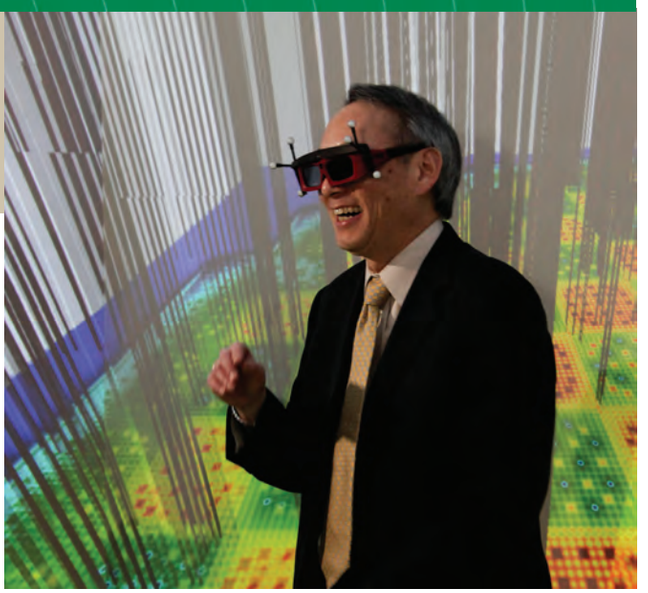
OAK RIDGE National Laboratory
Reporter
Retiree Newsletter
February/March 2013

SCIENCE

Supercomputers, materials and bears: ORNL marks eventful 2012



Secretary of Energy Steven Chu toured the Consortium for Advanced Simulation of Light Water Reactors Innovation Hub in 2012. (Image: Jason Richards)

Oak Ridge National Laboratory regained the lead in high-performance computing, enjoyed record-setting recognition for its research and became a showpiece for renewable energy technology during 2012.

ORNL's 2012 maintained a string of achievements in both research and support that is expected to continue into 2013. Among the highlights:

ORNL upgraded the Jaguar supercomputer to the 27-petaflops Titan, regaining the top spot on the TOP500 list of the world's supercomputers. Titan also proved to be one of the world's most energy efficient number crunchers, ranking No. 3 on the Green500 list.

An ORNL and University of Tennessee team used the Jaguar supercomputer to calculate the number of isotopes allowed by the laws of physics in research that was published in the journal *Nature*.

The Mars Curiosity rover successfully landed and began transmitting historic data back to Earth, thanks in part to ORNL's role in making the radioisotope-fueled generators that power the NASA vehicle.

ORNL set a record for R&D 100 Awards. Ten technologies involving ORNL research were named among *R&D Magazine's* top 100.

The Laboratory opened its new biomass-fueled steam plant that will generate up to 60,000 pounds of steam per hour from wood chips instead of fossil fuels.

ORNL scientist Steven Zinkle was elected to the National Academy of Engineering for his research in materials subjected to extreme environments. Neutron scattering researcher Herb Mook won the prestigious Onnes Prize for superconductivity research.

A black bear was trapped near the Laboratory in May 2012. (Image: Jason Richards)

ORNL's two world-class neutron facilities welcomed their 10,000th user since the addition of the High Flux Isotope Reactor's cold source and startup of the Spallation Neutron Source in 2006.

Two longstanding ORNL institutions observed golden anniversaries: The Radiation Safety Information Computation Center and Oak Ridge Isochronous Cyclotron, which is part of the Holifield Radioactive Ion Beam Facility, marked 50 years of service to the scientific community. A few weeks later, the Holifield Facility ended its 50-year run due to budget cuts, but not before a flurry of last-minute physics experiments.

Community outreach activities included ORNL researchers volunteering hours of personal time to area high school teams for the FIRST Robotics competition, Team UT-Battelle's role in building a house marking Aid to Distressed Families of Appalachian Counties' 25th year and a $150,000 UT-Battelle donation toward STEM-related renovations to the Boy Scouts of America's local camp. The Lab's United Way campaign raised more than $900,000 in a financially tough year.

ORNL's efforts in partnerships and technology transfer resulted in 203 new invention disclosures, 89 patent applications, 70 granted patents and the execution of 14 new cooperative research and development agreements with industrial partners.

The Oak Ridge Reservation experienced a flurry of bear activity in May, and one sighted bruin was eventually trapped by wildlife officers near the High Flux Isotope Reactor and relocated.

Last but not least, ORNL enjoyed one of its most injury-free years on record.

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Fred & Phyllis Smith help friends in need

Fred Smith and his wife Phyllis, who still works at the Lab.

Fred Smith in his ORNL office in 1998.

Fred and Phyllis Smith feel fortunate by virtue of the fact they are both active and can still do a number of activities with their three children and five grandchildren.

However, many of their senior friends either do not have children or their family members live far from Oak Ridge, which is why the Smiths have taken it upon themselves to serve these folks in various helpful ways.

"I grew up in Southern Mississippi where you learned to do a lot of different things at a young age and I still believe in living that way today," said Fred, who retired from ORNL's Chemical and Analytical Sciences Division almost a decade ago after 39 years service. "I believe you should help friends in need whenever possible and that is a lot of what I've been doing since I retired."

> "I've known many of these people for years and I am grateful that I can be of service to them."

Phyllis, Fred's wife of 52 years, has worked as a secretary at ORNL and Y-12. She is currently employed as a custodian at ORNL – usually working in the area around Main Street. In the meantime, Fred is staying busy helping his many friends.

"I can mow lawns, do some handyman chores, go grocery shopping – whatever is needed to be done," Fred said recently while sitting in the living room of his Emory Valley home that has been the Smith's residence since 1968. "I'm glad to help in any way I can. I've known many of these people for years and I am grateful that I can be of service to them either in their homes or if they are living in nursing homes or in assisted living."

A weekly highlight includes about a dozen of these friends attending a Bible study in the Smith's living room which is a program coordinated through Faith Promise Church of Solway.

"That class is where a lot of the activities I do originate from, but there are many others who I help out, as well," Fred says.

While helping friends is important to both Fred and Phyllis, activities with their children and grandchildren are important too.

Their daughter, Sonya, is a teacher at Oliver Springs High School. Their son, Terrell, works as an analytical chemist at TMA Everline in Oak Ridge. Daughter Michelle is a special education teacher in Sarasota, Fla.

The three children all played sports at Oak Ridge High School and the grandchildren have followed in their parents' footsteps.

A grandson played college soccer, but has since taken up lacrosse. Two granddaughters in Florida have played on national caliber high school softball teams and both are considered major college softball prospects.

"Phyllis and I always followed our kids in all of their activities and we try to do the same thing now with our grandchildren as much as possible," Fred says. "It means we have to travel a little further sometimes, but it is worth it."

Fred, who turns 74 on April 1, has no regrets about retirement.

"I enjoyed my time at ORNL, but I don't regret retiring when I did," Fred says. "I've been able to provide a lot of help for a lot of people these past 10 years. Phyllis and I both hope that we'll be able to continue that service for a long time to come."—*Fred Strohl*

Reporter is published for retirees of ORNL, which is managed by UT-Battelle for the U.S. Department of Energy.

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Scouring for evidence

ORNL tracks PCB contamination in White Oak Creek

Not many Oak Ridge National Laboratory research scientists can say that they have funding for scavenger hunts, but Teresa Mathews and colleagues in the Water Quality Protection Program can. The team has been tracking polychlorinated biphenyls, or PCBs, in fish from Oak Ridge Reservation waterways for the last five years.

PCBs are a class of highly stable compounds that were once used in a variety of industrial settings across the United States. However, the chemicals were banned in 1979 when they were found to be dangerous to wildlife and humans. Because they are able to cross cell membranes, accumulate in the fatty tissues of organisms and biomagnify up the food chain, these chemicals can severely impact ecosystems.

"PCB concentrations in fish collected in White Oak Creek are elevated with respect to fish collected from reference streams," Mathews says. "However, even though we know this watershed is contaminated because we have contaminated fish, we are not able to measure PCBs in the creek water using conventional analytical methods."

This is because PCBs are hydrophobic and tend not to stay dissolved in water at easily measurable concentrations. Because of this, tracking where these chemicals enter the creek is a challenge.

"We can't use fish as indicators of specific PCB sources to the creek because they're mobile," Mathews says. "Instead we had to look for alternative methods to pinpoint the source or sources of PCB contamination to the creek."

Mathews is using an innovative sampling tool for evaluating the specific sources and magnitude of PCBs entering the creek, which is helping her to eliminate potential suspects and has narrowed down her investigation. Called semipermeable membrane devices, or SPMDs, these sampling tools resemble scotch tape, but are filled with an oily substance that binds to PCBs. For three years she has been following the PCB trail that has led her from White Oak Creek to a small tributary called First Creek.

"If we want to see the concentrations of PCBs in fish go down, the first thing to do is identify the biggest source that is entering White Oak Creek and clean it up," Mathews says.

According to the initial SPMD results, the largest source is coming from First Creek. Later investigations have moved upstream in an attempt to even more narrowly identify PCB sources.

This summer, Mathews placed 28 SPMDs at 14 major storm drains leading into First Creek. The stationary SPMDs act as PCB nets, catching the chemicals and offering what the mobile fish cannot — clues that point toward the contamination source.

The fish of lower White Oak Creek contain more than 2 milligrams per kilogram of PCBs, which is higher than recommended state and federal guidelines for consumption of fish. Mathews and colleagues are hopeful that the PCB studies will be able to clearly identify the major sources of PCBs to area streams.

"We think that by using the results of our investigations to direct cleanup efforts, at some point in the future, fish in White Oak Creek will be at a level below the PCB health guidelines, and the health of the local ecosystem will improve," she says.–*Jennifer Brouner*

Terry Mathews, a member of the Water Quality Protection Program, is tracking the largest sources of PCB contamination in White Oak Creek.

Trent Jett, an aquatic ecology technician, collects the semipermeable membrane devices that are leading ORNL researchers to the source of PCB contamination in Oak Ridge Reservation waterways.

Honors and awards

ORNL researchers and support staff members have received a number of honors and awards in recent weeks, including those given out on Awards Night on November 16. The Awards Night honorees for 2012 can be seen on the Web at http://www.ornl.gov/info/awards/awards12/index.shtml.

Winners of the Director's Awards at Awards Night were for science and technology, **Lance Snead** of the Materials Science & Technology Division for his work in the application of materials science to nuclear technology; for Laboratory operations, Les Morgan of the Human Resources Directorate; for community engagement, **Gerry Palau** of the Facilities Development Division; and for team accomplishment, **Joe McAmis**, **Garfield Hedgecoth**, **Gregory Hughes**, **Robert Heidel**, **Kenneth Collins**, **Will Muncy**, **David Hill**, **Jason Baxter**, **Richard Boody**, **Billy Adkins** and **David Thomas** for their support for the Laboratory's new biomass steam plant construction project.

ORNL researchers elected fellows of the American Association for the Advancement of Science for 2013 are **Sean Smith**, director of ORNL's Center for Nanophase Materials Sciences; **Howard Hall**, UT-ORNL Governor's Chair for Global Nuclear Security; **Jimmy Mays**, professor of polymer chemistry and UT-ORNL distinguished scientist; **Gary Sayler**, Beaman Distinguished University Professor of Microbiology and researcher in the Joint Institute of Biological Sciences; **Alexei Sokolov**, Chemical Sciences Division researcher and UT-ORNL Governor's Chair in Polymer Science; and **Pengcheng Dai**, UT professor of physics and researcher in the Neutron Sciences Directorate.

ORNL's **Claus Daniel** and **Ben Preston** were selected by the Greater Knoxville Business Journal as two of 2012's "40 under 40" award winners.

Georgia Tourassi and **Songhua Xu** of the Biomedical Science and Engineering Center have been awarded a four-year grant to help answer one of the National Institute of Health's 24 "most provocative questions" in cancer research. They will focus on what environmental factors change the risk of various cancers when people move from one geographic region to another.

The Reactor & Nuclear Systems Division's **John C. Wagner** has been elected to fellow membership grade by the American Nuclear Society.

Materials S&T Division researcher and Corporate Fellow **Amit Goyal** has received a World Technology Award from the World Technology Network for his work in materials.

Robert Wagner and **Brian West** of the Fuels, Engines and Emissions Research Center at the National Transportation Research Center have received fellow grade status from the Society of Automotive Engineers.

Phil Maziasz of the Materials Science & Technology Division was awarded the 2012 William Hunt Eisenman Award of ASM International for his work in new heat-resistant stainless steel and alloy.

David Greene of the Center for Transportation Analysis has received the 2012 Roy W. Crum Distinguished Service Award from the National Academies' Transportation Research Board.

Oak Ridge High School students AJ Toth and Jim Andress won a $30,000 scholarship when they placed fourth Dec. 4 in the Siemens National Math and Science Competition. The duo, mentored by ORNL's **Chris Symons**, won the team category at the regional competition with their project titled "Creating a Higher-Efficiency Machine Learning Algorithm to Facilitate the Development of Cancer Treatment Drugs."

February

40 years: Gary E. Giles Jr., Computational Sciences & Engineering

35 years: Bonita M .Vought, EESD Safety & Business Operations; **John E. Polinsky Sr.,** Research Reactors; **Jim A. Crawford,** Facilities Management; **Phillip H. Hopper,** Utilities; **Steven Paul Hirshman,** Fusion Energy

30 years: Cheri Bandy Foust, Biosciences; **Mark W. Kohring,** Research Reactors; **Daniel L. Garner,** Reactor & Nuclear Systems; **Robert E. Norris Jr.** and **Kathy Ann Powers,** Materials Science & Technology

25 years: Randy M. Walker, Computational Sciences & Engineering; **Govind R. Rao** and **Barry D. Childs,** Nuclear & Radiological Protection; **Kahra G. Gilley,** Facilities Management

20 years: Randy L. Beatty, Global Nuclear Security Technology; **Catherine H. Mattus,** Energy & Transportation Science; **Sue L. Carroll,** Biosciences; **Donald H. Abercrombie,** US ITER Nuclear Systems; **JoAnn McReynolds Lowry,** Oak Ridge Counterintelligence; **Mengdawn Cheng,** Environmental Sciences; **Carolyn S. Harrell,** Logistical Services; **Gary W. McBee,** Facilities Management

March

35 years: William M. Giles, Logistical Services; **Russell Edward Langley,** Information Technology Services; **Peter F. Tortorelli,** Materials Science & Technology; **John D. Bell,** Computational Sciences & Engineering

30 years: Teri Hagan, Office of the Laboratory Director; **Darryl T. Dowling,** Physics; **Thomas Michael McNabb,** Logistical Services; **Jan Berry,** US ITER Nuclear Systems; **Francisco Barrera** and **Pedro L. Gonzalez,** Nuclear & Radiological Protection

25 years: Mary D. Eipeldauer and **William Joseph Reich,** Global Nuclear Security Technology; **Roger L. Davis,** Nuclear & Radiological Protection

20 years: Clark E. Piercy, Information Technology Services; **Glenda F. Hamlin,** Materials Science & Technology; **Kimberly B. Jeskie,** Integrated Operations Support; **Lucia L. Spears,** Logistical Services; **Richard Lowell Allen** and **Mark Travis Carr,** Environmental Protection & Waste Svs; **Michael D. Masters** and **Janet Arlene Loope**, Laboratory Protection; **Connie L. Dagley,** Accounting; **Phyllis S. Smith,** Facilities Management; **Diana Lynn Woody,** Utilities; **Cheng Liu,** Computational Sciences & Engineering

Mike Kyle's guitars have that 'rustic' look and feel

At ORNL's annual Fall Festival arts and crafts show in October, a back corner of the Conference Center's upstairs exhibit area frequently rang out with guitar sounds.

ORNL staff member Mike Kyle brought a selection of his "Rustic" line of musical instruments: custom-built electric guitars with bodies fashioned from barnwood and adorned with "found" rustic objects such as knobs, horseshoes and even vacuum cleaner logos. He builds them himself, often designing as he goes.

"I start laying parts out, and the guitar takes a shape of its own," Kyle says.

His Fall Festival exhibit drew Lab guitar pickers like cotton candy attracts kids.

While they are intriguing to look at, the guitars function extremely well as musical instruments. The necks are either taken from old guitars or ordered from a supplier, as are the pickups and electronics. They play and sound great.

Kyle, a facility maintenance supervisor at in the Research Reactor Division, had been a hobbyist guitar builder — you might say a luthier — for several years when his cousin, folk artist Bob Gray, brought him a guitar made from an old jerry can and asked him to help him align and attach the neck.

He designed a jig for the job and became interested in creating "folk art guitars" like his cousin. His Rustic designs are based on stuff you might come across in the backyard.

Each has a theme; for instance a horseshoe became "old gray mare", the logo plate of an ancient vacuum cleaner became Sweeper Vac, blown household fuses became knobs on the Fuse-caster, an old toy wagon became Radio Flyer and an antique license plate became the Tennessee Telecaster.

Since last fall's Lab exhibition he's added four more creations to the original five in his Paint Rock, Tenn. workshop. Prices range from $1500-$2500 for these one-of-a-kinders.

—Bill Cabage

Antique license plates — the cool ones shaped like the state of Tennessee — and screw-in fuses adorn Mike Kyle's designs. (Images: Jason Richards)

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.

Feb. 6	UT Men's Basketball vs. Georgia
Feb. 9	Knoxville Ice Bears vs. Pensacola
Feb. 10	Lady Vols Basketball vs. Ole Miss
Feb. 17	Lady Vols Basketball vs. Vanderbilt
Feb. 26	UT Men's Basketball vs. Florida
Feb. 28	UT Men's Basketball vs. Texas A&M
Mar. 9	Knoxville Ice Bears vs. Louisiana
Mar. 10	Mary Poppins (TN Theatre)
Mar. TBD	Dollywood/Splash Country Ticket Sale

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Magnesium Isotope Found by Former ORNL Researcher

Dr. Raymond K. Sheline, formerly a research participant at Oak Ridge National Laboratory and now a staff member at Florida State University, has reported the discovery of the first magnesium isotope with a half-life sufficiently long to permit its use in tracer studies. The report was made in a letter written by Dr. Sheline and his co-worker, N. R. Johnson, to the "Physical Review." The letter appeared in the January 15 issue. Mr. Johnson is a graduate student at Florida State.

Dr. Sheline's discovery is considered to be of particular significance because magnesium is the metal in the chlorophyll molecule; because of this fact, the new isotope is expected to provide another tool in photosynthesis research as well as in animal-metabolism studies involving magnesium. The isotope, magnesium-28, has a half-life of 21.3 hours and is a beta emitter. The next-longest-lived isotope, magnesium-27, has a half-life of only 9.6 minutes.

Dr. Sheline was a research participant at ORNL from September 1951 through January 1952, working with Dr. R. W. Stoughton of the Physical Chemistry group in the ORNL Chemistry Division. He spent two weeks at the Laboratory in June of last year, and has made many other visits here. Dr. Sheline's work and associations at the Laboratory have advanced his

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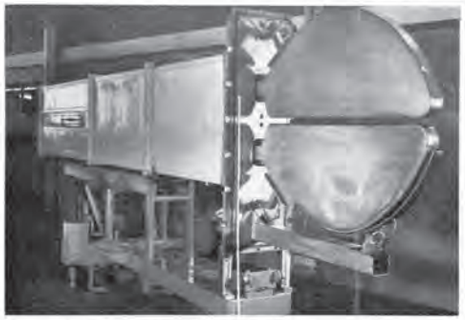


NEW ORNL CYCLOTRON MAKES NEWS—The 63-inch cyclotron at Y-12, operated by the Electromagnetic Research Division of Oak Ridge National Laboratory, is shown above. The cyclotron's "dees" (see story) are mounted in a vertical position and the whole system rests upon a motorized truck. Nitrogen ions originating in the ion source (not shown) placed in the center of the dees spiral outward until they strike the target, which is placed in the upper dee. When the deflector in the lower dee is used, the ions are directed into a target at the top of the vacuum chamber in which the dees operate. (Photo by Sienknecht)

PROUD GODPARENTS—Robert S. Livi... of the Electromagnetic Research Divi... is in charge of the experimental progr...

Laboratory Announces Achievement of Nuclear Fusion by 63-Inch Cyclotron

Public announcement has been made that the fusion of light elements to form heavier elements—the opposite of the widely publicized nuclear fission which makes the atom bomb and nuclear reactors a practical reality—has been achieved at Oak Ridge National Laboratory. The fusion is made possible by a special-purpose cyclotron now in use at the Laboratory's Y-12 facilities.

The new cyclotron, a 63-inch model, is the first such machine designed specifically to accelerate heavy particles. In the process, nitrogen ions are accelerated to an energy of 25 million electron volts (Mev), and with this energy it is possible to bring about the nuclear fusion of elements. Nitrogen nuclei are forced to combine with nuclei of such elements as oxygen and carbon to form the heavier nuclei of fluorine, sodium, and aluminum. These new and interesting reactions open a wide new field of fundamental research in physics, according to Dr. R. S. Livingston, head of the ORNL Electromagnetic Research Division, which is operating the cyclotron.

The first paper describing several unusual reactions produced by the new cyclotron was published in the January 15, 1953 issue of "The Physical Review," chief publication of the American Physical Society. The author, Dr. Alexander Zucker of ORNL, was also invited to present a report on these developments before the ASP meeting held in Cambridge, Mass., on January 24. To date, some twenty new nuclear reactions have been identified.

$1000 in Awards Will Be Presented To Fair Winners

More than $1000 in awards will be presented to the teen-age participants in the Fourth National Science Fair, which will be held in Oak Ridge on May 7, 8, and 9. Four first "wish awards," valued at $125 each, will be given. These prizes will enable the winners to purchase equipment needed in connection with their scientific projects. There are also four second-place awards valued at $75 each, and four third-place awards worth $50 each.

Only those boys and girls attending classes in the last three years of a secondary school whose exhibits have won highest honors in area competition will be coming to the fair, which is being sponsored locally by Carbide and Carbon Chemicals Company and the Oak Ridge Institute of Nuclear Studies. The fair is being administered by Science Service.

The contestants will set up their exhibits in the American Museum of Atomic Energy. While in Oak Ridge the youngsters will be con-

S. Corfman Heads UC Realty Company

Stanley A. Corfman has been appointed president of Carbide and Carbon Realty Company, a Division of Union Carbide and Carbon Corporation, according to an announcement by Morse G. Dial, president of the Corporation.

Mr. Corfman has been vice-president of the Office Building Division since 1951. A graduate of Oberlin College, he joined Union Carbide in 1919 as an assistant to the manager of the Industrial Relations Department. For the next ten years he served as industrial relations manager at plants of various companies in the Corporation.

S. A. Corfman

Mr. Corfman became connected with Union Carbide's realty activities in 1930 when he was made building manager of the Carbide and Carbon Building in Chicago. In 1945 he was transferred to New York and, in October 1951, was appointed vice president of the Office Building Division.

Pledges Asked For Bloodmobile Unit

Pledges should be made now for blood donations for the coming visit of the Bloodmobile Unit, announced Will D. Smith, blood-donor chairman of the Oak Ridge chapter, American Red Cross.

The unit will be in Oak Ridge Tuesday and Wednesday; February 24, from 2:00 PM to 8:00 PM and February 25 from 11 AM to 5:00 PM at Ridge Hall. "Because of the Bloodmobile's limited time in Oak Ridge, a well planned appointment schedule is necessary," Smith said.

The chairman called for an increased response from Ridgers, pointing out that the last quota was not reached. Blood donated to this unit is used for the armed forces. Anyone between the ages of 18 and 59 can donate.

Seventeen local organizations are helping recruit donors. Individuals wishing to donate blood can contact the ARC chapter at 5-5641.

Need a ride to work? Call The NEWS, 6310.

Sixty years ago this month

Taken from *The ORNL News* for February 1953

- ORNL announced the achievement of nuclear fusion by the 63-inch cyclotron at the Lab's Y-12 facility. Researchers in the Electromagnetic Research Division led by physicist Alexander Zucker accelerated nitrogen ions to an energy of 25 Mev, sufficient to allow nuclear fusion of elements to occur. These experiments opened a wide new field of fundamental research in physics.
- Electric power from nuclear energy was successfully produced by the Laboratory's Homogeneous Reactor Experiment. Even though the HRE only produced 150 kilowatts of electricity, it demonstrated the feasibility of a homogeneous, liquid-fuel reactor system for producing electric power.
- ORNL completes its first evacuation drill without a hitch. This drill is similar to standard drills held in large plants throughout the country as part of the national civilian defense program.

—prepared by ORNL History Room volunteers

From the Lab Director

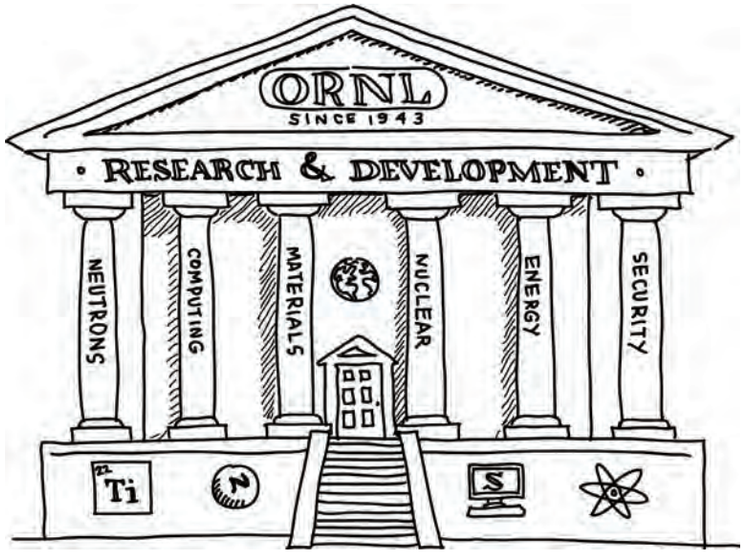
"ORNL and UT-Battelle are pitching in with students from several area high schools for this year's FIRST robotics competition."

ORNL staff members' efforts during Fiscal Year 2012 resulted in an excellent annual "report card" from DOE's Office of Science. We received A-minus and B-plus ratings and an award fee of approximately $10.5 million of a possible $11.2 million, or 94 percent of the potential fee. The Fiscal Year 2012 Fee Determination and Annual Performance Appraisal awarded A-minus ratings for mission accomplishment; design, fabrication and construction; science and technology program management; leadership-stewardship; environment, safety and health; and infrastructure; and B-plus ratings for business systems and safeguards and security. DOE cited ORNL's operation of its scientific user facilities, the Lab's "delivery of impactful science" and a successful work force restructuring to reduce operating costs. The annual letter from ORNL Site Office Manager Johnny Moore also cited the Lab's safety program, which achieved its second best injury rate on record. Science programs praised include the Lab's Energy Frontier Research Centers and a "highly productive" biological and environmental research portfolio. The letter also lauded ORNL's computational and neutron science work and the operation of the Holifield Radioactive Ion Beam Facility up to its termination of operations last spring.

ORNL and UT-Battelle are pitching in with students from several area high schools for this year's FIRST robotics competition. We hosted students for the kickoff event at our Manufacturing Demonstration Facility, or MDF, on Hardin Valley Road on January 5. Hundreds of students, parents and mentors attended to find out what this year's competition will be and to see a demonstration field where the students' complex robotic designs can be tested. The field, sponsored by Tech 2020 and assembled by the Hardin Valley Academy FIRST Alumni Club at the MDF, is available for all local teams to use during the build season. 2013 marks the third year of UT-Battelle's support for the FIRST robotics competition and the second year that the lab has opened the MDF to teams as a building space on evenings and weekends. If you are interested in participating, local FIRST representatives are looking for volunteers to help at the Smoky Mountains Regionals at the Knoxville Convention Center, March 28-30. Volunteer sign ups are available at https://my.usfirst.org/FIRSTPortal/Login/VIMS_Login.aspx.

If you like to spend time on a computer, I invite you to take a look at a "whiteboard" video that provides a 10-minute overview of ORNL. It's on ORNL's YouTube channel, http://www.youtube.com/watch?v=vOmmUHv3kaM.

Students check out the game field at a kickoff event for the 2013 FIRST Robotics Competition at ORNL's Manufacturing Demonstration Facility. (Image: Jason Richards)



The whiteboard video gives a great overview of the Lab's R&D mission. It's on YouTube.

Thom Mason

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Colorful science

This refrigerator in Building 1505 contains a colorful collection of chemicals used in microbiology experiments. It's in the Biosciences Division laboratory of Dwayne Elias. (Image: Jason Richards)