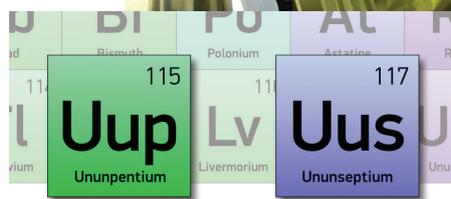


**SCIENCE**

## ORNL on team officially recognized for discovery of elements 115, 117



*Frank Riley of ORNL's Reactor and Nuclear Systems Division carefully prepares the berkelium-249 that would become element 117 material in a glove box at ORNL's Radiochemical Engineering Development Center. (ORNL photo)*

The International Union for Pure and Applied Chemistry has announced formal verification of four new chemical elements, recognizing ORNL and its collaborators for the discovery of elements 115 and 117.

In their report, IUPAC concluded that the collaboration of the Joint Institute for Nuclear Research, Dubna, Russia, ORNL and Lawrence Livermore National Laboratory had met the criteria for the discovery of elements 115 and 117.

The IUPAC announcement invites the team to submit names and symbols for the two elements for review.

RIKEN in Japan was given priority for element 113, and a JINR-LLNL collaboration was given priority for element

118. Official recognition of these new elements completes row 7 of the periodic table and provides evidence for the long sought island of stability for superheavy elements.

"These new elements expand our understanding of the nucleus, extend the periodic table, and provide evidence for the possibility of discovery of even heavier nuclei," says ORNL director Thom Mason. "The results demonstrate the power of international collaboration for addressing complex challenges in science."

Six atoms of element 117 were originally observed in 2010 during six months of intense bombardment of a berkelium target from ORNL with calcium ions at one of the world's most powerful heavy ion accelerators at JINR. Atoms of element

115, originally seen in earlier experiments at JINR, were also produced in the 2010 experiment from the decay of element 117. These results for elements 115 and 117 were confirmed in 2012 and 2013 by additional experiments at JINR and at GSI Helmholtz Centre for

Heavy Ion Research in Darmstadt, Germany. Vanderbilt University and the University of Tennessee, Knoxville, also participated in the experiments.

The berkelium target material was produced during a six-month irradiation in the world's most

intense thermal neutron flux at ORNL's High Flux Isotope Reactor, a DOE Office of Science User Facility. The resulting product was separated and processed during a three-month campaign at ORNL's Radiochemical Engineering Development Center, resulting in 22 milligrams of ultrapure berkelium. In addition to providing this unique target material, ORNL participated in all aspects of the experiments and contributed advanced detector technology to the effort.

The island of stability, originally proposed by Glenn Seaborg in the 1960s, refers to a region beyond the current periodic table where superheavy nuclei with enhanced lifetimes may exist. Such an "island" would extend the periodic table to

"These new elements expand our understanding of the nucleus, extend the periodic table, and provide evidence for the possibility of discovery of even heavier nuclei."

*(continued on page 2)*

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## Mike Willard is enjoying retirement, but still takes on challenges with family, hobbies



Mike and Gayle Willard.

“I don’t like to sit around. Retirement should be a time to do things you like to do.”

Almost seven years after he retired as a manager in ORNL’s Human Resources Directorate, Mike Willard has taken on his share of challenges.

Employed either at ORNL, Y-12 or K-25 during a 37-year period until June 2009, Mike has played a lot of softball, golf and tennis, as well as doing his share of travel, hiking and other recreational pursuits.

A serious traffic accident involving his wife Gayle in 2015 forced Mike to alter his schedule.

Between her surgeries and therapy, Mike has done much to care for Gayle, which caused “me to give up some things.” However, Mike has been able to adjust his schedule enough to still do the things most retirees enjoy doing.

“We have four active grandchildren ages 9 and under,” Mike said. “They are involved in either playing ball, cheerleading or other activities.”

Mike’s grandchildren take after their grandfather. At least twice a week, he is playing golf or tennis – weather permitting – and was preparing to play on two softball teams as spring approached.

Mike is still active as a board member and a past president of the Tennessee Valley Human Resources Association. He has worked part-time as HR manager for one of ORNL’s subcontractor companies, Management Solutions, LLC – the Small Business Administration’s 2012 National Subcontractor of the Year.

Mike has served on the board of the Coalition of Oak Ridge Retired Employees (CORRE), and as a volunteer with the Employer Support of the Guard and Reserve (ESGR) to help promote cooperation and understanding and assist in conflict resolution between service members and their employers. Mike is committee chair for Boy Scout Troop 451 located at Cumberland Baptist Church in Northwest Knoxville.

The extended Willard family has taken a Disney vacation and cruise since Gayle’s accident and hopes to do one again in the future, as well as other travel plans on the “bucket list.” Mike has been doing plenty of painting and other work around the house in anticipation of downsizing to eliminate stairs.

“I don’t like to sit around,” Mike said. “Retirement should be a time to do things you like to do.” –Fred Strohl 🌿

### Club ORNL events

Get the details and latest news online via <https://info.ornl.gov/sites/clubornl>. Request an XCAMS account, which will allow you to participate in these events or contact Lara James at 865-576-3753 or [jamesla@ornl.gov](mailto:jamesla@ornl.gov).

ORNL on team officially recognized for elements 115, 117 discovery continued from page 1) even heavier elements, and the increased lifetimes would enable chemistry experiments on these elements.

“The element 117 results include the observation of 11 new heavy isotopes that represent our closest approach to date to the proposed island of stability,” says ORNL’s Jim Roberto, who played a major role in forming the collaboration with JINR, LLNL, UT and Vanderbilt. “These new isotopes continue a trend toward increasing stability with increasing neutron number for superheavy elements, providing evidence for the existence of the island.”

Additional comments from Roberto may be accessed at <https://www.ornl.gov/news/ornl-team-officially-recognized-elements-115-117-discovery>.

The Russia-U.S. collaboration is currently searching for even heavier nuclei at JINR using a unique target of a mixture of californium isotopes, a byproduct of decades of californium-252 production at ORNL. A new detection system for radioactive nuclei developed at ORNL and UT is enhancing the discovery capability of this experiment.

Elements 115 and 117 bring to three the number of new chemical elements discovered by ORNL with its collaborators. Element 61, promethium, was originally observed in 1945 from the chemical analysis of fission products at ORNL’s Graphite Reactor. Overall, isotopes from ORNL have helped enable the discovery of nine chemical elements.

The IUPAC announcement can be viewed at <http://www.iupac.org/news/news-detail/article/discovery-and-assignment-of-elements-with-atomic-numbers-113-115-117-and-118.html>. –Morgan McCorkle 🌿



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## 1960s-era ORNL Molten Salt Reactor Experiment has enduring legacy

While ORNL's Molten Salt Reactor Experiment (MSRE) may have only operated four years during the 1960s, it has earned an enduring legacy that may pave the way for nuclear power plants of the future.

Located in a valley over from the laboratory's main campus, the MSRE was inspired by the campaign to build a nuclear-powered aircraft in the 1950s. Engineers saw promising results from a design that used molten fluoride salt as a fuel carrier and coolant for an onboard reactor. By the early 1960s, after the nuclear airplane project's cancellation, molten salt reactor efforts had transitioned to electricity generation.

Molten salt technology enables the development of high-temperature, low-pressure, passively safe reactors. While the alkali halide salts can be corrosive, ORNL's development of molten salt-compatible nickel-based alloys in the 1950s to 1970s largely addressed the corrosion issues.

The potential for molten salt reactors to work as breeder reactors attracted early proponents. Worries about the supply of uranium at the time appeared to disqualify nuclear as a large-scale energy source. A molten-salt breeder reactor could make fuel as it operated, and the circulating fuel eliminated the need for solid-fuel changeouts and fuel- and control-rod mechanisms.

The concept also had the allure of intrinsic safety. Molten salts expand as they heat up. The expansion causes some of the fuel to leave the core, shutting down the reactor, so operator response is not required to turn the reactor off.

Former ORNL Director Alvin Weinberg was a staunch proponent of liquid-fuel breeder reactors, and the MSRE was his crowning glory, successfully operating from January 1965 to December 1969 with a variety of fuel configurations.

The "salt" that carried the MSRE's fuel was a mixture of the fluorides of lithium-7, beryllium and zirconium with a melting point of 840 degrees F. The fuel-laden salt flowed from the reactor's graphite-moderated core to a heat exchanger that transferred heat to another molten fluoride salt system, which carried the heat to an air-cooled radiator.

The reactor and the parts of the system that came in contact with the fiery-hot loops of circulating molten salt were made of nickel-based INOR-8, which ORNL helped develop. It's now called Alloy N and has been available commercially for 50 years in industry, representing an early example of the Lab's materials research and commercialization prowess.

Construction on the MSRE began in 1962. Test runs began in 1965 using uranium-235 as a fuel. The reactor reached full power in 1966, and operators enjoyed progressively longer runs following some initial hiccups. In 1968, an amount of uranium-233 was added to the fuel salt to demonstrate the design's flexibility. Renowned physicist and Atomic Energy Chairman Glenn Seaborg, who led the team that created the first amounts of U-233, came to ORNL to start the reactor. The MSRE group also experimented with plutonium in the fuel salt.

Some problems arose, such as surface cracking in the Alloy N caused by fission products, but they were manageable and for the most part eventually solved.

Weinberg described the MSRE's design as "primitive," but to a layman it is complex, with its intricately engineered pump systems and complicated chemistry. It was far different from other reactors, which proved to be a disadvantage because the MSRE also had competition. The AEC was committed to sodium-cooled, "fast breeder" designs

(continued on page 6)



ORNL Director Alvin Weinberg marked 6,000 power hours of performance of his brainchild, the Molten Salt Reactor Experiment, in October 1967. (ORNL photo)

### Alvin Weinberg documentary now posted on YouTube

The documentary "Alvin Weinberg," chronicling the life of the long-time ORNL director and renowned nuclear scientist and advocate, is now available on YouTube. The one-hour film by award-winning filmmaker Keith McDaniel premiered last year near what would have been Weinberg's 100th birthday. It combines archival photos and film footage with interviews of contemporaries such as former ORNL Deputy Director Murray Rosenthal, Fran Silver, Dave Hobson, Dr. Seaton Garrett, John Auxier, Howard Baker, Pat Postma, Bill Burch, Ray Wymer, Dave Reister, Payson "Rick" Lyton and Shigeko Uppuluri. UT-Battelle joined several organizations in supporting the film including the American Nuclear Society, Oak Ridge Associated Universities, TVA and Friends of ORNL.

## Service Anniversaries

## December 2015

**40 years:** Clifton R. Hyman III, Research Reactors; James Arthur Ayers, Facilities Management

**35 years:** William D. Strunk, Enrichment Science & Engineering; Teresa F. Ault, Laboratory Protection; Donald Clifford Gregory and Randy Gorman, Nuclear & Radiological Protection; Gary J. Capps, Energy & Transportation Science

**30 years:** Sharon K. Allen, Center for Computational Sciences; Cyril V. Thompson, Chemical Sciences; Moonis Raza Ally, Energy & Transportation Science; Frederick Alyious List III, Materials Science & Technology; Darrell G. Lawson, Laboratory Protection

**25 years:** Rob R. Smith, Chemical Sciences; Alan S. Icenhour, Nuclear Science & Engineering

**20 years:** Tammy R. Weakley, Logistical Services; Diane J. Sams, Business Management Services; Clint Rash, Acquisition Management Services

## January 2016

**40 years:** Herman X. Phillips, Nonreactor Nuclear Facilities

**35 years:** Tom D. Hylton, Nuclear Security & Isotope Technology

**30 years:** Michael S. Pung and J.L. Parkison, Information Technology Services; C. Lynn Sowder, Nuclear & Radiological Protection; David E. Fowler, EESD Safety and Business Operations; Martha J. Meigs, Physics; Thomas A. Boden, Amy K. Wolfe, and Robert B. Cook, Environmental Sciences; Regina W. Loy, Office of Integrated Performance Management

**25 years:** Rebecca W. Hepler, Health Services; Ernest Ryan Jr., Environmental Protection Services; Bruce E. Bates, Nonreactor Nuclear Facilities; Raymond G. Boeman, Energy & Environmental Sciences; Kenneth F. Read Jr., Physics; Becky Lee Hatton, Facilities Management; Lee B. McGetrick, Nuclear Science & Engineering

**20 years:** Joan W. Lawson, Safety Services; Cora Christine Nappo, Laboratory Protection; Becky R. Maggard, Chemical Sciences

## February 2016

**40 years:** James O. Kiggans Jr., Materials Science and Technology; Steven Leon Townsend, Facilities Management

**35 years:** Michael Eugene Leach, Safety Services; J.F. Mannes Schmidt, Computational Sciences & Engineering; James R. Younkin, Nuclear Security & Isotope Technology

**30 years:** Angela H. Fincher, Accounting Services; Tim Brown, Utilities; Karen D. Peacher and Ken R. Gray, Information Technology Services

**25 years:** Leslie A. Hook, Environmental Sciences; Deborah M. Counce, Communications; Janet L. Wagner, Office of Integrated Performance Management; Jerry Cunningham, Transportation & Waste Management; R.B. Parrish, Facilities Management; Allen W. Smith, Nonreactor Nuclear Facilities; Amy Sanders Coen, Information Technology Services

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## Friends of ORNL collecting dues for 2016

**Friends of ORNL (FORNL) is collecting dues for the 2016 calendar year.** The annual dues for 2016 are \$20.

If you want to gamble that you will live 10 years or more, consider a life membership at \$200 and in the future and forget about whether you have paid. An up-to-date list of members and their dues status will be available for viewing at the monthly FORNL meeting. Dues can be paid at a meeting or sent to the FORNL Treasurer (payable to FORNL, Vinod Sikka, Treasurer); or sent to: Vinod Sikka, 115 Dansworth Lane, Oak Ridge, Tenn. 37830).

FORNL is also accepting requests for ORNL visitors' badges from those who have paid their 2016 dues (or who are life members). To request a visitors' badge, e-mail Bob Hightower at hightowerjr@comcast.net with your full name (as it appears on your driver license) and a declaration that you are a US citizen.

FORNL is a nonprofit organization of persons interested in fostering the scientific goals of ORNL. FORNL is composed of scientists, engineers and individuals from varied backgrounds who believe in increasing the United States' technological awareness by providing information to teachers, students and the general public. 🌱

# THE NEWS

## OAK RIDGE NATIONAL LABORATORY

A Publication for the ORNL Employees of Union Carbide Nuclear Company, a Division of Union Carbide and Carbon Corporation

Vol. 8, No. 38

OAK RIDGE, TENNESSEE

Thursday, March 29, 1956

### Nelson Appointed To ORSORT Post

Lewis Nelson of the Applied Nuclear Physics Division at Oak Ridge National Laboratory has been appointed acting director of the Oak Ridge School of Reactor Technology. Announcement of the appointment was made by Alvin M. Weinberg on March 21.



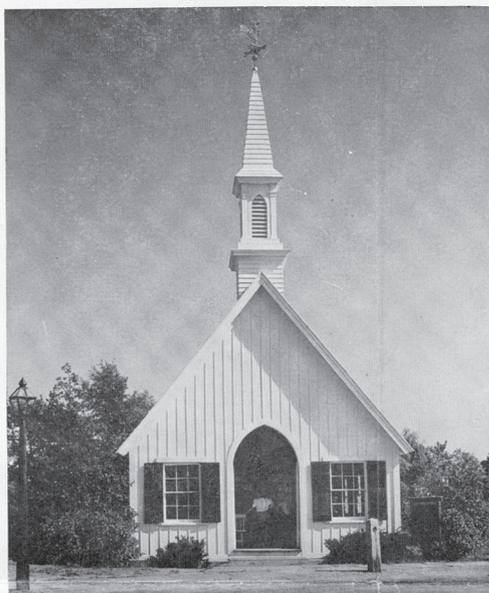
M. L. Nelson

Dr. Nelson will serve in the capacity of acting director of ORSORT during the absence of F. C. VonderLage, who is on leave to participate in the United States nuclear aid program for the Colombo Plan countries of the South-eastern Pacific.

#### Attended California Schools

Dr. Nelson has been a member of the Laboratory since May 2, 1949. He received his A.B. degree in mathematics from Chico State College, Chico, California, in 1936, and his Ph.D. degree in mathematics from the University of California in 1947.

He has been a member of the Applied Nuclear Physics Division since its formation in July of last year, and prior to that time served as assistant director of ORSORT.



**THE EASTER SEASON** will be observed by special services at churches throughout the city this week. The Community Sunrise Service will be at 6 AM on the lawn of the United Church Chapel in downtown Oak Ridge. The annual service is under the sponsorship of the Oak Ridge Christian Youth Council. This year's theme for the services will be the biblical "Three Gardens." Special music will be provided by a youth choir composed of young people from many different denominations in the community. The sponsoring organization is a national in nature, and people of all faiths are invited to join together.

### VonderLage Will Tour Asian Countries In Interests of Nuclear Energy Study

#### International Cooperation Administration Will Sponsor State Department Project

F. C. VonderLage of the Educational Division at Oak Ridge National Laboratory will leave the United States April 6 for a ten weeks' tour of south and southeast Asia. Dr. VonderLage will travel abroad as a member of a committee of people prominent in the fields

of medicine, agriculture, politics, science and atomic energy for the purpose of making a study and reporting recommendations for the establishment of an Asian Nuclear Center. The trip is sponsored by the International Cooperation Administration, United States Department of State.

The trip, which will include visits to Pakistan, India, Ceylon, Burma, Thailand, Cambodia, Laos, Viet Nam, Singapore, Indonesia, Japan, and the Philippine Islands, is being announced by J. B. Hollister, ICA Director, at a meeting of Colombo Nations in Singapore last fall.

#### Return to Brookhaven

Dr. VonderLage will arrive back

### Straub Will Attend Europe WHO Meet, ICRP Conferences

Conrad P. Straub, United States Public Health Service, on assignment to the Health Physics Division, Oak Ridge National Laboratory, will leave the United States on March 30 to attend three weeks of meetings in Europe. Dr. Straub will attend the Conference of the International Commission on Radiological Protection which will be held in Geneva, Switzerland, from April 3 through April 10. K. Z. Morgan of the Health Physics Division left Monday, March 26, to attend the



F. C. VonderLage



C. P. Straub

### Chicago University To Hear C. Collins

Clair J. Collins, Oak Ridge National Laboratory Chemistry Division, will present the Edward Clark Lee lecture for 1956 at the University of Chicago on April 3. Dr. Collins' subject will be "The Wagner-Meerwein Rearrangement."



C. J. Collins

The lectureship was endowed by the widow of the late Dr. Lee for the purpose of bringing to the university, lecturers who have conducted outstanding research in the field of organic chemistry.

Dr. Collins will also conduct the organic chemistry seminar at the University of Chicago, April 4, on "The Pinacol Rearrangement."

### Physical Society Draws Large OR

Eight divisions of Oak Ridge National Laboratory are represented at the annual meeting of the Southeastern Section of the American Physical Society now in progress at Fisk University, Nashville.

At the close of the meeting tomorrow, papers written by 34 members of the Laboratory will have been presented before various sessions of the meeting.

Invited papers by five ORNL members are included on the program. Presenting these papers are R. S. Livingston of the Electronuclear Research Division; W. C. Koehler, F. K. McGowan and T. A. Welton, Physics Division; and H. Rosenstock, Stable Isotopes Research and Production Division.

**Contributed Research Papers**  
Presented at sessions of the three-day meet will be contributed research papers by T. H. Handley of the Analytical Chemistry Division; J. D. Kington, Applied Nuclear Physics Division; N. G. Anderson, E. B. Darden Jr. and M. L. Randolph of the Biology Division.

Other divisions whose members contributed research papers include the Electronuclear Research Division, H. G. Blosser and A. Zucker; Health Physics Division, R. D. Birkhoff, T. E. Bortner,

## Sixty years ago this quarter Taken from ORNL "The News" for Winter 1956

- In the aftermath of the American Museum of Atomic Energy reporting a record attendance in 1955 of nearly 89,000 visitors, including 160 school groups, museum officials reported an exhibit of the Graphite Reactor and a demonstration of the Van De Graaff generator were the most popular activities.
- ORNL's Stable Isotope Research and Production Division reported the laboratory remained the primary source of stable (non-radioactive) isotopes, except deuterium, used in medicine, agriculture, industry and the physical sciences. Over the previous 10 years, ORNL issued nearly 50,000 authorizations (or licenses) for their everyday use to all 48 states, territories and 57 foreign countries.
- At the request of the Atomic Energy Commission (AEC), ORNL held a classified conference on the homogeneous reactor program (i.e., a homogeneous reactor is one in which the fuel material is evenly mixed throughout the moderator). This conference was held to inform industry of AEC's progress in the civilian power reactor program.
- It was determined the Oak Ridge Automatic Computer and Logical Engine (ORACLE) was researching mysteries of the atom so fast that its one-day output equaled 10 mathematicians working steadily for 10 years.—prepared by ORNL History Room volunteers

#### SAFETY SCOREBOARD

Your Laboratory Has Operated 2,491,000 Labor Hours Since Last Lost-Time Injury Through March 25



Meredith Graves working as a summer intern for HMK Architects in Brentwood.

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“I was able to see first-hand the importance of designing a structure that is both energy and environmentally efficient.”

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## Volunteers are always needed to help at AMSE

**Volunteers are always needed at the American Museum of Science and Energy** in Oak Ridge.

From serving at the information desk to helping with presentations to assisting visitors around the museum to talking about Oak Ridge history to helping with tours, volunteers are a useful resource for the tens of thousands of visitors who come to the museum each year. You don't have to have a science background.

While a number of volunteers are already serving at AMSE, more are always welcome.

If you are interested, please contact Glenda Bingham at 865-576-3200, [gbingham@amse.org](mailto:gbingham@amse.org).

## UT-Battelle Scholar Meredith Graves pursues dream of architecture career

From the time Meredith Graves was a freshman at Hardin Valley Academy, her goal has been architecture.

Now in the third year of a five-year program at the University of Tennessee, the 2013 UT-Battelle scholar is inching closer toward her goal.

“I'm interested in designing buildings that are environmentally friendly and will enable people to act and react to a structure and its design,” Meredith said recently while taking a break from classes. “I like to combine math with design and architecture. The experience I've had with the UT College of Architecture and Design has enabled me to pursue this interest with more passion than I ever thought imaginable.”

Meredith, the daughter of Van and René Graves of West Knoxville (Van works for ORNL's Nuclear Science and Engineering Directorate), was already focused on architecture when she earned the UT-Battelle Scholarship in April 2013. Her internship at ORNL during the summer of 2014 in the Buildings Technology Center helped Meredith to pinpoint her interest even more.

“I was able to see first-hand the importance of designing a structure that is both energy and environmentally efficient,” Meredith said. “I worked with Heather Buckberry (ORNL's Energy and Transportation Science Division) and I could see how there is so much more than just the design factor.”

Meredith also spent time that summer working with ORNL's Bill Miller – also of Energy and Transportation Science – who also taught her an environmental control systems class at UT.

“I learned a lot from Dr. Miller not only in the classroom, but also from the work he was doing at ORNL,” Meredith said. “That is one of the opportunities I might not have had without the UT-Battelle Scholarship.”

Meredith spent the summer of 2015 working as an intern for the firm HMK Architects, PLLC in Brentwood as she was able to expand her experiences. Between ORNL and HMK, Meredith has a planned path to follow.

“Designing public buildings such as schools and libraries very much interests me,” said Meredith, who as part of her college experience is planning to visit Poland during the spring of 2017. “As I'm scheduled to graduate in 2018, my next step would be to do what you might call a residency at a firm – not necessarily in Tennessee – and then either pursue a master's degree and/or hopefully work full-time for an architectural firm.”

In addition to UT's proximity to ORNL's Buildings Technology Center, Meredith credits the Governor's Chair program involving the university, ORNL and the firm Skidmore, Owings, and Merrill with enhancing her curriculum.

“The Governor's Chair program brings in many speakers and hosts programs that provide a wide spectrum about architecture that many schools probably don't offer,” Meredith said. “These programs have been extremely helpful to me. The Governor's Chair has allowed UT to be ranked 13th in the country among public universities' architecture programs.” –Fred Strohl 🌿

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*(1960s-era ORNL Molten Salt Reactor Experiment continued from page 3)*

while light-water, solid-fuel reactors eventually were adopted by the nuclear power industry. The MSRE lost funding and the entire program was shut down in 1973.

The reactor has been dormant ever since. In the early 1990s, reactions from the stored fuel triggered alarms in the facility, putting the MSRE briefly in the news. The facility has remained in stable repose under the purview of DOE's Office of Environmental Management. –Bill Cabage 🌿

## From the Lab Director

**Kudos.** We have a number of recent award winners from professional societies. Claus Daniel was invited to give a prestigious Gilbreth Lecture by the National Academy of Engineering (NAE). These lectureships are presented to early career researchers and named for the first woman elected to the NAE, Lillian Moller Gilbreth (who was, incidentally, grandmother of the Computer Science and Mathematics Division's Katherine Evans). UT-ORNL Governor's Chair professor Yilu Liu has been elected a fellow of the NAE. Robert Wagner and Adrian Sabau have been elected fellows of the American Society of Mechanical Engineers. Energy and Transportation Science Division researchers John Storey, Jim Szybist and John Thomas received McFarland Awards from the Society of Automotive Engineers for their service to the society.

**More honors.** A Nuclear Security and Isotope Technology Division team led by Tim Wynn received an Excellence Award from the National Nuclear Security Commission. The Hyperion cyber security technology, developed by a team led by the Computational Science and Engineering Division's Stacy Prowell, received a Federal Lab Consortium for Technology Transfer excellence award. The Chemical Sciences Division's Sheng Dai was listed on Thomson Reuters' "World's Most Influential Scientist Minds" list of top-cited researchers. Finally, the ORNL team that was part of the international element 117 collaboration was in the news again as the International Union for Pure and Applied Chemistry verified the new element. Congratulations to Jim Roberto, Krzysztof Rykaczewski and the team at the High Flux Isotope Reactor and Radiochemical Engineering Development Laboratory. (See cover story)

**Black History Month.** We had a very successful Black History Month observance in February highlighted by a keynote address delivered Feb. 24 by Dr. Gary S. May, Dean of Engineering at the Georgia Institute of Technology, one of our partner universities. The preceding week's Soul Food event featured showings of "The Clinton 12" film by Keith McDaniel and Will Minter's documentary on Oak Ridge from an African-American perspective. Proceeds from the month's activities will be donated to UUNIK Academy, Inc. of Knoxville.

**Support for students.** Approximately 30 students came to ORNL for a My Brother's Keeper Day, a White House initiative to help students of color reach their full potential. The event included the AMIE demonstration and a speed mentoring session with ORNL researchers and operations staff. Two UT-Battelle-supported teams from Jefferson Middle School (JMS) won in the regional FIRST LEGO League championship on Feb. 13. The Atomic Eagles received the Robot Strategy and Innovation Award. The JMS Master Builders received the first place Champions Award and will compete in the World Tournament in April in St. Louis. The Atomic Eagles are coached by Harold Shanafield, ORNL Environmental Sciences Division, and Janie Shanafield; the team's mentor is Thomas Proffen of the Neutron Sciences Directorate. Meanwhile, UT-Battelle-supported teams from several area high schools are using ORNL's Manufacturing Demonstration Facility to build and test robots for the annual FIRST Robotics Competition. This year, students are taking advantage of a new practice field provided by UT-Battelle. You can watch a video on YouTube about the program at <https://www.youtube.com/watch?v=OvJDiaA0NWY>

**HFIR milestone.** The High Flux Isotope Reactor recently achieved one million megawatt days of operation, a milestone that illustrates the durability and reliability of the nation's most powerful research reactor. In terms of days, HFIR has chalked up approximately 11,000 since its start in 1965, or just over 30 years of operation during its half century history, which includes a lengthy shutdown in the 1980s over embrittlement concerns. Thanks to the meticulous attention to detail by the staff members who support its operations, we'll see HFIR continue its service to the neutron science community for the foreseeable future.

*Thomas Mason*

Thom Mason



*Sam McKenzie, left, of ORNL's Neutron Sciences Directorate and a Knoxville County commissioner, talks to students from Knoxville's Austin-East High School about career opportunities in science, technology, engineering and math during the Laboratory's observance of My Brother's Keeper Day.*

(Photo by Jason Richards)

## Satyabrata Sen earns Sidney D. Drell Academic Award from security group

Satyabrata Sen of ORNL's Computer Science and Mathematics Division has been awarded the 2016 Sidney D. Drell Academic Award by Intelligence and National Security Alliance, an organization of public, private and academic sectors within the national security and intelligence communities



*Satyabrata Sen*

The award is named for Sidney D. Drell, a Fermi Award-winning theoretical physicist, arms control expert and professor emeritus at Stanford Linear Accelerator Center.

The award is named for Sidney D. Drell, a Fermi Award-winning theoretical physicist, arms control expert and professor emeritus at Stanford Linear Accelerator Center.



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## Researchers honored at UT-Battelle Awards Night

**Miaofang Chi of the Center for Nanophase Materials Sciences and Buddy Bland of the Center for Computational Sciences earned top honors at the 2015 UT-Battelle Awards Night.** Chi earned the ORNL Director's Award for Outstanding Individual Accomplishment in Science and Technology for her pioneering early career research in analytical electron microscopy. She also earned the Early-Career Research Award. Bland, director of the Oak Ridge Leadership Computing Facility, won the Director's Award for Outstanding Individual Accomplishment in Mission Support for his sustained, outstanding leadership and support of ORNL's high-performance computing initiatives under the DOE Office of Science. A team composed of Chris Patton, Judith Henry, Mike McIntosh, Ann Weaver, Glenn Buckley and Mike Mitchell won the Director's Award for Outstanding Team Accomplishment for the successful development and deployment of the Battelle Laboratory Operations Academy at ORNL – a key part of the ORNL plan to improve operational performance and the safety culture. 🌿



*Miaofang Chi*



*Buddy Bland*