

**SCIENCE**

## Superhydrophobic glass coating offers clear benefits for variety of products

A moth's eye and lotus leaf were the inspirations for an antireflective water-repelling, or superhydrophobic, glass coating that holds significant potential for solar panels, lenses, detectors, windows, weapons systems and many other products.

The discovery by ORNL researchers, detailed in a paper recently published in the Journal of Materials Chemistry C, is based on a mechanically robust nanostructured layer of porous glass film. The coating can be customized to be superhydrophobic, fog-resistant and antireflective.

"While lotus leaves repel water and self-clean when it rains, a moth's eyes are antireflective because of naturally covered tapered nanostructures where the refractive index gradually increases as light travels to the moth's cornea," said Tolga Aytug, lead author of the paper and a member of ORNL's Materials Chemical Group.

"Combined, these features provide truly game-changing ability to design coatings for specific properties and performance."

To be superhydrophobic, a surface must achieve a water droplet contact angle exceeding 150 degrees. ORNL's coating has a contact coating of between 155 and 165 degrees, so water literally bounces off, carrying away dust and dirt. This property combined with the suppression of light reflection from a glass surface is critical for improved performance in numerous optical applications, Aytug said.

The base material – a special type of glass coating – is also highly durable, which sets it apart from competing technologies, according to Aytug, who describes the process.



Tolga Aytug

"We developed a method that starts with depositing a thin layer of glass material on a glass surface followed by thermal processing and selective material removal by etching," Aytug said. "This produces a surface consisting of a porous three-dimensional network of high-silica content glass that resembles microscopic coral."

The fact the coating can be fabricated through industry standard techniques makes it easy and inexpensive to scale up and apply to a wide variety of glass platforms.

"The unique three-dimensionality interconnected nanoporous nature of our coatings significantly suppresses Fresnel light reflections from glass surfaces, providing enhanced transmission over a wide range of wavelengths and angles," Aytug said. The Fresnel effect describes the amount

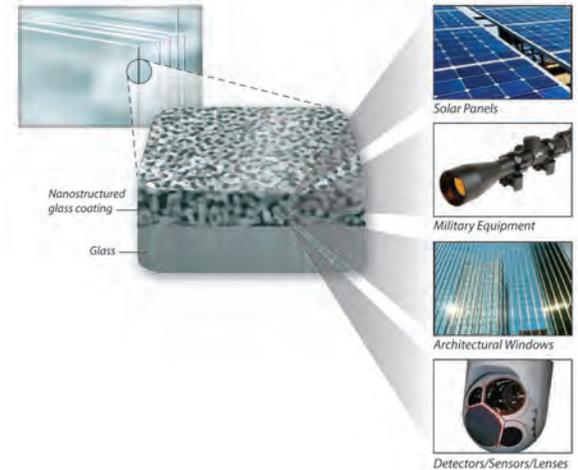
of light that is reflected versus the amount transmitted.

Where solar panels are concerned, the suppression of reflected light translates into a 3-6 percent relative increase in light-to-electricity conversion efficiency and power output of the cells. Coupled with the superhydrophobic self cleaning ability, this could also substantially reduce maintenance and operating costs of solar panels. In addition, the coating is highly effective at blocking ultraviolet light.

Other potential applications include goggles, periscopes, optical instruments, photodetectors and sensors. In addition, the superhydrophobic property can be effective

*(continued on page 7)*

Glass Target → Physical Vapor Deposition → Transparent Coatings → Post-Thermal & Etching Treatments → Product Enabled Multifunctional Applications



ORNL's Tolga Aytug is the lead author on a paper describing the superhydrophobic coating.

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## ORNL retiree Felicia Foust helps Anderson County seniors as Council on Aging head



Pictured, from left, are Vivian Young, Felicia Foust, Peggy Loy and Sharon Clapp practicing for an upcoming trivia competition. (Photo by Jason Richards)

Following 31 years working in a number of different positions at ORNL, Felicia Foust is still multi-tasking as president of the Anderson County Council on Aging.

The council helps coordinate activities for more than 6,500 Anderson County residents 60 years and up, hosting special events, providing assistance in a number of different areas, distributing food through Second Harvest Food Bank and enabling many people living alone to have times of needed socialization with other seniors. Felicia helps with all of these programs and more.

“I provided 149 hours of community service in July and loved every hour,” said Felicia, who last worked at the High Temperature Materials Laboratory from its inception in 1988 until 1993, managing its user program when she retired.

Among the tasks Felicia handles on behalf of seniors are home visits, coordinating games, crafts and other activities at the center, serving as an ombudsman at the Summit View Nursing Home in Rocky Top (formerly Lake City), setting up excursions to local and

regional attractions and handling office work chores at the current location on Leinart Street in Clinton across the street from the Anderson County Courthouse.

The council is currently under the management of the 16-county East Tennessee Human Resources Agency (ETHRA), but will soon come under the direction of Anderson County. The organization is also hopeful of relocating to a larger building somewhere in the Clinton area in the near future.

Upcoming events Felicia is working on include a Senior Appreciation Day in October and a Christmas party for seniors living alone. Felicia also oversaw Senior Day during July’s Anderson County Fair as the council received donations to provide door prizes.

Felicia said volunteers are welcome to help with the programs and provide donations, as well as sponsors.

“We have volunteers of all ages – even some teenagers – who have helped us out in all kinds of ways,” said Felicia, who praises office director Cherie Phillips for working well with a 20-member board that helps guide the efforts of the overall program. “We can always use more volunteers whether they are seniors or younger.”

Felicia’s work with seniors reaches beyond Anderson County’s borders. As secretary of the East Tennessee Council on Aging and Disability, she works with colleagues from counties in the region to address the needs and concerns of seniors.

With the hope of moving into a larger facility soon, Felicia said the Anderson County Office on Aging provides many possibilities to the people it serves.

“We probably have some kind of contact with as many as 85 percent of Anderson County seniors 60 and older each year,” Felicia said. “With all we are doing now, we hope to provide even more. One of our goals is to increase the council’s visibility so that seniors know we are here and will want to participate in our activities.” –Fred Strohl 🌿

“I provided 149 hours of community service in July and loved every hour.”

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

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## ORNL tech turns tires into battery anode

ORNL has competitively selected two firms – R.J. Lee Group of Pittsburgh and FWD:Energy of Las Vegas – to commercialize a new clean energy process that converts carbon black recovered from discarded tires into a high performance anode material for lithium-ion batteries.

The licensed pending patent is based on an invention by Amit Naskar (Materials Science & Technology Division), Parans Paranthaman (Chemical Sciences Division), and former ORNL post-doc Zhonghe Bi. 🌿

## Historic Alexander Inn begins new era as assisted living, memory care facility

Seven decades after hosting famous scientists and dignitaries, Oak Ridge's Alexander Inn is moving into its next era as an assisted living and memory care facility.

Sixty-three living units were scheduled to become available in early September. The inside has been revamped to look nearly the same as it did over 50 years.

Closed as a hotel during the early 1990s, the Alexander was literally crumbling despite a 20 years-plus effort by local and state historic preservation groups that eventually succeeded in obtaining the property to start the remodeling effort.

"This has been one of the most challenging projects I have ever been associated with," said Rick Dover, managing director of Dover Development of Knoxville, whose company has undertaken historic preservation construction efforts on such iconic East Tennessee structures as the old Knoxville High School and the Lenoir Cotton Mill Warehouse. "At first, the Alexander seemed too far gone to realistically save it. Fortunately, the efforts of so many individuals and groups in the area finally paid off. There developed a great working relationship with the city and these groups that had led to something many thought would never happen."

Originally known as The Guest House, the Alexander was built in 1943, hosting such notables as Enrico Fermi, Robert Oppenheimer and Leslie Groves. It underwent expansion in 1949 and the name was changed to the Alexander Inn in 1950. It was added to the National Register of Historic Places in 1993. Over 50 years, it also provided a social setting where residents could unwind in the bar at the end of the work week.

Using original blueprints drawn by the renowned Chicago architectural firm Skidmore, Owings and Merrill, Dover and his team of about 50 were able to gut the inside and recreate most of the rooms and hallways to their original look. Construction started during the summer of 2013. Mold, asbestos and lead paint were removed. New joists were installed, as well as reinforcing the flooring. To comply with the Americans with Disabilities Act (ADA), an elevator was installed in the

breezeway area between the north and south sections. The north section was added during the late 1940s to bring the building's total area to 42,500 square feet. A paint job restoring the color to the original gray was also done.

New insulation and energy efficient technology have been added to meet energy specifications as part of the \$8 million project that was funded through a Department of Energy historic preservation grant, private donations and working in partnership with Citizens Bank of Sevier County.

The new Alexander Inn will provide residents many services, including a dining area, recreation and cultural activities. A special area will serve residents memory impaired and with special needs.

"We will be fully staffed to serve our residents' needs," said Jody Daugherty of Senior Solutions Management Group, which will manage the Alexander "We have a medical director, nurse practitioners and nurses, as well as others who will coordinate social events, tours and other activities. Our residents can also be as independent as they want to be."

One of the groups that spearheaded the drive to save the Alexander was the Oak Ridge Heritage and Preservation Association, which started in 1999 with a handful of members and now boasts 170 in the organization.

"Our membership never gave up when it would have been easy to do so," said Mick Weist, president of the association. "You know Rick and his group did a great job when you walk into the lobby and feel as though you are back in the 1940s."

Daugherty said she hopes to host some small community events, as well.

A special package is available for residents who worked at the Oak Ridge DOE facilities. Information about that package and residential opportunities are available by contacting Daugherty at 865-399-2897, [jdaugherty@ssmgrp.com](mailto:jdaugherty@ssmgrp.com).

—Fred Strohl 🌿



Developer Rick Dover stands outside the Alexander Inn. (Photo by Jason Richards)

## Mentors needed for TN Promise students in area

**TN Promise is a program allowing high school seniors to attend community colleges without paying tuition or standard fees.** Students will still be required to pay all other fees and costs for books, etc.

As part of the program, students will need to comply with the TNAchieves protocol – one of which is to work with an adult mentor. Additional mentors are needed at Oak Ridge, Clinton and Anderson County high schools.

If you are interested in mentoring a student, please contact Graham Thomas at 615-604-1306, [graham@tnachieves.org](mailto:graham@tnachieves.org). This is an excellent program that takes very little time and provides many rewards for both students and mentors.

More information about the program is available at [graham@tnachieves.org](http://graham@tnachieves.org). An online application form for mentors is available at <https://tnachieves.org/mentor-application>.

## Service Anniversaries

## June 2015

**40 years:** **Nermin A. Uckan**, Fusion & Materials for Nuclear Systems; **Willie J. Allen**, Integrated Operations Support; **John C. Rowe**, Energy & Transportation Science; **William J. Allington**, Electrical & Electronics Systems Research

**35 years:** **Edward Leonard Churnetski**, International Security & Analysis; **LeJean M. Hardin**, Communications; **Tammy K. Hill**, Accounting Services; **Dorothy J. Tate**, Fusion & Materials for Nuclear Systems; **Susan D. Patty**, Computational Sciences & Engineering; **Paul D. Ewing**, Electrical & Electronics Systems Research; **S. N. Murray Jr.**, Research Accelerator; **Teresa A. Nichols**, Energy & Transportation Science; **Joseph Franklin Walker Jr.**, Nuclear Security & Isotope Technology; **Gail Robinson Hamilton**, Nonreactor Nuclear Facilities; **Tammy Sue Reed**, Computer Science and Mathematics; **John K. Mongar**, Utilities

**30 years:** **Samuel J. Henley**, Research Reactors; **Brian H. Davison**, Biosciences

**25 years:** **Walter Irving Dothard III**, Facilities Management; **Darlene Holt**, Biosciences; **Stacy Cagle Davis**, Energy & Transportation Science; **Volena A. LeTourneau**, Nonproliferation, Safeguards & Security; **Nancy W. Ward**, Fusion & Materials for Nuclear Systems; **Leesa K. Laymance**, Laboratory Protection; **Bo Saulsbury**, Energy & Transportation Science; **Glenn R. Romanoski** and **Teresa Chadwick Roe**, Materials Science and Technology; **James Barry Cole**, Facilities

Management; **M. Malinda Conger**, Nonreactor Nuclear Facilities; **TylerAnn Chapman**, Business Management Services; **Sonny Rogers Jr.** and **Lisa L. Cobb**, Acquisition Management Services; **Sherry L. Rowley**, US ITER Nuclear Systems; **Swati Kirpekar**, Facilities Strategic Planning; **Keith L. Kline**, Environmental Sciences

**20 years:** **Lawrence J. Satkowiak**, Nonproliferation, Safeguards & Security; **Sheryl A. Martin**, Information Technology Services; **Chris W. Wallace**, Research Reactors

## July 2015

**40 years:** **Donald Ray Jenkins**, Utilities; **Steve L. Allman**, Biosciences; **John E. Capshaw**, Logistical Services

**35 years:** **Jamie M. Johnson**, Laboratory Protection; **Linda L. Duncan**, Information Technology Services

**30 years:** **Brenda Jeffers Johnson**, Nuclear Security & Isotope Technology

**25 years:** **Ken C. Pressley Jr.** and **Truman Eugene Wilson**, Logistical Services; **Patty K. Thompson** and **Anita Jean Alton**, Biosciences; **Robert S. McKeehan**, Nuclear & Radiological Protection; **Fredia Mae Glenn**, Environmental Sciences; **Danny Ross Hickman**, Utilities; **Teddie S. Reagan**, Business Management Services; **Charles E. Eblen**, Transportation & Waste Management; **Bill Cabage**, Communications; **Ingrid Karin Busch**, Energy & Transportation Science

**20 years:** **Michael J. Gresalfi**, Homeland Security and Defense; **R. Douglas {Doug} Canaan**, Chemical Sciences; **Kathryn M. Emery**, Human Resources

## August 2015

**40 years:** **Thomas R. Gibson**, International Security & Analysis; **J. L. Johnson**, Laboratory Protection

**35 years:** **Jeffery S. Riggs**, Integrated Operations Support; **Mike B. Farrar**, Nuclear Science & Engineering

**30 years:** **J. Michael Whitaker** and **David W. DePaoli**, Nuclear Security & Isotope Technology; **Robert L. Varner Jr.**, Physics; **Ho-Ling Hwang**, Energy & Transportation Science

**25 years:** **Delphy N. Armstrong**, Research Accelerator; **Charles Patrick Higgins**, Facilities Management; **William Roger Hembree** and **Kevin Eugene Hamby**, Nuclear & Radiological Protection; **Jan M. Draine**, Energy & Transportation Science; **Timothy J. Tschaplinski**, Biosciences; **Thomas Paul Karnowski**, Electrical & Electronics Systems Research; **Mary Brooks**, Logistical Services

**20 years:** **Stephen E. Nagler**, Quantum Condensed Matter; **Russ Michael Smith**, Nonreactor Nuclear Facilities; **Bryan Dale Bryant**, Instrument and Source; **John William Sinclair**, Research Accelerator; **John Morse Storey**, Energy & Transportation Science; **David A. Edington**, Utilities; **David Jarvis Dean**, Physics

## ORICL offering fall classes

The Oak Ridge Institute for Continued Learning (ORICL) is offering a variety of classes during the fall on such topics as the life and death of stars, the electric grid, flower vases, piano, Richard Wagner, African-American religion, Shakespeare, Israel and analysis of dreams – to name a just a few of the offerings.

ORICL offers programs to East Tennesseans of all backgrounds and educational levels. These are designed to respond to the interests of its members.

Class information and registration is available at ORICL's web site:  
<http://www.roanestate.edu/?8465-ORICL-Oak-Ridge-Institute-for-Continued-Learning>.

If you have further questions, please contact Laura Bowles, 865-481-2000, Ext. 2271 or email her at [bowleslh@roanestate.edu](mailto:bowleslh@roanestate.edu).

# THE NEWS

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

Vol. 8, No. 3

OAK RIDGE, TENNESSEE

Friday, July 29, 1955

## Penn State Obtains Reactor License

A license to operate a research reactor and to receive, possess, and use special nuclear materials was issued to Pennsylvania State University on July 8 following an inspection of the completed facility by Atomic Energy Commission representatives.

The application from Penn State was one of 14 applications for licenses to engage in atomic energy activities received by the Commission through June 30. Ten relate to construction and operation of atomic reactors for industrial and medical research and for production of electric power; three are for licenses to possess and use special nuclear materials; and one proposes operation of a fuel element fabrication facility.

### Runs Through June 1965

The Penn State license, which runs through June 30, 1965, authorizes the University to receive and use as fuel up to 3600 grams of contained uranium 235, of which approximately 100 milligrams may be used in fission chambers. The University is also licensed to possess such special nuclear and by-product material as result from operation of the reactor.

Although the Penn State license is the first to be issued by the Commission under the growing program of civilian participation in the development and use of atomic energy for peaceful purposes, the reactor will not be the first privately owned facility to go into operation. A research reactor,

*Continued on Page 2*

## Manly to Address Technical Editors

W. D. Manly, associate director of the Metallurgy Division, will speak at the next meeting of the Oak Ridge Society of Technical Editors and Writers.



Mr. Manly's talk, entitled "Introduction to Physical Metallurgy," will be illustrated with slides. The meeting will be at 8 PM Saturday, August 2, in room 3 of the ORINS Training Building across from the heliport. Interested persons are invited to attend.

This talk is a continuation of a series of technical lectures sponsored by the society. The talks are not of a highly technical nature, and a comprehensive background in the subject matter will not be required of the listeners.

### NEWS OFFICE MOVES

The ORNL NEWS has moved its office from room 200 to room 205. It is now located in the middle of the second floor in building 206B.

The move also involved the changing of the NEWS phone number to extension 6421.

## New Physician



DR. GINO F. ZANOLLI, a graduate of the State University of New York, Downstate Medical Center, recently joined the staff of the Oak Ridge National Laboratory Health Division. Dr. Zanolli received an M.S. degree in engineering from Columbia University prior to obtaining his M.D. degree. He came to Oak Ridge from the U. S. Public Health Service Hospital in New York City. The physician is a native of New York and is making his home in Oak Ridge at 103 Albany Road with his wife Patricia and their children Margaret Mary, Eugene, and Michael.

## Technical Libraries Go to 23 Nations

Technical libraries of nonclassified data on nuclear energy and its applications have been shipped to 23 nations as one of several Atomic Energy Commission projects supporting the President's atoms-for-peace program.

These comprehensive collections, each containing the equivalent of documents which would fill 250 feet of library shelving, were developed by the AEC Technical Information Service.

### Eight Shipped Earlier

Fifteen of the libraries were shipped from the Commission's Document Distribution Center at the Oak Ridge Operations July 11. Eight libraries were shipped earlier. Each gift library, weighing approximately 1,000 pounds, consists of approximately 6,500 AEC research and development reports, 5,000 of which are on microcards; 22 miscellaneous books; 34 bound volumes of scientific and technical texts on nuclear theory; and 11 bound volumes of abstracts of some 50,000 reports and articles published in this country and abroad. Each collection also will include about 55,000 index cards which will be shipped later.

The individual collections duplicate material now available in 42 repository libraries in the United States, three in the United Kingdom, and one each in Belgium and Canada.

Libraries were shipped July 11 to Australia, Austria, Burma, Denmark, Egypt, Finland, Greece, Italy, Netherlands, New Zealand, Philippines, Portugal, Spain, Sweden, and Turkey.

## Livermore Will Get Pool-Type Reactor

The Foster Wheeler Corporation of New York has received a \$349,560 contract from the Atomic Energy Commission for the design, construction and test operation of a research reactor at the Commission's Livermore Research Laboratory, Livermore, California.

The reactor which has been designated the Livermore Pool Type Reactor (LPTR) will be used by the University of California Radiation Laboratory for research programs it conducts at the Livermore site. It is scheduled to be in operation by December 1956.

The Foster Wheeler proposal was the lowest of six lump-sum proposals submitted. The San Francisco Operation Office which invited the proposals last March has been designated to administer the contract.

## Rare Earths Conference Planned by ORINS in Fall

The Oak Ridge Institute of Nuclear Studies will sponsor a conference entitled "Rare Earths in Biochemical and Medical Research," to be held in Oak Ridge on October 28 and 29.

The Oak Ridge conference will emphasize chemical, pharmacological, and biochemical problems of the lanthanons and of yttrium, and their possible applications. The program is to be presented by

## Forty-Three ORNL Members to Attend Geneva Atoms-for-Peace Conference

Forty-three members of Oak Ridge National Laboratory will participate in the forthcoming International Conference on Peaceful Uses of Atomic Energy at Geneva, Switzerland, August 8-20, 1955. Laboratory members will present papers, act as technical advisors, operate and demonstrate the reactor exhibit, and serve in varied technical functions necessary for the presentation of a conference of this scope.



LIANE B. RUSSELL of the Oak Ridge National Laboratory Biology Division is the only woman listed among the ORNL representatives who are to attend the Geneva Conference. Dr. Russell also holds the distinction of being the only woman from the United States who will be giving a paper at the meeting. Her husband, W. L. Russell of the Biology Division, will also be attending the Geneva Conference.

### U. S. Delegation Named

In a recent U. S. State Department announcement of the roster of the United States delegation to the conference the names of ORNL members serving as technical advisors appear frequently. A total of 183 technical advisors was named from the United States and 23 of these advisors are from the Laboratory.

### Majority to Present Papers

The advisors were chosen from more than 50 different laboratories, educational institutions, industrial organizations and research groups in addition to seven government agencies, and will make contributions to every segment of the comprehensive agenda prepared for the conference. The majority of the advisors will present papers at conference sessions, but others have been chosen by the United Nations to preside at some of the approximately 60 separate conference sessions.

## Sixty years ago Taken from ORNL "The News" for Summer 1955

- On June 21, 1955, ORNL Research Director Alvin Weinberg hoisted the ceremonial shovel to signify the beginning of construction of a three story, air-tight structure to house a versatile high flux research reactor to be known as the Oak Ridge Research Reactor.
- In support of President Eisenhower's Atoms for Peace Program, ORNL built for the AEC a "swimming pool" research reactor for exhibit at the August Geneva International Conference for Peaceful Uses of Atomic Energy. (see page 8)
- Mrs. Enrico Fermi visited ORNL as part of her orientation tour for her forthcoming position as historian for the U.S. delegation to the Geneva International Atomic Energy Conference.
- At the Geneva Conference, Alvin Weinberg's presentation on "Fuel Cycles and Reactor Types" was ranked as one of the top 25 most important papers of the 474 submitted. Of ORNL's 43 members to present papers, Dr. Liane Russell held the distinction as the only woman to present a paper, that was titled "Hazards to the Embryo and Foetus from Ionizing Radiation."
- Alvin M. Weinberg was chosen to succeed Clarence E. Larson as director effective Oct. 1, 1955 while John A. Swartout was named deputy laboratory director.—prepared by ORNL History Room volunteers



Chris Ludtka graduated in May from the University of Tennessee with a B.S. degree in chemical engineering with a concentration in biomolecular engineering.

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“My parents provided a lot of guidance and encouragement, but they did not push me to go into science.”

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## AMSE seeking docents

The American Museum of Science and Energy (AMSE) is always looking for volunteers to act as docents.

Some of the activities docents are involved with are welcoming visitors to AMSE, provide information about AMSE's exhibits and programs, communicate general information about Oak Ridge and its history, host live demonstrations and assistance with traveling exhibits along with help at summer camps and special events.

If you are interested in serving as an AMSE docent, please contact Glenda Bingham at 576-3200.

## UT-Battelle Scholar Chris Ludtka grew up around family atmosphere of science

Chris Ludtka grew up in a home filled with a science atmosphere – particularly material science.

The 2011 UT-Battelle Scholar, Chris heard much about material science throughout his youth at the dinner table as both of his parents, ORNL researchers Gerry and Gail Ludtka, talked about activities taking place at ORNL.

“I can remember hearing my parents talking about ORNL when I was younger,” said Chris, who graduated from the University of Tennessee this past May with a B.S. in chemical engineering with a concentration in biomolecular engineering.

As Chris prepares to start a year's research this fall in Germany, he credits his parents with helping to guide his path in science, but notes he made his own decisions on his pursuits after high school.

“My parents provided a lot of guidance and encouragement, but they did not push me to go into science,” Chris said. “They let me make my own decisions. At the same time, they have been tremendous role models as parents and for what they have accomplished in their respective careers.”

Soon after arriving at UT following graduation from Oak Ridge High School, Chris quickly gained interest in biotechnology and took all of the courses he could in biology and microbiology.

“UT provided everything that I needed to help me reach this point,” said Chris, who will be spending the next year on a Whitaker Biomedical Engineering Fellowship at the Fraunhofer Institute for Material Mechanics in Halle, Germany.

Heading overseas, Chris is still trying to determine whether to pursue medicine, scientific research in biotechnology or a combination of both. He hopes his German experience will help define his focus.

“I've been thinking about this since before freshman year at UT,” Chris said. “One of the great things about majoring in chemical engineering was that I was able to complement my curricular courses with additional biology and biotechnology. Throughout that time, I have wrestled with the decision between practicing medicine or a pure scientific research focus. This next year in Germany will be the transformative experience in making a final decision.

Chris' interest in medicine is particularly directed toward the human spine. The interest started after his mother underwent a special spinal surgery a few years ago. During the summer of 2014, Chris went to the Fraunhofer Institute and conducted studies on the spine and how the procedure his mother underwent leads to recovery.

Last summer's time spent in Germany increased Chris' desire for a longer stay, which became possible through earning the Whitaker Fellowship.

“Halle is near Leipzig, located about an hour and a half southwest of Berlin and is within easy train access to quite a few places,” Chris said. “I did some traveling last summer to such places as Prague, Munich and Bavaria. I hope to see as much as I can during any free time, but I am more looking forward to the research and my hopes for its impact.”—Fred Strobl 🌱

## ORNL, Kodak sign MOU in Rochester

ORNL and Eastman Kodak have signed an MOU agreement to collaborate on roll to roll technologies for manufacturing, automotive, and clean energy applications.

ORNL's expertise in new technology development complements Kodak's capabilities in scaling technologies to full market-scale production. Through this partnership, ORNL and Kodak's Eastman Business Park will provide industry with a seamless support system for the generation and commercialization of innovative technologies.

The MOU ceremony was held at Eastman Business Park in Rochester, N.Y., in front of a standing room only crowd. 🌱

## From the Lab Director

**Corporate Fellows:** Congratulations are in order for Nancy Dudney, Lonnie Love and David Radford, ORNL researchers who have joined the ranks of the ORNL Corporate Fellows – an honor richly deserved.

Nancy, Lonnie and David have been widely recognized for their outstanding accomplishments and leadership in their respective scientific, engineering and technological fields. Nancy's work on battery technology, Lonnie's tireless efforts in advanced manufacturing and David's research in physics represent the span of applied and basic research at ORNL.

**United Way:** ORNL's 2015 United Way campaign kicked off in July highlighted by a presentation by WBIR-TV news anchor Robin Wilhoit, co-chairman of the Knox County United Way campaign.

We also hosted an agency fair where regional agencies supported by United Way were able to make presentations to our employees and answer questions about their programs.

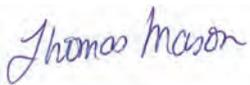
Last year, ORNL contributed more than \$895,000 to the United Way, with more than 90 cents of each dollar going to support local agencies that improve the quality of life in our communities. ORNL is one of the largest corporate contributors to United Way in Tennessee.

ORNL's United Way campaign supports 17 East Tennessee counties including Anderson, Roane, Knox and Loudon counties. Contributions enable United Way to bring together resources to create lasting improvements in the lives of people in our community.

Each year, United Way helps thousands of people in our area through the various agencies that it supports.

Phil Britt, Chemical Sciences Division director, and Sharon Kohler, Safety Services Division director, are the 2015 ORNL United Way chairs. They have made a video about the campaign that can be accessed at: <https://portal02.ornl.gov/sites/unitedway/SiteAssets/default/United-Way-2015-Post-Kick-Off.mp4>

Retirees are cordially invited to participate in the campaign. Contact Jackie Brewster, Payroll and Payment Services, at 865-241-5624 or [brewsterjl@ornl.gov](mailto:brewsterjl@ornl.gov) for information on how to authorize the deduction of a United Way contribution from your pension payment.



Thom Mason

*(ORNL's superhydrophobic glass coating continued from page 1)*

at preventing ice and snow buildup on optical elements and can impede biofouling in marine applications.

Aytug emphasized that the impact abrasion resistance of the coating completes the package, making it suitable for untold applications.

"This quality differentiates it from traditional polymeric and powder-based counterparts, which are generally mechanically fragile," Aytug said. "We have shown that our nanostructure glass coatings exhibit superior mechanical resistance to impact abrasion – like sand storms – and are thermally stable to temperatures approaching 500 degrees Celsius."

Other ORNL authors of the paper, titled "Monolithic Graded-Refractive-Index Glass-based Antireflective Coatings: Broadband/Omnidirectional Light Harvesting and Self-Cleaning Characteristics," were Andrew Lupini, Gerald Jellison, Pooran Joshi, Ilia Ivanov, Tao Liu, Peng Wang, Rajesh Menon, Rosa Trejo, Edgar Lara-Curzio, Scott Hunter, John Simpson, Paran Paranthaman and David Christen.

The work was supported by the Laboratory Directed Technology Program. STEM research was supported by the DOE Office of Science Basic Energy Sciences. A portion of the research was conducted at ORNL's Center for Nanophase Materials Sciences. Photovoltaic device measurements were done at the University of Utah. –Ron Walli 🌱



ORNL's 2015 United Way chairs are Phil Britt, left, and Sharon Kohler. (Photo by 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](mailto:jamesla@ornl.gov).

## Retirees invited to CORRE annual meeting Oct. 19

The Coalition of Oak Ridge Retired Employees will hold its 2015 annual meeting at 2 p.m. Monday, Oct. 19 at the Heritage Fellowship Church, 121 N. Illinois Ave., Oak Ridge, just north of the intersection with Oak Ridge Turnpike. All members are urged to attend and bring other retirees and friends. More information is available at <http://corre.info>



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## ORNL's Leo Holland briefed President Eisenhower during 1955 Geneva atomic conference

ORNL's Leo Holland, holding microphone, made a presentation to President Dwight Eisenhower about nuclear technology in August 1955 during the International Conference on the Peaceful Uses of Atomic Energy in Geneva. The conference stemmed from Eisenhower's Atoms for Peace proposal two years earlier during a speech at the United Nations to promote the peaceful use of atomic power. In the photo, the president is inspecting a small reactor built at ORNL in three months that was transported by air to Geneva. According to Anne Holland, one of Leo's six children, nuclear pioneer Glenn Seaborg was originally scheduled to make the presentation, but Eisenhower's two-hour delayed arrival conflicted with another conference event Seaborg was attending. "My father was a stand-in presenter," Anne Holland said. "My grandparents were surprised and proud when they watched their son on the national TV news the next day talking to the president. That photo represented an iconic moment in our family's history and has been proudly displayed in our home for years. My father always enjoyed telling the story to visitors." Leo Holland worked at ORNL for more than 40 years.

—Fred Strohl 

