

## Magical discoveries

### Holifield experiments close in on measuring elusive, 'doubly magic' nuclei

**B**eams produced at the Holifield Radioactive Ion Beam Facility for the first time anywhere are enabling nuclear structure researchers to study elusive, "doubly magic" nuclei that have previously been out of their reach.

One of the special nuclei they are hoping to study soon is tin-132, called doubly magic because it has closed nuclear shells of 50 protons and 82 neutrons, similar to the likewise magical nickel-56 and to the noble gases, with their closed shells of electrons. Physics Division researcher David Radford is principal investigator of Coulomb excitation experiments to study some of these isotopes.

"We've been very successful using RIBs (radioactive ion beams) from the Holifield Facility," David says. "We've added three new isotope measurements for both tellurium and tin. Holifield's beams allow us to do that. We couldn't measure them before because they are radioactive and thus not found in nature."

Radioactive isotope beams are created at the Holifield facility by fissioning uranium with beams from the Oak Ridge Isochronous Cyclotron. The fission fragments are then accelerated through the 25-MV tandem accelerator to make neutron-rich radioactive beams. The Holifield facility's combined ORIC and tandem configuration allows the beams to be made and studied

before they can decay, which can happen in less than a second with many very unstable isotopes.

Electromagnetic transition rates from these beam experiments give insight into the shape and behavior of an atom's nucleus. David explains that most of the stable isotopes have been measured for those transition rates (in fact, the Physics Division's S. Raman has catalogued them for years in an ORNL technical manual). Many unstable, or radioactive, isotopes are harder to measure, chiefly because they have such a brief existence.

By bouncing the ionized beams off of a carbon target, researchers attempt to measure how easy it is to "excite" the beam's nuclei, or give them extra energy. The strength of these transitions is one of the best measures that nuclear physicists have of nuclear deformation. "Soft" nuclei are fairly easy to excite—they wobble, sometimes crazily like a poorly punted football. (For a look at how vibrating nuclei behave, see [radware.phy.ornl.gov/movies.html](http://radware.phy.ornl.gov/movies.html) on the Web.)

Nuclei like tin-132 are different: With their tightly bound shells of protons and neutrons,

they are more rigid. Instead of behaving like flung gelatin, they react more like billiard balls. They "ring," which requires more energy.



Jim Richmond

The Physics Division's David Radford examines a gamma-ray detector in the Holifield Radioactive Ion Beam Facility.

"Tin nuclei are almost exactly spherical. The more deformed nuclei are easier to excite. With tin-132, it takes much more energy to set up oscillations. In fact, it is much less likely to happen at all," David says.

The effects are also less likely to be observed because the neutron-rich RIBs  
(See TIN, back page)



## 100 Eugene Wigner, 1902–1995, ORNL's 20th Century superlative

**E**ugene Wigner, ORNL's first director of research, Nobel laureate and one of the nuclear age's key figures, would have been 100 years old this month, on November 17. ORNL is marking the event with a special lecture by ORNL Director Emeritus Alvin Weinberg.

Wigner's legacy is evident at ORNL. The Lab's main auditorium bears his name, a change made in 1996, a year after his death. The Lab's leading fellowship program, the Eugene P. Wigner Fellowship, has attracted some of the nation's leading postdoctoral students to ORNL and has resulted in the retention of several of the Lab's leading research staff members.

Weinberg relishes talking or writing about Wigner at any opportunity. He worked alongside him at ORNL during the Manhattan Project and afterwards and was convinced of his genius early on.

"When fission was discovered in 1938, Wigner was the completely prepared mind," Weinberg writes in the October *Physics Today*. Wigner and his friend Leo Szilard had been thinking over the production of energy from fission for several years. Weinberg says Wigner had decided by 1936 that

nothing in the laws of physics precluded a nuclear chain reaction, an issue Germany's Hahn, Strassner and Meitner settled once and for all in 1938.

A number of that period's leading scientists were from eastern Europe, including Albert Einstein, Szilard, John Von Neumann and Wigner himself—and they all realized a nuclear chain reaction could make a devastating weapon. They also detested Hitler and his ilk, and Nazi Germany's headstart with fission must have terrified them. It was Wigner and Szilard who persuaded Einstein to sign the famous letter to FDR, which is credited with initiating the Manhattan Project. A reproduction of the letter is on the wall of the ORNL Visitor's Center.

"Wigner realized that humanity was in a struggle with the forces of evil, and that whoever made the bomb first would rule the world," Weinberg flatly states in *Physics Today*. Thanks to Wigner and a galaxy of likewise brilliant minds, the United States did come in first, if only to essentially rule the moment.

Wigner's brilliance is evident in much of today's nuclear  
(See WIGNER, page 2)

# Wigner

Continued from page 1

world. His Nobel Prize came from groundbreaking work he did in the 1920s in Hungary with fundamental mathematics and quantum mechanics. Wigner was by training an engineer, and Weinberg credits him, literally, with inventing nuclear engineering. He influenced the early directions in the design of the Hanford nuclear reactors, arguing against a gas-cooled reactor in favor of a simpler, water-cooled design.

The *McGraw Hill Dictionary of Scientific and Technical Terms* has 10 entries bearing his name, from theorems to scientific symbols. He collected 37 patents on his designs for various sorts of reactors. He is credited with designing the first fast breeder reactor and inventing the curved fuel plate that made high-flux reactors feasible.

He was on the front end of the development of nuclear power generation; however, at a 1993 event marking the Graphite Reactor's 50th year, Weinberg recalled a meeting in which Wigner expressed doubts as to whether the public would accept electricity provided by the technology also responsible for the atom bomb.

Wigner left ORNL shortly after the Manhattan Project concluded but returned frequently for projects that included civil defense research until the 1980s.

There are quite a few ORNL staff members around who knew Eugene Wigner. Almost to a one, they recall a person who may have been one of the 20th century's greatest gentlemen—an unfailingly considerate and courteous man.

There are also amusing recollections. It was unclear whether he pronounced his name *Wigner* or *Vigner*—no one was quite sure, because, it is said, he was too polite to correct anyone either way. A guard who greeted

Wigner in the mornings recalled how Wigner once requested he pronounce it with a *V*, then one day requested he change to *W* because his new wife preferred the American pronunciation.

Candice Strickler, who worked in an office he frequented in the 1970s, recalls a story that the Nobel laureate once smuggled in a bottle of champagne for a Christmas party but dropped it in the "canyon" between Buildings 4500-North and -South, smashing it to bits. Imagine that scene, true or not.

Howard Baker, on a visit to ORNL a few years ago, remembered that Wigner and his civil defense project colleague Conrad Chester once arrived at the former senator's Huntsville home on Chester's motorcycle, with Wigner perched against the sissy bar.

Wigner's Old World charm left lasting impressions. Candice says Wigner always greeted ladies with a quick bow. Judy Benton, who now works in the Spallation Neutron Source's publications office, first came to ORNL as Wigner's secretary. "He was one of the kindest, gentlest men I have ever met," Judy says. "One day a group of us went to the cafeteria. Dr. Wigner was helping my friend with her coat. She had shoulder-length hair, and Dr. Wigner gently lifted it so that it lay outside the collar."

Staff members have also noted that Wigner, despite his stature, would always take his place at the end of the cafeteria line.

Judy recalls another Wigner legend: He was at a service station staffed by an extremely rude attendant. Wigner, in his inimitable style and Hungarian accent, told him, "Would you kindly go to hell?"

Weinberg has said that if Wigner told you something you said was "very interesting," he thought you were wrong.

"Even though he was in actuality rather

diminutive in physical stature, his intellect seemed to render him in person rather larger than he was," recalls Doc Holladay of the Nuclear Science and Technology Division. "But what I remember the most about him was what an absolute gentleman he was, to both ladies and gentlemen. It seems that, like many of the great minds who made the Manhattan Program a rousing success, Dr. Wigner had quite a lot of concern for the U.S. population who stood to be the big losers in event of an unthinkable nuclear weapons exchange with the then-Soviet Union. Thus, he had become a

*Wigner's Old World charm left lasting impressions: "...one of the kindest, gentlest men I have ever met."*

major participant in the attempts to create some kind of U.S. civil defense program that could offer some *modicum* of protection for the highly exposed common folks."

Don Noid of the Computer Science and Mathematics Division came to ORNL in 1976 as a Wigner Fellow. "We did old quantum theory. There was a classic unsolved problem—of applying old quantum theory to systems of more than one degree of freedom. It's strongly connected to chaotic dynamics. I met with Wigner five or six times. Much to my surprise, he was very interested in my research—chaos was a new thing in the 1970s. In about the third session I told him how we could quantize these nonseparable systems—exactly. He asked me all kinds of questions—he was an incredibly fast thinker. He then paused. He says, 'You know, I worked on exactly that problem. I wasn't able to solve it.'

"I told him I used a computer to do it. He says, and I'll swear on a stack of Bibles, he said, 'I think computers are good things.'

"A few weeks later a letter from Wigner showed up with several questions. I called up my thesis advisor, Rudy Marcus, and told him I had a letter from Eugene Wigner. Rudy wanted to edit my reply to Wigner, and he did. This was in 1981. Rudy won the Nobel for chemistry in 1992. So I was an intermediary between two Nobel laureates!"

Finally, Kathy Gant of the Environmental Sciences Division, who worked on the civil defense project, remembers an amazing exchange at ORNL between Wigner and hydrogen bomb developer Edward Teller, who was in many ways Wigner's opposite.

"Dr. Teller had just presented a talk. I was fascinated by his remarkable eyebrows that punctuated his words. One attendee asked a question that upset Teller. He bristled, got more agitated (eyebrows working overtime) and became noticeably angry. Shortly afterward, I watched as Wigner quietly calmed his fellow Hungarian and gave him a gentle lecture. He told Teller that if he were 'less emotional,' he would be more effective in getting his ideas across."—B.C. [ornl](#)



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Curtis Beales

Stacy Hutchens (left) and Barbara Evans exam cellulose samples in Building 4500-North. Stacy is a University of Tennessee biomedical engineering graduate student working with Barbara in the Chemical Sciences Division's Molecular Bioscience and Biotech group.

# Lab Notes

## Maybe they just pretend they're broke

The military is famous for its acronyms, but ORNL researchers are also pretty good at coming up with their own. The latest: YAGWAM. It stands for Yet Another General Without Any Money, a reference to visitors from the defense sector who often show up on short notice to check out Lab technologies.

It's all in good fun, of course, and Associate Lab Director for National Security Frank Akers recently sprang lunch for a group of researchers who have hosted YAGWAMs. Frank, a retired general, knows that, despite the waggish acronym, the defense sector is a potentially huge customer and that much of the Lab's Work for Others funding comes from the Department of Defense. Often it's a matter of the time lag between a general's visit and the funding showing up.

"Matching our capabilities with the needs of our customers is the key to our success—being in the right place at the right time," Frank told the group as they chowed on hoagies. "You're the reason they send funding, and we have to be able to react fast."

ORNL, because it's a multiprogram lab, is well positioned to help the defense and homeland security sectors, Frank says.

The National Security Directorate, which has no researchers of its own, serves as interface between the Lab and the defense community. Thus, the cooperation and understanding of researchers across the organization is valuable to the NSD and also valuable to the Lab's programs.

"A lot of times it's a drop-what-you're doing thing," Frank says.

## No letdown for the United Way

This year's United Way campaign raised more than three quarters of a million dollars—a record that far exceeded the drive's goal. The 2002 campaign total of \$765,551 includes employee contributions of \$707,551 and a corporate donation of \$58,000 by UT-Battelle.

"We know that our employees are among

the most generous people anywhere," says campaign chairman Darryl Boykins. "They had already made significant contributions to several projects related to September 11, including raising more than \$20,000 in support of New York City firefighters and contributing some \$11,000 toward the purchase of a new Red Cross van."

The ORNL donations include the following amounts to counties in the region: Anderson, \$267,638; Blount, \$17,172; Campbell, \$10,003; Knox, \$288,147; Loudon, \$36,284; McMinn, \$2,349; Monroe, \$2,974; Morgan, \$24,221; Roane, \$99,747; Sevier, \$3,504; and Union, \$7,925.

## Partner checks superconductivity tech

ORNL's superconductivity program welcomed a new industrial partner last month. Superpower Inc. joins a list of companies with cooperative R&D agreements with the Lab to develop and test the RABiTS technology toward superconducting transmission lines.

Construction of new transmission lines through an increasingly crowded countryside is increasingly problematic; superconducting transmission lines are seen as a key to putting more power through existing lines.

The RABiTS technology is seen as a promising avenue toward fabricating long lengths of superconducting cable. Other CRADA firms are 3M, American Superconductor Corp., MicroCoating Technologies and Oxford Superconducting Technology.

Superpower's V. "Selva" Selvamanickam, who studied as a postdoc at ORNL, says the firm is also checking out technologies from Los Alamos and Argonne national labs. "Once

we get one of these cable technologies scaled up to kilometer lengths, we can bring the manufacturing cost down," says Selva. Then the juice will flow.

## Crystal experiments still going up

If only NASA gave frequent flyer miles for experiments. A batch of crystals from ORNL is set to go up via the space shuttle to the International Space Station, possibly this month, followed by another experiment later. The Life Sciences Division's Gerry Bunick has been working with the space agency for years in investigating and validating the effects of microgravity on growing protein crystals in space, which are then subjected to X-ray and neutron analysis. "This will be our first opportunity to send up D-CAMs (the NASA-designed diffusion-controlled apparatuses for microgravity containers) to see how large the crystals will grow and how microgravity increases diffraction resolution," Gerry says. ORNL's crystal experiments previously spent time on Russia's Mir space station, which is no more. Gerry's new experiments will likely spend three or four months on the ISS. Gerry stays on the ground, but if things work out he might get to see a night launch at Canaveral.

## Give the gift of AMSE

In a holiday quandary over what to get for that person who has everything? Why not give the American Museum of Science and Energy?

Purchase a \$30 one-year AMSE membership and give the gift of unlimited visits for a full year. Receive special members-only preview reception invitations and get a 10-percent discount in the Discovery Shop every day and on special members-only discount sale days.

The \$30 family membership includes two adults and children living in the same household; a \$30 grandparents membership includes two senior adults and four children. Individual annual memberships are available for \$20. Get AMSE membership brochures at the ticket desk inside the museum or by calling the Discovery Shop at (865)576-3229.

*Reported by Bill Cabage*



Selva examines superconducting material in the Coated Conductor Research Laboratory.

Curtis Boles

## Fare ye well

Buildings are coming down as well as going up at the Lab. The latest demolition is Building 2013, on the west end of Central Avenue. The half-century-old structure's razing followed Building 2506 just up the street and Building 6003 on the east end of the Lab. Also slated for teardown are Building 3550 and the 2001 Quonset huts.



Curtis Boles

# Awards Night 2002

**A**wards Night 2002 was held October 25. Following last year's model, the Awards Night committee notified finalists in advance, but the winners weren't announced until the ceremony. The individual and team category winners are listed here first. Congratulations to everyone selected to attend this year's Awards Night.

## Outstanding Community Service

### Exceptional Volunteerism Within ORNL by an individual

Christina M. Poole. For her initiative, leadership and personal commitment to programs that make the Environmental Sciences Division a better place: language classes for staff whose native language is not English; exemplary award nomination packages for staff members; and volunteer efforts for Veterans' Day, Coats for the Cold, Ronald McDonald House and the Thanksgiving food drive

### Exceptional Volunteerism Outside ORNL by an individual

William Eugene Comings. For his selfless commitment, along with his dog, Shadow, to bringing joy and comfort to the residents of the Homewood assisted-living center for Alzheimer's patients, through the University of Tennessee's Human-Animal Bond in Tennessee (HABIT) Program

#### Finalists

Tim Myrick. For his involvement in raising funds to purchase a disaster relief van for the Red Cross

John Norman. For his long history of community service in support of science education, youth sports, and charitable activities

### Exceptional Volunteerism by a Team

Wendell G. Ely, Nina Jean Roberts, Sherry E. Brown, Nancy C. Getsi, Robin Lambert Graham, Deborah W. Knox, S. Kaye McGinty, Ron Parr, Myra J. Rose and Swati Wilson. For organizing and publicizing Team UT-Battelle's participation in the Susan G. Komen Breast Cancer Foundation's Race for the Cure

### Science Communicator

Jeffrey E. Christian. For his extraordinary ability to effectively communicate the Engineering Science and Technology Division's research capabilities and successes—the ultimate science communicator

#### Finalists

Glenn O. Allgood. For effectively communicating ORNL's story in such areas as cognition, sensor agents, wireless technology, and acoustic signatures, through national outlets such as the *Chicago Tribune*, *Scientific American*, *The New Scientist*, and National Public Radio

Virginia H. Dale. For her impassioned commitment to spreading the science story and to enhancing an appreciation for science and the benefits of technology and science to society at large

## Outstanding Accomplishment in Laboratory Operations

### Administrative Support Exempt Payroll

J. Kyle Johnson. For remarkable success in the recruitment of top scientific and technical talent to the Computing and Computational Sciences Directorate

#### Finalists

Susan W. Diegel. For continuously demonstrating her commitment to excellence and her willingness to expand her responsibilities to a higher level

Paula F. Wright. For outstanding administrative support during the High Flux Isotope Reactor contractor and DOE operational readiness reviews

### Administrative Support Nonexempt Payroll

Sharon D. Curd. For her sustained exceptional support to the DOE Environmental Management Robotics Crosscutting Program

#### Finalists

Karen E. Bowman. For exceptional administrative support in the preparation of very complex environmental impact statements for the Nuclear Regulatory Commission and the U.S. Army

Renee Manning. For her artful and skillful work promoting the Spallation Neutron Source Project and the Joint Institute for Neutron Sciences

### Environment, Safety, Health, and Quality

Young Soo Kwon. For his leadership role during the HFIR tritium release, identification, mitigation, and recovery

### Integrated Safeguards and Security Management

Steve Cline. For his essential contributions to the Environmental Sciences Division's facilities and for his full commitment to "Science and Security Working Together"

### Workforce Diversity

Martin Schweitzer. For outstanding coordination and leadership of the Southeastern Consortium for Minorities in Engineering Program with Oak Ridge High School

#### Finalist

Saylor B. Hummel. For supporting diversity in the Engineering Science and Technology Division

### Secretarial Support

Kathy McIntyre. For leadership in creating a cohesive and efficient ESTD administrative support team

#### Finalists

Jeanine Holbrook. For sustained valuable

performance in the ESD office and outstanding contributions toward change at the Laboratory

Sandy Lowe. For outstanding secretarial support, particularly in support of planning workshops for the Center for Nanophase Materials Sciences

### Administrative and Operational Leadership by a Front-Line Manager

Mike B. Farrar. For leadership and management of the program to successfully complete HFIR's beryllium replacement and scientific upgrades.

#### Finalist

David E. Fowler. For leadership in ESD's financial management, ESH&Q, division-level computing, human resources, and facility management

### Bargaining Unit Support by a Team

Norm Kurtz, John Q. Bui, Larry DeLoach, Timothy E. Golden, John H. Johnson, Anthony McBee, John G. McCarter and D. B. Valentine.

For demonstrating exceptional conscientiousness, prowess and teamwork in providing audiovisual resources at ORNL conferences and meetings

### Operations Support by a Team

Robert Baird, Angela Calloway, Lisa A. Copeland, Roy L. Etheridge, Ronald J. Geouque, Al Guidry, Susan G. Hiser, M. Jack Liles, Barry R. Miller, Virginia L. Miller, Will Minter, Joel E. Pearson, Nicole E. Porter and William Thornton III. For procurement contributions to the SNS Project, DOE, ORNL, and the entire East Tennessee procurement community

### Operations Support by a Team

Tim Myrick, Arthur S. Bland, William R. Emanuel, Richard C. Griffin and Mahendra Lakumb. For their groundbreaking roles in ensuring the on-schedule construction start for the Joint Institute for Computational Sciences and the Oak Ridge Center for Advanced Studies

## Outstanding Accomplishment in Science and Technology

### Technical Support

Tonia L. Mehlhorn. For her breadth of knowledge and skill in supporting all aspects of ESD's hydrological and geochemical transport research

#### Finalists

Carmen M. Foster. For laboratory management and research support to the Functional Genomics group

Jerry McLaughlin. For the reestablishment of coated nuclear fuel particles technology

### R&D Leadership by a Front-Line Manager

Steven J. Zinkle. For outstanding leadership

of the ORNL Fusion Materials Program and the Radiation Materials Science and Technology Group in the Metals and Ceramics Division

*Finalists*

Dwight A. Clayton. For sustained performance as a front-line manager and exemplary leadership in an R&D environment

David B. Geohegan. For innovative leadership in establishing and managing a carbon nanotubes R&D program

**R&D Leadership by a Division or Program Director**

Michelle V. Buchanan. For leadership and management of the Chemical Sciences Division and support of ORNL's scientific missions

*Finalists*

Everett Bloom. For leadership of the Metals and Ceramics Division, preparing the division for a successful future through restructuring and strategic planning

Rudolph Damm. For building a team of experts to assemble, test and install high-tech accelerator equipment for the SNS Project

**Early Career Award for Engineering Accomplishment**

John C. Wagner. For research that has led to the application of enhanced analysis methods that have provided a technical basis for regulatory decision making

**Engineering Development by a Team**

Kenneth W. Tobin, Regina K. Ferrell, Shaun S. Gleason, William B. Jatko, Thomas P. Karnowski and Bobby R. Whitus. For developing ORNL's Automated Image Retrieval technology for improvement of semiconductor yield

**Distinguished Engineer**

Stan A. David. For outstanding contributions and international leadership in the field of materials joining

*Finalists*

Calvin M. Hopper. For leading the development of guidance, tools and innovative concepts in nuclear criticality safety

John W. McKeever. For his innovations in permanent magnet motor drives

**Early Career Award for Scientific Accomplishment**

Jian Shen. For his pioneering approach to the study of magnetism in nanostructured materials

*Finalists*

Claudia Cantoni. For work furthering the development of high-temperature superconducting wires

Nagiza F. Samatova. For her exceptional work in securing funding for innovative research programs.

**Scientific Research by a Team**

Bennett C. Larson and Gene E. Ice. For the development of submicron-resolution, three-

dimensional X-ray structural microscopy—a true breakthrough technique.

**Distinguished Scientist**

Charles C. Coutant. For his extraordinary scientific contributions over a 32-year career that have influenced two generations of policy makers, and leadership in restoring river systems affected by hydropower development

*Finalists*

E. Ward Plummer. For outstanding sustained achievement and leadership in surface science research, funding, mentoring, and service to the scientific community

G. Malcolm Stocks. For extraordinary contributions to alloy theory and the application of advanced parallel computing techniques to materials science

## Director's Awards



**Outstanding Team Accomplishment**

(Chosen from among team award winners in all categories)

(From left) **Bobby R. Whitus, W. Bruce Jatko, Regina Ferrell, Thomas P. Karnowski, Kenneth W. Tobin and Shaun S. Gleason**, Engineering Science and Technology Division. For developing ORNL's Automated Image Retrieval (AIR) technology—an image retrieval system for semiconductor yield improvement

**Individual Accomplishment in Community Service**

**William Eugene Comings**, Operational Safety Services. For his selfless commitment, with his dog, Shadow, to bringing joy and comfort to the residents of the Homewood assisted-living center for Alzheimer's patients, through the University of Tennessee's Human Animal Bond in Tennessee Program



**Individual Accomplishment in Laboratory Operations**

**Young Soo Kwon**, Research Reactors Division. For his leadership role in planning and resolving ESH&Q issues during the HFIR tritium release, identification, mitigation and recovery

**Individual Accomplishment in Science and Technology**

**Stan A. David**, Metals and Ceramics Division. For outstanding contributions and international leadership in the field of materials joining



# 2001 Benefit Plans Summary Annual Report

## Plan Participants and Beneficiaries:

(The 2001 benefits plans report has been prepared in accordance with instruction from the U.S. Department of Labor and is required by the Employee Retirement Income Security Act of 1974.)

This report summarizes the annual reports of the benefit plans provided by the sponsoring employers, BWXT Y-12, L.L.C. (Employer Identification Number: 54-1987297) and UT-Battelle, L.L.C. (Employer Identification Number: 62-1788235.) The report is written in language specified under regulations prepared by the U.S. Department of Labor.

The sponsoring employers offered benefit plans under three structures during calendar year 2001. The qualified retirement and savings plans are multiple employer plans, with both employers participating and under an administrative services agreement, BWXT Y-12, L.L.C. serving as the plan sponsor and plan administrator. Five health and welfare plans (The Group Health Plan, The Dental Assistance Plan, The Group Life Plan, The Special Accident Plan, and the Travel Accident Plan) were provided under a Multiple Employer Welfare Agreement, with an administrative services agreement that has BWXT Y-12, L.L.C. serving as the plan administrator. The individual companies sponsored separate health and welfare plans for Long Term Disability, Employee Assistance, Education Assistance, a Cafeteria Plan and a Severance Plan for Salaried Employees.

Complete annual reports for all the offered plans have been filed with the Internal Revenue Service as required by the Employee Retirement Income Security Act of 1974.

## Summary Annual Report

### Multiple Employer Plans

Retirement Program Plan for Employees of Certain Employers of the U.S. Department of Energy Facilities at Oak Ridge, Tennessee (The Retirement Plan).

The following is a summary of the annual report of the Retirement Plan for 2001.

### Basic financial statement

Benefits under the plan are provided by group annuity contracts and separate trust investment accounts. Plan expenses were \$157,336,746. These expenses include \$142,704,979 paid to participants and beneficiaries and \$14,631,767 in administrative expenses. A total of 22,414 persons were participants in or beneficiaries of the plan at the end of the plan year, although not all of these persons had yet earned the right to receive benefits.

The value of plan assets after subtracting liabilities of the plan, were \$2,579,464,442 as of December 31, 2001, compared to \$2,858,201,427 as of January 1, 2001. During the year, the plan experienced a decrease of \$278,736,985. The plan had a loss of (\$119,826,221) including earnings and losses from investments. During the plan year, the plan transferred \$1,574,018 to other pension plans.

The plan has contracts with the Metropolitan Life Insurance Company and the Prudential Insurance Company of America that guarantee the liabilities of all participants retiring before July 1998. The assets of the plan are invested in Separate Accounts of the insurance companies or in separate trust accounts in accordance with the contract terms.

### Minimum funding standards

An actuary's statement shows that enough money was contributed to the plan to keep it funded in accordance with the minimum funding standards.

### Your right to additional information

Participants have the right to receive a copy of the full annual report, or any part of it, upon request. The items listed below are included in that report.

- an accountant's report
- assets held for investment
- insurance information
- actuarial information regarding the funding of the plan
- transactions in excess of five percent of plan assets

### Savings Program for Employees of Certain Employers at the U.S. Department of Energy Facilities at Oak Ridge, Tennessee (The Savings Plan)

This is a summary of the annual report of the Savings Plan for 2001, including basic financial statements.

Benefits under the Savings Plan are provided by a trust fund. Plan expenses were \$67,485,813; including benefits paid to participants of \$66,855,026 and administrative expenses of \$630,787. A total of 10,352 were participants in or beneficiaries of the Plan at the end of the plan year, although not all these persons had yet earned the right to receive company matching contributions.

The value of plan assets as of December 31, 2001, after subtracting liabilities of the plan, was \$1,032,785,084 compared to \$1,023,397,618 as of January 1, 2001. During the year, the plan experienced an increase in net assets of \$9,387,486. This increase includes the unrealized appreciation or depreciation in the value of the plan assets; that is the difference between the value of plan assets at the end of the year and the value of assets at the beginning of the year or the cost of assets acquired during the year. The plan had total income of \$76,873,279; including employer contributions of \$15,763,726; employee contributions of \$40,438,235; realized and unrealized gains and investment earnings of \$20,424,434.

### Your right to additional information

Participants have the right to receive a copy of the full annual report, or any part of it, upon request. The items listed below are included in that report.

- an accountant's report
- assets held for investment
- transactions in excess of five percent of plan assets

### Multiple Employer Welfare Agreement (MEWA)

Under this agreement, the participating employers jointly offer health and welfare plans, including health, life, special accident, travel accident and dental. Insurance policies for the plans included in the MEWA are held in trust by the Oak Ridge Benefit Insurance Trust. This is a summary of the plans included in the MEWA.

### Group Welfare Benefit Plan

The Group Welfare Benefit Plan operates under contracts between the participating employers and various health care providers which include true insurance contracts (premiums paid for services provided) and other insurance arrangements that require that the participating companies will supply funds for the payment of all claims due under the terms of the contracts, up to a specified maximum determined each plan year. For the plan year 2001, the maximum (Cigna Option I Plan) was \$63,766,122. The companies share the cost of the Group Welfare Benefit Plan with the participants by charging premiums to the employees.

For the plan year ended December 31, 2001, the total premiums paid were \$19,521,013. Details on premiums paid are provided by the insurance companies in their

reports to the plan sponsor.

For the plan year ended December 31, 2001, the total claims paid were \$114,309,564 and administrative expenses were \$684,191. Details of claims paid and expenses incurred are included in the insurance company financial statements provided to the plan sponsor.

Employees provided \$24,805,238 of funds to pay these premiums, claims and expenses and \$109,709,530 was provided by the employers.

The financial statements of the Group Welfare Benefit Plan also reflect the postretirement benefit obligations of the employers. This obligation represents the present value of future benefits to be paid to covered participants. The benefit obligation is determined by the plan actuaries. As of December 31, 2001, the benefit obligation was \$929,808,091 as compared to the benefit obligation at January 1, 2001 of \$818,655,440. The increase in benefit obligation of \$111,152,651 is attributed to a change in benefit obligation of \$110,844,000 and an increase in claims incurred but not yet reported of \$308,651.

### Plans maintained separately by the sponsoring companies

#### BWXT Y-12, L.L.C.

In addition to the multiple employer plans above, BWXT Y-12, L.L.C. sponsors the following Plans: Special Medical Plans for LMUS Retirees, Long Term Disability Plan, Cafeteria Plan, Employee Assistance Plan, Educational Assistance Plan, Prescription Drug Plan (financial data included in The Group Health Plan) and The Severance Plan for Salaried Employees.

Annual reports are filed for each of these plans.

#### UT-Battelle, L.L.C.

In addition to the multiple employer plans above, UT-Battelle, L.L.C. sponsors the following Plans: Prescription Drug Plan (financial information is included in The Group Health Plan), Cafeteria Plan, Long Term Disability Plan, Employee Assistance Plan, Educational Assistance Plan and The Severance Plan for Salaried Employees.

Annual reports are filed for each of these plans.

### For more detailed information

To obtain a copy of the full or partial annual reports for the insurance plans, retirement program plan or savings program, write to Plans Administrator: BWXT Y-12, L.L.C., 104 Union Valley Road, Oak Ridge, TN 37831-6497. Copying costs are 25 cents per individual page; \$4 for the complete insurance plans; \$5 for each savings plan annual report; and \$10 for the entire retirement program plan annual report.

With regard specifically to the retirement program plan and savings plans, participants have the right to receive from the plan administrator, on request and at no charge, a statement of the assets and liabilities of the plan and accompanying notes, a statement of income and expenses of the plan and accompanying notes, or both.

For each participant requesting a copy of the full annual report, these two statements and accompanying notes will be included as part of that report. The copying cost previously mentioned does not include a charge for duplicating these portions of the report because they are furnished without charge.

Participants also have the legally protected right to examine the insurance, savings or retirement program plan annual reports at the main office, located at 104 Union Valley Drive, Rm. 126, Oak Ridge, Tenn., and at the U.S. Department of Labor in Washington, D.C.

Participants also may obtain copies from the U.S. Department of Labor upon payment of copying costs. Requests to the Department of Labor should be addressed to: Public Disclosure Room, N4677, Pension and Welfare Benefit Programs, Frances Perkins Department of Labor Building, 200 Constitution Avenue, N.W., Washington, DC 20216.

Plan Name	Insurance Provider	Total Premium Paid in 2001
Group Health	Cigna-Option II	\$8,951,730
Group Health	Aetna	\$719,144
Group Health	United Healthcare of Ohio	\$765,316
Group Health	PHP	\$598,629
Group Health	Pittman Associates	\$508,605
Life Plan	Metropolitan Life	\$6,636,935
Dental Assistance Plan	Metropolitan Life	\$1,046,106
Travel Accident Plan	Life Insurance Company of North America	\$16,000
Special Accident Insurance Plan	Life Insurance Company of North America	\$278,548

## Land-use planning group brings together views on ORR's preservation, development

The Oak Ridge Reservation is of vital importance to ORNL—after all, it includes the land the Lab sits on. But a number of other groups and entities have an interest in land use on the reservation, with standpoints ranging from preservation to development.

Those stakeholders came together a year ago for a series of land-use planning workshops. Project leader Pat Parr, also the ORNL area manager, believes the land-use planning process they developed and used sets a valuable precedent for melding the multiple interests within the community in a manner compatible with science and other DOE missions needs at Oak Ridge.

"If DOE doesn't have land, then there won't be places in the future for projects like the Spallation Neutron Source," Pat says. "Most of the ORR is needed for some sort of mission use, so 85 percent of the ORR was actually outside this planning process."

The report of the focus group will be incorporated into future ORR planning documents.

At the outset of the process, Pat and DOE contact Marianne Heiskell polled DOE programs—including the Office of Science, Energy Efficiency and Renewable Energy, Environmental Management, NNSA Reindustrialization and others—for their needs during the next five to 20 years. Approximately 5,000 acres (of the total 34,241 acres of ORR) were identified as an area where additional compatible land uses might be appropriate to coexist with current programmatic uses or become the primary use in the future. The focus group studied data on existing resources within the planning area (the northwest portion of the ORR near the East Tennessee Technology Park) and invited in experts to discuss environmental and socioeconomic aspects.

The group shared information with the public and solicited its input through public meetings, newsletters and presentations. With that information, both the focus group and public marked up maps indicating their ideas on appropriate land uses in the planning area.

"That there was consensus on the types of land uses for 87 percent of the planning area is really amazing," Pat says.

On the remaining 13 percent of the planning area, uses proposed ranged from conservation and research to residential and light industrial development. Four land-use scenarios were developed based on different types of pro-

posed land uses within that 13 percent of the planning area. A technical report analyzed the potential impacts for each of the four scenarios. The focus group's report, reflecting the discussions on various uses, should prove to be a valuable resource as DOE ponders land-use options for the northwest area.

The focus group agreed upon several "values" that should be reflected in any action regarding the disposition or management of ORR land. The five most highly ranked were to protect threatened and endangered species, ensure water quality, increase the Oak Ridge tax base, concentrate any new industry and increase the number of jobs in Oak Ridge.

The group also drafted three resolutions that, while not quite unanimously agreed upon, were recommended by the group as a whole.

First, the group strongly encouraged DOE to look into a "mechanism of perpetual preservation" of areas designated for conserva-

tion or research.


Second, the group felt strongly that the land-use process used for the northwest tract should be applied to the entire reservation, with continued stakeholder involvement.

Third, a significant part of the group wanted to expand the land-use analysis to include an evaluation of the biological resources of the area, which would be considered in assessing the relative values of conservation and development.

Participants in the process included those with interests in the community, business, government, economic development and the environment. Among the process's supporters have been outgoing ORO Manager Mike Holland and Rep. Zach Wamp, who started the process with former ORO Manager Leah Dever in August 2001.

Pat praises in particular the focus group participants.

"This diverse group followed the process for a year, developed their report, and achieved unanimous sign-off on their report. They were committed to making the process work, and it did," she says. "And, as a result of the efforts of the focus group and extensive public involvement, DOE is very much aware that there is considerable stakeholder interest in the ORR."

The focus group report, technical analysis report, and summary newsletter are available on the ORR Land Use Planning Process Web site, [landuseplanning.ornl.gov/](http://landuseplanning.ornl.gov/).—B.C. 



The 5,000-acre tract the focus group considered is near the East Tennessee Technology Park.

## New Staff Members

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

Marianne Ferguson, Spallation Neutron Source  
Melanie Mayes, Environmental Sciences  
Dorothea Thompson, Environmental Sciences  
Sergei Kalinin, Solid State  
Frederick Sheldon, Computational Sciences & Engineering  
Stacy Newbold, SNS  
Dale Pelletier, Life Sciences  
Matthew Stedinger, SNS  
Blen Triplett Jr., Research Reactors  
James Watson, Craft Resources  
Michael Ham, Computer Science & Mathematics  
Andrew A. Wereszczak, Metals & Ceramics  
Robert Louis Marascia, SNS  
Gregory Lee Christensen, Research Reactors  
Erica Leigh Francis, Laboratory Protection  
Burak Ozpineci, Engineering Science and Technology  
Mallikarjun Shankarm, Computational Sciences & Engineering  
Julie Ezold, Independent Oversight  
Victor Olman, Life Sciences  
Mark P. Cardinal, SNS  
Anthony W. Webster, SNS  
Jingxi Chu, Legal  
George Fann, Computer Science & Mathematics  
Michael Johnston, Bus. & Info. Services  
Liyou Wu, Environmental Sciences

## Service Anniversaries

**35 years:** Jerry M. Beeler, Craft Resources; Donald B. Shupe, Operational Safety Services

**25 years:** Barbara J. Beem, Fusion Energy; Betty A. Benton, Gary F. Galloway, Bradley D. Patton and Lee Zevenbergen, Nuclear Science & Technology; Joy N. Castleberry, ESH&Q Dir.; Chris L. Fitzpatrick, Fabrication & Site Services; Michael P. Hechler and William H. Wagner, SNS Accelerator Systems; Buddy Johnson, Jr., Facilities Management; Shirley H. Martin, D. D. Pollitt and Ronnie Wright, Craft Resources; Susan W. Masingo, Biological and Envir. Sciences Dir.; Terrell C. Patrick, Quality Services; James E. Phillips, Health Services; Linda B. Pierce, Operational Safety Services; Stephen P. Withrow, Solid State

**20 years:** Shui L. Chang, Networking & Computing Technologies; Gerard M. Ludtka and Gail M. Ludtka, Metals & Ceramics; John C. Poole, Fabrication & Site Services Division

# Tin

Continued from page 1

generated at Holifield until recently have been an assortment of isotopes with the same mass, such as tellurium-132. Only a small portion of a beam has been the “especially useful” tin-132.

“We can make it, but we couldn’t separate it from other nuclei with mass-132,” David says. “All we could do was extract a 132 beam, but only one percent was tin-132. The

extra stuff in the beam clutters the experiment, making it hard to measure the results.”

The ORNL researchers’ newfound ability to extract a more pristine beam came about largely by chance. A batch

of uranium that was contaminated with sulfur led to a more powerful beam of greater purity.

“Dan Stracener discovered, almost by accident, that by extracting the tin sulfide as a molecule from the ion source, we could get rid of the tellurium and other contaminants,” David says. “The beam is pure tin.” (See the sidebar.)

The Physics Division researchers recently completed a Coulomb excitation experiment with tin-130, which is very close to the magical tin-132. They recorded one of the smallest electromagnetic transition values on record. The ability to measure the transition rates for these fleeting isotopes goes a long

*“It’s the unexpected that is so appealing about doing these kinds of physics experiments.”*

## Pure beam: Sulfur solution

ORNL’s discovery of the key to a pure beam of radioactive tin ions adds up as one of those serendipitous events that occurs in science every so often.

The solution to obtaining the pure tin beam turned out to be the presence of sulfur in the target. The sulfur bound only to the tin isotopes, which resulted in the eventual acceleration of a pure tin beam. The sulfur—which was either an impurity in a uranium target or left over from a previous experiment—was fortuitous for the Physics Division’s Dan Stracener and his colleagues.

“When the uranium target fissions, a large number of elements are produced, and often the mass differences are quite small,” Dan explains. “For example, when we extract a mass-132 beam, we can’t separate the tin, antimony and tellurium isotopes. The tin-132 we were looking for is only one percent of the total beam intensity.

“However, in the tin sulfide beam, no other components were observed. The tin sulfide was then passed through a cesium vapor cell, where the molecule was broken up and a pure beam of negatively charged tin ions was available for the experiments.”

Dan says that in the year and a half since the initial discovery, Germany’s GSI facility has used the technique to purify beams. He adds that the sulfur technique is also good at purifying germanium from gallium, arsenic and selenium contaminants.

way toward testing existing nuclear physics theories and solving some mysteries, such as why transition values for some nuclei, such as tellurium-136, are lower than theorized.

“We’re learning unexpected and interesting things,” David says. “It’s the unexpected that is so appealing about doing these kinds of physics experiments. We’re learning a lot of details about what is going on inside the nucleus.”

In fact, David notes that with these experiments the Holifield Facility, which was converted from a heavy ion facility to a RIB accelerator facility in the 1990s, has chalked up a string of firsts. The Holifield is the first accelerator facility to accelerate neutron-rich beams, the first to discover a method for making pure tin beams and the first to perform

experiments with them.

The New Zealand native says the tin experiments, which were recommended as experiments of the year by CERN’s ISOLDE facility, have been very well received. He has given about a dozen invited talks. The experiments have attracted significant attention in the nuclear physics community, which awaits the next generation in RIB facilities—RIA, the proposed Rare Isotope Accelerator.

“The Holifield’s neutron-rich RIBs are unique in the world, and will be, probably at least for the next four years,” says David, who characterizes future nuclear structure experiments at the Holifield Facility and its successors as “exciting, challenging and feasible.”—*B.C. omi*

**omi** reporter

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