

Creekside strategy

ORNL pulls together mercury-related research programs to seek environmental answers

Mercury pollution is a local issue for Oak Ridge, as well as a global issue, and now ORNL has an integrated research program to address environmental mercury problems.

The bringing together of a number of

capabilities and disciplines residing at ORNL into a mercury science focus area was orchestrated largely by Liyuan Liang, leader of the Earth and Aquatic Sciences group in the Environmental Sciences Division.

Liyuan gained her understanding of the Lab capabilities that can be brought to bear on the mercury issue from a stint she did in the Strategic Planning Office, watching over the Laboratory-Directed R&D Seed Money Program.

“At the beginning of Fiscal Year 2008, DOE’s Office and Biological and Environmental Research implemented a new way to fund national laboratories. Rather than funding individual, single investigator projects, BER now funds integrated research programs. Our task was to merge six or seven smaller individual projects into a

larger science focus area,” says Liyuan.

ORNL’s wide range of activities and capabilities, usually regarded as a Lab strength, also presents a challenge to someone charged with not only corraling disparate projects under one umbrella but also looking for other potential capabilities to apply to the problem.

ORNL’s LDRD and Seed Money program office, which processes proposals based on some of ORNL’s most creative thinking, is a good place to learn about ORNL’s talent and capabilities.

“Working in Strategic Planning was a great advantage because I gained a working familiarity with what other researchers were doing throughout the Lab,” Liyuan says.

That’s fortunate, because there was little precedent or guidance for melding an array of small projects into a more coherent focus area aimed at learning exactly how mercury transforms and becomes such a potent and ubiquitous environmental pollutant.

Mercury’s notoriety in Oak Ridge stems from past operations at the Y-12 Plant, where residual mercury was found in building foundations, rubble and soils and released

(See **MERCURY**, page 4)



East Fork Poplar Creek has its bucolic stretches, but the mercury in its sediments has been the subject of a public debate and a scientific search for answers.

Injuries reduced

World-class year for Lab safety

ORNL recognized its safest fiscal year in its history with a ceremony during the annual Club ORNL Fall Festival.

The ceremony recognized the Lab’s achievement of Battelle’s World-Class safety standard of less than one serious injury for every one million hours worked.

“Everyone at ORNL is to be congratulated for their contributions to preventing injuries,” ORNL Director Thom Mason says. “We simply cannot be a successful, world-class science laboratory without also striving to be world-class in our safety performance.”

The Lab has reduced serious injuries by 90 percent since Fiscal Year 2000 and 30 percent from last year to join a small group of the most successful and safest companies who have achieved this goal.

“Certainly, it puts us in a category with a very select group of companies and institutions,” Thom says. “They are able to conduct

work that’s often very challenging in a way that is safe and protects the employees and makes sure they go home every night just as healthy as they are first thing in the morning.”

At the October 30 event, Jim Tarpinian, Battelle corporate vice president for environment, safety and health, read a letter from Battelle’s retiring CEO Carl Kohrt and Jeff Wadsworth, former ORNL director who assumes Kohrt’s role in January.

“Please accept our congratulations and our heartfelt thanks for working safely this year. We encourage you to stay the course toward eliminating all injuries at the Laboratory,” the letter says.

“ORNL is already recognized for practicing ‘world-class’ science. Today we are proud to add to your impressive list of noteworthy achievements by presenting ORNL with the first-ever Battelle World-Class Safety Award.” —Fred Strohl



Thom Mason says FY 2008’s safety stats put ORNL in a “select group.”

Project aims to put genetic sequencing in the doctor's office

A paper in the October issue of *Nature Biotechnology*, "The potential and challenges of nanopore sequencing," traces the peaks and pitfalls of a massive NIH-funded effort to make DNA sequencing cheap and easy.

The review paper describes the state of a grand project aiming to develop new technologies to decipher genetic codes quickly and efficiently, a project that owes its existence to an idea that emerged almost 20 years ago with the Human Genome Project.



Krstic

The Human Genome Project required scientists to develop reliable, automated ways of identifying lengths of nucleotide sequences. The effort was one of the high points in the history of genetics—a 13-year undertaking that catalyzed the multibillion-dollar U.S. biotechnology industry and fostered the development of new medical applications.

That effort has evolved into a new one—developing a desktop device capable of sequencing DNA in about 24 hours for a fraction of the cost of currently available technology. If successful, it too would be considered a peak in the history of genetics, enabling doctors to incorporate DNA sequencing into their routine medical diagnosis toolbox.

"It is an ambitious project," says Predrag Krstic, co-author of the paper and senior staff scientist in the Physics Division.

Nanopore sequencing attempts to drive a length of single-stranded DNA through a very small pore, one base at a time. DNA bases can be detected by changes in electrical signals as the charged particles pass through or across the pore. Because the method requires fewer preparation steps and eliminates expensive ingredients such as polymerases and ligases in the sequencing reaction, successful nanopore sequencing would reduce the cost of genome sequencing tremendously.

"Within next 10 years, a nanopore sequencing device could achieve the \$1,000 per mammalian

genome goal set by NIH," Predrag says.

The goal of the project is to cut the cost of whole-genome sequencing from millions of dollars to \$1,000 or less, making individual genome sequencing cost-feasible for medical care.

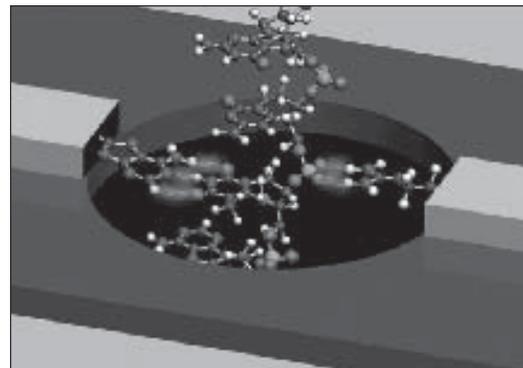
But key challenges still remain. It is difficult to get the correct balance between speed and sensitivity as the DNA travels through the pore. The authors of the review also point to long-term pore stability as another pitfall. Stability will most likely be found in the form of fabricated synthetic solid-state nanopores, they say.

Predrag, an atomic physicist, contributed his expertise in quantum mechanics and microdynamics of complex media—"the main building blocks for the nanopore science," Predrag says.

His role is largely theoretical, with many other researchers contributing in their respective areas of scholarship. Predrag says the project involves a huge investment of time and effort and draws on the talents of at least 30 research groups spread across the nation, many of whom were co-authors on the paper.

In fact, several scientists with Lab connections were involved in the project: Xiaoguang Zhang of the Center for Nanophase Materials Sciences (CNMS) and Computer Science and Mathematics Division (CSMD), Vincent Meunier of CNMS and CSMD, Xiongce Zhao of the University of Tennessee and CNMS, Peter Cummings of Vanderbilt University and CNMS, Miguel Fuentes-Cabrera of UT and CNMS, Radomir Zikic of the Physics Division and Jack Wells of CSMD and CNMS "all contributed to theoretical and computational research aiming to improve current DNA sequencing methods," says Predrag.

"We are working to develop a fast, inexpensive method for sequencing DNA," he says. "It is a very challenging subject, but there is no reason why we can't accomplish this if we try hard enough and continue to be open to expertise from a variety of fields."—*Sarah Wright*



A synthetic nanopore reader could be stable enough for a desktop device, where it could help speed the diagnosis and treatment of diseases.

Beth Guiton joins MSTD as latest Wigner Fellow

Beth Guiton joined Stephen Pennycook's lab in the Materials Science & Technology Division late this summer as the most recent Wigner fellowship recipient.

The fellowships are named for Nobel laureate Eugene Wigner, ORNL's first scientific director.

Beth's research interests are in the field of solid-state chemistry, with a focus on the structure and properties of metal oxide nanostructures. In 2007, while working on her doctorate in materials science and engineering with Peter Davies at the University of Pennsylvania, she discovered a "nanochessboard" structure in ion-conducting perovskites (a type of metal oxide crystal structure), which could act as a template for assembly of nanoscale objects. She also has a master of arts in chemistry from Harvard University and a master of science in chemistry from the University of Cambridge.

In her spare time, Beth enjoys singing. Choral singing, especially Renaissance and modern chamber music, is one of her favorite distractions, and she has sung in many prestigious choirs both as an undergraduate and a graduate student. Beth sings alto and is looking to join a local choir.

She is working with past Wigner fellow Maria Varela to get acquainted with her new surroundings. —*Sarah Wright*



Guiton



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Lab Notes

New steel super for fusion

ITER may include a new cast stainless steel developed by ORNL researchers. The steel, which is being evaluated for use in the huge shield modules required for the ITER fusion device, is 70 percent stronger than comparable steels.

ITER will require hundreds of tons of complex stainless steel components that must withstand the temperatures associated with being in the proximity of a plasma heated to more than 100 million degrees Celsius. When operational, the device will produce some 500 megawatts of fusion power.

Jeremy Busby of the Materials S&T Division says the ITER shield modules present a particular challenge. "The United States must produce nearly 100 of these modules that are three to four tons each and include geometric shapes and openings," he explains.

Jeremy says casting the steel into a near-final shape was another alternative, but it weakens its properties. "We're working to improve the materials' properties to reduce the amount of machining and welding and allow for better performance," he says. "The use of casting can have potential value engineering benefits resulting in cost savings on the order of 20 to 40 percent as compared to machining, so this could be a fairly significant economic issue, both for ITER and in other future uses."

The team's science-based approach involved modeling, advanced analytical techniques and industrial experience, building upon past R&D 100 award-winning efforts with other cast steels. The availability of advanced materials property simulations at ORNL also played a significant role. "We have used all the science tools available to us at the Laboratory," Jeremy says.



Jeremy Busby says the new alloy can better handle fusion's extremes.

RFID tech tracks weaponry

ORNL's work in RFID (radiofrequency identification) is contributing to safeguarding the firearms used by DOE protective force.

Visible Assets, a startup firm, has been working with the Global Nuclear Security

Technology Division on a system to help inventory weapons used by the DOE nuclear complex's security organizations. DOE's Office of Health,

Safety and Security had commissioned ORNL to devise a better way to inventory the department's weapons than the time-consuming and error-prone pencil and paper method.

"A DOE order requires an inventory of weapons at shift change, daily, weekly and monthly," says Chris Pickett of the GNST Division. "An automated inventory system provides significant cost savings compared with the manual inventory method, considering the number of DOE armories and the number of weapons in those armories that must be inventoried."

Visible Assets, which makes a tracking system called RuBee, contacted firearms maker Sig Sauer, who makes the sidearms used by some of the DOE protective force.

The team came up with a low-frequency RFID device that can

be placed in the pistol grip. That device's signal can be read by the weapons inventory network, providing a real-time record of the weapon's custody, location and maintenance and firing histories.

The ORNL team wrote an open-source program for the system that allows for quick tracking and inventory correction. Reliability tests are also being performed by the Lab's team, which includes Chris and Jim Younkin of the Global Nuclear Security Technology Division, Dave Richardson of the Computational Sciences & Engineering Division and Brad Stinson of the Measurement Science & Systems Engineering Division.

ORNL alternative: Pedal power

ORNL aims to replace gas-guzzling four wheelers with calorie-burning two wheelers. Thanks to a new program put together by ORNL's Wellness Program and the Facility & Operations' Energy Management group, Lab-supplied bicycles may soon be the preferred mode of transport for staff members looking for an alternative to driving or walking from one building to another.

"We looked at ways we could decrease fuel consumption here at ORNL and noticed that

people take a lot of short trips in the fleet vehicles," says John Forstrom of ORNL Logistical Services. As a result, 100 of the two-wheelers, which have "automatic" 3-speeds, will be stationed at various places around the campus, John says.

Joan Lawson, ORNL Wellness Program, says the bikes will be available for fitness as well as transportation purposes.

"The bikes are a great way to reduce vehicle use, and people can get a little bit of exercise at the same time," Joan says.

Phoenix goes out a winner

As ORNL moves toward petaflop computing, the Center for Computational Sciences turned off one of its former stars last month.

The Cray X1E Phoenix was state of the art not so many moons ago, and has most recently been used for climate simulations. But it is probably better known as the computer that is signed by the Lab's VIP visitors. One of the maroon cabinets bears signatures of DOE officials including secretaries Abraham and Bodman, elected officials including President Bush, and distinguished citizens including former Vice President Al Gore.

It was more than a show-piece. Each of Phoenix's 1,024 multistreaming vector processors could carry out as many as 18 billion operations per second, making the performance of the total system as high as 18.5 trillion operations per second.

Phoenix made several appearances on the supercomputing Top 500 list, debuting in June 2003 at 379 and rising as high as 17th in November 2005, says the CCS's Buddy Bland. By June 2008 it had dropped to a still respectable 175th.

"If Phoenix had remained in operation it would have dropped off the list of the 500 fastest computers in the world in June 2009," Buddy says.

Reported by Cindy Lundy, Sarah Wright and Bill Cabage



The fleet awaits its riders.

Jason Richards

Mercury

Continued from page 1

into the surface water and sediments of East Fork Poplar Creek. Bioaccumulation of mercury in a stream's fish is a significant risk, and high levels of the toxic element were discovered in the creek in the 1980s. A proposed cleanup—which would have cost tens of millions of dollars and disrupted much of the city—drew opposition from residents.

At the same time, environmental work under the Biological Monitoring and Abatement Program was dredging up surprising findings. The toxic form of mercury is methyl mercury, which is ingested by stream life. Inorganic mercury is converted to methyl mercury in a process called methylation, which is believed to be the work of microbes.

Stream surveys showed that levels of methyl mercury in organisms, although high, were not as high as would be expected based upon the very high levels of inorganic mercury present in the contaminated water.

"Some process was either inhibiting methylation or enhancing demethylation, the process that destroys methyl mercury. And that's what we're trying to find out," Liyuan says.

Mercury pollution is a problem worldwide. Liyuan notes that understanding the biogeochemical processes that underpin its toxicity to living organisms will provide invaluable clues to how best to remove or convert the mercury to more stable forms.

"Mercury in the headwaters of the East Fork Poplar Creek is in inorganic form," Liyuan says. "We want to understand the mechanisms behind its transformation to methylmercury that is available for fish bioaccumulation, which is very toxic to humans."

During her strategic planning time Liyuan attended a talk by the Center for Molecular Biophysics' Jeremy Smith on protein structure research. Liyuan asked Jeremy if he was interested in a mercury study.

Mercury pollution is a global problem. Understanding the processes that underpin its toxicity to living organisms could provide invaluable clues toward a solution.

It would be more of a challenge to find something the University of Tennessee-ORNL Governor's Chair researcher *isn't* interested in. The outcome of her inquiry was an experiment involving cold neutron analysis of molecular structures and computer simulations to explore how mercury interacts with cell proteins and RNA in sub-cellular processes.

Other elements of the mercury science focus area include field investigations and laboratory experiments to understand the chemistry behind how mercury is transformed and made available to microbes and the genetic controls on methylation and demethylation. The program aims to find ways to reduce mercury in biological systems.

These researchers also include ESD's Scott Brooks and George Southworth, who participate in site biochemistry; ESD's Baohua Gu, Carrie Miller and Wenming Dong, who study the fundamental mechanisms; and Biosciences Division's Tony Palumbo, Steve Brown and Craig Brandt, who investigate microbial and genetic controls. Liyuan and Jeremy are joined on the molecular scale and simulations team by Jerry Parks, Alex Johs, Hao-Bo Guo and the Neutron Scattering Sciences Division's Dean Myles. Former ORNL researcher Steve Lindberg, an authority on environmental mercury, is on the advisory panel, together with an external group of acclaimed experts. Many external investigators from universities and national labs are also included.

"Our sponsor at BER now sees the focus area as a well-coordinated, coherent approach using multiple skills and unique capabilities that include the Lab's exceptional neutron and computational facilities," Liyuan says of the powerful mix of research efforts that have garnered a \$3 million per annum program.

Ultimately, we could all reap the rewards.—B.C. 🌿

Building a program: Deadlines, and the occasional 'sunbreak'



Liyuan Liang

Liyuan Liang's task of pulling divergent Lab research efforts into a mercury science focus area for DOE's Office of Biological and Environmental Research involved long days, long nights and deadlines that superceded holidays.

She afforded herself "sunbreaks," which she describes as stepping out of the office for five minutes of sunshine during the long days devoted to creating an expert team to apply to the issue of mercury in the environment.

Liyuan is no stranger to hard work and collaboration with top-notch colleagues. She is a member of China's storied "Class of 1977," the first

group of students to emerge from China after its cataclysmic Cultural Revolution. That burst of pent-up talent has made an indelible mark on the world, particularly in the scientific community.

She left her native China, where she remembers that "everything was painted gray and there were A-bomb drills because of fear of war with Russia," for Caltech, where she found it "humbling to be with the best people" as she earned her doctorate in environmental engineering.

Humbled or not, she joined the research staff at ORNL. She briefly migrated to the United Kingdom's University of Wales, but eventually

she, her husband and her two "very American" children returned to Oak Ridge, where she was encouraged to take the Strategic Planning Office position by Deputy Director for Science & Technology Jim Roberto.

Liyuan says the scientific opportunities afforded by a national laboratory are a major part of why she returned to ORNL.

"I missed the teamwork. At university you have to operate too much as a solitary individual; but here we have so many diverse specialists in one place. There is no way we could have built this group without all these great scientists at ORNL," she says.—B.C.

Significant Event Awards cite outstanding service

Significant Event Awards recognize staff members for recent accomplishments in research and operations. Congratulations to all for their outstanding achievements.

Biological & Environmental Sciences

For successfully planning, organizing, leading and reporting on an international workshop on terrestrial ecosystems and climatic change: Paul J. Hanson and Gail R. Hamilton

Launch of NellOne Therapeutics, Inc.: Cymbeline T. Culiati

Launch of BESC cultivation pipeline: James G. Elkins, Mircea Podar, Tommy J. Phelps, Susan L. Carroll and Steve L. Allman

Biogeochemical and molecular mechanisms controlling contaminant transformation in the environment: Liyuan Lian, Scott Brooks, Baohua Gu, Tony Palumbo, George Southworth, Steve Brown, Craig Brandt and Beth Bailey

Contributions to the submission of urgent research proposals: David W. Bradford, Carol T. Rice and Julie Holthausen

Computing and Computational Sciences

Jaguar (Cray XT4) upgrade and acceptance: Don Maxwell, Ramanan Sankaran, Arnold Tharrington and Ann Baker

Successful design and implementation of a software system for visualizing energy resources dynamically on earth: Mallikarjun Shankar, John Stovall, Alexandre Sorokine, Steven Fernandez, Walter Dykas, Marc Filigenzi, Ronald W. Lee and Raymond Flanery Jr.

Developing and delivering DCA++ code base in record time and with record performance: Gonzalo Alvarez and Michael S. Summers

Communications & External Relations

Recognition of outstanding science-writing support for ORNL organizations: Dawn M. Levy, Deborah M. Counce and J. Leo Williams

Energy & Engineering Sciences

Designation of ORNL's Safeguards Laboratory as a national user facility: Hubert Y. Rollen Jr., Janie McCowan, James S. Bogard, William P. Painter and Jennifer Carpenter

Support to DOE/ASHRAE Buildings X Envelopes Conference: Teresa Williams

Continuous fabrication of nanostructured material: Brian R. D'Urso, Charles R. Schach and Joseph P. Cunningham

Support to U.S.-Azerbaijan Ministry of Emergency Situations Workshop: Kim Grubb, Laura Wagner and Nancy Jett

Collaborative partnership with U.S. Automotive Partnership for Advancing Research and Technologies (USAUTOPARTS): Ray-

mond G. Boeman, Judson R. Hightower and J. Quinn Windham

Environment, Safety, Health, & Quality

Building 8300 and Building 8330 high-voltage converter modulator mitigation upgrade: Patrick Thornton, David E. Anderson and Kenneth R. Rust

Time-critical environmental support for Multi-Computational Data Center land transfer: Terry Bonine and Richard Allen

Comprehensive project to implement the second phase of regulatory vulnerability reduction associated with Facility 9402-3: Laura Harvey, Mary Sue Hamilton, Charles Eblen, Mark Spann, Jerry Cunningham, Roger O'Dell, Scott Bowman, Bill Walker, Martin Tull and Claude Sampson

Comprehensive effort to reduce monitoring requirements and compliant vulnerability in newly issued ORNL NPDES Permit: Elizabeth Wright, Charlie Valentine, Paul Taylor, Wes Goddard, Scott Gregory, Lori Muhs, Regis Loffman, Joan Hughes, Mark Peterson and Mark Greeley

Facilities & Operations

Development of the Multiprogram Computational Data Center Acquisition Strategy and Alternative Analysis (Business Case) for ORNL: Keith J. Dempsey, Katie S. Medlock, Matt Rogers and Bryan Kendrick

Dedicated commitment to the continuous support of the Laboratory R&D organizations, facility operations, and staff and visitors during times of extreme abnormal conditions and situations: Jim Johnson, Butch Edgemon, Bill Eldridge, Yvonne Horton, Darrell Lawson and Danny Rosenbalm

Global Initiatives

Exemplary Special Service: Jon A. Kreykes

Accreditation of ORNL Multi-Program Research Facility Special Compartmented Information Facility: Carla H. Decker, Mark Fioravanti, Lisa D. Stone and Jonathan L. Underwood

Leading uranium processing expertise: Wesley J. Bicha

ITER

U.S. ITER exhibit for 2008 annual meeting of the American Association for the Advancement of Science: Cindy Lundy, Jamie Payne, Andy Sproles, Don Batchelor, David Williamson and Sean Ahern

Legal

Defense of Whistleblower Proceeding: Alan Parker and Jeff Guilford

Outstanding support to UT-Battelle Board of Governors meetings: Bonnie Nestor, Jo Roy and Claire Chitwood

Nuclear Operations Directorate

Efforts to assure one year of reliable operations since HFIR restart: Terry Brown, Mitch Greene, Greg Kickendahl, Blen Triplett and Mark Valentine

Actinium-225 operations in the support of human clinical trials: Karen Murphy, Greg Groover

Integrated Facility Disposition Project alternative selection and cost range (CD-1) submission: Martin Tull, Robert Jubin, Paula Kirk, Lance Mezga, Gerald Palau, Bradley Patton, Sharon Robinson and Michael Stafford

Neutron Sciences Directorate

Spallation Neutron Source science capability doubled by successful commissioning of three new instruments: Douglas L. Abernathy, Mark Loguillo, Steven C. Howard, Christopher A. Tulk, Jamie J. Molaison, Mark E. Phillips, Georg Ehlers, Wylie S. Keener, Jennifer L. Niedziela, William Barton Bailey and Gregory H. Jones

Resumption of High Flux Isotope Reactor Spent Fuel Shipping Campaign results in \$18 million cost avoidance: David G. Blanchard, Gregory J. Hirtz, Christopher M. Smith, V. Keith Raby and Jess C. Copeland

National Security Directorate

Proposal development team: Shirley McKamey and Priscilla Henson

Transition of the Collaborative Force-Building, Analysis, Sustainment and Transportation Program: Donald Vinson

Physical Sciences Directorate

First direct measurement of proton capture on fluorine-17: Dan Bardayan, Michael Smith, Yuan Liu, Dan Stracener, Martha Meigs, John Sinclair and Ray Juras

Lead proposal for Pebble Bed Modular Reactor, Pty Ltd., South Africa: Renetta D. Godfrey

First U.S. team to study new iron-based superconductors: David Mandrus, Brian Sales, Rongying Jin, Michael McGuire, Athena Safa-Sefat, David Singh, Andrew Christianson, Mark Lumsden, Mao Hua Du and Jane Howe

Establishment of the first thermal-magnetic processing facility in the United States for advanced materials and process R&D: Gerald M. Ludtka, Gail M. Ludtka, John B. Wilgen and Roger A. Kisner

Demonstration of large-bore quadrupole ion trap for ultra-high-mass mass spectrometry: P.T. Reilly and W.B. Whitten

A Laboratory Reborn chronicles history in photos

Every picture tells a story, especially when the pictures are of the people and places that are the foundation of almost 70 years of history at Oak Ridge National Laboratory.

A large format book, titled *A Laboratory Reborn*, features a succession of images documenting life and work at ORNL and its evolution from a secret wartime installation to one of the nation's leading research institutions.

"Our goal was a book that combined the remarkable scientific story of the Lab with the equally remarkable human story of the men and women who founded Oak Ridge," says ORNL Director Thom Mason.

"The book tells the story of the unique place that Oak Ridge National Laboratory holds both in our country's past and in our future. It gives insights into the science and the everyday lives of the people that have come together over the years to make the Lab one of our greatest research institutions," the American Museum of Science and Energy's Jim Comish says.

The historical and contemporary photographs are grouped into three sections. Presented in black and white, pictures from the Manhattan Project era show the construction of the Laboratory and "secret city" in the hills of Tennessee. Photos reveal details

of life in a community that swelled to 75,000 in only three years, showing workers knee deep in mud each time it rained on the heavily traveled, yet unpaved streets.

Transitioning into sepia tones, photographs from the post-war years depict the Laboratory's transition from a wartime experiment to a research institution. The photos include a number of famous visitors to ORNL, including future president John F. Kennedy and his wife Jackie. The three decades after the war at ORNL were a period of pioneering research in the fields of medicine, biology, materials and physics.

By the late 1990s, many of the buildings were dated and the infrastructure was deteriorating more and more rapidly. UT-Battelle stepped in as managing contractor with a massive modernization project. Color photographs of the modern era document the rebirth of the Lab as a major force driving research into scientific problems such as fusion, climate change

and alternative energy.

The book, which would make a beautiful addition to any library and a great holiday gift, is available in the bookstore at the American Museum of Science and Energy.—Sarah Wright



A Laboratory Reborn pictorially traces ORNL's history from the muddy Manhattan Project to the Lab's 21st Century modernization.

Swarm no harm to Lab's retired bee-man Howard Kerr

If you've got bees in your bonnet—or in your yard—call Howard Kerr.

That's what residents in a Maryville neighborhood did recently when a swarm of bees appeared on a street-corner dogwood limb.

The retired ORNL nuclear engineer and former state representative is known locally as the "bee-man."

Howard pulled up in his van at about 10 p.m. and walked over to the swarm, knotted up like protons and neutrons in a uranium nucleus, except about as big as a football.

"This is easy," he said.

With no bee suit, gloves nor netted hat, he reached down and shook the pulsating branch. The bees dropped into a box hive he placed under them. In the cool and moonlit night, no bees set out to whack any of the bystanders.

"I wouldn't shine the flashlight though," he noted. "They follow the light. Unless you don't mind."

Flashlights out, except for his. He apparently doesn't mind.

"There's the queen," he said, pointing at a bee bigger than the others, which skittered over a few workers and dropped into the hive. The workers started to follow.

Howard said this was the third swarm he'd retrieved in the past few days, which is unusual. He described it as a starvation swarm: With the dry weather, not enough fall flowers are in the area and without enough food, the bees broke from their home hive to start another.

Honeybees are critical to the ecosystem. In their search for flowers, they transfer pollen among plants. Many plants, including food crops,

rely on them for pollination.

"I've got another hive without a queen, so I'll merge these with them and they'll all be happy," Howard said.—B.C.



(Above) The swarm at night, on a dogwood limb. (Right) A bare-handed Howard Kerr shakes the swarm into a hive.



Team UT-Battelle groups busy in fall, holiday giving seasons

Team UT-Battelle won the award for the largest number of team members in the corporate category and came in fifth in terms of donations raised at the 2008 Knoxville Komen Race for the Cure, held on October 11 in downtown Knoxville.

The Komen team's 207 members raised \$6,415 in donations in addition to the \$5,470 in registration fees. The Team UT-Battelle coordinator was Cathy Cheverton.

The Team UT-Battelle 2008 Memory Walk team turned in \$15,000 to the East Tennessee Alzheimer's Association for this fall's campaign. Roughly \$2,300 of that was raised by the on-line auction, and roughly \$4,000 was raised by the in-house "arrests" of Joe Herndon and Frank Komegay, according to team captain Nancy Dailey. In addition, UT-Battelle contributed another \$1,000 to the association.

The ORNL Angel Tree, sponsored by Team UT-Battelle, is now on-line at home.ornl.gov/general/values/utb/angeltreeintro.html. The Angel Tree is filled with the names of needy children from surrounding counties. Contributors unable to select and shop for a child this year can consider donating to the Angel Tree Fund, established at the ORNL Credit Union (Lab Branch). The fund will be used to buy gifts for these children. Angel Tree contacts are Angie Raby, 576-5184, and Mary Sue Hamilton, 574-7150).

The Team UT-Battelle Relay For Life team has held their first fundraiser for the 2009 season. To sign up to be a member for Team UT-Battelle, contact the UT-Battelle Team Captain, Maggie Miller, at 241-9072.

New Staff Members

James Lloyd Bible, Jonathan Clark Sullivan and Anderson Bishop Short, Laboratory Protection
Regina Ann Calwell, Business & Information Services Dir.
Mark Dodson Laughter, Seth Michael McConchie and Shelby Jean Nolan, Global Nuclear Security Technology
Melissa Joy Preast, Human Resources Dir.
John Michael Scaglione, Nuclear Science & Technology
Melody Annette Scofield, Robert Fredric Heidel (re-hire), Brian Todd Christopher and Timothy Alan Hoffman, Campus Support & Instrumentation
Nagendra Singh, Computational Sciences & Engineering
Gregory Scott Stephens, NScD Research Accelerator
Tara Ann Hall, Environmental Sciences
Jeffery Scott Jackson and Robert Warren Crowell, Utilities
Robert Wayne Massey, Fabrication, Hoisting & Rigging
Gina Marie Ravetti, Global Initiatives Dir.
David Linn Sims, Technology Transfer
Jarrad Dwayne Stump and James Paul Abston, Safety Services
Travis Scott Dodds, Facilities Management
Karen Lea Lewis and Fedor Mikhailovich Rudakov, Computer Science and Mathematics
Christopher Page, NScD Research Reactors
Randall Curtis Pickens, Facilities Development
Bryan Jonathan Quilty, Quality Systems and Services
Aaron Christopher Sontag, Fusion Energy
Wei Zhang, Materials Science & Technology

Sohns, Measurement Science & Systems Engineering

25 years: Hamilton T. Hunter, Computational Sciences & Engineering; Rick R. Brown, Global Nuclear Security Technology

20 years: Mary Ann Hensley, NScD Research Accelerator; Roxanne C. Puglisi and Brian H. West, Energy & Transportation Science; Timothy W. Beatty, Environmental Protection & Waste Svcs; Robert L. Henry, Quality Systems and Services; Joan Tjapkes Muecke, NScD Research Reactors; Timothy D. Burchell, Materials Science and Technology

CORRE elects officers; FORNL open to Lab supporters

This is another in a series of columns in *ORNL Reporter* addressing concerns and information for retirees and is intended to keep the lines of communication open with these former employees.

CORRE holds annual meeting

The Coalition of Oak Ridge Retired Employees (CORRE) held their annual meeting on September 24. The meeting was attended by approximately 350 retirees, along with representatives of the congressional offices of Representatives Zach Wamp, Jimmy Duncan, and Lincoln Davis. Also in attendance were former Energy Systems presidents Clyde Hopkins and Gordon Fee, along with former ORNL Deputy Director Murray Rosenthal, and former ORNL Associate Director Alex Zucker.

At the meeting, Dub Shults, former director of ORNL's Analytical Chemistry Division, was elected president. Other officers elected include

Keith Kibbe, first vice president
Bib Keil, second vice president
Mary Helen Rose, secretary
Paula Wright, treasurer
Marty Goolsby, communications chair
Dave Reichle, former ORNL associate director, will remain on the board as immediate past president.

Additional information regarding the annual meeting and membership in CORRE may be obtained from CORRE's web site, <http://www.corre.info>.

Friends of ORNL

The Friends of ORNL is a non-profit orga-

nization of persons interested in fostering the scientific goals of Oak Ridge National Laboratory. Members include scientists and engineers, as well as individuals from varied backgrounds who believe the nation's technological awareness can be increased through outreach to teachers, students and the general public.

Among the Friends' activities are sponsorship of the free Dick Smyser Community Lecture Series at the American Museum of Science and Energy.

ORNL supporters may join Friends of ORNL by sending \$20 annual dues, name, mailing address and e-mail address (if applicable) to

Treasurer, Friends of ORNL
214 Park Lane
Oliver Springs, TN 37840

Service Anniversaries

November 2008

50 years: Althea S. Tate, Physics

35 years: Alden M. Inman, Facilities Management

30 years: Regina M. Stinnett, NScD Research Reactors; Nina Jean

Roberts, Logistical Services; Susan K. Holaday and Betty Kay Mansfield, Biosciences; Jerry Randall Coombs, Facilities Management; Mike W. Guidry, Physics; Carl William



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Community Shares Addressing root causes of community issues

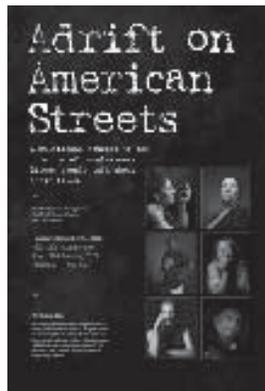
ORNL's 2008 Community Shares campaign runs from October 20 through November 20.

Community Shares promotes a more just and caring community by supporting many low-key, nonprofit organizations in the local communities, across East Tennessee and the state. Contributions go to nonprofit community groups that work to address root causes of problems such as hunger, health care, domestic violence, justice and environmental issues, offering support to a diverse group of more than 50 local member organizations

This year's campaign features several events, including the premier of "Adrift on American Streets—A multimedia journey to the interior of homelessness: Street people talk about their lives." After the presentation, guest speaker Roger Nooe from the University of Tennessee College of Social Work shares insights from two decades of research on homelessness in the East Tennessee region.

Other regional groups that benefit from Community Shares gifts were present at the Lab's Fall Festival on Oct. 30, including Tennessee Citizens for Wilderness Planning, Bridge Refugee, and the Appalachian Community Fund.

If you have questions about Community Shares or ORNL payroll deduction, contact Mac Post (postwmiii@ornl.gov; 576-3431) or Cindy Kendrick (kendrickcm@ornl.gov; 241-6584). More information on the campaign and how to contribute is available on the web site at <http://www.esd.ornl.gov/~wmp/CS/>.



Poster for "Adrift."



Healthy apples were on October 30's Club ORNL Fall Festival menu.



Get the details latest news on Club ORNL online via the ORNL home page and on ORNL Today. Retirees, to gain access to the ORNL home page, first register in XCAMS by

going to http://www.ornl.gov/adm/clubornl_signup.shtml. After receiving your XCAMS account and Club ORNL membership, retirees can then go directly to <https://www.ornl.gov/adm/clubornl>. Ross Toedte, 574-1912, toedterj@ornl.gov, is the retiree point of contact.