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Where's Bob?

Where did university photographer Bob Elbert get this bird's-eye view?

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The cover boys of plant science

Three members of Iowa State's Plant Sciences Institute have scored cover stories in top peer-reviewed journals. Read a little more about the men behind the research.



Bogdanove, Vollbrecht and Schnable

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How we're spending our stimulus dollars

As planned, about 70 percent of Iowa State's \$31.6 million in education federal stimulus funds will cover personnel expenses.

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Just another bump in the road

Record-breaking snow and cold have taken a toll on campus roads this winter. Find out what facilities planning and management's short- and long-term plans are to fix the problem.

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Among the very best

Cyclone All-American Lisa Koll ran the second-fastest American indoor collegiate 5,000-meters ever at the ISU Classic Feb. 13 at the Lied Center.



Lisa Koll

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Big three in energy savings

Morrill Hall, Veterinary Medicine and Parks Library top the list of campus facilities with reduced energy use in FY09.

Announcements

- Register for 4th annual "House of Cy" trivia tournament
- Vet Med's spring Ramsey lecture series opens Feb. 24
- Roy Carver student scholarship applications are due April 1
- Feb. 20 health fair targets underrepresented groups
- Miller Faculty Fellow 2010-11 proposals due March 8
- 11th annual ISCORE is March 5; register now
- Reminder: P&S Council nominations are due Feb. 19
- Symposium for BBMB students and researchers is March 25-26
- CEAH grants available for art and humanities faculty, research

Receptions & open houses

Reception

- Margaret Sloss Gender Equity Award and Scholarships

Arts & events

Varieties Sweepstakes

Varieties Sweepstakes

Students in three skits and five mini-acts made the final cuts and will perform in three Varieties Sweepstakes shows this weekend.

Honors & awards

- Timothy Borich
- Erin Hodgson

Around campus**ARRA projects**

The American Recovery and Reinvestment Act so far is supporting 30 ISU research projects, including work in advanced biofuels, public health intervention programs, undergraduate research and protein modeling.

Alum prepares to return to space

Clayton Anderson, the first Iowa State alum to become an astronaut, is scheduled to return to space March 18 aboard space shuttle Discovery.

Doraiswamy to National Academy of Engineering

L. K. Doraiswamy, Anson Marston Distinguished Professor Emeritus in the chemical and biological engineering, has been elected to the National Academy of Engineering.

Inside tools

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**Where's Bob?**

(Long armed) university photographer Bob Elbert was riding shotgun in the campus snowplow of Bill Ridnour earlier this week ... or earlier this month ... or maybe earlier this winter. There have been a lot of plowing hours this season for the campus services crews (Ridnour started his plow on this day at 3 a.m.).

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Plant science researchers (l-r) Adam Bogdanove, Erik Vollbrecht and Patrick Schnable. *Photo by Bob Elbert.*

The cover boys of plant science

by Meg Gordon, Plant Sciences Institute Communications

Erik Vollbrecht, Patrick Schnable and Adam Bogdanove have achieved cover boy status -- each capturing a cover story in *Nature*, *Science* and *Science*, respectively. Publishing work in either of these top peer-reviewed and widely read scientific journals is like winning a ski race on the World Cup circuit. Having your article selected as 'the' story of the issue is equivalent to winning Olympic gold.

"You could hope for one cover, could deserve five and get none," said Erik Vollbrecht, assistant professor of genetics, development and cell biology. Honors aside, such achievement is particularly advantageous because the popular press monitors these journals, creating avenues to share discoveries more broadly.

So, just who are these champions of plant science prose?

Adam Bogdanove

Virginia native, Eagle Scout, former gymnast and self-described tinkerer, Bogdanove ("Bog-DON-ov") studies the molecular equipment a particular bacterial pest uses to infect and multiply in rice. When this modest microbe (*Xanthomonas oryzae*) that causes bacterial blight or leaf streak spreads through rice fields, it can reduce harvest by up to 30 percent.

One of six siblings who chose fields as diverse as social worker and comic book artist, Bogdanove describes himself as "the lone geek in the family." Associate professor Bogdanove, who completed a doctoral degree in plant pathology at Cornell University in New York before joining Iowa State, was not interested in plants as a kid.



"A Simple Cipher Governs DNA Recognition by TAL Effectors" (in *Science*), Matthew J. Moscou and Adam J. Bogdanove

"I did collect bugs though," he said. "Once I caught a big bumble bee, put it in the KITT and mounted it with a pin. I realized a bit later when it started to buzz there in the cigar box that I'd only anesthetized it."

The struggle and subsequent mercy killing of the bee, along with an undergraduate experience in a neuropsychology lab involving rat brains at Yale University, may have influenced Bogdanove's eventual preference for flora over fauna.

Bogdanove and Moscou deciphered the homing signals specific bacterial proteins use to find their DNA landing pads.

"The potential biotechnology applications are huge," Bogdanove said. Disease resistance, gene therapy and strategies for understanding how genes work, are but a few.

Bogdanove's winning discovery, featured on the cover of the Dec. 11, 2009, issue of *Science* spells out how special molecules (in this case proteins) from the bacterium's equipment bag schuss into the nucleus of the rice plant cell and plant poles on tiny and precise pieces of DNA. There, the proteins set off more molecular events that culminate in a rice plant 'yard sale' -- with the microbe besting the plant's natural defenses.

Erik Vollbrecht

Avid back country skier Vollbrecht grew up in the San Francisco Bay area. Though always interested in the natural world, Vollbrecht preferred mathematics and later, physics. After completing an undergraduate degree in biophysics at the University of California, Berkeley, he fortuitously began a job as a laboratory technician in a corn genetics laboratory on campus. He fell in love with genetics, and as the technician who did all the work, earned his first *Nature* cover story -- the discovery of the first master developmental control switch gene found in plants (March 21, 1991).

"What I love about genetics is it's all about patterns," said Vollbrecht, who revels in taking things apart -- cars, appliances and now computers. "That's a part of what being in the lab is about, figuring out how to make things work. And the great thing about corn genetics is you get to do half of your work outside."

Inspired, Vollbrecht went on to earn his doctorate at Berkeley, mixing his studies in genetics with old school plant biology/plant development.

"Genetics is a tool and tools are great, but you have to know about what you're working on," he said.

Before joining Iowa State in 2003, Vollbrecht worked as a post-doctoral researcher at the 120-year-old non-profit research campus of Cold Spring Harbor Laboratory (CSH) in New York. CSH is rich with history and is the scientific home to James Watson, who along with Francis Crick, won the Nobel Prize for discovering the helical structure of DNA. There he began laying the scientific foundation for his second and most recent *Nature* cover article -- the Aug. 25, 2005, issue.

"My work is really about understanding natural and domesticated species, and the differences between them," Vollbrecht said. And it absolutely depends on access and the ability to compare domesticated species with their ancient wild relatives, championing preservation of native habitats.



"Architecture of floral branch systems in maize and related grasses" (In *Nature*), Erik Vollbrecht, Patricia S. Springer, Lindee Goh, Edward S. Buckler and Robert Martienssen

Vollbrecht's article about corn kernels and the genetic controls that set them in neat rows along the ear earned the cover because the work tied together several fields and began to answer a long-standing hot question in corn biology -- something farmers had been observing for centuries.

"The maize ear is a botanical freak," Vollbrecht said. "It is so productive and there is nothing else like it in the botanical kingdom."

Patrick Schnable

Vollbrecht's field also relies on DNA sequences like that generated for the maize genome by the group led by Baker professor of agronomy Schnable. Schnable secured the Nov. 20, 2009, cover of *Science* by leading a coordination effort culminating in the maize genome sequence, plus reports by people who made use of the sequence to further their understanding in their own areas of science. It was an ensemble -- not just the sequence, but the demonstration of its usefulness.

Schnable grew up in upstate New York after spending his earliest years in Sun Spot, N.M., where his optical engineer father worked on lens design at the National Solar Observatory. Schnable, too, was a Boy Scout, hiking and camping in the Adirondack Mountains, picking blueberries "above the treeline, where the whole world opens up."

An avid reader of science fiction as a kid with an affinity for math and science, Schnable liked plants, adding to his parents' gardens at every opportunity. He thought he wanted to be a plant breeder from an early age but after earning an undergraduate degree in agronomy at Cornell University, New York, he discovered that he really wanted to understand the "why," the underlying biology of plant breeding.

Schnable completed his doctoral degree at Iowa State in plant breeding and cytogenetics and, following post-doctoral study at the Max Planck Institute for Plant Breeding in Germany, joined the Iowa State faculty, where he is a recognized leader in the maize genetics community.



"The B73 Maize Genome: Complexity, Diversity and Dynamics" (in *Science*), Patrick S. Schnable, et al.

"Maize or corn is a crop of the Americas -- it's huge in the U.S. and the world. It is also a wonderful biological model," Schnable said.

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Majority of ARRA education funds will cover personnel costs

by Anne Krapfl

About 70 percent of the \$31.6 million in education federal stimulus funds awarded to Iowa State this fiscal year will be used for personnel expenses, including about \$10.6 million that is paying salaries and benefits for employees whose positions are expected to continue -- on another revenue source -- after June 30.

Companion amounts -- \$5.9 million and \$5.8 million, respectively -- will be used to pay employees participating in the first retirement incentive option and those whose positions will be eliminated by June 30.

The figures reflect university plans for the ARRA (American Recovery and Reinvestment Act) funds as of Feb. 15, and change as expenditures are completed. As of this week, units actually have spent nearly \$15.1 million. By June 30, the ARRA funds must be either spent or committed to an expense with a firm timeline to be spent.

As planned, the university also will spend about \$8.1 million of federal stimulus funds on other one-time projects, including \$2.2 million for classroom improvements, \$1.6 million for research equipment, \$1.8 million for bridge funding for regular programming (for example, in Extension 4-H, Study Abroad Center, Honors Program, university marketing), \$993,000 for IT upgrades and \$750,000 for faculty start-up costs.

What's ahead

At this time, about \$1.1 million of the federal stimulus funds are not committed. That number has inched upward in the last month, due in part to salary and benefit savings created by mandatory unpaid days for employees whose salaries are covered this year by ARRA funds.

Finding uses for the "uncommitted" funds by June 30 will not be difficult, said Ellen Rasmussen, associate vice president of budget and planning.

She also expressed confidence that the university's budget will not face a "funding cliff" this summer when the ARRA funds are gone.

"We have been quite strict on this point," she said. "Units applying for ARRA funds know that these are for one-time non-recurring expenses, or that they must have a specific and stable revenue stream in mind after June 30."

Bridge funding this year

Iowa State is using the \$31.6 million in federal stimulus funds as bridge funding to its FY11 budget. On July 1, 2009, the university's current budget year started with \$38.3 million less in state funding than the previous year. An October reversion to the state of \$24.5 million compounded the need for cuts or new revenue streams. Planning for the university's FY11 budget, under way for several months, is expected to accelerate next month as the Iowa Legislature moves toward approving a state budget, including appropriations to higher education.

Planned expenditures for ARRA funds, by function (as of Feb. 15)

RIO-1 expenses ¹	\$5,905,341
Salary and benefits for eliminated positions ²	\$5,779,313
Salary and benefits for continuing employees	\$10,611,553
Classroom upgrades, including technology	\$2,253,600
Other IT upgrades	\$993,000
Programming (bridge funding)	\$1,818,671
Research equipment purchases	\$1,579,500
Faculty start-ups	\$750,000
Student support ³	\$413,224
Library materials and acquisitions	\$200,000
ARRA administration	\$127,000
Subtotal	\$30,431,202
Uncommitted	\$1,164,750
Total	\$31,595,952

¹ Partial year salaries and benefits, vacation and sick leave payouts and the first year of health and dental benefits

² Includes salaries and benefits through last day of work. Also includes resignations and retirements for positions that aren't being filled

³ Includes recruitment, support services and work-study aid

Planned expenditures for ARRA funds, by major unit (as of Feb. 15)

Colleges	
Ag and Life Sciences	\$3,376,809
Business	\$721,784
Design	\$1,684,768
Engineering	\$2,335,102
Human Sciences	\$1,344,160
Lib Arts and Sciences	\$3,430,610
Vet Med	\$3,080,659
VP areas	
Business/Finance	\$3,810,520
Extension/Outreach	\$4,439,574
Research/ Ec Dev	\$1,444,383
Student Affairs	\$1,856,230
Exec VP/Provost	\$733,879
President	\$399,584
Library	\$318,705
IT Services	\$1,454,435

Subtotal	\$30,431,202
Uncommitted	\$1,164,750
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Just another bump in the road

by Paula Van Brocklin

Potholes of all shapes and sizes. Bulging asphalt. Endless bumps that test your patience and your vehicle's shocks. What's up with the rough roads both on and off campus? Winter, of course.

Just as this record-setting winter has taken a toll on even the hardest Iowans, it also has battered campus roads.

Angie Solberg, landscape architect with facilities planning and management, said this winter's string of sub-zero temperatures and snowstorms have left their mark on campus roads in the form of potholes and heaving pavement.

According to the Iowa Department of Transportation, the problem starts when moisture seeps through cracks and crevices in the pavement. As the subsurface freezes, the moisture expands, causing the pavement to bulge, heave and break. Snowplow blades and traffic further damage the elevated pavement, creating a pothole.

This winter has shown no mercy to any part of campus; the damage is everywhere.

"The pothole problem is pretty widespread, but the older roads with more cracks are more susceptible to the freeze-thaw problem that creates most of the potholes," Solberg said.

The fix

FPM's campus services is placing a cold patch (a black, rocky substance similar to asphalt) in the potholes for a quick fix.

"Unfortunately, this is only a temporary solution since moisture penetrates the repair and pops the material loose," Solberg said.

Once warm spring temperatures return, short-term repairs with longer-lasting materials will commence. Campus services will handle crack sealing, and outside contractors will take on more extensive repairs, like hot patching (similar to cold patching, but more permanent) or concrete replacement. Warm temperatures also will remedy the heaving problems naturally by allowing the pavement to settle back into place.

Priorities

Funding for ISU's road repairs comes from the State Parks and Institutional Roads program (P/IR), administered by the Iowa DOT. The program is funded as a percentage of the state's Road Use Tax Fund and is allocated by the state Board of Regents each year.

With the number of roads that need repairs rising and the budget dwindling from extensive snow removal costs, the worst potholes, bumps and cracks will be the priority.

"We probably won't be able to get to all of the areas with problems," Solberg said. "We're going to do as much as we can with the available funds."

The best long-term fix? Replace aging roads as funds become available. It could be another bumpy

winter next year.

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Feb. 18, 2010



Among the very best

Cyclone All-American Lisa Koll ran the second-fastest American indoor collegiate 5,000-meters ever at the ISU Classic Feb. 13 at the Lied Center. Koll is a second-year student in the veterinary medicine program. *Photo by Steve Pope.*

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Morrill Hall and Veterinary Medicine (see below) outdid other buildings on campus in FY09 in reducing energy use. Both facilities used 28 percent less energy than in the previous year, according to recently released FPM figures. *File photo.*

Top energy savers: Morrill, Vet Med, Parks Library

by Diana Pounds

The numbers are in, and in the spirit of the times, let's just say that Morrill Hall takes the gold, Veterinary Medicine the silver and Parks Library the bronze.

These three buildings have risen to the top in the campus quest for more energy savings. From FY08 to FY09, energy use (electricity, steam and chilled water) went down by just over 28 percent in Morrill, an even 28 percent in Vet Med and 21.5 percent in Parks Library.

Just missing the podium was the Union Drive Community Center (UDCC), with 21.4 percent less energy use in FY09.

Facilities planning and management staff recently compared energy use in 42 campus buildings. ([See chart.](#)) More than 60 percent of the facilities used less energy in FY09 than FY08. (Excluded from the study were buildings that weren't fully metered for electricity, steam and chilled water in FY08.) Energy savings can come from big things like renovations or little things like flipping switches.

Here are some of the things that made Morrill, Vet Med, Parks Library and UDCC top energy savers last year.

Morrill Hall

With a **LEED silver rating**, Morrill is designed to use 10 percent less water and 35 percent less energy for heating and cooling than standard buildings, said FPM project manager Kerry Dixon-Fox. In addition, on a sunny day, nothing more than sunlight is necessary to illuminate more than 82 percent of the occupied spaces in the building.

FY08 was the first year of operation for the newly renovated Morrill. Dixon-Fox says energy savings in FY09 may be a result of first-year tweaks on the new building. Another energy-saving routine

adopted by administrative specialist Jane Henning is periodic classroom "walk-throughs" during the day to ensure that unnecessary lights are off.



Veterinary Medicine. Photo by Bob Elbert.

Veterinary Medicine

Program coordinator Brian Adams cites a list of energy-saving improvements that may have cinched the silver for Vet Med. New energy-efficient lighting replaced the old incandescent and fluorescent lights in a classroom, an outdoor plaza and restrooms.

A new electric chiller reduced consumption of electricity and steam, and a new air handler control system provided more precise control of heating and cooling. Unused fume hoods also were deactivated, insulation was added over some lab spaces, and temperatures were set back in unoccupied or lightly used areas.

Parks Library

With the formation of a sustainability task force in early FY09, library staff kicked conservation efforts up a notch. A few months later, the task force had much more to show for its efforts than a report and a 94-item sustainability "to-do" list. Weatherizing film had been installed on first floor windows in the old part of the library. Many library faculty and staff had adopted task force suggestions to turn electronics off, to print only when absolutely necessary, and to share refrigerators, microwaves and coffee pots.

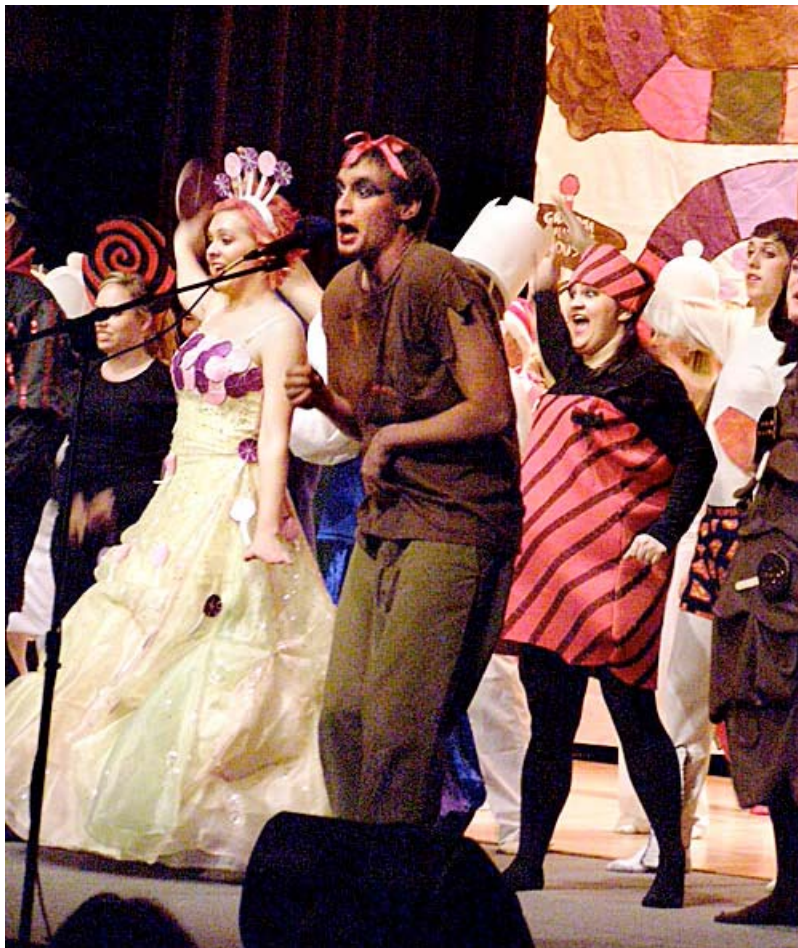
"There was lots of community buy-in," said Sarah Passonneau, assistant to the dean and head of the task force.

FPM staff did their part. Area mechanic Bob Kalvik said FPM staff upgraded many areas of the library with more efficient lighting and windows. They also found ways to refine use of the library air handlers, to provide more efficient heating and cooling.

UDCC

Officials of ISU Dining, which makes up 90 percent of the UDCC, can't point to any big project or activities that would account for the nice energy savings realized in FY09. However, ISU Dining has built up a strong resume of sustainable activities that includes using green products, contributing food waste to ISU's composting program and purchasing local food. This green mindset, program coordinator Brittney Rutherford said, is reflected in general everyday efforts to save by turning off fume hoods, using less water and shutting down computers and other unused electronics.

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Iowa State's annual student talent show, Varieties Sweepstakes, takes the stage Friday, Feb. 19, with two performances (6 and 9 p.m.) and one show Saturday, Feb. 20 (8 p.m.). All shows are in the Memorial Union's Great Hall. Attendees will enjoy three original skits, like "Chaos in Candyland," pictured here. Each show also features five shorter mini-acts. An awards ceremony follows Saturday's performance. *Submitted photo.*

Varieties Sweepstakes highlight student talent

by Paula Van Brocklin

ISU students will showcase their talents Friday, Feb. 19, and Saturday, Feb. 20, during the annual Varieties Sweepstakes.

This year's theme, "Living the Lyrics," will be highlighted in two Friday performances at 6 and 9 p.m., and one on Saturday at 8 p.m. All shows are in the Memorial Union's Great Hall.

Each sweepstakes show will feature the same performances, including three 20-minute musicals or skits, performed with original lyrics and choreography. Five shorter vignettes, or mini-acts, also will be interspersed throughout. Saturday's show will conclude with an awards ceremony. The top three performances, judged by local theater people and ISU faculty, will receive a first-, second- or third-place trophy. Plaques for outstanding performances also will be awarded.

The sweepstakes feature the best of about 450 students who originally auditioned for Varieties over the

past several weeks.

General admission tickets, available at the MU Maintenance Shop, are \$10 (\$8 for students) and increase \$1 on show day.

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