

2007

2007

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# UNDERGRADUATE RESEARCH

at SIUC ..... 2007

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## INSIDE

Staying safe while staying connected....2

Broadcast news makes news....2

Agriculture sustainability goes to the worms....3

Success on the brain: undergrads test potential brain injury treatments....4

Spotlight on....5  
—artist Sarah Vaughn  
—biologist Ryan McMillen  
—geographer Justin Hassler  
—photojournalist Max Bittle

Dishing the dirt at Kincaid Mounds....8

Engineers wired about wearable antennas....8

Research follow-ups:  
—McNair alum serves internship with policy magazine....4  
—Ms. Reardon goes to Washington....6  
—Creative kudos....7

## REGULAR FEATURES

2007 Undergraduate Research Forum....3

What is REACH?....6

Twenty students win 2007-08 REACH Awards....6

Special mentions....7

Important deadlines....8



Southern  
Illinois University  
Carbondale

## ARCHITECTURE STUDENTS PRESENT PLANS FOR MARKET IN NEW ORLEANS' LOWER NINTH WARD

Students from the School of Architecture traveled to New Orleans at the end of March to present plans for a community market in one of the areas hardest hit by Hurricane Katrina.

Residents there reviewed slide shows, models, and display panels representing master planning proposals generated by senior architectural studies students **Robert Clodi**, **Christopher Malone**, and **Benjamin Boyles**. Clodi and Boyles, along with architecture professors Michael Brazley and Robert Swenson, presented the proposals to the Holy Cross Neighborhood Association at its new community center, the Lower Ninth Ward Center for Sustainable Engagement and Development.

The School of Architecture, part of the College of Applied Sciences and Arts, has been working on several projects since the August 2005 hurricane tore through the Gulf Coast. Clodi, Malone, and Boyles were among approximately 34 School of Architecture students who paid their own way in fall 2006 and surveyed about two-thirds of the Lower Ninth Ward, photographing the condition of each house and property.

The three students then undertook an independent study course in spring 2007 to continue their relationship with residents in that area, and were asked to provide proposals for the community market, Swenson said.

The partnership forged with New Orleans residents is providing an "invaluable" opportunity for SIUC architecture students and faculty, Brazley said. Students are getting



From left: Senior Christopher Malone, associate professor Robert Swenson, senior Benjamin Boyles, assistant professor Michael Brazley, and senior Robert Clodi are assisting with Ninth Ward development efforts.

the chance to work with real clients and receiving first-hand client/architect contact.

"The students were passionate about it; you could see the passion," Brazley said. "It was wonderful. They took something away from the experience."

—see "Architecture," page 7

## SIUC SWEEPS POSTER COMPETITION AT ST. LOUIS AREA UNDERGRADUATE RESEARCH SYMPOSIUM

Undergraduate researchers from SIUC cleaned up at the second annual St. Louis Area Undergraduate Research Symposium, held on April 21. They took home four of eight awards—the most of any participating institution—at the daylong competition, including all three poster awards and first place in the oral presentation category. The other institutions competing in the event were Washington University (the event sponsor), Webster University, St. Louis University, the University of Missouri–Rolla, and the University of Missouri–Columbia.

• **Jeremy Pierce**, a senior in psychology, won first place in the poster competition. His faculty mentor was Michael Hoane, assistant professor of psychology. Pierce's project used rats as a research model to test the potential of a compound called COG1410 to speed recovery from brain injury. See page 4 for more about this work.

• **David Dalzotto**, a senior in forest hydrology, won second place in the poster competition. His faculty mentor was Sara Baer, assistant professor of plant biology. Dalzotto investigated factors affecting the restoration of

giant cane, a native bamboo species, in bottomland areas of Southern Illinois.

• **Brett Timmons**, a senior in zoology, won third place in the poster competition. His mentor was Anita Kelly, assistant professor of zoology. Timmons worked to develop a hybrid sunfish that will excel at keeping parasite-bearing snail populations under check in aquaculture ponds.

• **Sean Goodin**, a sophomore in physiology, philosophy, and political science, won first place in the oral presentation competition. April Strader, an assistant professor of physiology, served as his mentor. Goodin studied gender differences in the body system that regulates energy balance, food intake, and body weight.

Students interested in competing in next year's StLAURS event can get valuable experience by participating in SIUC's Undergraduate Research Forum (see [www.siu.edu/~reach/forum.html](http://www.siu.edu/~reach/forum.html)). The application deadline for StLAURS 2008 will probably be in late March or early April; check [ur.wustl.edu/stlaurs](http://ur.wustl.edu/stlaurs) in spring semester 2008.

—Tim Crosby, University Communications

## STAYING SAFE WHILE STAYING CONNECTED

Students may want to be a little more cautious about their postings on social networking sites like MySpace and Facebook. That's according to a survey on "cyber risk-taking" done last summer by **Miranda Griffith**, a McNair Scholar (see page 8) who earned her bachelor's degree in workforce education this past spring.

Griffith found that even students who were aware of potential privacy risks often ignored those concerns in constructing their profiles on these sites. "There appears to be a lax attitude toward posting personal information online," she says.

Perhaps that's because social networking sites have become such an integral part of life for teenagers and young adults, as a way of keeping up with friends and finding new ones. For example, Facebook says that almost two-thirds of U.S. college students are members.

The McNair program requires students to carry out a research project during an eight-week summer institute. At the suggestion of her mentor, health education professor Mark Kittleson, Griffith used a website directory he maintains to contact health education faculty nationwide and solicit their students' participation in her study.

A total of 145 students completed an online survey about their social networking habits, concerns about privacy issues, and so forth. As it turned out, nearly all were members of MySpace, Facebook, or both. (Ironically, Griffith, a 28-year-old mother of two, says she doesn't have time to be a user of either site. "My [younger] peers seem more comfortable with the technology," she adds.)

More than 80% of the students who responded to the survey said they posted their age and birthday on their networking pages, and more than 90% posted pictures of themselves. On the plus side, very few included their address or home phone number. But almost 15% posted their cell phone number, and almost 20% posted the classes they were taking—which could enable a stalker to

figure out the student's schedule, Griffith points out.

Also worrisome was that more than 40% admitted to posting pictures of friends without their permission, a violation of these sites' rules. (Take-home lesson: Even if you remove your own profile, that embarrassing photo of you could live on—on other people's profiles.)

Students' behavior sometimes contradicted their thinking about privacy issues, Griffith says. More than half of the survey respondents were either "very" or "somewhat" concerned about information privacy. Yet only 10 respondents had actually read these sites' terms of use and privacy policies in depth. The rest said they'd either just scanned them or agreed to them without reading them.

The national media have reported cases where graduates have lost job offers, or students have been suspended, because of content on their social networking profiles. Other cyber risks include identity theft or safety issues such as stalking or harassment. About 10% of Griffith's survey respondents said they'd had a "risk to safety" resulting from their postings, 8% had had a "negative experience with a stranger," and 2% had had a "negative experience with an employer."

Griffith recommends that users keep their privacy settings high, even though that means not expanding their network as easily. Students "need to be aware that the choices they make [in online networking] can come back to haunt them," she says. She thinks that awareness has increased recently. MySpace now posts a page with safety tips, and in fall 2006 angry students demanded—and got—more privacy controls for a newly launched Facebook feature that automatically alerts others to changes on one's profile.

Griffith presented results from her study at the **national McNair Scholars Conference** in November 2006 and also at SIUC's Undergraduate Research Forum this past March, where she took honorable mention.

She says that the McNair program and its research component "opened my eyes" to possibilities for her life. Originally intending only to get a bachelor's degree, she will start her master's program in public health this fall.

"I was a C-average student in high school, but I've blossomed at SIUC," she says. "It should show others that there's always hope and room for improvement."

—Marilyn Davis, ed.



Social networking sites such as MySpace (above) and Facebook have millions of members at universities. Students need to be more aware of the risks of posting information, according to an undergraduate research study.

### Broadcast news makes news

"alt.news 26:46," an independent, student-run television program showcasing offbeat news and features, won an **Emmy for Best Student Production** from the National Academy of Television Arts & Sciences Mid-American Regional Chapter in October 2006. The program also landed Emmys for individual segments and program graphics. Radio-television and cinema & photography team members honored at the awards presentation in St. Louis were senior **Jon Solita**, junior **Kyle Tekiela**, sophomore **Adam Slutsky**, senior **Andrew Mitchell**, senior **Jordan Gzesh**, and senior **Nicholas Karsten**.

"alt.news," which is supported by the Radio-Television Department, has won more than 20 professional and student Emmys in its seven-year history.

Meanwhile, the December 6, 2006, broadcast of "River Region Evening Edition," an entirely student-produced news program that airs on WSIU-TV, won **Best Newscast in the national student competition of the Broadcast Education Association (BEA)**. Radio-TV undergraduates who worked on the award-winning broadcast included anchor-reporter **Corenna Dolce**, reporter **Christa Stierwalt**, weather reporter **Kalee Dionne**, producer **Ethan Fife**, anchor-reporter **Julie Smallheer**, and sports anchor **Andrew Waterman**. In addition, senior **Max Orenstein** won second place in best TV feature for "Wheels for Life," a story about a legally blind cyclist, and senior **Julie Koch** won third place in best hard-news reporting for a piece called "Housing Headaches."

The River Region group followed up by landing the Charles and Lucille King Family Foundation and BEA's **"2007 Student Broadcast News Team"** award during BEA's annual convention in April 2007 in Las Vegas.



Members of the winning River Region newscast included (clockwise from upper right): senior **Ethan Fife**, senior **Kalee Dionne**, sophomore **Corenna Dolce**, senior **Julie Smallheer**, junior **Andrew Waterman**, graduate student **Rachel Gartner**, and graduate student **John Savage**.

## AGRICULTURE SUSTAINABILITY GOES TO THE WORMS

You won't find worms and broccoli on a menu, but they make a good combination. **April Vigardt**, a senior in plant and soil science, designed and conducted a 12-week experiment to find out if compost made by worms could replace peat moss in growing broccoli starts in the greenhouse and transplants out in the field.

The short answer seems to be yes.

"An increase in broccoli growth is usually seen with the addition of vermicompost," she concluded in a report prepared with her mentor, professor Jorge Hernandez of the Department of Plant, Soil and Agricultural Systems.

What difference does it make whether broccoli grows in peat moss or vermicompost? It's a matter of ecological sustainability and recycling.

"A peat-based growing medium is a nonrenewable resource harvested from peat bogs," Vigardt says. "When it's gone, it's gone."

Worms also are easy and cheap to feed: they like food scraps, cattle manure, and plant trimmings. "These are things we have too much of and have problems getting rid of," Vigardt points out. "When they go through the worms, they become a stable, peat-like substance, though more granular—like a rich, dark soil. It's odorless, and the worms absorb only 5 percent of the nutrients; the rest pass through to become available to the plants."

Vigardt, a 35-year-old nontraditional student, was torn between plant biology and agriculture when she started back to school. She was interested in alternative crops and farming, but thought she might want to do research instead.

Then, two years ago, she got a job managing Hernandez's soil fertility lab. Shortly afterwards, she

applied for and won the REACH Award that funded this project.

"It was the best opportunity I've ever had," Vigardt says. "It gave me the opportunity to do my own research, to see what worked and what could go wrong, and to see how what I had learned [in classes] fit into it."

In her project, Vigardt grew broccoli starts in pots with no vermicompost, in pots containing only vermicompost, and in pots of a traditional growing medium mixed with 10 percent, 25 percent, 50 percent, and 75 percent vermicompost. After three weeks, she took half the pots from each category and fertilized them, leaving the others alone. After six weeks, she transplanted the best of the starts from each group to a farm field in Anna. She took weekly measurements of stalk height, number and height of nodes (where leaves attach to the stem), and leaf number. After 12 weeks, she analyzed plant tissue samples.

The study showed that you can substitute up to 100 percent vermicompost for peat without hurting plant growth. Broccoli grown in 75 percent to 100 percent vermicompost actually got established better. Although root development dropped off a bit at levels above 75 percent, that didn't affect overall establishment in the field.

Because the study only ran 12 weeks, Vigardt didn't collect data on the flowerets, the part of the plant that people eat. "But this is preliminary work," Hernandez says. "We wanted to see if it justified moving forward to a larger-scale experiment."

—K. C. Jaehnig, *University Communications*



April Vigardt (right), under the guidance of faculty member Jorge Hernandez, determined that vermicompost (worm castings), a natural product of biological "recycling," can serve as a soilless growth medium for broccoli starts.

## PARTICIPATION BEST EVER AT 2007 UNDERGRADUATE RESEARCH FORUM

Forty-nine students from academic programs across campus presented posters at the 2007 Undergraduate Research Forum on March 26. The psychology program came away the biggest winner, however, with four of eight awards given.

**Erin Shanle** (see page 7), a senior in plant biology, and **Jeremy Pierce** (see page 4), a senior in psychology, tied for first place. Shanle explored the formation of certain substances within moss and the relationship they imply between fungi and plants. Pierce's work, which also won first place at the 2007 St. Louis Area Undergraduate Research Symposium, tested whether a compound known as COG1410 would improve recovery from traumatic brain injury in an animal model. Shanle's mentor was plant biology professor Aldwin Anterola; Pierce's was psychology professor Michael Hoane.

Both Shanle and Pierce held REACH Awards to support their research.

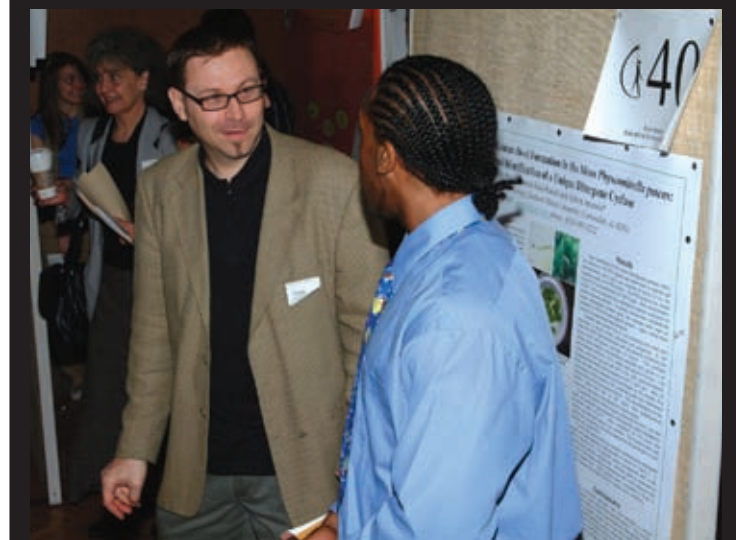
**Abigail Burnam**, a senior in psychology, took second place for her project exploring the relationship between students' academic motivation, procrastination, and perfectionism, using 238 test subjects who completed a survey. Burnam did the work under the mentorship of psychology professor Meera Kamaraju.

There was another tie for third place. **Aileen O'Hearn**, a senior in zoology, explored apical cell anatomy in a genus of liverworts (primitive land plants) and the function of tubes produced by some such species. **Seth Clark**, a senior in psychology, explored the relationship between action and reward in a project that has applications to behavioral studies in humans and lab animals. O'Hearn was mentored by plant biology professor Barbara Crandall-Stotler; Clark worked with psychology professor Eric Jacobs.

**Miranda Griffith**, a senior in workforce education and a McNair Scholar, took honorable mention for exploring students' awareness of the risks involved with providing personal information on social networking web sites such as MySpace and Facebook (see page 2). Griffith's mentor was health education professor Mark Kittleson.

**Shannon Banning**, a junior in chemistry, took the Independent Researcher Award for developing a method to precisely quantify the amount of the medication methimazole in meat-based tablets given to cats to treat a common thyroid condition. Banning's mentors were chemistry professor Gary Kinsel and associate scientist Mary Kinsel.

Finally, the People's Choice Award went to **TeSha Dozier**, a senior in psychology and a McNair Scholar, for research on how psychological and cultural influences affect body image and dissatisfaction among African-American college women. Dozier, who also had a REACH Award, worked with psychology professor Rheedea Walker.



Undergraduates Kelly Smith, in information systems technologies (top, left), and Willie Walker, in technology (bottom, right), discuss their posters with judges Wayne Paris and Craig Anz.

Photos by Cheryl Broadie, IMAGE.

## SUCCESS ON THE BRAIN

If it takes a village to raise a child, how many faculty mentors does it take to raise a whole cadre of undergraduate researchers?

Sometimes just one.

In the three years since he joined SIUC as an assistant professor of psychology, neuroscientist Michael Hoane has hired more than a dozen undergraduates to help him research potential treatments for traumatic brain injury. Although Hoane has had offers to work in industry, he says that working with students keeps him in academia.

Hoane recruits some students from classes, but others find him by word of mouth. Many are psychology majors; some are in zoology or physiology. “We try to be proactive in the Psychology Department in getting undergrads involved in research,” Hoane says.

This fall he will have four upper-level undergraduates running their own projects, plus another four to five undergraduates at the beginning stages of working in the lab. “Some students discover it’s not quite for them, but others become very adept at research,” he says. “If you get involved early, you can do real science.”

**Jeremy Pierce**, a senior in psychology, epitomizes the possibilities. In spring 2006, about a year after joining Hoane’s lab, he applied for and won a REACH Award to underwrite his testing of a compound called COG1410 for its ability to prevent or repair brain damage from trauma. COG1410, which is a snippet of a fat-transporting protein, is “small enough to easily cross the blood-brain barrier,” Pierce says. The research also received funding from Cognosci Inc., which makes the compound.

In the project, anesthetized rats were injured on one side of the cortex. As in humans, such an injury causes sensory and motor problems on the opposite side of the body. Thirty minutes after the injury, one group of rats was given a low dose of COG1410, another group a higher dose,

and a third group a placebo injection.

Behavioral tests showed that the low dose didn’t substantially help the rats recover function—but the high dose did. For example, when placed in a glass tank, rats will normally rear up and use both forepaws to explore the sides of the enclosure. Rats with a unilateral brain injury won’t use the affected forepaw. But within a few days after receiving the higher dose of COG1410, injured rats acted almost like normal rats. COG1410 also significantly reduced the size of their brain lesions.

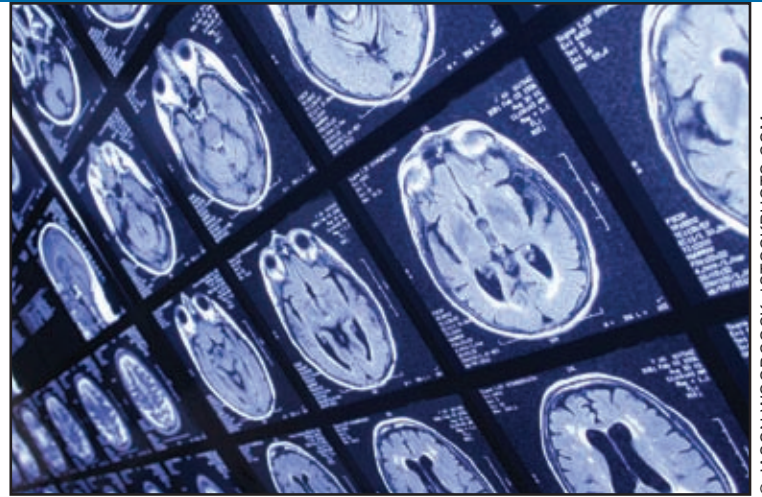
Why do such experiments? “Annually, about 80,000 to 90,000 people become permanently disabled, and about 50,000 die” in the United States as the result of traumatic

“If you get involved early, you can do real science.”

—Michael Hoane



Top: Michael Hoane (center) and some of the undergraduates working with him: Jordan Yearwood, Jeremy Pierce, Nicholas Kuypers, Nicholas Birky, and Sarah Heck. Bottom: Pierce in the lab.



© JASON WOODCOCK, ISTOCKPHOTO.COM.

More than a quarter of a million people yearly in the United States are hospitalized for traumatic brain injury. Undergraduates in Michael Hoane’s Restorative Neuroscience Laboratory are working on potential treatments.

brain injury, Pierce says. There is no effective treatment; medical intervention focuses on reducing swelling of the brain to save lives and limit damage as much as possible.

Pierce’s REACH project was a “proof of principle” study showing that COG1410 works with traumatic brain injury in lab animals. More testing is needed to determine how long after an injury COG1410 can be given and still work, and whether larger doses or continuous infusions over several days would produce greater benefits.

Presenting his results at the 2007 St. Louis Area Undergraduate Research Symposium (see page 1), Pierce took first place in the poster competition. The findings were published in the July 2007 issue of the *Journal of Neurotrauma*—the third scientific publication Pierce has co-authored to date. Undergraduates **Nicholas Birky, Michael Holland, and Tan Dang**, who helped with the research, were co-authors as well. (Holland and Dang have since graduated.)

Pierce and other students working with Hoane also have been testing vitamin B3, which looks just as promising for treating brain injury. Pierce won a small grant for this work from the Illinois Rural Health Association (brain injury is more life-threatening in rural areas because of long distances to trauma centers). He later presented some of the findings at the **2006 National Neurotrauma Society conference**, where he was the only undergraduate named a student research finalist and the only one invited to give a research talk.

Hoane says that the work done by undergraduates in his lab on B3 and other potentially therapeutic substances is laying the scientific foundation to test them in patients. For example, University of Washington scientists interested in doing clinical trials are working closely with Hoane to help determine the type of data most useful to them.

Hoane believes that undergraduates can usually get more extensive research experience at SIUC than at bigger institutions. “My senior undergraduates are working at the same level as graduate students,” he says. “I put a lot of responsibility on their shoulders. You have to take the risk of giving them an important project to do. Mistakes happen, but we deal with that.”

“Research isn’t for everybody,” he adds, “but for those looking to go on with their education, they can do things here they can’t do anyplace else in the state.”

—Marilyn Davis, ed.

—research follow-up—

### McNair alum serves internship with policy magazine

**Deanese Williams-Harris '06**, a former McNair Scholar at SIUC (see [www.siu.edu/~mcnair](http://www.siu.edu/~mcnair)), landed a plum assignment as a public affairs reporting intern for *Illinois Issues* magazine in spring 2007. The internship allowed her to work as a Statehouse reporter, tracking and analyzing legislative measures for the magazine. She also wrote several feature articles for *Illinois Issues*, on such topics as school accountability and public housing.

Williams-Harris received her bachelor’s degree in **journalism**, with a minor in **political science**. For her research project with the McNair program, she analyzed the ways in which Chicago newspapers covered residents of the Robert Taylor Homes and the Stateway Gardens public housing complexes, which were being closed. She recently earned her master’s degree in public reporting from the University of Illinois at Springfield.



COURTESY OF ILLINOIS ISSUES MAGAZINE.

## SPOTLIGHT ON...

### Art with Sarah Vaughn

For the first time in more than 30 years, a single winner captured the annual **\$20,000 Rickert-Ziebold Trust Award Competition** at SIUC's School of Art and Design. Sarah Vaughn won for her kiln-fired glass wall sculpture, "The Moment of Choice."

The competition, which carries one of the largest awards of its type in the country, is open to art and design seniors ready to graduate. Typically four or five winners split the prize. Faculty votes, cast in secret, determine the winner or winners.

Vaughn's wall sculpture, only a small section of which can be seen at right, stretches from floor to ceiling and bends around a corner onto the next wall. It is a flowing piece of thin, textured glass resembling veins or nerve endings—or an infinity of options. Vaughn describes it as a "snapshot of my thoughts and feelings to share with the world ... a visual representation of when I became aware that I was allowing my fears to control my life and consume everything. This is a moment when I saw that I had a choice."

The award-winning piece was **exhibited at the Third Degree Glass Factory gallery in St. Louis** in May, along with work by several other SIUC students.



### Plant biology with Ryan McMillen

The evolution of early land plants is the research focus of Ryan McMillen, who works in the laboratory of plant biologist Karen Renzaglia on a National Science Foundation project called "**Assembling the Tree of Life.**" The lab traces evolutionary relationships in part by using electron microscope images to study minuscule plant structures.

Scientists knew that, in seed-bearing plants, the length of tiny pores called stomata correlates to the size of the plant's genome (its total DNA package). But McMillen explains that no one knew if the same was true for seedless plants such as ferns and mosses, which evolved earlier. With funding from a REACH Award, he made electron micrographs of stomata from various species and compared measurements with genome size. He found a direct correlation. This means that stomata length in fossilized seedless plants could indicate relative genome sizes among the earliest land plants—a key to establishing evolutionary events and relationships.

McMillen presented his findings at the **Botany and Plant Biology 2007 Joint Congress**, and one of his electron micrographs (right) won third place in a student plant-imaging competition sponsored by the Botanical Society of America. The photo, published in the *American Journal of Botany* in September 2006, is of a stoma in a horsetail fern native to Illinois.



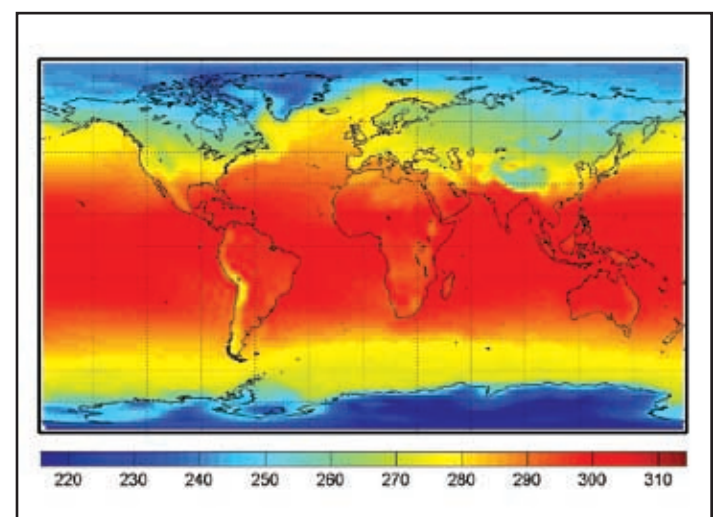
© RYAN MCMILLEN

### Climatology with Justin Hassler

As an undergraduate research assistant, Justin Hassler generated web-based maps from more than **50 years' worth of global climate data** to illustrate how atmospheric variables change over space and time. The result may be the most extensive global climate animation web site in existence for this particular dataset. Justin Schoof, the geography professor who set Hassler the task, says the site will aid climate science teaching and research: "It's sort of an online atlas."

Working with a huge dataset from the **National Centers for Environmental Prediction** and the **National Center for Atmospheric Research**, Hassler used statistics and graphics software to generate thousands of maps showing monthly and yearly averages for various climate data, such as specific humidity, air temperature at the surface of the Earth and at various levels of the atmosphere, and wind speed. He set up the maps to run as animations, so that variation from year to year, or from month to month within a given year, could be easily seen.

Many of the maps are shown in pairs for comparison, with one showing averages and the other showing "anomalies" (deviations from the long-term average). In atmospheric science, Schoof explains, there's "as much interest in variability as in averages."



### Photojournalism with Max Bittle

"The main goal is to take good pictures, tell people stories, and meet people," says Max Bittle of his career choice. The junior in photojournalism has already freelanced for *Illinois Issues* magazine, the *Chicago Tribune*, and the *New York Times*; he's considering a freelance career after graduation.

Bittle won the \$10,000 **Nikon Spirit Initiative's** Eddie Adams Scholarship in fall 2006 and placed 10th in the photojournalism category of the 2006-07 Hearst Journalism Awards Program. He captured **Student Photographer of the Year** honors from the National Press Photographers Association in 2004-05; as we go to press, he's the point leader for the 2006-07 award (entries are judged quarterly, and winning entries are awarded points, which are cumulative).

The image at right is of a Carbondale barbershop near dusk. "I was looking for a different kind of rain photograph," Bittle says. "The reflections, color, and condensation in the window caught my eye. I went up to compose my [shot] when the barber, Nasee Yehuda, looked out the window, and that turned out to be the picture."



© MAX BITTLE

## REACH AWARD WINNERS FOR 2007-08

### What is REACH?

REACH (Research-Enriched Academic Challenge) publicizes and promotes undergraduate research at SIUC. Each year, the program awards 20 competitive grants of \$1,500, along with undergraduate assistantships, to students proposing a specific research, scholarly, or creative-arts project under the guidance of a faculty mentor.

REACH also sponsors an annual Undergraduate Research Forum at which students present posters describing their research.

See page 8 for application deadlines for REACH awards and the forum. See [www.siu.edu/~reach](http://www.siu.edu/~reach) for information and links to other undergraduate research funding opportunities.

REACH is funded by the Office of the Provost and by the Office of Research Development and Administration, which coordinates the program.



Students from the Colleges of Agriculture, Applied Sciences and Arts, Education, Engineering, Liberal Arts, and Science, as well as the School of Medicine, were winners of 2007-08 Undergraduate Research/Creative Activity Awards administered through the REACH program.

Awards enable students to run independent yearlong research, scholarly, or creative-arts projects with support from faculty mentors. The awards include undergraduate assistantships and small grants to pay for materials and services. The winners and their proposed projects:

**Ashley Baker**, senior in interior design, will study design interventions in the built environment that may enhance early childhood learning. Mentor: Melinda La Garce (architecture/interior design).

**Nicholas Birky**, junior in zoology, will conduct a project called "A New Kind of Hangover: NutraSweet, Formaldehyde and Alcohol." Mentor: Michael Hoane (psychology).

**Jared Boulds**, junior in chemistry, will work on determining and optimizing the efficiency of current methods of protein identification. Mentors: Gary Kinsel (chemistry), Mary Kinsel (ORDA/chemistry).

**Jared Burde**, junior in physics and electrical engineering, will study films of complex molecules adsorbed on carbon nanotube bundles. Mentor: Mercedes Calbi (physics).

**Michael Burns**, junior in zoology, will look at shape analysis and systematic status of the Blenny darter, a fish from the Tennessee River drainage. Mentor: Brooks Burr (zoology).

**Katie Butera**, junior in physiology and psychology, will study cooperation development in young twins. Mentor: Lisabeth DiLalla (behavioral and social science).

**Jamie Douglas**, senior in animal science, will study the effects of dietary phytoestrogens on gut microflora and disease resistance in two species of ray-finned fish. Mentor: Anita Kelly (zoology).

**Julius Frazier**, junior in zoology, will study spatial and temporal thermal habitat distribution for the Cayos Cochinoboa constrictor. Mentor: Karen Lips (zoology).

**Kathleen Lask**, junior in physics and mathematics, will study the adsorption of hydrogen, deuterium, and methane on metal-organic frameworks. Mentor: Aldo Migone (physics).

**Christopher Leffelman**, junior in plant biology, will study the effects of oil and fatty-acid supplementation on volatile flavors of the oyster mushroom. Mentor: Aldwin Anterola (plant biology).

**Bryan McConomy**, junior in physiology, will study vagus nerve stimulation as a possible stroke treatment using rats as a model. Mentor: Douglas Smith (psychology).

**Kara McConville**, junior in rehabilitation services, will study contingency management as a treatment plan for methamphetamine abuse in Southern Illinois. Mentor: D. Shane Koch (rehabilitation).

**Russell McKeith**, junior in animal science, will investigate whether using sodium bicarbonate to alter pH in hot dogs can result in a better pork product. Mentor: Karen Jones (animal science).

**Amanda Rabideau**, sophomore in physiology, will investigate whether mice expressing a particular genetically engineered luteinizing hormone receptor could serve as a model for determining the molecular basis of premature ovarian failure. Mentor: Prema Narayan (physiology).

**Naketa Ross**, junior in psychology, will study how resiliency contributes to the effects of campus involvement on student retention. Mentor: Kathleen Chwalisz Rigney (psychology).

**Andrew Somor**, senior in forestry, will study the effect of autumn olive removal on nitrogen leaching at plot and watershed scales. Mentor: Karl Williard (forestry).

**Tina Steibel**, senior in social work, will look at the effect of monitored exercise on physical impairment and depressive symptoms among cardiac patients in Southern Illinois. Mentor: Wayne Paris (social work).

**Benjamin Vandermyde**, senior in forestry resource management and administration of justice, will research a biological alternative to herbicide for the control of invasive shrubs. Mentor: John Groninger (forestry).

**Joan Weber**, senior in early childhood education, will conduct a project called "Findings Across Screening Tools (FAST)." Mentor: Deborah Bruns (special education).

**Christopher Williams**, junior in civil engineering, will conduct a project called "Development of a Prototype of an Intelligent System." Mentor: Shing-Chung "Max" Yen (civil engineering; director, Materials Technology Center).

—Tim Crosby, University Communications

—research follow-up—

### Ms. Reardon goes to Washington

A 21-year-old senior who already has presented her research at international conferences explained it to the country's lawmakers April 25 on Capitol Hill.

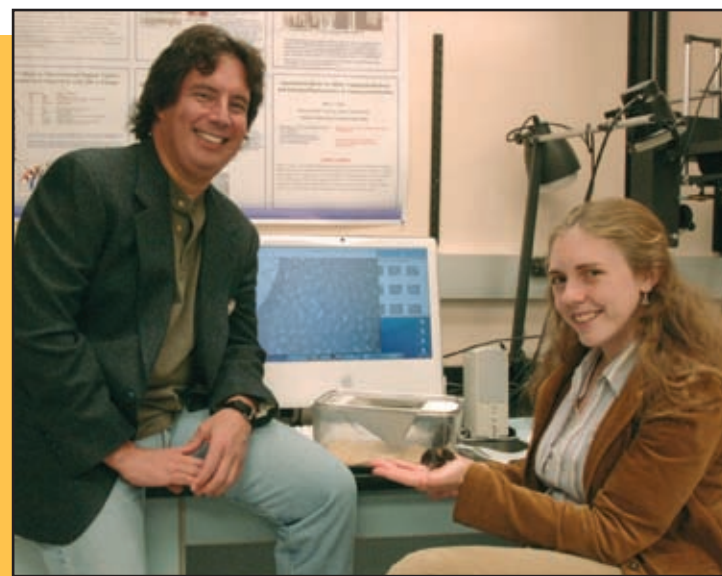
Last year we reported that microbiology major **Sara Reardon** (right, with physiologist Michael Collard) took second place at the inaugural St. Louis Area Undergraduate Research Symposium (see page 1). This year, she was one of 60 students chosen by the Council on Undergraduate Research from a national pool of hundreds of applicants to participate in the group's annual "Posters on the Hill" exhibit in Washington, D.C.

Her work focuses on a gene, called DEAF-1, that when mutated may drive cancer development and impair fertility in mammals, including humans.

Reardon joined the research team of Collard and physiologist Jodi Huggenvik in her freshman year. She started out by maintaining their mouse colony. Some of these mice lack a working copy of DEAF-1. "We knew there was this defect in male fertility," Collard said of the mice. "It was Sara who established to what degree this loss occurs and the genetic background that produces it."

Male offspring of these so-called "DEAF-1 knockout" mice often have a normal DEAF-1 gene—yet they still have impaired fertility. Collard, Huggenvik, and Reardon believe the explanation lies with DNA methylation. As part of reproduction and development, methyl groups attach to DNA, affecting gene expression. The team thinks that the absence of the DEAF-1 gene changes the methylation of other genes in a mouse's sperm or eggs. These methylation abnormalities get passed along to the mouse's offspring. That's why the offspring—even if they have a normal copy of the DEAF-1 gene—can still suffer inherited fertility problems, obesity, and prostate cancer.

Reardon is now testing that hypothesis, which may have applications to human health. She has invented techniques to look at changes in DNA in 7,000 mouse genes to determine which genes may be affected by methylation abnormalities. After graduate school, she plans on a career in biomedical research.



## SPECIAL MENTIONS

For the second year in a row, SIUC has dual winners of prestigious scholarships from the Barry M. Goldwater Scholarship and Excellence in Education Foundation.

**Jared Burde**, a junior majoring in **physics** and **electrical engineering**, and **Erin Shanle**, a junior majoring in **chemistry** and **plant biology** (see page 3), are among only 13 students in Illinois to receive the honor. Each will receive up to a maximum of \$7,500 for the 2007-08 school year.

The Goldwater Foundation is a federally endowed program that assists outstanding students in mathematics, natural sciences, and engineering. Scholars are selected on the basis of academic merit. This year the field included 1,110 applicants; only 317 scholarships were awarded.

Last year in this publication, **Fahran Robb**, a senior in **agricultural information** and **political science**, was highlighted for being the first SIUC student named to the All-USA College Academic Team by *USA Today*. Well, she's done it again. The newspaper selected Robb for the second consecutive year as one of the top 80 students from a pool of more than 600 nominees. And to cap things off, she also won a 2007 Phi Kappa Phi Graduate Fellowship.



Goldwater Scholars Erin Shanle and Jared Burde.

In summer 2006, Robb completed an internship with the U.S. Department of Agriculture, where she served as an economics assistant and wrote several white papers on topics including U.S. **ethanol and biodiesel production policy**. She also was one of 12 students on the International Collegiate Agriculture Leadership Team, which spent several weeks in Spain and Morocco studying agriculture policy.

After graduate school, she plans to work in the area of renewable fuels.

Other recent national award winners:

- **Daniel Elijah Smith**, a senior in **geography and environmental resources**, won the National Council for Geographic Education & Association of American Geographers Excellence of Scholarship Award.

- **Nicole Saylor**, a junior majoring in **secondary English education** and **Spanish**, has won a Jo Anne J. Trow Undergraduate Scholarship from Alpha Lambda Delta, a national honor society.

- **Oscar Schlenker**, a senior in **radio-television**, was one of 14 students nationwide to win a \$5,000 scholarship from the John Bayliss Broadcast Foundation. In 2005, the foundation's board of directors selected SIUC as having one of the top radio programs in the nation, giving SIUC students a chance at the award.

- **Alicia Gallegos**, a senior in **health care management**, took first place in the 2007 American College of Healthcare Executives Essay Competition. Her essay, called "Retail Medicine: The Cure for Healthcare Disparities?", brought

her a \$3,000 award and will be published in the *Journal of Healthcare Management*.

A nine-member team of undergraduates in **computer science** and **information systems technologies** placed second in the Illinois Regional Cyber Defense Competition hosted at SIUC in February 2007, being edged out by a DePaul University team. In 2006, SIUC won the state competition and also the inaugural Midwest Regional Competition.

Teams had to **defend a corporate computer network against a cyber-attack**—and keep the network running and functional—for the course of the 21-hour competition. Security professionals attempted to disrupt each team's operations during the competition and then debriefed team members afterwards as a learning experience.

In addition, in November 2006 an SIUC computer science programming team placed 19th in their first appearance in the **ACM International Collegiate Programming Contest for the Mid-Central USA Region**. The event drew teams from 122 universities, including several of the top-ranked universities in the Midwest.

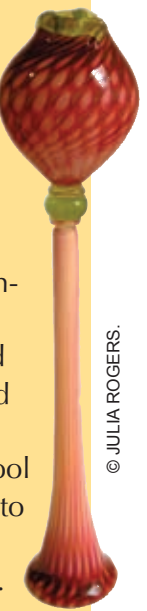
—research follow-up—  
**Creative kudos**

**Esteban del Valle**, a student in art and design who was featured in last year's edition of this publication, won honorable mention in the state's 2007 Annual Collegiate Artists Competition for his drawing entitled "Self-Reflection 13" (below).

Del Valle, a REACH Award winner and McNair Scholar, graduated in spring 2007 and is headed to the Rhode Island School of Design this fall to work on a master of fine arts degree.

**Julia Rogers**, another senior in art and design, was also a finalist in the competition for her 26" tall glass piece called "Sherrie" (above).

Only 50 students statewide were selected as finalists.



© JULIA ROGERS.



© ESTEBAN DEL VALLE.

### ARCHITECTURE — FROM PAGE 1

There is only one convenience store in the area and the thought is to have a community market located at one of the main intersections to provide a common place for people to meet, Swenson said. Only about 15 percent of the approximately 22,000 pre-hurricane Lower Ninth Ward residents—about 3,000 people—have been able to return so far, he added.

The work by SIUC students on this and other projects "is wonderful and most beneficial," said Charles E. Allen III, assistant director for external relations at the Center for Bioenvironmental Research at Tulane and Xavier Universities, and also vice-president of the Holy Cross Neighborhood.

"Their work further helps our community have a clear and attainable vision for how we wish to see our community redeveloped post-Katrina. Their current work for us is focused on a community market, which we hope will be a market that fully exemplifies the concept of passive surviv-

ability, in the event of another hurricane or major storm."

He added, "Our community has gone through a tremendous 2006 year of strategic recovery planning and the SIUC architecture students and faculty have helped us greatly to articulate various elements and projects of our overall sustainable recovery plan. We greatly appreciate SIUC and consider them to be lifelong partners of our community."

College of Applied Sciences and Arts Dean Paul Sarvela said the project is a credit to everyone involved. "It's a great learning experience for our students and a wonderful example of how SIUC is trying to make a difference not only in Illinois, but beyond," he said.

A second group of SIUC architecture students has been working on building designs at Tulane University's RiverSphere complex.

—Pete Rosenbery, *University Communications*

**"We greatly appreciate SIUC and consider them to be lifelong partners of our community."**

— Charles E. Allen III, vice president, Holy Cross Neighborhood Association, New Orleans



### Important Deadlines

Applications for **2008-09 REACH Awards** are due on **Friday, January 25, 2008**. Application materials and information, including eligibility requirements, can be found at [www.siu.edu/~reach/awards.html](http://www.siu.edu/~reach/awards.html). Information about other research funding opportunities can be found at [www.siu.edu/~reach/funding.html](http://www.siu.edu/~reach/funding.html).

Letters of intent to participate in the **2008 Undergraduate Research Forum** are due on **Friday, February 15, 2008**. Information can be found at [www.siu.edu/~reach/forum.html](http://www.siu.edu/~reach/forum.html). The 2008 forum will be held on **Monday, March 31**.

SIUC's Ronald E. McNair Postbaccalaureate Achievement Program (**McNair Scholars Program**) prepares undergraduates who are first-generation-college/low-income students or minority students to succeed in doctoral study. McNair Scholars work closely with mentors, conduct research projects over the summer, and present research findings at a July symposium.

Applications are usually due in March. For information and eligibility requirements, see [www.siu.edu/~mcnair](http://www.siu.edu/~mcnair).

## DISHING THE DIRT AT KINCAID MOUNDS

A team of students attending SIUC's annual archaeology field school has returned to the Kincaid Mounds site at the southern tip of Illinois this summer. They hope to come one step closer to understanding the mystery of the region's prehistoric mound builders—the same culture (900-1500 A.D.) that built Cahokia Mounds across from St. Louis.

Undergraduates **Nina Fuscaldo** and **Wesley Pinks** are working in the trenches alongside graduate students and the dig's director, Paul Welch, an associate professor of anthropology. The focus of this year's excavation is a large, circular structure atop one of the largest mounds on the multi-mound site. The structure, which may have been a sort of council house, is more than 65 feet in diameter, with projections at the four compass points and an inner circle that may once have been lined with benches.

Kincaid was one of two major political centers of the mound-building Mississippian culture in the lower Ohio Valley. Located on the Ohio River about 75 miles southeast of Carbondale, it's one of the largest prehistoric Native American sites in Illinois, and the seventh or eighth largest site of its time period in the eastern United States.

Kincaid was inhabited from about 1100 until about 1350, when it and similar mound communities in the

mid-South were abandoned for unknown reasons. The area was resettled after 1500 by other Native American groups. Understanding the layout of the Kincaid settlement may provide clues about the cultural identity and fate of its people.

Past SIUC field schools, which also involved undergraduates, confirmed the existence of a wooden palisade around much of the site, discovered a mound outside the palisade, and uncovered burned houses with evidence of thatched roofs that helped establish the site's inhabited dates.

—*Andrea Hahn, University Communications*



**Nina Fuscaldo sifts excavated dirt from the Kincaid Mounds site for evidence of human habitation.**

## ENGINEERS WIRED ABOUT WEARABLE ANTENNAS

As wireless personal technologies are becoming more commonplace, research is focused on antennas with improved capabilities. One area of research utilizes antennas made from e-textiles—that is, electronic textiles. Such antennas are referred to as e-textile antennas.

The area of interest in terms of applications involves wireless personal communications, which would include cellular phones, PDAs, hand-held computers, and various other wireless devices.

SIUC's College of Engineering Antenna and Propagation Lab is interested in integrating e-textile antennas into articles of clothing to improve signal quality and possibly increase range for signal reception. Our current tests



have involved antennas constructed for use at a center frequency of 2.4 GHz, which is the frequency most commonly used in today's wireless devices.

Studies in this area have involved fashioning an antenna shape from the electronic textile to form a patch. The patch is then secured to standard fabric by means of an adhesive sheet and a hot iron, much like an iron-on appliqué. These antennas have proven to be just as good, in terms of radiation pattern and antenna efficiency, as the microstrip antennas found in cell phones.

We also have been researching whether similar results can be obtained from an e-textile antenna created with embroidery (see example at left). An e-textile antenna made with embroidery could prove to be more durable and longer lasting than the antenna in patch form.

—*David Hutson and Jonathan Fessler*

*Ed.*—*David Hutson and Jonathan Fessler both held undergraduate assistantships in the laboratory of Fran Harackiewicz, professor of electrical and computer engineering. They presented their research on e-textile antennas at the 2007 Undergraduate Research Forum.*

*Various labs nationwide are working on such antennas, which pose special design and performance challenges due in part to the fact that they are worn in such close proximity to the body. These and other e-textile innovations could be useful for both civilian and military applications.*

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**Contact:** [reach@siu.edu](mailto:reach@siu.edu), (618) 453-4540  
Woody Hall C-206 | Mail Code 4709  
900 S. Normal Ave. | SIUC | Carbondale, IL 62901

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**Editor:** Marilyn Davis, ORDA. **Contributors:** Tim Crosby, Andrea Hahn, K. C. Jaehnig, Pete Rosenbery, and Tom Woolf, University Communications.

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