

Ultrananocrystalline-diamond coating improves mechanical pump seals



These ultrananocrystalline diamond-coated pump seals garnered one of Argonne's two 2008 R&D 100 awards, which recognize the most important inventions in the previous year. Photo by George Joch.

By Rachel Lichtenfeld

From petroleum to foods and beverages to pharmaceuticals, most industries use mechanical pumps, and all these pumps rely on seals to reduce leaks and maintenance costs. Argonne researchers, along with industry partners, have developed a new, efficient and cost-effective alternative to conventional seals.

The surfaces of these Ultrananocrystalline-Diamond (UNCD) mechanical seals are specially treated with a continuous film of tiny diamonds. This diamond coating improves the pumps' reliability, durability and ability to prevent fluids from escaping into the environment. UNCD is an engineered nanomaterial invented at Argonne. It consists of diamond grains two to five nanometers in diameter.

For their work on the innovative mechanical pump seals, Argonne scientists and their industrial partners received an R&D 100 award this summer. The award is Argonne's 101st since the R&D 100s were introduced by R&D magazine in 1964. Dubbed the "Oscars of innovation" by the Chicago Tribune, the award indicates that a product represents one of the most innovative inventions of the year, according to R&D magazine.

Scientists have known about the advantages of diamond-based products for a long time, but diamonds are generally difficult to synthesize as small films and are even harder to integrate with other materials. To make a difference in manufacturing, any new mechanical pump seals would have to be priced to

compete with the less-efficient silicon-carbide seals they would replace.

"I think that's a big part of what makes this such a huge breakthrough," said John Hryn, principal process development engineer at Argonne. "We not only managed to integrate UNCD with the pump seal, but we also made it in a way where it could be manufactured at a large production facility and would be cost-effective for those who would want to use it."

Argonne developed the UNCD thin film production technology in 2002 with partner iplas GmbH, near Cologne, Germany. This technology won an R&D 100 Award in 2003. UNCD marked the first-ever affordable diamond film suitable for mass production of a wide range of diamond-based microelectromechanical systems, nanoelectromechanical system devices, biodevices, biosensors and microelectronic circuits. Adjustments in the original production process made UNCD cost-effective for mechanical seals. The UNCD Mechanical Seals were jointly developed by a team from Argonne, Advanced Diamond Technologies, Inc., (ADT), Romeoville, Ill., and John Crane Inc., Morton Grove, Ill. The Argonne team included John Hryn, lead development engineer, Gregory Krumdick, engineer, Jeffrey Elam, chemist, and Joseph Libera, engineer and post-doctoral appointee. The ADT contributors included Charles West, vice president of engineering, James Netzel, director of seals engineering, John Carlisle, chief technical officer, and Orlando Auciello, ADT technical

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Flat funding: What a continuing resolution means for Argonne

By Abigail Allred

Argonne is again this fiscal year, as in several previous years, faced with a continuing resolution (CR) from the federal government.

A CR is legislation passed by both the U.S. House and Senate that permits executive branch agencies to continue operating at the start of a new fiscal year in the absence of an approved budget. CRs allow federal agencies to continue operation using the same funding levels as the previous fiscal year. Programs that are scheduled to conclude at the end of a fiscal year receive no new funding, and new programs can not begin until a budget is passed.

With the impending change of administration, the U.S. Department of Energy is preparing for the possibility of a lengthy CR, possibly as long as six to 12 months. "In the past, CRs were used as an emergency stop-gap measure," Deputy Director for Operations Steve Richardson said. "They were measured

in days or possibly weeks. In recent years, it's become more common to measure them in months. They weren't designed for that."

Richardson also says that CRs tend to last longest during years of an administration change. "When Congress reconvenes after the new year, they might, instead of looking at the fiscal year 2009 budgets, look forward to the 2010 budget instead, and leave the lab in a continuing resolution situation for all of fiscal year 2009."

In preparation of this possibility, associate laboratory director offices have been asked to provide projections of what a possible CR will mean for their directorship. Whatever the specific impacts will be, however, the reality is that a lower budget will certainly impact Argonne in negative ways. Budgets will need to be tightened, and discretionary spending will need to be curbed, including decreased travel, less overtime and no new hires. Reductions in Force

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Laboratory Management System: benefits and development process



Steve Richardson,
deputy director for
operations

Richardson

The first article on Argonne's Laboratory Management System (LMS) described the reasons why Argonne is fundamentally rethinking the way

we manage the laboratory to meet the requirements of our customers and sponsors. It is clear that, in this time of budget crises and continuing resolutions, for Argonne to thrive and continue to produce world-class science and engineering, we must improve our management systems, and find efficiencies to provide an edge in a competitive environment.

Argonne's new Laboratory Management System will directly benefit nearly all aspects of laboratory operations.

Benefits

Employees in many large organizations often wonder if "the right hand knows what the left is doing." They wonder who makes the decisions, and how. LMS is designed to clarify and make consistent

our decision-making processes through well-defined roles and responsibilities, clear policies and procedures and a strengthened system for document control. Employees will benefit through

Argonne's core processes

- Research, development and engineering
- Strategic planning
- Asset management
- Human resources
- Scientific user facilities
- Business development
- Information services
- Financial management
- Contract management
- Acquisition of goods and services
- Security
- Governance
- Communications
- Environment
- Safety and health
- Risk management
- Project management

well-documented procedures, which will provide consistent work practices. The laboratory will benefit through a new management decision process, which

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- LEONARD TO BE HONORED FOR CHEMICAL ENGINEERING CONTRIBUTIONS
- 'ARGONNE ALERT SYSTEM' UNDERGOING TESTING; EMPLOYEES SHOULD UPDATE CONTACT INFORMATION



UChicago
Argonne LLC



LMS



At this LMS process interaction meeting on Oct. 7, process owners presented overviews of purpose and scope while identifying where their processes interact with others. The meeting helped LMS teams understand all 17 LMS core processes. At right, Acting Chief Financial Officer Betsy O'Connor talks about the risk management process. Photos by Dave Jacqué.



When done correctly, these standards result in the organization consistently achieving desired results.

As part of the ISO standards, we will be measuring the success of our processes and tracking process improvements in order to confirm our effectiveness and identify where changes are required. Our Laboratory Management System encourages employees to provide input into process improvements. Employee input is vital to the project's overall success; your efforts to identify process improvements can have clear benefits to the laboratory.

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establishes the involvement of stakeholders who will provide input to decisions prior to implementation. Gaining this input will allow management to better balance the trade offs required between the improvement and the cost. We'll all benefit from the competitive edge this will give us as we go after new projects in support of our scientific mission.

For any work that must be performed in a specific way, LMS procedures will be written. LMS procedures will clearly state who does what, will identify any standards the work must meet, and will show how each employee's actions fit into an overall work flow. Over a two-year transition period, LMS procedures and, as needed, policies, will replace chapters in existing laboratory-wide policy and procedure manuals. The new LMS procedures and policies will be available through the Web site, which will give employees multiple ways to

find needed information and will connect necessary and related documents to core processes. Until they are replaced or eliminated, chapters of legacy manuals will remain in effect and will be available to employees through the same Web interface as new LMS procedures and policies.

Development process

As mentioned in the first article, the team developing LMS is using ISO 9000 "quality" and 14000 "environmental" standards as guidelines for the development of the system. These standards are accepted worldwide and provide a basis for determining what a management system should do to achieve customer requirements.

ISO standards require that the system be documented, objectives and measurements set, and employees included in the process. "Ad hoc" or "seat of the pants" activities are replaced with established processes, clear roles and responsibilities.

The first step is to document how we do business today. More than 300 of your colleagues have been working in teams to identify and define 17 core processes necessary for us to conduct business and meet our science objectives (see list on page 1). These interdisciplinary teams documented how each core process works and evaluated improvements that should be made. Some of these process improvements have already taken effect, and with good results. Next, the teams identified the objectives and measurements that would establish how core process success will be measured moving forward.

The status of the LMS project will be the subject of an upcoming article, which will also outline transition plans for individual employees and divisions. A final article will address process education and employee education. For more information on the LMS initiative and how it will be improving the way we do business at the laboratory, visit inside.anl.gov/lms/. ▀

LMS improves quality, communication in Work for Others program

Although Argonne's Laboratory Management System is not ready to be used in all laboratory operations, the Work for Others Program has been applying LMS decision-making procedures to some of its more difficult issues for the past two months to test the procedures and resolve issues.

Work for Others (WFO) is the designation used for all non-DOE-sponsored research projects. These projects are important to the laboratory; they are responsible for about 25 percent of the Argonne's revenues. The WFO preparation, submission and approval process is complex and requires cooperation between the programmatic divisions, the associate laboratory director offices, the Office of Technology Transfer, Legal, Procurement and Accounting to produce required materials for DOE that show that the laboratory is working within the boundaries of the Prime Contract.

"This would be relatively simple if all of the projects were the same," said David Lewis, process owner for business development processes, "but they vary widely in size and content and require careful preparation to meet

our contract requirements. The process we had been using was no longer able to give the lab the efficient, timely turnaround that our engineers and customers expect."

Lewis was given the task of making the process more efficient. He appointed Steve Ban, director of the Office of Technology Transfer, issue manager and appointed a working group representing stakeholders from across the laboratory. Lewis also asked DOE program managers Robbie Dalton and Jennie Stricker to serve on the working group to ensure that the process meets the needs of both Argonne and DOE.

There were vigorous discussions and the present system was examined in detail. Thus far, the working group has recommended deleting steps that don't add value, suggested process enhancements, and reached consensus on trade-offs that promise to benefit the overall system significantly.

"Participating in the LMS Work for Others Process Improvement Team has taught each of us a lot about a system we thought we already knew," said Dalton, program manager for reimburs-

able work in DOE's Argonne Site Office. "Using a systematic evaluation process has made us each receptive to new ideas and enabled an understanding of the other person's needs and point of view. We're already seeing improvement in the quality of WFO packages, and improved communication among DOE and Argonne staff. I'm excited about the final product which will enable each of us to do a better job and save time — something we all strive for."

"I certainly agree with Robbie," echoed Ban. "Based on our discussions to date, we have already implemented some improvements in OTT that have accelerated the current process."

The working group is in the final stage of completing its job and the Business Development Team is now codifying the recommendations as Argonne procedures.

"We're not there yet," Lewis said, "but for the first time, a working group representing all of the stakeholders has come together and hammered out an improved process that they all believe benefits the lab as a whole." ▀

Performance appraisal process is now under way

The 2008 Performance Appraisal process began Oct 1. Annual performance appraisals are required for all full- and part-time non-union employees and are due electronically to Human Resources (HR) by Monday, Dec. 15.

If their supervisors request it, employees can enter their achievements and goals directly into the performance appraisal or upload a "Statement of Accomplishments."

Employees should take a few minutes to view the new, online "Performance Appraisal Employee Tutorial," which will help them navigate the performance appraisal Web application. The tutorial can be downloaded by clicking the PDF link in the top right corner of the tutorial screen. Text-only employee instructions are also available.

New Ratings

The Performance Evaluation Process (PEP) Committee reviewed the performance appraisal process and made recommendations that are effective as of Oct. 1. There are now five ratings for overall performance:

- Far Exceeds Expectations
- Exceeds Expectations
- Achieves Expectations
- Meets Most Expectations
- Fails to Meet Expectations

Three ratings are recommended for Section 1: Accomplishments:

- Exceeds
- Achieves
- Fails to Meet

Performance appraisals are completed through the Performance Appraisal Application on Inside Argonne, which requires employees to log in with a Argonne domain username and password.

For the application to function correctly, cookies and JavaScript must be enabled, and pop-up windows must be allowed from Web addresses that end with ".anl.gov."

Employees who do not have computer access can use the machines in the libraries and the HR area in Building 201. Employees who are off site must access the Web application via VPN Client software.

More information and instructions are available on the Performance Appraisal Web page on Inside Argonne. Employees can also contact HR/Performance Development at ext. 2-8786 for more information. ▀

Performance Appraisal Web page: inside.anl.gov/hr/performance_appraisals/annual_review.html

Performance Appraisal Employee Tutorial: www.eshtraining.anl.gov/courses/PAtutorial

Text-only instructions: inside.anl.gov/hr/performance_appraisals/employees.html

Pump seals



Argonne's inventors of the UNCD-coated mechanical pump seals with their award-winning product. Back row (left to right): chemist Jeffrey Elam and engineer Joseph Libera. Front row (left to right): ADT technical consultant and senior scientist Orlando Auciello, lead development engineer John Hryn and engineer Gregory Krumdick. Photo by George Joch.

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consultant and Argonne senior physicist. The John Crane team included Douglas Volden, new products director, Joe Haas, vice president of engineering, and Rick Page, vice president of marketing.

The Industrial Technologies Program of the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy provided funding for the development of the UNCD Mechanical Seals. The Industrial Technologies Program works with U.S. industry to improve industrial energy efficiency and environmental performance. The

program invests in high-risk, high-value R&D to reduce industrial energy use while stimulating productivity and growth.

ADT, an Argonne spin-off company, has developed a commercial manufacturing platform for making UNCD Seals in volume with exceptional reproducibility and quality. John Crane, the world's largest manufacturer of seals and associated products, performed exhaustive tests to show that the UNCD-enhanced seals significantly reduce friction, which improves their performance compared to seals made with conventional materials. ▀

Amazon's chief tech officer to speak at Oct. 22 colloquium



Vogels

Werner Vogels, Amazon.com's vice president and chief technology officer, will present "A Head in the Cloud — The Power of Infrastructure as a Service" at a director's special colloquium

Wednesday, Oct. 22, starting at 2 p.m. in the Building 362 Auditorium.

Building the right infrastructure that can scale up or down at a moment's notice can be a complicated and expensive task, but it's essential in today's business landscape. This applies to an enterprise trying to cut costs, a young business unexpectedly saturated with customer demand or a start-up looking to launch. There are many challenges when building a reliable, flexible architecture that can manage unpredictable behaviors of today's Internet business. This presentation will review some of the lessons learned from building one of the world's largest distributed systems: Amazon.com. The focus will be on state management, which is one of the dominating

factors in the scalability, reliability, performance and cost-effectiveness of the overall system.

Vogels is responsible for driving Amazon.com's technology vision, which is to continuously enhance innovation on behalf of Amazon's customers on a global scale. Prior to joining Amazon, he worked as a research scientist at Cornell University, where he was a principal investigator in several research projects that targeted the scalability and robustness of mission-critical enterprise computing systems. He has held positions of vice-president of technology and chief technology officer in companies that handled the transition of academic technology into industry. He holds a doctorate from the Vrije Universiteit in Amsterdam.

Amazon.com, Inc. opened on the World Wide Web in July 1995, one of the first major companies to sell goods by Internet. It began as an online bookstore, but soon diversified to carry products in dozens of categories. Amazon Web Services provides developer customers with access to in-the-cloud infrastructure services based on Amazon's own technology platform, which developers can use to enable virtually any type of business. ▀

CR

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(RIFs) might also be required, especially in areas that have projects reaching conclusion. "Right now, we are trying to gauge the impact that a lengthy CR will have on the lab at large and individual programs in specific," said Betsy O'Connor, acting chief financial officer.

Argonne, unlike Fermilab, is a multi-purpose laboratory and more than 20 percent of funding comes from work for others, which can help to dull the negative impacts of budget cuts from DOE. It's important to note, however, that a CR will negatively affect many of the other agencies and laboratories that Argonne works with, so less money from those sources should also be expected.

O'Connor says that the flat funding that occurs with a CR also poses problems because costs at the laboratory are increasing, specifically energy costs. The cost of electricity is up nearly 25 percent over last year, and the price of gas has increased significantly as well.

Argonne is also involved with several big-budget legacy issues, such as waste removal, that have been commit-

ted to and must be addressed. "These are costs that we can't negotiate; they are a priority under any circumstances," Richardson said.

The Human Resources (HR) division is also preparing for flat funding and is working on ways to mitigate its effects. They are in the process of reviewing all benefits costs in order to be as financially responsible to the lab as possible. "Part of this process includes negotiating with our health care providers for the best possible health insurance rates for lab employees," John Hyzer, HR assistant division director said. "We always look with a critical eye to balancing the short-term impact on each current employee with the costs to the lab, as well as with the impact on recruitment and retention."

"This will be a difficult time for Argonne," Richardson says, but "as soon as we identify a problem, we will be working on solutions. We will be proactive and communicate to the lab what steps will be taken."

Look for more information on the CR and its effects in future issues of *Argonne Today* and *Argonne News*. ▀

Leonard to be honored for chemical engineering contributions



Leonard

Chemical Engineer Ralph A. Leonard (CSE) has been selected as the 2008 recipient of the Robert E. Wilson Award of the Nuclear Engineering Division of the American Institute of Chemical Engineers.

The Nuclear Engineering Division's highest award recognizes Leonard's outstanding chemical engineering contributions to the nuclear industry in the areas of nuclear technology and separation science. Many of these contributions are currently used in industry: the caustic-side solvent extraction process, the technical basis for centrifugal contactors, the spreadsheet algorithm for stagewise solvent extraction and the dispersion number for predicting the behavior of coalescing liquid-liquid dispersions.

The award consists of a wall plaque and a \$1,000 honorarium sponsored by the Fluor Foundation, and will be presented at a special luncheon during the institute's annual meeting in November in Philadelphia.

The Nuclear Engineering Division serves engineers and scientists in the nuclear and nuclear chemical sectors, sponsoring nuclear symposia and present-

ing information to the public. The present emphasis is on providing factual nuclear information to institute members, governmental agencies and the general public.

The Robert E. Wilson award is the oldest award presented by a division of the American Institute of Chemical Engineers, first presented by the Nuclear Engineering Division in 1967. The award is given in memory of Robert E. Wilson, a noted chemical engineer and long time member of the institute.

Ralph A. Leonard has been a member of the institute's Nuclear Engineering Division since he joined Argonne in 1976. He has been membership chair, director, vice chair, chair, programming chair and nominating committee chair and worked on various technical programs in the areas of nuclear technology and separation science. These programs include liquid extraction, ion exchange, flowsheet development, and centrifugal contactor design for nuclear fuel reprocessing and separation of nuclear wastes; uranium dissolution for Mo-99 recovery; sodium technology for fast breeder reactors; tritium and liquid metal technology for the fusion power program; and proof-of-breeding analytical support for the light water breeder reactor. He is the author or co-author of more than 100 articles and reports; most of these publications have been a result of work at Argonne. ▀

Southbound sandhills

Gina Block (FMS) took this picture of sandhill cranes (*Grus Canadensis*) near the East Gate Oct. 8. Mated pairs stay together year round, and migrate south as a group with their offspring. Flocks of migrating sandhills sometimes fly so high that their grating croaks are the only way to tell they are overhead.



Employee Benefits Open Enrollment for 2009 to be held Nov. 3 – 26

Who should care?

- Employees with dependent(s) age 18 as of Dec. 31, or will be turning 19, 20, 21, 22 or 23 in 2009.
- Employees who want to participate in Flexible Spending Accounts for 2009.
- Employees who want to make a change to their medical plan.
- Employees who want to know about rate or plan changes.

Watch for the Open Enrollment materials to be sent to you Nov. 3. The link to the Web site will be sent via e-mail. If you do not have e-mail access, you will receive a paper copy.

Dependent children who are full-time students in the above-listed age bracket will be dropped from the medical plan if the employee does not go online during Open Enrollment and verify eligibility.

Employees who do not go online during Open Enrollment to elect Flexible Spending for 2009 will not be able to participate in the plan next year. Participation does not carry over from 2008 to 2009. Employees must re-enroll every year.

Representatives from BCBSIL PPO, the HMOs and Argonne Benefits will be in the Building 213 Cafeteria Tuesday, Nov. 4, through Thursday, Nov. 6, from 11:30 a.m. until 1:30 p.m. to answer questions about the health care plans. Changes made online during open enrollment become effective Jan. 1, 2009.

Any employee who anticipates being out on business travel or sick leave during the full period of Open Enrollment (Nov. 3 - 26) and cannot make election online should contact Marge Vaught at ext. 2-2985 prior to Nov. 26. ▀

'Argonne Alert System' undergoing testing; employees should update contact information

A new sitewide notification system, the Argonne Alert System, will allow employees and site occupants to learn of time-sensitive and other emergency announcements as soon as possible via a phone call, e-mail or text message.

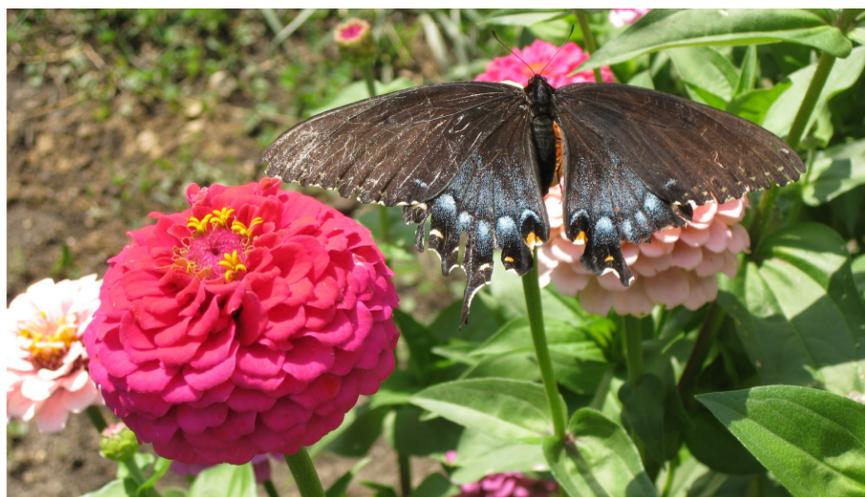
For example, if the lab has a late start or has a change in operations due to snowfall, employees will receive an e-mail, text message or telephone call to one of their contact numbers listed in Inside Argonne. The communications route used for each announcement is determined by the sender and circumstances surrounding the event.

"Over the next week, employees are urged to verify and update their contact information on Inside Argonne," said Scott Pinkerton, communications infrastructure section manager. "Personal information such as home phone, cell phone and home address should be entered, but does not need to be viewable to all employees for the Argonne Alert System to work."

To enter contact information, log into Inside Argonne and go to the "Contact Information" page. On the left-hand side of the contact information page, click on

the "home address" tab. Once all information is entered and verified, employees can keep their home information private by using the "ANL Directory" drop-down bar on the right-hand side of the page. By clicking on the drop-down bar, an employee can choose from four different options: make the home phone number and address viewable, keep the home phone private, home address private or keep both home phone and address private in the Argonne Directory.

The Argonne Alert System will be tested twice over the next couple of weeks. The initial test, on Monday, Oct. 20, will consist of an e-mail message to ensure that all employees' e-mail addresses are current and correct. The second test will take place on a Saturday or Sunday and will consist of a phone call to the employee's work phone number, where a brief message will be left. When employees receive a call from the Argonne Alert System, the number displayed on caller ID will read 630-252-0015. Depending on the results of the two initial tests, a third test may be added at a later date. For more information, contact CIS. ▀



Garden plots to be offered again in 2009

The garden plot pilot program will be continued next year, giving Argonne employees a chance to do some gardening in the courtyards of Building 200 and on the north side of Building 214. Additional areas will be added next year if the number of participants increases.

Fifty-four employees took part in this past season's inaugural program, sponsored by Facilities Management and Services. FMS is looking for improvement suggestions for the 2009 season; send your ideas to Marcia Konopa at konopa@anl.gov. FMS will announce the start of garden plot assignment in early spring.

Novice gardener Valerie Davis (EQO) requested a plot in a Building 200 Courtyard.

"When I heard that there were garden plots, I jumped at the chance," Davis said. "I never had a garden before, and thought I would try and learn to plant, and to help beautify Argonne, and also spread some cheer."

Davis grew a variety of flowering plants from seed, including zinnias, mini-sunflowers, petunias, marigolds, vincas, geraniums and purple coneflowers. She tended to the plot during her lunch hour.

"It was so exciting to see my seedling actually growing. Not only did my garden attract people in the 200 F-wing, but also other visitors came — butterflies, and a hummingbird," Davis said. "A few residents in F-wing asked for a flower garden under their window, and I wish I could do for all, but there is only so much time in this universe. I am glad to say that I have one garden, my first garden, and it worked!"

◀ *Bettylou Wahl (EQO) took this picture of a black swallowtail (*Papilio polyxenes asterius*) in the garden plot started and tended by Valerie Davis (EQO).*

Classified ads

MISCELLANEOUS

MISCELLANEOUS – Bunk bed, twin over full (inc. mattresses). \$75. Pool filter. \$75. Pool pump. \$75. Fridge. \$100. Stove. \$100. Trampoline. \$75. Freestanding basketball net. \$75. Wanda Woods. (815) 773-2921.

BLACKHAWKS TICKETS – Several pairs, call or e-mail for details. Claude Reed. (630) 217-0978 or claudio.reed@gmail.com.

BAKER'S RACK – Black metal frame with wood counter top. Built-in wine rack and hanging stemware rack. \$25. Jeff Ullian. (815) 953-9607.

PIANO – Used Yamaha upright piano with a bench and a lamp for sale. \$1,500 OBO. Yiyang Ge. (630) 985-5749.

DRILLS – New, never used Rigid 1/2 inch heavy duty T handle drill model # R7121, 9 amp. \$100. New, never used Rigid pistol grip 1/2 inch drill model# R7111, 8.0 amp, 0-850 rpm. \$75. Nicole Green. (815) 462-4272.

ELECTRONIC DRUMSET – Roland

TD7K, complete with eight rubber pads, great condition. \$450. Jay Johnson. (630) 378-1248.

STATIONARY BIKE – Vitamaster exercise bike w/ tension control, chair driven with extra wide seat. \$60. Laurie Carbaugh. (708) 598-8641.

AUTOMOBILES

2008 FORD – Escape XLT, V6, 4WD, loaded with extras including leather seats, CD player, sun/moon roof, keyless entry, 18K miles, dark gray, like new, excellent condition. \$18,000 OBO. Mary Dzielski. (630) 730-3007.

HOUSING

HOUSE/SALE – 3BR, 1.5 BA, 2 car garage Gorgeous Aurora SFH, over-improved with brand new carpet, fresh paint, never been lived in. SD 204. Ready to move in; tell your friends. Too much to list. Price more negotiable if you're without a realtor. See link for pictures; e-mail me for more, I have plenty. <http://chicago.craigslist.org/wcl/reb/873552434.html>. Michael Rosenow. (630) 430-7362.

CONDO/SALE – Spacious 2 BR 2 BA condo in Naperville. All-brick secure building. This spacious unit has loads of closet space, large laundry room, a private, detached one-car garage and more. Great nearby amenities with an easy stroll to quaint shops and restaurants and there are plans to extend the Riverwalk to run right through this area. Priced to sell at \$147,000. Wes Agresta (815) 254-5120.

APARTMENT/SUBLET – Large 1 bedroom, good area, very good condition, light and quiet, close to Argonne and shopping. Available ASAP until Dec. 31 with possibility of lease renewal. \$875 + utilities. Mihaela Tanase. (412) 352-1979.

APARTMENT/SHARE – 15 min from lab, utilities included, short term available. \$350/month. Moonkyu Park. (630) 991-6594.

TOWNHOUSE/SALE OR RENT – 3BR, 2.5 bath, 2 car garage, hardwood floors, fresh paint, backs to pond, end unit, sunny and bright, cul-de-sac. Close to shopping mall, train station and highway, 15 miles to Argonne. Hairong Shang. (630) 660-3854.

APARTMENT/RENT – 2 BR apartment

for rent in Darien. 5 minutes from the lab at Cass & Concord. \$1,025/mo. Konstantin Ignatyev. (630) 322-9819.

CONDO/SALE – Willowbrook (The Knolls), 1 BR, 1 BA, completely remodeled, everything is new. MLS #06999761. \$119,900. Jerry Gogol. jg695@juno.com.

WANTED

WATER COOLER – Hot and cold. Karen Kucer. (815) 838-3609.

TO BE GIVEN AWAY

KITTEN – Free kitty, rescued from dumpster. Very cute, playful, friendly, black and white male who needs good home. Donna Shaw. (815) 942-2691.

GECKOS – Two leopard geckos, 29 gal. cage, and accessories, free to good home. Ray Ziegler. (815) 436-4515.

LOST AND FOUND

FILM – 1 roll 35mm film in white film container marked with masking tape "Paul's tooth" on Oct. 1. Mary van Gemmeren. (630) 717-8348. ▀