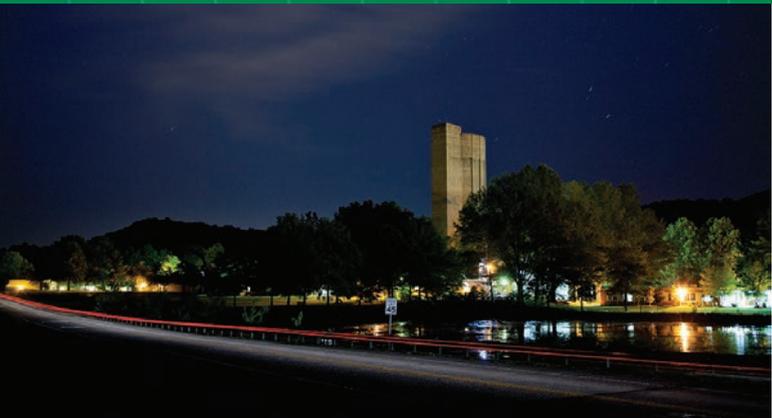


**SCIENCE**

## American Physical Society names ORNL's Holifield Facility national historic physics site



ORNL's Holifield Radioactive Ion Beam Facility.  
(Photo by Jason Richards)

**The American Physical Society (APS) has honored the Holifield Radioactive Ion Beam Facility as an APS Historic Physics Site.** It is the first designated APS Historic Physics Site in the state of Tennessee.

The APS is one of the world's top professional societies for scientists. APS President Laura Greene presented a plaque July 25 marking the historical designation of the now decommissioned physics research facility to kick off the Nuclear Structure 2016 Conference and Neutrinos in Nuclear Physics Workshop in Knoxville. ORNL Deputy for Science and Technology Thomas Zacharia accepted the plaque for ORNL.

"In naming the Holifield Radioactive Ion Beam Facility as a Historic Physics Site, the American Physical Society took into consideration the half century of nuclear and atomic physics research performed there, as well as the scores of scientists who performed experiments with its unique capabilities," Greene said. "The Holifield Facility has indeed been an important contributor to the physical sciences history."

The Holifield Radioactive Ion Beam Facility and its predecessors, the Oak Ridge Isochronous Cyclotron (ORIC) and the Holifield Heavy Ion Research Facility, supported five decades of nuclear physics and astrophysics research at ORNL. The facilities provided unique accelerated beams of light ions, heavy ions and short-lived radioactive nuclei for nuclear structure and reaction studies, astrophysics research and interdisciplinary applications.

"The Holifield Facility is an ORNL landmark in many ways, from the iconic tower for the tandem

accelerator to the groundbreaking scientific results obtained there and published," Zacharia said. "We are very honored by the American Physical Society's recognition."

Placed into operation in 1962, the ORIC was one of the world's first cyclotrons to exploit azimuthally varying field focusing. It provided a wide variety of particle beams for nuclear physics and chemistry experiments.

In the 1970s ORNL added the 25-million volt Tandem Electrostatic Accelerator and the ORIC was reconfigured to serve as a booster

accelerator. In 1980, the resulting Holifield Heavy Ion Research Facility — named for U.S. Rep. Chet Holifield, D-Calif., an atomic energy advocate

— was identified as a DOE national user facility to provide more than 70 ion species for researchers worldwide.

Growing interest in research using beams of short-lived radioactive ions led to another reconfiguration of the facility, with the ORIC serving as a driver accelerator to produce radioactive ion species that were then injected into and accelerated by the 25-MV tandem. The new configuration, opened in 1997, was renamed the Holifield Radioactive Ion Beam Facility (HRIBF).

Through world-leading isotope separation developments, the HRIBF

*(continued on page 2)*

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## Retired Sustainable Transportation Program director Ron Graves leaves innovation legacy



Ron Graves with his current track car, a rare Porsche 911 GT2, at the victory circle area of Pocono Raceway in Pennsylvania.

Sitting in the driver's seat comes naturally to Ron Graves, the recently retired head of ORNL's Sustainable Transportation Program.

Graves has logged more than 100 days on national racetracks such as Daytona, Road Atlanta and Pocono and routinely reaches speeds of 175 mph in high-performance driving events. He jokes that it is not the speed that is dangerous at these events, but the "sudden stops."

His early race track skills were developed in a DeTomaso Pantera that he restored, rebuilding the engine, transmission, brakes and updating the original pumpkin orange paint to a shiny red.

"Learning to drive fast in a car with bad brakes and diabolical handling has advantages in the long run," said Ron, whose passion for cars has been a hobby and a career.

"Being a gearhead has enhanced networking with automotive executives and technology leaders over the years," Ron said. "Most of the leadership is car people."

"Being a gearhead has enhanced networking with automotive executives and technology leaders over the years."

During his 39 years at ORNL, Graves worked closely with vehicle experts from across the industry through R&D partnerships and by personally serving on technical teams, working groups and committees for DOE and other professional transportation organizations. He was the first ORNL staff member elected as a fellow of the Society of Automotive Engineers International and has a slew of honors to his credit from DOE and organizations such as the Tennessee Automotive Manufacturers Association, which recently inducted him into its hall of fame for his positive impact on the state's automotive industry.

ORNL twice contributed to the implementation of national clean fuel regulations and helped make non-sulfur "clean diesel" a reality, saving hundreds of millions of tons of greenhouse gas emissions and virtually eliminating pollutants from diesel exhaust. His teams developed award-winning research instruments that industry cited as helping tune engine combustion in ways not thought possible and gave new insights on emission control chemistry.

As Sustainable Transportation Program director, Ron implemented expanded uses of ORNL big science tools to vehicle technology barriers along with new work for the Department of Transportation in transportation cyber security and battery safety, helping materials researchers' innovations continue to have an impact on millions of vehicles.

Before ORNL established the National Transportation Research Center in West Knox County, Ron made the quiet suggestion to leadership 40 years ago that ORNL could contribute in addressing the transportation-related national challenges of petroleum dependence and declining air quality.

Though he tends to downplay his pivotal role, Ron was a key driver behind the creation of ORNL's engines and emissions research capabilities as well as the growth of its \$65 million dollar Sustainable Transportation Program. —Kim Askey 🌿

### ORNL contributes to new federal truck standards

ORNL's Vehicle Systems Integration (VSI) Laboratory research has been cited by the Environmental Protection Agency and the Department of Transportation's National Highway Traffic Safety Administration in the recently released jointly finalized standards for medium- and heavy-duty vehicles.

The new standards are designed to improve fuel efficiency and cut greenhouse gas emissions while bolstering energy security and spurring manufacturing innovation. The VSI Lab is part of the Center for Transportation Analysis.

Researchers used the VSI Lab to assist development of new engine and powertrain test procedure options.

*Atomic level magnetic behavior detection now possible continued from page 1)*

provided high-quality beams of 200 rare isotopes. More than 50 of these were produced at world-record intensity.

The exceptional abilities of the staff and instrumentation enabled groundbreaking achievements including the first measurement with a reaccelerated unstable beam in North America.

The Holifield Facility was placed in shutdown status in 2012, which marked its 50th year of operation. —Bill Cabage 🌿

# Manufacturing Demonstration Facility's 3-D-printed tool used for building aircraft achieves Guinness World Record recognition

A 3-D printed trim-and-drill tool, developed by ORNL researchers and to be evaluated at The Boeing Company, has received the title of largest solid 3-D-printed item by Guinness World Records.

ORNL printed the lower cost trim tool in only 30 hours using carbon fiber and thermoplastic composite materials, which will be tested in building the Boeing 777X passenger jet. At 17.5 feet long, 5.5 feet wide and 1.5 feet tall, the 3-D-printed structure is comparable in length to a large sport utility vehicle and weighs approximately 1,650 pounds.

"The existing, more expensive metallic tooling option we currently use comes from a supplier and typically takes three months to manufacture using conventional techniques," said Leo Christodoulou, Boeing's director of structures and materials. "Additively manufactured tools, such as the 777X wing trim tool, will save energy, time, labor and production cost and are part of our overall strategy to apply 3-D printing technology in key production areas."

During an awards ceremony held Aug. 29 at DOE's Manufacturing Demonstration Facility at ORNL, where the component was 3-D printed on ORNL's Big Area Additive Manufacturing machine, Guinness World Records judge Michael Empric measured the trim tool, proved it exceeded the required minimum of 0.3 cubic meters, or approximately 10.6 cubic feet, and announced the new record title.

"The recognition by Guinness World Records draws attention to the advances we're making in large-scale additive

manufacturing composites research," said Vlastimil Kunc, leader of ORNL's polymer materials development team. "Using 3-D printing, we could design the tool with less material and without compromising its function."

After ORNL completes verification testing, Boeing plans to use the additively manufactured trim-and-drill tool in the company's new production facility in St. Louis and provide information back to ORNL on the tool's performance. The tool will be used to secure the jet's composite wing skin for drilling and machining before assembly. Production of the 777X is scheduled to begin in 2017 and first delivery is targeted for 2020.

The project is supported by DOE's Office of Energy Efficiency and Renewable Energy Advanced Manufacturing Office (AMO), which supports applied research, development and demonstration of new materials and processes for energy efficiency in manufacturing as well as platform technologies for the manufacturing of clean energy products.

More information about ORNL's Innovations in Manufacturing program is available at <http://web.ornl.gov/sci/manufacturing/>.

—Sara Shoemaker

"The recognition by Guinness World Records draws attention to the advances we're making in large-scale additive manufacturing composites research"



ORNL's Vlastimil Kunc, left, leader of ORNL's polymer materials development team, holds the plaque presented by Guinness World Records judge Michael Empric. (Photo by Carlos Jones)



A 3-D-printed trim tool developed by ORNL and Boeing to be used in building Boeing's 777X passenger jet has received the title of largest solid 3D printed item by Guinness World Records. (Photo by Carlos Jones)

## ORNL media highlights available weekly online at <http://fornl.info>

A weekly listing of ORNL's mentions in the media is now available on the web at <http://fornl.info>.

Compiled by ORNL's Office of Communications from information provided by several media monitoring resources, the media highlights list all of the stories related to ORNL that appear in local and national media during a given week, along with a link to the stories when the links are available. The highlights are available along the left-hand side of the web site.

For more information, contact Fred Strohl, 865-544-4165, [strohlhf@ornl.gov](mailto:strohlhf@ornl.gov).



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## Service Anniversaries

## June 2016

**40 years:** Karen H. Galloway, Nuclear & Radiological Protection; Robert Thomas Jubin and Benjamin E. Lewis Jr., Nuclear Security & Isotope Technology; Benjamin Thomas Jr., Homeland Security; Raymond C. Juras, Physics; Bennett Richard Bass and Johnny S. Tolliver, Computational Sciences & Engineering; Michael T. Huie and Leroy Sims, Business Management Services; Charles R. Foust, Fusion & Materials for Nuclear Systems

**35 years:** Larry R. Baylor, Fusion & Materials for Nuclear Systems; Deryl A. Steinert, Center for Computational Sciences; James W. Simmons, Information Technology Services; Rebecca J. Moses, Reactor & Nuclear Systems

**30 years:** Suzanne W. Willoughby, Information Technology Services

**25 years:** William D. Rogers, Directorate Operations Office; Paul C. Shipe, Computational Sciences & Engineering; Leon M. Tolbert, Electrical & Electronics Systems Research; Kenda Norris Evans, Integrated Operations Support; William John Black, Health Services; Michael Hulsey, Business Management Services; Ed F. D'Azevedo, Computer Science and Mathematics; Charles Trent Ramsey, Mary L. Wells and Terry Lynn Brown, Research Reactors; N. Diane Kosier and Mark Stephen Greeley Jr., Environmental Sciences; Tricia Bryant, Business Operations & Strategy Services; David K. Broughton, Information Technology Services; Tina C. Moore, Fusion & Materials for Nuclear Systems; Roy E. Shearin, US ITER Nuclear Systems; Tse-Yuan S. Lu, Biosciences; Donnie Edward Bentley, Laboratory Protection; Cathryn P. Wilson, PSD Integrated Research Operations

**20 years:** Sandra S. Goldston, DOD/IC Integration

## July 2016

**40 years:** Eddie H. McBay, Chemical Sciences; Tim Welch, Nuclear Security & Isotope Technology

**35 years:** Mark E. Mathews, Safety Services; Terry D. Scoggins, Information Technology Services; Stanton W. Hadley, Electrical & Electronics Systems Research

**30 years:** Ralph H. Ilgner, Chemical Sciences

**25 years:** Vincent L. Harvest and Mark T. Russell, Logistical Services; Terry M. Bonine and Patricia A. Scofield, Environmental Protection Services; Michael Caldwell and Barney T. Gaskin, Facilities Management; Bruce G. Walker, Nonreactor Nuclear Facilities; Joel A. Miller, Nuclear & Radiological Protection; James W. Pearce, Communications; Ella Hawkins DuBose, Human Resources; Paula D. Irizarry, Integrated Operations Support; Steven Jerome Heimsoth, Research Accelerator; Hugh Thomas Christie II, Research Reactors; John Etheridge Price and Donald E. Searle, Utilities; Anthony O. Seay, Information Technology Services; Miriam L. Land, Biosciences; Kimberley K. Miner, Global Security; Lisa P. Hawk, Acquisition Management Services; Lee C. Smith, Office of Integrated Performance Management; Mary Sue Hamilton and April S. Dixon, Transportation & Waste Management; Slobodan Rajic and Charles David Warren, Energy & Transportation Science

**20 years:** Lori Love, US ITER Non-Nuclear Systems

## August 2016

**40 years:** Johnny H. Fairs, Integrated Operations Support; Janet V. Honey, Research Reactors; Richard Wayne Leggett, Environmental Sciences; Richard M. Davis, Defense; Jack P. Adams, Transportation & Waste Management; Margaret Boone "Bonnie" Nestor, Office of the Laboratory Director; Nancy Young Wright, Human Resources

**35 years:** Eddie Martin Shirley II, Research Reactors; Michael A. Green, Nuclear & Radiological Protection

**30 years:** Matthew R. Feldman, Reactor & Nuclear Systems; Kathy D. Rowley, Nuclear Security & Isotope Technology; Fay Frederick, International Security & Analysis; David O. Vick, Safety Services

**25 years:** Mark D. Lower, Kenneth Edward Dailey and John Andrew Christopher, Facilities Management; Renee Manning, Communications; Laurie Rae Brown and Charles Edward Dinkins, Research Reactors; Sheila A. Moore and Jerald Allen Atchley, Energy & Transportation Science; Judy Chumley Zager and Jeff Hensley, Information Technology Services; Lee Ann Wilson, Environmental Sciences; George Q. Rennich, Instrument and Source; Louis M. Walden II and Vanessa Black, Human Resources; Patricia Jo Crabtree, Retirement Services; Crystal A. Schrof, Scientific and Program Services Office; DeAnn Ingram, Laboratory Protection; Keith Roy Adkins and James M. Hill, Logistical Services; Joey T. Weaver, Research Accelerator; Mark Stephen Luttrell, Nuclear & Radiological Protection; Robert Wayne Holbert, Integrated Operations Support; Cheryl M. Edwards, DOD/IC Integration; Mitzi B. Bailey, Acquisition Management Services; Greg Byrd, Facilities & Operations

**20 years:** Phong T. Nguyen and Paul M. Lane, Nuclear & Radiological Protection

## 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.

# 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. 9 — No. 12

OAK RIDGE, TENNESSEE

Friday, Sept. 28, 1956

### ORNL's Combined Community Chest-Red Cross Drive Slated

#### Laboratory Schedules Visit and Lecture By Notable English Scientist, Cockcroft

On Monday, October 1, the members of Oak Ridge National Laboratory's technical staff will hear a seminar given by the eminent English scientist Sir John Cockcroft, who is director of the Atomic Energy Research Establishment at Harwell, England. The seminar, entitled "The United Kingdom's Nuclear Power Program," will be presented at 2 PM in the auditorium of Building 4500.

Sir John Cockcroft is one of the members of the United Kingdom Atomic Energy Authority, which on August 1, 1954, took over control of all atomic energy developments in Britain. Formerly one of Cavendish Laboratory's brilliant young scientists and then Professor of natural philosophy at Cambridge, he played a leading part in government-defense research during the second world war.

President of the European Atomic Energy Society, which is concerned with the industrial uses of atomic energy, Sir John is also an appointed-member of the Scientific Advisory Committee to the European Organization for Nuclear Research.

#### Nobel Prize Winner

It is as a nuclear physicist that Sir John is best known today. Five years ago he shared with Professor E. T. S. Walton of Dublin the Nobel Prize for physics. Achieving outstanding results in the field of nuclear research, Sir John is also recognized in the field of electrical engineering for his contribution to the wartime de-

Continued on Page 3

#### Instrument Society Will Hear Gifford

The Oak Ridge Section of the Instrument Society of America will hold its 111th meeting on October 3 at the Ridge Recreation Hall, beginning at 8 PM. F. A. Gifford Jr., United States Weather Bureau, Oak Ridge, will deliver the main address, "The Planet Mars."

Dr. Gifford, in his talk, will present information of general interest concerning studies of the planet Mars along with some of the many instrumentation problems involved therein, such as the special adaptation of infra-red spectrophotometers.

#### Attended Penn State

The speaker has been with the United States Weather Bureau at Washington, D. C., and in Pennsylvania for five years. He received his M.S. and Ph.D. degrees in meteorology from Pennsylvania State University. He has been active in the International Mars Committee, an informal organization of astronomers and others interested in intensive studies of Mars. He has recently returned from Arizona and New Mexico, where he participated in observations of Mars during the recent close approach of the planet.



SIR JOHN COCKCROFT

#### AEC Welding Group Holds ORNL Meet

The sixth annual meeting of the Atomic Energy Commission Welding Committee was held at Oak Ridge National Laboratory this past week, Tuesday and Wednesday, September 25 and 26. Approximately 80 representatives of industries and research organizations across the country attended the classified sessions.

#### SAFETY SCOREBOARD

Your Laboratory Has Operated 2,254,000 Labor Hours Since Last Lost-Time Injury Through September 23



Tower Shielding Facility—Oak Ridge

#### Knox-Ridge Section Slates Monday Talk By AIChE Leader

Walter G. Whitman, national president of the American Institute of Chemical Engineers, will address a meeting of the Knoxville-Oak Ridge Section of AIChE on Monday night, October 1, at the Knights of Columbus Hall in Oak Ridge beginning at 8 PM. Dr. Whitman's topic will be "Some Experiences at the Atoms for Peace Conference in Geneva."

#### Qualified Authority

Dr. Whitman was secretary-general of the United Nations' International Conference on the Peaceful Uses of Atomic Energy, which was held in Geneva, Switzerland, in August, 1955. He is presently head of the Department of Chemical Engineering at Massachusetts Institute of Technology and a member of the General Advisory Committee to the Atomic Energy Commission. In addition, he heads a nation-wide organization of some 16,000 chemical engineers.

All interested persons are invited to attend the meeting.

#### Dresner Presents Paper At Brookhaven Meeting

Lawrence Dresner of the ORNL Applied Nuclear Physics Division attended the Brookhaven Conference on Resonance Absorption of Neutrons in Nuclear Reactors, which was held at Brookhaven National Laboratory on Monday.

#### W. Unger Will Head ORNL Campaign; October 8 Set as Drive's Opening Date

On October 8, the Oak Ridge Community Chest, Incorporated, and the Oak Ridge Chapter of the American Red Cross will open their joint campaign for funds at Oak Ridge National Laboratory. For the first time in the local history of the two organizations, they will join forces for fund-raising activities here in Oak Ridge. A considerable saving in both expense and time is expected to be the result of the combined drive, with contributors getting an opportunity to give "Once and for ALL."



W. E. UNGER

William E. Unger will be general chairman of the ORNL drive. He is a member of the Chemical Technology Division. Mr. Unger's divisional coordinators are expected to be announced early next week.

The over-all drive for the Oak Ridge area is under the direction of W. V. Hamilton, head of Carbide's Central Employment Office in Oak Ridge. George Flack will conduct the Y-12 campaign, and Harold Mayberry will be chairman of the K-25 drive. Howard Doyle of Carbide's General Industrial Relations Department will coordinate the three-plant drives from his K-25 offices.

This year's contributions may

Continued on Page 3

#### MANLY PRESENTS TALK

William D. Manly of the Oak Ridge National Laboratory's Metallurgy Division will present an invited address in Pennsylvania next week. Mr. Manly will speak before members of the Naval Air Development and Material Center at Johnsville, Pennsylvania.

#### 'Tower' Article by Laboratory Member Is Featured by National C-F Magazine

### Sixty years ago this quarter

Taken from ORNL "The News" for Summer 1956

- Democratic presidential candidate Adlai Stevenson and his running mate, Sen. Estes Kefauver, D-Tenn., visited ORNL during a campaign swing through East Tennessee. See Page 8 for details.
- Nobel Prize laureate Sir John Cockcroft of Great Britain, director of the Atomic Energy Research Establishment in Harwell, England, presented a seminar to ORNL's technical staff titled "The United Kingdom's Nuclear Power Program."
- Gibson Morris of ORNL's Engineering and Mechanical Division wrote a feature story for Civil Engineering, the monthly publication of the American Society of Civil Engineers, about the Tower Shielding Facility.—prepared by ORNL History Room volunteers

## New residential water heater concept promises high efficiency, less cost due to ORNL–University of Florida collaboration

A team of scientists from ORNL and the University of Florida has developed a novel method that could yield lower-cost, higher-efficiency systems for water heating in residential buildings.

The theory behind the newly termed “semi-open” natural gas-fired design, explained in an ORNL-led paper published in *Renewable Energy* reduces the cost and complexity of traditional closed gas-fired systems by streamlining, and even eliminating, certain components.

“When applied, the new concept could result in better than 100 percent energy efficiency, because the system draws energy from the surrounding air as well as from the natural gas,” said ORNL’s Kyle Gluesenkamp, lead author of “Efficiency Analysis of Semi-Open Sorption Heat Pump Systems.” The published paper is available at <http://www.sciencedirect.com/science/article/pii/S0960148116306905>.

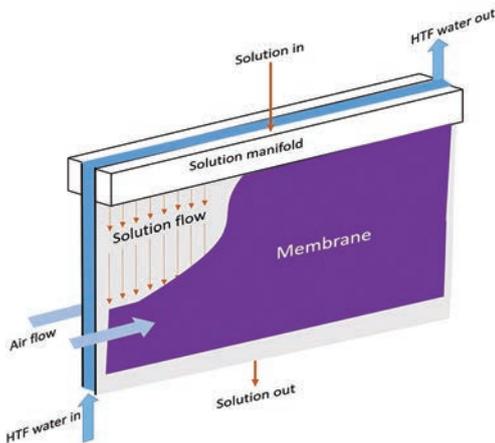
The versatile design combines water heating and dehumidification functions, which are typically found in separate architectures. In the semi-open scenario, the novel absorber device acts in place of the traditional evaporator component, pulling water vapor directly from the air through a membrane into a liquid solution. As the vapor is absorbed, much of the heat is transferred to domestic hot water.

The simpler semi-open system would operate at the surrounding atmospheric pressure, using an inexpensive, non-sealed solution pump. This approach eliminates the need for vacuum pumps found in closed systems that purge gas buildup. It also allows manufacturers to consider lower-cost, lightweight polymers instead of costly, bulkier metals to build equipment, making it less susceptible to corrosion.

“The semi-open architecture introduces a new class of ultra-efficient heat pump water heaters that could become commercially available in a few years to homeowners seeking to replace their existing gas water heater,” Gluesenkamp said.

University of Florida researchers are leading the development of a semi-open gas-fired heat pump prototype and are using both ORNL’s Building Technologies Research and Integration Center and University of Florida facilities to evaluate the potential of commercial applications.

Co-authors of the study include ORNL’s Omar Abdelaziz and the University of Florida’s Devesh Chugh and Saeed Maghaddam. —Sara Shoemaker 🌱



A new class of gas-fired heat pump water heater systems, based on a novel semi-open sorption concept, replaces the evaporator in a traditional closed sorption device with a permeable membrane that more efficiently absorbs and transfers heat for residential applications.

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“When applied, the new concept could result in better than 100 percent efficiency because the system draws energy from the surrounding air as well as from the natural gas.”

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## ORNL, Berkeley are part of \$16 million DOE effort toward computer design of materials

DOE is planning to invest \$16 million over four years to accelerate the design of new materials through the use of supercomputers utilizing teams from ORNL and Lawrence Berkeley National Laboratory.

The two teams will work to develop software to design fundamentally new functional materials destined to revolutionize applications in alternative and renewable energy, electronics and a wide range of other fields. The research teams include experts from universities and other national labs.

The new grants—part of DOE’s Computational Materials Sciences program begun in 2015 as part of the U.S. Materials Genome Initiative—reflect the enormous recent growth in computing power and the increasing capability of high-performance computers to model and simulate the behavior of matter at the atomic and molecular scales.

The teams are expected to develop sophisticated and user-friendly open-source software that captures the essential physics of relevant systems and can be used by the broader research community and by industry to accelerate the design of new functional materials. —Dawn Levy 🌱

## From the Lab Director

**Historic site:** The American Physical Society's president-elect, Laura Greene, recognized ORNL's Holifield Radioactive Ion Beam Facility as an APS Historic Physics Site at the recent Nuclear Structure 2016 Conference and Neutrinos in Nuclear Physics Workshop held in Knoxville.

It's always gratifying to see ORNL's legacy in the sciences documented, particularly by such an esteemed professional society. The Holifield Facility, in its evolving arrangements as a heavy ion facility, a radioactive ion beam facility and as home of the Oak Ridge Isochronous Cyclotron and Tandem Electrostatic Accelerator, contributed decades of important physics research and hosted scores of researchers from around the world.



**ORNL Review:** Our science magazine, *ORNL Review*, has revamped its website. Articles that are featured in the magazine will be included on the website, along with other science and technology news from the Lab. Our Communications and Information Technology Services staff members have collaborated to present the latest work of the Lab to the public in a sleek new blog format.

**Energy and Environmental Sciences Directorate: Congratulations to Moe Khaleel** on his new post as Associate Laboratory Director for Energy and Environmental Sciences. Since coming to ORNL last year, Moe has managed the Laboratory's Office of Institutional Planning and ARPA-E program and has been a motivator for major initiatives such as Big Science Questions. In EESD, he will be responsible for a range of science and engineering activities serving several DOE programs. He succeeds Martin Keller, who is now director of the National Renewable Energy Laboratory. I'd particularly like to thank former Environmental Sciences Division Director Gary Jacobs for coming out of retirement to so ably run the directorate during the interim.

**Kudos:** We have several new professional society fellows. The Materials Science and Technology Division's **Michael Brady** is a fellow of ASM International. **Nidea Gallego**, also of MSTD, has been elected fellow of the American Carbon Society and US ITER's **Graeme Murdoch** is a fellow of the UK Institution of Mechanical Engineers. Congratulations to our four finalists for this year's YWCA Tribute to Women: **Diana Hun, Suzanne Parete-Koon, Andrea Rocha** and **Athena Safa Sefat**. Finally, everyone from ORNL who entered a technology for this year's R&D 100 competition is a finalist. The R&D 100 awards winners will be announced in November.

*Thomas Mason*

Thom

## New ladder installed atop SNS water tower

**ORNL's Facilities and Operations Directorate recently replaced the ladder** that runs up the side of the 210-foot-tall water tower at the Spallation Neutron Source. The old ladder needed to be replaced because it did not meet current code requirements.

J.P. Biondo headed the team whose members are experienced in working on smokestacks rising to heights of 200 feet-plus. J.P.'s team consisted of ironworkers Gary Sills, Tim Jones and Mickey Phillips, welder Steve Malone and crane operator Jason Lainhart. 🌱



*Ironworker Gary Sills stands at the summit of the Chestnut Ridge water tower. (Photos provided by Facilities and Operations Directorate)*

## ORNL-led study analyses electric grid vulnerabilities

**ORNL's climate and energy scientists have developed a new method** to pinpoint which electrical service areas will be most vulnerable as populations grow and temperatures rise.

"For the first time, we were able to apply data at a high enough resolution to be relevant," said ORNL's Melissa Allen, co-author of "Impacts of Climate Change on Sub-regional Electricity Demand and Distribution in the Southern United States," published in *Nature Energy* and can be accessed at <http://www.nature.com/articles/energy2016103>.

Allen and her team developed new algorithms that combine ORNL's unique infrastructure and population datasets with high-resolution climate simulations run on the Titan supercomputer. The integrated approach identifies substations at the neighborhood level and determines their ability to handle additional demand based on predicted changes in climate and population.

The new, high-resolution capability can explore the interconnections in complex systems such as critical infrastructure and weather and determine potential pathways to adapt to future global change.

"These results can affect how future service areas are defined and where new substation capacity within the national grid may need to be located," Allen said.

The authors note the study could inform city leaders and utilities when planning for adjustments or upgrades to existing infrastructure. The analysis also helps decision makers prepare resources needed for population movement in response to future extreme weather events, particularly in the Gulf Coast region. After a natural disaster, such as a high-intensity hurricane, tens of thousands could be displaced to areas ill-equipped to handle the sudden influx of people for an unknown period of time.

For this analysis, the research team examined impacts of population and temperature changes through 2050 in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Oklahoma, Tennessee and Texas, but Allen said that the method could be applied to other regions. —Sara Shoemaker



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## ORNL provided campaign stop during 1956 presidential election

The 1956 presidential campaign made a stop at ORNL Thursday, Aug. 30 when Democratic candidate Adlai Stevenson and his running mate, Sen. Estes Kefauver, D-Tenn., visited. Accompanied by an entourage of 300, including news media and Democratic Party officeholders primarily from the South, Stevenson and Kefauver visited Knoxville, Norris Dam and Y-12 before touring the Graphite Reactor. Stevenson and Kefauver were joined by Tennessee Gov. Frank Clement and Sen. Albert Gore Sr., D-Tenn. ORNL Director Alvin Weinberg hosted the visitors at the Graphite Reactor and explained the research taking place there. After departing ORNL, the entourage headed to Madisonville, Kefauver's hometown. Stevenson would lose the election in November as President Dwight D. Eisenhower was re-elected. Eisenhower previously defeated Stevenson, then governor of Illinois, in 1952. —Fred Strohl 🌿



Standing in front of the Graphite Reactor on Thursday, Aug. 30, 1956 were, from left, Sen. Estes Kefauver, ORNL Director Alvin Weinberg, Democratic presidential candidate Adlai Stevenson, Tennessee Gov. Frank Clement and Sen. Albert Gore Sr. (ORNL file photo)