

Researchers develop technique for bacteria crowd control

SYLVIA CARSON

A surprising technique to concentrate, manipulate and separate a wide class of swimming bacteria has been identified through collaboration between researchers at Argonne, Illinois Institute of Technology, University of Arizona at Tucson and Cambridge University, U.K. This device could have enormous applications in biotechnology and biomedical engineering, including use in miniaturized medical diagnostic kits and bioanalysis.

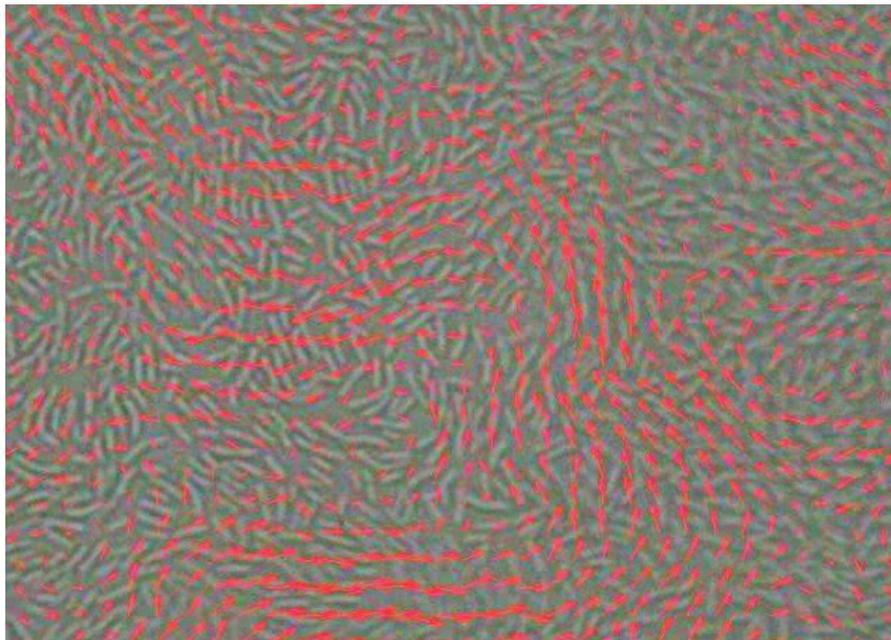
The technique is based on the transmission of tiny electric currents in a thin film sample cell containing a colony of bacteria. The current produces electrolysis that changes the local pH level in the vicinity of the electrodes. The bacteria, uncomfortable with the changes in pH, swim away from the electrodes and ultimately congregate in the middle of the experimental cell. Concentrated bacteria form self-organized swirls and jets resembling vortices in vigorously stirred fluid.

The method, which is suitable for flagellated bacteria such as *E. coli* and *Bacillus subtilis*, among many others, relies on the ability of bacteria to swim toward areas of optimal pH level. The bacteria live in an environment of a specific pH level, so that an increase or decrease of pH stimulates the bacteria to avoid areas of non-comfortable pH and swim in the direction of pH gradient. The researchers used an electric current to create a controlled deviation of the pH levels from the bulk values. Since only living bacteria respond to the pH stimulation, using this method can separate living and dead cells or bacteria with different motility.

The device, with the capability to change the thickness of a film from one millimeter to one micron (with five-percent accuracy) and control the position of electrodes, is intended to separate and concentrate small quantities of living and dead microorganisms in confined spaces. It can be used for the purposes of express bioanalysis, diagnostics and identification of small bacterial samples, and to separate sick and live cells. A patent for the device is currently pending.

"Using this method, our research succeeded in dramatically increasing the concentration of microorganisms in tiny fluid drops and films. Unlike traditional centrifuging techniques, the new approach allows selective concentration of healthy cells," said Andrey Sokolov, Ph.D. student from Illinois Institute of Technology and contributor to the research.

In addition to the development of the device used in the experiment, research findings uncovered the explanation



This image shows swimming bacteria in a thin film.

for the long-standing fundamental questions on the properties of collective and organized motion in the systems of interacting self-moving objects. Besides swimming bacteria, other examples include bird flocks, fish schools, motor proteins in living cells, and even swarms of communicating nano-robots.

"We have presented experimental studies of collective bacterial swimming in thin fluid films where the dynamics are essentially two-dimensional and the concentration can be adjusted continuously," explained Igor Aronson (MSD). "Our results provide strong evidence for the pure hydrodynamic

origin of collective swimming, rather than chemotactic mechanisms of pattern formation when microorganisms just follow gradients of a certain chemical, such as nutrient, oxygen, or other."

Detailed results of these findings have been published in *Physical Review E* and in *Physical Review Letters*.

Funding for this research was provided by the U.S. Department of Energy's Office of Basic Energy Science.

Details of the instrument and animations are available online. ■

www.anl.gov/Media_Center/News/2007/news070416.html

Catlett named CIO, director of CIS



Catlett

Catlett brings more than two decades of information technology research, development and management experience, most recently as director of the National Science Foundation's nation-wide TeraGrid initiative and principal investigator of the TeraGrid's Grid Infrastructure Group. This distributed team coordinates TeraGrid operations, planning, software integration and architecture.

Catlett will continue to work with the TeraGrid project in a strategic advisory role and as chairman of the TeraGrid leadership forum. Dane Skow, deputy director of the TeraGrid's

CHARLIE Catlett has been named chief information officer and director of Argonne's Computing and Information Systems Division.

Grid Infrastructure Group since 2005, will assume the role of principal investigator and director.

Catlett joined Argonne in 2000 as a senior fellow at the Computation Institute of The University of Chicago and Argonne. He has served in a variety of advisory committees to national infrastructure programs including the Energy Sciences Network (ESnet), Internet2 and National LambdaRail.

"We are delighted to have Charlie on board," said Argonne Director Robert Rosner. "His technical and community-building skills will be a real asset to the leadership team at the laboratory. A key aspect of the laboratory's strategic plan is a new initiative called the 'Digital Laboratory' that recognizes information technology as a catalyst to improving Argonne's ability to do science. Charlie's experience and skills will be essential in completing that initiative."

In 1999, Catlett founded Global (See 'Catlett', page 3)

Arts at Argonne to host vocal ensemble 'Tapestry'



TAPESTRY, a vocal ensemble, will perform at Argonne's Building 402 Conference Center Saturday, May 12, at 8 p.m.

The trademark of the ensemble is combining medieval repertory and contemporary compositions in bold conceptual programs. Critics have hailed the rich distinctive voices of the ensemble, their "technically spot-on singing," their emotionally charged performances, their impeccably delivered harmony and complex counterpoint. Tapestry has appeared throughout the United States, Canada and Europe, and has recorded four CDs for Telarc and more recently with the German label MDG.

The concert is open to the public. Visitors who are U.S. citizens need photo identification to enter the site and should call to register before the concert. Non-U.S. citizens must register before the event by calling (630) 252-3751 during business hours.

Admission is \$25. To order tickets, call ext. 2-3751 or mail a request using the online ticket request form. Remaining tickets will be available the week of May 7 in the Building 213 Cafeteria between noon and 1 p.m. ■

www.anl.gov/ARTS/upcoming.html

ARGONNE COMBINED APPEAL UNDER WAY; PLEDGE ONLINE

The electronic system for the May 2007 Argonne Combined Appeal is now available. It is accessible by logging into the Inside Argonne Web page, selecting the "Personal Info" tab, clicking on "My Payroll" and then selecting the Argonne Combined Appeal link on the left-hand side. The renewal system will be available throughout the month of May. Prizes will be given away weekly.

Detailed instructions and more information about the Argonne Combined Appeal are available online.

http://inside.anl.gov/community/aca/pledge_card.html

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Consortium to widen talent pool by attacking 'dual-career dilemma'

It's called the "dual-career dilemma": one person gets a great job in a distant region of the country, giving that person's partner the unwelcome choices of leaving his or her current position and facing a job search in unfamiliar territory, insisting that the couple stay put or long-distance commuting. Dual careers also put the pinch on institutions: the best candidates for a particular position may be half of a dual-career couple living in other parts of the country or a foreign nation.

To address this problem, Argonne, Fermilab, The University of Chicago, Northwestern University and the University of Illinois at Chicago have formed a Greater Chicago Higher Education Recruitment Consortium (GC-HERC). The concept originated with colleges and universities in northern California in 2000 as a way to address common dual career and employment outreach issues in the region. The GC-HERC will also enlarge the available pool of applicants, enhancing diversity and excellence in staff and senior management.

One hundred four academic and research institutions from the six-county region that GC-HERC will represent were invited to join. Specific

information about the actual number of institutions joining the GC-HERC will be available in mid-summer.

GC-HERC will address the dual career issue by:

- Providing a comprehensive, regional listing of faculty, executive and staff job listings on a central Web-based database and offering tools such as the dual-search feature and e-mail job alert function.
- Allowing member institutions to use the HERC e-mail and phone list to circulate CVs and resumes to member institutions and call colleagues to get information about departments and arrange informational interviews.

The Web site will provide augmented information resources, networking and outreach programs as well as information on the local area of interest to the job seeker and his or her partner, and gives applicants the ability to seek jobs by institution, job criteria, keyword and geographic area.

The Web site is projected to be up and running this fall. It will be open to the public.

For more information, contact Rosalie Bottino (HR) at ext. 2-2966. ■

X-ray scattering techniques determine how dissolved metal ions interact in solution

SYLVIA CARSON

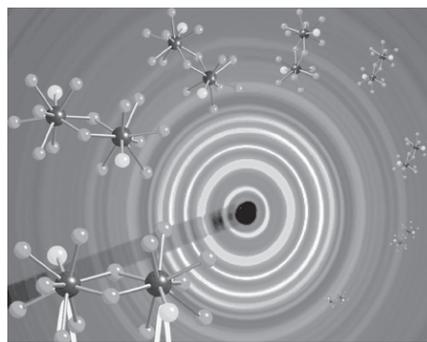
RESEARCHERS at Argonne and the University of Notre Dame have successfully applied X-ray scattering techniques to determine how dissolved metal ions interact in solution. These findings will help researchers better understand how metal ions, such as those found in nuclear waste and other industrial processes, behave in the environment.

The results show that the ion structures are visible in solution and reveal their interactions with other ions.

"The scientific community has long asked the question, 'What happens to a metal ion in solution?'" said Suntharalingam "Skantha" Skanthakumar (CHM), Argonne senior scientific associate. "Direct measurement of metal correlations in solutions show long-range interactions and a strong correspondence to the structures in solution and solid state environment."

"We have been provided with additional structural and chemical insight into tetravalent actinide hydrolysis," said Lynda Soderholm (CHM). "We discovered that the way atoms interact is transferable with a lot more detail than what was previously thought. Hydrolysis of dissolved metal ions is one of the most fundamental and important reactions in aqueous chemistry."

Experiments for this work were conducted at Argonne's Advanced Photon Source (APS). The 1,104-meter circumference APS accelerator complex, large enough to encircle a baseball stadium, houses a complex of machines and devices that produce, accelerate and store a beam of electrons that is the source of the APS X-rays. For this



research, thin beams of high-energy X-rays were used to bombard the dissolved ions. When the X-rays scattered off the solutions, special CCD cameras mapped out their two-dimensional pattern.

The detailed results of these findings were published in the paper "Structures of Dimeric Hydrolysis Products of Thorium" and in the journal *Inorganic Chemistry*.

"Going forward, additional research is planned with thorium and other dissolvable materials across the periodic table," said Argonne postdoctoral researcher Richard E. Wilson. "The goal is to be able to predict reactions to metal contaminants and determine the chemistry that influences their transport in the environment."

This research involved collaborations from various scientific disciplines including input from physicists, chemists and geologists. Collaborators on this research were Richard E. Wilson, S. Skanthakumar, and Lynda Soderholm from Argonne, and Peter Burns and Ginger Sigmon from the University of Notre Dame.

Funding for this project was provided by DOE's Office of Basic Energy Sciences, and Division of Chemical Sciences, Geosciences, and Biosciences. ■

Argonne Air Force fellow promoted to colonel

WARREN G. Ward, a national laboratories technologies fellow in the U.S. Air Force Fellowship Program, was promoted from the rank of lieutenant colonel to colonel in a ceremony at Argonne.

This is the second year Argonne has participated in the U.S. Air Force Fellowship Program, an elite educational opportunity administered by the College of Aerospace Doctrine, Research and Education of Air University at Maxwell Air Force Base in Montgomery, Ala. Sixty Air Force officers are participating in the 2006-2007 fellows program in a variety of one-year educational opportunities. Colonel Ward and Major David Benson, assigned to Argonne, are among 10 officers assigned to five national laboratories. Other fellows are assigned to various institutions including the White House, the U.S. Senate and House of Representatives, the Kennedy School of Government at Harvard, the Rand Corporation, Massachusetts Institute of Technology, Deutsche Bank in London, Microsoft and other national laboratories. Participating officers are majors and lieutenant colonels selected for leadership, and whose assignments will benefit both the hosting institution and the Air Force.

A command pilot with more than 3,400 hours of flight time, Ward's primary weapons system was the B-52. His most memorable B-52 operations include piloting one of seven aircraft on the opening strike of Operation Desert Storm. This 35.4-hour sortie marked the first operational use of the Conventional Air Launched Cruise Missile. In August 1994, he was an aircraft commander on the longest-ever B-52 sortie, a 47-hour non-stop around-the-world mission. A year later in August 1995, he was an instructor aboard a B-52 which suffered a catastrophic explosion that resulted in two engines literally falling off the aircraft; he was directly responsible for the safe recovery of the crew and the aircraft.

Ward is a graduate of Squadron Officer School, Air Command and Staff College, Air War College and the Joint Forces Staff College. He has served on the headquarters staff of U. S. Strategic Command at Offutt Air Force Base, Neb. He was responsible for training new USAF pilots during a tour as a T-38 instructor pilot and Chief of Safety at Vance Air Force Base, Okla. Prior to reporting to Argonne in August 2006, he commanded the 321st Training Squadron at Lackland Air Force Base, Texas, from September 2004 to July 2006 where he and his staff were directly responsible for transforming more than 10,500 civilian recruits into USAF Airmen to serve America in locations the world over.

Major General John L. Borling (USAF-retired) of Rockford officiated the ceremony. Argonne Director Robert Rosner was the host and provided comments regarding the value of the USAF Fellowship program to Argonne. Colonel Ward's wife, Amanda, and children, Michaela and Ethan, helped pin the new rank insignia to Ward's



Major General John L. Borling (USAF-retired), at left, administers the oath of office to Colonel Warren G. Ward, a national laboratories technologies fellow in the U.S. Air Force Fellowship Program. The promotion ceremony took place April 3 at Argonne.



Colonel Warren G. Ward (center) receives his new rank insignia from his wife, Amanda, and Major General John L. Borling (USAF-retired).

uniform. Major Benson served as narrator and Technical Sergeant Jeremy Lemaire, an Air Force recruiter from Downers Grove, assisted with the festivities. The ceremony was attended by Mike McGrath, commander of the Judd Kendall VFW Post 3873 in Naperville, and many of Ward's friends and Argonne employees. ■

Argonne Credit Union names new president/CEO

BRIAN Cedergren has been named the new president and chief executive officer of the Argonne Credit Union, effective June 4.

Cedergren comes to ACU from First-Light Federal Credit Union in El Paso, Texas, where he served as the chief operations officer since 2004. As COO, Cedergren served as back-up to the chief executive officer and oversaw operational functions for 88,000 members and a total of \$500 million in assets.

Cedergren earned a bachelor of arts degree in economics from Washington State University. He began his credit union career in 1991.

"I look forward to continuing the tradition of helping the members of Argonne Credit Union build a solid financial future for themselves and their families," Cedergren said.

Established in 1949, Argonne Credit Union (ACU) is a full-service financial institution. With assets exceeding \$161 million, ACU continues to grow by offering better rates, personal service and fewer fees to the communities it serves in Illinois and Idaho. For more information on Cedergren or Argonne Credit Union, visit www.argonnecu.org. ■

Catlett

(Continued from page 1)

Grid Forum (now Open Grid Forum), the leading international standards body focused on distributed systems and “grid” middleware standards, developing the organization as general chairman during its first five years. From 1999-2004 Catlett also directed the I-WIRE optical network project, deploying dark fiber and transport infrastructure to interconnect 10 locations in Illinois.

Prior to joining Argonne in 2000, Catlett was chief technology officer at the National Center for Supercomputing Applications (NCSA), overseeing all information technology services, research, development and support for academic and commercial application users. As part of the team that established NCSA in 1985, Catlett was responsible for NCSA’s participation in creating NSFNET, which evolved into today’s Internet.

Mike Skwarek, who served as interim CIO, will return to his role as deputy CIO and Cyber Security Program manager. ■

Some Acer notebook batteries recalled

THE U.S. Consumer Product Safety Commission, in cooperation with Acer America Corporation, announced a voluntary program for the replacement of certain notebook computer lithium-ion batteries containing Sony-made cells.

The recall affects about 27,000 lithium-ion batteries with certain part numbers and battery week codes sold from May 2004 through November 2006. These batteries can overheat, posing a fire hazard. Consumers should use affected notebook computers with AC power until a replacement battery pack is received.

For assistance in determining if a battery pack is covered by this program, visit the firm’s Web site. Consumers also can contact Acer toll-free at (800) 503-2330.

All employees with Acer notebooks should check their computer’s batteries. Those who find batteries subject to the recall, or who need assistance determining if a battery is included, should contact the CIS Help Desk at ext. 2-9999 (option 2). ■

www.acerbatteryrecall.com

New catalyst helps eliminate NOx from diesel exhaust

DONNA JONES PELKIE

A catalyst developed by Argonne researchers could help diesel truck manufacturers eliminate harmful nitrogen-oxide emissions from diesel exhausts.

The technology — which has a patent pending — appears so promising that multiple large and small companies have expressed interest in licensing it and working with Argonne researchers to scale up the technology and bring it to market. Argonne researcher Christopher Marshall (CMT), one of the technology’s developers, believes there could be a commercially available product within two to three years.

Nitrogen oxides — collectively called “NOx” — contribute to smog, acid rain and global warming. Yet they are among the most difficult pollutants to eliminate from diesel exhaust. For example, many technologies that reduce NOx result in increases in undesirable particulate emissions.

“For diesel engines, we envision manufacturers placing ceramic catalytic reactors in the exhaust pipes, where they will convert NOx emissions into nitrogen,” said Marshall. Nitrogen, or N₂, is a harmless gas that makes up more than 80 percent of the Earth’s atmosphere.

“Our most promising catalyst for diesel engines,” Marshall said, “is Cu-ZSM-5 with an external coating of cerium oxide.” Cu-ZSM-5 is a zeolite with copper ions attached within its micropore structure. Zeolites are common catalysts in the petroleum industry.

Those working previously with Cu-ZSM-5 and similar catalysts, he said, found that they performed poorly at removing NOx from diesel exhaust. They require temperatures higher than normal diesel exhaust temperatures and don’t work well in the presence of water vapor, which is almost always found in engine exhausts.

With the help of the Advanced Photon Source at Argonne to analyze the structure and performance of various catalysts, Marshall’s group at Argonne developed an additive that allows Cu-ZSM-5 and similar catalysts to overcome these difficulties.

“Our new cerium-oxide additive,” Marshall said, “is the breakthrough that makes it work. When it’s combined with Cu-ZSM-5, the resulting catalyst works at normal exhaust temperatures and is



actually more effective with water vapor than without it. With a lean fuel-air mixture, it removes as much as 95-100 percent of NOx emissions.”

Argonne’s new catalyst also avoids the problems associated with ammonia, which competing catalysts use as the reductant. The Argonne catalyst uses the diesel fuel that is already on board thereby requiring no additional tanks.

“Another type of technology is ammonia-selective catalytic reduction, using a material called urea as the ammonia source,” Marshall said. “Ammonia is toxic, and unless all of it is converted during the process, whatever remains could be released to the atmosphere. While some European diesel manufacturers are taking the urea approach, U.S. diesel manufacturers are looking for alternatives.”

Since a system using the new catalyst would not require an on-board urea storage tank and uses the onboard diesel fuel as the reductive material, the new catalyst is considered safer and more energy-efficient.

Another alternative for U.S. manufacturers is the use of NOx traps. These are platinum-based systems that work well if they don’t come into contact with sulfur, which is present in most commercial diesel fuel. Since the Argonne-developed catalyst contains no platinum, it is de-

graded far less by the fuel-borne sulfur.

Marshall says the Argonne catalyst has been tested and performed well with a number of diesel and diesel-type fuels, including standard diesel, synthetic diesel, bio-diesel and JP8, which is a jet fuel preferred by the military. Having performed well in these tests, the next step is to subject the catalyst to engine testing. This will take place soon at Argonne’s Diesel Engine Test Facility. Marshall expects these tests will show that in addition to its other advantages, the Argonne catalyst has a greater life expectancy than other catalysts currently on the market.

Marshall and his colleagues are also working with the Chemical Engineering Division’s fuel cell research group. Using a reformer developed by this group could provide better fuel for the catalyst, said Marshall. “Our catalyst already works well, but it would work even better with the smaller hydrocarbons produced by a reformer. Collaborations like this and access to Argonne’s unique facilities allow us to work together on projects in a way that couldn’t be done anywhere else.”

Initial research on the cerium-oxide catalyst was funded by the U.S. Department of Energy’s Office of Energy Efficiency and Renewable Energy. The catalyst was developed for chemical plant emissions under a joint research agreement with BP. Research plans call for expanded work aimed at both diesel and natural gas engines and coal-fired power plants. ■



Argonne recently celebrated “Illinois Particle Accelerator Day” by hosting a class of honors chemistry students from the College of DuPage. These students have been using Argonne’s accelerator research facilities to perform experiments as a part of their class, and they toured the Advanced Photon Source as part of their visit. Murray Gibson, right, associate laboratory director for scientific user facilities also met with the students. *Photo by George Joch.*

RETIREES

RONALD COX (FMS-DR) retired March 30 with 44 years of service.

RONALD L. DETTLING (AES) retired April 13 with 13 years of service.

MARTIN R. KROLL (CIS) retired April 20 with 23 years of service.

DAVID C. WADE (NE) retired March 30 with 34 years of service.

VICKI L. WORRELL (CIS) retired April 19 with 12 years of service.

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Argonne... “For a brighter future”



The races were held on a neoprene track 10 meters (33 feet) long, set up in a gallery in the Museum of Science and Industry's West Pavilion. Cars were powered by a fuel cell and guided down the track on fishing line. All photos by George Joch.



This team from Daniel Wright Middle School won the race portion of the competition. From left to right are Lou Harnisch (DEP), David Jin, faculty advisor Paul Nordhaus, Yiding Hao, Dennis Huang, Eric Huang, and Mary Jacqué of CNH Corp.

Young engineers test their skills in hydrogen-powered race

CHICAGO area middle school students raced hydrogen-fueled model cars at the 17th annual model car competition, held April 28 at the Museum of Science and Industry in Chicago.

Two teams from Daniel Wright Middle School, Lincolnshire, took top honors in the design and racing components of the competition.

Each team started with a standardized kit that included an electrical motor powered by a fuel cell. Teams were required to use the unaltered fuel cell, motor and battery pack. The rest of the car design and components — chassis, gears, wheels, axles and gas collection/storage tank —

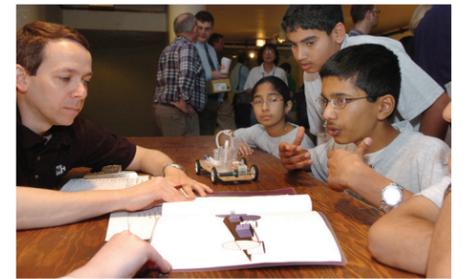
were limited only by their imaginations.

The competition, for students in grades six, seven and eight, is sponsored by Argonne, the U.S. Department of Energy's Office of Science, General Motors, CNH Case New Holland, the Society of Automotive Engineers and the Museum of Science and Industry.

The competition is part of the Chicago Regional Science Bowl sponsored by the U.S. Department of Energy and Argonne.

A short video of the competition is available online. ■

http://www.anl.gov/Media_Center/News/2007/news070428.html



CLOCKWISE FROM LEFT

- Young engineers cheer their model cars down the track
- From left to right are Lisa Michalowski, Anne Buckardt and Remy Shipley of Daniel Wright Middle School. Their car came in 2nd in the race competition.
- Shannon Kurian, Ani Sailesh and Anirudh Kulkarni, of Crone Middle School, discuss their car's workings with design judge Dave Dobbins of CNH Corp.

Classified Ads

MISCELLANEOUS

SOX TICKETS — White Sox vs. Oakland, 4 lower box seats, section 119, row 13, seats 1-4, Tuesday, May 22, 7:11 p.m., parking pass included. \$100. Fran Perri, (815) 439-1678.

MISCELLANEOUS — HP inkjet cartridges #78, #15, new, 1 each. \$10 both. Bruce Murdoch, (815) 744-0354.

COFFEE URN — Farberware, heavy gauge stainless steel, 18-55 cups, new. Originally \$150, asking \$65. Fran Perri, (815) 439-1671.

MATTRESS — Sealy Backsaver, twin mattress, box spring, perfect condition, used less than one year. New \$320, asking \$95. John Hyzer, (815) 436-2101.

TICKETS — Tim McGraw/Faith Hill, Friday, July 13, section 114, row 13, United Center, face value. Jim Podraza, (708) 212-5250.

DOG CAGE — Largest size, like new. \$25. Maria Heinig, (708) 645-0406.

FURNITURE — Sofa, chair, forest green, pictures at <http://home.comcast.net/~musky60/>. \$100 o.b.o. Kenneth Belcher, (630) 690-4961.

LAPTOP COMPUTER — \$400. Mary Lipowski, (815) 834-0337.

MISCELLANEOUS — RCA, 16", two years old. \$70. Daewoo DVD player, two years old. \$30. Nina Rohringer, (312) 402-6718.

GOLF CLUBS — 5 woods, 9 irons, 1 putter, bag. \$200 o.b.o. Roger Santagato, (630) 267-2314.

MOTOR — Johnson, outboard, 1973, 6hp, 17" shaft, 2-blade prop, used last season, runs fine, needs tune-up, gas tank, hose, service manual. \$350 o.b.o. Alex Deriy, (630) 670-0554.

GARDEN TRACTOR — John Deere LX 176, electric PTO, new front tires/belts, full pressure oil lubrication, K-line commercial engine, 38" deck. \$800. Nicole Green, (815) 735-4524.

TICKETS — HH Dalai Lama's Teaching, May 6, Pritzker Pavilion, Chicago, two front section seats. \$180 ea. Ivy Wong, (630) 898-3028.

CAMPER — Jayco Light Hawk, 1999, 24', bunk house, A/C, refrigerator, microwave, furnace, stove, stereo system, TV antenna, awning, sleeps 6. \$4,500 o.b.o. Kathy Vanoskey, (815) 726-7040.

MISCELLANEOUS — Tree trimming shears, 24" handle. \$10. CD/DVD disk labeler, Casio CW-75, nearly new. \$45. Vise, bench mount, 4" jaws, swivel base. \$20. Bike helmet, child size. \$8. Jim Woodring, (630) 983-5373.

PALM — M100 handheld series, never used, for Windows or Mac. \$60. Sandy Gotlund, (630) 257-5558.

BICYCLE — 1990 Fuji Boulevard, reasonable shape. \$10. Michael Smith, (815) 474-2234.

BASEBALL BAT — Easton Triple 7, scandium alloy, 30", 21.5 oz., 2.75" barrel. \$40. Mark Knickelbein, (708) 848-6536.

GARAGE SALE — Lemont, 904 Singer Ave., May 4-5, 9 a.m. to 3 p.m., clothes, twin bed set, accessories, toys, books, games, misc. items. Karen White, (630) 257-1479.

SOFA — Blue-gray, 3 seats, tuxedo style, 90" long, very clean, excellent condition. \$125. Robbie Dalton, (630) 920-8912.

FURNITURE — Carved wood sofa, love seat, chair, matching dining table, 6 matching chairs, excellent condition, you haul. \$400 o.b.o. all. Sam Ambegaoker, (630) 960-5731.

PRAIRIE DIRT — As much as you want. \$5. Jill Jonkouski, (773) 586-1664.

LEATHER JACKET — Kenneth Cole, men's XL, extremely soft leather, black, lined, mint condition. Paid \$750, asking \$150. Cheri Jo Giacomi, (815) 260-2437.

COMPUTER — Dell desktop, Celeron CPU 2.53GHz, 256MB DDR S-Dram, 80GB hard drive, 48x CD-RW/DVD, integrated 10/100 ethernet, 56K fax modem. \$170. Monitor, 17", E773 CRT, very good condition. \$50. Lin Zhang, (765) 409-3285.

MISCELLANEOUS — Dell Inspiron 2650 laptop, 1.7 GHz, 256 Ram, 14.1 XGA, 16MB video card, 20GB hard drive, floppy, nylon case, wireless card, XP Home, MS Works Suite. \$500. Canon photo printer, PIXMA iP4300, new. \$60. Adobe Photoshop Elements 5.0, Premiere Elements 3.0, new. \$90. David Compton, (630) 897-5867.

AUTOMOBILES

1993 DODGE — Ram 250 conversion van, 5.1, 135K miles, very good condition. \$2,500 o.b.o. Robert Tesar, (815) 210-2404.

2004 NISSAN — Sentra, 1.8L, 4 cyl., 4 door, 71K miles, 30 mpg, auto, no problems. \$7,000. Karen Walker, (815) 744-6432.

HOUSING

APARTMENT/RENT — Morris, 1 bedroom, furnished, appliances, window air, no pets, deposit and references required. \$475 mo. Loren Knoblich, (815) 942-9815.

HOUSE/SHARE — Immediate occupancy, private bath, furnished, laundry facilities, close to lab, utilities included. \$450 mo. Rose Pausche, (630) 739-0126.

CONDO/SALE — St. Augustine, Florida, 200 yards from beach, 2 bedroom, 2 bath, 1120 sq. ft., many upgrades. \$270,000. Julie Hlavacik, (815) 741-1361.

TOWNHOME/SALE — Willowbrook, end unit with side yard, 2 bedroom, 2.5 bath, hardwood floors, finished basement, 2 car garage. \$299,000. Julie Bittke, (630) 321-1933.

CONDO/SALE — Downers Grove, 2 bedroom, 2 bath, built in 2004, CAC, patio, storage, reserved parking, move-in condition, appliances, laundry facilities in building. \$189,500. Sam Ambegaoker, (630) 960-5731.

WANTED

CHEST OF DRAWERS — White, good condition, reasonable. Sandy Classen, (630) 921-4051.

KITTEN — Special-needs gray tabby, female, recently rescued. Marlene Nowotarski, (630) 901-5774.

MISCELLANEOUS — Grand or upright piano, will haul, for Argonne Music Club. Musicians, violinist, cello viola, wind, brass, sax, trombone, trumpet, flute, clarinet, all for Argonne Music Club. Mike Jagger, (630) 337-4308.

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