



To eat – or flee? Circuit links hunger, pursuit in sea slug brain

By Diana Yates
Life Sciences Editor

If you were a blind, cannibalistic sea slug, living among others just like you, nearly every encounter with another creature would require a simple cost/benefit calculation: Should I eat that, do nothing or flee?

In a new study, researchers report that these responses are linked to a simple circuit in the brain of the sea slug *Pleurobranchaea*. A heightened state of excitation in the neurons that control the animal's attack and feeding behavior means it is hungry and will go for nearly anything that smells like food, the researchers found. Lower activity in the same neurons means the animal is satiated and will do nothing, or will turn away from the smell of other creatures, most likely to avoid becoming food.

"The question was, how does this animal, a predatory forager, make a decision?" said Rhanor Gillette, a UI molecular and integrative physiology professor who



ONLINE VIDEO

www.life.illinois.edu/slugcity/movie/learnprdgm1.mpg

conducted the study with graduate student Keiko Hirayama. "And after some work it became clear that they do it pretty much like you and I. They make decisions not so much on the basis of information, per se, but on the basis of how information makes them feel."

Like most animals, sea slugs must integrate their internal state – how hungry they are – with information from their senses (Does this thing smell good? Is it bigger than me?) and memory (What happened last time I encountered something like this?), Gillette said.

Sea slugs have a very primitive nervous system, but they quickly figure out what not to eat, he said. For evidence of this, he has a video of an encounter between an inexperienced *Pleurobranchaea* and another sea slug species, *Flabellina iodinea*, which produces a noxious chemical in its tissues to ward off predators. Thirty minutes after this encounter, the researchers put the two together again and *Pleurobranchaea* steered clear of *F. iodinea*. (The video illustrates this trait; see link above.)

"This is an example of one-trial learning," Gillette said. "This is the one trick it's really good at: learning what to eat or not. *Pleurobranchaea* is evaluating the odor and estimating risk."

Only "an insanely hungry" animal will attack an unpleasant or painful stimulus, such as an electric shock or the learned, unpleasant taste of *F. iodinea*, Gillette said.

The researchers focused on the sea slug's approach/avoidance behavior when it catch-

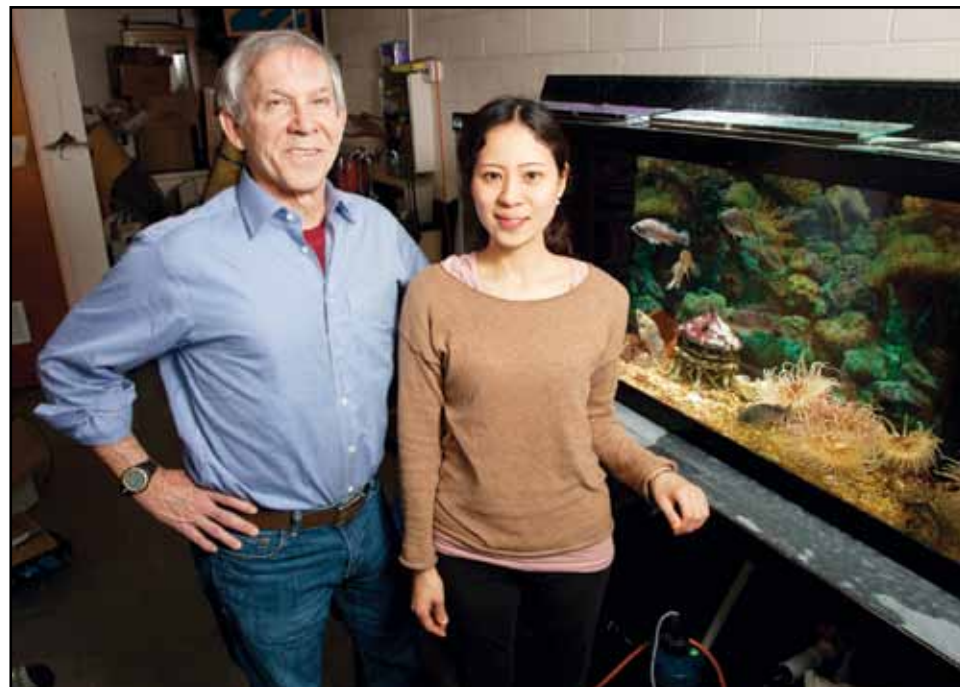


photo by L. Brian Stauffer

Sea-slug switch Rhanor Gillette, a UI molecular and integrative physiology professor, left, and graduate student Keiko Hirayama found a simple circuit in the sea slug brain that integrates hunger, sensory information and memory to drive the animal's response to the smell of food.

es a whiff of another sea creature (in the lab, the researchers use the amino acids glycine and trimethylglycine, "the essence of sea-food," Gillette said). A hungry animal turns toward the stimulus; a satiated animal turns away or does nothing. By turning away, it avoids possible attack by another predator, Gillette said. No response "means that the estimated value of the stimulus is not worth the effort of an attack," he said.

Hirayama found that the sea slug's central nervous system, even when removed from the animal and placed in a dish, responds to a sensory stimulus as it had in the intact animal. If the brain of a hungry animal detects the odor of food, the neurons

that control movement will fire as if turning the animal towards the stimulus. The CNS of a satiated animal will "turn away" from the side of the stimulated nerve.

"Then Hirayama found that nervous systems from very hungry animals had higher levels of spontaneous activity than those that were not hungry," Gillette said. The neurons involved in biting or extending the proboscis – the sea slug's feeding apparatus – appeared to be ready for action. And if the researcher artificially enhanced activity in the neural circuit that controls feeding, "she could change an avoidance turn to an orienting turn," Gillette said.

SEE **SEA SLUG**, PAGE 3



photo by Tracy Clark

Feast or flee? Every time it encounters another animal, the blind sea slug *Pleurobranchaea* must decide whether to risk trying to eat it.

Quebec ban on fast-food ads reduced junk-food consumption

By Phil Ciciora
Business and Law Editor

With mounting concerns over childhood obesity and its associated health risks in the U.S., would a ban on junk-food advertising aimed at children be more effective than the current voluntary, industry-led ban? According to published research from a UI economist, advertising bans do work, but an outright ban covering the entire U.S. media market would be the most effective policy tool for reducing fast-food consumption in children.

Kathy Baylis, a professor of agricultural and consumer economics, studied the ban on junk-food advertising imposed in the Canadian province of Quebec from 1984 to 1992 and its effect on fast-food purchases.

By comparing English-speaking households, who were less likely to be affected by the ban, to French-speaking households, Baylis and co-author Tirtha Dhar, of the University of British Columbia, found evidence that the ban reduced fast-food expenditures by 13 percent per week in French-speaking households, leading to between 11 million and 22 million fewer fast-food meals eaten per year, or 2.2 billion to 4.4 billion fewer calories consumed by children.

"Given the nature of Quebec's media market and demographics, a ban would disproportionately affect French-speaking households, but would not affect similar households in Ontario or households without children in either province," Baylis said.

Baylis says the study is applicable to the U.S., although the re-

sults wouldn't be quite as robust if bans were instituted state by state.

"What we found is that advertising bans are most effective when children live in an isolated media market, and it's only because they're in an isolated media market that they're getting these effects," she said. "If any state on their own decided to do this, it would be problematic. If the U.S. as a whole decided to do it, our research indicates that such a ban could be successful. The comparison is a strongly regulated system in Quebec to a less strongly regulated system in Ontario, and we still found an effect. If anything, our study is finding a lower-bound of that effect."

The big caveat to the study, according to Baylis, is that it's based on data from the 1980s and '90s.

"Obviously, the Internet has exploded since then, and com-



photo courtesy College of Business

Advertising ban An outright ban on junk-food advertising aimed at children would be more effective than the current industry-led ban, according to research by UI economist Kathy Baylis.

puter games have also risen in popularity," she said. "So we don't know how well a television ban would work when children are

spending an increasing amount of time online rather than watching TV. So it would be very hard to SEE **JUNK FOOD**, PAGE 10

ILLINI ALERT TEST 10 a.m. Feb. 21

The campus will conduct a test of the Illini Alert system at 10 a.m. Feb. 21. The system will send email and text messages in the event of a campus emergency. If you are not registered, go to:

emergency.illinois.edu

In This Issue



Performance funding

The first of a two-part look at performance-based funding.

PAGE 4



Finding patterns

A study has detected patterns in iguanas and tortoises that have antibiotic-resistant bacteria.

PAGE 8

INDEX

ACHIEVEMENTS	14
A MINUTE WITH ...™	5, 10, 12
BRIEF NOTES	13
DEATHS	6
ON THE JOB	3

Senate statements decry alleged unethical conduct

By Mike Helenthal

Assistant Editor

Urbana academic senators acted unanimously Jan. 30 in support of three measures addressing recent alleged unethical conduct in UI President Michael J. Hogan's administration.

Senators offered support of a statement made at the Jan. 19 UI Board of Trustees meeting by University Senates Conference chair Donald Chambers, a UIC physiology and biophysics professor, who was critical of the administration's handling of an incident involving Hogan's chief of staff, who resigned as a result of allegations she misrepresented herself by email as a USC member and tried to secretly influence debate of a pending enrollment management plan.

Chambers referred to the incident as "the most serious assault on the principles and process of shared governance that has ever occurred in the history of this great university."

Lisa Troyer, who was the chief of staff, maintains she did not send the emails.

Senators also stood without dissent behind a Senate Executive Committee-drafted statement on ethical leadership and shared governance, which condemned the administration's "broad pattern of surveillance and intrusion into legitimate faculty governance deliberations."

The statement ended, "This is not the Illinois way."

Senators also unanimously voted to approve a faculty-led resolution reiterating widespread support for recommendations made by the senate's Enrollment Management Task Force, which was critical of the administration's attempt to centralize en-

rollment management functions and recommended more faculty consultation.

"Be it resolved that the Senate urges the president and the university administration to reaffirm, in word and deed, a commitment to genuine shared governance where the advice of faculty is not only encouraged but seriously considered," the resolution said.

Joyce Tolliver, a Spanish professor, spoke outside of her senate vice-chairmanship to address the issue of the president's accountability in the email incident.

She said he was "clearly trying to divide the campus senates from each other" through "intimidation" and "misrepresentations."

Hogan's apology for the email incident before senators at the Jan. 23 SEC meeting was "not an apology at all," she said, because he failed to take full responsibility. Tolliver also questioned whether "Dr. Hogan's ethical bar is set too low" based on previous statements he has made about the incident. Senators applauded at the conclusion of her statement.

Senate chair Matthew Wheeler, an animal sciences professor, said the senate's support of the three resolutions showed that the faculty was united in its opinion of the administration's alleged tactics.

"We're not asking for any penalties," he said. "This is a statement of our values."

Troyer's future

Wheeler told senators Troyer insists she didn't send the anonymous emails.

**"We're not asking for any penalties.
This is a statement of our values."**

—Matthew Wheeler

Several investigations concluded that Troyer's computer was the source of the emails. The investigations indicated there was no forensic evidence tying Hogan to the incident.

Troyer recently made contact with Wheeler in order to make "minor" corrections to supplemental materials included in the earlier senate-approved SEC statement on ethical leadership and shared governance. He said she also reiterated her innocence.

Urbana Chancellor and UI Vice President Phyllis Wise said Troyer had been given the terms of her position in the psychology department. She said Troyer had requested a time extension for signing the appropriate paperwork that would make her a full-time faculty member, noting the deadline for acceptance was Jan. 27.

One senator expressed concern that Troyer's case could be publicly cast as an argument against tenure protection. Another asked whether the university had the ability to sanction Troyer.

Wise said university statutes do allow for sanctions, but as it stands, Troyer was hired as an administrator with a zero-percent faculty appointment.

"She needs to sign that before we can go forward," Wise said. "We will go through that process, but I think we are all working on this as we go."

Other business

Senators approved changes in the senate bylaws and standing rules, proposed by

the university statutes and senate procedures committee to bring all proceedings under senate auspice in closer compliance with the Illinois Open Meetings Act.

Changes include required public disclosure of the specific exemption being cited for a closed-session meeting, and the prerequisite that any final vote on a closed-session issue be made in public.

Senators declined to support a senator-led resolution to alter a senate rule preventing a binding vote from being taken on issues that don't already appear on the agenda.

The resolution, which was sent to committee for further review, suggested that issues raised in agenda-listed reports should also be eligible for same-day senate action.

Resolution sponsor and Sen. Peter Loeb, a mathematics professor, said he believed the change was allowable under the Illinois Open Meetings Act — an assertion challenged by Sen. Mary Mallory, a library professor.

"I think that you're suggesting we break the law," she said prior to the vote.

Senators agreed to not change senate statutes to reflect the tradition of rotating leadership positions for the USC, but approved a resolution indicating the rotation tradition should continue.

The proposed change, initiated by UIS officials, also was rejected by the UIC Senate.

"Codifying the tradition in the statutes as proposed by UIS is too inflexible," said a statement by the members of the university statutes and senate procedures committee. ♦

ON THE WEB

<http://senate.illinois.edu>

Board approves 4.8 percent tuition increase

By Christy Levy

UIC News

University trustees approved a 4.8 percent increase in the guaranteed, four-year tuition rate — which equates to a 1.9 percent increase per year — for incoming students in fall 2012.

The state's guaranteed tuition law locks in rates for new students for four years, said Walter Knorr, university vice president and chief financial officer.

"We are proposing an increase in tuition that's no more, no less than the rate of inflation," Knorr said during the Jan. 19 meeting at UIC.

"But in the back of our minds, we have to know that we have a state situation that's very precarious."

The increase was in line with the Higher Education Price Index — a measure of the inflation rate — which rose to 1.9 percent this year, Knorr said.

Tuition for in-state students at the Urbana campus will rise by \$266 to \$5,818 per semester. Tuition for in-state UIC students will increase by \$234 per semester to \$5,116, and UIS in-state students will pay \$4,545 each semester, an increase of \$210.

University President Michael J. Hogan

said tuition increases have been on the decline — from 9.5 percent two years ago to less than 5 percent for next fall's new students.

UIC student trustee Kenneth Thomas cast his vote against the increase.

"We are citing a concern about the financial aid gap," UIC student trustee Kenneth Thomas said.

"We know every year financial aid goes up, but we're concerned about the gap between financial aid and tuition getting too wide."

Knorr said he estimates that federal and state-funded financial-aid programs, combined with supplemental financial aid provided by the university, will likely rise from about \$183 million to \$191 million.

At UIC, about 40 percent of students pay the "sticker price," Knorr said, but 42 percent receive enough scholarships and aid that they don't pay anything.

Concerns about financial aid and affordability were raised by administrators and trustees at the board's public retreat Jan. 18.

**"We are proposing an increase
in tuition that's no more, no less
than the rate of inflation."**

—Walter Knorr

An analysis presented by Avijit Ghosh, a special assistant to the president and a professor of business administration, showed that enrollment yield — the number of students admitted who actually enroll — has

fallen below peer universities at Urbana and UIC.

"There is a general feeling that the financial aid packages we are offering

might not be attracting a number of students we want to admit," Ghosh said.

Hogan agreed.

"This year, the chancellors and I have put a strong emphasis on trying to increase our financial aid," Hogan said, mentioning Access Illinois, a three-year campaign to raise money for scholarships he announced in June with the UI Foundation.

"That's the only way we'll be able to keep pace," he said.

Student fees will increase by \$5 at Urbana to \$1,441, by \$3 per semester at UIC to \$1,452, and \$18.50 per semester at UIS to \$891.50.

Housing costs, based on a standard dou-

ON THE WEB

www.uillinois.edu/trustees/

ble room and meal plan, will increase \$118 per semester at Urbana, by \$99 per semester at UIC, and by \$100 at UIS.

Other business:

Trustees re-elected Christopher G. Kennedy as chairman during the annual election of officers.

"Our current chair has demonstrated very clearly that he is devoted to the interests of the university," said trustee James Montgomery. "We are privileged that he is willing to serve yet another year."

Trustees Edward McMillan and Pamela Strobel were re-elected to serve with Kennedy on the board's executive committee.

The Chicago Rooms in Student Center West, the conference rooms that house board meetings when they're held on the UIC campus, were designated the Michele M. Thompson Conference Rooms A, B and C in honor of the board secretary, who retired after 35 years at the university.

"Dr. Thompson will be remembered for her consummate graciousness and generosity — in patience, spirit and dedication to the SEE TRUSTEES, PAGE 3

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On the Job *Evelyn Grady*

By Mike Helenthal
Assistant Editor

There is a multipurpose tool that Evelyn Grady, an office support specialist for the College of Education's Student Academic Affairs Office, brings with her everywhere.

It's a smile, and she's not afraid to use it.

"You look outside on a day like today and want to go, 'Oh my goodness,'" said the 23-year UI employee, gazing out a conference room window onto a cold, gray and drizzly day. "But every day I'm able to rise, I smile, thank the Lord and keep going. You have to deal with the reality of today."

Like her enduring faith, Grady's smile is never absent.

She said being able to smile and find humor, regardless of the situation, has allowed her to navigate almost any challenge work or life throws at her.

"Humor is good and it works in a lot of areas," she said. "I just always try to stay positive, even if I'm not feeling the greatest, and that ends up coming back to me."

Grady started in 1989 in the UI physics department as a "clerical learner," part of a training program that taught her the varied tasks needed to succeed as a campus office worker. She transferred to the Computer-based Education Research Laboratory in 1991 and then landed at the College of Education in 1993 and has never left.

She assists in a variety of ways, from basic secretarial duties to following and updating a graduate student roster to ensure general academic requirements are met. She has served on departmental committees, helped build a student database and speaks to groups of graduate students about meeting their requirements, just to name a few of her ever-changing tasks.

"I've served on as many as four com-

mittees at once," she said.

Grady said she enjoys the varied work and working with other people, especially the students.

For her, it's just one more chance to put on a smile, bring out the humor and to help someone face-to-face.

"I make my connection based on each individual because you never know what someone else is going through on the inside," she said. "We have some who come in jolly and we have some that seem sad. Each student is different. No matter what, I'm always there if anyone has any questions."

A desire to interact with people was what led Grady to the clerical field.

Being at-ease with almost anyone is a skill she learned by watching her mother, a retired teacher and administrator who worked with the Champaign County Head Start program for more than 35 years and is heavily involved in local church-based programs.

"I watched her and I just always wanted to be a part of it," she said. "I am a people person – that's the gift I received, that's the way my mom and dad brought me up. I've always been active in church. I had always wanted to work directly with people, and I always wanted to work at the University of Illinois."

Grady's father, who is now retired, was a UI building service worker for 30 years. A resident of the Champaign-Urbana area all her life and a graduate of Centennial High School, she has four sisters and a brother. One sister is a UI master's student and works on campus.

Grady also has a 16-year-old daughter, Alexis, a junior at Urbana High School. Grady considers her a chip off the old block – or in other words, "a real go-getter." She also proudly mentions her 18 nieces and nephews and her 23 great-nieces and nephews – part of a large family that "talks daily and gets together weekly."

A car accident nine years ago has made



photo by L. Brian Stauffer

People person Evelyn Grady, an office support specialist for more than 20 years, has spent most of her UI career in the College of Education's Student Academic Affairs Office – and much of that time with a smile on her face. A self-described people person, Grady says she enjoys her job because it involves assisting graduate students and staff members.

some days more difficult than others when it comes to putting on a smile.

She said she regularly gets through the day – smile intact – despite lingering pain from a back injury she suffered in the accident.

"You always have to change and adapt – always," she said. "You are responsible for making a negative into a positive. I have my days, but I overtake that pain. I'm not going to let it get me."

She said her job is made more enjoyable by the caring and capable staff around her. In addition, department leaders also have offered employees personal development opportunities, something she welcomes and appreciates.

"I like having the skills and the knowledge I need to excel at my job," she said. "Whatever you learn, you bring it back and you use it."

She said her job has motivated her to do more, not just get by.

"You have to go the extra mile," she said. "I always smile and show I'm here to assist. They are the customers and we are here to serve."

She said she appreciates the high standards expected of her, and she says she holds herself just as accountable.

It has paid off. She said the relationships she has developed with faculty and staff members and students alike are invaluable to her well-being, and at the very least make a difficult day a little more bearable.

"It makes your day when one of the students just stops by, not because they need something, but just to say 'hello,'" she said. "I feel like I have tons of friends." ♦

On the Job features UI staff members. To nominate a civil service employee, email insideil@illinois.edu.

UI to lead U.S. DOT research center on rail transportation

The U.S. Department of Transportation has awarded a grant of \$3.5 million to a multi-university consortium led by the UI's Urbana campus to establish a rail transportation and engineering research center. Headquartered within the department of civil and environmental engineering at Illinois, the National University Rail Center will focus on rail education and research to improve railroad safety, efficiency and reliability. Particular focus will be on challenges associated with rail corridors in which higher-speed passenger trains share infrastructure with freight trains.

The NURail Center will be the first University Transportation Center focused solely on rail. The proposal received broad sup-

port from a large number of public, private sector and international rail organizations. The UI leads a consortium of research universities comprising UIC, Massachusetts Institute of Technology, Michigan Technical University, Rose-Hulman Institute of Technology, the University of Kentucky and the University of Tennessee. Within the theme of shared rail corridors, research projects will focus on track and structures; train control; rolling stock; human factors; and other topics identified based on Federal Railroad Administration and Association of American Railroads priorities. The center will be under the direction of professor Christopher P.L. Barkan, the Krambles Faculty Fellow in the department of civil and

environmental engineering and the director of the Illinois Rail Transportation and Engineering Center.

In addition to being part of the NuRail Center, the Urban Transportation Center at UIC will join a collaboration led by the University of South Florida's National Center for Transit Research, one of only two centers designated to work on transit research nationally. Work at UIC may include projects related to the issues of safety, maintenance, competitiveness, livability and environmental stability in the Chicago region, Illinois and nationally. UIC has been guaranteed \$700,000 of the \$3.5 million federal grant to the University of South Florida, with a \$700,000 matching grant from the

Illinois Department of Transportation. UIC also is a participant in a third UTC consortium led by the University of Wisconsin at Madison.

These research grants are part of \$77 million in DOT grants to 22 UTCs – involving a total of 121 U.S. universities across the country – to advance research and education programs that address critical transportation challenges facing the nation. The UTCs conduct research that directly supports the priorities of the DOT on transportation-related issues such as shared rail corridors, innovations in multimodal freight and infrastructure, bridge inspection methods, and reducing roadway fatalities and injuries. ♦

SEA SLUGS, CONTINUED FROM PAGE 1

Hirayama and Gillette think that they have identified a very simple and general type of circuit for cost/benefit decisions, one that is at the core of the more complicated valuations and decisions that are made by the social, higher vertebrates like ourselves. More research into this circuitry could lead to the development of better digital personal assistants and Internet avatars, Gillette said. These findings also may help those studying various kinds of addictions or other extreme, reward-seeking behaviors.

"What we're talking about is a fundamental economic decision of resource acquisition or avoidance," he said. "This basic type of decision is subverted in substance abuse, in illogical gambling and in badly managed shopping, for example. This is why I think that studying the basis of this type of decision in a very simple animal, where we can work it out, is important."

The National Science Foundation and National Institutes of Health supported this research.

The study appears in the journal *Current Biology*. ♦

TRUSTEES, CONTINUED FROM PAGE 2

well-being of the University of Illinois," the resolution states.

■ Donald Chambers, the chairman of the University Senates Conference, addressed an investigative report completed after Hogan's former chief of staff, Lisa Troyer, was accused of sending anonymous emails to members of the senates conference about an enrollment-management initiative. The report, conducted by Jones Day and Duff & Phelps, concluded that the emails were composed and sent from Troyer's university laptop and that there was no evidence that anyone else knew Troyer had sent the emails.

Troyer resigned from her administrative position Jan. 4.

"Ethical conduct means more than legal conduct," said Chambers, a UIC professor of biochemistry and molecular genetics and of physiology and biophysics.

"Leaders must accept responsibility for what happens on their watch, even if they may not have personally directed or approved it."

■ Two trustees voted against the board's appointment of Timothy Beckman as Urbana's new football coach, saying the university should continue its search in an effort to increase diversity.

Trustee Lawrence Oliver said the Urbana-Champaign campus has never had an African-American head football or basketball coach.

The university did interview

two African-American candidates for the position during the search last month, Oliver said, offering a contract to one, who turned it down. "We have to increase our efforts," Oliver said. "Making an opening offer for a hot African-American coaching prospect is not enough. "There are times when one candidate is head and shoulders above the rest, and this is not the case here. This is a missed opportunity."

Trustee Montgomery agreed and also voted against Beckman's appointment. Beckman was the head football coach at the University of Toledo. His contract will expire Jan. 31, 2017. ♦

IBHE to recommend guidelines for performance-based funding

By Mike Helenthal

Assistant Editor

Editor's note: This is the first of a two-part story on performance-based funding, a new mechanism expected to be incorporated in the state of Illinois' 2013 education budget. This week's story is on the mechanics of performance funding and why it is being considered. The second story, to appear in the Feb. 16 edition of Inside Illinois, focuses on Tennessee's experience with performance-based funding and whether Illinois will be able to emulate it.

An Illinois Board of Higher Education steering committee is expected to deliver final recommendations Feb. 7 for a performance-based funding system likely to be implemented with the state's 2013 budget.

Formed by Illinois General Assembly mandate, the committee was charged with finding ways to reach goals outlined in the Illinois Public Agenda for College and Career Success, a study commissioned by legislators in 2008 and completed by the Illinois Higher Education Finance Study Commission in 2010.

Components of the Illinois Public Agenda include goals of greater and less-expensive higher-education access in an effort to better prepare the state's workforce for the future, and retool the struggling Illinois economy.

The 10-year plan also calls for looking

percent at public universities in those eight years), and declining student assistance (the state's student-assistance program, the Monetary Award Program, dropped by 12 percent over the same period).

Performance-based funding alone will not solve the state's higher-education funding crisis, but according to Abbas Aminmansour, a UI professor of architecture and chairman of the IBHE's Faculty Advisory Council, it's a first step in changing the state's funding mechanisms and meeting the goals of the Illinois Public Agenda.

Aminmansour, also a member of the IBHE Finance Study Commission and its performance-funding steering committee, said officials are approaching the performance concept seriously, but cautiously.

"We really want to have a good handle on this because there may be unintended consequences," he said. "There are a lot of intricacies we have to be very careful about. We have to use the metrics that we know we have a handle on and we have to make sure there's no damage done."

The committee originally proposed tying performance metrics to only new funding. But in a state where new funding is unlikely, the committee this January settled on proposing a formula for four-year institutions calling for a half-percent of the overall budget to be set aside as performance funds – but only if funding remains at 2012 levels. If overall funding were to return to higher 2011 levels, a little more than 1 percent of



photo by L. Brian Stauffer

Committee commitment Abbas Aminmansour, a UI professor of architecture, also serves on the Illinois Board of Higher Education steering committee charged with formulating a performance-based funding system for the state's colleges and universities. He said the committee's work has been rigorous and is expected to result in performance-funding recommendations this year. The recommendations will be used by the IBHE and state legislators in setting the 2013 education budget.

he said. "There's been a general agreement that we should not treat all institutions equally. We've had to develop metrics and criteria that target individual institutional performance and types of degrees offered, and then tie them to the institution's strategic goals. The institutions will be able to adjust those goals to compete for that additional funding."

Aminmansour is confident the UI would fare well under any measure of comparison and maximize any potential funding linked to performance.

"It's actually a chance to show the U. of I.'s strengths," he said.

It is still unclear how performance funding will fare in Illinois, or if it will become a catalyst for exploring other new methods for achieving the state's educational goals.

The state's ongoing fiscal problem is one barrier proponents must face, as legislators grapple with seemingly unending priorities and billions of dollars in red ink. Gov. Pat Quinn said recently that higher-education funding likely will remain level for at least the next three years.

"It is up to (institutions) to make the case that the higher-education system should be funded at a higher rate," Aminmansour said. "We have to show it is a very good investment that will actually help the state to get out of some of the financial trouble. The numbers show the state benefits significantly from higher education. It's our responsibility to keep making that point. If we don't, who will?"

And the second barrier is that, across the country, the actual performance of perfor-

ON THE WEB

■ **For more information on HB1503, the legislation calling for performance-based funding:**
<http://go.illinois.edu/HB1503>

■ **Tennessee's performance-based system:**
http://www.tn.gov/moa/strGrp_prefund.shtml

■ **Illinois Public Agenda for College and Career Success:**
<http://www.ibhe.state.il.us/masterPlanning/>

■ **IBHE Performance funding:**
<http://www.ibhe.state.il.us/PerformanceFunding/default.htm>

mance funding has been less than glowing.

Robert Rich, the director of the UI's Institute of Government and Public Affairs and author of a white paper on performance funding commissioned by President Michael J. Hogan, said about half of the 25 states attempting to implement a performance system since 1979 had abandoned their funding models altogether.

According to Rich's report, five state systems dropped performance funding immediately following establishment, four others abandoned models after the policy was mandated, and three scrapped their models after performance indicators were added. Even Illinois in 1998 tried to tie its

SEE **FUNDING**, PAGE 5



photo by L. Brian Stauffer

Follow the leader Robert Rich, the director of the UI's Institute of Government and Public Affairs, wrote a "white paper" on performance-based funding commissioned by UI President Michael J. Hogan. According to Rich's work, Tennessee is the only state that has successfully implemented a long-term performance-based system that supports legislative goals for the state's higher-education system.

at new approaches for the issues of student financial aid and inclusion, a rollback of a long list of unfunded legislative mandates, ways to better integrate statewide innovation into economical solutions, a statewide articulation initiative meant to align curriculum from high school through college, as well as better metrics to track the achievement of these goals.

The overarching goal is to have 60 percent of the Illinois workforce earn a college degree or certificate by 2025. But to do that, the state's higher-learning institutions would have to produce 600,000 more graduates – a rate increase of 3.2 percent compounded annually.

"Illinois is not ready to face its future," says the first line of the Illinois Public Agenda report. "Today's workforce has a massive skills deficit that threatens the economic well-being of the state and its citizens."

While performance funding traditionally has carried a negative connotation among educators, a number of factors have led to the consideration and embrace of new approaches.

Those factors include ongoing reductions in public funding (down overall by an estimated 26 percent between 2002 and 2010), rising tuition and fees for students (up 84

the budget would be set aside to reward performance factors.

The committee also is recommending that the percentage of funds eligible for performance should increase if the state's education budget increases, though specific percentages have not been worked out. Under the proposed formula, about 60 percent of earmarked performance funding would go toward general institutional goals such as graduation rate, while the remaining 40 percent would reward specific Illinois Public Agenda goals – such as increasing minority, low-income and first-in-family college students. In the first year, higher-education institutions would receive evaluation results only, based on the specified metrics. Actual performance funding wouldn't be allocated until year two.

Aminmansour said the key to the process is that Illinois' universities will be competing against their own past performances based on a three-year average, not against one another, and that funding for specific strengths – like the Urbana campus's well-known research mission – are weighted under a standardized funding model that takes into account the varied missions of each four-year university and community college.

"It's been a very difficult thing to do,"

Performance-based Funding Model Steps (Four-year public university)

- STEP 1** Identify the performance measures or metrics that support the achievement of the state goals.
- STEP 2** Collect the data on the selected performance measures
- STEP 3** Award an additional premium (for example, 40 percent) for the production of certain desired outcomes such as completions by underserved or underrepresented populations.
- STEP 4** Normalize (scale) the data, if necessary, so it is comparable across variables.
- STEP 5** Weight each of the Performance Measures that reflects the priority of the measure and the mission of the institution.
- STEP 6** Multiply and sum the Scaled Data times the Weight to produce the Weighted Results.
- STEP 7** Use the Weighted results (or Total Performance Value) to distribute performance funding.

Source: IBHE Steering Committee Report

FUNDING. CONTINUED FROM PAGE 4
community colleges to a performance model, but abandoned the idea four years later.

Rich credits Tennessee for being the first to adopt a performance-funding model, which became an official program in 1979 after a five-year pilot effort. The state's program has changed over the years, but it is still considered the best working model. Other states regularly copy the complicated formula that Tennessee has developed and used to accurately compare its varying institutions, and measure their success in meeting state priorities.

"Tennessee has lasted longer than any other state," he said.

Rich said adopting a performance-based system is difficult because so many factors become involved in any formula designed to encompass a multi-missioned state education system.

"Funding traditionally has been based on enrollment and there was no competition between institutions," he said. "Simply put, large institutions got a lot more money."

And while the state's colleges and universities already have access to a great amount of institutional data, according to Rich, "How you track that data becomes crucial, and when you interpret those numbers you must take into account very different places with sometimes divergent missions."

He said the effort becomes more difficult by the fact that, outside Tennessee, there are no other "best practices" procedures from which to learn.

"No state besides Tennessee that has tried performance funding has kept it, other than in fits and starts," he said. "It's a very difficult task." ♦

A linguist's analysis of the State of the Union speech

A Minute With ...TM linguistics expert Dennis Baron

Editor's note: Given that this is a presidential election year, President Obama's State of the Union speech Jan. 24 was, of course, tempered by politics, but UI English and linguistics professor Dennis Baron was more interested in the president's word choices. Baron is the author of seven books – most recently "A Better Pencil: Readers, Writers, and the Digital Revolution." His website, "The Web of Language: the Go-to Site for Language in the News," is at <http://illinois.edu/blog/view/25>. He parsed the president's speech in an interview with News Bureau news editor Dusty Rhodes.

What did you look for in the president's speech?

Two things: Will Vice President Joe Biden stay awake? And will Speaker of the House John Boehner unfreeze his face? In fact, Biden stayed attentive, though one Tweeter said he checked his iPhone toward the end; and Boehner, like many Republicans, including Eric Cantor, actually applauded a number of times. That's because a lot of what Obama said was unifying, and his words were, well, as American as apple pie. Seriously, the word cloud of the most frequently used words in the speech shows the top three were "American," "America" and "Americans," followed by "jobs," "new," "get" and "energy."

OK, so his co-stars stayed alert. Didn't you have any expectations for the president himself?

Mr. Obama is an accomplished speaker. He has been accused in the past of sounding too professorial. As a professor myself, I don't see what's wrong with that – and it's not surprising, since Obama was a professor of constitutional law at the University of Chicago. But his rhetorical style during the speech was not at all off-putting – remember, I'm not talking about the politics, but the president's word choice and delivery. The president even resorted to a pun about crying over some literal spilled

milk, and that groaner, an example of least-common-denominator humor, proved to be yet another unifying, defusing moment for the audience.

Did you notice any patterns to his word choices?

Shortly after the speech, The New York Times published a vocabulary analysis of the top words used over the past four years in major speeches by Mr. Obama alongside the Republican presidential candidates. That graphic shows the president, who was once criticized for not wearing a flag pin in his lapel, used "America" and "American" more frequently this year than ever, while those words occur far less frequently, and are trending downward, in speeches and interviews by Newt Gingrich, Mitt Romney and Rick Santorum. Ron Paul's vocabulary seems to follow the beat of a different drummer entirely, which I suppose is not surprising for a libertarian.

Another interesting contrast: The president used the word "government" less than ever in this year's speech, while his opponents have increased their mentions of "government" significantly. Obama's mention of health care and education is down over past years, but his references to energy, jobs and taxes are way, way up. These shifts in emphasis represent both political strategies and signs of the times.



photo by L. Brian Stauffer

Hours before the speech, a Republican presidential candidate offered a "prebuttal." That term gets a red squiggly line from our spell-checker. In your expert opinion, is it a real word?

Yes. The Oxford English Dictionary credits Vice President Al Gore with the earliest use of "prebuttal," defined as "a pre-emptive rebuttal," in 1996. Here's the citation, from The Washington Post: "President Clinton's White House and campaign team have been drawing favorable reviews for their rapid response operation and penchant for picking off issues before Senate Majority Leader Robert J. Dole...even gets his TelePrompTer warmed up. Vice President Gore calls it 'prebuttal.'" However I wonder whether "prebuttal" might suggest not so much a pre-emptive strike but rather "putting your rear end first." ♦

A Minute With ...TM is provided by the UI News Bureau. To view archived interviews, go to illinois.edu/goto/aminutewith.

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Family debt hurts children's chances for success in college

By Sharita Forrest
News Editor

Families that have high amounts of unsecured debt, such as outstanding credit card balances and payday loans, diminish their children's prospects of attending or graduating from college, according to a new study by social work professors Min Zhan at the UI and Michael Sherraden, the founder of the Center for Social Development at Washington University in St. Louis.

And differences in the types of household assets and debt that white, black and Hispanic families have may explain, at least in part, the racial disparities in college attendance and graduation rates, the researchers say.

Zhan and Sherraden explored links between household assets, debt and college achievement for 1,162 children whose biological parents participated in the 1979 National Longitudinal Survey of Youth conducted by the U.S. Department of Labor's Bureau of Labor Statistics. The ongoing survey, which studies the life experiences of adults born from 1957-1964, is a nationally representative sample, but includes a supplemental oversample of minority and economically disadvantaged families.

Zhan and Sherraden also drew data about female participants' children from a related ongoing survey, begun in 1986, which collects statistics about household composition, schooling and work experiences, among other information.

Studies of families' finances and their relationship to college attendance and graduation typically lump assets and liabilities together to estimate families' net worth. However, Zhan and Sherraden wanted to isolate assets and liabilities to determine whether asset types (including financial assets, such as savings, and nonfinancial assets, such as vehicles, properties and businesses) and types of debt (secured debt, such as mortgages, and non-secured debt, such as consumer loans) had differing effects on college achievement for white and minority children.

The authors found large gaps in educational achievement among children in the study sample, with Hispanic and black children dropping out of high school at higher rates, 23 percent and 17 percent respec-

tively, versus white children (7 percent).

White children were more likely to enroll in and graduate from college than black or Hispanic children, with more than half of the white children, 53 percent, attaining at least some postsecondary education compared with 31 percent of Hispanics and 37 percent of blacks. About 23 percent of white students graduated, versus 12 percent of black students and 9 percent of Hispanic students.

Among families in the sample, the researchers found wide disparities in income and asset accumulation by race/ethnicity as well. White families had nearly five times the amount of financial assets (\$17,871) of Hispanic families (\$3,653) and black families (\$3,726). About 95 percent of white families had nonfinancial assets versus 84 percent of Hispanics and 63 percent of blacks.

Ownership of financial assets was linked to parents' college expectations for their children, and, along with family income, had stronger associations with college attendance and graduation for white children than minority children. On the other hand, nonfinancial assets had greater significance for black and Hispanic children – but no impact on white children.

Nonfinancial assets, especially home and real estate ownership, could be more critical for minority children partly because they compose a larger portion of the families' assets, facilitating college success, the authors suggested.

The type of debt that families carried affected educational achievement as well. Children from families with larger amounts of secured debt were more likely to graduate from college – but when household assets were included in the analyses, the positive effect disappeared.

The authors suggested that the positive influence of secured debt on college attendance/graduation depended on families' levels of household assets – that is, whether



photo by L. Brian Stauffer

Debt and college Levels of unsecured debt, such as payday loans and credit cards, influence whether children attend and graduate from college, especially children from low-income and minority families, according to recent studies by Min Zhan, a professor in the School of Social Work, and Michael Sherraden, a faculty member at Washington University in St. Louis.

families had the economic ability to service the debt and if the value of the assets exceeded the associated debt.

Greater amounts of unsecured debt in the household decreased the probability that children, especially black and Hispanic children, would attend or graduate from college.

The ratio of unsecured debt to financial assets also was much greater for black families (36 percent) and Hispanic families (22 percent) than for white families (14 percent), indicating that minority families were less able to repay their debt, the authors suggested.

The presence of unsecured debt, especially heavy debt, might be indicative of financial difficulties that could limit long-term educational opportunity as well as families' ability to obtain future loans, perhaps explaining some of the racial gaps in college achievement.

"(U)nsecured debt may suggest a lower level of financial functioning, while the presence of secured debt suggests a higher level of financial functioning, and both of these apparently matter for college completion," Zhan and Sherraden wrote.

Much of the unsecured debt carried by low-income families often is in the form

of loans with non-mainstream financial institutions, such as high-interest payday lenders, check-cashing outlets and credit cards, Zhan said.

Stricter regulation of predatory lending practices and policy changes that facilitated access to credit through mainstream financial institutions could help low-income families reduce debt and accumulate assets, enhancing children's opportunities for college success. Providing incentives, such as matching families' contributions to college savings programs, might encourage asset accumulation, the researchers wrote.

Oftentimes, financial constraints preclude low-income families from taking advantage of the savings and tax incentives associated with state college savings programs, Zhan said.

Financial resources aside, however, structured savings programs have attitudinal implications, raising educational expectations and motivation to achieve.

"It goes beyond economic impact," Zhan said. "If kids have some savings, especially in their own names, for funding college, they have this cognitive recognition that the money is for their education so they need to work hard."

Parental expectations have an even stronger bearing on college graduation rates than children's own expectations for themselves, the researchers found in a related study using the same data set. Among other factors in the analyses, mothers' level of education "was overwhelmingly important" to families' educational aspirations for their children.

Clearly, then, savings and assets alone aren't all that matter, according to the researchers.

"However, because saving and asset building has straightforward and doable policy implications, this is a public policy strategy that should not be ignored," Zhan and Sherraden wrote.

The studies appeared in the June and November 2011 issues of the journal *Children and Youth Services Review*. ♦

deaths

Thomas "Mike" Bridges Sr., 63, died Jan. 24 at his Champaign home. Bridges worked as a painter sub-foreman for Facilities and Services for 20 years, retiring in 2010. Memorials: The Mesothelioma Applied Research Foundation, www.curemeso.org.

Gert H. Gentner, 60, died Dec. 17. Gentner had been a driver for University Housing for six years.

Louis G. Lariviere, 91, died Jan. 17 at his Champaign home. Lariviere worked for

the Division of Operation and Maintenance (now Facilities and Services) for 21 years, retiring in 1980 as a chief engineer draftsman. He also worked as extra help for four years after retirement. Memorials: Veterans of Foreign Wars Post 5520, www.vfw5520.org.

Howard E. Patterson, 86, died Jan. 24 at Meadowbrook Healthcare Center, Urbana. Patterson worked as a building service worker for the Division of Operation and

Maintenance (now Facilities and Services), retiring in 1982 after 31 years of service. Memorials: Carle Hospice, 206A W. Anthony Drive, Champaign, IL 61820; or Champaign County Humane Society, www.cuhumane.org.

Wreatha H. Peters, 95, died Jan. 17 at Sarah Bush Lincoln Health Center, Mattoon, Ill. Peters worked for University Housing for 17 years, retiring in 1980 as an assistant food production manager. She worked

10 more years after retirement. Memorials: First Christian Church of Neoga, www.fccneoga.org.

Memorial service

A memorial service will be held from 4-6 p.m. Feb. 9 at Grainger Library to honor **Stanley M. Mechling**. Mechling, 58, died Jan. 19 at his Champaign home. He had worked at Grainger Library for the last 9 years. Memorials: Champaign County Humane Society, www.cuhumane.org. ♦

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New technique makes it easier to etch semiconductors

By Liz Ahlberg

Physical Sciences Editor

Creating semiconductor structures for high-end optoelectronic devices just got easier, thanks to UI researchers.

The team developed a method to chemically etch patterned arrays in the semiconductor gallium arsenide, used in solar cells, lasers, light emitting diodes (LEDs), field effect transistors (FETs), capacitors and sensors. Led by electrical and computer engineering professor Xiuling Li, the researchers describe their technique in the journal *Nano Letters*.

A semiconductor's physical properties can vary depending on its structure, so semiconductor wafers are etched into structures that tune their electrical and optical properties and connectivity before they are assembled into chips.

Semiconductors are commonly etched with two techniques: "Wet" etching uses a chemical solution to erode the semiconductor in all directions, while "dry" etching

uses a directed beam of ions to bombard the surface, carving out a directed pattern. Such patterns are required for high-aspect-ratio nanostructures, or tiny shapes that have a large ratio of height to width. High-aspect-ratio structures are essential to many high-end optoelectronic device applications.

While silicon is the most ubiquitous material in semiconductor devices, materials in the III-V (pronounced three-five) group are more efficient in optoelectronic applications, such as solar cells or lasers.

Unfortunately, these materials can be difficult to dry etch, as the high-energy ion blasts damage the semiconductor's surface. III-V semiconductors are especially susceptible to damage.

To address this problem, Li and her group turned to metal-assisted chemical etching (MacEtch), a wet-etching approach they had previously developed for silicon. Unlike other wet methods, MacEtch works in one direction, from the top down. It is faster and less expensive than many dry etch techniques, according to Li. Her group

revisited the MacEtch technique, optimizing the chemical solution and reaction conditions for the III-V semiconductor gallium arsenide (GaAs).

The process has two steps. First, a thin film of metal is patterned on the GaAs surface. Then, the semiconductor with the metal pattern is immersed in the MacEtch chemical solution. The metal catalyzes the reaction so that only the areas touching metal are etched away, and high-aspect-ratio structures are formed as the metal sinks into the wafer. When the etching is done, the metal can be cleaned from the surface without damaging it.

"It is a big deal to be able to etch GaAs this way," Li said. "The realization of high-aspect-ratio III-V nanostructure arrays by wet etching can potentially transform the fabrication of semiconductor lasers where surface grating is currently fabricated by dry etching, which is expensive and causes surface damage."

To create metal film patterns on the GaAs surface, Li's team used a patterning technique pioneered by John Rogers, the Lee J. Flory-Founder Chair and a professor of materials science and engineering at the UI. Their research teams joined forces to optimize the method, called soft lithography, for chemical compatibility while protecting the GaAs surface. Soft lithography is applied to the whole semiconductor wafer, as opposed to small segments, creating patterns over large areas – without expensive optical equipment.

"The combination of soft lithography and MacEtch make the perfect combination to produce large-area, high-aspect-ratio III-V nanostructures in a low-cost fashion," said Li, who is affiliated with the Micro and Nanotechnology Laboratory, the Frederick Seitz Materials Research Laboratory and the Beckman Institute for Advanced Science and Technology at the UI.



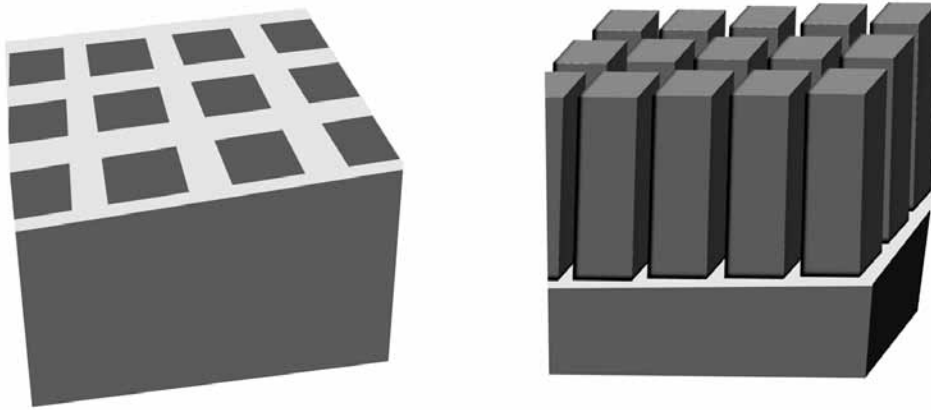
photo by L. Brian Stauffer

Easier etching *Xiuling Li, a professor of electrical and computer engineering, led a team that has developed a method to chemically etch patterned arrays in the semiconductor gallium arsenide, used in solar cells, lasers, light emitting diodes (LEDs), field effect transistors (FETs), capacitors and sensors.*

Next, the researchers hope to further optimize conditions for GaAs etching and establish parameters for MacEtch of other III-V semiconductors. Then, they hope to demonstrate device fabrication, including distributed Bragg reflector lasers and photonic crystals.

"MacEtch is a universal method as long as the right condition for differential etching with and without metal can be found," Li said.

The Department of Energy and the National Science Foundation supported this work. ♦



graphic by Xiuling Li

Etched in gold *Metal-assisted chemical etching uses two steps. First, a thin layer of gold is patterned on top of a semiconductor wafer with soft lithography (left). The gold catalyzes a chemical reaction that etches the semiconductor from the top down, creating three-dimensional structures for optoelectronic applications (right).*

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Patterns seen in antibiotic-resistant bacteria in reptiles

By Diana Yates

Life Sciences Editor

Land and marine iguanas and giant tortoises living close to human settlements or tourist sites in the Galápagos Islands were more likely to harbor antibiotic-resistant bacteria than those living in more remote or protected sites on the islands, researchers report in a new study.

Feces collected at several different sites from free-living reptiles harbored *Escherichia coli* bacteria that were resistant to ampicillin, doxycycline, tetracycline and trimethoprim/sulfamethoxazole. Another bacterial species collected from the feces, *Salmonella enterica*, was found to be only mildly resistant or not resistant at all to the same antibiotics, most likely because of the differing ecology of these two bacterial species in the gut, researchers said.

The study results are reported in the *Journal of Wildlife Diseases*.

This is not the first study to find that wild animals living near humans or affected by tourism can obtain antibiotic-resistant bacteria from that exposure, said UI animal sciences professor Roderick Mackie, who led the study. But it does offer researchers and wildlife managers a way to determine which vulnerable animal species are most at risk of exposure to human pathogens.

“Oceanic island systems such as the Galápagos archipelago are ideal for studying



photo by Roderick Mackie

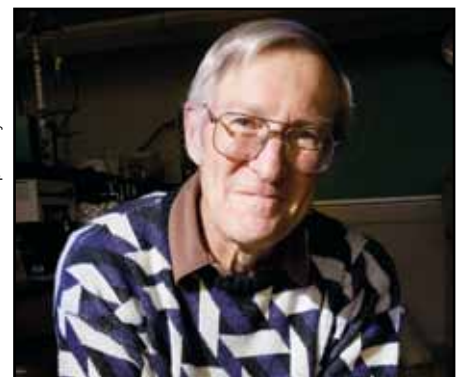


photo by L. Brian Stauffer

Detecting patterns UI animal sciences professor Roderick Mackie and his colleagues found evidence of antibiotic-resistant bacteria in reptiles on the Galápagos Islands. Proximity to human settlements or tourist sites was the best predictor of antibiotic-resistant bacteria in Galápagos reptiles. Land iguanas such as this lizard on Isla Fernandina live in remote locations with no human contact and are unlikely to carry resistance genes.

patterns and processes of ecology and evolution, such as antibiotic resistance,” Mackie said. “Although the data are interesting, we don’t have enough data to identify the likely source of antibiotic exposure and origin of the resistance genes, or to draw conclusions about transmission direction.”

Also, it is not yet clear “to what extent this potential exposure translates to ongo-

ing exchange of bacterial strains or bacterial traits,” the researchers wrote. Further studies are needed “to understand better how human associations influence disease risk in endemic Galápagos wildlife.”

The work was carried out by Emily Wheeler as part of her doctoral studies in Mackie’s lab, and was supported by a U.S. Environmental Protection Agency STAR

Fellowship and a student research grant from the Conservation Medicine Center of Chicago. Postdoctoral researcher Pei-Ying Hong and field biologist Lenin Cruz Bedon, of Isla Santa Cruz, Galápagos, are co-authors on the study.

Mackie also is an affiliate of the Institute for Genomic Biology at Illinois. ♦

Particle-free silver ink prints small, high-performance electronics

By Liz Ahlberg

Physical Sciences Editor

UI materials scientists have developed a new reactive silver ink for printing high-performance electronics on ubiquitous, low-cost materials such as flexible plastic, paper or fabric substrates.

Jennifer Lewis, the Hans Thurnauer Professor of Materials Science and Engineering, and graduate student S. Brett Walker described the new ink in the *Journal of the American Chemical Society*.

“We are really excited about the wide applicability and excellent electrical properties of this new silver ink,” said Lewis, the director of the Frederick Seitz Materials Research Laboratory at the UI.

Electronics printed on low-cost, flexible materials hold promise for antennas, batteries, sensors, solar energy, wearable devices and more. Most conductive inks rely on tiny metal particles suspended in the ink. The new ink is a transparent solution of silver acetate and ammonia. The silver remains

dissolved in the solution until it is printed, and the liquid evaporates, yielding conductive features.

“It dries and reacts quickly, which allows us to immediately deposit silver as we print,” Walker said.

The reactive ink has several advantages over particle-based inks. It is much faster to make: A batch takes minutes to mix, according to Walker, whereas particle-based inks take several hours and multiple steps to prepare. The ink also is stable for several weeks.

The reactive silver ink also can print through 100-nanometer nozzles, an order of magnitude smaller than particle-based inks, an important feature for printed microelectronics. Moreover, the ink’s low viscosity makes it suitable for inkjet printing, direct ink writing or airbrush spraying over large, conformal areas.

“For printed electronics applications, you need to be able to store the ink for several months because silver is expensive,” Walker said. “Since silver particles don’t actually form until the ink exits the nozzle and the ammonia evaporates, our ink remains



photo by S. Brett Walker

High performance

Reactive silver ink is airbrushed onto a thin, stretchy plastic film to make a flexible silver electrode.

stable for very long periods. For fine-scale nozzle printing, that’s a rarity.”

The reactive silver ink boasts yet one more key advantage: a low processing temperature. Metallic inks typically need to be heated to achieve bulk conductivity through a process called annealing. The annealing temperatures for many particle-based inks are too high for many inexpensive plastics or paper. By contrast, the reactive silver ink exhibits an electrical conductivity approaching that of pure silver upon anneal-

ing at 90 degrees Celsius.

“We are now focused on patterning large-area transparent conductive surfaces using this reactive ink,” said Lewis, who also is affiliated with the Beckman Institute for Advanced Science and Technology, the Micro and Nanotechnology Lab and the department of chemical and biomolecular engineering at the UI.

The U.S. Department of Energy and the National Science Foundation supported this work. ♦

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A better way to gauge the climate costs of land-use change

By Diana Yates
Life Sciences Editor

Those making land-use decisions to reduce the harmful effects of climate change have focused almost exclusively on greenhouse gases – analyzing, for example, how much carbon dioxide is released when a forest is cleared to grow crops. A new study in *Nature Climate Change* aims to present a more complete picture – to incorporate other characteristics of ecosystems that also influence climate.

“We know that forests store a lot of carbon and clearing a forest releases carbon dioxide into the atmosphere and contributes to climate change,” said UI postdoctoral researcher Kristina Anderson-Teixeira, who pioneered the new approach with plant biology and Energy Biosciences Institute professor Evan DeLucia. “But ecosystems provide other climate regulation services as well.”

The climate effects of a particular ecosystem also depend on its physical attributes, she said. One such attribute is its reflectivity, a quality climate scientists call albedo.

“If you think of an open snow-covered field or bare sandy soil, that ground acts somewhat like a mirror, reflecting solar radiation back to space,” Anderson-Teixeira said. “In contrast, a forest is dark and absorbs a lot of solar radiation. In that sense, any type of vegetation is going to warm the land surface to some extent.”

Another factor that should be considered is an ecosystem’s ability to release heat through the evaporation of water. The more water available in an ecosystem, the more it cools itself by evapotranspiration or, as DeLucia puts it, “planetary sweating.”

“It takes a great deal of energy to convert liquid water to vapor, and this transition cools the soil and the surface of leaves as water evaporates, in the same way that sweating cools your skin,” said DeLucia, who also is an affiliate of the Institute for Genomic Biology at Illinois.

Scientists have known about biophysical effects for a long time, Anderson-Teixeira said. “But the challenge has been to incorporate them into a single metric that will help us design land-use policies that are going to help mitigate – and not exacerbate – climate change.”

To tackle this problem, Anderson-Teixeira and DeLucia teamed with University of Minnesota professors Peter Snyder and Tracy Twine; professor Santiago Cuadra, of the Federal Center of Technological Education in Rio de Janeiro; and professor Marcos Costa, of the Ministry of Science, Technology and Innovation in Brazil.

The researchers compiled data to calculate the “greenhouse gas value” of 18 “ecoregions” across North and South America, and also modeled the ecoregions’ biophysical characteristics. They looked at several types of forest, as well as grassland, tundra, tropical savanna and agricultural crops, such as soy, sugarcane, corn, miscan-



photo by L. Brian Stauffer

Climate costs UI plant biology and Energy Biosciences Institute professor Evan DeLucia and postdoctoral researcher Kristina Anderson-Teixeira developed a new way to calculate the potential climate impacts of land-use changes, one that takes into account the greenhouse gas value and the biophysical attributes of different ecosystems.

thus and switchgrass.

“The challenge of combining the greenhouse gases with the biophysical effects is that they operate over very different spatial and temporal scales,” Anderson-Teixeira said. To integrate the two, the researchers

first divided the local biophysical effects by the global land surface area. They then combined the measures and converted the values into carbon dioxide equivalents, a common currency in the world of climate mitigation.

The researchers found that biophysical attributes make a tropical rainforest even more valuable for protection against climate warming, but lessen the climate value of boreal (evergreen) forests in Canada.

Any forest provides a climate service by storing carbon, the researchers said, but forests also absorb more solar radiation than bare ground. Tropical forests cool the land by evapotranspiration, but northern boreal forests have much

lower evapotranspiration and are dark in comparison to open spaces. These factors give Amazon forests “the highest climate regulation value of all the ecoregions we studied,” Anderson-Teixeira said.

Crops also have an enhanced climate-regulating value when their biophysical attributes are considered, DeLucia said.

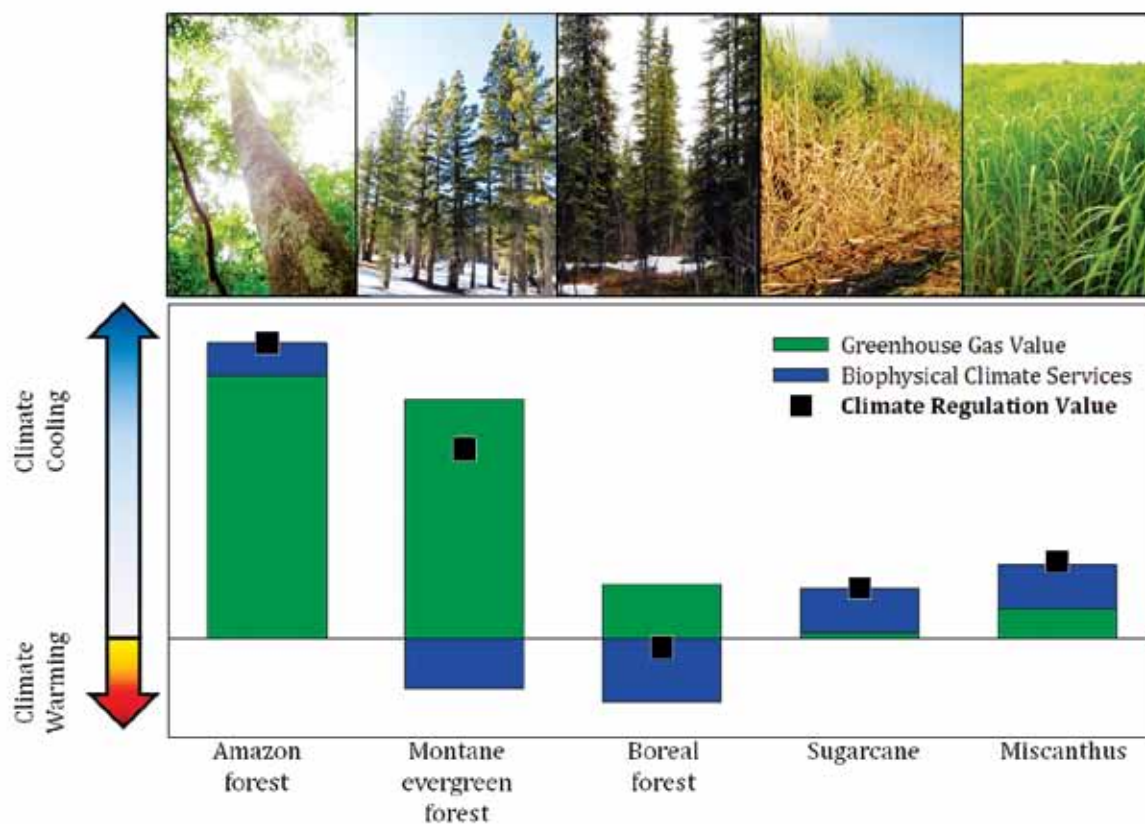
“When considering only their effect on greenhouse gases, annually tilled row crops like corn tend to have a warming effect by contributing large quantities of nitrous oxide and carbon dioxide to the atmosphere,” he said. “But when you factor in the ability to reflect solar energy and high rates of evapotranspiration, the net effect (compared with bare ground) is cooling.”

Ecosystems perform a lot of other services of importance to humans and the planet, DeLucia said.

“While the climate-regulating value that we propose in this paper captures how ecosystems affect climate, it is important to note that this is only one of many services ecosystems provide,” he said. “Ultimately the value of any given ecosystem to society must include these other services, including biodiversity, water purification and the production of food and fiber, to name just a few.”

The researchers note that theirs is not the only valid way to quantify the climate services various ecosystems offer. But it captures more of the picture than previous methods have.

“We hope that this approach will help to design land-use policies that protect the climate,” Anderson-Teixeira said. ♦



graphic by Kristina Anderson-Teixeira

Valuable considerations Tropical rainforests have an even greater climate cooling impact when biophysical attributes, such as evapotranspiration, are included in calculations. Other ecoregions, such as boreal forests, have less climate cooling potential when biophysical attributes also are considered.

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Illinois income tax anniversary:**A Minute With ...™** economist J. Fred Giertz

Editor's note: J. Fred Giertz is a UI professor of economics and a member of the Institute of Government and Public Affairs at Illinois. In an interview with News Bureau business and law editor Phil Ciciora, Giertz discusses the effect of the state of Illinois raising personal and business tax rates one year later.

Was raising both the state income tax rate by 67 percent and the corporate tax rate by 46 percent the right thing to do?

In retrospect, it was certainly something that had to be done; whether that exact amount had to be done or not is another question.

Illinois clearly needed extra revenue. Illinois was not a healthy state one year ago. If you had a healthy state, where bills were paid, it wouldn't make a lot of sense to have a substantial increase in taxes. But for the past five to eight years, Illinois has been teetering on the edge of insolvency. Business doesn't like to pay higher taxes, but business also doesn't like to operate in a state that's totally irresponsible – a state that doesn't pay its bills or fix its roads, for example. So it wasn't a choice between a well-run state government and low taxes or a well-run state government and high taxes; it was a choice between a very imprudent state with low taxes and a slightly more prudent state with higher taxes.

The tax increase was sold by Gov. Pat Quinn as a temporary measure. Do you foresee these tax rates being repealed or phased out to former levels in near future?

No. The state has had a long-term situation where it hasn't been paying for what it has been spending, and that was true before the tax increase and to a lesser extent today. Even in this last year, we're still running a shortfall, but one that's just not as big as in the past. So there's virtually no chance we'll let the tax expire. The choice will be between having a huge cut in state government spending, which I don't think we have the political will to do, or continuing with something like the current tax rate.

If you look back to last year's elections, Illinois was not like many other states – we didn't throw our politicians out, we validated what was going on. We re-elected the same governor who has been spend-

ing billions of dollars per year more than we've been taking in. We re-elected Democrats to the House and Senate, and the leadership has stayed the same. So nothing really changed in terms of the politics, so it wasn't very likely that we were going to have huge cuts in spending. But given the fact that we were on the brink of insolvency, something had to be done.

This past year, though, we have had some measure of discipline, much more so than in the past. Under the leadership of Speaker Michael Madigan, the Illinois House chose a relatively low budget target, and tried to keep spending within that target. In the past, we didn't even worry about revenue. We simply spent money and then worried about how to pay for it later. So there was actually an improvement in the process this year.

What effect have the tax increases had on the Illinois economy? Many predicted this would drive businesses out of the state to Wisconsin and Indiana. Has that happened? Or is it just a matter of time before it happens?

The state of Illinois is not in a great position right now, but the counterfactual is, how would we have done if the state were spending an extra \$5 billion more every year than it took in?

It's very difficult to tell what the actual impact is. A tax increase in and of itself is not a very good idea for business, but if the state is not behaving in a prudent way, that's also not a very good thing for business. Some businesses have threatened to leave, while others have received tax breaks after threatening to leave. It's probably too soon to tell, but I don't think there's been any huge impact in the short run.

Do you foresee more tax increases in the future, or more service fee increases and gambling revenue?

I don't see another major across-the-board type of hike because that can only be done so often. The state has to worry

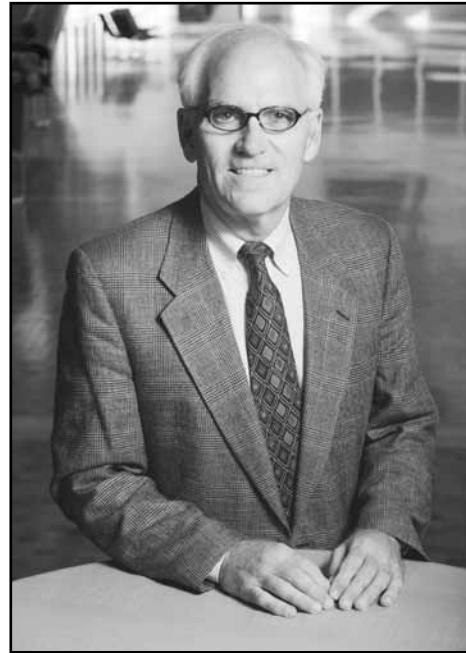


photo by L. Brian Stauffer

about living within its means. In a normal situation, that would be a challenge but not an insurmountable one. But the problem with the state of Illinois is, in addition to all these other problems, we also have the large amount of unfunded pension liability that has to be dealt with, which because of past inaction by the state, makes the degree of difficulty that much higher.

The pension liability issue is still an open question. One possibility is that there will be some sort of pension reform that will reduce pension costs in the future. That's been talked about for a year or two but it's very difficult to enact because of the constitutional restrictions on reducing benefits that have already been earned. The question then becomes, can you take away benefits from people currently employed. That's still an open question, from a constitutional perspective.

The biggest thing is the state needs to set up a tax system that is stable and pays for the activities of government and is not punitive for individuals and businesses.

A Minute With ...™ is provided by the UI News Bureau. To view archived interviews, go to illinois.edu/goto/aminutewith.

JUNK FOOD, FROM PAGE 1

enforce an Internet ban, and the only way to tackle it would be how they're doing it in Quebec, which is to prohibit advertising websites for junk food during cartoons, or even on product packaging in stores. But if a 10-year-old is searching for 'Lucky Charms' on the Internet, that would be hard to police on its own."

Baylis says one policy tool that's being revisited in the U.S. is the voluntary agreement that some prominent food companies have signed to limit advertising to kids.

"There's been a lot of concern that this voluntary agreement isn't working," she said. "The FCC has considered stepping in and doing more formal regulation. Our research indicates that this might be the way to go. The folks on the other side of the debate are always saying: 'Don't go down that road. It's a dead-end. Absolute bans don't work and a voluntary approach to self-regulation is better.' Well, that's not true, and this research is more ammunition for the FCC."

Although the advertising lobby would like to deny that advertising to kids works, Baylis notes that about \$11 billion per year is spent on advertising aimed at that audience.

"Fast food is one of the most highly advertised product categories, but what's interesting is the amount of discussion around having tighter regulations on advertising directed at children, or when countries look to impose a junk-food advertising ban," Baylis said.

"The advertising lobby is very fond of saying bans don't work, that regulations don't work. There's been a huge policy debate as to whether advertising bans work, and that's why we decided to study the Quebec example, because it was brought up a lot by advertisers as proving their point. And what we discovered is, if you're just averaging overall kids, if you don't control for anything, you're just throwing in enough noise so that it's not statistically significant. When we started controlling for things, we realized that there was something else going on."

The research was published in the October issue of the *Journal of Marketing Research*. ♦

Enhancing cognition in older adults also changes personality

By Diana Yates
Life Sciences Editor

A program designed to boost cognition in older adults also increased their openness to new experiences, researchers report, demonstrating for the first time that a non-drug intervention in older adults can change a personality trait once thought to be fixed throughout the lifespan.

Personality psychologists describe openness as one of five major personality traits. Studies suggest that the other four traits (agreeableness, conscientiousness, neuroticism and extraversion) operate independently of a person's cognitive abilities. But openness – being flexible and creative, embracing new ideas and taking on challenging intellectual or cultural pursuits – does appear to be correlated with cognitive abilities.

The new study, published in the journal *Psychology and Aging*, gave older adults a series of pattern-recognition and problem-solving tasks and puzzles that they could perform at home. Participants ranged in age from 60 to 94 years and worked at their own pace, getting more challenging tasks each week when they came to the lab to return materials.

"We wanted participants to feel challenged but not overwhelmed," said UI educational psychology and Beckman Institute



photo by Daryl Quitalig

professor Elizabeth Stine-Morrow, who led the research. "While we didn't explicitly test this, we suspect that the training program – adapted in difficulty in sync with skill development – was important in leading to increased openness. Growing confidence in their reasoning abilities possibly enabled greater enjoyment of intellectually challenging and creative endeavors."

Researchers tested the cognitive abilities

and personality traits of 183 participants and a control group of 131 older adults a few weeks before and after the intervention.

At the end of the program, those who had engaged in the training and practice sessions saw improvement in their pattern-recognition and problem-solving skills, while those in the control group did not. And those who improved in these inductive reasoning skills also demonstrated a moder-

Personality trait UI psychology professor Brent Roberts and educational psychology and Beckman Institute professor Elizabeth Stine-Morrow found that an intervention that boosts cognition in older adults also makes them more open – being flexible and creative, embracing new ideas and taking on challenging intellectual or cultural pursuits.

ate but significant increase in openness.

This study challenges the assumption that personality doesn't change once one reaches adulthood, said Illinois psychology professor and study co-author Brent Roberts.

"There are certain models that say, functionally, personality doesn't change after age 20 or age 30. You reach adulthood and pretty much you are who you are," he said. "There's some truth to that at some level. But here you have a study that has successfully changed personality traits in a set of individuals who are (on average) 75. And that opens up a whole bunch of wonderful issues to think about."

Study authors also include psychology professor Joshua Jackson, of Washington University in St. Louis; UI postdoctoral researcher Patrick Hill; and graduate student Brennan Payne. ♦

Risk-based passenger screening could make air travel safer

By Liz Ahlberg

Physical Sciences Editor

Anyone who has flown on a commercial airline since 2001 is well aware of increasingly strict measures at airport security checkpoints. A study by Illinois researchers demonstrates that intensive screening of all passengers actually makes the system less secure by overtaxing security resources.

UI computer science and mathematics professor Sheldon H. Jacobson, in collaboration with Adrian J. Lee at the Central Illinois Technology and Education Research Institute, explored the benefit of matching passenger risk with security assets. The pair detailed their work in the journal *Transportation Science*.

"A natural tendency, when limited information is available about from where the next threat will come, is to overestimate the overall risk in the system," Jacobson said. "This actually makes the system less secure by over-allocating security resources to those in the system that are low on the risk scale relative to others in the system."

When overestimating the population risk, a larger proportion of high-risk passengers are designated for too little screening while a larger proportion of low-risk passengers are subjected to too much screening. With security resources devoted to the many low-

risk passengers, those resources are less able to identify or address high-risk passengers. Nevertheless, current policies favor broad screening.

"One hundred percent checked baggage screening and full-body scanning of all passengers is the antithesis of a risk-based system," Jacobson said. "It treats all passengers and their baggage as high-risk threats. The cost of such a system is prohibitive, and it makes the air system more vulnerable to successful attacks by sub-optimally allocating security assets."

In an effort to address this problem, the Transportation Security Administration introduced a pre-screening program in 2011, available to select passengers on a trial basis. Jacobson's previous work has indicated that resources could be more effectively invested if the lowest-risk segments of the population – frequent travelers, for instance – could pass through security with less scrutiny since they are "known" to the system.

A challenge with implementing such a system is accurately assessing the risk of each passenger and using such information appropriately. In the new study, Jacobson and Lee developed three algorithms dealing with risk uncertainty in the passenger population. Then, they ran simulations to demonstrate how their algorithms, applied to a risk-based screening method, could estimate

risk in the overall passenger population – instead of focusing on each individual passenger – and how errors in this estimation procedure can be mitigated to reduce the risk to the overall system.

They found that risk-based screening, such as the TSA's new Pre-Check program, increases the overall expected security. Rating a passenger's risk relative to the entire flying population allows more resources to be devoted to passengers with a high risk relative to the passenger population.

The paper also discusses scenarios of how terrorists may attempt to thwart the security system – for example, blending in with a high-risk crowd so as not to stand out – and provides insights into how risk-based systems can be designed to mitigate the impact of such activities.

"The TSA's move toward a risk-based system is designed to more accurately match security assets with threats to the air system," Jacobson said. "The ideal situation is to create a system that screens passengers commensurate with their risk. Since we know that very few people are a threat to the system, relative risk rather than absolute risk provides valuable information."

The National Science Foundation and the U.S. Air Force Office of Scientific Research supported this work. ♦

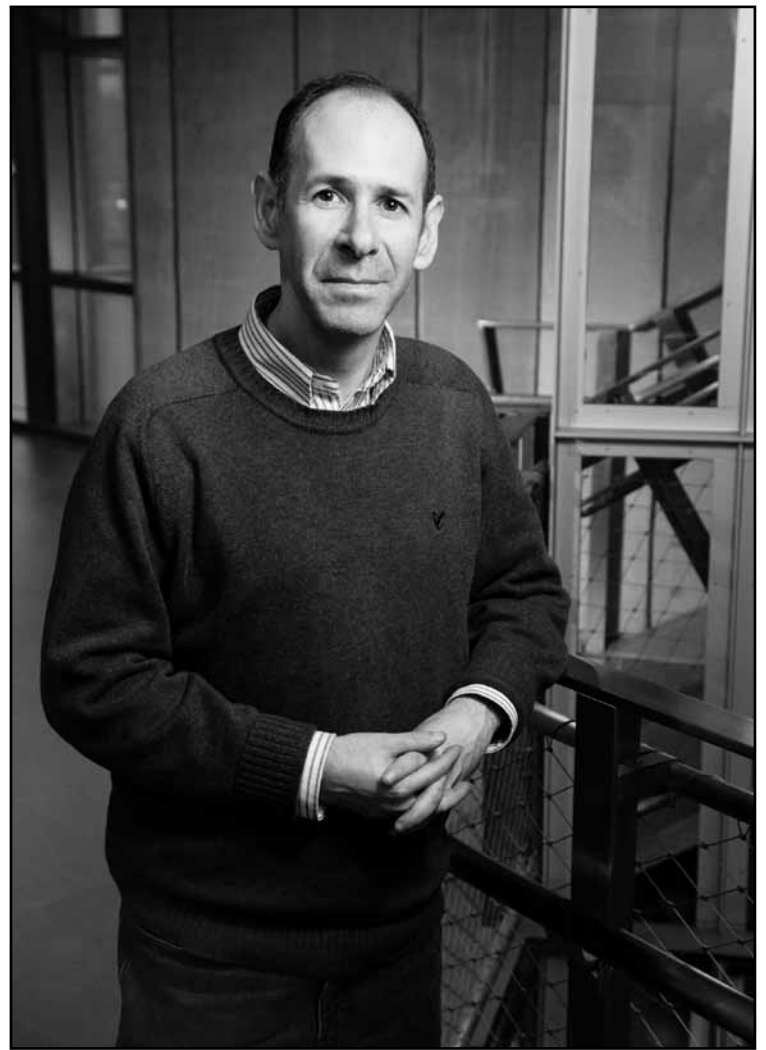


photo by L. Brian Stauffer

Airport security A study by Illinois researchers demonstrates that intensive screening of all passengers actually makes the system less secure by overtaxing security resources. Sheldon H. Jacobson, a professor of computer science and of mathematics was one of the collaborators on the study, which explored the benefit of matching passenger risk with security assets.

What factors might predict intervention to stop bullies?

By Sharita Forrest

News Editor

A new study of more than 346 middle-school children indicates that boys are less likely than girls to intervene to protect a bullying victim, especially if the boy is a member of a peer group in which bullying is the norm. The study also suggests that anti-bullying programs that focus on bystander intervention and empathy training aren't likely to have much impact unless attention is given to reducing bullying perpetration within children's peer groups.

The study, led by educational psychologist Dorothy Espelage at the UI, examined the attitudes and behaviors of sixth- and seventh-grade students and their networks of friends to determine if certain factors – such as gender, empathy and belonging to peer groups that perpetrate bullying – might be predictive of bystander intervention.

The students were asked how many times in the prior 30 days they had engaged in bullying behaviors such as teasing, name calling and social exclusion. Their attitudes toward bullying were measured using a four-item scale, developed specifically for the study from in-depth interviews with middle-school students, with higher scores interpreted as having a favorable view of bullying.

Additionally, students indicated their extent of agreement with statements about intervening directly or indirectly – by alerting an adult, for example – when they

encountered others being bullied.

The cognitive and emotional aspects of empathy also were assessed for each student, including "perspective taking" – that is, willingness to adopt others' psychological points of view – and levels of empathetic concern for others (for example, "When I see someone being taken advantage of, I feel kind of protective toward them").

Boys who belonged to friendship networks that perpetrated higher levels of bullying and who looked upon bullying favorably were less likely to intervene to protect a victim. Seventh-grade males had the least willingness to intervene, less than sixth-grade boys and girls of both grades.

Girls, however, were somewhat more willing than boys to intervene on a victim's behalf, regardless of bullying perpetration and attitudes toward it within their friendship groups.

The findings suggest that "we may be thinking about willingness to intervene in an inaccurate way," Espelage said. "It appears that until you reduce bullying within certain peer groups, some kids are unlikely to intervene. Just telling kids to intervene doesn't recognize that some of the bystanders are entrenched in peer groups where bullying is just their repertoire."

While boys who scored higher on perspective taking were significantly more willing to intervene than other boys, the researchers found no relationship between

empathic concern and willingness to intervene.

Many scholars advocate anti-bullying curricula that promote empathy, nonviolence and prosocial behavior and encouraging individual bystanders to be allies for victims. However, such programs "fail to have a conversation with children about how their intervening is viewed by their friends," Espelage and her co-authors wrote. "It is important to recognize that early adolescence is a time in which the opinions and attitudes of friends play a pivotal role in the individual decisions that kids make about their own behavior."

While encouraging bystanders to intervene directly or indirectly can be beneficial, educators need to adjust their expectations to their schools' particular context. Schools and peer groups are microcosmic societies with social-influential leaders, and developing interventions that focus on modifying the behavior of the individuals and peer groups that engage in high levels of bullying may be required in addition to anti-bullying curricula for all students, Espelage said.

"We suggest that schools should be getting the bullying behaviors to a low level where it is safe for kids to intervene," Espelage added. "It behooves us as scholars to understand the complex dynamic behind willingness to intervene and recognize that simply saying to a middle-school kid that you need to just stick up



photo by L. Brian Stauffer

Peer intervention New research by Dorothy Espelage, a professor of educational psychology in the College of Education, indicates that boys are less likely than girls to intervene to protect bullying victims, especially if their friends engage in high levels of bullying perpetration.

for the victim or you're going to be held liable is not the way to approach this. There has to be simultaneous consideration of the level of bullying in the schools and the extent to which it's going to minimize the likelihood of in-

tervention."

Harold Green, of RAND Corp., and Joshua Polanin, a doctoral candidate at Loyola University, were co-authors on the study, published online last month by *The Journal of Early Adolescence*. ♦

The Tuskegee Airmen

A Minute With ...TM historian Sundiata Cha-Jua

Editor's note: America's first unit of African-American fighter pilots, the highly decorated Tuskegee Airmen, is the subject of the movie "Red Tails," which opened recently. Part of the unit got early training at Chanute Field in Rantoul, Ill. Why is the story of these World War II pilots so important? And what do we need to know that isn't in the movie? Sundiata Cha-Jua is a professor of history and of African American Studies who teaches courses in African-American history and the civil rights movement. He was interviewed about the airmen and the movie by News Bureau social sciences editor Craig Chamberlain.

In the context of World War II and the role played by most black servicemen, why does the story of the Tuskegee Airmen stand out?

The experience of the Tuskegee Airmen both confirms and departs from the overall experience of African-American soldiers during World War II. They were subjected to the same type of apartheid or segregation and racial oppression as almost all black soldiers. Chanute Field in Rantoul, Ill., was the only base that was desegregated, and that was because the small number of blacks trained there made apartheid too expensive.

Tuskegee Airmen, like other blacks, were barred from officers clubs, as well as all-white establishments off base. Initially, they too spent much of their time driving trucks, cutting lawns, and wielding shovels, paintbrushes and mops, rather than in combat situations. They, too, were generally referred to as "boy" and were subject to the prevailing belief that as blacks they were incompetent and incapable of fighting.

Whites could become pilots right out of high school, but blacks had to have a college degree. Any pilot became an ace when he got five "kills," or downed planes. But according to one of the few surviving Tuskegee Airmen, Quinton Smith, in a recent news story, when an African-American downed four planes he was transferred back stateside.

Their experiences departed from that of the regular African-American soldier in that as pilots they were engaged in the thrill of combat and excelled at it. The four fighter squadrons that composed the black 332nd Fighter Group – the 99th, 100th, 301st and the 302nd – shot down 112 enemy planes and destroyed 150 on the ground, as well as 600 railroad cars. They also sank one destroyer, along with 40 boats and barges. The Tuskegee Airmen won six Distinguished Unit Citations. In 1949, they won the Air Force's first Top Gun competition, though their victory was not acknowledged until April 1995. They embodied the African-American aphorism that "you have to be twice as good to get half as far."

You call the war years and after of the 1940s a "watershed" in African-American history, though the dramatic events of the civil rights movement would come later, in the '50s and '60s. What factors or events made the '40s so important?

The 1940s were a watershed because it was a time of tremendous change and progress. Significant change occurred in the demography, socioeconomic role, and legal and political status of blacks, as they battered the first meaningful cracks in American apartheid during that decade. Most importantly, by 1950 the Second Great Migration, from the South to other

parts of the country, had shifted African-Americans from a majority rural population to one in which 62 percent resided in urban areas. With urbanization came industrial jobs, better educational opportunities and access to better social services.

The March on Washington Movement led by A. Phillip Randolph, of the Brotherhood of Sleeping Car Porters, forced President Franklin D. Roosevelt to issue two executive orders. The first, 8802, required companies with defense contracts to practice fair employment, and the second, 9346, created the Fair Employment Practices Committee to monitor hiring in 1941. These executive orders opened defense industry jobs to blacks.

African-Americans adopted the militant strategy reflected in the Pittsburgh Courier's campaign for the "Double V," for victory abroad and victory at home against anti-black racial oppression. Black union membership grew from 150,000 to 1.25 million. In 1944, the U.S. Supreme Court decision in *Smith v. Allwright* ruled the all-white primary unconstitutional, immediately increasing the African-American electorate by 450,000. Jackie Robinson desegregated Major League Baseball in 1945, and President Truman's Executive Order 9981 desegregated the armed forces in 1948.

These advances laid the material and organizational base for the emergence of the modern civil rights movement of the 1950s and '60s.

The movie is all about the exploits of the Tuskegee Airmen during the war. But what role did they play in the years after?

They represented a leadership group. Just as they often openly challenged segregation and racial oppression on the base

and in the surrounding communities where they were stationed, they "returned fighting." Ellsworth Dansby, a Tuskegee Airman from Decatur, Ill., is representative of that. When he returned home, along with other war veterans he organized African-Americans to pay their power bills in pennies until the Illinois Power Co. hired black female office workers.

"Red Tails" is a combat movie that puts an emphasis on action and heroism over history. Executive Producer George Lucas has said one goal was to make "an inspirational (film) for teenage boys." Do you think there's value in that? And what would you most want audiences to know that wasn't part of the movie?

It's interesting that the film is titled "Red Tails." Others called the Tuskegee Airmen that name after they painted the tails of their planes red. But they referred to themselves as "the Lonely Eagles" in reference to their isolation as a result of segregation and discrimination.

In many ways, the film neglects the backstory and racial issues embedded in it. The flight program at Tuskegee was the product of a 10-year battle with the military to train black pilots. The civilian struggle provides needed sociohistorical context but is not incorporated. Nevertheless, by portraying African-American men as heroes in contrast to much of their contemporary image in mainstream television and film, "Red Tails" has merit. ♦

A Minute With ...TM is provided by the UI News Bureau. To view archived interviews, go to illinois.edu/goto/aminutewith.

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brief notes

University Primary School

Enrollment begins for 3- to 5-year-olds

University Primary School is accepting enrollment applications for the 2012-2013 academic year. Applications sent in by March 16 will be given first consideration.

The school, an early childhood lab school affiliated with the College of Education, serves preschool, kindergarten and first-grade students. Children must be 3 years old on or before Sept. 1 to enroll in preschool and 5 years old on or before Sept. 1 to enroll in kindergarten.

Families applying to the school must schedule a site visit by March 9 or attend the Community Open House on Feb. 8 or 9. Families are welcome to observe the preschool classroom between 8:30 a.m. and noon, and the combined kindergarten/first grade classroom between 8:30 a.m. and 2:30 p.m. Children also are encouraged to visit.

An optional informational meeting will be from 6:30 to 7:30 p.m. Feb. 16 in Room 26 of the Children's Research Center, 51 Gerty Drive, Champaign.

Applications may be downloaded from the school's website, www.ed.uiuc.edu/ups/, or can be picked up at the school at 51 Gerty Drive, Champaign. For more information, visit the school website or call 217-333-3996.

Graduate College

Research discussion series begins Feb. 9

The Graduate College will host a series of brown bag discussions about the college's current research activities on campus. Faculty and staff members and students may attend the sessions, which begin Feb. 9. Advanced registration is required at www.grad.illinois.edu/research/brownbag.

All sessions meet from noon to 1:15 p.m. in Room 304 Coble Hall. Attendees may bring their own lunch.

The discussions will cover a variety of topics. On Feb. 9, Michael C. Loui, a professor of electrical and computer engineering, will talk about mentoring relationships in summer undergraduate research programs. Andrea Golato, a professor of Germanic languages and literatures, will present an overview of the Graduate College's current research efforts on March 8.

On April 12, Illinois Rep. Naomi Jakobsson will talk about her legislative efforts to improve graduate education. Merinda Hensley, an instructional services librarian, will host the series' final discussion on April 26 about teaching information-management skills to graduate students.

For more information, contact Kathleen (Kat) Oertle at oertle@illinois.edu.

Asian Educational Media Service

AsiaLENS film series begins Feb. 7

The AsiaLENS film series will begin at 7 p.m. Feb. 7 at the Spurlock Museum. The series will feature three arts-related films and is free and open to the public. The full schedule is online at www.aems.illinois.edu/events/asialens.htm. All films will include an introduction by a local expert who will lead the audience in a post-screening discussion.

The first film in the series on Feb. 7, "Follow Your Heart: China's New Youth Movement," highlights China's national hip-hop movement. The film shows how a new generation of Chinese youth has embraced technology, art and consumer culture to express individuality in ways that clash with both traditional and modern Chinese values.

Rayvon Fouché, a professor of history, will introduce the film and lead a post-screening discussion. An encore screening of "Follow Your Heart" will be at the Urbana Free Library at 7 p.m. Feb. 22.

The series also will feature "The Red Chapel" at 7 p.m. March 6 at the Spurlock Museum. The documentary follows Danish journalist Mads Brügger, who leads two adop-

Annual faculty retreat shares principles for smart teaching and learning

The 2012 Annual Faculty Retreat will begin at 8 a.m. Feb. 23 in Illini Union Rooms A and B. The event brings faculty members together from across campus to share and explore best practices and innovations. This year's theme is "Research-based Principles for Smart Teaching and Enhanced Learning." The principles are based on research evidence from the science of learning and the science of instruction and can help people understand why certain teaching strategies are effective in improving student learning and others are not.

Susan Ambrose, the director of the Eberly Center for Teaching Excellence and a teaching professor in the department of history at Carnegie Mellon University, is the plenary speaker. She has conducted national and international seminars and workshops for faculty members and administrators. In addition, Ambrose has received funding from the National Science Foundation,

FACULTY RETREAT GOALS: To build on the campus's collective knowledge about teaching and learning, to share innovative ideas and approaches, and to promote partnerships within and beyond the campus community.

the Alfred P. Sloan Foundation, the Fund for the Improvement of Post-secondary Education and the Lilly Endowment. She is a co-author of "How Learning Works: Seven Research-Based Principles for Smart Teaching" (2010).

The event also will offer opportunities for participants to engage in discussions building on the plenary talk. The retreat will feature interactive concurrent sessions by UI faculty members and a poster session highlighting research on teaching and learning. May Berenbaum, a professor and the head of entomology, will speak during lunch.

The Faculty Retreat is free. Advance registration is required; seating is limited. For additional infor-

mation and to register, visit <http://conferences.illinois.edu/facultyretreat2012>.

The retreat is sponsored by the Office of the Provost and Vice Chancellor for Academic Affairs, the Center for Teaching Excellence, and Online and Continuing Education. ♦

ON THE WEB

- **Faculty Retreat**
<http://conferences.illinois.edu/facultyretreat2012>
- **Graduate student session with Susan Ambrose**
<http://go.illinois.edu/GradStudSession>

tees from North Korea on a cultural exchange visit to the land of their birth under the guise of a comedic theater troupe. An encore screening will be held at 7 p.m. March 13 at the Champaign Public Library.

The final film of the series, "ANPO: Art x War," will be shown at 7 p.m. April 3 at the Spurlock Museum. The film explores the story of resistance to the 1960 signing of the Anzen Hoshō Joyaku treaty, which allowed for continued U.S. military presence in Japan.

The AsiaLENS series is organized by the Asian Educational Media Service in collaboration with the Spurlock Museum. The media service is a program of the Center for East Asian and Pacific Studies.

For more information, email aems@illinois.edu or visit <http://www.aems.illinois.edu>.

University YMCA

Exhibition features recycled art

The University YMCA will host a monthlong exhibition called "Paper Quilts: Musings From the Mailbox." The exhibition, on display through Feb. 29, is free and open daily from 9 a.m. to 9 p.m.

The exhibition features work by Velga Easker, a University of Iowa graduate. Easker transformed materials such as postage stamps, security envelopes and junk mail into art. Easker's work is inspired by women who use scraps of fabric and worn-out clothing to create visually beautiful and functional quilts.

For more information, visit www.universityymca.org/art/upcoming, or contact Ann Rasmus, program director, at 217-337-1514.

Graduate student academic reviews

Sessions to address grad reviews

For the 2012-2013 academic school year, graduate programs will be required to conduct annual academic reviews of all graduate students enrolled in degree-seeking programs.

The Graduate College Executive Committee approved

the policy last April. The progress reviews will help students by offering timely evaluations of their performance, clarifying expectations for academic progress and identifying areas for improvement.

Two informational sessions will be held in Room 304 Coble Hall. The first will be from 10 to 11 a.m. Feb. 10. (Register online at <https://illinois.edu/fb/sec/4177361>.) The second session will be from 2 p.m. to 3 p.m. March 13. (Register online at <https://illinois.edu/fb/sec/6501060>.)

Because of differences in size and structure of graduate programs, there is no single model for annual reviews that would work for all programs. Each department will be required to determine their practices for academic reviews. All reviews should include a student's self-report and assessment of academic progress, a review by the adviser, a review by another faculty member, and an opportunity for the student to discuss the review in person.

More information about the annual review policy is online at www.grad.illinois.edu/policies/annualreview. Additional questions can be addressed to Andrea Golato, the college's associate dean, at golato@illinois.edu.

Library and Information Science

College to host TEI workshop

Interested in digital humanities? The Data Curation Education Program at the Graduate School of Library and Information Science is offering an opportunity to learn about an important element of digital humanities research: the Text Encoding Initiative.

"Introduction to Text Encoding Initiative" is a hands-on workshop on how to work with XML technologies to develop digital representations of texts using the TEI standard. Participants will learn the fundamentals of using XML for research, teaching, electronic publishing and management of digital text collections.

The workshop will be Feb. 17-19 in Room 52 of the Library and Information Science Building.

SEE BRIEFS, PAGE 14

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Free yoga classes at Krannert Art Museum gain in popularity

By **Dusty Rhodes**

Arts and Humanities Editor

Yoga classes in an art museum? The mixture makes sense – stretching and sculpture, posing and paintings, art and asanas seem to go together.

For about five years, Krannert Art Museum at the UI has been offering hatha yoga every Friday at noon. What began as a group of seven or eight participants now attracts 20 to 40 yoga enthusiasts, says Hayli Peterson, an instructor with the Living Yoga Center in Urbana, who teaches the weekly class.

“It’s an inspiring place to be,” Peterson said.

KAM offers all the necessary elements for a yoga class: a hard, flat floor; abundant space; a calm, contemplative atmosphere; and, perhaps most important, plenty of drishti.

“Drishti is a Sanskrit word for ‘gazing point,’ which can be a spot on the floor, your fingertips or something else,” Peterson said. “Still art is extremely calming and it’s fascinating, so people really like to stare at it. It gives us something to focus on.”

Melinda Campbell, a wetlands geologist with the Illinois State Geological Survey, has been practicing yoga in conventional studios and at home for four years, and she



photo by L. Brian Stauffer

Focused *Melinda Campbell, a wetlands geologist with the Illinois State Geological Survey, has been doing yoga about four years and has participated in the Krannert Art Museum class for two semesters.*

values KAM’s unique environment.

“One theme you hear in a lot of yoga classes is that you need to try to silence your brain to everything that goes on in your life, and having art all around you helps you to

be in that room, in that place,” she said.

“I think it is so cool, such a neat mix of the kind of floor that you’d have in a dance studio with the ambience of art – whoever thought of that is pretty creative and fun.”

At the UI, the idea was suggested by Anne Sautman, the director of education at KAM. She had heard about another museum, possibly one in Chicago or New York, offering yoga, and then over lunch one day, a co-worker suggested starting a yoga class at KAM. “I think by doing different types of programs like this, the museum itself is more on the radar,” Sautman said. “I feel it draws people who have never been to the museum, or have not been in a long time. It informs people that the museum is more than just art on the walls.”

It’s a trend that is quietly stretching across the art world – the Cincinnati Art Museum, the Asian Art Museum in San Francisco, the Baltimore Museum of Art, the Milwaukee Art Museum, the Crow Collection in Dallas, the Blanton Museum of Art at the University of Texas and the Johnson Museum of Art at Cornell University all offer yoga classes.

Unlike most of those classes, KAM’s yoga class is free and open to the public, in keeping with the philosophy of KAM director Kathleen Harleman. “She believes strongly that all of our events should be free,” Sautman said. No advance registration is required, but participants should bring their own mats. For more information, contact Sautman at asautman@illinois.edu. ♦

achievements

A report on honors, awards, appointments and other outstanding achievements of faculty and staff members

ENGINEERING

Sarita Adve, a professor of computer science, was named a 2011 fellow of the Institute of Electrical and Electronics Engineers for her contributions to shared memory semantics and parallel computing.

The institute is the world’s largest professional association dedicated to advancing technological innovations.

Ioannis Chasiotis, a professor of aerospace engineering, received the J.R. Hughes Young Investigator Award from the American Society of Mechanical Engineers for his contributions to the field. He was presented the award at the society’s annual meeting in Denver.

The award recognizes special achievements of applied mechanics investigators younger than age 40.

John A. Rogers, the Lee J. Flory-Founder Chair in Engineering Innovation, has been named to Nature magazine’s 2011 “10 who mattered this year” list for taking his innovations from ideas to engineering prototypes.

In his work with semiconductor materials and stretchable electronics, Rogers has devised technology solutions across fields such as solar power, biointegrated electronics, sensing, thin film metrology and fiber optics.

Jeffery R. Roesler, a professor of civil and environmental engineering, received the Marlin J. Knutson Award for Technical Achievement from the American Concrete

Pavement Association for his contributions to best practices in the design and construction of concrete pavements.

Roesler’s research has advanced the understanding and use of thin, economical concrete pavement systems.

Dan Roth, a professor of computer science, was named a 2011 fellow of the Association for Computing Machinery for his “contributions to machine learning and natural language processing.” Roth’s research focuses on the computational foundations of intelligent behavior.

The association is the world’s largest educational and scientific computing society, dedicated to advancing computing as a science and a profession.

Uday Shanbhag, a professor of industrial and enterprise systems engineering, received the Faculty Early Career Development award from the National Science Foundation that will support his research on stochastic and robust variational inequality problems.

Shanbhag’s project aims to develop new and enhanced tools for the operation of network systems. The project also includes a comprehensive education plan aggregated around high school discover courses, undergraduate research projects and graduate-level seminars.

Enlu Zhou, a professor of industrial and enterprise systems engineering, received the Air Force Office of Sponsored Research Young Investigator Program award for her

proposal, “Dynamic Decision Making Under Uncertainty and Partial Information.”

Zhou’s research interests include stochastic control, Markov decision processes and simulation optimization.

The objective of the program is to foster creative basic research in science and engineering and enhance early career development of outstanding young investigators.

KRANNERT CENTER

Mike Ross, the director of Krannert Center for the Performing Arts, received the NAPAMA Award For Excellence in Presenting the Arts from the association of North American Performing Arts Managers and Agents.

Founded in 1979, the association is a not-for-profit service organization dedicated to promoting the vitality of the performing arts.

LAS

Ed Diener, a professor emeritus of psychology, received the American Psychological Association’s Distinguished Scientist Award for his contributions to the field.

The award honors psychologists who have made distinguished theoretical or empirical contributions to psychological research.

Based in Washington, D.C., with more than 154,000 members, the APA is the largest association of psychologists worldwide.

Lisa Lucero, a professor of anthropolo-

gy, was appointed to the American Anthropological Association’s new Task Force on Climate Change.

The task force was created to bring anthropology’s contributions to issues of environmental concern into the spotlight and increase its engagement with current research, policy discourse and the communities they study worldwide.

Lucero and eight other members of the task force will promote and develop anthropological contributions to climate change-related issues.

Founded in 1902, the association is the world’s largest organization that promotes anthropology.

PUBLIC AFFAIRS

L. Brian Stauffer, a photographer for the UI News Bureau, was honored by the University Photographer’s Association of America. His photo of helium balloons on stage at Foellinger Great Hall at Krannert Center for the Performing Arts – which illustrates the Anderson localization, a general wave phenomenon – received first place in the general features and illustrations category for September in the association’s monthly image competition. The photo was taken to illustrate research by physics professor Brian DeMarco.

The association is an international organization of college and university photographers. ♦

BRIEFS, CONTINUED FROM PAGE 13

The initiative is an international project to develop guidelines for the preparation and interchange of electronic texts for research.

Participation is limited to 30 people without their own laptops, plus up to eight people with their own laptops. Participants without prior experience working with markup will be given a short suggested reading list.

Participants are required to register by emailing tei-workshop@illinois.edu. When registering, include your address, phone number and university identification number. Indicate if you wish to bring your own laptop and if so, which operating system the laptop uses. (Those bringing their own laptops will need to install a trial version of the Oxygen text editor prior to the workshop. Information will be provided after registration.)

The workshop cost per person is \$25 for UI students; \$50 for UI faculty and staff members and alumni; and \$150 for non UI-affiliates. All payments should be mailed to Sally Eakin, Text Encoding Initiative Workshop, 112 Li-

brary and Information Science Building, 501 E. Daniel St., Champaign, IL 61820, MC-493.

Participants who cancel their reservation for any reason will receive a 50 percent refund of their registration fee.

For more information about the workshop, contact co-organizers Ashley Clark and Megan Senseney at tei-workshop@illinois.edu or 217-244-5574.

External income

Update non-university income form

Salaried faculty members and academic staff members are required to report any external income-producing activities through the annual Report of Non-University Activities. If an employee’s external income-producing activities have changed since last reported, it is requested that employees revise their RNUA form and submit it for review and approval by their unit head before beginning the external activities. If an employee’s external activities have not changed, no action is required.

The university’s Policy on Conflicts of Commitment and Interest requires prior approval for all non-university income-producing activities, as well as new activities, extensions or changes to previously approved outside activities. Such changes or updates must be approved by the department head prior to the start of the external activity.

External income-producing activities are frequently beneficial to the individual and the university, but must be approved in advance, even if you plan to use vacation, weekend or evening time to conduct the activity.

The university’s Policy on Conflicts of Commitment and Interest, the RNUA form, instructions and FAQs are available online at www.vpaa.uillinois.edu/policies/COCI.cfm.

This policy applies to salaried faculty and academic staff. Civil service employees are covered under a different policy and do not complete the RNUA.

Questions about the RNUA or conflicts of interest may be sent to contact Melanie Loots, associate vice chancellor for research, at mloots@illinois.edu or 217-333-0034. ♦

Rare snowy owl recovering at UI Wildlife Medical Clinic

By Cailun Gangi
News Bureau Intern

The people who have been taking care of the injured snowy owl that was brought to the UI Wildlife Medical Clinic in January are hoping he lives up to his name, Qiqiq – Inuit for “white hawk that flies in the sky.”

Anne Rivas, who’s in charge of care for the rare owl, gave him the name and hopes that eventually he’ll be able to fly the hundreds of miles back to the Arctic Circle.

Rivas, the senior manager at the clinic, suspects Qiqiq – pronounced KWIG-ick – may not have been much of a hunter and was surviving on road kill and was most likely struck by a car while looking for food.

She thinks Qiqiq was a part of the unusual southern migration of snowy owls this winter caused by a shortage of lemmings, the birds’ usual source of food.

An ornithologist who had seen Qiqiq standing for several days in a field in Tolono brought the bird to the clinic. The humerus bone in Qiqiq’s left wing was badly broken. The fracture is near the joint with the bird’s body.

Because Rivas and her team are concerned Qiqiq could wind up with a limited range of motion, they’re frequently massaging the ligaments in his wing.

“Physical therapy is very important for him,” Rivas says.

When Qiqiq first arrived at the clinic he was extremely malnourished and was kept on a liquid diet. He since has undergone two surgeries to repair the wing. If everything goes according to plan, it will take four to six weeks for the fracture to heal.

After the injury heals, the Illinois Raptor Center in Decatur will work with Qiqiq to build up his strength and endurance. Flight cages and hunting simulation will allow him to sharpen the skills and stamina he’ll need when returned to the wild.

Rivas and her team said they’re optimistic about Qiqiq’s recovery although they haven’t put an exact date on when he’ll be able to be set free.

Updates on Qiqiq’s care and information about an upcoming fundraiser for the clinic, “Doodle for Wildlife,” is available at <http://vetmed.illinois.edu/wmc/>. ♦



photos by L. Brian Stauffer

Making progress Qiqiq, an injured snowy owl, shows off his progress to Anne Rivas, the senior manager at the UI Wildlife Medical Clinic, who has been in charge of his care since he arrived at the clinic in January. At right, the bird’s injured left wing is mobilized with a splint while it’s healing. Qiqiq has undergone two surgeries to repair the fractured humerus. The rare bird will complete his rehabilitation at the Raptor Center in Decatur before being released back into the wild.



Trio of exhibitions on view at Krannert Art Museum

By Dusty Rhodes
Arts and Humanities Editor

Three exhibitions opened last week at Krannert Art Museum.

“Carolee Schneemann: Within and Beyond the Premises” features the art of the multidisciplinary feminist who, beginning in the 1960s, used painting, photography, film, installation and performance art to ignite an exploration of sexuality, gender and social taboos.

Schneemann’s art has been shown at the Museum of Modern Art in New York, the Whitney Museum of American Art, the Centre Georges Pompidou in Paris and the Museum of Contemporary Art in Los Angeles. Her films, the best known of which are “Fuses” and “Meat Joy,” have been shown at the National Film Theatre of London, San Francisco Cinematheque and the Anthology Film Archives in New York. The latest of her four books is “Correspondence Course: An Epistolary History of Carolee Schneemann and Her Circle,” a collection of letters the artist exchanged with friends and colleagues over four decades. The book was edited by art historian Kristine Stiles.

This show is a revised version of an exhibition first organized by the Samuel Dorsky Museum of Art at the State University of New York at New Paltz, and curated by



image courtesy Krannert Art Museum

On display Included in the Krannert Art Museum exhibition “After Abstract Expressionism,” which is drawn from the museum’s permanent collection, is Roy Lichtenstein’s “Peace Through Chemistry IV,” 1970 Lithograph (© Estate of Roy Lichtenstein).

Brian Wallace in 2010. Presented in partnership with the University of Washington’s Henry Art Gallery, the exhibition includes works spanning Schneemann’s entire career.

Schneemann will present a visual lecture, “Mysteries of the Iconographies,” at 7:30 p.m. March 1 in the museum auditorium. The exhibition runs through April 1.

Also opening last week: “Fifty Years: Contemporary American Glass From Illinois Collections,” guest curated by Jon Lieberman, a UI professor emeritus of environmental engineering and long-time collector of contemporary glass sculpture. He will lead an exhibition tour at 5:30 p.m. Feb. 9, as well as a panel discussion in the auditorium on March 8 with Illinois State Uni-

versity art professor John Miller, UI ceramics professor Amy Rueffert, collector Joy Thornton-Walter and artist Carmen Lozar.

All works in the exhibition are drawn from private collections of Illinois residents, and include not only blown glass but also cast, coldworked and hot-sculpted glass, most created in the past 25 years.

The artistic pedigree of many works in the exhibition can be traced to Harvey Littleton, who, in 1962, established a small glass furnace at the Toledo Museum of Art, setting off the American Studio Glass Movement. The exhibition includes works by his students Dale Chihuly, Marvin Lipofsky, Joel Philip Myers, and by artists trained by Littleton’s students. The exhibition runs through April 29.

Works by Sam Francis, Jasper Johns, Ellsworth Kelly, Roy Lichtenstein, Kenneth Noland, Robert Rauschenberg, Niki de Saint Phalle and Frank Stella, among others, will be shown in another retrospective, “After Abstract Expressionism” – the 1960s and ’70s era in which artists emphasized social and political context, often addressing or incorporating pop culture into their work. This exhibition, curated by Kathryn Koca Polite, consists of works from the museum’s permanent collection. The exhibition also runs through April 29. ♦

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