in Knoxville. The network is aimed at providing superior research resources to foster education and technology development, grow new business ventures, and assist in

(continued on page 3)



Signing ceremony for TVA/ORNL computer access agreement. From left to right: ORNL Director Jeff Wadsworth; Gerald Boyd, manager of DOE's Oak Ridge Operations; TVA Director Bill Baxter; Ray Orbach, director of the DOE Office of Science; U.S. Representative Zach Wamp; and Under Secretary Phillip Bond, U.S. Department of Commerce.

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TECHNOLOGIES



ORNL's Center for Computational Sciences will house the world's most powerful supercomputer by 2007.

ORNL to Build World's Largest "Civilian" Supercomputer

ORNL has been chosen to lead a partnership with a goal of building the world's most powerful supercomputer for unclassified use by 2007. The National Leadership Computing Facility (NLCF) proposal selected by the Department of Energy is a five-year, \$25 million effort that will pool the partnership's computational resources for a sustained capacity of 50 trillion calculations (teraflops) per second and a peak capacity of more than 250 trillion teraflops per second.

(continued on page 2)

ORNL Technology Transfer & Economic Development (TTED) seeks to foster economic development and the growth of business and industry by making available the most innovative equipment, the latest technology, and the expertise of ORNL researchers to technology-based companies throughout the nation.

MESSAGE FROM THE DIRECTOR

(OUR TECHNOLOGIES continued from page 1)



Alex Fischer

President Bush visits and salutes ORNL. The world's largest supercomputer to be built in Oak Ridge. The Tennessee Valley Corridor wins the top U.S. economic development award. ORNL construction of the nation's "largest science project," the Spallation Neutron Source, on schedule and on budget. TVA-ORNL partnership to provide universities computer access for economic development. ORNL sweeps Federal Laboratory Consortium technology transfer awards. "Mr. Nano" visits ORNL. New UT President committed to Oak Ridge partnership. Record royalty distributions to ORNL staff. State of Tennessee dedicates Joint Institute for Computational Facility—hails ORNL's economic development opportunities.

These are only a few of the many headlines and comments making news and making a difference at ORNL. It is truly a remarkable time as we aggressively continue our efforts to leverage the science and technology of the nation's largest multipurpose laboratory for business, industry, and our region. The world is truly taking note and is beginning to recognize our region as the region of choice in which to do business.

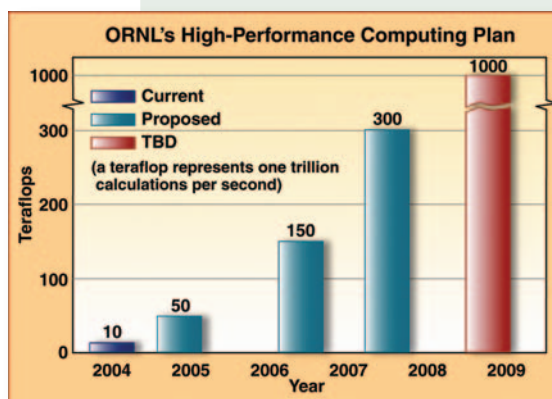
As you read this newsletter, think about how we can help you Put Science to Work for your business, organization or community.

ORNL to Build....(cont.)

The initial goal of the project is to surpass the world's current fastest supercomputer, Japan's 40-teraflop Earth Simulator, within a year. The new machine, says ORNL director Jeff Wadsworth, "will enable breakthrough discoveries in biology, fusion energy, climate prediction, nanoscience and many other fields that will fundamentally change both science and its impact across society."

The partnership's aggressive timetable calls for increasing the capacity of the current ORNL Cray X1 computer to 20 teraflops this year and adding a 20-teraflop Cray Red Storm-based machine in 2005. A key member of the partnership, Argonne National Laboratory, will install a 5-teraflop IBM Blue Gene

computer. A 100-teraflop Cray system to be added in 2006 will subsequently be increased to 250 teraflops in 2007.



In addition to the world's best hardware available for scientific computing, a large new facility, and a staff of 400, the NLCF will provide the computational modeling software needed to take full advantage of the computer's capabilities.

Greatly expanded computational power for advanced computer simulation has become increasingly essential to research. The enhanced computational power will continue to provide scientists with the tools to study and solve complex problems such as weather, disease, and the development of therapeutic drugs for which conventional experiments are not practical. Advanced computational simulation also ensures America's market leadership in technology-based industries that manufacture cars and trucks, aircraft, pharmaceuticals, and chemicals by helping in the development of new products and by shortening the time and cost of product development.

Related Story: ORNL Dedicates JICS, page 8

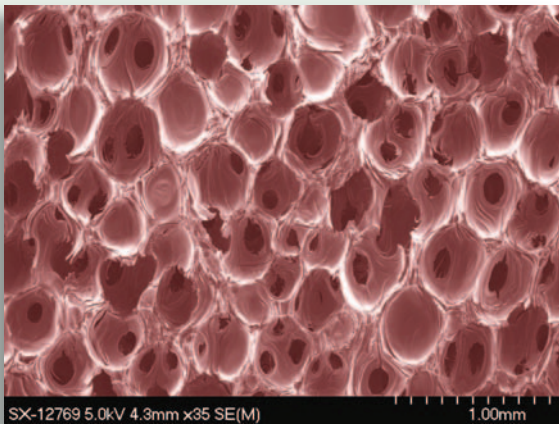
(OUR TECHNOLOGIES continued)

High-Thermal-Conductivity Graphite Foam

High-thermal-conductivity graphite foam, discovered in 1996 by ORNL researcher James Klett, is a material with a unique set of properties that promises to be of vital importance in a number of industries in the future. The material, which is almost 100% graphite, has a thermal conductivity equivalent to that of aluminum at one-fifth its weight. It is also electrically conductive, has a low infrared signature, and is a very good acoustic absorber. The porosity resulting from its open cell structure allows air, water, and other fluids to pass through it. In 2000, the foam received an R&D 100 Award from *R&D Magazine* as one of 100 most significant innovations in that year.

Since 1996, the technology for processing graphite foam, as well as its properties and potential applications, have been expanded and refined so that it is now a versatile material on the verge of seeing significant commercial utility. The technology to manufacture the foam has been licensed non-exclusively to POCO Graphite of Decatur, Texas.

Applications for graphite foam include thermal management for notebook computers, automobile batteries, evaporative cooling devices such as refrigeration units and heat pumps, and personnel cooling systems for the Department of Defense. Because of its superior heat



Micrograph showing the open cellular structure of graphite foam.

transfer characteristics, the material could allow auto designers to place the radiator somewhere other than at the car's front end. It could also displace heavy cooling fans, metallic fins and heat sinks in electronics. More information about graphite foam can be found on the TTED web site (www.ornl.gov/tted).

(BUILDING ECONOMIC DEVELOPMENT continued from page 1)

TVA, ORNL Sign Deal...(cont.)

developing the overall economy of the Tennessee Valley.

Thomas Zacharia, associate director for the Computing and Computational Sciences Directorate at ORNL, notes that the new networking capabilities will allow the university partners and Laboratory researchers to pool their "unique intellectual and technological strengths . . . to maximum economic advantage." Baxter adds that the network "will not only help provide [Tennessee] Valley universities access to valuable research, but it will also help the region capitalize on economic development based on the existing technology sector."

Initial links will be established with the University of Tennessee and Vanderbilt University. Other potential collaborators include Tennessee Tech, the University of Memphis, UT Health Sciences Center at Memphis, St. Jude Research Hospital, the University of Mississippi, Mississippi State University, the University of Alabama-Huntsville, NASA Research Institute, East Tennessee State University, Western Kentucky University, the University of Louisville, and universities in the University of Kentucky system.

"We are delighted that we have the opportunity to provide access to ORNL's unique national user facilities," Wadsworth said. "It is a great example of how we are leveraging our resources for the collective good of the region."

Related Story: More news on the Tennessee Valley Corridor Summit, page 4

(BUILDING ECONOMIC DEVELOPMENT continued on page 4)



(BUILDING ECONOMIC DEVELOPMENT continued from page 3)

Tennessee Valley Corridor, Inc., Wins Top U.S. Economic Development Award

The Knoxville-based Tennessee Valley Corridor, Inc., was the joint winner of an award from the U.S. Department of Commerce for its contribution to economic development in the region encompassing northern Alabama, eastern Tennessee, southwestern Virginia, and southern and eastern Kentucky. The Corridor—along with the Research Triangle Regional Partnership in Raleigh, N.C.—won the 2004 Excellence in Economic Development award for Enhancing Regional Competitiveness



The award noted the organization's "commitment to sound, research-based, market-driven economic development in helping grow the local economy." Among the accomplishments cited by the award are the Corridor's assistance in bringing about "support and public consensus building" for DOE's \$1.4 billion Spallation Neutron Source at ORNL; the development of a tri-lateral alliance for interagency cooperation between the Marshall Space Flight Center, Arnold Engineering Development Center, ORNL, and Y-12; and highway, air, and industrial infrastructure improvements throughout the corridor. The nomination form also noted initiatives such as advanced transportation and energy research, redevelopment and reuse of brownfield industrial sites, workforce development, and homeland security efforts.

U.S. Representative Zach Wamp conceived the Tennessee Valley Corridor concept in 1995 and has garnered strong support from Tennessee's two senators as well as U.S. Representatives John Duncan, Lincoln Davis, and Bill Jenkins

(BUILDING ECONOMIC DEVELOPMENT continued on page 5)

TTED Staff Members Attend Several Meetings

Regional economic growth and development and the role that ORNL can play in advancing it were the topics as TTED staff attended several meetings over the last few months. Among them were the Atlanta Venture Forum, the Southern Growth Policies Board meeting, BIO 2004, the North Carolina Electronics and Information Technology Conference, and the Mississippi Technology Expo.

Southern Growth Policies Board Meeting



TTED staff participated in the 2004 annual meetings of the Southern Technology Council (STC) and the Southern Growth Policies Board (SGPB) held in Oklahoma City on June 12–15. This year's meetings addressed the topic "Globally Positioning the South."

The SGPB conference examined how communities, states, and entrepreneurs can better connect to the opportunities of the global economy. It looked at the future of manufacturing and spelled out steps the South needs to take to remain competitive in the international marketplace while addressing head-on the fears arising from the restructuring of the global business enterprise.



(BUILDING ECONOMIC DEVELOPMENT continued from page 4)

Staff Members Attend....(cont.)

Atlanta Venture Forum

On June 16, TTED director Alex Fischer was the special guest of the Atlanta Venture Forum, where he spoke to a group of 75 venture capitalists on how ORNL can assist the venture capital industry. To illustrate ORNL's potential role in this effort, Fischer focused on specific ways that ORNL has worked with such venture capital firms as Kleiner Perkins and Draper Fisher Jurvetson. ORNL has helped the venture capital industry understand important scientific trends such as nanotechnology and has discussed attracting more capital for the Laboratory's promising technologies and its licensees.



This event marked the first of a series of joint efforts with Tech 2020 to help broaden ORNL's interaction with venture capitalists in the region. Tech 2020 has been involved in attracting venture capital to the region, especially through involvement with the Southern Appalachian Fund and the annual Tennessee Valley Venture Forum.

As a result of the Atlanta presentation, several Atlanta-based venture firms have expressed interest in visiting ORNL. Fischer will make a similar presentation to investors attending the Tennessee Valley Venture Forum in Chattanooga on September 23 and 24.

(PEOPLE AND EVENTS continued on page 6)



of Tennessee; Bud Cramer of Alabama; and, most recently, Hal Rogers of Kentucky. The Corridor sponsors regional economic summits that bring together representatives from the region's federal facilities—including DOE's Oak Ridge Operations, ORNL, the Y-12 nuclear weapons plant, NASA's Marshall Space Flight Center in Huntsville, and the Air Force's Arnold Engineering Development Center in Middle Tennessee—along with elected state and local government officials and business leaders.

Tennessee Valley Corridor Summit Focuses on Homeland Security Technology

Homeland security was the focus at the most recent Tennessee Valley Corridor Summit, held in Knoxville June 1–3. The featured speakers were Homeland Security Secretary Tom Ridge and Tennessee Governor Phil Bredesen. The summit had 935 attendees.

Ridge praised the collaboration between universities, research centers, and businesses that is exemplified in the Tennessee Valley region. "The country can no longer afford to be parochial," Ridge said. "The communities and states that think regionally will outpace those who think locally."

During the summit, Ridge and others attended a ceremonial signing that recognized the creation of the Tennessee Homeland Security Consortium (see article on page 8).

(BUILDING ECONOMIC DEVELOPMENT continued on page 6)



Homeland Security Secretary Tom Ridge addressing the recent Tennessee Valley Corridor Summit.

(BUILDING ECONOMIC DEVELOPMENT continued from page 5)

ORNL Director Addresses Economic Development Groups

In April and May, ORNL director Jeff Wadsworth briefed two regional groups on ORNL capabilities that are particularly germane to economic development. On April 30 he spoke to Memphis business leaders and University of Memphis researchers at the FedEx Institute of Technology on the University of Memphis campus. On May 26, Dr. Wadsworth addressed the East Tennessee Technology Council during its luncheon at Technology 2020. The message in both presentations was clear: ORNL is a modern research institution with world-class research facilities, world-renowned researchers, and a desire to work with industry in applying the fruits of that research.

The relationship between ORNL and the Mid-South region is continuing to develop, with the FedEx Institute of Technology providing an excellent home base for regional ORNL TTED activities. As a result of Dr. Wadsworth's presentation in Memphis, faculty from the University of Memphis plan to tour ORNL in August. In addition, Terry Payne, director of economic development for TTED, spends two days per month at the FedEx Institute of Technology; Terry can be contacted at 901-678-5105 or 865-574-0008. More information about the FedEx Institute can be found at <http://fedex.memphis.edu/>.

(BUILDING ECONOMIC DEVELOPMENT continued on page 7)



ORNL Director
Jeff Wadsworth

(PEOPLE AND EVENTS continued from page 5)

Staff Members Attend....(cont.)



BIO 2004

ORNL, in coordination with the Tennessee Biotechnology Association and the Tennessee Department of Economic and Community Development, manned an exhibit booth at the 2004 annual convention of the Biotechnology Industry Organization (BIO 2004) in San Francisco. The four-day convention, which ended June 9, is the world's largest biotech event and this year had more than 15,000 attendees, including representatives from 61 countries, 49 U.S. states, and 10 Canadian provinces.



N.C. Electronics and Information Technology Conference

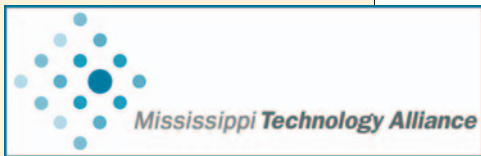
Terry Payne represented ORNL at the annual conference of the North Carolina Electronics and Information Technology Association (NCEITA) in Charlotte on May 25. Dr. Payne was an invited participant on a panel entitled "Homeland Security: Threats and Opportunities across the Globe." The panel discussion provided an opportunity to promote the use of ORNL technology as a defense against future threats.

(BUILDING ECONOMIC DEVELOPMENT continued from page 6)

Staff Members Attend....(cont.)

Mississippi Intellectual Property Forum and Technology Expo

TTED Director Alex Fischer and Tom Ballard, director of regional economic development, will participate in the inaugural Intellectual Property Forum and Technology Expo September 16 and 17 in Jackson, Mississippi. The two-day event, co-sponsored by the Mississippi



Research Consortium and Mississippi Technology Alliance, will bring together university researchers, business leaders, and venture capitalists to explore licensing and collaborative research opportunities. "This event gives us the opportunity to better understand the ways in which ORNL can be a meaningful partner in the economic development activities in Mississippi," Fischer said. "It underscores the commitment we made in Starkville in July to helping Mississippians grow technology-based jobs."

Visitors to ORNL

University of Memphis President Dr. Shirley Raines

Dr. Shirley Raines, president of the University of Memphis, visited ORNL on June 2 and met with ORNL director Jeff Wadsworth and other

(PEOPLE AND EVENTS continued on page 10)

New UT President Enthusiastic about ORNL-UT Collaboration

Even before he was selected in late April as the next president of the University of Tennessee, Dr. John Petersen was a strong advocate for strengthening the relationship between

ORNL and UT. In fact, he told a number of people during the interview process that UT's partnership with Battelle to manage ORNL was a key factor in his attraction to the job.

Since his selection, Petersen, the former Provost and Executive Vice President for Academic Affairs at the University of Connecticut, has underscored his commitment in a number of

significant ways. On the second day of the recent Tennessee Valley Corridor Summit, he made a special trip to Oak Ridge to talk about the importance of science and technology development and a well-trained workforce. To underscore the UT-ORNL connection, one of Petersen's first meetings after he assumed his job as UT president on July 1 was with ORNL director Jeff Wadsworth.

(BUILDING ECONOMIC DEVELOPMENT continued on page 8)



UT President John Petersen

TENNESSEE **FOCUS** ON **TED**

(BUILDING ECONOMIC DEVELOPMENT continued from page 7)

ORNL and State Dedicate Joint Computational Facility

Outing potential economic benefits to Tennessee, the state's head of economic development helped dedicate a new \$10 million facility on May 21 to house the Joint Institute for Computational Sciences (JICS) at ORNL. The new 52,000-square-foot building, funded by the state, will improve access to the world's most powerful supercomputers for America's scientists, universities, and businesses.

"The joint institute launches a new era for the Oak Ridge National Laboratory and UT," Matt Kisber, Tennessee Commissioner of Economic and Community Development, said. "It's also an essential step as we position ourselves as a technological leader."

JICS is the first of three state-funded joint research institutes to be completed. Also to be built on the ORNL campus are the Joint Institute for Neutron Sciences and the Joint

Institute for Biological Sciences.

ORNL Director Jeff Wadsworth notes that the Laboratory's university partners will both benefit from and contribute to the compu-

tational facility. In addition to UT, ORNL's "core" university partners are Duke, Florida State, Georgia Tech, North Carolina State, Virginia, and Virginia Tech.

Thom Dunning, UT-ORNL distinguished scientist and director of the joint institute, said the institute will work closely with ORNL researchers and others to develop the software needed to take full advantage of the new supercomputer to be built at the Laboratory and will use the new capabilities to solve some of the nation's most pressing scientific problems.

TENNESSEE FOCUS continued on page 9)



The new building, one result of ORNL's \$300 million modernization program, houses the Joint Institute for Computational Sciences and the Oak Ridge Center for Advanced Studies.

ORNL and Partners Form Tennessee Homeland Security Consortium

Homeland Security Secretary Tom Ridge, Governor Phil Bredesen, members of the Tennessee congressional delegation, and representatives of the state's top research institutions signed a memorandum of understanding creating the Tennessee Homeland Security Consortium (THSC). THSC—a formal partnership between ORNL and Tennessee's six Carnegie I Research institutions—"was conceived to bring the combined capabilities of Tennessee's top research institutions to the war on terror," according to Dr. Robin White, executive director of the UT/ORNL Center for Homeland Security and Counterproliferation.

The director of the governor's Office of Homeland Security, Major General Jerry



TENNESSEE FOCUS continued from page 8)

...Consortium (cont.)

Humble said, "The Tennessee Homeland Security Consortium represents a distinct advantage for the State of Tennessee, drawing upon an exceptional array of intellectual resources, experiences, and perspectives from our state's top research institutions and the Oak Ridge National Lab."

Signing the memorandum of understanding were Dr. Jeff Wadsworth, director of ORNL; Dr. Joe Johnson, president of the University of Tennessee; Dr. Shirley Raines, president of the University of Memphis; Colleen Conway-Welch, dean of the School of Nursing, Vanderbilt University; Dr. Tom Cheatham, dean of the College of Basic and Applied Science, Middle Tennessee State University; and Dr. Michael Woodruff, interim associate vice president for research at East Tennessee State University.

(BUILDING ECONOMIC DEVELOPMENT continued on page 11)

ORNL Director Jeff Wadsworth and representatives from five Tennessee universities sign an MOU creating the Tennessee Homeland Security Consortium.



JICS (cont.)

In addition, the institute will participate in the education of the next generation of scientists and engineers.

The unique media conference room at JICS. The room features microphones at each seat and voice-activated video cameras for distant learning.



ORNL Capabilities To Be Part of Tennessee's Technology Marketing Strategy

On April 30, TTED director Alex Fischer and ORNL communications director Billy Stair hosted a visit to ORNL by Eric Cromwell, director of technology for the Tennessee Department of Economic and Community Development (ECD). Cromwell is responsible for developing and advancing policies and initiatives that will support economic expansion created by the development and adoption of technology throughout Tennessee. Governor Bredesen has indicated interest in efforts to leverage ORNL's award-winning technology transfer efforts.



Tennessee's director of technology, Eric Cromwell (right), on a tour of the Center for Computational Sciences with ORNL's Buddy Bland.

Cromwell visited the Spallation Neutron Source (currently under construction) and the new ORNL Center for Computational Sciences and discussed how ORNL's commercialization efforts could complement the state's technology strategy. He also noted how the Laboratory's successes, such as ORNL's selection to construct the National Leadership Computing Facility (see story on page 1), can be included in ECD's marketing message for Tennessee.

Visitors to ORNL (cont.)

Dr. Raines Visit (cont.)



senior Lab managers. Topics of discussion during

Dr. Raines' visit were utilization of the advanced computing facilities at ORNL by UM researchers, a planned visit to ORNL by key UM faculty later in the summer, and opportunities for expanded research collaborations in biomedical and genomics.

Venture Capitalist Steve Jurvetson

Steve Jurvetson, the managing director of the venture capital firm Draper Fisher Jurvetson (DFJ), visited ORNL on April 30. During his visit to ORNL, Jurvetson heard a series of presentations on the specifics of the Laboratory's research and capabilities in nanotechnology, gave an overview of DFJ and the nanotechnology market, and toured the Spallation Neutron Source and the Computational Sciences Center.

The Silicon Valley-based DFJ, which bills itself as "the leader in early-stage Internet venture capital, is well-known for its investments in Hotmail, Google, and the up-and-coming Skype (a peer-to-peer software program that enables users to make free international calls). Jurvetson, an outspoken advocate for the potential of nanotechnologies who is often introduced at conferences as "Mr. Nanotech," has led DFJ to become one of nanotech's leading investors.



During his ORNL visit, venture capitalist Steve Jurvetson toured the Spallation Neutron Source site.

AWARDS AND REWARDS

UT-Battelle Distributes Over \$135K in Tech Transfer Awards

At a ceremony held on May 25 at Technology 2020 in Oak Ridge, UT-Battelle distributed over \$135,000 in awards to FY 2003 key contributors to the ORNL technology transfer program. Presentations were made by Jeff Wadsworth, ORNL director; Lee Riedinger, ORNL deputy director for science and technology; and Alex Fischer, TTED director. This was the first year of a new program that presents awards not only to inventors and authors, but also to business, legal, and

ORNL's Lab-on-a-Chip inventors were among the recipients of recent Tech Transfer awards from UT-Battelle. From left to right: ORNL Associate Director Lee Riedinger; TTED Director Alex Fischer; TTED Commercialization Manager Ashok Choudhury; Lab-on-a-Chip inventor Mike Ramsey; and ORNL Director Jeff Wadsworth.

Other inventors not pictured are Roswitha Ramsey and Stephen Jacobson.



(BUILDING ECONOMIC DEVELOPMENT continued from page 9)

...Tech Transfer Awards (cont.)

support personnel who have played a vital role in the success of ORNL's technology transfer program. ORNL's receipt of \$1.8 million in royalties last year is a measure of that success.

Sixty-six awards were presented to 53 recipients representing 10 divisions of the Laboratory. These individuals had been identified as having made a substantial contribution to the commercialization of one or more technologies in FY 2003 and included the four teams who won national Federal Laboratory Consortium awards. A highlight of the program was the recognition of the inventors of the "lab-on-a-chip" technology, which generated the single largest one-time payment in the Lab's history.



National SWIFT Tour at FedEx Institute of Technology

On September 10, program managers from federal agencies with Small Business Innovation Research (SBIR) Programs will be at the FedEx Institute of Technology on the University of Memphis Campus to describe research funding opportunities for researchers at small businesses and universities. The SBIR Program will provide \$1.6 billion in FY 2005 to small businesses and their

university (or federally funded R&D center) partners. The Memphis SWIFT (SBIR: Where Innovation Focuses Technology) Tour sessions will include briefings by SBIR program managers on strategies for submitting successful proposals, as well as opportunities for small businesses to meet one-on-one with program managers to discuss specific ideas and needs.

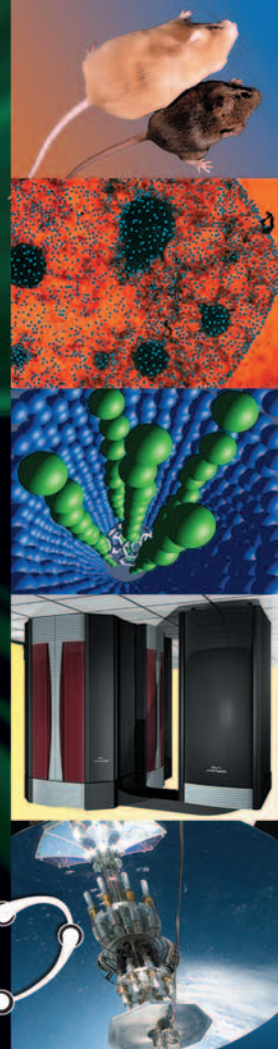
TTED Meets with Northeast Mississippi Economic Development Leaders

Tennessee Valley Authority (TVA) Chairman Glenn McCullough and ORNL TTED Director Alex Fischer are exploring closer ties between ORNL and groups charting the economic development future of Northeast Mississippi. Following a visit by McCullough to ORNL, Fischer and Tom Ballard, TTED's new director of regional economic development, met on July 16 in Starkville with about 30 Mississippi leaders to start the discussion about how ORNL technologies might help produce better jobs in the region.

Those attending included representatives of the state's Congressional delegation, TVA, Mississippi Development Authority, Mississippi State University and the University of Mississippi, and area economic development organizations. Just a few days later, the *Northeast Mississippi Daily Journal* wrote in an editorial that the possible collaboration was "a pulse-pounding invitation to the economic future." The newspaper also praised ORNL's "established success as an economic development engine in Tennessee." Follow-up discussions are planned in the next few months.



TECHNOLOGY TRANSFER AND ECONOMIC DEVELOPMENT



UPCOMING EVENTS

- September 10 SBIR: "Where Innovation Focuses Technology" Tour, Memphis, Tennessee. For more information: <http://www.sbiroutreach.com>
- September 16-17 Intellectual Property Forum and Technology Expo, Jackson, Mississippi. For more information: <http://www.outreach.olemiss.edu/events/technology/>
- September 23-34 8th Annual Tennessee Valley Venture Forum, Chattanooga, Tennessee. For more information: <http://www.tech2020.org/incubation/vcf.php>
- September 28-30 Tennessee Governor's Conference 2004, "Planning for Job Growth Success," Nashville, Tennessee. For more information: <http://www.state.tn.us.ecd/>
- October 5-7 Musculoskeletal New Ventures Conference, Memphis, Tennessee. For more information: <http://www.memphisbioscience.com/>
- November 8-9 Tennessee Valley Corridor Fall Summit, Somerset, Kentucky



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