

Doubled vision

SIMS and tandem mass spec techniques combine to form a promising analytical and diagnostic tool

Researchers in the Chemical Sciences Division have developed a mass spectrometry technique that could revolutionize the analysis of biological samples, including human tissue. The technique combines tandem mass spectrometry, or MS/MS, with secondary ionization mass spectrometry, or SIMS.

With SIMS-MS/MS, CSD researchers can map the makeup of tissue samples in terms of the fatty acids and other chemicals present in them.

The work, supported by the National Institutes of Health, could have promising applications, particularly in diagnostic medicine. The technique is sensitive enough to create a secondary ion image of a fingerprint, which the Chemical and Isotopic Mass Spectrometry group's Peter Todd says has never been done anywhere else. Forensics, however, is not the objective.

"The chemical signature of tissue changes when there has been disease or damage," Peter says. "If you can map out chemicals in tissue samples and compare maps of one sample against a normal tissue sample, you can detect areas where there is disease or damage."

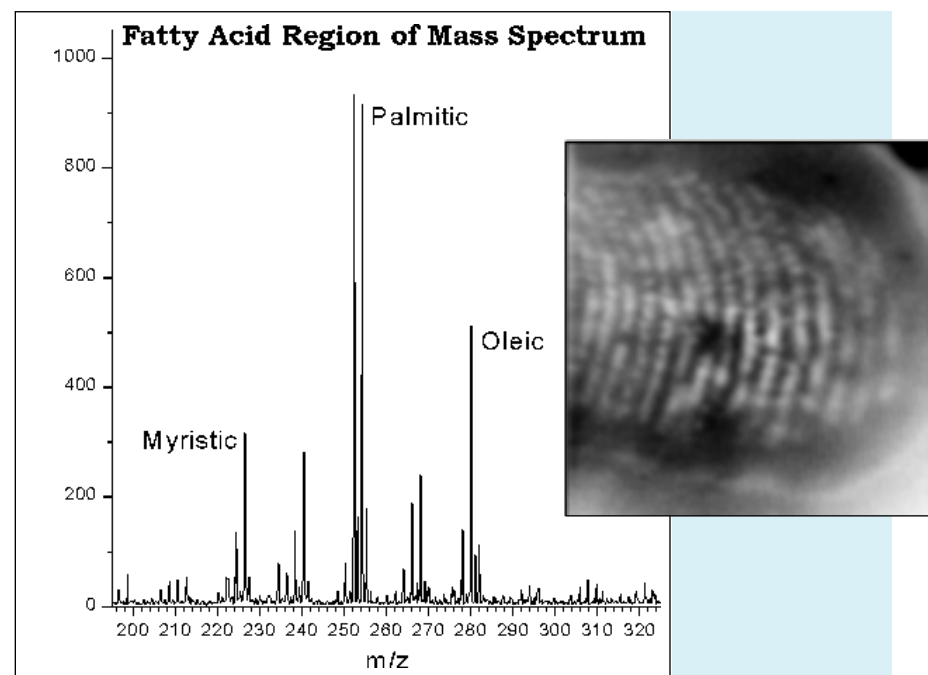
Chris Christie, an ORNL retiree, pioneered the application of SIMS for inorganic and isotopic analysis years ago. The CSD group has also delved into its applications to biological tissue for years—the NIH program has been ongoing for more than a decade. Peter and colleague Greg Schaaff have configured SIMS for biological analysis (with the help of many smart people, they say, including former colleagues Casey Grimm and Tim Short).

For SIMS, the tissue sample is struck by a beam from an ion probe, which causes the emission of many secondary ions. These secondary ions are focused and transmitted to an ion trap where they are captured by an rf, or radio frequency, field.

"By scanning the amplitude of the rf we can get a normal mass spectrum, or we can trap ions of one particular mass-to-charge ratio and cause them to fragment into smaller ions," says Peter. "Thus you get tandem mass spec—two steps—and that MS/MS spectrum is virtually unique to the structure of the ion that we trapped."

The system requires two computers to deal with the 40,000 data points representing variables generated by the ion-probe

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The SIMS-MS/MS fingerprint image was made by mapping the secondary ion emission of palmitic acid, a compound found in most living things. The chart shows the peaks of different fatty acids from one spot on the fingerprint. A markedly different map of data peaks would probably indicate that the individual is unwell or on some sort of lipid-controlling medication. Other peaks might also indicate some kind of contamination, such as toxins or other chemicals. In that respect, SIMS-MS/MS could prove to be a valuable diagnostic or forensic tool.

Biological & Environmental Sciences: From molecules to the entire globe

Associate Laboratory Director for Biological and Environmental Sciences Frank Harris contributes the most recent in ORNL Reporter's series of Leadership Team guest articles.

BY FRANK HARRIS

One of last year's top news stories was the announcement that the sequence of bases in the human genome had been determined. In addition to the human, genomes of other types of organisms are being similarly sequenced. For instance, ORNL is collaborating on a project to sequence the genome of the poplar tree (*Populus*).

Because we now have knowledge of complete genomes, today's biological research is vastly different in approach from even a few years ago. For example, molecular genetics research was previously done largely by examining one gene, one enzyme system at a time, in a very slow process for

understanding how genes lead to proteins. Research on how systems of proteins interacted was accomplished by eliminating a protein (perhaps by a gene mutation) and examining subsequent effects on metabolism. This also is a slow way to examine the hundreds of thousands of possible interactions of proteins in a cell.



Frank Harris

With the genetic information we now have, the emphasis is shifting to a more holistic approach that seeks to understand gene expression in terms of how suites of proteins are interacting at the same time—at a whole genome level as opposed to gene-by-gene.

One has to understand that the cell is a highly organized set of structures operating at the micro- and nano-scales. We need techniques that allow us

to directly measure the reactions and interactions in this space-and-time domain. Our challenge is to visualize the cell as more than a bag of chemicals—to see it as a highly ordered structure.

With new tools such as lab on a chip, microcantilevers, PROSPECT software for elucidating protein structure and the MicroCAT mouse imaging system for visualizing at the level of the tissue and organ system, we can capitalize on our newfound knowledge of genes and molecular genetics.

These techniques were all developed at ORNL through partnerships among different directorates.

Modern, genome-enabled biology is equally dependent on true scientific partnerships among the physical and computational sciences. In the "new" biology, we depend on being able to make many measurements very quickly and to analyze the results

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BES

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of these measurements. For example, for DOE's Genomes to Life program, ORNL is proposing to use high-throughput mass spectrometry to measure both the suite of proteins in a cell at any time and, more importantly, the complex arrangement of these proteins in protein-to-protein interactions and eventually in metabolic networks.

Because so much data is involved, "high throughput" becomes a key element to working with complex biological systems—processing many samples very quickly. The need for high throughput creates a real need for the partnerships we have at ORNL between the biological and allied sciences. Researchers in the Biological and Environmental Sciences Directorate need the expertise of the computer science, analytical science and instrumentation organizations.

This summer work will start on ORNL's new "Mouse House"—more formally known as a vivarium. Actually, the effort to build the appropriately named William L. and Liane B. Russell Laboratory for Comparative and Functional Genomics began many years ago, but its groundbreaking last fall and eventual completion are well timed for the next phases of the quest to understand the human genome, especially for areas of DOE interest such as the health effects of energy production and use.

The vivarium and other new facilities will help ORNL to play a significant role in this large-biology research agenda for the 21st century.

While our mutant mice are supported largely by health-effects research, DOE's Genomes to Life program places an emphasis on microorganisms,

and for good reason: When all is said and done, after 3.7-plus billion years of evolution, everything depends upon them. Single-celled organisms are responsible for nearly every facet of life on Earth.

Our Environmental Sciences Division has many capabilities for looking at the function of microorganisms, including the Natural and Accelerated Bioremediation Research facility—a field research site that has been established in Bear Creek Valley. NABIR allows us to study how microorganisms function in soils and rock, to transform and concentrate radionuclides and metals in legacy wastes. Other ESD research on microorganisms addresses questions about carbon cycling and carbon sequestration in terrestrial environments—forests and soils. In fact, we have researchers looking at carbon storage and metabolism at different sites across the Oak Ridge Reservation.

In that sense, the ORR functions as a laboratory in much the same way a linear accelerator is a lab. It has many of the same characteristics—many researchers use it to generate knowledge and information. Those hills and trees you see on your way to and from work are as much a lab as the buildings. The ridges and valleys of the ORR allow us to delve into experiments that range from molecules to the entire globe.

The breadth of research and facilities nestled in the ORR are very important to our directorate's mission. Research breakthroughs often follow upon technological breakthroughs, and those often occur in other disciplines. Leeuwenhoek's microscope, for instance, led eventually to the development of the cell theory in biology. As the technology progressed to the electron microscope and atomic force microscopes, the understanding of biological function has progressed, as well.

The need for high throughput creates a real need for partnerships between the biological and allied sciences.



The research community will reap the greatest rewards from ORNL's new Mouse House, but the furry inhabitants of the William L. and Liane B. Russell Laboratory for Comparative and Functional Genomics will benefit, as well. Mice born in clean facilities, as ORNL's new "vivarium" will be, weigh 25 percent more on average than the "pups" born in the current Mouse House.

Computing represents another one of those technological leaps. The role of computational science in the future of biology and environmental science cannot be understated. Gene annotation software requires a tremendous number of calculations and comparisons to arrive at a logical arrangement of nucleic bases into a functional gene sequence. Many of these tools were developed at ORNL and today run on the current ORNL high-performance computing system.

In an example from my own experience at ORNL, in 1978 we were conceiving models of a distributed biosphere, including terrestrial carbon exchange with the atmosphere. We dealt with it in concept but made little actual progress. First, the data just weren't there at a resolution we needed, but we also couldn't deal with the problem computationally. These are still complex and difficult problems and we still struggle with them today, even as we add oceans and atmospheres to the models. But the new high-performance computers, and the new facilities that will house them, give us the tools to actually do what we could only conceive of 25 years ago.

The neutron is another tool we'll use. The Center for Structural and Molecular Biology will consist of a small-angle neutron scattering device that uses a beam from the High-Flux Isotope Reactor to elucidate details of structure in soft materials such as proteins. The center will allow us, working with the Physical Sciences Directorate's neutrons, to study protein dynamics in ways not possible today.

That's the beauty of neutrons. The Center for Structural and Molecular Biology is just one of the ways the Biological and Environmental Sciences Directorate, not to mention the entire scientific community, will benefit from ORNL's emerging leadership in neutron science.

And that's why a national laboratory is so great—we can bring together, better than other institutions, the right kinds of scientists to address a problem with extraordinary tools not available elsewhere. [ornl](#)

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ORNL Laundry Services' Lefty Miller was among those who attended the ORNL Fitness Center's Grand Opening on Feb. 4, welcomed by fitness celebrity Missy Kane (right).

Curtis Boles

Lab Notes

Hip, hip, hooray

In 1980, Jim Williams' boss asked the then-Solid State Division researcher to look into new applications for ORNL's ion implantation technology. At the time the technology was used mainly for nuclear reactor materials research.

After reading volumes of material, one of the areas Jim suggested was biomedical. Soon Jim played a key role in the development of an ion-implantation process that vastly improved the wear resistance and performance of prosthetic joints, such as hip and knee replacements.

Now Jim is wearing his own handiwork. Jim received a replacement hip in early January. He insisted on ion-implanted materials, which he knew—better than anyone—were smoother and more durable.

"Oh, I couldn't *not* have an ion-implanted hip," he says.

It's apparently working pretty well.

Although he retired in 1996, Jim still consults at the Lab, and he was out at the Surface Modification and Characterization user center just a month later.

Lab researchers apparently saw the promise of ion implantation technology early on. "I was given the opportunity by (former Solid State Division Director) Bill Appleton to exercise some initiative and start a program. Biomedical applications for ion implantation was my broad idea, and I looked for collaborators in the area," Jim recalls.

He found such a "marriage" at the University of Alabama-Birmingham, and before long ion implantation had become a staple of the artificial joint industry.

Did Jim's orthopedist realize his patient practically thought up the ion-implanted hip joint he was going to receive?

"I gave him the last paper I published on it. He thought it was pretty good," says Jim, who adds that his wife has two replacement hips—ion-treated, of course.



Bill Appleton and Jim Williams (right) developing the ion-implanted hip in 1983.

Parking is necessary for life as we know it

Hundreds of ORNL staff members experienced a shift in their morning routines on February 20. That's the day a majority of spaces in the east parking lot closed forever to make way for new facilities construction. The loss of the old asphalt prairie—once called "vast and grim" by a local newspaper writer but appreciated by commuters nonetheless—was compensated by the simultaneous opening of new parking just to the southeast.

The change appeared to come off without significant upset and confusion. That could be the result of various efforts to get the word out that included electronic road signs, leaflets, a staff e-mail and numerous articles in the Web news and in this newsletter. In the meantime, all ORNL staff are being urged to be extra alert and cautious when negotiating the changing scenery around the Lab.

Tim Myrick, who leads the Lab's building campaign, says the east lot went back a long way. "In the historical documentation we had to prepare for (regulatory bodies), we provided aerial photos and companion discussion that showed the lot was used as a construction laydown location during the early 1950s for Building 4500-North, and it became a parking lot at the end of that construction. So, the lot has been almost as-is for 45 years or so. It is the end of an era in that regard."

But it's the beginning of a new one.

Forties pair looks at early OR life

The guys looked snazzy in their 1940s-era suits, but their presentation was much more than a fashion show.

Small Business Office Director Will Minter and Ombudsman Steve Stow narrated their "Manhattan Project: The Rest of the Story" presentation as part of February's Black History Month slate of events.



Will (left) and Steve with an early communications apparatus.

They gave many interesting and sometimes downbeat details of life in the early days of Oak Ridge. Although the mud and secrecy were shared by all, African-American workers and residents endured inequalities, most notably in housing but also in other facilities such as "nice" cafeterias for whites and "not as nice" eateries for blacks.

Oak Ridge scientists such as Waldo Cohn saw the educational gap between the races and demanded education for African American kids, even teaching them themselves. Eventually, Oak Ridge had the first fully integrated school system in the state.

Will and Steve also learned from first-hand reports how romances were carried out in the



Emptied out: Same view from a new lot, looking toward east parking lot before (left) and on February 20.



Jim Richmond

gender-separated facilities and dorms full of single, pretty women (gentlemen "snuck" in). They even uncovered another name—Project 9733—for what's now ORNL to go with Clinton Labs, Manhattan Engineering Works, X-10, etc.

If you missed the talk, don't despair. Will and Steve will likely reprise their roles in the future, fedoras and all.

New emphasis on safeguards and security

With the shift to proximity readers for building access and the closing of Bethel Valley Road to the public, not to mention recent world events, safeguards and security has become a prominent topic around ORNL. The timing is nearly perfect, then, for a DOE program getting under way, called Integrated Safeguards and Security Management.

ISSM takes a similar approach to Integrated Safety Management in that attention to safeguards and security must be part of the job planning and execution process, just like safety.

ISSM Coordinator Bill Rich says that safeguards and security comprises several aspects of life at the Lab, including facilities' physical security, computer security and the protection of classified and proprietary information. Every employee, then, has safeguards and security as some accountable aspect of his or her job.

"You will be hearing more about ISSM," Bill promises.

Reported by Bill Cabage

Mass spec

Continued from page 1

process. "It's very tough to do," says Greg.

It is also very sensitive. The latent fingerprint imaging from MS/MS analysis produces a clear image from the fatty acids in the otherwise invisible prints. Greg has also written tiny *ORNLS* into samples with an ink he prepared from choline chloride, which the combined SIMS-MS/MS method clearly detects. Lots of other people, Peter and Greg say, have tried unsuccessfully to duplicate their craft with MS/MS.

Fingerprint detection and microscopic handwriting are just for demonstration—the sensitivity of the instrument could lead to much bigger things. The thrust of the NIH program has been toward medical diagnostics. Peter gives the example of the information the chemicals in brain tissue can reveal about a brain's health.

"Most of the brain is fat," Peter says, noting the irony. "These lipids, which make up the brain cells, can be detected and identified very well with SIMS. After age four, the lipid distribution in the brain doesn't change unless you have become very sick or

have been seriously injured. Subtle changes, in fact, could have lethal consequences."

Peter says the MS/MS technique can be used to map those compounds in the brain or other organ tissue, revealing many details about the health of the research animal, and more.

"For instance, does the lipid distribution in the brain change with alcoholism? If so, could a medication restore it? Within the next few months, we will find out the answer to the first question by analyzing brains from rats subjected to conditions mimicking alcoholism in humans."

Those answers could be found with other tedious and time-consuming analytic techniques. SIMS-MS/MS, however, offers a way to achieve the bioscience goal of increased "throughput."

"A biochemist usually puts a tissue sample in a blender, mixes it up, then separates it before subjecting it to separation and chromatography. They have to keep separating until they get the sample they want and then do the mass spectrometry," Peter says.

"We analyze strictly by mass spectrometry, working with very small samples of tissue and without going through all of those steps."

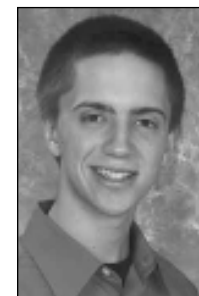
"That," Peter says, "is a leap."—*B.C. omi*

Bearden student earns UT-Battelle Scholarship

Bill Dabbs, a senior attending Bearden High School, is the recipient of the 2002 UT-Battelle Scholarship.

The scholarship, worth up to \$16,000 over a four-year period, is awarded to a graduating high school senior who is the son or daughter of a UT-Battelle employee and plans to attend the University of Tennessee. The scholarship also includes a summer internship at ORNL.

Bill, the son of Dowe and Anne Dabbs of Knoxville, plans to major at UT in biomedical engineering as a foundation for medical school.



Bill Dabbs

As a Bearden student, Bill has a grade-point average of 3.96 and is a member of the National Honor Society. He is also involved in a number of extracurricular activities, including Key Club, Students Mentoring Another Class, Mu Alpha Theta mathematics honors society and Senior Class Committee.

Bill is the senior representative for the 2001-02 Bearden High School band, in which he plays trumpet. He also co-founded and plays piano in the Sax Appeal jazz quartet that performs in the Knoxville-Oak Ridge area. Bill also is an Eagle Scout.

Bill's father is an engineer with ORNL's Research Reactors Division. His mother is an independent interior designer.—*Fred Strohl omi*

Take Your Child To Work Day set for April 25

ORNL's next "Take Your Child To Work Day" is set for Thursday, April 25. More than 300 kids came to the Lab for last year's event.

Event planners see this year's event as another unique opportunity for kids grades 5 to 12 to experience science and technology in a way that is not available to them in the classroom. ORNL divisions will provide a variety of exhibits and interactive activities that will give the kids an up-close-and-personal look at what their parents do at work everyday and possibly set them toward a career in science for themselves.

All UT-Battelle employees are welcome to participate. Additional information about this year's event, including guidelines governing it, can be found on the Take Your Child to Work Day Web site at www.ornl.gov/cfw/tyc2002/.

Here are some of the guidelines:

- A child must be a current UT-Battelle employee's child of which the employee is the legal guardian.
- Children must be in school grades 5-12.
- Children must be escorted by the parent or another employee at all times while on site. *omi*

Hank's progress From Manhattan Project to nonproliferation Grand Challenge

The Chemical and Isotopic Mass Spectrometry group is participating with Los Alamos National Laboratory and others in a DOE Grand Challenge to develop the next-generation mass-spectrometry technology. Its intended use is for nuclear nonproliferation and will likely contribute in no small way to the homeland defense effort.

Hank McKown is working with the group on ORNL's part of the project. He brings to the project what could be considered an ultimate "homeland defense" background, not to mention technical expertise.

Hank, 80, worked on the Manhattan Project, starting in 1942. He retired from ORNL in 1992 but continues to lend his considerable technical expertise a decade later.

"I started with the Manhattan Project on Dec. 23, 1942, at Columbia University," Hank recalls. "Columbia did a lot of the early work on the gaseous diffusion technology, and I came to Oak Ridge's K-25 Plant in support of that in 1946.

Hank's saga also includes spending more than a year in British Columbia during the Manhattan Project days with a plant that was making deuterium, or heavy water. He also worked in Austria in conjunction with the International Atomic Energy Agency in the 1980s for three years.

The next-generation detector project, Hank says, requires smaller and smaller electronics. "That's where I come in."

ORNL's part in the project relates to isotope measurement processes. Peter Todd says Hank's contributions to the project have been invaluable.

"He's one of my heroes," Peter says. "Hank comes in here creative, curious and enthusiastic. He is a key player in our part of this Grand Challenge project."



Hank McKown in what colleague Peter Todd calls a familiar pose: working in the lab.

SNS amazing construction facts!



A recent shot of the SNS construction site. The Earth's curvature is factored into the construction of the linac tunnel, shown in the foreground.

The Spallation Neutron Source is one of the largest scientific facility construction projects that the United States has undertaken in several decades. When it is complete in 2006, the SNS—a collaboration of the Oak Ridge, Argonne, Lawrence Berkeley, Los Alamos, Brookhaven and Jefferson national laboratories—will be the world's premier facility for neutron research.

Currently, however, the SNS is a mammoth building site on a ridgetop in East Tennessee, buzzing with cranes, concrete trucks and hard-hatted workers. So what does raising a \$1.4 billion neutron science facility involve?

Here are some facts and figures on the SNS construction project, sprinkled liberally with Ripley-esque bold type and exclamation points.

The 1.4 million cubic yards of earth moved for the facilities would fill the University of Tennessee's Neyland Stadium—which seats more than **100,000 fans** in its double decks—to a level above the press box!

Project structures call for approximately 80,000 cubic yards of concrete, equivalent to a sidewalk three feet wide **that would reach from Knoxville to Memphis** (about 400 miles)! That's the amount of concrete needed to build the Tennessee Valley Authority's **Fort Loudoun Dam!**

5,500 tons of rebar—reinforcing steel rods—will be used for project structures.

The target building's **deep foundation** contains 937 concrete pilings, reinforced with steel pipe. These pilings range from 35 to 181 feet deep in the earth and are seated 10 feet into bedrock. **Nearly 20 miles of pilings** are in place under the target building!

The initial concrete pour for a portion of the target building foundation was accomplished in **just one very busy day!** Concrete trucks, essentially all that were available in the region, delivered 78 loads to the construction site—at a rate of **one truck every three minutes!**

The target building will **weigh as much** as a conventional 40-story building of the same footprint!

The SNS electrical substation capacity is 70 megawatts, or enough electrical capacity to supply electrical service to **about 35,000 homes!**

The SNS will **fire** an ion beam down its linear accelerator tunnel toward a mercury target; a beam that, **at 80 percent of the speed of light**, could **reach the moon in 1.5 seconds.** The resulting protons will **bombard** a mercury target, generating, or "spalling," the neutrons for use in research. Alignment of the tunnel and accelerator components is so critical that **the curvature of the earth must be factored into construction!**

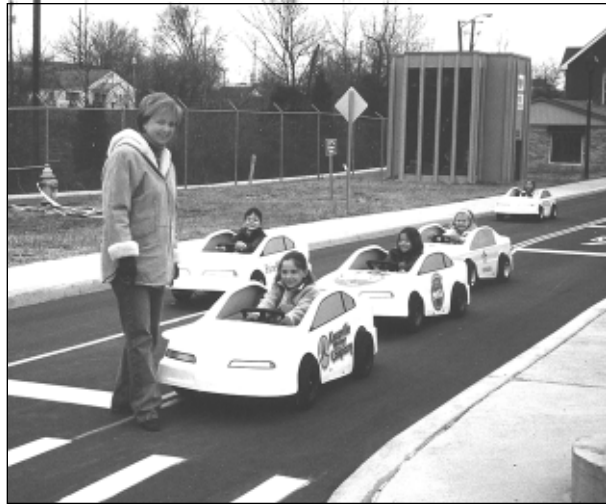
But the most remarkable thing about the SNS is **the science** that will be performed there in **the years ahead.** When the facility is **completed in 2006**, researchers from the United States and abroad—**an estimated 2,000 a year**—will come to the SNS to study materials that will form the basis for new technologies in telecommunications, manufacturing, transportation, information, biotechnology and health. This broad range of scientific impact **will strengthen the nation's economy, energy security and national security!**

The SNS Publications Office's Charlie Horak assisted in gathering facts for this article.

Safety City's ORNL building comes through UT-Battelle corporate gift

UT-Battelle's recent \$20,000 corporate contribution to Knoxville's Safety City project will result in a symbol of ORNL's commitment to both science and safety education, corporate officials say.

Safety City—a miniature city built on one-fourth scale—provides a classroom—yet lifelike—



Safety City Coordinator Vicki Dagnan plays pedestrian for Safety City drivers. They'll soon have a UT-Battelle-funded ORNL building to drive by.

environment for kids to learn safety skills. It's sponsored by the city of Knoxville, the Knoxville Police Department and the Knoxville Fire Department. UT-Battelle's contribution is going toward construction of a Safety City building that will represent ORNL.

"We wanted ORNL's structure to symbolize a place where learning takes place," said Marilyn Z. McLaughlin of the ORNL Communications and Community Outreach Office. "Our miniature facility currently under construction will resemble a traditional schoolhouse, rather than an industrial building."

The structure, which should be completed in the spring, will become part of a community setting that replicates the residential, suburban, park, downtown and light industrial areas of the city.

Knoxville police officers and firefighters provide safety instruction in a safe and unique classroom environment for second-grade students, who learn about bicycle and pedestrian safety and fire safety, as well as how to use 911 properly.

Students learn the necessary safety skills to use in different parts of the city through the miniature city's child-size buildings, roads, curbs, sidewalks, and working traffic and railroad signals. They practice safety skills in small activity groups by

driving bicycles and miniature cars, performing pedestrian exercises, using an interactive 911 CD Rom program and experiencing a nontoxic house fire.

There is no admission charge to Safety City, and the Knoxville Area Transit provides transportation for the Knox County School system.

Safety City is located at 165 S. Concord Street, between Kingston Pike and Sutherland Avenue. For more information on the project, contact Marilyn McLaughlin, 574-4163.—Marilyn McLaughlin [ornl](#)

ORNL people

Vince Mei, staff member in Engineering Science and Technology Division's Building Equipment group, has been elected a fellow of the American Society of Mechanical Engineers. Vince is well known for his work on advanced heat pump and air-conditioning technologies.

Stan A. David, Suresh S. Babu and Ed Kenick, of the Materials Joining and Nondestructive Testing group, Metals and Ceramics Division, received the McKay-Helm Award and the Warren F. Savage Memorial Award from the American Welding Society. The McKay-Helm award is presented "for the best contribution to the advancement of knowledge of low-alloy steel, stainless steel or surfacing welding metals. The Savage Award recognizes the year's top paper published in the *Welding Journal*."

The Nuclear S&T Division's **Russ Knapp** was recently an invited speaker at the 25th Annual Bad Gastein Symposium on Radioactive Isotopes in Clinical Medicine and Research, held in Bad Gastein, Austria. His talk was titled "Rhenium-188: Advantages and Clinical Potential for Use of a Readily Available, Cost-Effective Therapeutic Radioisotope for Applications in Nuclear Medicine." The Bad Gastein symposia are the oldest nuclear medicine meetings in the world, celebrating their 50th anniversary in 2002.

The Fusion Energy Division's **Martin Peng** and **Rajesh Maingi** and the Computational Science and Engineering Division's **Dennis Strickler** were mentioned in a recent *Science* article (25 January 2002, Vol 295, p. 602), "Spherical tokamaks are on a roll." The article discusses promising plasma-confining results from spherically shaped fusion reactors, as opposed to the typical donut-shaped tokamaks. It's an approach, the article cites, that was first suggested by Peng and Strickler in the early 1980s.

FED's **Lee Berry** has been appointed chairman of the Coalition of Plasma Science, a nonprofit educational group of universities, laboratories and companies whose goal is to "increase public awareness and understanding of plasma science and its many applications and benefits for society."

Disaster can reveal the value of your records

How valuable is your research? What would be the impact of losing it in a disaster?

It happens, as a researcher at the University of California Santa Cruz has learned—the hard way. On January 12, fire destroyed laboratories and 14 years worth of human genome research.

"It's a devastating situation," the researcher said, "I don't know how far it has set me back."

Chances are remote that such a disaster would occur here, but even a small inconvenience—such as a water-damaged notebook—that wastes even the smallest amount of time and money is too great a cost if it could be prevented.

In fact, DOE contractor records must be managed to meet federal requirements. "This does not need to be a burden," says Records Management's Juli Stewart. "Records Management provides free storage space for paper and film records. Other specialized services are on a cost-recovery basis."

"For instance, the Inactive Records Center has stored mainly paper, but Records Management is offering to store electronic records, including R&D notebooks, as a new service. Retrieval is quick and convenient," says Juli. "Operations groups have traditionally used the service, although it is available to all ORNL organizations."

Records Management offers a variety of services in addition to inactive records storage:

The Engineering Records and Copy Center supports records management activities for Engineering Services. The center maintains drawing and project records information in paper and electronic

form and provides for distribution and reference, often at the desktop. It also provides for complex copying, printing and scanning for engineering drawings.

Records Management provides records staff for the records and document needs of ORNL organizations. Document centers provide document control services including distribution of controlled documents, maintenance of record copies and other needed information and reference services through the Research Library and the Web. Automated records and document control services are available to all ORNL customers through a purchased-service model.

Records Management also manages the Lab director's records activities, tracking Laboratory commitments and storing record copies for the director's office.

Records Consulting and Analysis assists site-wide records activities including program improvement reviews, records disposition, records management and document control training, electronic records and document systems and coordination for the use of ORNL records by DOE and other groups.

In short, Records Management can help ORNL staff with any records concerns or requirements. Look for the comment form located on the Records Management home page at home.ornl.gov/divisions/computing_information_networking/records/ or contact Records Management, 576-5061, stewartjg@ornl.gov. [ornl](#)

Everyone benefits

Flexible Workplace works for employees, supervisors, customers

Readers of "ORNL in the News," a Web-based roundup of ORNL-related news items and other articles of general interest, usually have their morning news waiting for them when they arrive at work and log in. One reason that service is so timely is the Lab's Flexible Workplace program.

Because of the flexible arrangement, the Research Library's Gabrielle Boudreau and Terry Depp can assemble and post the news each morning from home. Their Information Services supervisor, Randy Hoffman, says that in all cases where her employees work on the flexible workplace program, everyone benefits—the program results in improved service to the Laboratory.

"The Flexible Workplace program allows the news to get out by 7:30 a.m.," Randy says. "Taking advantage of the (program) enables us to meet our customer needs; we're able to provide expanded service, even though we're a very small staff."

The ORNL Committee for Women wants to increase the awareness of the Flexible Workplace Program. The complete procedure can be found by connecting with the Human Resources and Diversity Programs homepage (home.ornl.gov/divisions/human_resources/hrdp.html) and accessing the Flexible Workplace procedure (HR007) under Directives.

The procedure "makes available an alternative work arrangement of a home-based office to (all salaried) employees whose nature of work and performance history indicate that such an arrangement would enhance their productivity, creativity and job satisfaction." It also provides a mechanism for accommodating employees with either temporary or permanent disabilities.

ORNL employees who work or have worked under this program include an employee who does computer-based work at home three days a week and an employee who worked temporarily from home following a physical injury. Others, like Gabrielle, may perform tasks best done off normal business hours.

Another supervisor who is pleased with the program is Roger Jenkins in the Chemical Sciences Division. Since Amy Dindal's husband was pro-

moted to a job in another city, she has been able to continue working for the Lab. Through telecommuting and the flex program, Roger has been able to retain the services of a valued employee.

"Amy is a central figure in a program, and she's loyal to the program and our office," says Roger. "It's a wonderful arrangement, even more successful than I thought it would be."

Such an arrangement, however, may be limited to certain types of tasks and requires certain amounts of dedication and discipline.

"I would certainly not do it for every employee," says Roger, who holds half-hour teleconferences with Amy daily. "Amy is highly self directed, extremely productive and does a type of work amenable to being done from anywhere. Away from the workplace, she has fewer distractions, which ratchets up her high level of productivity even higher."

A key point of this policy, says Carol Forsyth of the Committee for Women, is that the employee

and supervisor must mutually agree upon the arrangement. She and former CFW member Susan Michaud offer the following advice if you are interested in working a flexible schedule:

- Read the procedure carefully and make sure that you meet the required qualifications.
- Draft a written plan to discuss with your supervisor. This program is not new, but because it has not been widely implemented, supervisors often are not familiar with its benefits.
- Propose something on an interim basis—perhaps one day a week for three months, after which you agree to review the work with your supervisor and continue as-is or modify your schedule.
- Select work that is measurable and can be accomplished away from the office.
- Plan on demonstrating your continued availability either through e-mail or the telephone—your work phone can be forwarded to your home number.

"The Flexible Workplace Policy was put in place to enhance employee creativity, productivity and job satisfaction," says Carol. "We all know how valuable a little uninterrupted time can be in reviewing a document or writing a proposal. It may also help reduce parking demand during the facility revitalization construction." [ornl](http://ornl.gov)

Oak Ridge—Anderson March of Dimes walk April 13

The Oak Ridge—Anderson County March of Dimes "WalkAmerica" will be held Saturday morning, April 13, at the Oak Ridge Marina. Walkers will travel four miles along the Melton Lake Drive walkway that connects Oak Ridge Turnpike with Edgemoor Road.

Money raised from the walk will go toward Oak Ridge National Laboratory

research to counter birth defects and for promotion of the campaign's Healthy Babies effort. The Oak Ridge "WalkAmerica" event is a Team UT-Battelle activity. Fred Strohl of Communications and Community Outreach is coordinating the ORNL effort.

If you are interested in participating, call Fred at 574-4165 (e-mail: strohlhf@ornl.gov).

Service Anniversaries

March

55 years: J. W. Dennis, Logistical Services

35 years: Randall D. Burris, Computer Science and Mathematics; Danny W. Ramey, Nuclear Science & Technology

30 years: R. C. Hackler and Jack W. McNew, Craft Resources

25 years: Richard A. Boody, Carl E. Conley and Leonard E. Presley, Craft Resources; Linda S. Burnett, Business & Information Services Dir.; Jimmy S. Davis, Logistical Services; Charles L. Garren, SNS Conventional Facilities; James S. Goddard, Jr., Saylor B. Hummel and Larry D. Phillips, Engineering Science & Technology; Hu F. Longmire, Metals & Ceramics; Tom T. McConnell and Leonard P. Phillips, Jr., Nuclear Science & Technology; Henry C. Ruth, Fabrication & Site Services; Marcia D. Whitson, Contracts

20 years: Charles Hagan, Jr., Environmental Sciences; Gregory L. Kickendahl, Research Reactors; Daniel G. O'Connor, Facilities Management; William P. Painter, Contracts

Compensation act amended

Amendments to the Energy Employees Occupational Illness Compensation Program Act (EEOICPA) were signed into law by President Bush on Dec. 28, 2001. The program is designed to aid current and former DOE weapons facility workers and survivors who qualify and may be eligible for compensation of \$150,000 and paid medical benefits. The amendments reflect significant changes to the survivor definition. They specifically removed the age requirement for a child to be an eligible survivor under the law. In addition, other members of the employee's family may be eligible for compensation if there is no spouse or children.

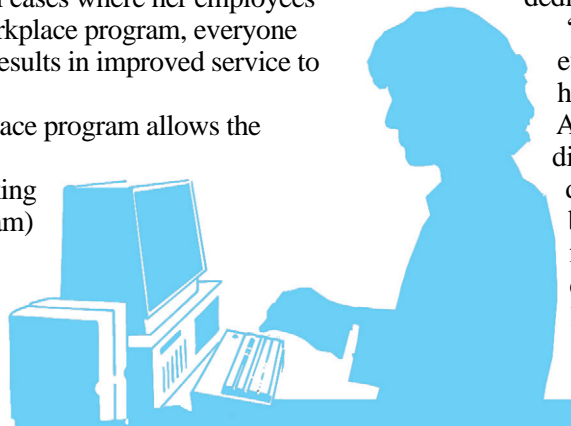
Information regarding these and other changes may be obtained at the Energy Employees Compensation Resource Center in Oak Ridge. Call (865) 481-0411 or toll-free 866-481-0411 if you need any additional information on the amendments or wish to file a claim.

Beneficiary statements mailed

Benefits has recently mailed Beneficiary Confirmation Statements to individuals with life insurance coverage. If you wish to change your beneficiary, call the OneCall Service Center at 574-1500 or toll free at 1-877-861-2255 to obtain a new beneficiary designation form.

Book of Benefits mailed to retirees

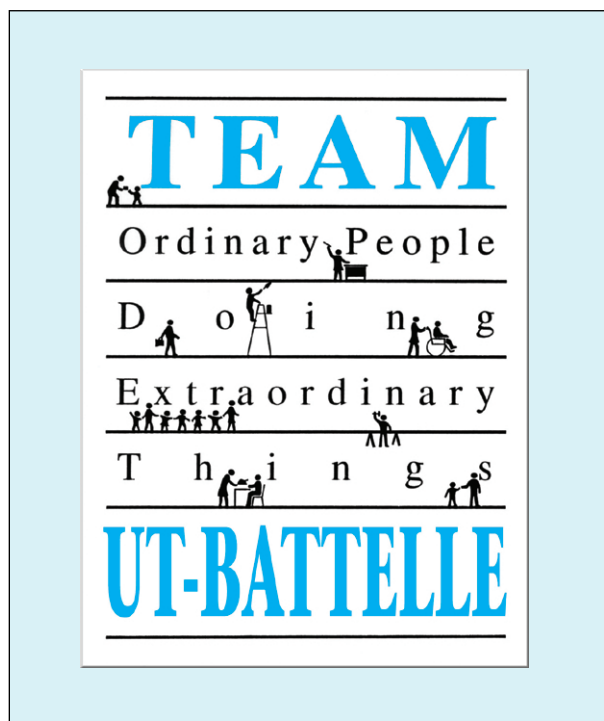
A new *Book of Benefits* for retirees is being distributed by mail. This new three-ring binder has tabs that will make it easier to find information and to add updated pages as legal or plan requirements change. Retirees should keep this book with other important documents so it is readily available when there are benefit concerns.



Team UT-Battelle aims to lengthen ORNL's community service strides

Team UT-Battelle marks a successful first year this month. The volunteer program, rolled out in March 2001, is intended to facilitate worthwhile staff involvement in the communities where they live and work.

Last year's activities included participating in "walks" and "races" to fight breast cancer, multiple sclerosis and diabetes; support for the American Museum of Science and Energy; and volunteer work for the Oak Ridge Community Playhouse. Team volunteers also helped erect a Habitat for Humanity dwelling that is now the home of a young family.



The employee-driven organization assists groups helping charitable, cultural, civic and other worthwhile causes anywhere in our region. Volunteer services include fund raising, contribution of personal time and talents and aiding in the conduct of events and public service.

Employees who identify worthwhile causes are the initiators of Team UT-Battelle activities. An advisory committee reviews and approves projects and also identifies worthwhile opportunities, evaluates staff interest and seeks out prospective project captains.

Team UT-Battelle is not formally connected with the UT-Battelle corporate contribution program; however, it enjoys strong management support. Communications and Community Outreach Director Billy Stair and the contributions management committee can and sometimes do choose to make corporate contributions to Team UT-Battelle causes. Brenda Hackworth, manager of Community Outreach, has direct responsibility for the program, assisted by Bill Pardue, coordinator of volunteer activities.

Advisory committee members include Herb Debban (Facilities and Equipment), Lou Dunlap (Technology Transfer), Teresa Ferguson (Engineering, Science and Technology), Jaime Fernandez-Baca (Solid State), Constance Goodman (Craft Resources), Tim Myrick (Lab Revitalization), Dave Reichle (Friends of ORNL), Hackworth and Pardue.

Anyone interested in volunteering for any of the Team UT-Battelle projects or with an idea for a new project can contact Bill Pardue at 576-0235 or e-mail pardueb@ornl.gov.—B.C. [ornl](http://ornl.gov)

For first year, a good track record

Team UT-Battelle projects included the following for 2001:

- Susan G. Komen Race for the Cure for breast cancer
- Aid to Distressed Families of Appalachian Counties (ADFAC)
- Habitat for Humanity
- MS Bike-a-thon
- Walk for March of Dimes
- Walk to Cure Diabetes – Juvenile Diabetes Research Foundation
- America's Walk for Diabetes
- United Way Gas Pump Day
- Support for American Museum of Science and Energy
- Support for Oak Ridge Community Playhouse

These projects raised approximately \$25,000 for worthy causes, with approximately 500 volunteers, some of whom participated in more than one project and contributed over 4,000 hours of their time. All of the 2001 activities are expected to be continued or repeated in 2002. New projects being initiated or considered include

- Trash pickup along Highway 95
- *Tour de Cure* bike ride for cancer
- Melton Hill Lake trash pickup
- Great Smoky Mountain National Park improvements
- Identification of ORNL antiquities
- Oak Ridge baseball tournament

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