

**SCIENCE**

## ORNL fundamental discovery casts enzymes in new light

**A tree outside ORNL researcher Pratul Agarwal's office window provided the inspiration** for a discovery that may ultimately lead to drugs with fewer side effects, less expensive biofuels and more.

Just as a breeze causes leaves, branches and ultimately the tree to move, enzymes moving at the molecular level perform hundreds of chemical processes that have a ripple effect necessary for life. Previously, protein complexes were viewed as static entities with biological function understood in terms of direct interactions, but Argawal's research has shown that not to be the case. This finding, published recently in PLoS Biology, may have enormous implications.

"Our discovery is allowing us to perhaps find the knobs that we can use to improve the catalytic rate of enzymes and perform a host of functions more efficiently," said Agarwal, a member of the Computer Science and Mathematics Division.

Making this discovery possible was ORNL's supercomputer, Jaguar, which allowed Agarwal and co-author Arvind Ramanathan to investigate a large number of enzymes at the atomistic scale.

The researchers found that enzymes have similar features that are entirely preserved from the smallest living organism – bacteria – to complex life forms, including humans.


"If something is important for function, then it will be present in the protein performing the same function across different species," Agarwal said. "For example, regardless of which company makes a car, they all have wheels and brakes."

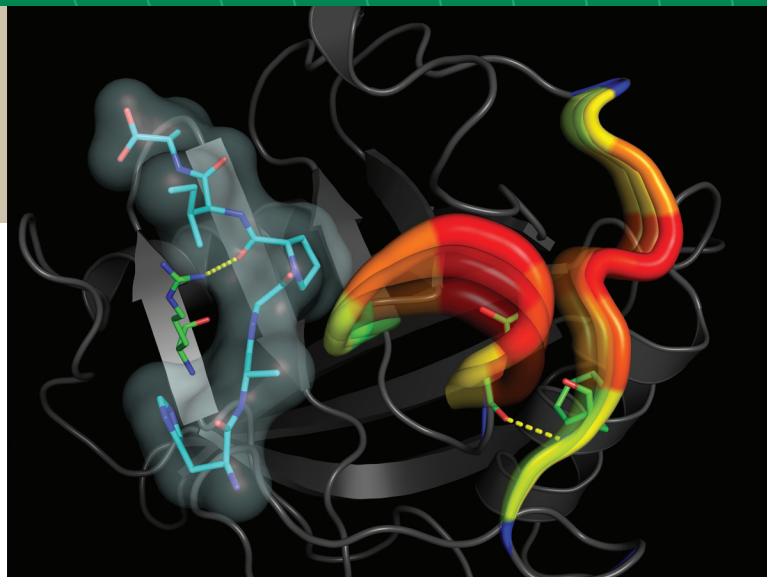
Similarly, scientists have known for decades that certain structural features of the enzyme are also preserved because of their important function. Agarwal and Ramanathan believe the same is true for enzyme flexibility.

"The importance of the structure of enzymes has been known for more than 100 years, but only recently have we started to understand that the internal motions may be the missing piece of the puzzle to understand how enzymes work," Agarwal said. "If we think of the tree as the model, the protein moves at the molecular level, with the side-chain and residues being the leaves and the protein backbone being the entire stem."

This research builds on previous work in which Agarwal identified a network of protein vibrations in the enzyme cyclophilin A, which

is involved in many biological reactions, including AIDS-causing HIV-1.

While Agarwal sees the possibility of this research leading to medicines able to target hard-to-cure diseases such as AIDS, he is also excited about its energy applications, specifically in the area of cellulosic ethanol. Highly efficient enzymes could bring down the cost of biofuels, making them a more attractive option.—Ron Walli 



*The picture represents how motions of distal enzyme loops (shown as thick colored tubes) in the enzyme cyclophilin A can impact the catalytic step through changes in enzyme-substrate interactions. The substrate is shown as cyan sticks and the multiple transparent frames represent the direction of the motion. These motions are conserved across evolution: from single-celled organisms to humans.*

**“Our discovery is allowing us to perhaps find the knobs that we can use to improve the catalytic rate of enzymes and perform a host of functions more efficiently.”**

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## Bob Hightower: Building, traveling, and sharing with friends



Bob shares an example of his woodworking talent. Looks good.



Bob and wife Dot Hightower in their renovated kitchen.

As the current president of the Friends of ORNL, Bob Hightower is excited about the growth of the organization and the potential that growth brings.

“Our membership is up to 82 members, which is significantly greater than it was not too long ago,” says Bob, who retired from ORNL in 2005 as the manager for the depleted uranium hexafluoride program. “We have seen a number of new people join, and that adds to the collection of people who have made this group such an important part of the Greater Oak Ridge community.”

Bob notes that FORNL membership has allowed him to stay abreast of DOE-related activities in Oak Ridge. Other members have echoed those same sentiments.

“Even though it has been some time since I’ve had a badge, being part of FORNL and hearing the speakers who come to our monthly meetings has enabled me to keep up with things taking place out at the Lab,” Bob says. “While I may not be employed any longer at the Lab, I still have a strong connection to the place where I worked for most of my 40-year career in Oak Ridge, and I still enjoy hearing everything about what is going on. Keeping Oak Ridge retirees up to date with what is taking place in the Oak Ridge facilities is one of the reasons FORNL was started in the first place, and it has been very successful in meeting that expectation.”

In retirement, Bob has undertaken a number of projects to keep him active, in addition to his duties as FORNL president.

“My wife, Dot, and I sold our house on Watts Bar Lake and have concentrated on renovating our Oak Ridge home,” Bob says of his residence where he first moved in 1969. “We’ve made a number of renovations that were needed, and we’re very happy with what we’ve been able to do.”

One of the key additions brought about as a result of the home renovations was the construction of a woodworking shop for Bob.

“I’ve been able to spend a lot of pleasurable time working in that shop,” Bob says. “I’ve made some small furniture items, workshop jigs and equipment, boxes, and specialty items—with moving parts—of my own design. It has been a lot of fun.” The Hightowers also sponsor an award (The Heartwood Award) for the best woodworking entry in the annual open show at the Oak Ridge Art Center, where they’ve both served as president.

Bob and Dot have been married 50 years this year. Dot keeps busy as a member of the Board of Commissioners for the Oak Ridge Housing Authority. In spite of the fact the Hightowers have remained Oak Ridge residents in their retirement years, they still get out of town quite a bit.

“We enjoy traveling, and we’ve been making a lot of road trips recently,” says Bob. “We took our daughter’s family and our grandchildren to New Orleans last Christmas—a very enjoyable time for everyone. Dot and I also made a driving trip to Nova Scotia, and we picked out a route that allowed us to skirt around major cities like New York and Boston. It took us five days to drive from Oak Ridge to Nova Scotia, but the beautiful scenery along the way made the long trip worthwhile.”

The Hightowers also enjoy yearly trips with children and grandchildren to Emerald Isle, N.C., located not too far from the Outer Banks.

“When you’re retired, you can take your time making these trips at your own pace,” Bob said. “That’s one of the fun parts of being retired.”—Fred Strohl 🌿

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“While I may not be employed any longer at the Lab, I still have a strong connection to the place where I worked for most of my 40-year career in Oak Ridge.”

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“By popular demand, we’re adding a new, old feature to Reporter—a list of those celebrating significant service anniversaries each month. To begin, we decided to include the service anniversaries during the last quarter of this calendar year. See anyone you remember?”



### October Anniversaries

**40 years:** Thomas C. Jernigan, Fusion Energy

**35 years:** Carrol R. Bingham, Physics; Susan W. Diegel and Jim Conklin, Energy & Transportation Science; Terry L. White, Fusion Energy; Darrell Keith Thomas, Center for Nanophase Mat’ls Sciences; John E. Hensley, Jr., and J. J. Lynn, Jr., Logistical Services; Charles W. Alexander, Fuel Cycle & Isotopes; William B. Whitten, Chemical Sciences; Jenny L. Keller, Business Services Dir.; Kathy S. Gant, Environmental Sciences; Larry E. Davis, NScD Neutron Facilities Development

**30 years:** James J. Kulesz, Computational Sciences & Engineering; Sandy Glazier, Business Services Dir.;

**25 years:** Eric T. Manneschildt, Materials Science and Technology; Patricia Gail Epperson and Victor W. Pardue, Human Resources & Communications Dir.; Roger A. Underwood, Nuclear & Radiological Protection; Rick L. Dailey, Environmental Protection & Waste Svcs; Diane L. Ridge, Business Services Dir.; Michael R. Aaron, Laboratory Protection; Steven R. Bolden, Logistical Services; Anne Rowland, Information Technology Services; Mark Reeves, Technology Transfer; Keiji G. Asano and Michael N. Burnett, Chemical Sciences; Michael J. Gouge, Fusion Energy; Angela A. Blankenship, Energy & Environmental Sciences Dir.

**20 years:** Greg A. Strickland, Quality Systems and Services; Sherry E. Livengood, EESD Safety and Business Operations; David E. Hill, Computational Sciences & Engineering; Carolyn E. Gilliam, Integrated Operations Support; Mark B. Hawk, Global Nuclear Security Technology; Randall Lee Hinton, Jr., Alfred W. Duval, and D. A. Fye, Logistical Services; Anthony Douglas McBee, Fabrication, Hoisting & Rigging; Jeffery Reasor, Facilities Management; Carole Holbrook, Center for Nanophase Matls Sciences; Douglas Wayne Jones, NScD Neutron Scattering Science; Wesley D. Goddard, Environmental Protection & Waste Svcs; Pam B. Hale, Information Technology Services

### November Anniversaries

**45 years:** Linda Ann Dockery, Reactor & Nuclear Systems

**35 years:** Ronny D. Lomax, Materials Science and Technology; James R. Beene and Dan Shapira, Physics; Thomas Bruce Conley, Environmental Management Program Office; Kathy F. Rosenbalm, Office of the Laboratory Director; Gerald L. Scott, Facilities Development

**30 years:** Allen E. Ekkebus, Neutron Sciences Dir.; Brenda Alfreida Johnson, Information Technology Services; David A. Rasmussen, US ITER Nuclear Systems; Christy W. Griffith, Business Services Dir. 25 years: Dana E. Freshour, NScD Research Reactor; Polly B. Ladd, Global Nuclear Security Technology; Jose A. March-Leuba, Reactor & Nuclear Systems; Jaime A. Fernandez-Baca, NScD Neutron Scattering Science; Jeffrey O. Johnson, Global Security & Nonproliferation Progs.; Edward L. Gibson, Business Services Dir.; Lindsay M. Long, Utilities; Joan F. Hughes and Randal E. Pudelek, Environmental Protection & Waste Svcs; Mark M. Valentine, NScD Research Reactors; Phyllis Philpot Young, Biosciences; Michael D. Galloway, Information Technology Services

**20 years:** Jeff S. Fickey, Robert Scott Brackett and Bruce F. Siefken, NScD Research Reactors; Sybil Hastings, Facilities Management; Jerry L. Underwood and Melissa G. Madgett, Utilities; Stephen D. Nunn, Materials Science and Technology; Danny L. Castleberry, Mike Bluford, Michael Wayne Jessie, and Hilda Ruth Lawrence, Logistical Services; Edward C. Uberbacher, Biosciences; Tonia L. Mehlhorn, Environmental Sciences; Peter D. Lloyd, Measurement Science & Systems Engr; Michael S. Whittenbarger, Nuclear & Radiological Protection; John B. Caughman, Fusion Energy

### December Anniversaries

**40 years:** Mary Jacqueline Ruppe, Information Technology Services

**35 years:** Rupert Gregory Smith, Facilities Management; Terry Lee Collins, Research Accelerator; Joanne Oxendine Ramey, Materials Science and Technology; Richard C. Goldfinger, Computational Sciences & Engineering

**30 years:** Brenda Alice Johnson, Business Services Dir.; Bryan L. Broadhead, Reactor & Nuclear Systems; Glenn M. Cross, Integrated Operations Support; George B. Ulrich, Materials Science and Technology

**25 years:** Ed Benson, Nonreactor Nuclear Facilities; Charles L. Britton, Jr., Measurement Science & Systems Engr; Ann L. Stanton, PSD Integrated Research Operations; Don W. Powers, Facilities Management; Sharon D. Thompson, Environmental Protection & Waste Svcs; Raymond A. McCord, Environmental Sciences

**20 years:** Barbara Vogt Sorensen and Mark J. Peterson, Environmental Sciences; Donna W. Isham, Business Services Dir.; Thomas John Karas, Information Technology Services; Cynthia Lee Terry, Computational Sciences & Engineering; Elizabeth M. Schilling, Contracts; Andre Omer Desjarlais, Energy & Transportation Science; Jane R. Lowe, Partnerships Dir.; Judi M. Noe, Facilities Development; J. Robert Ihle, Safety Services; William J. Toth, Global Nuclear Security Technology

## BENEFITS

**Each year ORNL's employee savings program sends out a report to participating members.** The report below provides information for the 2010 calendar year.

### Club ORNL

**Club ORNL sends its best wishes for a happy and prosperous new year to all our retirees,** including those who retired in 2011. We also extend our thanks to those of you who took part in any of the activities the Club sponsored in 2011, and we invite the rest of you to join us in 2012. We think we have a good lineup of activities planned for the year.

Remember that to sign up for some of the events, you'll need to use your XCAMS userID to log on to the site (go to <http://info.ornl.gov/sites/clubornl> for instructions on how to establish an account). Then follow the registration steps outlined there. We look forward to seeing you in 2012.

Got an idea for an activity the Club can sponsor? Send your ideas to Lara James, [jamesla@ornl.gov](mailto:jamesla@ornl.gov).

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#### SUMMARY ANNUAL REPORT FOR SAVINGS PLAN FOR EMPLOYEES AT ORNL

This is a summary of the annual report for the SAVINGS PLAN FOR EMPLOYEES AT ORNL (employer identification number 62-1788235, plan number 002) for the period 09/01/2010 through 12/31/2010. The annual report has been filed with the Employee Benefits Security Administration, as required under the Employee Retirement Income Security Act of 1974 (ERISA).

#### Basic Financial Statement

Benefits under the plan are provided by a trust fund. Plan expenses were \$16,440,386. These expenses included \$136,548 in administrative expenses and \$16,303,838 in benefits paid to participants and beneficiaries. A total of 6,123 persons were participants in or beneficiaries of the plan at the end of the period, although not all of these persons had yet earned the right to receive benefits.

The value of plan assets, after subtracting liabilities of the plan, was \$917,100,865 as of the end of the period, compared to \$0 as of the beginning of the period. During the plan period the plan experienced a change in its net assets of \$917,100,865. This change includes unrealized appreciation or depreciation in the value of plan assets; that is, the difference between the value of the plan's assets at the end of the period and the value of the assets at the beginning of the period or the cost of assets acquired during the period. The plan had total income of \$90,577,046, including employer contributions of \$4,982,264, employee contributions of \$13,045,333, and earnings from investments of \$72,041,847.

#### Your Rights to Additional Information

You have the right to receive a copy of the full annual report, or any part thereof, on request. The items listed below are included in that report:

1. An accountant's report.
2. Financial information and information on payments to service providers.
3. Assets held for investment.
4. Insurance information, including sales commissions paid by insurance carriers.
5. Information regarding any common or collective trusts, pooled separate accounts, master trusts or 103-12 investment entities in which the plan participates.

To obtain a copy of the full annual report, or any part thereof, write or call the office of the plan administrator at:

UT-BATTELLE, LLC  
1060 COMMERCE PARK DRIVE  
OAK RIDGE, TN 37830  
PHONE: 865-241-6215

You also have the right to receive from the plan administrator, on request and at no charge, a statement of the assets and liabilities of the plan and accompanying notes, or a statement of income and expenses of the plan and accompanying notes, or both. If you request a copy of the full annual report from the plan administrator, these two statements and accompanying notes will be included as part of that report. The charge to cover copying costs given above does not include a charge for the copying of these portions of the report because these portions are furnished without charge.

You also have the legally protected right to examine the annual report at the main office of the plan: 1060 COMMERCE PARK DRIVE, OAK RIDGE, TN 37830, and at the U.S. Department of Labor in Washington, D.C., or to obtain a copy from the U.S. Department of Labor upon payment of copying costs. Requests to the Department should be addressed to: Public Disclosure Room, Room N-1513, Employee Benefits Security Administration, U.S. Department of Labor, 200 Constitution Avenue, N.W., Washington, D.C. 20210.

## New year, new you

As we enter a new year, our minds are still filled with memories of Thanksgiving feasts, holiday shopping, and spending time with family and friends. But that was last year. A new year brings with it the possibility of new beginnings. We can take a good look at where we are and decide to set realistic goals that will get us to where we want to be, especially in our overall health...mind, body, and spirit. Some helpful advice from the wellness professionals at ORNL and in the community can help you set those realistic goals for the new year.

Let's start with eating healthy. Donna Pierce, ORNL's registered dietician, provides some fun and easy ways to make sure you're putting the right food in your body.

1. Eat dishes that are low fat, low salt and high fiber; eat lots of fresh fruits and vegetables; and limited commercial breads and cereals.
2. Focus on eating good-quality protein, such as egg whites, skim milk, low-fat cheese, baked chicken, fish (twice a week), turkey, and cooked dried beans (once or twice a week).
3. Stay away from fat, salt, sugar and refined carbohydrates. Seniors get the least amount of high-quality protein of all age groups.
4. Dine in with a friend. Take turns preparing lunch or dinner for each other. University of Tennessee Extension hosts free or low-cost cooking programs, such as "Heart Healthy Cooking" and "Diabetic Cooking."
5. Set a goal to eat more fiber (four to five servings a day of whole grain bread or cereals) and five fruits and vegetables a day.

In addition to eating healthy, we need exercise. Kathryn Pittman, ORNL exercise physiologist, and Joan Lawson, ORNL Wellness Program manager, offer ways to improve your physical health.

1. Engage in strength training. It prevents muscle loss, increases metabolism and bone density, and reduces overall body fat.
2. Relieve stress through exercise. The social interaction and the increased release of endorphins that can accompany exercise can lower stress levels in the short term. Long-term benefits of cardiovascular exercise—walking, running, swimming, and biking—help you lose weight and increase your self-esteem.
3. Find an exercise buddy. Spending time with someone who is full of energy and fun can only increase your willingness to establish a regular exercise routine.
4. Work your core. Core muscles are simply those that girdle your trunk and pelvis. Building core strength can improve your posture and may protect you from lower back pain.
5. Set SMART goals—specific, measurable, attainable, realistic, and time-based.

Eating healthy and exercising are both important to your physical health, but don't forget the mental health aspect of a healthier you. Dottie Crist, the Lab's onsite employee assistance professional through Magellan Health, and Kathy Sergeant, a social worker in the Knoxville Office on Aging, give tips on how to keep your mind in shape.

1. Find a volunteer opportunity in the community; contact someone with whom you have lost touch; enjoy free, fun activities; or surprise someone with an unexpected act of kindness. Doing good can help you feel good.
2. Don't overschedule yourself; prioritize activities. Even though you may want to do everything available, save some energy for specific activities you're looking forward to.
3. Keep a schedule. Set time for meals, physical activity, etc. Read a book or watch a movie after lunch. E-mail or call at least one person, or socialize on Facebook or a similar social networking medium.
4. Be active. Consider walking outside, around the local mall, or someplace with interesting sights. Enjoy nature, or just go people watching. Open the shades, and "let the sunshine in." Sunlight has been shown to be helpful in relieving seasonal affective depression.

Eating right, engaging in some form of exercise, and spending time with friends—now that's a recipe for a good start to a great new year and a spectacular new you.



*Kathryn "Fireball" Pittman, herself full of energy and fun (hence the nickname) leads a lunchtime walking group. She, at least, appears to be smiling.*

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**"Set SMART goals: Specific, measurable, attainable, realistic, and time-based."**

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# THE NEWS OAK RIDGE NATIONAL LABORATORY

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

Vol. 4—No. 24

OAK RIDGE, TENNESSEE

Friday, December 28, 1951

## Registration Opens for U-T Extension Program, January 2

Registration for the University of Tennessee's new evening extension program in Oak Ridge will be held from 6:30 PM to 9:30 PM Wednesday, January 2, in Room A-129 of Oak Ridge High School.

Ray H. Sullinger, Jr., supervisor of U-T's Knoxville Extension Center, said that registration in Oak Ridge will be held for the one period only. However, Oak Ridge classes may register by mail for the local classes any time before noon, Saturday, January 5, Mr. Sullinger announced.

Announcements of the new program, along with registration blanks for those who wish to register by mail, were distributed Thursday and Friday, December 27 and 28, to previous students, through various Oak Ridge plants, and at the Oak Ridge Library.

The U-T program, consisting of adult extension courses on the college level, is being resumed in Oak Ridge this winter quarter after being temporarily suspended during the fall. The past quarter, Oak Ridge's attended evening classes on the Knoxville campus.

All of the winter quarter classes will be held in the new building of Oak Ridge High School and will begin Monday night, January 7.

Evening program fees are based on charges at the rate of \$6.00 per quarter hour for undergraduate credit and \$8.00 for graduate credit. A late registration fee of \$1.00 will be charged students who register after Saturday noon, January 5.

Courses to be offered under the new program include a psychology course entitled "Personality Development." Designed for teachers as well as parents, the course traces factors contributing to the growth of personality, starting with the very small child, and taking him through school, adolescence, young adulthood, and marriage.

Sullinger said that this course, normally covering three quarters, will be accelerated so that students may complete the required work in two quarters. It carries two hours credit.

A three-credit basic course in

Continued on Page 2

### Safety Scoreboard

Your Laboratory  
Has Operated  
87 Days

Without a Lost Time  
Injury  
Through December 23

*Wishing You . . . .*

**A HAPPY  
and PROSPEROUS  
NEW YEAR!**

### Dr. A. J. Miller Appointed To New ANP Project Post

Dr. A. J. Miller has been named assistant director of the ANP Project in charge of project coordination, according to an announcement made last week. In this capacity, he will assume the duties which have been performed by C. B. Ellis, who is leaving the Laboratory to join Nuclear Development Associates.

Captain B. T. MacCauley will serve as assistant to Dr. Miller.

### MATERIALS HANDBOOK

A reference book, entitled "Handbook of Dangerous Materials," written by N. Irving Sax, toxicologist at General Electric in Schenectady, assisted by W. W. Schultz of the General Engineering Laboratory, and M. J. O'Herin, of the G. E. Fungicide Laboratory, has recently been published. The handbook covers over 5,000 hazardous industrial materials, including trade-name products, and offers valuable information on safety handling, storing, or shipping chemicals and other dangerous items.

### ORNL Set To Make Television Debut

Oak Ridge National Laboratory, whose work has been so often featured in newspapers, magazines, and the radio, will make its television debut next month.

Early last week a television crew from CBS arrived at the Laboratory to make a film on radioisotope production. The crew included Edmund Scott, Charles Mack, and Andrew Wiltoner; the film will be featured on Edward R. Murrow's Sunday night newscast, "See It Now," during the middle or latter part of January.

The portion of the program de-

### R. L. Bailey Injured In Pre-Holiday Accident

Robert L. Bailey, 30-year-old Lab chemist, is suffering from several fractured ribs and internal injuries received Monday in a truck-car collision. Bailey, an employee of the Isotopes Division, Y-12 Area, is in Blount Memorial Hospital.

The collision occurred Monday morning on the Alcoa Highway one mile from the Knoxville airport. The truck was headed toward Knoxville, and Bailey was returning to his home in Maryville when his 1936 model car sideswiped the pickup

### Dr. Bethe Visitor To Lab This Week; Gives Two Seminars

Dr. Hans Albrecht Bethe, well-known Cornell University physicist, visited Oak Ridge National Laboratory on December 27 and 28 to consult on ANP research. Professor Bethe has lent his help to this program from its inception, consulting regularly with the NEPA (Nuclear Energy for the Propulsion of Aircraft) project throughout its four-year existence.

Professor Bethe also gave two seminars this week. One, given December 27, was held at ORNL; the subject of the seminar was "Resonances." The second seminar, on "Mesons," was given in the east lounge of Ridge Hall on December 28, and included a report on recent work of the Cornell betatron.

During World War II, Dr. Bethe was at Los Alamos, supplying much of the theory which brought about the success of that project. He still visits that laboratory from time to time.

During the war, Bethe's contributions to science has been the working out of the cycle by which the sun releases its energy. His contributions, however, have embraced nearly all fields of physics, and he stands as one of the best-rounded scientific experts today.

## Sixty years ago this month Taken from *The ORNL News* for December 1951

- Two new isotopes, Phosphorus-32 and Iodine-131, have been added to the National Bureau of Standards' list of standard samples available for general distribution to investigators in physics, chemistry, medicine, and industry.
- The new Reactor Physics Laboratory of the Oak Ridge School of Reactor Technology (Building 3017), will hold its first classes to conduct experiments in physics, chemistry and reactor physics.
- Dr. Alexander Hollaender chairs a symposium on radiation (isotope) botany at the annual meeting of the American Association for the Advancement of Science.
- Dr. Hans Albrecht Bethe, well known Cornell University physicist and theorist at Los Alamos during the WWII Manhattan Project, will be at the Lab to consult on the Aircraft Nuclear Propulsion Program.
- CBS arrives at the Lab to make a film on radioisotope production. The program will show the production of radioactive iodine from its insertion into the pile to its shipment to a New York hospital for use in radiotherapy treatments.

—prepared by ORNL History Room volunteers



ON STAGE—Pictured above are the Linder "Christmas Windows," presented Sunday, E Joanne Bridges, Bobbie Cox, Jimmy Culp, Lyn Hemphill, Charlie Jones (seventh from Sanford, Nelly Sharpe, and Sandra Walker.

## From the Lab Director

On the evening of November 11, I had the honor and pleasure of announcing 2011's Director's Award winners at the Laboratory's Annual Awards Night, honoring ORNL's top achievers.



Each year the Laboratory's Awards Night honorees gather for an evening that includes socializing, dinner, and the presentation of awards for outstanding performance in science and technology, operations and support, and community outreach. The Director's Awards are selected from among these honorees.

Petro Maksymovych received the Director's Award for Outstanding Individual Accomplishment in Science and Technology at Awards Night.

Petro, or Peter, earned his award for pioneering discoveries of electrical conductivity in normally insulating oxide materials that can be switched on and off by an applied voltage. This creates opportunities for extremely small and energy efficient memory devices and sensors.

Earlier in the evening Peter was presented the Early Career Award for Scientific Accomplishment.

Suzy Tichenor of the Computing and Computational Sciences Directorate earned the Director's Award for Outstanding Individual Accomplishment in Laboratory Operations.

Suzy was honored for outstanding leadership in the creation and launch of ORNL's High Performance Computing Industrial Partnerships Program. She earlier earned the award for Administrative and Operational Leadership at the Director Level.

Sherry Livengood of the Engineering & Energy Sciences Directorate was presented with the Director's Award for Outstanding Individual Accomplishment in Community Outreach.

Sherry was recognized for more than 15 years of volunteer community service to impoverished families in Anderson County and East Tennessee. She was earlier presented the award for Individual Community Outreach.

The Director's Award for Outstanding Team Accomplishment went to a group that worked on the licensing of the Alumina-Forming Austenitic (AFA) steel family to Carpenter Technology Corp. earlier this year. The team consisted of Craig Blue, Michael Brady, Alex DeTrana, Alan Liby, Joe Marasco, Phil Maziasz, Bruce Pint, Michael Santella and Yukinori Yamamoto.

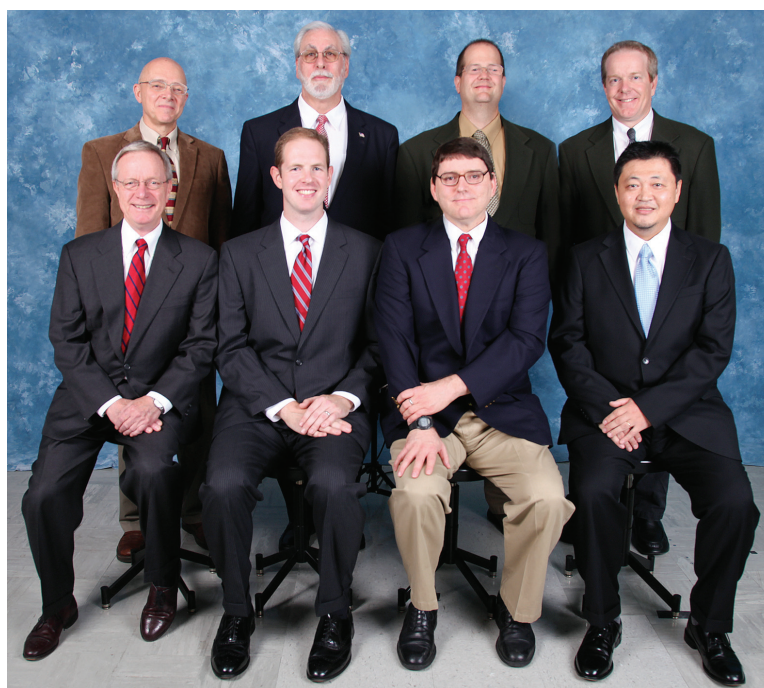
The citation noted the development and licensing of AFA steels, a revolutionary new class of heat-resistant steels for higher energy production and chemical process industry applications. Earlier that evening the group received the UT-Battelle Award for Excellence in Technology Transfer.

Congratulations to everyone. In a year with so many challenges, it's good to note the many accomplishments of our research and support staff members.

"In a year with so many challenges, it's good to note the many accomplishments of our research and support staff members."



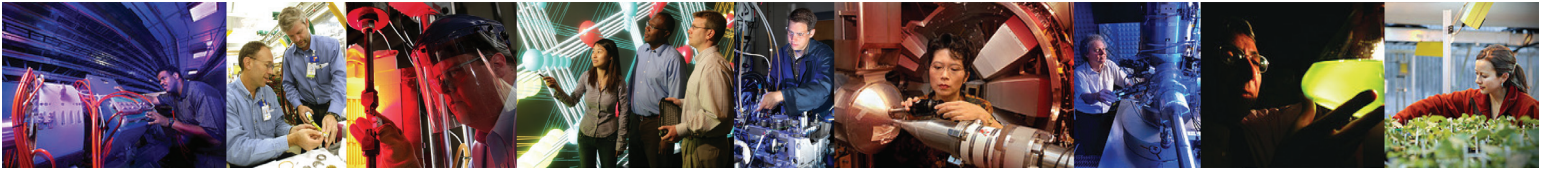
Awards Night's big winners, recipients of individual Director's Awards: Petro Maksymovych, Suzy Tichenor, and Shirley Livengood.



The AFA steel team: Seated, Alan Liby, Alexander DeTrana, Mike Brady, Yukinori Yamamoto; Standing, Michael Santella, Joseph Marasco, Bruce Pint, Craig Blue.

*Thom Mason*

Thom Mason



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## Veterans Day 2011

The Powell High School Marching Band led this year's Veterans Day parade, providing stirring patriotic musical selections along the way. Among the band members were several ORNL kids, which added a special boost to the day for some proud ORNL parents



Linsay Anderson with mom Joy Anderson. Joy works in Photography.

