

## Lifesaving waste

### Lab ups shipments of medically promising radioisotope

ORNL's noted trash-to-treasure program—the reprocessing of decades-old uranium waste products into medically useful radioisotopes—reached a milestone recently. ORNL shipped nearly 43 millicuries of actinium-225 to New York's Sloan-Kettering Cancer Center for clinical trials.

The amount sent to New York more than quadruples the first shipment, in 1997, of

leukemia—blood cancer.

“It is like a nuclear device brought against the cancer cells, only at a molecular level,” says Saed.

The processing of the uranium waste through a string of daughter isotopes involves world-class technical expertise and specialized facilities. Those facilities include special hot cells that were refurbished particularly for attaining the strict quality control standards that nuclear medicine requires. The cells are designed for working with alpha-emitting radioisotopes—they have equipment that traps the radon gas emanating from these radioisotopes.

Saed explains: “An alpha facility usually means a facility that, in addition to providing containment and shielding, also has the capability to hold radioactive radon for short duration, allowing it to decay harmlessly prior to discharge.”

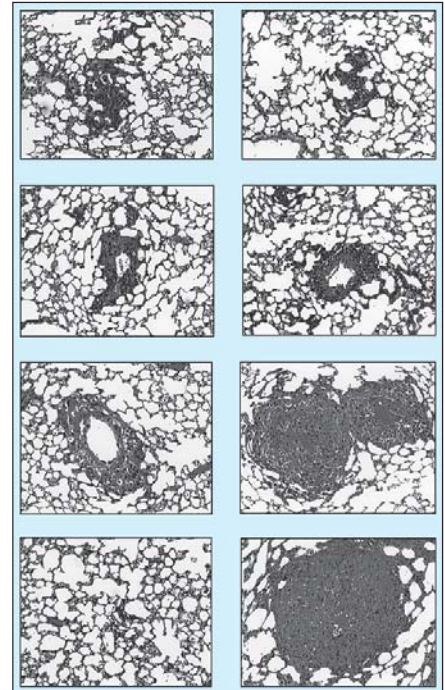
The opportunity to retrieve the valuable radioisotopes presented itself several years ago when ORNL's stash of uranium-233-laden

(See **TREASURE**, page 4)

*Bismuth-213 is like a nuclear device against cancer cells, only at a molecular level.*

5 mCi to the National Institutes of Health. Nuclear S&T Division researcher Saed Mirzadeh credits a host of Lab employees from a number of different organizations for their dedication to providing the medical community with a material that has the potential to save many lives.

ORNL is the only major source of the radioisotope bismuth-213, which is derived from actinium-225. Bismuth-213 coupled with a tumor-cell-targeting antibody can be a very effective treatment for acute myelogenous



ORNL studies showed that mouse lung cancer cells treated with bismuth-213 nearly disappeared (left column), while they grew rapidly in untreated mice (right).

## Employees start reaping rewards of a maturing SBMS

BY FAY FREDERICK

When was the last time you felt that reading a procedure was actually useful?

The Standards-Based Management System Development Team's goal is to increase the frequency of positive answers to that question.

The SBMS project is in the final year of development. The team has been working to translate ORNL's external and internal requirements into procedures that are easy to read and relevant to the work that you do. The procedures are organized with other procedures related to the same topics. They are grouped together into subject areas, similar to chapters in a book. If you used past ORNL directives and guidance documents, you should immediately notice that the audience for our subject areas is different. We want to write documents that tell the R&D and support staffs what they need to know about a subject—not make them experts on every topic.

Over the past two years, quite a few SBMS project accomplishments have had a positive effect on your job.

**We are improving compliance and reducing risk.** Through the development of the work control process, we have documented evidence that the research community is using SBMS subject areas, and per the latest Independent Oversight assessment, they find the development process “a valuable process.” Some previously unidentified hazards have been identified and are being controlled through the annual review of more than 650 R&D projects. Stay tuned: Maintenance, operations and services activities are now being reviewed and adding to this number daily.

On the requirements management front, by the end of 2002 the project team had reduced the number of external and internal requirements from 465 (CY 2000) to 320. During that time 70 percent of the old directives and guidance documents were retired. The portions pertaining to all ORNL staff were converted to SBMS subject areas. The development of these documents

has been based on risk to the worker and the company. Those that could be of the most benefit to you were developed first.

**We are modifying culture through participation.** You are the most important part of the SBMS development process. Your participation in our subject area development teams and document reviews makes the



subject areas relevant and usable. To date, more than 1700 staff members have participated in our development teams and focus groups. Over 600 were R&D representatives. Perhaps the most striking numbers of all—in 2000, the ORNL directives and guidance along with the very first subject areas were

(See **SBMS**, page 5)

## Two million safe hours reached

In February, for the first time in a decade, ORNL employees reached more than two million hours without a work day lost to injury on the job. The Laboratory celebrated reaching the million-hour mark last summer and again earlier this year.

The last time the two-million-hour milestone was reached was in 1993, when Lab employees worked 2.6 million hours without sustaining an injury resulting in time away from work.

The current no-injuries streak began last November.

Kelly Beierschmitt, ORNL director of Environment, Safety, Health and Quality, says the two-million-hour number is a strong indication of the Laboratory's continued emphasis on safety. "Imagine ORNL as a small city with a population of four or five thousand folks working without any serious injuries and the hospital quiet for four

months," Kelly said. "Our lost-time case rate is already 75 percent lower for this fiscal year than for the same time a year before. This speaks volumes for the commitment to safety our employees have made during recent months."

Kelly added that he hopes this accomplishment will be an incentive for employees to continue their strong dedication to safety, both on the job and at home.

Ed Mee, first vice president of the Atomic Trades and Labor Council, the Lab's bargaining unit, says the effort at improving safety has been a joint effort of labor and management. "The Atomic Trades and Labor Council takes pride in the improvement of safety at the Laboratory since UT-Battelle became the managing contractor," Ed says. "We are pleased this contractor has such a high regard for safety."—Fred Strohl [ornl](#)

## Job-related illness, injury rates low, study says

DOE's most recent Epidemiologic Surveillance Report for ORNL, for the year 2000, indicates that the Lab's occupational illnesses and injuries are low. The ORNL report, received in December, summarizes the data submitted by the Laboratory and presents detailed analyses by DOE staff at the Oak Ridge Institute for Science and Education.

Through its Epidemiologic Surveillance Program, DOE monitors the health of workers at a number of its facilities; specifically, it looks at illnesses and health conditions that result in an absence of five or more consecutive days, occupational illnesses and injuries, and disabilities and deaths among current workers.

Although the study reports a low injury rate, the Lab is continuing with its efforts to further

reduce its incidences of and costs associated with occupational illnesses and injuries as compared with other national laboratories.

The report noted that the overall rate of OSHA-recordable events (recorded occupational injuries and illnesses) was 3 per 100 workers and that sprains, strains and bruises were the most common occupational injuries.

The full text of the 2000 *ORNL Annual Epidemiologic Surveillance Report*, as well as appendices and the 1999 report, can be found at <http://tis-nt.eh.doe.gov/health/epi/surv/>. This Web site also contains links to reports for other DOE facilities.

For more information or if you have questions, contact Dr. Jim Phillips, ORNL Health Division, 574-7431. [ornl](#)



Office of Science Director Ray Orbach

## Big Cray coming, set up for science

With the delivery next month of the Cray X1 supercomputer, ORNL and Cray Inc. will take an important step toward investigating computer architectures for scientific discovery.

The Center for Computational Sciences will deploy the Office of Science-funded Cray X1 system to test its effectiveness in solving important scientific problems in climate, biology, nanoscale materials, fusion and astrophysics.

Office of Science Director Ray Orbach says the ORNL-Cray partnership is one of the first steps in the initiative to explore computational architectures essential to 21st century scientific leadership. "Modern computational methods are developing at such a rapid rate that computational simulation is possible on a scale that is comparable in importance with experiment and theory," he says.

Under the program, ORNL and Cray will evaluate the processors, memory and scalability of the architecture and software environment of the X1 system to determine its effectiveness for the solution of the most challenging scientific problems. The Cray X1 is the first U.S. computer to offer vector processing and massively parallel processing capabilities in a single architecture. The system has been specifically designed for scientific applications.

Initial delivery of the eight-cabinet expandable Cray X1 system is expected to begin this month, and the system should be fully deployed at ORNL by the end of September.

An important part of the Lab's initiative with Cray is to ensure that the next-generation computer hardware and systems software are appropriately balanced for scientific needs. CCS is working closely with the academic and laboratory community in evaluating and deploying the Cray system.

ORNL Director Bill Madia says he envisions a partnership that will benefit America's scientists. "We are committed to working with Cray and the scientific community to help ensure that the next generation of supercomputers meets critical research needs. We also look forward to locating the X1 in our new state-of-the-art computational sciences facility, which is scheduled for completion later this year," he says.—Cindy Lundy [ornl](#)



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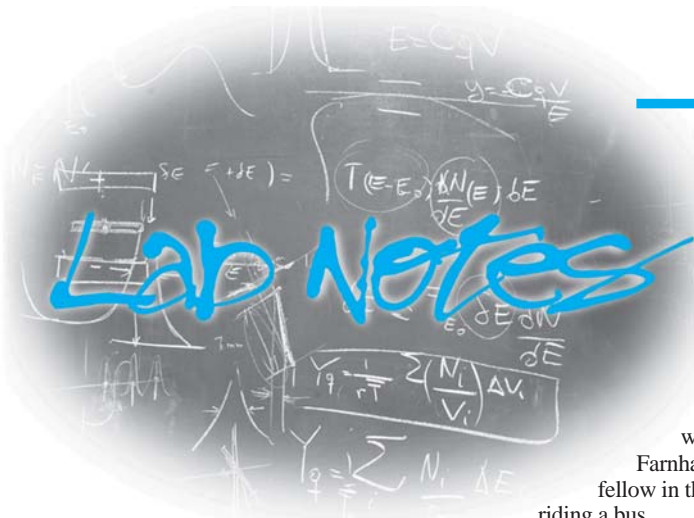
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Curtis Boles

"Who ordered this?" wonders the Life Sciences Division's Thomas Thundat as he de-ices his car on a snowy afternoon.



students from Oak Ridge High School, who were special guests of the Lab.

**I know you rider**

Last month's history issue of *Reporter*, which took an approach to Lab history that was just a little offbeat, proved to be a popular one, particularly with retirees. One, Bob

Farnham, called in to identify the fellow in the hat, reading a paper while riding a bus.



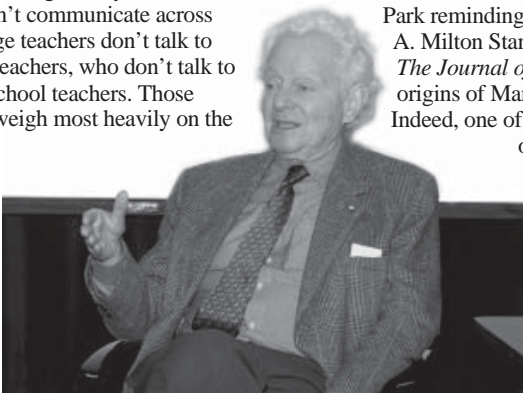
The fellow on the bus was the father of a current Lab employee.

**Lederman: Teach physics first**

Even though he shared a Nobel Prize in 1988 for highly exotic discoveries in subatomic particle physics, Leon Lederman has always been an advocate of teaching science in the most approachable ways. So it wasn't surprising to hear him base his February 7 Distinguished Lecture on science education and his theories on how to make it better.

One thing wrong, he says, is that science educators don't communicate across levels. College teachers don't talk to high-school teachers, who don't talk to elementary school teachers. Those disconnects weigh most heavily on the student.

Another problem, he says, is that we've got it backwards. U.S. schools follow a 19th century science education



Leon Lederman has a notion or two about how science is taught in secondary schools.

model of teaching biology first, then chemistry, then physics, even though a basic understanding of physics could shed light on the mysteries of chemistry, which in turn is responsible for the basic processes of life.

"We still follow this sequence in spite of profound revelations in science," Lederman says. "A radical revision of the K-12 curriculum is long overdue."

Lederman's talk was illustrated with handwritten overhead transparencies embellished by expressive stick figures. He also included the quips he's known for ("Ninety-nine percent of all numbers are made up" and the tale of the electric hand dryer with a handmade sign: "Push for a message from the director.")

But his message is dead serious. U.S. schools hold their own with other countries in science and math up to the eighth grade. By the 12th grade they lead only South Africa and Cyprus.

"What is needed is not taught, and what is taught is not needed. That's a *mild* criticism," he says.

Following his talk, Lederman met with

In turns out the rider's ties to ORNL have endured. He is the late Henry Klemski, father of ORNL fleet manager John Klemski. Henry, Bob says, was a supervisor at the Lab and a great baseball catcher (note the jacket).

Although we alluded to horseshoe pitching as something done in the recent past, Roberta Grafton in the Independent Oversight office reports that the irons still fly over in the 7000 area.

We also received a note from retiree Jim Park reminding us that R. P. Prince and A. Milton Stanley published an article in *The Journal of East Tennessee History* on origins of Manhattan Project names. Indeed, one of our sources for the article on place names was their article.

Retiree Gene Hatfield called in to offer his account of why ORNL has been called the "country club." At an open house in the early 1960s, he recalled, a visitor saw some picnic tables and then looked at the open house's map, which

called out the "swimming pool," reactor. "Picnic tables and swimming pools. Why, this place is just like a country club," remarked the visitor.

But we still don't know exactly where "Lagoon Road" came from.

**Fitness Center marks one year**

Lately it seems it wouldn't be a day around ORNL without it being an anniversary for something. It has already been one year since the ORNL Fitness Center opened, in February 2002.

The Fitness Center was a direct result of the Quality of Work Life survey from a few years ago. Employees expressed their wishes for a fitness center, which got the ball rolling to make the center a reality.

As one faithful user, Regina Parks, says, "Regardless of the muscle pain, I'm not as stressed out or as unhealthy as I used to be. I'm enjoying it, as well!"

Regina is one of scores of employees who are getting fit at the center. Statistics (derived

from proximity card data) show more than 26,000 visits to the center—obviously there are many repeat users and dedicated exercisers in that number.

**Parking: Fewer still, but still enough**

ORNL's parking situation is a lot like East Tennessee weather: If you don't like it, don't worry, it will change.

The recent loss of nearly 140 spaces in the south parking lot for construction of the Advanced Materials Characterization Laboratory appears to have been sufficiently absorbed by other parking lots. ORNL parking coordinator Faye Brewer says, in time, new parking lots inside the fence will shorten the morning and afternoon trek for many.

Most of those new spaces will be built upon the 3523 and 3524 holding ponds just off Southside Drive. That capping and paving project is slated for completion this summer, just in time for the Lab's planned shift to "open campus."

With open campus, the current regime of allotted parking passes will go away, to be replaced by a first-come, first-served system. Spaces will be set aside, of course, for medical restrictions, government vehicles and two-hour parking slots for business purposes, but the early birds will get the rest of the slots.

"Those who arrive later will park in perimeter lots," Faye says. "There won't be enough spaces inside the fence to accommodate everyone. But there will be enough spaces overall."

A concern for planners and Lab managers is the prospect of increased traffic inside the Lab.

"Traffic pattern studies are being done now, and we'll likely make changes based on their recommendations," Faye says.

Lab staff members have already seen some changes, such as speed "humps," intersections converted to all-way stops and other traffic-calming measures.

Faye cautions that the open campus plan is subject to delay by outside influences, such as security measures. In the meantime, help reassure planners by driving carefully and parking only where you are supposed to.

*Reported by Bill Cabage and Deborah Barnes*

# Treasure

Continued from page 1

process waste came to represent a source of risk and environmental issues.

The raw resource, uranium-233, which is fissionable and classified as a “special material,” dates back to the Manhattan Project and Cold War days. It was produced in the 1960s and ’70s as part of the DOE molten-salt breeder program.

“Waste from the original uranium-233 production was stored in tanks in Building 3019 (the Lab’s original radiochemical processing lab) for 30 years,” Saed says. “We received Lab-directed R&D funding years ago to take sludge from the tanks and extract thorium from it, and after extensive purification we used it with some in-house biology experiments.”

That work began in 1995 and demonstrated, in work by Life Sciences Division researcher Steve Kennel, that the final product in the process, bismuth-213, was an efficient killer of mouse cancer cells. That work went on to show that treatment with bismuth-213 targeted to the lungs could cure mice of lung cancers (see the images on page 1).



Mirzadeh

The waste’s progression from sludge to medicine may seem like the alchemy of myth. It is in fact the result of the sort of know-how one finds at a national laboratory with a rich history in nuclear engineering and radiochemistry. The project was helped, however, by some chance discoveries.

For instance, it was discovered that, over time, thorium encrusted the boron-rich glass rings, called Raschig-rings, that had been placed in the sludge tanks as a neutron absorber. (Boron absorbs neutrons, thus blunting any accidental fission reaction). Much of the useful thorium was retrieved by washing the glass rings in an acid bath.

After preliminary purification, thorium from the uranium-233 processing sludge was sent to a special hot cell in Building 3047 for further purification and routine processing. Thorium-229, which has a half-life of around 7,500 years, decays to actinium-225, a daughter isotope with a mere 10-days’ half-life.

“Every 60 days we ‘milk’ the actinium from our thorium-229 stock,” Saed says. “It is purified, subjected to the proper quality controls and then sent to Sloan Kettering Cancer Center in New York, where it is being used in clinical trials for a blood cancer treatment.”

In addition to supplying ongoing biological studies at Oak Ridge, smaller amounts of actinium-225 have been sent to other sites, such as the NIH and the Fred Hutchinson

Cancer Research Center in Seattle. Yet even smaller quantities are sent to a number of other research institutes in the United States, Europe and Australia. Some of the products derived from the waste are also sold to a private company, and some of the thorium extracted from the material is currently held in the Institute of Transuranium Elements at Karlsruhe, Germany.

At Sloan Kettering and other clinics, about half a milliliter or so of the actinium-

225 is loaded on a small column called a generator. The final product, bismuth-213, with a half-life of only 46 minutes, is eluted from the generator and incorporated into a monoclonal antibody, which is immediately injected into the patients. The antibody in this case homes in on leukemic cells.

The 46-minute half-life of bismuth-213 means it must be generated on demand and on-site in the clinical trials, which are testing an outpatient therapy program.

“The short half-life of bismuth-213 fits well for the treatment of leukemia,” Saed says.

“The antibodies find the leukemic cells in the blood within a few minutes. It is very much like a torpedo driven by some special internal mechanism that allows it to arrive at the target and drop its payload.”

One or two alpha particles from bismuth-213 are sufficient to kill the cell to which it is attached, while other cells within a radius of about 100 micrometers (about 10 cell diameters) also will get a hefty dose of radiation. “But the cells outside of the 100-micrometer sphere will receive very little radiation, so it is like micro-surgery—a novel approach to treat micrometastasis without radiating the healthy tissues,” Saed says.

“Without a doubt, the uranium-233 stock at ORNL is a national treasure, but it also represents a source of risk and expense,” Saed says. “The primary source of thorium-229 is ORNL’s uranium-233 inventory, and direct extraction of thorium-229 from uranium-233, although chemically a simpler task, politically is complex because of the nature of uranium-233.”

“Uranium-233 is a strategic nuclear material and therefore requires extensive security, safeguards and regulatory concerns,” Saed says.

Programs are under way to reprocess, stabilize and possibly move the special material elsewhere. The DOE Isotope Program has been somewhat under the gun to retrieve the useful parts from uranium-233 before it is repackaged or otherwise rendered unavailable, and they’ve accomplished the

feat so far with a minimum of funding. In the past three years, ORNL’s Isotope Program has been able to take advantage of inspections of the uranium-233 packaging by the Defense Nuclear Facilities Safety Board to retrieve some thorium-229 while the containers are being opened and inspected.

Saed credits many ORNL researchers,

*The progression from sludge to medicine may seem like the alchemy of myth. It is in fact the result of the sort of know-how one finds at a national laboratory.*

managers and technicians with making the actinium program work, often through sheer dedication and ingenuity. He singles out Rose Boll, who joined the thorium-229 program in 1996 as a postdoc and developed the processing chemistry for this project. She remains an “invaluable” member of the team, Saed says. Others include Alan Krichinsky, Judy Butler, Karl Thomas, Dave Clark, Steve Wood, Tim Warren, Stan Cooper, Randy Gibson and Don McTaggart (Building 3019); Herman Phillips, Dairin Malkamus, Linda Farr, Greg Grover, and Miting Du (Building 3047); and John Keller and others in Building 2026.

“I should also acknowledge the continued support of a number of program managers, including Emory Collins, Brad Patton, Jerry Klein, Jim Rushton, Dan Ramey, Fred Peretz and Russ Knapp. The interaction with Steve Kennel from Life Sciences has been very fruitful.”

One particular bright spot for the sparsely funded program is that there is a market for the actinium.

“At this point, what we make, we can sell,” says Saed, explaining that revenue from sales of the actinium-225 is helping to sustain the program. “The only budget we really have is what we sell.”—B.C. [ornl](#)

## ORR nature walks offered

The annual Community Nature Walks on the DOE Oak Ridge Reservation are under way. Three guided bird walks are scheduled during April and May.

- April 19, Bird Walk at Poplar Creek, 7 a.m.
- April 26, Bird Walk at Freels Bend, 7 a.m.
- May 3, Bird Walk at Solway Bend, 7 a.m.

There is no charge for the walks, but space is limited. Those interested in participating in the guided bird walks must pre-register with Lissa Clarke, 576-3218, at the American Museum of Science and Energy by the Thursday preceding each scheduled Saturday bird walk. Participants should bring binoculars, a flashlight, water and a light snack; also, wear long pants, comfortable shoes and light rain gear, just in case. [ornl](#)

# SBMS

Continued from page 1

accessed an average of 3,000 times each month by approximately 50 different staff members. During the last half of 2002, over 3,000 unique users accessed SBMS documents approximately 150,000 times.

**We are increasing ease of understanding and relevance.** Of the 95 subject areas that have been released, approximately 90 percent have contained no new requirements. The 10 percent that did contain new requirements were mostly the result of changes in our external requirements. Through these new subject areas, we have decreased our self-imposed internal requirements, increased staff's awareness and drastically reduced extraneous information. The SBMS Office has also provided a Help Desk service to our users. Since the beginning of the project, we have responded to more than 300 questions. Sixty percent of the questions were answered within 24 hours; 80 percent within 72 hours.

**We are improving the efficiency of our operations.** As has been previously mentioned, our goal throughout the development process has been to produce a system that is relevant and easy to use. We are building systems that will collect data behind the scenes and tell us what is or is not working to support our research and development mission. We are improving the efficiency of ORNL operations by fully integrating operating systems to align with ISO standards and the tenets of integrated safety management and integrated safeguards and security management. Laboratory costs are being

## ORNL people

The Tennessee Junior Science and Humanities Symposium, sponsored by UT-Battelle, the University of Tennessee, the U.S. Army Research Office and the U.S. Naval Research Office, made its annual visit to Oak Ridge February 28. ORNL researchers who addressed more than 75 Tennessee high school teachers and students included the Environmental Sciences Division's **Gerald Tuskan** ("Accelerated Domestication in Trees"); the Metals and Ceramics Division's **Claudia Rawn** ("Neutron Diffraction Studies"); Spallation Neutron Source Executive Director **Thom Mason** was the keynote speaker ("Materials Science in the Modern World") for the symposium's banquet. ORNL judges of the scientific papers competition were the Physics Division's **Michael Smith** and ESD's **Art Stewart** and **Tom Ashwood**.

**Josh Sharp**, a UT graduate student working in the Chemical Sciences Division, has been selected to attend the 53rd meeting

## What they say...

For staff members who often deal with procedures, SBMS has made a positive difference. Here's what two employees say:

### Sandra Kennedy, Physics Division, ESH&Q waste:

"I use SBMS on a daily basis to help me identify requirements for conducting work. The best thing about SBMS is the way the information is organized. I don't have to read a long document to find the one little piece of information that I want. Procedures in subject areas provide an outline of requirements to help you find the information you are looking for. If I need a specific form, I can go straight to the forms section in the subject area. If I am looking for training requirements, I know that there will be a procedure in the subject area on training. If I want to research drivers for a requirement, I can use the links to the regulatory requirements. And if the procedures don't answer my questions, I can always call the subject matter expert identified for each subject area. SBMS saves me a lot of time and trouble and makes it possible for me to stay knowledgeable of requirements."

### Mark Vance, Quality Services Division:

"My initial interaction with the SBMS organization was a pleasant surprise. Since then, I have worked with SBMS from both a line support and management system perspective. They should be commended for their consistent customer empathy and proactive role in making the system both understandable and useful to the Laboratory. They are an excellent candidate for benchmarking by others looking for an effective organizational model functioning in a very challenging and constantly changing environment."

reduced through the redesign of systems and processes and the integration of systems and tools.

So what are we doing in FY 2003? We are developing the remaining 40 to 50 subject areas and retiring all of the old directives and guidance documents. Processes will be developed and tested for measuring the performance and degree of integration of each of our 24 management systems. We are developing user interfaces that will allow you to create your own virtual world within

SBMS. You will be able to customize SBMS to return only the information that is relevant to the work you do and the things that interest you.

And, most importantly, we are looking for more efficient ways to capture your suggestions and translate those into system improvements. [ornl](#)

*Fay Frederick directs the Environment, Safety, Health and Quality Directorate's SBMS program.*

of Nobel laureates and students in physiology and medicine in Lindau, Germany, which will be held June 30 through July 4. Josh was nominated for this honor by Associate Laboratory Director Frank Harris, in response to a request from the Office of Science.

All four of ORNL's nominations for this year's Federal Laboratory Consortium Excellence in Technology Transfer category will receive awards at this year's national meeting, set for May 5-9, in Tucson, Ariz. The winners include "Automated Image Retrieval System for Semiconductor Yield Improvement," **Regina Ferrell, Shaun Gleason, Bruce Jatko, Tom Karnowski, Ken Tobin and Bobby Whitus**; "Carbon Composite Bipolar Plate," **Ted Besmann, Tim Burchell, John Henry Jr., and James Klett**; "Expression Data Clustering Analysis and Visualization Resource (EXCAVATOR)," **Dong Xu, Ying Xu and Victor Olman**; and "ASAP: Any Source, Any Position Fluid-Handling Device," **Mitch Doktycz and Steven Hicks**. "Automated Image Retrieval System" and "Carbon Composite Bipolar Plate" recently won their categories in the FLC

Southeast Region competition. "EXCAVATOR" received honorable mention.

The Life Sciences Division's annual achievement award winners for 2002 are Scientific Achievement—**Keith Eckerman**, for his exemplary leadership on the International Commission of Radiological Protection committees and for his contributions to the advancements in radioimmunotherapy; Management Achievement—**Brian Davison**, for his leadership of the Biochemical Engineering Group; Distinguished Achievement—**Nancy Watlington**, for her superlative contribution to the success of the 24th Symposium on Biotechnology for Fuels and Chemicals, a four-day conference attended by over 300 scientists in Gatlinburg; Administrative Achievement—**Darlene Holt**, in recognition of her willingness to go beyond the call of duty to provide an effective level of administrative support; and Technical Achievement—**Fred Baes**, for of his dedication, devotion and expertise in creating, improving and maintaining Websites for a number of different groups with diverse needs.

# Sixty years ago

## Manhattan Project veterans recall whirlwind year of '43

ORNL celebrated its 60th anniversary in style—which in a sartorial sense was fedoras on men and hats with veils on women, further accessorized with furry objects draped over their shoulders. The atmosphere on February 6, 2003, harkened back to February 1943, when work first began in remote Bethel Valley on what was to become Oak Ridge National Laboratory.

ORNL was conceived as a project to test the feasibility of controlling a fission reaction in a “pile”—a concrete and steel structure we now know as a nuclear reactor. The ultimate goal was to produce plutonium from uranium, which would be done on a much grander scale across the country in Hanford, Wash.

The setting was as authentic as it gets.



Deputy Director for Operations Jeff Smith (left) and Manhattan Project veteran John Gillette discuss wartime technology in the “Clinton Pile’s” control room.

Scores of veterans of the Manhattan Project and other special guests were invited out to the Graphite Reactor Museum on February 6 to mark the date, and despite a gray and brisk

day, most of them made the date. They saw ORNL Director Bill Madia, portraying Enrico Fermi, and ORO Manager Gerald Boyd, representing Gen. Leslie Groves, enact an imagined discussion of the importance of what they were doing.

What Fermi, Groves and a host of others achieved nearly 60 years ago, of course, was to propel the world into a nuclear era.

One of the 25 or 30 present who were part for that historic project was also a guest speaker. John Gillette described to the audience, which included Nobel laureate physicist Leon Lederman and ORNL Director Emeritus Alvin Weinberg, the work he did just seven months after work started on the “Clinton Pile.”

The uranium slugs, John said, were “heavier than heck” as they loaded them into the reactor throughout the night. The first three or four tons went slowly, but as they gained confidence, the loading went faster. At around 5 a.m. on November 5, 1943, twenty-five tons of uranium had been loaded into the reactor and Fermi was summoned from town. Soon Fermi would scrawl “critical reached” in the famous lab notebook.

“When word came that criticality had been reached, there were sighs of relief,” Gillette said.

Y-12 retiree Bill Wilcox, one of the Oak Ridge community’s most enthusiastic historians, described the Oak Ridge scene in early 1943 as “two Army engineers and a lot of construction people.” By summer, he said, the area was teeming with

people. Despite the omnipresence of armed guards, he says that making friends was very easy.

That might have partly been because of the new community’s relative youth. Guest Dick DeVaney recalled that he was, at age 20, a supervisor. Gillette said that, at the ripe age of 26, he was “one of the older people.”

The day before the Graphite Reactor ceremony, Colleen Black, who lived and worked in Oak Ridge during the Manhattan Project, described a budding community where the one funeral home that tried to establish itself failed because death was so rare in such a young population. It was a gated town where young ladies, bereft of hosiery, drew lines up the backs of their legs with eyebrow pencils. She recalled that muddy Oak Ridge shoes were washed off so that Knoxville merchants wouldn’t guess their wearers’ origins. (Some merchants, she said, errone-



Lab employees received a commemorative pin with a design similar to the one on this birthday cake.



Photos by Curtis Boles and Jim Richmond

From left: Enrico Fermi (Bill Madia) and Gen. Leslie Groves (Gerald Boyd) talk over old times with speakers Bill Wilcox and John Gillette.

### Review recaps 60 years of science with impact

One very popular handout at ORNL’s 60th anniversary celebration on February 6 was a special issue of the *Oak Ridge National Laboratory Review*. The issue describes scientific research and technological developments at ORNL over the past 60 years that have had notable national or international impacts. These developments have often improved people’s lives.

Its cover features ORNL’s four lab directors, in a photo taken at the Eugene Wigner centennial celebration last November. Left to right are Al Trivelpiece, Bill Madia, Herman Postma and Alvin Weinberg. Wigner, shown in the portrait they posed with, was ORNL’s first director of research, a Nobel laureate and one of the nation’s foremost nuclear pioneers.

If you haven’t been able to obtain a copy, try the Web. The “60 Years of Great Science” issue can be accessed at [www.ornl.gov/ORNLReview/](http://www.ornl.gov/ORNLReview/).

Also at that address, the *Review*’s Web version of “ORNL: The First Fifty Years (1943-93)” has been upgraded and updated. The 50-year history was one of the first documents put on the ORNL Web. Last summer’s science writing intern, the University of

Tennessee’s Jodi Lockaby, redesigned it and a new chapter, “Sprinting into the Millennium: The Latest Chapter of ORNL’s History (1993-2003),” recaps the past decade.

ously believed that Oak Ridgers had deep pockets.)

She described the social life in a growing town awash in Casablanca beer, a punchless brew originally destined for North Africa that somehow showed up in “Dogpatch.”

Mrs. Black eventually raised a house full of kids in her government “D” house, which she still occupies. Like Wilcox and Gillette, she has obvious pride in her youth spent in Oak Ridge.

“The work was very challenging. We were doing something that had never been done,” Wilcox said in his remarks, noting also that “The Graphite Reactor was the first successful facility in the wartime mission, and the first in postwar peaceful applications.”—B.C. [ornl](http://www.ornl.gov)



## Report fraud, waste and abuse

UT-Battelle is committed to performing its business activities with the highest standards of integrity, honesty and professional competency. As a UT-Battelle employee, you play an important role in our commitment to maintaining the highest business standards through your individual commitment to excellence.

Further, you have the responsibility to provide notice of inappropriate activities that threaten our joint dedication to integrity in the workplace and that may prevent us from meeting the expectations of DOE and our other customers. For work done under the DOE contract, UT-Battelle employees have a number of options for expressing their concerns about activities they may view as inappropriate on the job. Any employee with information about alleged fraud, waste, abuse, corruption or mismanagement relating to DOE programs, operations, funds or contracts may provide information directly to the following.

- Line management.
- Scott Branham, director of the Audit and Management Advisory Services Directorate (241-7614 or [home.ornl.gov/offices/audit\\_management\\_advisory\\_services/](http://home.ornl.gov/offices/audit_management_advisory_services/)).
- The Office of Inspector General, 1-800-541-1625. The toll-free hotline number is operated 24 hours a day to permit immediate access by any employee.

All such disclosures may be made without fear of employer reprisal. Employees are also free to refuse to engage in illegal or dangerous activities which the employee believes to be unsafe; to violate laws, rules or regulations; or to involve fraud, mismanagement, waste or abuse.

Also, it is important that all employees work cooperatively with internal and external auditors and investigators.

*Scott Branham, Director Audit and Management Advisory Services*

### Flexible Spending Account claim deadline March 31

The deadline for filing 2002 Health Care and Dependent Care Flexible Spending Account claims is March 31, 2003. All claims for reimbursement must be received by Ceridian on or before the March 31 deadline. Any contributions remaining in your account after March 31, including balances resulting from submitting ineligible claims, will be forfeited. Any 2002 claims for reimbursement received by Ceridian after March 31 will not be accepted.

Claims forms are located on the ORNL Benefits Web site. Select ORNL Benefit Forms in the "Additional Information" section. Select form UCN-20575: Flexible Spending Account Reimbursement Request. Information for submitting the claim and supporting documentation are included on the form.

For questions, contact Ceridian at 1-888-588-6852.

## Friends' Community Lecture Series continues

The sixth Friends of ORNL series of community lectures includes several historically themed talks. All lectures, which are free to the public, begin at 7:30 p.m. in the auditorium of the American Museum of Science and Energy.

*Tuesday, March 11*—Stephane Groueff, author of *The Manhattan Project: The Untold Story of the Atomic Bomb*.

*Tuesday, March 25*—Michele Gerber,

author of a history of the Hanford, Wash., nuclear operations.

*Thursday, April 24*—David T. Zava, also a native Oak Ridge, biochemist, research scientist and co-author of *What Your Doctor May Not Tell You About Breast Cancer: How Hormone Balance May Save Your Life*.

*Thursday, May 8*—Robert Norris, author of *Racing for the Bomb: Leslie R. Groves, The Manhattan Project's Indispensable Man*.

## Happens every spring: Softball teams forming

The Y-12 Employees' Society has issued a call for softball teams to participate in the YSL co-ed softball league's 2003 season, which begins in May. Games will be on Mondays, Tuesdays and Thursdays on the upper field at Clark Center Recreational Park in Oak Ridge.

The YSL is open to all Oak Ridge DOE and DOE contractor employees, retirees and their spouses. An ORNL team, the Stonefingers,

won last season's league tournament.

Entry deadline for teams is April 18. Mail the team roster and registration check to YSL/Peter McKenzie

P. O. Box 4262  
Oak Ridge, TN 37831-4262

For a copy of the league rules, roster sheets or more information, contact Peter McKenzie at 574-3624 or by e-mail, [atmckenziep@y12.doe.gov](mailto:atmckenziep@y12.doe.gov).

## New Staff Members

ORNL is growing. This feature lists new employees at the Lab. Welcome all.

Timothy Cofer, Facilities Management  
Cindy Shi, Business & Information  
Paul Lane, Computational Sciences & Engineering

Mark Wezensky, Spallation Neutron Source  
Richard Griffey, Facilities Management  
Frances Drake, Records, Training, & SBMS Services

Thomas Bonner, Nuclear Science & Technology

Bruce Bunting, Engineering Science & Technology

Robbie Hardy, Health Services

## Service Anniversaries

March

**40 years:** Fred R. Chattin, Nuclear Science & Technology

**25 years:** John D. Bell, Computational Sciences & Engineering; Betty J. Cale and William M. Giles, Craft Resources; G. F. Grubbs, Operational Safety Services; Marvin J. Haire, Nuclear Science & Technology; Tana S. Helms, Communications & Community Outreach Dir.; Russell E. Langley and Renee M. Tucker, Business & Information Services Dir.; Ralph N. McGill, Engineering Science & Technology; Peter F. Tortorelli, Metals & Ceramics; Mary H. Wrinkle, Logistical Services

**20 years:** Francisco Barrera and Pedro L. Gonzalez, Operational Safety Services; Jan B. Berry, Engineering Science & Technology; Darryl T. Dowling, Physics; Teri Hagan, Physical Sciences Dir.; Thomas M. McNabb, Logistical Services; Carol E. Stewart, Research Reactors

### Retiree Charles Segaser dies

Charles Segaser, 89, who worked in ORNL's Engineering Department until he retired in 1978, died in December. The Knoxville resident worked at the Lab for 31 years, initially under the Lab's first contractor, Monsanto, beginning in 1943 with the Manhattan Project.

Charles worked on a multitude of other projects and also taught at the University of Tennessee. His widow, Muriel, says he had many friends in the retiree community.

### VITA tax help available

VITA, the Volunteer Income Tax Assistance program, is providing free tax-filing help from 3 to 8 p.m., Monday to Friday, and from 10 a.m. to 12:30 p.m. on Saturdays, at the Oak Ridge Mall. No appointment is necessary.

# Lab's new signs better reflect 'world-class' institution

When they are finished, ORNL's entrances will be set in stone. Specifically, limestone.

Three new stonework signs are almost complete, marking the way to the Spallation Neutron Source, the High Temperature Materials Laboratory and the High Flux Isotope Reactor. Two more signs will follow, at the eventual main entrance and at the Environmental and Life Sciences Complex entrance on the west side.

Deputy Director for Operations Jeff Smith says the signs are a long overdue effort by the Laboratory to reflect what ORNL really stands for.

"These signs are designed to reinforce that we are a world-class scientific institution. Therefore, we are giving prominence to our major scientific facilities, versus the past practice of dominating the landscape with signs that point out things like "shipping and receiving," "excess property sales" and "west gate."

Jeff says that the overall design of the signs builds on the natural surroundings of the region as opposed to the "industrial" look that has dominated the scenery until now.

"As a major provider of energy and environmental research, we felt it important to reinforce through our signs our commitment to be sensitive to our natural surroundings and the history of East Tennessee," he says.

Most of the stone in the signs, from a quarry near Nashville, is called "breaker" limestone, according to Facilities & Operations' Bud Brickeen, who is looking after the project. The cut stone for the sign faces is a buff colored, standard-grade Indiana limestone. The signs will be illuminated with



Curtis Boles

The Spallation Neutron Source's stonework is one of five impressive monuments being constructed for the Lab's entrances.

state-of-the-art fiber-optic lights.

Bud identifies the mason as an East Tennessean who goes by "Pop." Pop builds the signs using a method known as "simulated dry stack." Among his special touches are using lichen- and moss-covered stone to present a weathered face.

The color ranges are natural from stone selected at the quarry, Bud says. The colors specified were 70 percent blue-gray, ranging from dark to medium gray, 30 percent brown range, ranging from buff, yellow, brown and gold. Hawkins Partners, Inc., of Nashville designed the signs, which complement the vehicle portals' stone.

An extra bonus feature of one of the signs was a pond of water, which surrounded it after February's incessant rain. Landscaping will take care of that, but some thought the aquatic theme—though temporary—was a nice touch.—B.C. [oml](#)

## PNNL, Brookhaven name new directors

Two of ORNL's sister national laboratories named directors last month. Dr. Leonard Peters will direct Pacific Northwest National Laboratory. Peters is the vice provost for research at Virginia Polytechnic Institute and State University and Virginia Tech's representative on UT-Battelle's board of governors. PNNL is managed by Battelle.

Brookhaven National Laboratory earlier announced that Dr. Praveen Chaudhari, a veteran IBM scientist and manager, has been selected to lead that laboratory. Brookhaven is managed by Brookhaven Science Associates, a partnership of Battelle, Stony Brook University and six partner universities.

Both start their new jobs on April 1. [oml](#)

**oml** reporter

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Number 46 March 2003

[U-233 treasure](#), page 1

[SBMS progress](#), page 1

[Lab Notes: Lederman on education, rider ID'd, fit for a year, parking](#), page 3

[60th celebrated](#), page 6

[Report concerns](#), page 7

Inside