

Putting Science to Work

SPRING 2004

Newsletter

UT-BATTELLE LAUNCHES PRIVATELY FUNDED TECH TRANSFER PROGRAM

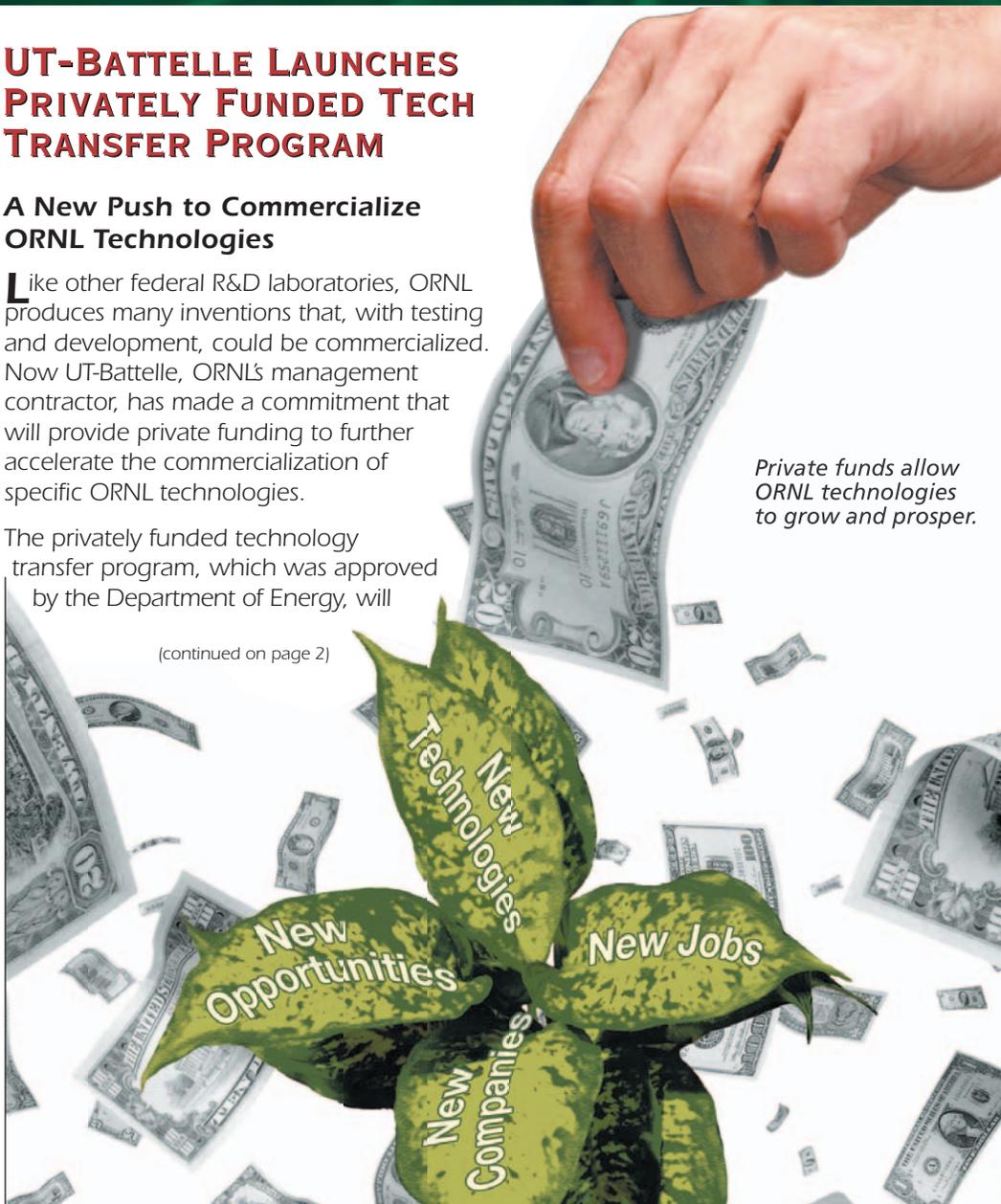
A New Push to Commercialize ORNL Technologies

Like other federal R&D laboratories, ORNL produces many inventions that, with testing and development, could be commercialized. Now UT-Battelle, ORNL's management contractor, has made a commitment that will provide private funding to further accelerate the commercialization of specific ORNL technologies.

The privately funded technology transfer program, which was approved by the Department of Energy, will

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Private funds allow ORNL technologies to grow and prosper.



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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

COVER STORY continued from page 1)



Alex Fischer

This issue comes to you from our recently relocated offices in the heart of the ORNL campus in the original main research building. Previously, we had been located offsite, an arrangement we found to be very inconvenient in working with those who drive our commercialization opportunities—our top-notch research staff at ORNL.

While logistically strategic, it is also symbolically representative of our efforts to become more closely engaged with our scientific and technical organizations as a source of information and dialog about private markets and commercialization opportunities. Also in our new office are our patent and legal partners, who help ensure that our technologies are properly protected and positioned from an intellectual property standpoint.

Our new location is also only steps away from the heart of the Lab's multi-million-dollar modernization program. With hundreds of thousands of square feet of new laboratory and office space, the new buildings represent a continued renaissance of one of the world's leading research and development institutions. The new space, laid out in a campus-type environment, is sure to be a more inviting presence to private-sector partners and other research organizations.

We hope you visit us soon and explore the many ways that we can put science to work at the Oak Ridge National Laboratory.

involve a three-step process. First, UT-Battelle will select technologies to participate in the program through the invention disclosure process. UT-Battelle will then contribute at least \$250,000 a year from its ORNL management fee to cover the initial legal, patent, and other expenses involved in preparing the invention for further development. Finally, TTED staff will seek private funding for the technology through licensing or arrangements such as cooperative research and development agreements. Some of that private funding may come from new venture capital relationships that are being established.

"The motivation for privately funded technology transfer is to provide private funds for the commercialization process, including technology maturation," says Alex Fischer, TTED director. These investments will

enhance the likelihood that the selected technologies will enter the private marketplace.

According to the agreement between UT-Battelle and DOE, UT-Battelle will retain ownership rights to the technologies that are privately funded and, in return, will share in the

licensing income from them. Both the Lab and the community will benefit from the arrangement: 51% of the returns will be reinvested in ORNL, and 49% will be invested for purposes outlined by the federal Bayh-Dole Act. "That federal law says the income must be used for scientific

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– Alex Fischer, TTED director

OUR TECHNOLOGIES

research and education, consistent with the missions and objectives of this facility," Fischer says. Accordingly, the money will be used for local science education efforts, to hire new staff at the Lab, to buy research and development equipment, or to build new facilities and upgrade existing ones.

The revenue-sharing portion of the agreement sold DOE on the privately funded proposition, said Gerald Boyd, manager of DOE's Oak Ridge Operations. "We had to be assured that any royalties that come from this government effort benefit the taxpayer as well as benefiting UT-Battelle." Boyd noted that the arrangement is the "next logical step in the evolutionary approach to enhancing tech transfer and commercialization."

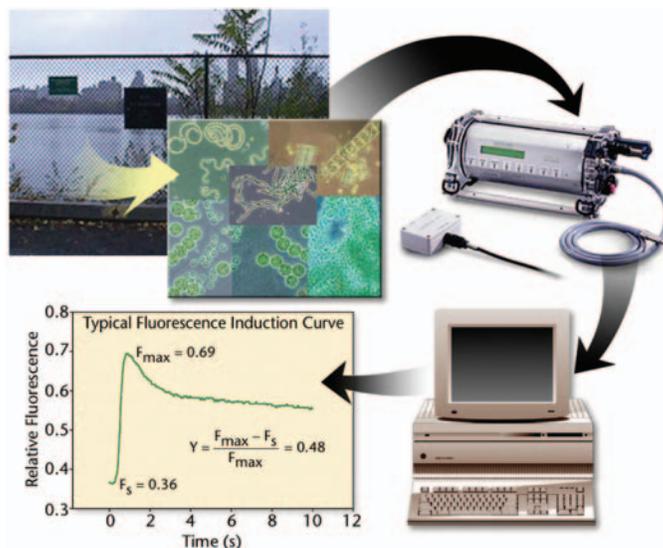
TTED's Fischer says that UT-Battelle will give equal access and opportunity to those interested in licensing technologies selected for the private efforts, just as it currently does in its government-funded tech transfer programs.

"This is another example of ORNL's attempts to bring new and creative means to our efforts to use our resources and technologies as an economic driver throughout the region and nation."

ORNL's AquaSentinel Technology Licensed for Development

Early warning systems for sensing toxic chemicals in public water supplies and transportation waterways are an increasingly critical component in homeland security scenarios. The AquaSentinel, developed jointly by researchers at ORNL's Chemical Sciences Division and Metals and Ceramics Division, is a field-deployable, continuous, real-time water monitoring system that works by detecting changes in the fluorescence "signature" of naturally occurring algae if exposed to toxic substances such as potassium cyanide or herbicides. Now, United Defense, LP, has entered into a commercial license and research agreement with ORNL to develop, test, and deploy the system. The technology is envisioned to be cheap, sensitive, and easy to use.

In the AquaSentinel system, water is siphoned into a buoy. The photo-reactivity of a tissue-based sensor is measured by changes in fluorescence when toxic chemical agents are present in the water, such as might be introduced either intentionally (terrorism) or by accident (a spill). These data can be transmitted to a central monitoring station to provide an early-warning system. The resulting system is passive and self-contained. A wireless data transmission interface incorporated into the design contributes greatly to low maintenance for the system.



ORNL's AquaSentinel, using naturally occurring algae as biosensors, transfers information directly to analytical software for rapid analysis.

AWARDS AND REWARDS

ORNL Earns Four More FLC Awards

ORNL's efforts in technology transfer are once more receiving national recognition. For the second year in a row, the Lab will receive 4 of the 24 national Federal Laboratory Consortium (FLC) awards for outstanding work in transferring a technology to the commercial marketplace. The FLC is composed of 711 federal laboratories and facilities representing approximately 100,000 scientists and engineers.

Four is the maximum number of awards any laboratory can receive, and ORNL was the only laboratory to receive this number. The awards will be presented at the FLC meeting in San Diego in May.

This year's Excellence in Technology Transfer awards are for robust wireless technologies for extreme environment communications, thin-film rechargeable lithium batteries, micro-cantilever-based biosensors, and the Lab-on-a-Chip.



- **Robust Wireless Technologies for Extreme-Environment Communications** allow for the deployment of highly reliable, low-power communications devices to operate in harsh physical and atmospheric environments.

Wireless technologies will improve tracking and locating capabilities for maritime shipping companies.



ORNL researchers recognized for this work are (L to R, seated) Michael Emery, Paul Ewing, and Gregory Hanson; (standing) Nance Ericson, Stephen Killough, James Moore, Stephen Smith, Bruce Jatko, Gary Turner, Mark Buckner, Miljko Brobrek, and Michael Moore. Not shown: William Dress and James Hylton (retired), John Jones, Jr., Roberto Lenarduzzi, Timothy McKnight, and Alan Wintenberg.

PEOPLE AND EVENTS IN TTED NEWS

TTED Announces New Regional Economic Development Director

Tom Ballard, currently vice president for Public and Governmental Relations at the University of Tennessee, has accepted a position as director of Regional Economic Development Programs with ORNL. Ballard plans to retire from UT this summer at the end of Tennessee's current legislative session.



Tom Ballard

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In announcing Ballard's appointment, Alex Fischer, TTED director, noted, "Tom brings a wealth of economic development experience throughout Tennessee and in our region as well as nearly 35 years of working knowledge from the University of Tennessee." Much of his work at UT has focused on building collaborative relationships in the Southeast on behalf of the university. Ballard's considerable experience, knowledge, and relationships will help ORNL expand its economic development activities throughout the Southeast and through partnerships with the Southern Growth Policies Board, the Southern Technology Council, state governments, and southern universities.

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Alan Liby Joins TTED Staff

Dr. Alan Liby has recently joined the ORNL staff and will be working with TTED and the UT/ORNL Center for Homeland Security and Counterproliferation. At TTED he will work to develop strategies to increase industrial collaboration and business creation associated with nanotechnology and neutron science. At CHSC he will be responsible for building collaboration on homeland security projects among ORNL and Tennessee Valley Corridor industries and universities.

(AWARDS AND REWARDS continued from page 4)

Dr. Liby co-founded Manufacturing Sciences Corporation and relocated the company to Oak Ridge in 1984. As president, he led the company in its growth from 3 to over 200 employees with more than \$40 million capital investment in Oak Ridge. Liby has been active in many community organizations. He is a past chairman of the East Tennessee Economic Council and represents that organization on the Technology 2020 Board. He also serves as chairman of the Oak Ridge Utility District Board of Commissioners and in board positions for SunTrust-Anderson County and the Emory Valley Center Foundation.



Alan Liby

TTED Moves to New Quarters

On March 1, TTED moved from its long-time office location on Union Valley Road in Oak Ridge to Building 4500-North on the ORNL campus. This move makes us more accessible to our internal customers and provides an excellent opportunity for more interaction with all organizations at the Lab. All contact phone numbers remain the same. Our new internal mailing address is Building 4500N, MS 6196. Our external mailing address is now P.O. Box 2008, Oak Ridge, TN 37831-6196.

- **Thin-Film Rechargeable Lithium Batteries** are less than 10 micrometers thick and when fully integrated with a device have energy and power densities surpassing other battery technologies. They can be recycled thousands of



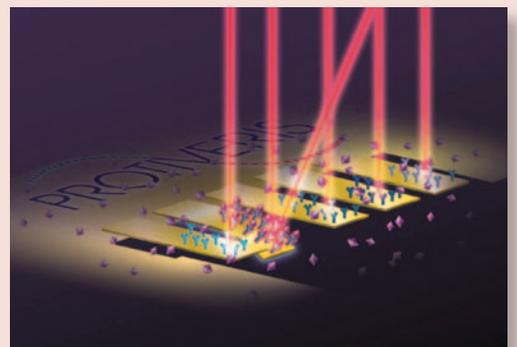
One application for a thin-film battery.

times and can be fabricated on a variety of substrates and devices in arbitrary shapes and to any size to meet specific application requirements.



The ORNL thin film battery development team: (L to R) Ashok Choudhury, Greg Gruzalski, and Nancy Dudney. Not shown: John Bates, Bernd Neudecker, and Chris Luck

- **Microcantilever-Based Biosensors** can be used in the diagnosis of disease, as cancer and cardiac markers, in high-throughput drug screening, and to detect exposure to chemical and bio-warfare agents.



Microcantilever biosensor concept.

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BUILDING

ECONOMIC DEVELOPMENT

TTED Staff Members Address Northeast Tennessee Business Representatives



Regional economic growth and development and the role that ORNL can play in advancing it were the topics as TTED director Alex Fischer and Dr. Terry Payne, director of economic development programs at ORNL, addressed some 50 local business, industry,

and government officials at a joint meeting of the ETSU Regional Economic Development Collaborative and the Northeast Tennessee Technology Council (NETTC) on January 12, 2004, in Kingsport. The message was clear: there needs to be a cultural shift in East Tennessee so that people are willing to take risks and raise venture capital to spur economic growth and development.

Fischer spoke on ORNL's desire to form partnerships with businesses and industries not only in the Knoxville/Oak Ridge area but also regionally to aid in economic development, noting that ORNL has created 10 companies in the past year and nearly 40 companies in the past three years. Dr. Payne explained the mechanics of how ORNL can assist businesses and industries in East Tennessee through procurements and technology transfers.



Terry Payne, ORNL's director of economic development programs, spoke at both the NETTC meeting and the recent SBIR/STTR meeting.

Noting the region's world-class technology, great universities, and state and community support, Fischer said that East Tennessee could be the next technology hot spot. What is missing is a broad entrepreneurial culture, venture capital, and expanded access to ORNL's laboratory facilities. Fischer recognized that ORNL needs to do a better job providing access to its facilities for small and larger

companies and make the Lab more responsive to business and industry.

ORNL's Bronze Cornerstone membership in NETTC signifies its commitment to the northeast Tennessee

TTED Participates in National SBIR/STTR Conference

TTED's Terry Payne was one of the speakers at the recent National Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Conference in Atlanta on April 26–29. Payne, who was on the planning committee for the conference, participated in a panel entitled "Partnering with Universities and Federal Laboratories on SBIR Projects" and chaired a session titled "Using Large Corporations for Commercialization of SBIR-Developed Products."

The purpose of the national conference was to inform new and aspiring small businesses about the SBIR/STTR Program. The SBIR Program funds high-risk projects at the earliest stages of technology development, often before companies can attract venture capital, and works with businesses through that development and on into the actual commercialization of the technology.

Among the approximately 650 attendees at the SBIR/STTR conference were

- ❑ representatives from each of the agencies participating in the SBIR Program;
- ❑ Eric Cromwell, director of technology for the state of Tennessee;
- ❑ representatives of state small business development centers and business incubators; and
- ❑ many representatives of small businesses.

Several contacts were made with small businesses that may become ORNL partners on future SBIR projects. In addition, ORNL has been asked to be a member of the team that will develop a proposal for Louisville, Kentucky, to host an upcoming national conference. This proposal is being submitted by the Kentucky Science and Technology Corporation.

TENNESSEE **FOCUS** ON **TTED**

**State of Tennessee
Receives NSF
EPSCoR Grant**



Tennessee has received an EPSCoR (Experimental Program to Stimulate Competitive Research) grant from the National Science Foundation to develop a plan for increasing the state's capability to compete for federal research funding. The initial step in developing a long-range plan is to identify the state's research strengths, barriers to improvement, and investment needs.

In a series of February and March "town meetings" in the state's five largest cities, Tennessee solicited input for developing such a plan. The public was invited to attend the most convenient session. An NSF representative attended each meeting.

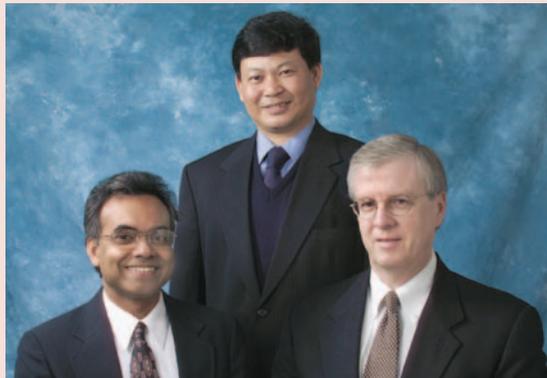
Eric Cromwell, director of technology for the Tennessee Department of Economic and Community Development, notes that "as a designated EPSCoR state, Tennessee has access to new funding opportunities not formerly available." He adds that "the EPSCoR planning process has already proven valuable as leaders from diverse research organizations have gathered to share information and ideas on how to prepare Tennessee for a more prosperous future by supporting education, research, and the creation of knowledge."



Eric Cromwell, director of technology, Tennessee Department of Economic and Community Development.

The grant proposal and other information regarding the EPSCoR program can be found at <http://epscor.tennessee.edu>. The EPSCoR web site also provides a mechanism for registering to receive future electronic correspondence.

(AWARDS AND REWARDS continued from page 5)



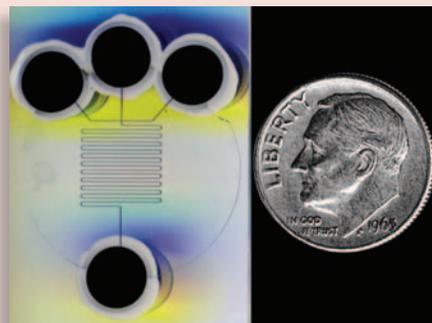
Researchers from ORNL working on the biosensor project are (L to R) Thomas Thundat, Zhiyu (Jerry) Hu, and Russ Miller.

ORNL has licensed the biosensor component of its microcantilever technology to Protiveris, Inc. of Rockville, Maryland.

- **The Lab-on-a-Chip** is a microfabricated device that performs chemical and biochemical procedures under computer control, using miniscule quantities of samples to be analyzed.



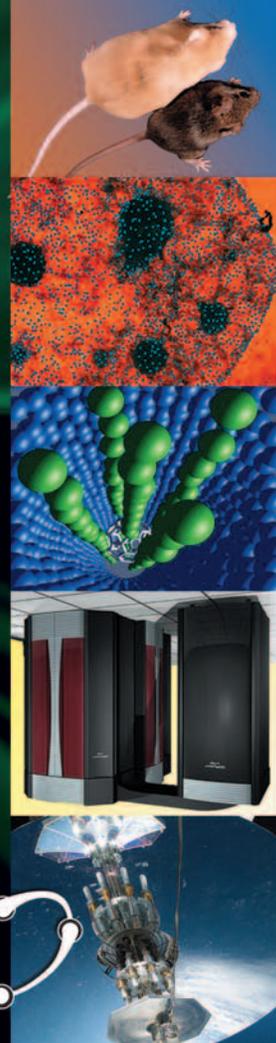
ORNL Researchers working on this technology are (L to R) Michael Ramsey, Ashok Choudhury, and Roswitha Ramsey. Not shown: Stephen Jacobson.



Chip shown with a dime for scale.

In congratulating these ORNL researchers, U.S. Secretary of Energy Spencer Abraham noted, "These outstanding scientific achievements by ORNL's staff not only benefit the nation's economy through creation of marketable products, but they also represent the world-class scientific research that is contributing to the nation's security."

TECHNOLOGY TRANSFER AND ECONOMIC DEVELOPMENT



UPCOMING EVENTS

- September 28-30 Tennessee Governors' Conference, Nashville
<http://www.southern.org/conf.asp>
 Oklahoma City. For more information:
 Southern Growth Policies Board Annual
 Conference, "Globally Positioning the South,"
<http://www.bio.org/events/2004/>
 For more information:
- June 6-9 BIO (Biotechnology Industry Organization) 2004
 Annual International Convention, San Francisco
<http://www.tennvalleycorridor.org/>
 For more information:
- May 31-June 2 Tennessee Valley Corridor Summit, Knoxville
 For more information:
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