Argonne NATIONAL LABORATORY

News

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Compression of metallic glasses sheds light on phase transitions

JARED SAGOFF

Scientists at Argonne have identified a variation in the compressibility of an unusual class of metals in research that may shed light on the electrodynamics of amorphous materials.

Using high-energy X-rays produced by Argonne's Advanced Photon Source (APS), researchers from Argonne, the Carnegie Institution of Washington and the International Center for New-Structured Materials at Zhejiang University discovered an unusual change in the bulk modulus of lanthanum/cerium-based bulk metallic glasses at a pressure of about 14 gigapascals (GPa), more than 100,000 times the pressure of Earth's atmosphere. The bulk modulus of an object denotes how much its volume shrinks as the surrounding pressure increases; at pressures above 14 GPa, the samples began to shrink at slower rates than they had at pressures below the break.

This sudden change in compressibility may indicate the occurrence of an "amorphous-to-amorphous" phase transition in these types of materials. Amorphous solids, of which metallic glasses are one example, have long confounded scientists who seek to characterize them. Unlike crystalline solids, which possess a regular long-range atomic order, amorphous materials consist of atoms arranged rather randomly with only short-range order, making their behavior much harder to predict, said Argonne physicist Yang Ren (XSD), who worked on the project.

"It's very difficult to get an amorphous form for metals — they love to crystallize," said Guoyin Shen, another physicist on the project. "Just being able to synthesize a metallic glass larger than 10 millimeters is an accomplishment."

While scientists have an easy time detecting amorphous-to-crystalline phase transitions, like water freezing into ice, the natural disorder of the atomic structure of metallic glasses had precluded them from seeing amorphous-to-amorphous transitions until very recently.

Even those physicists who believe that they have observed an amorphous-to-amorphous transition have not yet explained the mechanisms that underlie the transformation, Ren explained. "We know quite a bit about phase transitions in crystalline materials, but for amorphous material it gets quite complicated. You have to ask, 'just how do you define a phase?'"

In order to answer this question and to explain the bulk modulus discontinuity, the researchers looked for the cause on the atomic level. Even if they are not visible to the naked eye, pressure-induced phase transitions in amorphous materials at high pressure often produce a change in the number of atoms that surround the central atom, known as the atom's coordination number. However, the experiments at the High-Pressure Collaborative Access Team beamline at the APS showed that no coordination change had occurred, leaving the research team with one other plausible explanation: The pressure engendered a sudden reconfiguration of the electrons that surround each atom in the material. "For decades," Shen said, "people have been able to study the long-range order in materials at high pressures, but we have now begun to study short-range order as well.

"If this kink is caused by electron reconfiguration," he said, "we can come up with a recipe that makes use of that type of change in the next phase of the research. This discovery is significant because it provides us with important information about how to work with a poorly understood, but widely used, class of materials."

Applications of bulk metallic glasses include recording heads, sensors and transducers, motors, sports equipment and power transformer cores. In general, the superior fracture strength and toughness, the excellent corrosion and wear resistance, and improved plasticity of bulk metallic glasses may lead to more applications in structural materials, electronic products, medical, defense and security systems in the future. The lanthanum/cerium-based metallic glass, due to its superplastic behavior at low temperatures, could be used for stamps, Shen said.

Results of the research, which was funded by DOE Office of Basic Energy Sciences, were published in the August 21 issue of the *Proceedings of the National Academy of Sciences*. ■

Nobel laureate conducted research at Argonne

Grünberg

Peter Grünberg, who shares the 2007 Nobel Prize in Physics, conducted part of his groundbreaking research on magnetoresistive materials at Argonne in 1984 and 1985. Grünberg visited Argonne while a research scientist at the Institute of Solid State Research at Research Centre Jülich, Germany.

Grünberg, and Albert Fert's group at the University of Paris-Sud, Orsay, France, independently discovered a totally new physical effect in 1988: giant magnetoresistance, or GMR. The effect dramatically changes the electrical resistance of thin magnetic layers in the presence of external magnetic fields. The effect occurs in metals and is based on the relative orientation of the magnetization of two magnetic layers that sandwich a nonferromagnetic spacer layer.

Starting in the mid-nineties, within 10 years of the basic research discovery, GMR read heads started being manufactured as part the hard disk drives of all computers to read the information stored as nanoscale magnetic bits on the revolving disk.

Sam Bader, now chief scientist at Argonne's Center for Nanoscale Materials, invited Grünberg to Argonne as part of an exchange program with Research Centre Jülich. Bader had spent

(See "Grünberg" on page 2)

CHORAL 'AMERICANA'

Katie Weber (University of Chicago), in foreground, directs the Argonne Choral Group during their 'Americana' concert Oct. 11. The group performed a variety of music, including such pieces as "Shenandoah" and a madrigal on the wonders of duct tape. Two recordings made at the concert are available online in MP3 format. The group's next appearance will be at a Veteran's Recognition Ceremony Nov. 8. The group performs year-round and is always looking for more singers of any and all talent levels. Rehearsals are held Mondays and Thursdays from 11:45 a.m. to 12:30 p.m. in the Building 362 Auditorium. For more information, contact Pat Garner (NE) at *plgarner@anl.gov* or Weber at *kpweber@uchicago.edu*.
www.anl.gov/Media_Center/Argonne_Today/media/2007/choral.htm

Center for Nanoscale Materials fully operational

The Center for Nanoscale Materials (CNM) at Argonne, one of the premier nanoscience research facilities in the world, has been declared fully operational.

The Department of Energy issued the CD-4b resolution approving the start of full operations Oct. 1, marking the completion of the process of supplying and furnishing Argonne's newest user facility. "The CNM building opened for research in May 2006, but the time since has been spent largely setting up the facility, including hiring," said Katie Carrado Gregar, manager of the CNM's User and Outreach Programs.

"The CNM will provide access to some of the most advanced nanoscience technology in the world for roughly 200 users a year from around the nation and the world who will come to Argonne to take advantage of its unique resources,"

(See "CNM" on page 2)

UChicago ▶ Argonne LLC

Office of Science U.S. DEPARTMENT OF ENERGY

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Grünberg

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six months at the German laboratory and became friends with the future Nobel laureate.

Originally planned as a year-long visit, Grünberg liked Argonne so much he extended his stay by six months.

"He had a clear plan in mind," said Bader. "He mapped it out on my blackboard, and I kept it there for years because I knew it would be significant some day. Eventually I changed offices, and the board was washed clean."

Layered iron-chromium thin-film samples created by Argonne's C. H. "Harvey" Sowers, now retired, were critical to Grünberg's research. Those samples showed the first evidence of antiferromagnetic interlayer coupling, which was the discovery that led to the existence of the GMR effect. Sowers was a co-author of a *Physical Review Letters* paper in 1986 that detailed the breakthrough.

Bader is happy for his friend and hopes he enjoys his international recognition.

"He is a humble and shy guy," Bader said, "just as interested in his kid's fishing trips as a father should be." ■

CNM

(Continued from page 1)

she explained.

Approximately 50 user projects have been able to take advantage of the facility so far, and the recent completion of the hard X-ray nanoprobe beamline this summer and the installation of a Beowulf-class supercomputer array with 12 teraflop capacity for computational and experimental nanoscience is expected to focus more interest in the CNM's facilities.

"The past 17 months were devoted to hiring world-class researchers, installing major pieces of equipment, laboratory instrumentation, IT networks, and office furniture," Gregar said. "It has been an extraordinarily busy time to fully equip the building, but at the same time we have been committed to allowing both basic research and user programs to take place as facilities were commissioned."

With the assembly of the facility complete, employees at the CNM will now be able to focus entirely on their research and on facilitating the nearly 90 new user projects that were submitted during the July 2007 call for proposals. ■

Retirement plan interest rates

Current interest rates for the annuity funds in the staff and non-staff retirement plans are:

Vendor	Rate	Contributions from	Earned through
TIAA Traditional	5.25%	10/01/07 – 10/31/07	02/29/08
TIAA Supplemental	4.50%	10/01/07 – 10/31/07	02/29/08
Prudential Guaranteed (Plans 5017 & 4245)	4.42%	10/1/07 – 12/31/07	06/30/08
Prudential Guaranteed (Plan 4643)	4.00%	03/31/07 – 06/30/07	12/31/08
Prudential Guaranteed (Plan 7680)	4.00%	03/31/07 – 06/30/07	12/31/08
Lincoln National (Old Account)*	3.60%	N/A	12/31/07
Lincoln National (No Load)*	4.00%	N/A	12/31/07

(* No longer accepting contributions)

Continuing resolution in effect through Nov. 16

ONCE AGAIN, Argonne starts a new fiscal year under a continuing resolution (CR), as Congress has not passed appropriations bills for FY 2008. The CR is a stopgap measure that allows federally funded agencies to continue operating in the current fiscal year pending passage of the FY 2008 appropriations.

The current CR is in effect through Nov. 16 for all U.S. Department of Energy and most other agency appropriations. If Congress passes funding legislation by that date, the CR's impact on the laboratory should be minimal, said Chief Financial Officer Mike Bartos.

The CR provides funds based on the FY 2007 rate of operations. New activities cannot be started unless they were funded as part of the FY 2007 Appropriation Acts.

The full House and the Senate Appropriations Committee responded favorably to the FY 2008 request. The two versions of the Energy and Water Development Appropriations bill fully funded the administration's request. But the Senate bill has yet to reach the floor, and until that happens, a final bill cannot be written. The Senate may consider its version of the Energy and Water Development bill in the first weeks of October. ■

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www.inside.anl.gov

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ARTS AT ARGONNE PRESENTS CRITICALLY ACCLAIMED PIANIST MYKOLA SUK

Arts at Argonne will present a concert by Mykola Suk, whom the Washington Post said in concert "nearly set the keyboard on fire." The concert, which will include the music of composers such as Bach and Mendelssohn, will take place on Saturday, Nov. 10, at 8 p.m. in the Building 402 Auditorium.

Winner of the first prize and gold medal at the 1971 International Liszt-Bartok Competition in Budapest, the Ukrainian-born pianist Mykola Suk has appeared to great acclaim in numerous solo recitals, as a soloist with with major orchestras under leading conductors, and at chamber music festivals throughout the former USSR, North America, Europe, the Middle East, Australia and Asia. A performer of both traditional and contemporary music, Suk has received numerous accolades from the international press. He has premiered a number of concerts and solo works by composers such as Valentin Sylvestrov, Ivan Karabits, Myroslav Skoryk and Virko Baley, some of them written especially for him.

Admission to the concert is $25.

The concert is open to the public. Photo ID is required to enter the laboratory site. Visitors need to register prior to the event by calling ext. 2-3751 during regular working hours.

www.anl.gov/ARTS/order.html

FIRST FRIDAY FORUM TO BE HELD

"From Science to Security - Managing (Research) Technical Vitality in IBM," by Sharon L. Nunes. Friday, Nov. 30, 11 a.m., Building 212, Room A157.

More information about this event is posted on the WIST Sharepoint.

https://www.workspace.anl.gov/wist/default.aspx

ARTS AND CRAFTS CLUB SEEKS CRAFTERS FOR ANNUAL CRAFT SHOW

The Arts and Craft Club is planning the Annual Craft Show in November and is looking for people who would like to participate.

Anyone interested can contact Valerie Gaines at ext. 2-5610 or Noreen Sorensen at ext. 2-4634.

WORKSHOP PROVIDES STEPS TO A SECURE RETIREMENT

Employees are invited to "Six Steps to a Secure Retirement," a workshop offered by Wachovia Securities (a Prudential representative).

The workshop provides guidance on how to invest money for retirement and is intended for all ages. The workshop has been highly recommended by Argonne employees who attended in the past.

The one-hour workshops will be held Wednesdays at noon Nov. 7 and 21 in the Building 213 Cafeteria Private Dining Room. Seating is limited.

For a reservation, call Cheryl at (630) 285-8876.

NOMINATIONS FOR LEMELSON-MIT PRIZE DUE SOON

The $500,000 Lemelson-MIT Prize is awarded to outstanding mid-career inventors who have developed a patented product or process of significant value to society which could be or has been adopted for practical use.

These individuals will receive the prize mid-career, when both the recognition and the cash award can be of significant benefit to their future creativity and productivity.

More information can be found online.

Nominations should be sent to Cindy Wilkinson (C&PA), Building 201, Room 258 by Friday, Oct. 26.

mit.edu/invent/a-prize.html

L'OREAL ACCEPTING APPLICATIONS FOR 2008 FELLOWSHIPS FOR WOMEN IN SCIENCE

Now in its fifth year, the L'Oreal Fellowships for Women Program aims to annually recognize, reward and support five female postdoctoral researchers in the United States who are pursuing careers in the life and physical/material sciences, as well as mathematics, engineering and computer science.

L'Oréal USA awards each recipient $40,000 to apply toward her postdoctoral research.

The L'Oréal USA Fellowships for Women in Science program is open to women postdoctoral researchers only. Candidates interested in applying may visit the L'Oréal USA Fellowships for Women in Science Web site to obtain more information about program eligibility and requirements.

All applications must be postmarked by Oct. 31.

www.lorealusa.com

CHESS TEAM SEEKS PLAYERS

The Argonne chess team is looking for players. On-site employees of Argonne, DOE, the University of Chicago or contractors are eligible to join the Argonne Rooks.

The Rooks play 10 matches in the Chicago Industrial Chess League against teams from Lucent, Fermilab and other Chicago-area organizations. Matches are played in the evening after work.

For more information, please contact Bob Hill at ext. 2-4865 or Dave Baurac at ext. 2-5584 or see the Argonne Chess Club Web site.

www.anl.gov/Chess/index.html

PERFORMANCE APPRAISAL UPDATE

All employees have had data entry access to their own performance appraisals from Oct. 1 - 15. During that time, employees could enter draft assessments of their work during the past year and also enter suggested goals.

At this point in the performance appraisal process, supervisors are completing the performance appraisals.

A variety of information is available on the Web application to support them in this process. Supervisors can view the position description, the job hazard questionnaire and the training profile for each of their supervisees.

If an employee has also uploaded a formal statement of accomplishments, the supervisor can also view that file.

Matrix input is also available through the Web application if a supervisor has requested it.

The supervisor will edit and complete the performance appraisal document and submit it to the second-level supervisor for approval. Later, each employee will receive an e-mail letting him or her know when the completed and approved performance appraisal is available to view or print.

More information on how to complete responsibilities as a supervisor is available online.

http://inside.anl.gov/hr/performance_appraisals/supervisors.html

Argonne NATIONAL LABORATORY

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Submit classified ads online at *www.anl.gov/Media_Center/Argonne_News/Classified_Ads* ■ Deadline for all materials is 5 p.m. Friday. ■ Argonne National Laboratory is managed by UChicago Argonne, LLC for the U.S. Department of Energy.

Three new members join Board of Governors for Argonne

UChicago Argonne, LLC has named three new members to its Board of Governors for Argonne National Laboratory.

New members are Harry Davis, the Roger L. and Rachel M. Goetz distinguished service professor of creative management for the University of Chicago's Graduate School of Business; Susan Eisenhower, president of the Eisenhower Group, Inc.; and Edward Snyder, dean and the George Pratt Shultz professor of economics at the Graduate School of Business.

The Board of Governors for Argonne National Laboratory is appointed by the UChicago Argonne, LLC, the organization selected by the U.S. Department of Energy to manage and operate Argonne. UChicago Argonne, LLC provides oversight to the laboratory through its board of governors. The board of governors helps oversee and guide Argonne research, operations and management. Members of the board are chosen from faculty, administrators and trustees of the University of Chicago, from other universities, from national and international organizations and from industry.

Harry Davis has been a member of the Graduate School of Business (GSB) faculty since 1963. In addition to his research and teaching in the areas of consumer behavior, marketing management, business strategy, new product development, industrial marketing, leadership and creativity, he has introduced many innovative executive education programs in the United States and abroad, including the first core leadership program of any top-rated MBA program in the country, opening the first international campus of the Chicago Graduate School of Business in Barcelona, Spain, when he was deputy dean for GSB MBA programs, and the Management Lab (The New Product Laboratory).

Davis teaches in the areas of strategy, leadership and creativity. He is the founder of Chicago GSB's Laboratory in New Product and Strategy Development, in which student teams work with sponsoring firms to research, develop and market new products. He also is the architect of the Leadership Effectiveness and Development Program, a required student-directed course that focuses on the building of community and the development of managerial skills.

Susan Eisenhower is president of the Eisenhower Group, Inc., which provides strategic counsel on political, business and public affairs projects. Eisenhower has consulted for major companies doing business overseas, such as IBM, American Express, Diebold Corporation and Loral Space Systems. She is a senior director of Stonebridge International, a Washington-based international consulting firm chaired by former National Security Advisor Samuel "Sandy" Berger.

Eisenhower is chairman emeritus of the Eisenhower Institute, where she also served as president. After more than 20 years in the foreign affairs field, she is best known for her work in Russia and the former Soviet Union. Eisenhower has served on many government task forces. She has also served as an academic fellow of the International Peace and Security Program of Carnegie Corporation of New York, and is a director of the Carnegie Endowment for International Peace and the Nuclear Threat Initiative, co-chaired by Senator Sam Nunn and Ted Turner.

Edward (Ted) Snyder is dean and the George Pratt Shultz professor of economics at the University of Chicago Graduate School of Business. He was the John M. Olin visiting associate professor at the University of Chicago's George J. Stigler Center for the Study of the Economy and the State from 1991-92.

Snyder began his professional career as an economist with the Antitrust Division of the U.S. Department of Justice. In his 16-year tenure at the University of Michigan Business School, Snyder was a faculty member and served as senior associate dean. He also served as the inaugural director of the Davidson Institute at the University of Michigan, which focuses on such emerging markets as India, China and central Europe. Before joining the GSB, Snyder was dean and Charles C. Abbott Professor of Business Administration at the University of Virginia's Darden School.

Snyder's research develops insights into business practices, specifically distribution and contracting practices, antitrust enforcement and public policy. He is an editor for *The Journal of Law and Economics*. ■

VIP VISIT

Argonne's science- and simulation-based approach to help address key challenges in the nuclear energy field was one of the key topics discussed during a Sept. 28 visit by high-level energy executives from Japan. There was also discussion on the assurance of nuclear fuel supply issues including retransfer rights of U.S.-origin nuclear fuel. The visit included this tour of the Advanced Photon Source. From left to right are Takashi Mizuno, deputy representative of the Washington, D.C., office of the Federation of Electric Companies of Japan; tour hosts Stephen Goldberg, special assistant to the director, and George Srajer, associate division director for the X-ray Science Division; Yosaku Fuji, president of the Institute of Nuclear Safety Systems, Inc.; and Mrs. Fuji. Not pictured: Yoshikazu Tsuchihashi, deputy director of the Institute of Nuclear Safety Systems.

Problems often work in combination to cause accidents

ABIGAIL ALLRED

Recently, a fire occurred in an Argonne facility because of an equipment failure. An electronic temperature controller allowed a plastic container of a silicone liquid to be heated above its melting point. As the container melted, the liquid inside leaked into an adjacent electrical power strip, setting the electrical insulation on fire. Argonne emergency responders immediately extinguished the small blaze, and no one was injured. A formal investigation was undertaken to recommend ways to prevent similar incidents.

From this and similar incidents elsewhere in U.S. Department of Energy laboratories, there are lessons to be learned for everyone who works at Argonne, said Danny Whittaker-Sheppard, environment, safety, health and quality representative for Operations. To prevent similar situations, there are some simple preventive steps everyone can take to ensure safety for themselves and others — not only at work, but also at home.

One of the most important steps involves recognizing all the potential safety hazards involved in a situation. It is not enough to look at each hazard in isolation. Instead, recognize and evaluate all of the hazards, holistically, in order to visualize and understand the potential impacts or outcomes of various combined-hazard scenarios — with the ultimate goal of preventing the hazards from resulting in an accident.

In the case of the recent fire, hazards arose from a combination of factors placed near one another: electricity, fire and liquid. By anticipating the various potential negative end results of mixing these sources, the setup could have been modified to eliminate or reduce the opportunity for an accident. For example, a Pyrex glass (non-melting) container could have been used, the temperature controller could have had an independent means of fail-safe shutoff, and the various hazards could have been physically isolated from each other.

It is important to be proactive, rather than reactive, in eliminating and preventing potential hazards, Whittaker-Sheppard said. This requires anticipatory thinking, sustained vigilance and a greater appreciation for what could go wrong, and a commitment to participate in these endeavors each and every day.

The goal of attaining the highest levels of important scientific research, engineering, development and associated support work at Argonne cannot be nurtured and sustained in an unsafe work environment, he said. Everyone at the lab can contribute greatly to this goal by recognizing and preventing hazards. ■

Employees urged to take the 'Change a Light' pledge

The U.S. Department of Energy is again encouraging the use of compact fluorescent light bulbs (CFLs) in the home through the "Change One Light" campaign, now under way.

CFLs provide high-quality light while requiring less energy and lasting longer than typical incandescent bulbs. Energy Star qualified CFLs use 66 percent less energy than a standard incandescent bulb and last up to 10 times longer. Replacing a 100-watt incandescent with a 32-watt CFL can save at least $30 in energy costs over the life of the bulb.

If every household in the United States replaced one light bulb with an Energy Star qualified compact fluorescent light bulb (CFL), it would prevent an amount of pollution equal to removing one million cars from the road.

Through Oct. 31, individuals can pledge to "Change One Lamp" at DOE's EnergyStar Web site. Argonne will receive credit from DOE for every participant who enters the laboratory's name and an "*anl.gov*" e-mail address.

In last year's campaign, Argonne was a leader among DOE Office of Science laboratories. Employees submitted 981 pledges to change at least one light, with the potential to save an estimated 1,208,088 kilowatt-hours of electricity and $112,352.

CFLs are becoming more common at the laboratory, too, as part of an initiative to reduce energy costs.

"With the help of the lab's custodian crews, we are actively replacing incandescent bulbs in laboratory work areas," said Gwendolyn Morrison, Argonne Energy Manager. "Argonne also has been very successful in reducing its building energy use by improving building operations systems."

Energy conservation measures completed in the last year include site-wide lighting system retrofit work, air handling system retrofits and upgrades to building automation control systems.

"We continue on the road to greater energy efficiency with the implementation of the $8.9 million dollar Energy Saving Performance Contract," Morrison said. "The project is expected to complete in February 2008 and save $1.1 million annually. Lab employees can help extend this effort to their homes, one light bulb at a time." ■

www.energystar.gov/index.cfm?fuseaction=cal.showpledge&cpd_id=696

Argonne joins in 'Science in the City' kickoff

ARGONNE, Fermilab, the University of Chicago and dozens of area institutions and businesses sponsored booths and exhibits at the "Science in the City" kickoff event in Daley Plaza Oct. 2.

The Science in the City initiative allows Chicagoans to explore and experience various fields of science and raise awareness of its importance to the city's past, present and future through a variety of scientific city-wide events.

Communications and Public Affairs hosted a booth with giveaways and information about the laboratory, and offered tours of Argonne. The Division of Educational Programs brought two "energy bikes" that demonstrate the energy efficiency of compact fluorescent bulbs and LEDs over conventional incandescent lighting.

Also unveiled at the kickoff event was a list of the top 10 scientific achievements to originate in Chicago. The number-one achievement was the first controlled nuclear reaction. A group of scientists led by Enrico Fermi built and operated the first nuclear reactor at the University of Chicago in 1942, a project that led directly to the establishment of Argonne. ■

Harold Myron, director of Argonne's Division of Educational Programs, (top) explains the "energy bike" exhibit to Chicago Mayor Richard M. Daley at the "Science in the City" kickoff event Oct. 2. The bikes (above) demonstrate the energy efficiency of compact fluorescent bulbs and LEDs over conventional incandescent lighting. *Photos by Dave Jacqué.*

BREAKTHROUGHS

A jury of Chicago area science professionals unveiled their list of the area's 10 most important scientific achievements Oct. 2 at Daley Plaza, part of the kickoff for the second annual Chicago Science in the City, a two-week program featuring science carnivals, museum exhibits, demonstrations, lectures, films and workshops. Jurors considered each of the 55 nominees' contributions to science, impact on the general public and ties to the Chicago area. Top science achievements in Chicago history were:

1. Demonstration of the first controlled nuclear reaction.
2. Invention of the first cell phone.
3. Development of hormone treatment of prostate and breast cancer.
4. Invention of magnetic recording.
5. Development of treatment for malaria.
6. Development of the skyscraper.
7. Discovery of the top quark.
8. Discovery of chromosome abnormalities in cancer.
9. Development of carbon-14 dating.
10. Discovery of the human body's process for making insulin.

Duckworth to speak at Nov. 8 recognition

Duckworth

ARGONNE will celebrate the contributions of America's veterans at a ceremony Thursday, Nov. 8. All employees whose schedules permit are invited to attend.

The event will start at 11:15 a.m. in the Building 402 Auditorium with a musical presentation by Tim Branch (EQO) and Jim Corsolini (TSD). The Argonne Choral Group will also honor the nation's veterans in song.

The ceremony will begin at 11:30 a.m. Keynote speaker will be Tammy Duckworth, director of veteran's affairs for the State of Illinois, who will speak on "Support Off the Battlefield."

As a member of the military, Duckworth is currently a major with the Illinois Army National Guard. Previously she was a logistics officer with the National Guard in Peoria, managing all logistical operations and maintenance for more than $1.7 billion in equipment.

Duckworth has served as commander of a 15-ship Blackhawk helicopter company, supervising the training for 60 aircrew members and overseeing maintenance for more than $50 million in equipment. As battle captain and assistant operations officer, she helped with planning, assigning and tracking combat missions of a 500-soldier aviation taskforce in Iraq, and flew more than 200 combat hours as a Blackhawk pilot. It was during a mission in November 2004 that a rocket-propelled grenade struck the cockpit of her helicopter and exploded. Duckworth suffered grave injuries, losing both legs.

Duckworth has received the Purple Heart, the Air Medal, the Army Commendation Medal, the Meritorious Service Medal and the National Defense Service Medal, along with other decorations, citations and badges.

Since coming home from Iraq, Duckworth has remained active in the public arena, regularly speaking to veterans' groups, testifying before Congress on issues of medical care for returning veterans and running for a U.S. Congressional seat. She helped establish the Intrepid Foundation and is involved in fundraising to build a rehabilitation center for injured veterans. ■

Argonne to be featured on *Nightly Business Report*

LATER this month, PBS' *Nightly Business Report* (NBR) will air a series about the "nuclear renaissance," or the potential comeback of nuclear energy in this country as a source for electrical power.

During production of the series, NBR visited Argonne and interviewed Mark Peters, deputy to the associate laboratory director for applied science and technology, and Monica Regalbuto, head of the Process Chemistry and Engineering Department, about recycling nuclear waste and related topics. The segment featuring Argonne will run Oct. 31 and can be viewed in the Chicago area on WTTW Channel 11. For information on when the segment will air see WTTW's Web site at *www.wttw.com*. In addition, the show can be viewed the following day via streaming video on the NBR web site at *www.pbs.org/nbr*. ■

Monica Regalbuto, head of Argonne's Process Chemistry and Engineering Department, explains the UREX+ aqueous separations process to Diane Eastabrook from PBS' *Nightly Business Report* during a tour of the K-wing in Building 205.

END OF DAYLIGHT SAVING IS A GOOD TIME TO CHECK SMOKE DETECTORS

Daylight saving time ends at 2 a.m. Sunday, Nov. 4. Clocks should be set back one hour.

The Argonne Fire Department encourages employees to change the batteries in their smoke detectors when they change their clocks. Daylight Saving Time provides a convenient reminder that fresh batteries should be installed at least once a year, if not twice. A working smoke detector more than doubles a person's chances of surviving a home fire. More than 90 percent of homes in the United States have smoke detectors, but one-third of those have dead or missing batteries, according to some estimates.