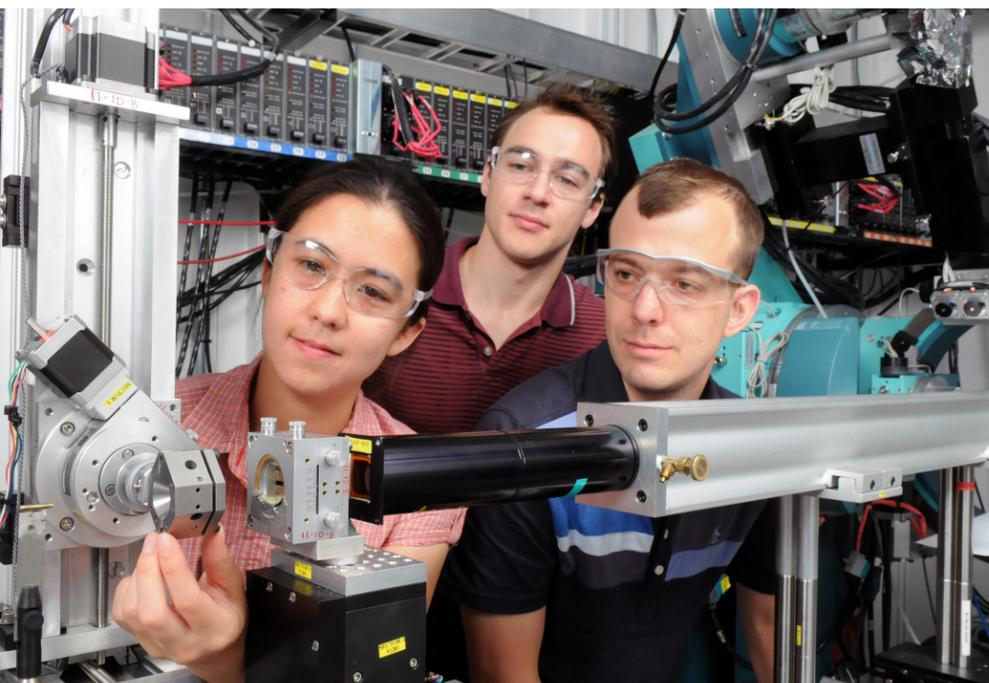


Metal-organic frameworks feel the pressure of Argonne scientists



From left to right, Argonne scientists Karena Chapman (XSD), Gregory Halder (MSD) and Peter Chupas (XSD) examine the diamond anvil pressure cell at the Advanced Photon Source. Photo by George Joch.

By Brock Cooper

Scientists at Argonne are putting the pressure on metal-organic frameworks (MOF).

In MOF materials, metal ions can be connected by organic molecules to form scaffolding-like structures similar to a molecular Tinkertoy. The struts that make up the framework structure do not fill space efficiently, in the way that Lego blocks might, leaving extra spaces in the structure which are capable of containing guest molecules.

Behaving as molecular-scale sponges, these MOFs have wide ranging potential uses for filtering, capturing or detecting molecules such as carbon dioxide or hydrogen storage for fuel cells.

“By examining the framework at various pressures,” said scientist Karena Chapman (XSD). “We found that the MOF compresses rapidly at high pressures.”

Because the MOF frameworks do not fill space efficiently, the structures are particularly sensitive to even relatively moderate applied pressures. For any carbon dioxide or hydrogen gas storage applications, the MOF materials (which are generally formed as fine particles or small crystals) will need to be compressed into pellets to optimize their storage capacities. This would subject the structure to pressures up to several gigapascals (GPa).

While a few GPa of pressure would have minimal impact on denser oxide-based materials, MOFs may show significant and possibly irreversible distortions

to the structure and to the selective gas storage properties. Understanding how MOF materials can behave under pressure is an important step in taking MOF technology beyond the lab.

Chapman, along with Argonne scientists Gregory Halder (MSD) and Peter Chupas (XSD), synthesized a copper-benzenetricarboxylate MOF and subjected the framework to various pressures inside a diamond anvil cell with and without pressure-transmitting fluids at Argonne’s Advanced Photon Source (APS).

X-ray diffraction data from the APS showed a transition from the hard regime where pressure-transmitting fluid penetrates the framework cavities, to a soft regime where the MOF compresses concertedly.

This uncharacteristic behavior is caused by the presence of smaller molecules in the pressure-transmitting fluid that can permeate the framework’s cavities. This leads to a supersaturated state that counteracts the external pressure until a threshold pressure is reached, and the MOF rapidly compresses and cannot allow additional guest molecules into the cavities.

“MOFs have wide and varied potential applications in the real world,” Chapman said. “By exploring high pressure phenomena, we come a step closer to realizing these advanced applications.”

A paper on their work can be seen in a recent edition of the *Journal of the American Chemical Society*. Funding for this research was provided by the U.S. Department of Energy, Office of Science, Office of Basic Energy Sciences. ▀

Q&A with Eric Isaacs: Strategic planning



Isaacs

Eric Isaacs, Argonne’s deputy laboratory director for programs, is leading the laboratory’s strategic planning initiative, aimed at providing the laboratory with a road

map for future research directions.

A Strategic Planning wiki is now online with more information, including milestones and key documents.

For the last five years, Isaacs has distinguished himself both as director of the Center for Nanoscale Materials and as professor of physics in the University of Chicago’s James Franck Institute. During his 13-year tenure at Bell Laboratories, he was a member of the technical staff, director of the Materials Physics Research Department, and director of the Semiconductor Physics Department. He received his Ph.D. in Physics from Massachusetts Institute of Technology in 1988 in the area of magnetic semiconductors and was a postdoctoral fellow at Bell Laboratories (1988-1990) studying magnetic and superconducting materials, mostly with synchrotron-based X-ray techniques. He is a fellow of the American Physical Society and served on a number of national scientific advisory committees, including the Basic Energy Sciences Advisory Committee.

What brought you to Argonne? How has your background prepared you for your role as leader of Argonne’s strategic planning initiative?

WIST seeks volunteers for 2009 ‘Science Careers in Search of Women’

Planning is underway for the 2009 edition of the Science Careers in Search of Women Conference, the award-winning yearly outreach event for high school girls organized by Argonne’s Women in Science and Technology program. Next year’s conference will be held April 2.

Each year, some 350 students and 70 counselors visit Argonne for a day of activities aimed at familiarizing our young visitors with the many opportunities for great careers in the sciences and engineering fields. Activities include lab

For my research interests, there was simply no question that Argonne provided the best opportunity for professional growth one could hope for. The people and facilities here are peerless and with a little hard work, Argonne will be well positioned for continued future growth. My experience as CNM director gave me broad insight into the process of growing an important new multidisciplinary research facility within a DOE lab, and I hope to apply that experience across the entire lab.

What needs does the strategic planning initiative address? And why now?

To remain competitive for limited sponsor resources, Argonne must have an overarching plan for the future of all laboratory programs that demonstrably supports the national agenda. The growing importance of energy research and development and the need to continue to refine the message that fundamental science is in the national interest, coupled with a change in administrations, make this a critical time to be ready for both budget expansions and contractions. Those with a coherent and well-thought-out plan on how to best support this agenda, while spending precious taxpayer dollars wisely, will in the end succeed above those not so prepared.

Can you describe the process and philosophy for strategic planning? How are the strategic directions determined?

The strategic planning process will look at the goals of our sponsors, balanced against Argonne’s current and desired future capabilities, to build a vision for the future. This vision will have key objectives with supporting strategies and See “Q&A: Isaacs” on page 3

INSIDE

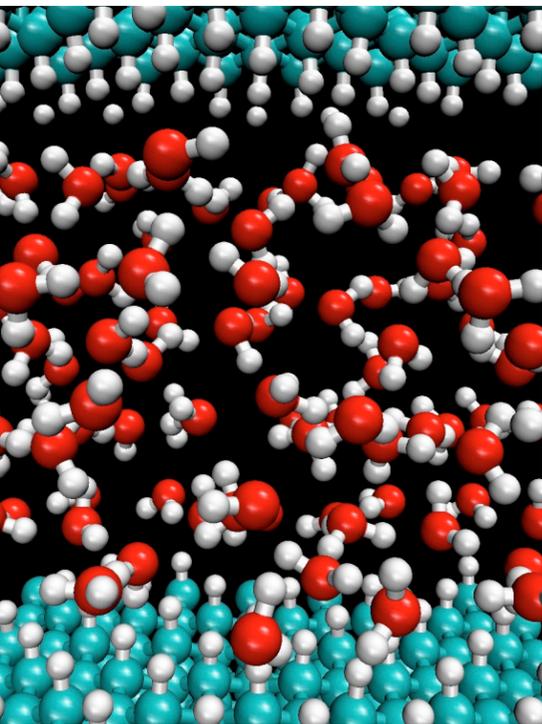
- FOUR ARGONNE PROJECTS RECOGNIZED AMONG DOE’S TOP 10
- ARGONNE SCIENTISTS PEER INTO HEART OF COMPOUND THAT MIGHT DETECT CHEMICAL, BIOLOGICAL WEAPONS
- TICKETS ON SALE FOR CONCERT BY PIANIST



UChicago
Argonne LLC



Four Argonne projects recognized among DOE's top 10



Determining the atomic and electronic structure of the "simple" water molecule has long challenged scientists.

Four projects spearheaded by Argonne computer scientists and users of the Argonne Leadership Computing Facility have been selected as being in the top 10 scientific accomplishments supported by DOE's Advanced Scientific Computing Research (ASCR) program. The winning projects, chosen by a special committee appointed by ASCR, were announced at the 2008 Scientific Discovery through Advanced Computing conference in Seattle.

"We are proud of this distinction," said Rick Stevens, associate laboratory director of Computing, Environment, and Life Sciences. "The investigators in these projects — through their development of innovative parallel solvers, numerical libraries, and computational models and methodologies — are driving dramatic advances in the physical, biological, and environmental sciences."

One of the award-winning projects is PETSc (Portable, Extensible Toolkit for Scientific Computation), a portable, extensible software toolkit developed by researchers in Argonne's Mathematics and Computer Science Division to support high-performance petascale and terascale simulations based on partial differential equations (PDEs). "PDEs are used to model phenomena in virtually all areas of science and engineering, from brain surgery to rocket science," said Barry Smith (MCS), principal developer of PETSc. With the solv-

ers in PETSc, scientists and engineers can focus on their primary discipline interests, reducing implementation costs and achieving results more rapidly. To date, the PETSc library has been used in more than 200 applications, including nanostructures, biological and medical sciences, fusion, geosciences and computational fluid dynamics.

Argonne also played a key role in three of the other top 10 ASCR projects. Each is making use of extensive grants of time at the Argonne Leadership Computing Facility to conduct large-scale calculations needed to achieve new scientific discoveries.

Giulia Galli (University of California-Davis) is investigating the atomic and electronic structure of water molecules. Scientists still are uncertain whether water molecules cluster in groups of four as tetrahedral groups or in rings and chains. "We've run literally trillions of quantum calculations in hopes of settling this controversial issue," Galli said. Her team's results so far support the tetrahedral shape. Galli and her colleagues are also probing how water behaves in extremely small spaces. Results here are expected to help in building nanoscale devices that handle liquids.

Igor Tsigelny (University of California-San Diego) is developing a set of programs to study the aggregation of unstructured proteins and their interaction with cell membranes. His innovative approach involves breaking the processes of large molecular systems into separate types of interaction with overlapping time lines or event horizons. He and his colleagues have tested this approach successfully on the unstructured protein alpha-synuclein, which causes Parkinson's disease. The results have produced considerable interest in the scientific community and have already been used to generate leads for drug discovery.

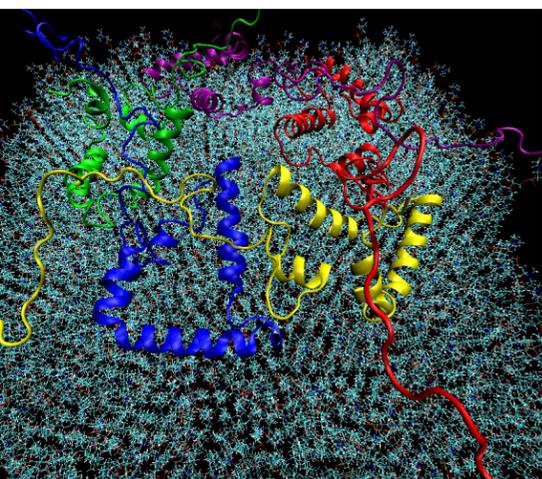
David Baker (University of Washington) is also using simulation to accurately predict structures of biologically important proteins. "Our objective is to engineer novel protein-protein interactions and protein-based inhibitors, which would be a significant step toward development of novel therapeutics," Baker said. His work is also related to environmental cleanup.

The three projects together have been awarded almost 20 million hours on the Blue Gene/P under the Energy Department's INCITE (Innovative and Novel Computational Impact on Theory and Experiment) program.

"These accomplishments — made possible with Argonne's state-of-the-art parallel numerical libraries and with the Argonne Leadership Computing Facility — underscore the fact that Argonne is playing a major role in making our environment and our lives better," said Stevens. ▀

www.mcs.anl.gov/petsc

◀ *Increased aggregation of a protein known as alpha-synuclein can lead to the formation of harmful pore-like structures in human membranes.*



NNSA nonproliferation program recognizes NE's Gohar for leadership, expertise



Gohar

Argonne's Yousry Gohar (NE) was recently recognized by the National Nuclear Security Administration Office of Global Threat Reduction for

his leadership and expertise.

Yousry, a senior nuclear engineer, was a crucial part of efforts to eliminate stockpiles of highly enriched uranium (HEU) by returning Russian-origin HEU to Russia and encouraging countries to use low enriched uranium (LEU) instead of HEU in their research facilities.

In the first project, he designed a neutron source facility using LEU fuel

for the Kharkov Institute of Physics and Technology of Ukraine. The facility design is now under consideration for construction with U.S. support.

In the second project, he completed the first conversion phase of the YALINA-Booster facility for the Joint Institute for Power and Nuclear Research – SOSNY in Minsk, Belarus, allowing for the use of LEU fuel without penalizing its performance.

"Dr. Gohar has established a worldwide reputation as a scientist and expert in the field of nuclear development and design," said Kelly Cummins, director of NNSA's office of Former Soviet Union and Asian Threat Reduction, in a letter to Argonne Director Robert Rosner. "In addition, he is respected in the international nuclear engineering community for his credible judgment on complex scientific issues." ▀

NIH awards Argonne \$800,000 to develop tool to measure distances within proteins

By Angela Hardin

Argonne scientists have received an \$800,000 award from the National Institutes of Health (NIH) to develop MADMAX, a precise molecular ruler for measuring distances within a protein.

MADMAX, which stands for the Multi-wavelength Anomalous Diffraction using Medium Angle X-ray solution scattering, would not only dramatically reduce the time necessary to reveal the behaviors of a protein, but could provide a new tool for pharmaceutical companies developing new drugs such as protease inhibitors for the treatment of HIV. It could also be a stark improvement to the decades-old method of crystallizing proteins, which involves the use of harsh chemicals and can show how a protein is structured but often provides precious few clues as to how it moves in nature.

"There's almost nothing that a protein does that doesn't involve some movement," said Senior Scientist Lee Makowski (CLS), principal investigator of the project. "Proteins have to move, and understanding that movement is key to figuring out how the proteins work."

MADMAX will precisely measure the inter-atomic distances between different parts of proteins in a solution by using the naturally occurring metal selenium to "tag" the proteins so the labels can be detected via the X-ray scattering. The selenium is easily incorporated into proteins, allowing for their study while

not interfering with their functions.

The proteins in solution are then hit with a beam of X-rays, and the scattering is used to determine the distances between selenium atoms in the protein. When the protein moves, the distances change and the movements of the protein can be measured with great accuracy.

"If successful, MADMAX would change how we study proteins and protein motion," Makowski said.

MADMAX would allow scientists to see how a protein changes as a result of its environment, observe how ligands bind to a proteins' surface and follow the process of protein or RNA folding. It would also give pharmaceutical companies the chance to observe how their drugs interact with proteins, potentially saving time and expenses by providing them with unique insight into the mechanism of the drugs' action.

The MADMAX program will take advantage of the Argonne's Advanced Photon Source, the brightest source of X-rays in the Western Hemisphere, and open to 3,500 users per year.

The MADMAX program is set to run for four years and will determine if the method would be suitable for the study of proteins on a routine basis. The team will begin by developing software and data collection protocols and then move on to study well known compounds such as hemoglobin and HIV protease to check the accuracy of the method. ▀

Medical Department to offer flu vaccines

The Medical Department will offer flu vaccines to Argonne, U.S. Department of Energy and University of Chicago employees on the following dates:

- Tuesday, Oct. 7:
Ages 65 and over: 8:30 - 11:30 a.m.
Ages 55-64: 1 - 3 p.m.
- Wednesday, Oct. 8:
Ages 45-54: 8:30 - 11:30 a.m.
Ages 44 and under: 1 - 3 p.m.

- Tuesday, Oct. 14:
Make-up for all ages: 1 - 3 p.m.

Flu vaccines will be given during the posted dates and times only, and cannot be held. There will be no exceptions. Please do not call the Medical Department.

Vaccines will be given in the Argonne Medical Department, Building 201. ▀

Argonne scientists peer into heart of compound that might detect chemical, biological weapons

By Brock Cooper

A light-transmitting compound that could one day be used in high-efficiency fiber optics and in sensors to detect biological and chemical weapons at long distances almost went undiscovered by scientists because its structure was too difficult to examine.

However, scientists at Argonne and Northwestern University were able to determine the structure of the compound using the uniquely suited Chemistry and Materials Beamline of the Center for Advanced Radiation Sources (ChemMatCARS) at the Advanced Photon Source.

“Like other such materials, this material has an electrically polarized structure. The incident light interacts with the electron cloud and in the process is disturbed,” said Argonne scientist Mercuri Kanatzidis (MSD). “The disturbance changes the wavelength of the emitted light and creates two beams: the original and the second harmonic — a beam with half the wavelength and double the frequency.”

This second-harmonic beam is 15 times more intense than that produced by the best current material. This two-for-one wavelength boost is paired with greater transparency, so the material can actually transmit the whole higher-wavelength beam. This could have eventual real-world applications in identifying biological and chemical weapons at long distances and in optical communications.

However, these properties almost went undiscovered. The material, (A)ZrPSe₆, where A can be potassium,

rubidium or cesium, has a unique and difficult chemical structure that does not crystallize very well. It grows lengthwise, but not in other directions. This creates long, thin crystals — perfect for fiber optics but a headache to study by conventional means.

“They are not very easy to design or make,” Kanatzidis said. “They don’t like to grow in other directions.”

Finally, using the ChemMatCARS at the APS, Kanatzidis, Christos Malliakas (MSD) and Northwestern’s Santanu Banerjee, Joon I. Jang, and John B. Ketterson were able to determine the structure and analyze its remarkable properties.

A paper on their work can be seen in a recent edition of the *Journal of the American Chemical Society* (J. Am. Chem. Soc. 2008, 37, 12270-12272.) Funding for the research was provided by the National Science Foundation.

ChemMatCARS specializes in X-ray diffraction from ultra-small crystals and is operated by the Center for Advanced Radiation Sources of the University of Chicago.

ChemMatCARS is jointly funded by the National Science Foundation and the U.S. Department of Energy’s (DOE) Office of Science, Office of Basic Energy Sciences. The mission of DOE’s Basic Energy Sciences (BES) program, a multipurpose, scientific research effort, is to foster and support fundamental research to expand the scientific foundations for new and improved energy technologies and for understanding and mitigating the environmental impacts of energy use. ▀



Scientist Yu-Sheng Chen calibrates the needle of the X-ray diffraction machine at ChemMatCARS in the Advanced Photon Source. The beamline is the only place in the U.S. able to examine the small crystals of compounds that may be able to identify biological and chemical weapons. Photo by George Joch

Q&A: Isaacs

Continued from page 1

plans for achieving success. The final strategic direction will be crafted from an exhaustive analysis of where we are today, where we could be in the future given sufficient support, and where our sponsors would like us to go. We’ll also take a close look at areas where we can help support our sponsors in creating new opportunities.

How is input being gathered from the S&T staff, and where can employees go for more information on how to participate?

Well, first off, it is our desire to engage every interested member of the Argonne community in the strategic planning process. We’re beginning with a grass-roots self-assessment and look to the future, and I’ve posted an initial discussion and call for papers on the Inside Argonne Wiki under Strategic Planning. I encourage all of you to take a look and engage yourself in the process.

What role do the laboratory’s partners play in the strategic planning?

Argonne’s partners are playing a crucial role in the planning process by taking on a “customer” role and telling us what they need and want from our laboratory. We cannot be all things to all people, so it is important to adhere to a framework

that allows us to send the right message to our most important partners.

Where does LDRD funding fit in?

LDRD has been and will remain a critical component of our research funding mix and our tool for exploring exciting new initiatives. One thing the strategic planning process will do for us is ensure that LDRD grants support the goals and mission of the Lab, which in turn support our sponsor goals. The clarity of this linkage will improve the probability of continued support for our many LDRD success stories.

What do you foresee as the long-term benefits and outcomes of the strategic planning effort? How will you measure success?

The long-term benefit of having a well-thought-out strategic plan is that everyone involved with Argonne will know what we stand for and where we would like to go. We’ve had some great successes in recent years, but that doesn’t mean we will continue to create and attract “the next big thing.” In other words, we must not rest on our laurels.

Upon completion of the strategic planning process, we will have a set of key goals, and a plan to achieve these goals, that we will share with all of you. Our success will simply be a measure of our progress to achieve these goals. Some

will be harder than others, or perhaps have a longer horizon, but everyone will know what direction we are heading and what we need to accomplish to get there. ▀

https://wiki.inside.anl.gov/inside/Laboratory_Strategic_Planning

Tickets on sale for concert by pianist

Arts at Argonne will close out its 21st season with a concert by pianist Mykola Suk Saturday, Oct. 25, at 8 p.m. The concert will be held in the Building 402 Auditorium, an intimate surrounding with outstanding acoustics.

Suk, awarded the title of Outstanding Artist of the Ukraine, will perform selections by Bach, Mendelssohn, Liszt, Thalberg and Hummel.

Admission is \$25. To order tickets, call 630-252-4793. VISA and MasterCard are accepted. Tickets can be ordered by mail by using the ticket request form on the Arts at Argonne Web site. Remaining tickets will be sold in the lobby of the Building 213 Cafeteria from noon to 1 p.m. during the week of Oct. 20, and the Auditorium Box Office will open one-half hour before the performance.

Winner of the first prize and gold medal at the 1971 International Liszt-



Pianist Mykola Suk will perform at Argonne Saturday, Oct. 25 at 8 p.m.

Bartok Competition in Budapest, the Ukrainian-born pianist has appeared in numerous solo recitals, as a soloist with major orchestras under leading conductors, and at chamber music festivals throughout the world.

The audience is invited to join the artist at a reception following the performance.

The concert is open to the public, and families, co-workers, friends and neighbors of employees are welcome to attend. Photo ID is required to enter the laboratory site. Employees can register their guests through the online gate pass system on *Inside Argonne*. ▀

www.anl.gov/ARTS/intro.html

'Blues and barbecue'

The Argonne Music Club's "Blues and BBQ" brought more than 170 employees, their families and friends to the Guest House the evening of Sept. 12.



The Big Eddy Springs Blues Band provided the "blues" part of the Blues and Barbecue. From left to right are guitarist Charles Pelkie; George Joch (TSD), a.k.a. Big Eddy; drummer Frank Glorioso and bassist Ted Slowik.

"The packed house for the Blues and Barbecue and the Jazz Social made it pretty clear that the Argonne community values the chance to meet and socialize in non-work related ways," said Argonne Music Club president Eric Zoellner (SUF). "The Argonne Music Club will continue to provide opportunities for this type of interaction in the future."

The event featured an outdoor barbecue buffet and music provided by the Big Eddy Springs Blues Band. Fronted

by George Joch (TSD), the band was formed at Argonne in 1993 and regularly performs at several area establishments. ■



The music brought out many guests to dance away all those barbecue calories.

DIS employees receive accolades

John Hummel (DIS) was presented with the 2007 Team Award for Process Improvement from the assistant secretary of the Air Force for acquisition in recognition of his efforts with the Air System Verification Team of the F-35 Lightning II Program. The verification team was challenged to develop a cohesive verification process that integrated all specification requirements across the three F-35 aircraft variants and multiple development block capability upgrades.

The evolutionary verification approach developed has, to date, realized a savings of more than \$300 million, with the potential for continued cost reductions. Hummel's hard work and dedication to developing the Functional Data Analysis Plans focused on the core capabilities that must be demonstrated by the Joint Strike Fighter.

Yung Y. Liu (DIS) was presented with a Certificate of Appreciation from the American Society of Mechanical

Engineers (ASME) in appreciation of his valued service in advancing the engineering profession. The award cites his work in co-developing and giving a tutorial on "Applications of the ASME Code to Radioactive Materials Packaging" at the 2008 ASME Pressure Vessels and Piping Conference. The course was presented at Argonne for the 34th time in June.

Ronald Fisher (DIS) has earned the designation of Certified Protection Professional (CPP) from ASIS International, the largest organization dedicated to advancing security professionals, with 36,000 members worldwide. The CPP designation is evidence that Fisher is board-certified in security management. The credential is internationally recognized as the standard of competency throughout the security industry. Fisher joins an exclusive group of only 5,800 CPPs who have obtained this designation since the program began in 1977. ■

Dance ensemble to mark Hispanic Heritage Month

In honor of Hispanic Heritage Month, Argonne's Hispanic-Latino Club will present the Ensemble Español Spanish Dance Theater Thursday, Oct. 9, at noon, in the Building 362 Auditorium.

The ensemble shares the rich traditions of the dance, music, literature and culture of Spain in the classical, folkloric and Flamenco styles. It encourages new

artistic creativity within the framework of the Ibero-Hispanic experience. The company, founded in 1976 by artistic director Libby Komaiko, comprises 40 dancers, singers and musicians representing a mosaic of cultures from around the world.

Appetizers will be served before the event. All are welcome. ■

Classified ads

MISCELLANEOUS

STAND-UP TICKETS - Two tickets for Mike Toomey comedy show, Beverly Arts Center, Chicago, Oct. 11, 8 pm. Free parking. Mike is hilarious, you'll have a good time. Tickets originally \$50, will sell for \$40. Janice Marco. (708) 974-0692.

SNOWBLOWERS - Toro 4hp two-stage snowblower, electric start. \$250. Toro s200 snowblower. \$125. Sears Craftsman snowblower, 5hp, two stage. \$200. Scott Gildo. (630) 834-1550.

CAMERA - Polaroid PDC-700 digital camera w/all original accessories, excellent condition, but has limited features. \$10. Jay Johnson. (630) 378-1248.

MISCELLANEOUS - Small Ikea kitchen table and four chairs. \$75. Weight bench, bars, dumbbells, iron plates. \$150. Nice patio table, chairs and stool. \$200. Foosball table. \$125. Nearly new elliptical exerciser. \$150. Mike Dunn. (630) 330-0118.

MOVING SALE - China cabinet, dining table, chairs set, sofas, reclining chairs, coffee and end tables, dining table and chairs, lamps, crystals, beds, patio furniture w/ six chairs and table with an umbrella. All at reasonable prices. Thiyaga P. Thiyagarajan. (630) 910-0256.

SLEEPER SOFA - Queen size sleeper futon sofa, prairie style, cherry, excellent condition. \$100.

MISCELLANEOUS - Desktop, CPU: AMD Athlon 1700+, memory: 512M, hard disk: 120G, DVD, CDRW, ethernet, USB 2.0 hub, Windows XP professional and Microsoft Office; webcam, wireless keyboard and mouse. \$100 or items available separately. Window Air conditioner, btu 8000, two years old. \$50. Ruobing Xie. (630) 945-5656.

EXERCISE EQUIPMENT - Parabody EX350, 205-lb weight stack, leg extension, press, pec dec, lat bar, etc., 3'2" X 5'6" floor space, 6'11" tall. You disassemble and carry. \$400. Anna Voeks. (630) 620-8921.

HAY - 1st and 2nd cutting, timothy, rye, alphalpha & clover mixes. \$4.50 per square tied bale. Nicole Green. (815) 462-4272.

FURNITURE - 1930s antique rocker with blue fabric backrest & cushion. \$100 OBO. Wooden rocker. \$35.00 OBO. Child's wooden rocker and chair. \$10 each. Two antique table lamps. \$80 OBO. Stella Blickhahn. (630) 257-7818.

BASINS - Pair Toto lavatory basins, Model #LT401.4, white, self-rimming, oval 20 x 17 1/2. Single-mount faucets included. \$50 for the pair. Richard Cirillo. (630) 852-0150.

SLEEPER SOFA - Queen size, Rowe Furniture product, used six years, but never used as a sleeper, clean. Digital photo available upon request to

shigemi.sasaki@sbcglobal.net. Shigemi Sasaki. (630) 790-4507.

GLIDER CHAIR - Dutilier glider with gliding ottoman, denim blue fabric, bought in 2001. \$100. E-mail djrsyaeger@comcast.net for a picture. Judi Yaeger. (630) 852-2854.

AUTOMOBILES

1981 HONDA - C70 Passport. Great condition, new battery. 3 speed semi automatic. est 90mpg. Top speed 45 mph. \$1,100. Tad Jesionowski. (630) 960-2663.

1996 CHEVY - Monte Carlo LS, dark green, automatic, ABS, CD, power steering, power window, power mirror, power lock and remote, cruise, rear defrost, rear spoiler, 175K miles. \$1,300. Kun Chen. (847) 849-0888.

2004 TOYOTA - 4Runner SR5, 4x4, V6, 18 - 24 MPG, Grey, 68K, new tires, original owner, garage kept, excellent condition. \$15,500. Sana Sandler. (847) 340-9705.

1996 HONDA - Accord, 125k, runs well. Some body dents. \$1,500. Gregory Peck. (630) 624-0885.

HOUSING

TOWHOUSE/SALE - 3BR, 1.5 BA, two-car garage. Brand new carpet, never been lived in, SD 308 (Oswego), Kendall County, fresh paint, ready

to move in. Tell your friends. Price more negotiable if you're without a realtor. See link for pictures! E-mail me for more, I have plenty. New lower price! chicago.craigslist.org/wcl/reb/855694674.html Michael Rosenow. (630) 430-7362.

WANTED

VAN POOL - Looking for riders to join a van pool from Channahon, Minooka or Shorewood areas. Bob Tesar. (815) 210-2404.

HOUSE/CAT SITTER - Need responsible house/cat sitter for condo in Chicago over Christmas break. Move in 12/22, move out 01/01. Will pay \$15/day. Nice place, nice neighborhood near White Sox ball park. Carrie Clark. (773) 612-9702.

REFRIGERATOR - In good working condition & reasonably priced. Nancy Brennan. (708) 424-2948.

HOUSING - Looking to rent a condo/apartment or small house within 15 miles of Argonne. Totju Totev. (630) 363-2094.

HOUSING - MSD postdoc looking for an apartment/room/shared house in the vicinity of the lab with a month-to-month lease, for a period of three months only (October-December), starting date flexible. Mihaela Tanase. (412) 352-1979. ■