

Waste not

Managed correctly, farm manure could be the next big thing in renewable energy

We're not likely to ever run short. Often it's a problem, but it could be a strong renewable energy resource candidate. We're talking about farm animal manure. As the animal farm industry has concentrated more and more production on smaller parcels of land, handling the outflow has become a more serious pollution issue.

But that manure, John Sheffield says, also represents a gold mine as an energy source, if the farmers can get enough economical and technological help in putting it to better use.

"In the past, a small animal farm could be a more or less closed ecological system. The manure was the fertilizer for the crops used to feed the animals. Now operations are larger and more concentrated and the feed may come from producers far away. For example, corn grown in the Midwest feeds animals in the East. Unfortunately, the manure as an unmodified fertilizer is much less valuable than the feed. Therefore it is not economic to ship it back."

Today, many farms spread the dung on local fields. But those fields may already be saturated with phosphates, and the runoff pollutes stream, rivers and the water system generally. The problems are compounded by

the presence of both pathogens and antibiotics in the manure. The odor and dust from the animal farm operations is also seen as a public nuisance and a health hazard.

"It is a challenge to develop a system to reduce pollution, while ensuring the retention of a strong U.S. livestock and poultry industry. There are concerns that failure to meet this challenge could lead to the industry moving off-shore to countries with lower environmental standards," says John. "Providing value-added products from manure—electricity, heat and a more concentrated fertilizer—is the way to offset the costs of reducing air and water pollutants."

Fortunately, it is a problem that, he says, is "absolutely fixable." Ultimately, it may be fixed at a profit using modern technologies and systems, many of them from ORNL and other DOE laboratories, including biotechnology, catalysts, advanced materials, separations systems,

improved combustion, instrumentation and controls and computer models. Work in this area has received a boost from the President's bio-based products and bio-energy initiative for commercialization of technologies and the Lugar bill for research, development and deployment.

"Animal manure has value," he says. "The United States produces 1.4 billion tons of wet manure a year, or more than 200 million tons in dry weight. The solids have value: as

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Instead of creating a problem, Bossy could be a source of renewable, clean energy on the farm.

Riedinger: Partner universities represent troves of talent

One of the questions from the audience at October 2's senior staff meeting related to the enduring quest for youth. ORNL, with an aging staff and tight budgets, is finding that new, talented staff members are increasingly harder to find and hire, particularly in competitive technical fields. All labs are facing that problem.

An important key to a solution for ORNL may lie with UT-Battelle's university partners, says Deputy Director for Science and Technology Lee Riedinger. Those universities—Duke, Georgia Tech, Virginia Tech, Virginia, Florida State and North Carolina State—joined the University of Tennessee and Battelle partnership to bid for the ORNL contract last year.

"This Lab is going to grow, but that growth won't be possible if we can't attract excellent scientists and engineers, particularly in



Lee Riedinger

competitive areas such as computational and materials science," says Lee. "Joint appointments with our partner universities are a good way to attract those people. They can receive the best of both worlds through these arrangements."

Lee explains that universities have graduate students and teaching appointments that provide some relief from funding pressures, while national laboratories have the best equipment and the "highest density" of experts. ORNL's experimental and user facilities have historically been a magnet for students and faculty from universities. Now the Lab seeks to build those relationships toward providing the talent growth the facets of the Laboratory Agenda will require.

"UT is ideally situated for ORNL collaborations because it's close by. Outlying universities are more difficult simply because of logistics," Lee says. "You really have to know how to work together, and the UT-ORNL successive model of shared faculty has demonstrated that. We intend to solve these

issues as we work with our core university partners, then in time step out to include more schools."

Different universities bring different strengths, Lee notes. Virginia Tech, for instance, has strong engineering research, while the University of Virginia stands out with its medicine and basic sciences programs.

"We want to learn them as they learn us," he says. "We can match up in common growth areas, and the resulting short-term marriages—for instance, cost-sharing postdoctoral researchers—can lead to scientists on our staff and faculty members for the schools."

Riedinger is a product of such a "marriage." As a Vanderbilt graduate student, he came to ORNL through his professor, Joe Hamilton, to do radioactive decay studies under Noah Johnson. Hamilton later was a force in building the ORNL Holifield accelerator lab into a first-class user facility.

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Farm

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fertilizer, because it is rich in phosphates, and as an energy source. Those 200 million tons of manure contain energy equal to the energy in about 100 million tons of coal, roughly 10 percent of U.S. annual coal use."

Waste treatment systems can capture methane gas from anaerobic digestion of manure, or through gasification or burning to provide an energy source to produce electricity and process heat. After undergoing these



The energy in one year's U.S. output of manure is equal to 10 percent of annual coal use.

processes, the manure will have lower concentrations of polluting phosphates and also will have much reduced levels pathogens and antibiotics, allowing it to be recycled more readily.

Through the University of Tennessee's Joint Institute for Energy and Environmental Studies, ORNL, the Tennessee Valley Authority and UT's College of Agriculture have been discussing various approaches for helping farmers.

R&D and demonstrations are needed because many of the systems for energy production installed over recent decades have failed. John cites one success—a North Carolina hog farmer who recycles his manure, traps methane gas that is used to make electricity and hot water to warm his barns, and recovers nutrients that are used to fertilize tomatoes. In addition, the farmer uses carbon dioxide exhausted from the process to enhance tomato growth. The whole operation is odorless, John says.

Technology is one of the fundamental issues, along with simple economics and regulatory policies.

"We simply don't pay enough to the farmer," he says. "The price of meat, milk and eggs doesn't cover the social cost of producing them. Just as we pay a fee per tire to dispose of old ones, consumers should pay, one way or another, a realistic price to help farmers reduce pollution. The challenge in providing a system is to make sure that money actually gets back to the farmer. Green labeling can be part of the approach."

Laws concerning farm runoff vary from state to state and often penalize farmers who would otherwise deal responsibly with waste. Areas with tough restrictions often drive operations to other states or countries with lax codes, which worsens the pollution problems there. The farmers need consistent laws and policies that allow them to dispose of manure soundly and profitably.

"A whole range of products could be produced from waste that could recover three or four cents of every five spent in recycling. We need industry-based support that doesn't put the load on the farmer. The technology providers should take the risk, and it will require government help. You have to prime the pump," he says.

Through the Joint Institute, John is working with farm industries, farmers, trade associations, universities and other government agencies such as the Environmental Protection Agency and Department of Agriculture to come up with policies and technologies that help farmers deal with their waste products and convert them into beneficial uses: Not only beneficial to them, but to their neighbors and to the environment as a whole.

John Sheffield sees it as an opportunity. Farm manure represents a potential energy source that rivals many other renewable resources, and it is a crop nutrient resource as

well. ORNL, with its expertise in biofuels, bioreactors, computing, instrumentation and controls, materials and renewable energy technologies, is ideally situated to contribute to taking advantage of this timeless and endless resource.—B.C. [ornl](#)

Universities

Continued from page 1

Lee went on to become a department head at UT and the S&T deputy director at ORNL.

"As far as I know, Vanderbilt was the first example of the Lab's working closely with a distant university, while UT and ORNL have worked together for decades," Lee says.

"It helps to have graduate students here—you have those active minds, eager to learn and talented. They give you a boost. But it is sometimes difficult to arrange to have grad students from distant universities come here for their research, and it can be tough for them since they have much course work to take.

These difficulties can be overcome by having good scientist-faculty connections and a partnership that benefits both sides—the lab and the school.

"Our relationships with the partner universities will build on that. That's the model."—B.C. [ornl](#)

Bill signed; full '01 funding for SNS

President Clinton signed Energy and Water appropriations legislation on October 27. The act is significant for ORNL: It represents major milestones for two major Lab projects—the Spallation Neutron Source and a new Mouse House.

The bill contains \$278 million for the SNS, the full amount of the administration's request for Fiscal Year 2001, and a figure that came out of House and Senate conference through funds that were added late in the budgeting process. The law boosts basic research in DOE's Office of Science by \$399 million, or 14 percent.

Full funding for the SNS is good news for all six of the partnering laboratories. Besides ORNL, the project is a collaboration among the Argonne, Lawrence Berkeley, Los Alamos, Brookhaven and Jefferson laboratories. That teamwork is being cited as a major factor in the SNS's budget success and could prove to be a bellweather strategy for funding big science projects in the future. The SNS' final price tag is about \$1.4 billion.

The bill also provides \$2.5 million for concept and design work for a new Mouse House, which will be located on the west end of the Laboratory. The Mouse House is currently located in a deteriorating facility at Y-12. ORNL is also positioning itself to play a significant role in a new nanotechnology initiative that received significant funding in the legislation.—B.C. [ornl](#)



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Curtis Boles

The Computing, Information and Networking Division's Ta-chang Liu is a mainstay in the ORNL Research Library. She's also one of more than 300 Awards Night winners listed starting on page 4.

Lab Notes

Cleanup projects reach the end game

Two cleanup projects on the ORNL site recently reached their final stages, meaning a lot of waste material is outta here. The first—a major, major one—is the removal of sludge from the Gunit tanks at the intersection of Central Avenue and Third Street. The tanks, installed during World War II to catch Manhattan Project wastes, had been emptied in the 1980s but still contained some pretty nasty sludge.

Robotic and remotely operated equipment, much of it staged and tested by ORNL, was used to clean the inside of the tanks. The technology is likely to be used at Hanford and other DOE cleanup sites.

The tank farm shares an intersection with the ORNL cafeteria, and the sludge was considered a potential risk to

workers and the public. The project is the first of its kind to be completed in the United States.

If you walk on down Third Street to White Oak Avenue, you'll notice that the 3524 holding pond is now a gravel lot. It's actually filled with boulders, 70 truckloads of grout and another 70 truckloads of gravel. More sediment removal from the area is planned for next year.

What's going to happen to those sites? Tim Myrick, who heads the facilities modernization project, says the former ponds will eventually become parking lots. There is no near-term reuse plan for the Gunit tank farm, however: The tanks will be filled with grout and remain in place.

Lab packs a publishing punch

ORNL is maintaining its position as a scientific publishing powerhouse. The Lab is ranked in the top 10 of U.S. universities, national labs and industrial institutions in eight categories of the most frequently published institutions, according to a recent survey by the

Institute for Scientific Information. That's more than any other national lab.

ORNL is the only DOE lab to lead all of the 139 institutions in the survey in categories of the number of publications, and we did it in two: spectroscopy/instrumentation/analytical science and nuclear engineering. ORNL also has the most publications in the 1981–1999 period of any institution in those categories.

ORNL was one of three DOE labs with a number two ranking in a category, appearing second in metallurgy. Other top 10 appearances in number of publications for ORNL include third in biotechnology and applied microbiology, fifth in materials science and engineering, seventh in environmental engineering/energy, eighth in instrumentation/measurement, and ninth in applied physics/condensed matter physics/materials science.

A front man in a crisis

When the reactor at Three-Mile Island went awry in May of 1979, chaos reigned in the media room. President Carter dispatched Harold Denton of the Nuclear Regulatory Commission to restore order and help get a lucid message on the situation at TMI to both the White House and an increasingly frantic public.

Denton shared the history-changing experience with a Lab audience on October 16, hosted by the Laboratory Shift Superintendent's emergency operations folks. He stressed the importance of being prepared for trouble at all times.

"Don't become complacent. You need a good public relations program prepared for emergencies," he said.

Metropolitan Edison, the TMI operator, had next to

Christina Carbajo and Graydon Yoder, both students at Oak Ridge High School, performed Latin dances at last month's Hispanic Heritage celebration. Graydon is the son of Graydon Yoder of the Engineering Technology Division; Christina is the daughter of ETD's Juan Carbajo.

none. Soon experts and commentators from all over the country were describing the scene and the perceived threat of a hydrogen bubble that had accumulated in the reactor vessel. The bubble's threat proved to be minimal, but the sometimes hyperbolic rhetoric that sprang out of the crisis dashed the fortunes of the nuclear industry.

Denton said he maintained an open line to the White House, had the confidence of Pennsylvania's governor and eventually was able to convey that the situation at TMI was manageable and in control, but not before 400,000 citizens evacuated the surrounding area even though no evacuation order was issued.

Denton says candor, credibility and refraining from speculation and blaming are crucial in such times. News releases, he says, are next to useless when real-time information is demanded—something more true today than in 1979. Such situations require a top-notch spokesperson who can command the respect and confidence of the media and the public, he says.

"The best source of information is at the site," Denton says. "Put credible sources on the firing line."

HFIR pauses for new reflector

The High Flux Isotope Reactor began its scheduled outage in October to replace its permanent beryllium reflector. It's part of an ongoing upgrade program that will play a role, along with the Spallation Neutron Source, in making ORNL a center for neutron research.

Research Reactors Division staff have been planning the outage, which began Oct. 1, to replace the reflector. The operation is a normal maintenance activity that happens every 10 effective full-power years of operation. This will be the HFIR's third.

Over time, intense neutron bombardment degrades the beryllium, which may cause it to swell or crack. To replace the reflector, the reactor must be disassembled.

RRD staff will also replace HFIR's horizontal beam tubes during the outage. Some upgrades to the scientific capabilities for the neutron scattering facilities will be made as well.

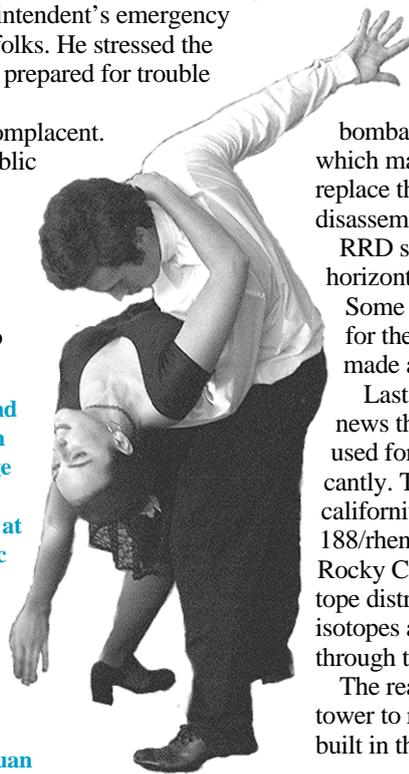
Last month several media outlets ran the news that ORNL's sales of radioisotopes used for cancer treatments were up significantly. Those isotopes, which include californium-252, actinium-225 and tungsten-188/rhenium-188, are all produced at HFIR. Rocky Cline, who manages ORNL's radioisotope distribution, says quantities of the isotopes are sufficiently stocked to last through the outage.

The reactor is also getting a new cooling tower to replace the original one, which was built in the 1960s.

Reported by Bill Cabage



Dump trucks fill the former 3524 pond.



Curtis Boles

UT-Battelle honors 300+ at its first Awards Night

The first UT-Battelle Awards Night was held November 9. Honorees for the year 2000 are listed; there are more than 300. Congratulations to all.

Community Service

Previous Year

Constance R. Goodman: For her exemplary dedication to, and inspiration of, her family, her friends and her community despite what might have been overwhelming adversity

Sustained

Gary T. Alley, Instrumentation and Controls: For leadership and

commitment of time, energy and heart to the youth of Kingston and Roane County to develop our future leaders from East Tennessee

Tim Myrick, Facilities Revitalization Project: For extensive contributions of time, leadership and resources through many channels, including Aid to Distressed Families of Appalachian Counties, Habitat for Humanity, United Way and other personal initiatives

Leadership

Administrative and Operations Support, First Level Management

Rebecca A. Lawson, Spallation Neutron Source: For superior leadership in designing and implementing a document control system to control the project technical baseline across the six SNS partner laboratories

Administrative and Operations Support, Middle Management

Tim Myrick, Facilities Revitalization Project:

For comprehensive leadership of the transition of environmental management work from ORNL to the private sector

R&D, First Level Management

Peter Angelini, Metals and Ceramics: For outstanding leadership in developing winning proposals for ORNL in DOE's Industries of the Future Program

Art Clemons, National Security Directorate: For outstanding leadership and dedication to program development leading to \$13M in funding from the Defense Advanced Research Projects Agency

Jeffrey O. Johnson, Computational Physics and Engineering: For distinguished leadership of the Neutronics and Shielding Team in support of the Spallation Neutron Source project

R&D, Middle Management

Michelle V. Buchanan, Chemical and Analytical Sciences: For R&D leadership at the interface between biology and analytical technologies, resulting in important successes for ORNL programs in Structural Biology and Functional Genomics

George E. Courville, Energy: For sustained leadership in the Energy Division, setting an example for entrepreneurship, professional integrity, and work ethic

Gary K. Jacobs, Environmental Sciences: For exceptional leadership that has helped position the Environmental Sciences Division for success in the highly competitive and evolving future

Thomas Zacharia, Computer Science and Mathematics: For exceptional vision and leadership in revitalizing the Computer Science and Mathematics Division and bringing the nation's most powerful non-defense computing facility to ORNL

Operations And Support

Administrative Support, Exempt

Teresa D. Ferguson, Energy: For exceptional performance and continuous improvement as administrative assistant to the director of the Energy Division, especially in promoting Workforce Diversity

Lenora McBee, Energy: For outstanding achievements in providing financial support to the Energy Division

Jennifer Lynn Seiber, Environmental Sciences: For exceptional support through leadership of support staff, execution of HR processes, and participation in improvement efforts for administrative processes

Administrative Support, Nonexempt

John H. Johnson, Instrumentation and Controls: For applying exemplary technical acumen and a faultless work ethic to transform a challenge into an opportunity to become an indispensable part of a tremendously successful project

Patricia M. Presley, Environmental Sciences: For excellent support to the management team, the finance officer, and the staff in the Environmental Sciences Division

Donna Jo Roy, Computing, Information and Networking: For sustained, superior support in

providing exceptional graphics services to customers, especially for support of the UT-Battelle Leadership Team

Bargaining Unit Support

Larry W. Cox, R. C. Gilliam, Damon W. Robertson, Jackie Bryant, Charlene Burt, Mike Caldwell, Doug Collins, Max D. Cronan, Donnie Finks, Pat Higgins, T.A. (Bear) Jackson, W.H. Johnsey Jr., H. O. Johnson, Greg Knox, Jeffrey D. McNabb, Mike Mitchell, Dan Mobley, Linda Moyer, John C. Poole, Gary A. Powers, Larry R. Roach, Dan R. Russell, Kathy S. Shelton, Gary Shepherd, Harold Chet Thornton Jr. and John P. Webb; Plant and Equipment: For sustained fabrication support to critical, high-visibility development projects supporting ORNL, the Savannah River Site, and the Molten Salt Reactor Experiment Conversion Project

Sharon Hopper-Goins, Kim Porter, Vincent Smith, Raymond E. Andrews Jr., Dennis Carroll, Pam Cope, Margie J. Crabtree, Scott Griffis, Sybil Hastings, Dale Jackson, Nathan Langley, Clark Lee, Eva Leinart, Patricia Martin, Gene Phillips, Anthony Scales, Ray Seeber, Allan A. Toney, Dennis Weaver and Nancy Wright; Life Sciences: For outstanding teamwork in contributing significantly to improvement of the ORNL animal care and use program

J.E. Kitchens, Jeff Patty, R. Merrill Sexton, Jim Ayers, Kim Breeden, Larry Brummette, Jack Crawford, Willie Crosby, W. Doyle Garrett, David Gibson, Ken Guymon, Jerry Martin, Michael J. Richmond, Bruce G. Walker and Gary A. Wright; Plant and Equipment: For excellence in craft support for the nuclear operations at the Radiochemical Engineering Development Center

Joey T. Weaver, Instrumentation and Controls: For exemplary contributions to solving highly complex data acquisition problems and for upholding the ORNL tradition of performing beyond expectations

Environment, Safety, Health and Quality

Robert S. Burlage, James A. Hall and B. Monty Ross; Environmental Sciences and Environmental Protection and Waste Services: For successfully pioneering the EPA TOSCA and NEPA process for the release of genetically modified bacteria as biosensors

Steve E. Childs, Environmental Protection and Waste Services: For expert technical support to the Environmental Sciences Division by arranging the disposal of over 2,000 items of hazardous waste

David G. Edds, Operational Safety Services: For sustaining and improving the ES&H programs within the Life Sciences Division in an innovative and cost-effective multiple program and multiple assignment role

Elvira Mealer Hodges, Chemical Technology: For excellence in criticality safety support for the Chemical Technology Division's nuclear facilities

Kimberly B. Jeskie, Chemical and Analytical Sciences: For exemplary performance and cost avoidance in support of environmental and waste management activities in the Chemical and Analytical Sciences Division

Frank C. Kornegay, SNS: For unique skills and diligent efforts to ensure integrity in nuclear safety, integrated safety management, construction safety and environmental stewardship for the Spallation



'Of the year winners'

ORNL's Awards Night 2000 ceremony included the "of the year" winners.

Five members of a team led by Daniel Bardayan was named authors of the year for "observing the astrophysically important 3+ state in neon-18 via elastic scattering of a radioactive fluorine-17 beam from hydrogen-1."

A multidivisional team of 16 led by **Jinwun Winston Lue** and **John P. Stovall** of the Fusion Energy Division and the Energy Division, respectively, were named engineers of the year for "developing and operating the world's first successful application of a high-temperature superconducting power cable system for industrial use."

Kimberly B. Jeskie of the Chemical and Analytical Sciences Division and **Randall B. Ogle** of the Metals and Ceramics Division were named environment, safety, health and quality contributors of the year—Kim for "exemplary performance and cost avoidance in support of environmental and waste management activities" and Randy for "exemplary leadership in promoting the incorporation of ES&H considerations."

A multidivisional team of five led by **Thomas G. Thundat** of the Life Sciences Division are inventors of the year for developing a new class of coatingless chemical sensors and demonstrating the concept for explosive vapor detection.

Thomas Zacharia was named leader of the year for "exceptional vision and leadership in revitalizing the Computer Science and Mathematics Division and bringing the nation's most powerful non-defense computing facility to ORNL."

A team of 15 in the Plant and Equipment Division led by **J.E. Kitchens** was recognized for ORNL's operational improvement of the year for its craft support for the nuclear operations at the Radiochemical Engineering Development Center.

The Chemical Technology Division's **Elias Greenbaum** was named scientist of the year for "sustained and pioneering contributions to the biological physics of green plant photosynthesis."

Neutron Source Project

Scott B. Ludwig and Tammra W. Horning; Chemical Technology and Engineering Technology: For the safe delivery of weapons-derived plutonium test fuel to the Chalk River Reactor in Canada

Randall B. Ogle, Metals and Ceramics: For exemplary leadership in promoting the incorporation of ES&H considerations into the research and development activities in the Metals and Ceramics Division

Operations Support

Ray R. Arp Jr. and Roger Miller, Plant and Equipment: For outstanding oversight and coordination of maintenance and operation for the #6 Boiler and the #7 Air Compressor construction projects at the steam plant

Sigurd W. Christensen, Environmental Sciences: For exemplary leadership in readying the Environmental Sciences Division for Y2K in a manner that served as a model for ORNL

Don E. Coffey, Environmental Protection and Waste Services: For developing and applying innovative cost saving approaches in the characterization of radioactive wastes and for exceptional support to Chemical Technology Division operations

John C. Glowienka, Jeffrey S. Guilford, Russell E. Hand Jr. and Becky J. Verastegui, Office of the Laboratory Director and Computing, Information, and Networking: For exemplary efforts in ensuring the readiness of ORNL's electronic systems for the rollover to the year 2000

Randy L. Hinton, Logistical Services: For exceptional contributions in roles of significantly increased levels of responsibility within the Materials Management Organization during periods when regular supervisors had to be absent

Dicky W. Howard, Dan Gourley, Jim Mathys, John K. Mongar and Terry G. Sanford, Plant and

Equipment: For major updates to ORNL utility systems maps, thereby significantly enhancing effective management of these systems

C.J. Humphreys, Connie L. Begovich, Gail Benefield, David Broughton, Tricia Bryant, Peggy Fowler, Janice S. Ishee, Sally Jaunsen, Miriam E. Kelmers, Bob Martin, Pamela B. Thomas and Renee Tucker; Business and Information Services; Computing, Information, and Networking; and Human Resources and Diversity Programs: For the on-time, under budget implementation of the SAP Human Resources module

W.K. Kahl, Engineering Technology: For exemplary leadership in moving the National Transportation Research Center from dream and vision to a comprehensive "bricks and mortar" center capable of performing world class research

Dwayne G. Kilpatrick, Don H. Abercrombie, Laurie R. Brown, Wayne A. Camp, R. Dowe Dabbs, Edward M. Ducko, David C. Dunthorn, Max L. Gildner, Harold L. Haga, Steve Hammonds, Joseph R. Inger, John K. Keith Jr., Henry A. Kmiecik, Young Soo Kwon, Beverly R. Large, L.D. Proctor, Ronald J. Reagan, Kevin L. Rogers, Bruce F. Siefken, Kevin A. Smith, Christopher M. Smith and Karl P. Zimmerman; Research Reactors and Office of Quality Services: For extraordinary contributions toward producing the new HFIR Technical Safety Requirements procedures, in compliance with a DOE order

Ta-chang Liu, Gabrielle Boudreau, Bob Conrad, Della L. Elliot, Randy Hoffman and Marvin L. Poutsma; Computing, Information, and Networking and Chemical and Analytical Sciences: For leadership in developing electronic information resources in support of ORNL research—arguably one of the single greatest improvements in the quality of a researcher's life at ORNL in recent years

Jeffrey D. McNabb, Plant and Equipment: For outstanding support of the development and

commercialization of technology for welding nickel aluminide alloys

Don Reid, Steven L. Laman and Stanley E. Whittenbarger; Engineering and Operational Safety Services: For effective, efficient and safe completion of the \$15 million project to replace deteriorated roofs

W.R. Rich, M. Vanessa Black, Walter P. Dykas Jr., Gregory A. Herdes, W. Mark Logan and John H. Watson; Laboratory Protection and Computing, Information, and Networking: For outstanding contributions to preparation for and interaction with the FY 2000 DOE Safeguards and Security Inspection and Evaluation

Charlie Smith, Instrumentation and Controls: For exhibiting superior performance in audio visual services at ORNL and for placing the Laboratory's mission at the forefront of his personal priorities

Secretarial Support

Significant Achievement

Kimberly R. Grubb, Energy: For outstanding logistical and administrative support for two international workshops that addressed environmental issues relating to the Black Sea

Kim Y. Smith, Environmental Sciences: For significant contributions in organizing and facilitating the 7th Conference on Microbial Genomes

Pat Trentham, Chemical and Analytical Sciences: For facilitating the major reorganization of the Chemical and Analytical Sciences Division

Sustained Performance

Brenda L. Bush, Engineering Technology: For sustained excellence in support to the Engineering Technology Division and for exemplary standards as a role model and team player

Volena A. LeTourneau, Chemical Technology: For dedicated administrative support to the Chemical and Energy Research Section of the Chemical Technology Division

Susan W. Masingo, Life Sciences: For sustained excellence and outstanding professionalism as division secretary for the Life Sciences Division

Technical Achievement

Development Accomplishment

Jacob Barhen, Computer Science and Mathematics: For groundbreaking discoveries in signal analysis using neuromorphic devices

Larry R. Baylor, Stephen K. Combs, Charles R. Foust, and Thomas C. Jernigan; Fusion Energy: For developing a new capability to explore the physics of pellet fueling of fusion plasmas

Craig A. Blue, Metals and Ceramics: For developing a new, large funding source through the establishment of a unique infrared-based materials processing center at ORNL

Lynn A. Boatner, Solid State: For developing a concept that has led to the creation of an entirely new class of nanocrystalline-based materials, functionalities and devices

Ingrid K. Busch, T. Randall Curlee, J. Charles Davis, Michael R. Hilliard, Lara James, Cheng Liu, David P. Middelndorf, Frank Southworth and David Paul Vogt, Energy: For outstanding contributions to the development of the Ohio River Navigation Investment Model for the U.S. Army Corps of Engineers

Meng-Dawn Cheng, Environmental Sciences: For developing the first technology to provide real-

(See AWARDS, page 6)

Awards

Continued from page 5

time characterization of aerosol size and elemental composition under field conditions

James S. Goddard, Regina K. Ferrell, James A. Mullens and Bobby R. Whitus; Instrumentation and Controls: For developing a tree-based pattern analyzer system for semiconductor yield learning

Wayne H. Griest, Andy Andrews, Janice M. Ausband, Don W. Bible, Michael N. Burnett, Kim N. Castleberry, Dwight A. Clayton, Richard I. Crutcher, Mike Cutshaw, Peggy P. DePorter, Timothy F. Gee, Kevin J. Hart, Michael S. Hileman, Donald E. Hurst, Ralph H. Ilgner, Bruce Jatko, Roger A. Jenkins, Stephen A. Lammert, David E. McMillan, Randal L. McPherson, Roosevelt Merriweather, Dick Reid, Irene F. Robbins, David E. Smith, Rob R. Smith, Carl Sohns, Katherine Ann Stewart, Cynthia L. Terry, Cyril V. Thompson, Arpad A. Vass, Lucinda C. Watkins, Kenneth S. Weaver, Robert A. Whitaker, Marcus B. Wise, Dennis A. Wolf, R. Wesley Wyso and Judy C. Zager; Chemical and Analytical Sciences, Computational Physics and Engineering, Computer Science and Mathematics, Instrumentation and Controls, Life Sciences, and BWXT Y-12: For designing, fabricating and demonstrating the first integrated detector for chemical and biological warfare agents—the Block II Chemical Biological Mass Spectrometer

Baohua Gu, Peter V. Bonnesen, Gilbert M. Brown, Liyuan Liang and Bruce A. Moyer; Environmental Sciences and Chemical and Analytical Sciences: For developing novel regeneration techniques for exchange resins used to remediate perchlorate-contaminated ground and surface waters

Gerald E. Jellison Jr. and Frank A. Modine; Solid State: For developing advanced spectroscopic ellipsometry for materials analysis

Richard A. Lowden, Metals and Ceramics: For developing a non-toxic, high-performance material to replace lead in ammunition for civilian and military applications

Jinwun Winston Lue, John P. Stovall, Glenn C. Barber, R.D. Benson, Jonathan A. Demko, Alvin R. Ellis, Andy Fadnek, Paul W. Fisher, Christopher A. Foster, Michael J. Gouge, D. Randy James, Patrick M. Martin, Vaughan P. Patania, Isidor Sauers, S. William Schwenterly and Dennis O. Sparks; Fusion Energy, Energy, Engineering, Life Sciences, and Metals and Ceramics: For developing and operating the world's first successful application of a high temperature superconducting power cable system for industrial use

Vladimir I. Merkulov, Gyula Eres and Douglas H. Lowndes; Solid State: For developing a method to produce spatially aligned carbon nanofibers

J. Michael Ramsey, Chemical and Analytical Sciences: For developing pioneering microfluidics patents (often referred to as “Lab-on-a-Chip”) and the supporting intellectual property

Thomas G. Thundat, Moonis R. Ally, Panos Datskos, Govindarajan Muralidharan and Zhiyu Hu; Life Sciences, Energy, and Engineering Technology: For developing a new class of coatingless chemical sensors and demonstrating the concept for explosive vapor detection

Research Accomplishment

Significant Accomplishments in Previous Year

Sudarsanam Suresh Babu, Metals and Ceramics: For applying state-of-the-art computational models

and characterization techniques to advance fundamental understanding of weld microstructure development in structural materials

Cyrus Baktash, David J. Dean, Witold Nazarewicz, Lee L. Riedinger and Chang-Hong Yu; Physics and Office of the Laboratory Director: For discovering rotational bands in the doubly magic nucleus ^{56}Ni

Daniel W. Bardayan, Jeff C. Blackmon, Ray L. Kozub, D.E. Pierce and Michael S. Smith; Physics and Tennessee Technological University: For observing the astrophysically important $3+$ state in neon-18 via elastic scattering of a radioactive fluorine-17 beam from hydrogen-1

Michael D. Barnes, Adosh Mehta and Thomas G. Thundat; Chemical and Analytical Sciences and Life Sciences: For a landmark paper describing experiments probing the dynamics of single rare-earth ions in metal-oxide nanocrystals

Yehuda Braiman, Computer Science and Mathematics: For groundbreaking work in exploring basic mechanisms of, and designing efficient strategies to control, friction at the nanoscale

Bryan C. Chakoumakos, David G. Mandrus and Brian C. Sales; Solid State: For discovering a new and powerful screening technique to identify promising new thermoelectric compounds for refrigeration and power generation applications

Reza Dabestani, Phillip F. Britt, Gilbert M. Brown, Haifeng Ji and Thomas G. Thundat; Chemical and Analytical Sciences and Life Sciences: For designing cesium-selective sensors based on novel supramolecular recognition agents

Juske Horita, David R. Cole and Lee R. Riciputi; Chemical and Analytical Sciences: For exemplary effort leading to multiple, significant advancements in the field of isotope geochemistry

Lynne E. Parker, Computer Science and Mathematics: For significant contributions in the design of distributed control mechanisms enabling fault tolerant, heterogeneous multi-robot cooperation

Mohana Yethiraj, David K. Christen and James R. Thompson; Solid State: For pioneering neutron scattering experiments demonstrating how the interaction between superconductivity and crystal symmetry determines the vortex lattice structure

Sustained Accomplishments

Charles T. Garten Jr., Environmental Sciences: For elucidating the fundamental pathways of biogeochemical cycling in the environment through innovative analysis of stable carbon and nitrogen isotope ratios

Elias Greenbaum, Chemical Technology: For sustained and pioneering contributions to the biological physics of green plant photosynthesis

Michael Z. Hu, Chemical Technology: For initiative and sustained research accomplishment in the synthesis and processing of nanoparticles and nanostructured materials

Michael A. Huston, Environmental Sciences: For international scientific leadership in addressing the ecosystem functionality of biodiversity

E. Fred Jaeger, Fusion Energy: For sustained contributions toward understanding the physics of radio frequency interactions with high-temperature plasmas

Paul N. Leiby, Energy: For developing the Alternative Fuel Vehicle Model that has been pivotal in supplying guidance to DOE on how to conduct its alternative fuels program

Nageswara S.V. Rao, Computer Science and Mathematics: For pioneering work in computer network research

Lance Lewis Snead, Metals and Ceramics: For developing radiation-damage-resistant silicon carbide composite materials and for contributions to understanding fundamental mechanisms of radiation-induced property changes in ceramics

Technical Support

Kimberly Anderson, Chemical Technology: For exceptional creative contributions to the development and characterization of inorganic microspheres for electronic materials, biomaterials and waste cleanup

Walter P. Dykas, Marty F. Davidson, Tom Dunigan, Greg Hinkel and Carl E. Thomas Computing, Information, and Networking and Computer Science and Mathematics: For outstanding support of ORNL's cyber resources, which has enhanced the Laboratory's R&D mission and leadership position in the area of information technology and protection requirements

Kathleen Prater Gambrell, Connie Dagley and Kathy L. Johnson; Engineering Technology and Energy: For important and significant technical support to the U.S. Department of Transportation's Technology Truck Demonstration Project

Dave Hill, Metals and Ceramics: For outstanding technical support to scientists and technicians in the Metals and Ceramics Division

Mike Howell, Metals and Ceramics: For excellence in technical support related to high-temperature, high-pressure exposure facilities used in developing materials for advanced turbine systems

Randall L. Linkous, Energy: For excellence in technical support to the Buildings Technology Center's test of a residential hydronic system

Jeffery S. Riggs, Instrumentation and Controls: For the ingenious application of common materials to uncommonly difficult tasks and the unselfish dedication of personal effort to the success of ORNL projects

Sherry B. Wright, Energy: For outstanding performance in the administration of the U.S. liaison office of the Greenhouse Gas Technology Information Exchange

Jon Coddington, head, Graduate Program in Architecture Design, University of Tennessee College of Architecture and Design: For exceptional leadership in the design of the UT-Battelle master plan for the new Oak Ridge National Laboratory campus [ornl](#)

ORNL people

Three ORNL staff members received awards at the Knoxville YWCA Tribute to Women, held October 19. **Katherine Yuracko**, Life Sciences Division, won top honors in the Science and Technology category; **Linda Cain**, Communications and Community Outreach, won in the Education category; and **Lorena F. (Tykey) Truett**, Energy Division, was the winner in the Human Services category.

Recent ORNL recipients of DOE-ORO Pollution Prevention Awards included **Junior L. Davis**, **Melissa Green**, **Rick Lowden**, **Jerry Sams** and **Norm Vaughn** in the category of Environmental Preferability for the use of a non-lead bullet in the Central Training Facility, and **Greg Irby**, **Al Marcenkus**, **Earl Schubert**, **Ralph Shooster** and **Mark Belvin**, who implemented improvements in cooling tower management.

November is benefits open enrollment; Long-term care among new offerings

Benefit Plans' annual open enrollment for employees, retirees and their surviving spouses is going on this month. As in the past, employee and retiree coverage will remain in effect unless you elect to make changes, except for flexible spending accounts, which require annual enrollment.

During the November open enrollment, employees and retirees and surviving spouses under age 65 can elect to switch their medical plan coverage from one carrier to another and add eligible IRS dependents or add dental coverage with MetLife.

This year, in response to requests, an additional medical plan option is being offered to employees, retirees and surviving spouses under age 65. If the CIGNA Preferred Provider Organization (PPO) Plan is elected, you have the choice of obtaining medical care from any provider within the local network. You do not need referrals to see in-network specialists, and your care does not have to be coordinated by a primary care physician. The PPO Plan will be offered only if 100 or more participants enroll.

During the November open enrollment Benefit Plans is also offering a new MetLife Long-Term Care Insurance benefit option priced at a large group rate to employees and retirees of any age. Long-Term Care is designed to protect employees, retirees, their spouses, their parents and in-laws from having to spend down their financial assets if

nursing-home care or home care is needed.

Two other new options—offered to salaried employees only—are a significant revision in the Supplemental Life Insurance Program and the addition of Dependent Life Insurance coverage.

To learn more about the Long-Term Care Insurance benefits, plan to attend a Long-Term Care meeting at Benefit Plans at 104 Union Valley Road in Oak Ridge. Sessions are scheduled for November 14, from 11 a.m. to 1 p.m. or from 6 to 8 p.m., and for November 15, from 2:30 to 4:30 p.m. Or call MetLife directly at 1-800-438-6381. OneCall staff do not have information on the Long-Term Care plan.

However, for more information on open enrollment offerings, call OneCall, 574-1500 or 1-877-861-2255. Details on the open enrollment, new offerings and additional meetings on-site are also available on the Web at www.y12.doe.gov/benefits/wnew/OneCall.pdf as well as in a mailing to employees' and retirees' homes. 



HR generalists named

The Human Resources and Diversity Program Directorate recently revised their HR generalist assignments as part of a reorganization to “better align resources and capabilities with customer needs.”

Generalists are assigned to specific Lab organizations to advise their employees on HR matters. The assignments are as follow:

Barbara Arrington
574-4015, *arringtonbg*
Business and Information Services
Communications and Community Outreach
Legal
Tech Transfer and Economic Development
Office of Counterintelligence
Audit and Mgmt. Advisory Services
Office of Independent Oversight

Ron Honeycutt
574-4449, *honeycuttra*
Environment, Safety, Health and Quality
Facilities and Operations
Human Resources and Diversity Programs

Janet Swift
241-2942, *swiftje*
Energy and Engineering Sciences
Office of the Laboratory Director

Kevin Trent
574-4430, *trentkc*
Physical and Computational Sciences
Biological and Environmental Sciences

Service Anniversaries

November 2000

40+ years: Rodney W. Knight, Research Reactors; Gilbert V. McKinney, Plant and Equipment; Althea S. Tate, Physics
35 years: Arnold L. Beets, Life Sciences; John T. Hutton, Instrumentation and Controls; Herbert A. Mook, Jr., Solid State; Samuel E. Shell, Chemical Technology; Samuel S. Stevens, Energy
30 years: Jerry B. Hunt, Office of Radiation Protection; Herbert F. Krause, Physics; Larry P. Smarsh and Samuel L. Turner, Plant and Equipment
25 years: Larry W. Anderson, Contracts & Procurement; Thaxton H. Brown, Jr., Instrumentation and Controls, Technical Support Mgmt. Systems Section; James A. Bucholz and Bernadette L. Kirk, Computational Physics & Engineering; Kowetha A. Davidson and Charles M. Turner, Life Sciences; John R. Drake and Karen L. Nolan, Computing, Information, and Networking; Christopher A. Foster, Fusion Energy; Robert E. Halliburton, Office of Radiation Protection; Patricia H. Miller, Human Resources & Diversity Programs Directorate; Richard W. Murphy and Susan L. Rider, Energy; Steven R. Tallent, Plant and Equipment;
20 years: Marvel D. Burtis, Environmental Sciences; Michael R. Cates, Engineering Technology; William A. Gabbard and Gary E. Nelson, Metals & Ceramics; Peter K. Mioduszewski, Fusion Energy; Kyle O. Rutherford, Jr., Environmental Protection & Waste Systems; Nancy D. Smith, Business & Information Services Directorate

Letters

Metric vs. Imperial

Editor,

I have been amazed about the continued use of the parochial Imperial System in the *Reporter*, as for example in the report on this great graphite foam material from the Metals and Ceramics Division in the last issue. I trust you are not considering this use of old measurement units, abandoned by Canada, Australia and even Great Britain—the “inventor”—some while back, as the *Reporter's* contribution to making ORNL a ‘world-class’ institution.

Sincerely,
Manfred O Krause
Chemical and Analytical Science Division

Ed.'s response: Someday that noble cause will triumph. In the meantime, Reporter goes by the measurements the sources use.

Retirements

To arrange for a portrait, call Deborah Barnes, 576-0470



Toth



Atchley

Kenneth Toth has retired from the Physics Division with 41 years of service. He worked in the Holified Radioactive Ion Beam Facility and lives in Oak Ridge.

Bob Atchley has retired from the ORNL Fire Department with 38 years of service. He resides in Knoxville.

Despite everything, wheels roll

Communication was key to keeping this summer's traffic tie-ups to a minimum

The Oak Ridge Reservation's traffic nightmare—that wasn't—is almost over. Commuters feared the worst last February when plans began to come together to divert Oak Ridge city traffic down Scarboro Road for construction of a new interchange. Then Highway 95 commuters were downright horrified when they saw construction equipment staged beside the Charles Vanden Bulck Bridge, the ORR's only alternate access route for the ORR from points south and west.

Commuter traffic flow was going to be choked on either end by the by the dual construction projects—the Scarboro Road detour and the one-laning of the Highway 95 bridge.

"It's going to be a mess," is how this writer was quoted in one of the local dailies.

As it turns out, delays occurred, including some glacially paced rush periods initially, but by and large they were manageable and wheels for the most part kept rolling. Much of that can be attributed to efforts by the contractors, Rogers Group and Midstate Construction, and the Tennessee Department of Transportation to establish and communicate alternate traffic arrangements.

State and local officials, the contractors and members of the Lab Shift Superintendents office met at ORNL in April to discuss arrangements to keep traffic moving on Scarboro. LSS officers had earlier visited the Bulck bridge site for an explanation of how the traffic signals on the one-laned span operated.

Once commuters realized, with the help of some temporary traffic guides, that changing

lanes too soon threw off the sensor plate that determined how long the green light held, delays on the bridge were reduced. Those sensors, as it turns out, hold the green for as long as traffic moves over them, up to a few minutes. About half the drivers changed lanes too soon and missed the sensor.



Knowing how the traffic light worked helped the flow.

On the other end, TDOT and Rogers officials worked with DOE and city officials to make sure drivers were aware of the numerous route and traffic signal changes that were made to expedite traffic through the Scarboro Road detour.

Except for one memorable April afternoon when a trench blocked U.S. 62, and another morning after a storm knocked out the Bulck bridge signal,

delays were kept to a relative minimum.

"TDOT and the contractors deserve a lot of credit for working with us to help traffic keeping moving," says the LSS' Steve

Abercrombie. "Restricted traffic flow is a concern to us, both safety and security, besides being a hardship on the people who work here. Once TDOT and the contractors realized the magnitude of the flow of traffic going on and off the ORR at peak times, they were very quick to offer solutions and suggestions."

For instance, at the Highway 95 bridge, signs advised drivers to stay right to hold the green light. The signal's operation was also described in employee news channels such as *ORNL Today*.

Over on the east side, the detour seldom delayed ORNL traffic to and from Knoxville, although Oak Ridge commuters often had more radio listening time. At any rate, TDOT officials maintained that the closing of Highway 62 for the project speeded the project along. At last word, Highway 62 could reopen at the end of this month.

Or as one TDOT employee remarked at the April meeting with the LSS: "Just think of how nice that flyover's going to be when they get it finished."—B.C. [ornl](#)

Strobes alert motorists that the Lab's lights are red

ORNL is the major presence on Bethel Valley Road, which is otherwise a long stretch of two-lane blacktop through open country. Occasionally the Lab's three traffic lights catch motorists by surprise.

Those lights cycle red-yellow-green only at rush periods. The Lab's Shift Superintendent's office is arranging to install strobe lights on the traffic lights' red signals to make them more apparent to oncoming traffic.

The flashing lights, says the LSS's Steve Abercrombie, should call drivers' attention to the signals. In the meantime, it's always a good idea to look both ways before pulling out into a major roadway, even if you've got the green.

ornl reporter

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