

University of Arkansas, Fayetteville

ScholarWorks@UARK

Research Frontiers

Research Frontiers

Fall 2011

Research Frontiers, Fall 2011

University of Arkansas Fayetteville. Office of University Relations

Follow this and additional works at: <https://scholarworks.uark.edu/research-frontiers-magazine>

Citation

University of Arkansas Fayetteville. Office of University Relations. (2011). Research Frontiers, Fall 2011. *Research Frontiers*. Retrieved from <https://scholarworks.uark.edu/research-frontiers-magazine/17>

This Periodical is brought to you for free and open access by the Research Frontiers at ScholarWorks@UARK. It has been accepted for inclusion in Research Frontiers by an authorized administrator of ScholarWorks@UARK. For more information, please contact scholar@uark.edu.



Medgar Evers
Mississippi Martyr
 Michael Vinson Williams
 \$34.95 cloth
 "An important and readable study of this seminal leader and the history of the civil rights movement."
 —*Publishers Weekly*

Camp Nine
A Novel
Vivienne Schiffer
\$29.95 cloth
"Beautifully captures a sense of
time and place that resonates
with authenticity."
—Delphine Hirasuna

Dearest Letty
The World War II Love Letters of Sgt. Leland Duvall
 Edited by Ernie Dumas
 \$29.95 cloth
 "The beautiful and poignant wartime letters of Leland Duvall are utterly fascinating."
 —Dale Bumpers

Daddy's Money
A Memoir of Farm and Family
 Jo McDougall
 \$19.95 paper
 "Read Daddy's Money; it's a clinic on how to write a memoir."
 —Lewis Nordan

Defining Moments
*Historic Decisions by
Arkansas Governors from
McMath through Huckabee*
Robert L. Brown
\$19.95 paper
"A lesson-book on leadership."
—Mack McLarty

Arkansas/Arkansaw
*How Bear Hunters, Hillbillies,
and Good Ol' Boys Defined
a State*
Brooks Blevins
\$19.95 paper
"An exhaustive investigation into
two centuries' worth of images
of Arkansas."
—Andrei Codrescu

The Oxford American Book of Great Music Writing
 Edited by Marc Smirnoff
 \$19.95 paper
 "Snatch a copy of this superb anthology."
 —Bibliobuffet

**Statesmen, Scoundrels,
and Eccentrics**
A Gallery of Amazing Arkansans
Tom Dillard
\$22.95 paper
"This collection of biographies lets
the light shine on our past in a
whole new way."
—Paul Greenberg

Season of the Gar
Adventures in Pursuit of
America's Most
Misunderstood Fish
Mark Spitzer
\$19.95 paper
"There is a wildness here—
in both fish and man."
—David Gessner

Waiting for the Cemetery Vote
The Fight to Stop Election Fraud in Arkansas
Tom Glaze
\$19.95 paper
"A spirited and captivating memoir of his courageous days in the sixties and seventies combating election fraud in Arkansas." —Robert L. Brown

UNIVERSITY OF ARKANSAS
RESEARCH
FRONTIERS

researchfrontiers.uark.edu

FALL 2011

MAPPING THE POLITICAL GENOME

MAPPING THE
POLITICAL GENOME

University of Virginia



UNIVERSITY OF
ARKANSAS
— THE YOU OF A —

800-626-0090 • www.uapress.com

Find us on Facebook! [facebook.com/uarkpress](https://www.facebook.com/uarkpress)



Interdisciplinary Programs Lead to Innovative Research

Todd Shields
Dean, Graduate School and International Education

Top tier universities often tout interdisciplinary graduate programs and research teams in their bragging points, but is this just a passing trend or the way of the future? Interdisciplinary programs benefit researchers by erasing lines between disciplines that sometimes are barriers to collaboration. However, some researchers lament that their interdisciplinary teams are “name only,” not really achieving the goals that were initially set for the group.

The University of Arkansas was an early adopter of interdisciplinary programs. Provost Sharon Gaber says that the university will continue to advance interdisciplinary research through all means possible, to keep the university growing toward the research institution we wish to be.

The Graduate School currently houses five interdisciplinary programs: public policy, space and planetary sciences, cell and molecular biology, gerontology, and microelectronics-photonics. Other interdisciplinary programs housed in academic colleges are comparative literature and cultural studies, environmental dynamics and plant science.

I see a bright future for interdisciplinary programs. Students are drawn to interdisciplinary programs because of the breadth of research projects and topics.

The public policy doctoral program, led by director Brinck Kerr, provides an opportunity for students and faculty to research important public policy problems in specialized areas of study such as aging, health, management and recreation.

The cell and molecular biology program under the direction of Douglas Rhoads was awarded \$300,000 for three years for Research Experience for Undergraduates, which will enhance the diversity of that

program. The grant will help us bring college students from historically black colleges, Hispanic serving institutions and tribal colleges to the university for a ten-week summer research program.

While some universities have struggled to put research teams together across traditional boundaries, the University of Arkansas has been able to make robust progress. Greg Salamo, one of the university’s first researchers to implement interdisciplinary graduate programs and research teams, put it this way: “One of the grand challenges facing our nation is the need to out-innovate our competition and be the place where new products are created and put into the marketplace. One exciting source of innovation is the ‘interdisciplinary program,’ which transcends traditional disciplinary boundaries to facilitate a greater diversity of ideas and knowledge.”

Interdisciplinary programs are here to stay, both at the University of Arkansas and nationally. The National Science Foundation and the National Institutes of Health both have grant programs for which only interdisciplinary programs can apply, and both agencies look favorably on proposals in all fields that have an interdisciplinary component. Jim Rankin, vice provost for research and economic development, says that interdisciplinary programs are important to the research enterprise.

Often, the synergy generated by researchers from different disciplines provides a better and more complete research product. This research is crucial in order for our university to lead in research productivity and to stay on the cutting edge of new discoveries. ■

University of Arkansas *Research Frontiers* is published twice a year by the Office of University Relations in the Division of University Advancement.

Questions or comments should be sent to:
Editor, *Research Frontiers*
800 Hotz Hall
1 University of Arkansas
Fayetteville, AR 72701
or sent by e-mail to rfeditor@uark.edu

Chancellor G. David Gearhart	Provost Sharon Gaber
Vice Provost for Research and Economic Development Jim Rankin	
Editor Melissa Lutz Blouin	
Writers Barbara Jaquish Matt McGowan Will Bryan Heidi Stambuck	Design Team Roy Cordell Amanda Ryan Laura Bennett
Art Director Eric Pipkin	Photographer Russell Cothren
Webmaster Chris Nixon	

Deans	
Graduate School and International Education Todd Shields	Sam M. Walton College of Business Dan Worrell
Global Campus Interim Dean Pauline Rankin	Dale Bumpers College of Agricultural, Food and Life Sciences Michael Vayda
School of Law Stacy Leeds	College of Education and Health Professions Tom Smith
University Libraries Carolyn Henderson Allen	Fay Jones School of Architecture Jeff Shannon
J. William Fulbright College of Arts and Sciences Robin Roberts	Honors College Bob McMath
College of Engineering Ashok Saxena	

To see more stories about University of Arkansas research, visit <http://researchfrontiers.uark.edu/> or download a QR code reader to your mobile device and scan this code.



Poetry means different things to different people. For University of Arkansas professor and poet Michael Heffernan, it is an act of discovery. The journey that he knows as poetry has spanned over five decades and led to the publishing of nine books, with a tenth due out in the spring.

His act of discovery began in May 1958 when he was a sophomore in a Jesuit high school in Michigan. The educators at the school believed in a firm base in the classics and emphasized Latin and Greek teachings and languages. The Latin metrics fascinated him. While studying Virgil’s Latin, he began translating it into English iambic pentameter, something he thought was a brand new idea. Unknown to him at the time, the translations had been done in the 16th century. Mere decades later, William Shakespeare used the verse, what he called “blank verse,” as the base for his famous works. It would become the base of Heffernan’s budding poetry.

While many authors spend lots of time searching for inspiration for the articles, novels or poetry that they write, Heffernan does not. He draws on his knowledge of the English language and the consistent beat found in iambic pentameter to write.

“The English language is the great resource,” Heffernan said. Always armed with a small notebook and a well working mechanical pencil, Heffernan is ready to write whenever he feels compelled to. Sometimes it happens in the comfort and solace of his backyard, other times it is along the busy streets of Paris, France. The location does not matter, nor necessarily does the subject of the poem, so long as it has an element of adventure and surprise and a sense of going somewhere new. The resulting work is not always good, but that’s not a problem to Heffernan. He believes that there are worst things than writing a bad piece of work.

“The worst thing in the world is not to have something to write, and the second worst thing is not to have something to look at that you already did write just a while before,” he said.

Having an idea about what to write is crucial. One of his favorite times to get ideas about what to write is sitting in front of the television.

“It is as good as doing anything you do where you brain is half engaged then something else will occur to you in the process” he said. “You find that voice talking to you from the back of your brain or that impulse that wants to get verbal. The next step is to write.”

After nearly five and a half decades of writing poetry, in the past year Heffernan has found himself working more in prose. A novel appears to be in his future, but he approaches it cautiously.

“[Prose] relies on getting sentences to work and paragraphs to take a certain shape. There’s an art to that that you master, and I’m not sure I have, so I go at with the instincts of a poet who basically peeks around the next corner to see what’s there,” Heffernan explains.

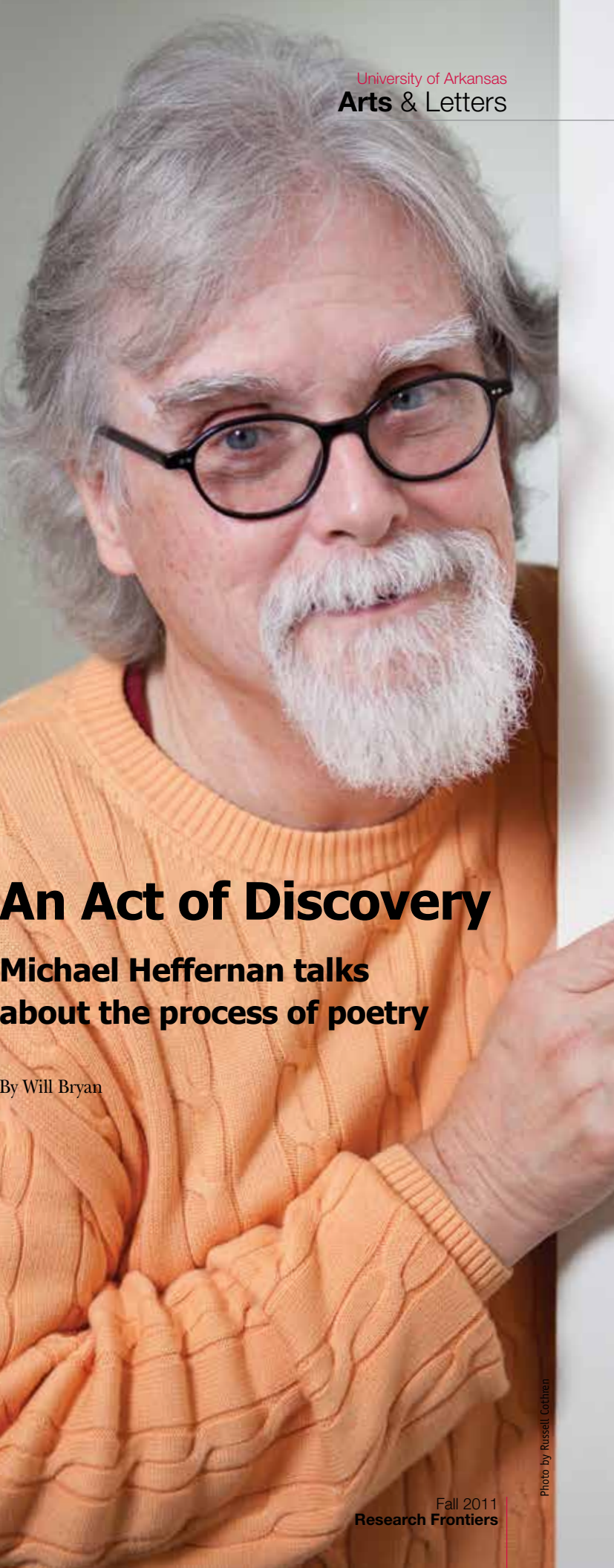
Peeking around corners is one of the things he enjoys most about writing.

“It’s a process. It’s fun to see where this takes you,” he said. “If I can get lost in a sentence and not know where I’m going to end it, I’m in heaven. That’s perfection.”■

An Act of Discovery

Michael Heffernan talks about the process of poetry

By Will Bryan



UNIVERSITY OF ARKANSAS
RESEARCH FRONTIERS

Departments



2 On the Web

3 Research Briefs

6 Student Research

30 Book Reviews

32 UA Q & A

33 Arts & Letters

Features

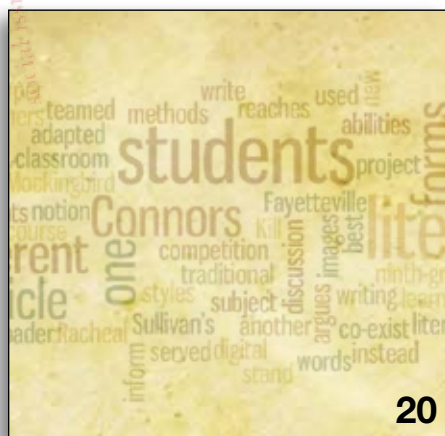


8 Political Genome

Four political science researchers use a comprehensive poll to study traditionally underrepresented groups, including Latinos and African-Americans in both the South and non-South. The result is a wealth of information about the country's attitudes towards the political, social and economic issues facing the country today.

14 Logical Logistics

The newly formed transportation and logistics department examines what makes some businesses succeed in making sure what consumers want is stocked on the shelves. They thrive in Northwest Arkansas, an incomparable locus of logistics knowledge and experience. (also look at how those same logistics can be used in times of crisis, such as a natural disaster.)



20 Lyric Graphics

Poetry, novels and short stories are not the only forms that literature can take. Two education researchers employ music lyrics and graphic novels in the classroom to teach teachers — and their students — about the richness of literature.

26 Material Man



A physicist sets out on the ultimate quest to find room-temperature superconductivity. His quest teaches scientists many new things about materials along the way.

Who “done” it? ▶

When it comes to dead plants, look no further than the Division of Agriculture’s own plant detective to find out the culprit. If you have pustules on your poppies or warts on your wisteria, you can send your specimens to the Plant Health Clinic. To find out how to submit a plant, please visit http://bumperscollege.uark.edu/health_clinic/. To see the video of Sherrie Smith, plant detective, please visit: <http://www.youtube.com/watch?v=HpbKxr7QRgw>.



◀ Waste? Not!

Food waste builds up on campus to about 200,000 pounds a year! Honors College student Zoe Teague decided to research what could be done about getting the food out of the garbage cans and putting it to work. Please visit <http://www.youtube.com/watch?v=zZeylaPDtt8> to see what she did.

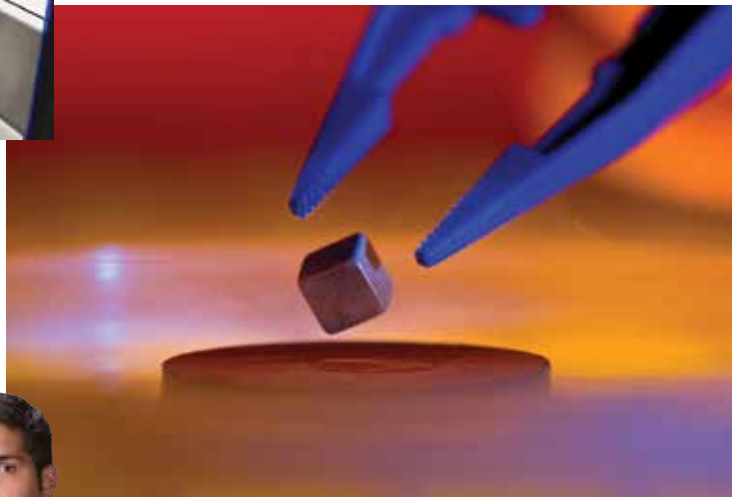


Photo by Russell Cottrien

Cooking up nanoscience ▶

Join *Research Frontiers* editor Melissa Lutz Blouin as she learns more about superconductivity and its importance in a live demonstration with physicist Jak Chakhalian. Please visit <http://www.youtube.com/watch?v=zMGCVDnLte8> to see how it turns out.



◀ Political science profiles

The four researchers of the Blair-Rockefeller Poll team each answer a question in these short videos. Visit http://www.youtube.com/watch?v=_eXfMXkpT8E to see them.



To see more stories about University of Arkansas research, visit <http://researchfrontiers.uark.edu/>

E. coli Test Confirmed by UA Center for Food Safety

Preliminary tests by scientists at the Center for Food Safety and a federal agency have confirmed that a technology developed by the center’s industry collaborator, Litmus Rapid-B LLC (LRB), works better than current conventional methods for detecting pathogenic *E. coli* bacteria.

A Food and Drug Administration’s Food Emergency Response Network laboratory validated LRB’s detection technology. Tests at the Center for Food Safety confirmed the performance claims by LRB, and also mirrored the FDA labs data.

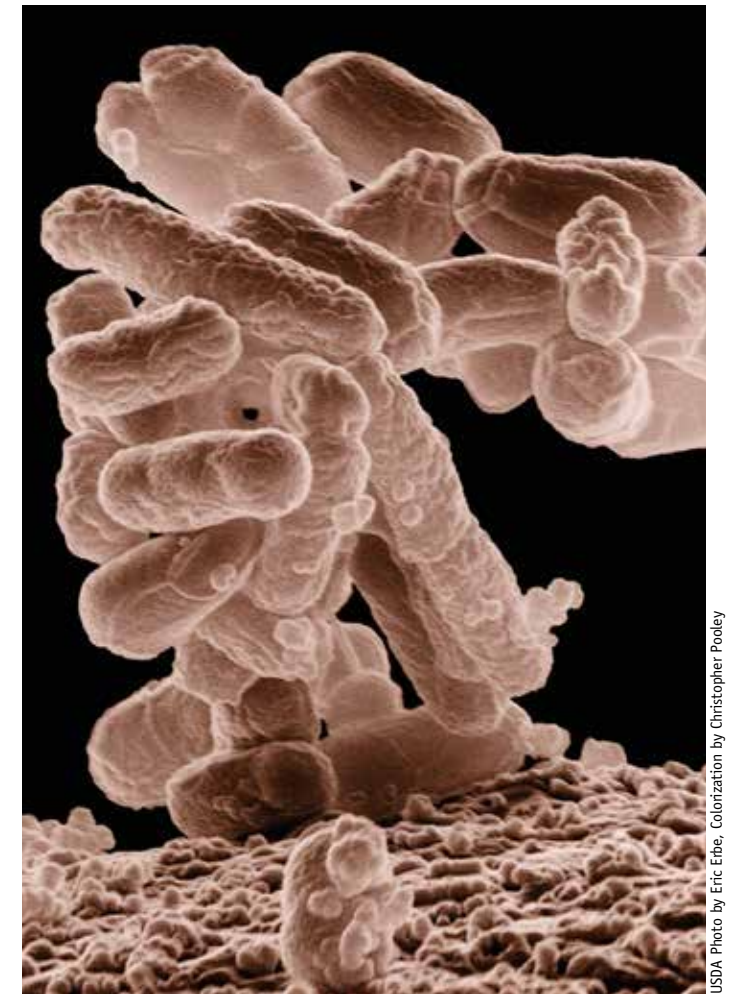
“The significant improvement in speed and accuracy by LRB could improve detection and allow protocols to shift to more proactive testing for *E. coli*,” said Steven Ricke, director of the Center for Food Safety. “Accurate results are provided in five hours rather than eight to 24 hours for other rapid methods,” he said.

LRB, a Little Rock-based biotechnology company, developed its technology in collaboration with the National Center for Toxicological Research, an agency of the FDA based in Jefferson, Ark.

Based on the confirmation of LRB’s performance claims for testing *E. coli*, the center will begin work to confirm the company’s performance claims and protocols for *Salmonella*.

“The collaboration with LRB will allow the Center for Food Safety to continue its tradition of introducing novel technologies and protocols to the food processing industry,” Ricke said. In addition to improving prospects for food safety, Ricke said, the collaboration with LRB helps the Division of Agriculture in its drive to improve economic development in Arkansas.

Recently, LRB began working with the center to improve identification of food-borne bacteria such as *E. coli* and *Salmonella* throughout processing and distribution points. ■



USDA Photo by Eric Ebbe. Colorization by Christopher Pooley

Researchers are determining faster and more accurate ways to detect *E. coli* in food supplies, which will lead to fewer recalls and safer food in the grocery store.

U.K. Law Does Not End Corporate Political Spending

A finance professor analyzed a key British law on corporate funding of political parties and found that the law did not cause corporations to end political spending. However, the law did modify the spending behavior of some companies.

The research addresses the call for a shareholders protection act following the U.S. Supreme Court’s decision in *Citizens United v. Federal Election Commission*, which allows publicly traded corporations to use unlimited sums of money to fund political advertisements in federal election campaigns without disclosure or shareholder consent.

The 2000 and 2006 Amendments to Companies Act of the United Kingdom allow shareholders a say in future corporate

political spending and require companies to report political spending to shareholders in annual reports. They also require political parties to report the source of their funding to the voting public.

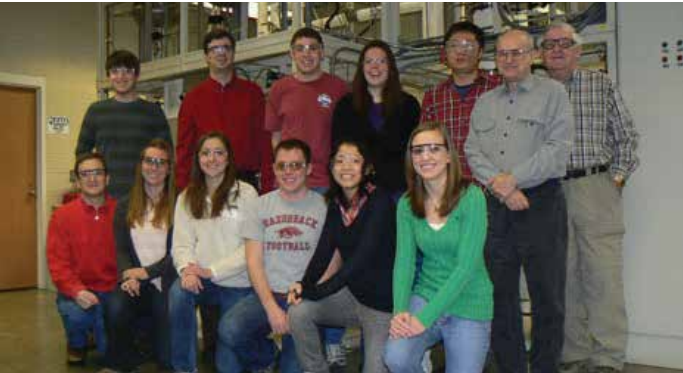
Fogel and her colleague found that the U.K. Companies Act had not deterred corporate political spending. However, the act did modify the spending behavior of some companies. Some companies in the study sample stopped spending on politics altogether, and political budgets sought by managers and approved by shareholders were typically modest.

“We believe [American] shareholders need new protections from managers’ spending corporate money on politics,” Fogel said. “Implementing a U.K. Companies Act-styled disclosure requirement through U.S. securities laws or regulations is one way to achieve transparency for political spending by publicly traded corporations.” ■

Planet Forward Following Hestekin Team’s Research

Jamie Hestekin and his team of undergraduate engineering students have won Planet Forward’s Innovator of the Year contest. As one of two Innovators of the Year, Hestekin and his team is featured on *Planet Forward’s* website and television special through 2012 as they work on a method of producing biofuel from algae. The project focuses on using algae to produce biofuels such as butanol. Algae, which grow quickly in streams and ponds, can be used to remove pollutants such as nitrogen and phosphorus from the water and then be harvested to make cleaner-burning biofuel. In addition, the leftover plant material can serve as fertilizer. Led by Hestekin and co-advisers Bob Beitle and Roy Penney, the students are working on a biofuel miniprocessing unit, a machine that can turn algae and other biomass directly into fuel. Their device, which is small enough to fit in the back of a pickup truck and produces a few milliliters of fuel-grade butanol at a time, could serve as a model for larger applications of this technology. For example, a larger machine based on this model could be used

by farmers to turn plants directly into fuel for farm equipment. *Planet Forward*, a project of the Center for Innovative Media at George Washington University, features ideas about energy, climate and sustainability on its website and through television specials, which air on public television stations across the country. ■



The Winning Team. Back row: Kylan Rakestraw, Jamie Hestekin, Ethan Carter, Elizabeth Bevan, Jianjun Du, Tom Potts, and Roy Penney. Front row: Bob Beitle, Jill Ivey, Megan Huslig, Jeremy Stout, Hiroko Nakao and Michelle Shepherd.

Photo submitted



Research Magazine Association Conference Comes to Arkansas

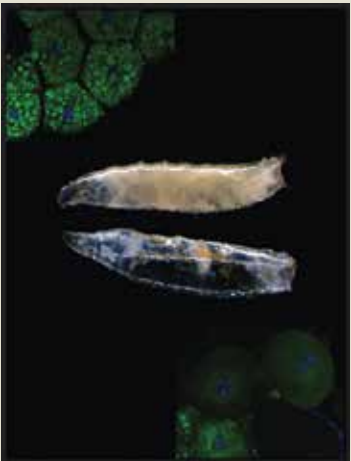
Photo by Russell Cottrien

The University of Arkansas hosted the University Research Magazine Association in May. Thirty-five people from as far away as Hawaii and London, England, came to campus to learn from other editors and writers and share their experiences. Many of the visitors came early and enjoyed a trip to the Buffalo National River. Speakers included Pulitzer Prize-winning journalist and author Deborah Blum, who spoke about narrative non-fiction and about covering animal research in research magazines; Carl Zimmer, blogger, book author and journalist who spoke about how do decide which story to use in which medium; Dale Keiger, associate editor of *Johns Hopkins Magazine*, who spoke about best practices in editing and writing; Will Gisler of the University

of Arkansas, who spoke about telling stories through video; Jennifer Bogo, science editor at *Popular Mechanics*, who spoke about how to tell unlikely stories; Andrea Gibson and Tina Ullman of Ohio University, who spoke about integrating good writing with design; Kyle Kellams of KUAF, who spoke about the art of the interview; and Josh Chamot of the National Science Foundation, who spoke about the online research magazine *Mosaic*, which will be up and running this fall. Guests also got a feel for university research by experiencing the ground shaking from an earthquake simulator, touring the houses of E. Fay Jones and visiting virtual reality laboratories that take people inside a protein and back to ancient Pompeii. ■

Does This Gene Make You Look Fat?

University of Arkansas researchers found a way to use fat development in fruit flies to help understand fat metabolism in other animals, including humans. They have developed a genetic model to study a protein that regulates fat production and storage in fruit flies. This protein, which has counterparts in humans, will help researchers better understand the complex regulation of fat production and metabolism at the molecular level. “It seems surprising that we can use a fly to study these fundamental aspects of fat metabolism and relate them to humans,” said Michael Lehmann, professor of biological sciences. “But we know from other examples, such as insulin regulation, that basic metabolic pathways share similarities in fruit flies and humans.” The researchers focused on lipin, a protein involved in fat and energy metabolism. Three different lipins regulate metabolism in humans and mice, and the interaction of these three proteins complicates metabolic studies in mammals. However, fruit flies have only one lipin gene. This makes them an ideal model for basic studies that can be conducted in flies with less



cost and more speed than in mice. When the researchers studied fruit fly larvae that carried a mutation in the lipin gene, they found that the animals looked like liposuction had been performed on them. The larvae barely had any fat deposits and the skinny animals quickly died after entering the stage of metamorphosis. “Fruit fly larvae store large amounts of fat that provide the energy needed for metamorphosis into the adult fly,” Lehmann said. “Without fat, the animals run out of fuel and die before they can emerge as adults.” While humans don’t go through metamorphosis, fat still serves a purpose. “We have fat stores to survive starvation,” Lehmann said. In modern times, however, fat storage for humans has become problematic: Estimates suggest that two-thirds of Americans are either overweight or obese, and obesity is associated with health problems ranging from diabetes to heart disease and cancer. So understanding how fat metabolism is regulated at a fundamental level may help researchers understand what happens when people pack on too much fat. ■

Fruit fly (*Drosophila melanogaster*) larvae that do not express sufficient amounts of the protein Lipin look transparent due to a lack of fat (bottom larva). Normally, the body cavity is filled with white fat tissue (top larva). Image courtesy of the American Society for Microbiology.

Photo submitted

Research goes social: Like us on Facebook, follow us on Twitter

Here at *Research Frontiers*, we are outgrowing our paper boundaries! To keep up with the dynamic happenings in research at the University of Arkansas, you can “like” us on Facebook at University of Arkansas Research or follow us on Twitter at UArkResearch. These two sites will have the latest research news from campus, as well as blog posts, videos and added features for you to browse through. So “friend” us or “follow” us to keep in touch. ■



A Different View

By Will Bryan

One student's perspective on changing a visually impaired world.



Students on campus are working on projects covering a vast range of topics from trying to unlock the mysteries of the universe to prolonging the shelf life of meat. Elizabeth Phillips, a recent architecture graduate, worked on something closer to home and even closer to her heart.

Her honor's thesis project was aimed at helping those with visual impairments navigate more easily through spaces, such as sporting arenas and convention centers. It is something that Elizabeth herself has difficulty with.

"I, myself, have a visual impairment that really affects my ability to move through spaces that have inadequate lighting," Phillips said.

Commonly to increase the excitement of an event and decrease the operating costs, movie theaters, sports arenas and other similar venues will use low lighting in the pedestrian pathways. While the low lighting may not inhibit people without difficulty seeing, it has a big impact on those with impairments. The problems are not limited to one type of impairment, which makes solving the problems difficult.

"The problems caused by visual impairments varies anywhere from the type of visual impairment, what extreme the impairment has progressed to, the individual, etcetera," she said. "That is exactly what makes this the most challenging. Anything a designer does to the lighting can be a hindrance for one and helpful for another."

Phillips, along with her advisor, Tahar Messadi, came up with a project to improve conditions. She first took volunteers and had them walk through a common public location and recorded their feedback. Based off of the feedback, she designed and built a model of the original location the participants walked through that incorporated changes. The model used a scale of one half inch equals one foot. Once the model was completed, she invited the volunteers back to view it. Peering through carefully constructed view ports built into the model that blocked out ambient light from outside of the model, they were able to see the area and its changes as though they were standing in it. She recorded their feedback once again.

The changes made included placement and angles of the lights as well as intensity. The materials in the area were also changed. Different materials have different albedos or light reflectance properties. Changing the materials therefore can affect how people are able to see obstacles. White walls appear brighter than dark carpeting because the walls reflect more light than they absorb; the dark carpeting absorbs more than it reflects making the area appear to be darker. Problems arise when there is little or no differentiation between the walls and the carpets. Things that people with normal vision are able to detect with ease, such as an upcoming stair case or slight slope in the floor, people who have difficulty seeing are not able to do so. It is important to incorporate contrast into the areas in the form of lighting or different materials, especially when a change is occurring.



A scaled model of a popular entertainment venue, above left, incorporates changes to help those with visual impairments.

Phillips had to be careful, though, because changes will not necessarily help everyone with a visual impairment. The goal of her project is not to solve all of the problems; instead, she wants to find a "common ground" that will emphasize the commonalities shared by people facing different challenges. Trying to solve every problem, she says, is simply not practical.

"Proposing a set of guidelines/suggestions/standards for lighting will never meet the needs of every person with a visual impairment," she said.

A few of her recommendations include using indirect lighting, directing light away from reflective surfaces, avoiding dark areas and shadows, using lighting as directional and way finding tools and illuminating unavoidable obstructions. She hopes her project and the recommendations will bring greater awareness and encourage research and collaboration in an area that has not been heavily researched.

"I am not necessarily endorsing new standards be mandated for fear that creativity in design might be stifled. Rather, my initiative at this point is to draw awareness of this need for designing public spaces with this issue considered in the process. It can be addressed in order to encourage more research and inquiry into the subject. It should be a collaborative effort between designers and the community of people with visual impairments," she said.

Phillips is pleased with the results.

"The participants seemed to respond quite positively to the changes made within the model."

The recommendations that were made by Phillips will benefit people who do not have visual impairments as well.

"People without visual impairments still have problems with similar lighting conditions, but their eyes adjust much better to the problem areas," Phillips said. "In many cases the negative conditions are just much more amplified for people with visual impairments."

Phillips finished her project and graduated in August. She now works and lives in Tulsa where, outside of her job at an architectural firm, she actively continues her research and works to bring awareness to the difficulties of those with visual impairments. ■

A Complex Poll • for a Changing Nation

By Barbara Jaquish



Four researchers are mapping the political genome of 21st century America

Todd Shields is a political scientist, and he claims to be boring. But then he leans forward in his seat and begins to talk about politics in the United States. He talks about serious gaps in knowledge and what he and his colleagues are learning through a poll that both covers familiar

territory and asks questions that have not been asked before. He is intent and anything but boring. He pulls up maps and explains the “Republican L.” He talks about the end of Southern exceptionalism and the dearth of data about a region that can no longer be viewed as homogenous.

Todd Shields,
professor of political science, director
of the Diane D. Blair Center of Southern Politics
and Society, and dean of the Graduate School
and International Education

Shields' research interests lie broadly in applied statistics and American elections. He and Angie Maxwell co-edited *Unlocking V.O. Key Jr.: "Southern Politics" for the Twenty-first Century*, which was released by the University of Arkansas Press in spring 2011. He wrote *The Persuadable Voter: Wedge Issues in Presidential Campaigns* with Sunshine Hillygus. The book won the Robert E. Lane award for the best book in Political Psychology, awarded by the American Political Science Association in 2009.

"The significance of this survey is difficult to overstate. Given the general absence of accurate data on Southern politics and the attitudes and trends among minority groups, the Blair-Rockefeller Poll is a source of accurate information about Southern politics and policy, as well as the political and social attitudes of African Americans and Latinos."



Pearl K. Ford Dowe,
assistant professor of political science

Dowe's research interests include African-American political behavior, the intersection of race and class, and electoral behavior. She is editor of a book published by Mercer University Press, *African Americans in Georgia: A Reflection of Politics and Policy in the New South*, in which she provides a comprehensive study of the impact of structural and historic racism on the implementation of public policy and on political climate in Georgia.

"The data confirms that African-Americans are politically and socially conscious regardless of which region they reside in."



"Everything is happening here in the South," he says, "and we're not focused on it. It's an afterthought. The South is changing, and we don't have the data to understand the changes."

He and his colleagues in the Blair Center of Southern Politics and Society – Pearl Ford Dowe, Angie Maxwell and Rafael Jimeno – decided to address the data gap by creating a complex polling instrument designed to get a clearer picture of the people who make up the nation as a whole, with particular emphasis on the South.

They designed a poll that would provide data about African Americans in the South, who have been under-represented in previous polling, and about Latinos in the South, who have not been represented at all in previous polling. They designed a poll with enough white respondents from the South and outside the South to clarify whether values and behaviors are Southern or features of 21st Century America.

The result, the Blair-Rockefeller Poll, is actually six powerful polls in one: the researchers have rich data for whites in the South and in the non-South, African-Americans in the South and in the non-South, and Latinos in the South and in the non-South. They have the data with the depth and complexity needed to begin to map the political genome of the United States.

In partnership with the Winthrop Rockefeller Institute, they contracted with Knowledge Networks to conduct the poll in the weeks following the 2010 election.

Knowledge Networks employs a methodology that has improved representation in survey samples of young adults, racial minorities, Hispanics, low-educated, and low-income households, and this method has proved particularly useful for understanding the South.

While hundreds of thousands of bits of data from 3,406 poll respondents is important, it is the analysis that makes it useful. In addition to their diverse and complementary scholarly backgrounds, the four Blair Center researchers bring enthusiasm for what they can learn about experiences, attitudes and opinions in the nation and the South. The knowledge they produce can further the understanding of political scientists and inform policymaking and political campaigns.

"The significance of this survey is difficult to overstate," Shields says. "Given the general absence of accurate data on Southern politics and the attitudes and trends among minority groups, the Blair-Rockefeller Poll is a source of accurate information about Southern politics and policy, as well as the political and social attitudes of African Americans and Latinos."

Immigration of Latino populations and the migration of African Americans back to the South are producing changes in the ethnic and racial composition of the region and of both the national and Southern electorate. One question for political scientists and politicians is what these changes will mean for elections and the power

of the "Republican L." Since World War II, the L-shaped swath of states from Montana south to Texas and across to the Atlantic have voted heavily Republican in presidential elections. Democrats win those elections only when they pick off some Southern states: With the help of Johnson in 1960, Kennedy took several southern states; Carter took the South overwhelmingly in 1976; Clinton picked up several Southern states in 1992 and 1996; and Obama won in Florida, North Carolina and Virginia in 2008.

One thing the researchers have learned is that today there is relatively little difference between the South and the country as a whole. Maxwell calls it the "Southernization of America." Regionally and nationally, people share similar unemployment rates and views about the economy: 20.4 percent of Southerners and 20.3 percent of non-Southerners expect their personal financial situation to be worse in 2011 than in 2010. When it comes to the country as a whole, 35.9 percent of Southerners and 35.7 percent of those outside the South expect things to be worse or much worse.

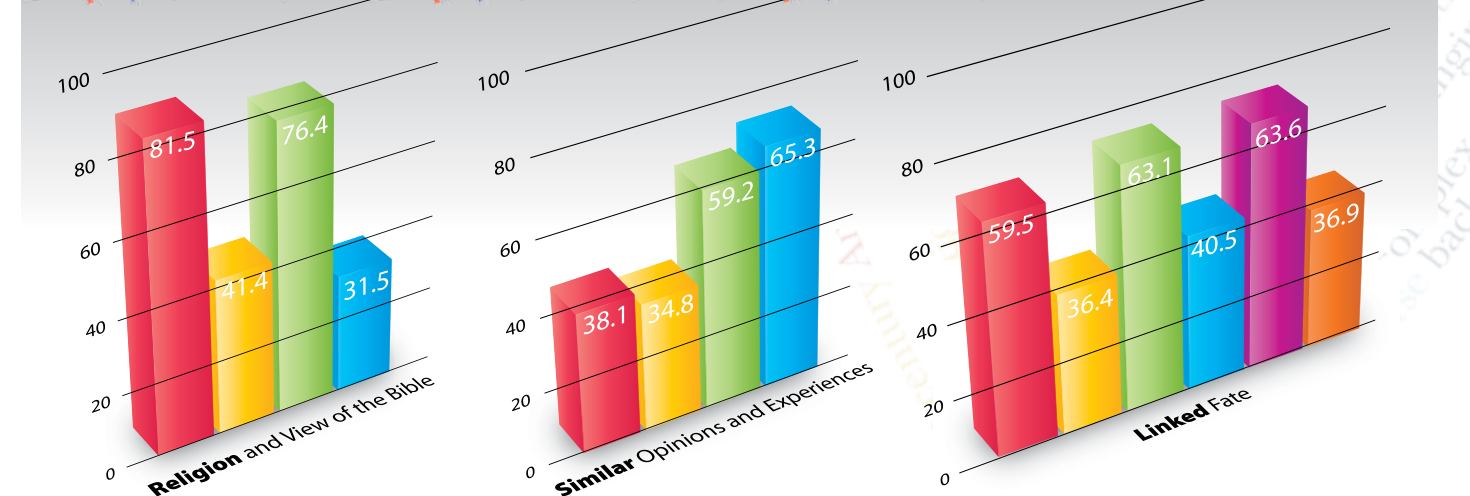
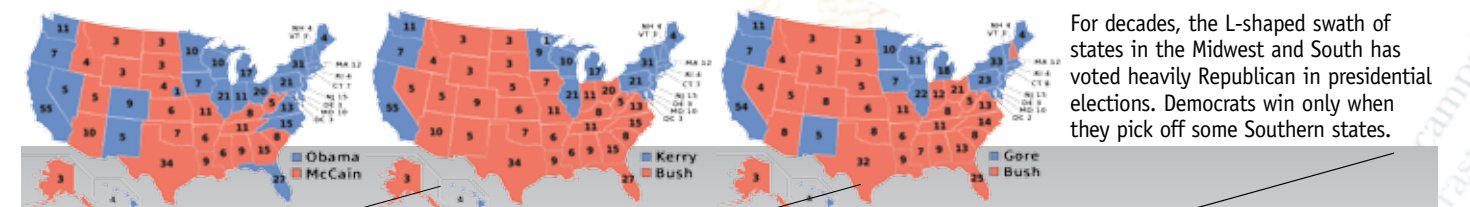
Dowe also found that African Americans in the South and nationally hold similar views of politics and social issues.

"The data reveals that although African-Americans in the South identify as Southern, their opinions and experiences are often consistent with African-Americans throughout the nation," she says.

She goes on to explain that African-Americans are not a monolithic group: "However, the identity of the group has been shaped by a unique culture and a group consciousness that developed due to exclusion and racism. Regardless of status, gender or occupation, the group is still subject to addressing overt and structural racism daily, as the data reveals. Southerners have expressed an increased satisfaction with life in comparison to non-Southern blacks; however, over 56 percent of Southern blacks and 58 percent of non-Southern blacks expressed that they experienced day-to-day discrimination."

She notes that many African-Americans in the South are "new Southerners," descendants of African-Americans who left the South in the 1920s, looking for opportunities in Northern cities. They see today's South as a place of opportunity, and a large percentage are highly educated with above-average incomes.

So, does anything still distinguish the South from the rest of the nation? Yes, it's religion, Maxwell finds.



Religion and view of the Bible are key distinguishing factors between the South and non-South:

- Southerners who are Christian
- Southerners who are Biblical literalists
- non-Southerners who are Christian
- non-Southerners who are Biblical literalists

Although Southern and non-Southern Blacks report similar opinions and experiences, Southern Blacks report being more satisfied with life:

- Southern Blacks who are satisfied with life
- non-Southern Blacks who are satisfied with life
- Southern Blacks who believe they have less opportunity than whites
- non-Southern Blacks who believe they have less opportunity than whites

Latino responses to a question about linked fate: "Does what happens to Blacks have something to do with what happens in your life?"

- None or little connection:
- all Latinos
- native-born
- foreign-born
- Some or a lot of connection:
- all Latinos
- native-born
- foreign-born

Angie Maxwell,
assistant professor of political science and the
Diane D. Blair Professor of Southern Studies



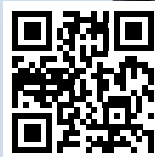
An American Studies scholar, Maxwell's research interests include the modern South, the social construction of race and identity, and white political behavior. She and Todd Shields co-edited *Unlocking V.O. Key Jr.: "Southern Politics" for the Twenty-first Century*, released by the University of Arkansas Press in spring 2011. Her future publications include an edited volume of the notebooks of journalist James Agee and a book titled *Why Do They Live There?: How the White Southern Inferiority Complex Shaped Modern America*. "Demographically, religion and, specifically, one's view of the Bible remain the key distinguishing factors between the South and the non-South."



Rafael Jimeno,
assistant professor of political science and the
Diane D. Blair Professor of Latino Studies

Jimeno's research and teaching interests include political behavior, party identification and ideology, racial and ethnic politics, and Latino and immigration politics. In his most recent work, he has studied the dynamics of Latino "linked fate" and the pre-immigration preferences of Latino immigrants and how those impact their preferences in the United States.

"Nowhere like in the South can the dynamic nature of the Latino community be observed. Because the South is a relatively new receiving area for Latino immigrants, the growing influence this community may come to exert is a promising area of inquiry."



"Demographically, religion and, specifically, one's view of the Bible remain the key distinguishing factors between the South and the non-South," Maxwell finds. Not only do 81.5 percent of Southerners identify with some Christian denomination, but also 41.4 percent agree that "the Bible is the actual Word of God and is to be taken literally, word for word." In contrast, 76.4 percent of non-Southerners describe themselves as Christian, and 31.5 percent are Biblical literalists.

Along with the ability to compare the South and the rest of the country, the Poll offers researchers data about Latinos' opinions and voting habits and the ability to compare foreign-born and native-born Latinos.

"Nowhere like in the South can the dynamic nature of the Latino community be observed," Jimeno says. "Because the South is a relatively new receiving area for Latino immigrants, the growing influence this community may come to exert is a promising area of inquiry."

Using data from the Blair-Rockefeller Poll, Jimeno can begin to make a preliminary assessment of how Latinos see their fellow Americans. For example, the Poll asked respondents to place members of racial and ethnic groups on a scale of how hard-working these individuals seemed to them. While Latinos gave the lowest ratings to African-Americans, much of this was driven by the perceptions of immigrant Latinos.

"More recently arrived Latinos will invariably bring with them the biases extant in their homelands," Jimeno says. "A process of acculturation will bring their opinions more in line with those of the native-born."

Latinos seem to be aware of their own disadvantages, but not of the disadvantages African-Americans face. Over 42 percent responded that Latinos have less opportunity in life than white Americans. Yet, over 57 percent of Latinos stated that "Blacks have about the same opportunities in life as Anglos," and fewer than 30 percent thought that African-Americans had less opportunity than whites. While African-Americans also rated themselves as the most disadvantaged group, more than 55 percent said that Latinos have less opportunity than whites.

Jimeno is interested in how Latinos understand their relationship with both their African-American and white neighbors. In particular, he wonders if they have a sense of "linked fate" with African-Americans.

Since 1995, when Michael C. Dawson published *Behind the Mule: Race and Class in African-American Politics*, political scientists have used his theory of linked fate – a sense that what happens to one African-American has an impact on all – to examine, in Dawson's words, "political unity that transcends class." The civil rights movement is the classic example of a sense of linked fate operating among African-Americans.

While the theory "has been a rough fit in the Latino community," Jimeno says, there have been signs that it can apply. There are factors that make having a sense of linked fate a complicated proposition for Latinos. For

example, Latinos, who come from various countries, perceive each other to be quite different culturally, while recognizing certain structural commonalities. Unlike African-Americans in the South during the civil rights movement, Latinos are not equally disadvantaged; they do not all face Jim Crow discrimination.

For African-Americans, an appreciation of linked fate has been important to social progress from the civil rights movement through the push to elect African-American officials. The 1980s saw the campaigns of Jesse Jackson for president; Harold Washington's election as mayor of Chicago; and Harvey Gantt, mayor of Charlotte, N.C., running twice for U.S. Senate.

There have been no extensive surveys of linked fate in recent years, and Dowe is curious about what linked fate looks like today. In addition to questions about economic status and sense of linked fate, the Poll asks questions about life experiences, such as "Have you received poorer service in public accommodations?" Taken together, the answers will offer insight into how closely connected African-Americans of different social classes feel to each other.

Understanding linked fate among Latinos and between Latinos and African-Americans, Jimeno says, "could determine how much Latinos mobilize in defense of rights and opportunities."

There is so much more in the 2010 Blair-Rockefeller Poll, and this is only the beginning. The researchers plan a biennial poll, and with longitudinal data comes the ability to more completely plot the social and political genome of the nation.

Dowe is looking at questions of equity and support for or opposition to government involvement in housing and employment. She wants to know where the political center lies and how far to the right the center has moved in America today. In future polls, she'll be looking at biracial identity and to what degree whiteness influences social and economic access and privilege.

Jimeno will continue to deepen his study of Latino linked fate and also analyze voting behavior. He is interested in how voting preference in the country of origin impacts Latino political involvement in the United States.

Maxwell wants to address a hole in political science research: "What is white linked fate and how does whiteness operate?"

Shields is interested in what will happen with the Republican L in 2012. Traditionally campaigns have been geared to middle-aged and older white voters. In 2008, the Obama campaign "picked off the Republican L" with a different strategy, targeting minorities and youth through social media.

In 2012 and beyond, the researchers want to work with data that gives a rich and complex view of American society and voters. They want the Blair-Rockefeller Poll to expand data on Latinos nationally and in the south and to extend the Poll to Asians and Native Americans.

As Shields says, "We want to be able to talk with accuracy about every voice." ■

Christy Carpenter,
Chief Executive Officer, Winthrop Rockefeller
Institute, University of Arkansas System

"As a center for thought leadership, the Winthrop Rockefeller Institute is very pleased to partner with the Blair Center on this effort to get a deeper understanding of voters, nationally and regionally, and to share that knowledge with the widest possible audience. The partnership is a perfect blend of resources, combining the Blair Center's impressive faculty with the Institute's convening power and outstanding conference facilities."



Blair-Rockefeller Poll Methodology

Conducted by Knowledge Networks between November 19 and 30, the 2010 Blair-Rockefeller Poll included a total sample of 3,406 individuals who were 18 years and older. This included 1,649 White, Non-Hispanic respondents, 825 African Americans and 932 Hispanic Latinos. In regional terms there were 1,689 respondents living in the South and 1,717 respondents living in the non-South. The survey was conducted in both English and Spanish.

Knowledge Networks uses an Internet-based survey methodology that overcomes the digital divide, which is particularly pronounced in parts of the American South, by including representation of the roughly 30 percent of U.S. households without Internet access and the 23 percent of households that use only cell phones.



LOGISTICS RESEARCHERS KEEP SHELVES

STOCKED AT STORES *everywhere*

by Matt McGowan

A vein of Matt Waller's research would not exist if it weren't for a decision Sam Walton made many years ago. By the late 1980s, the visionary and now iconic founder of Wal-Mart Stores Inc., which last year posted sales of \$419 billion, had already broken a few cardinal rules of retail.

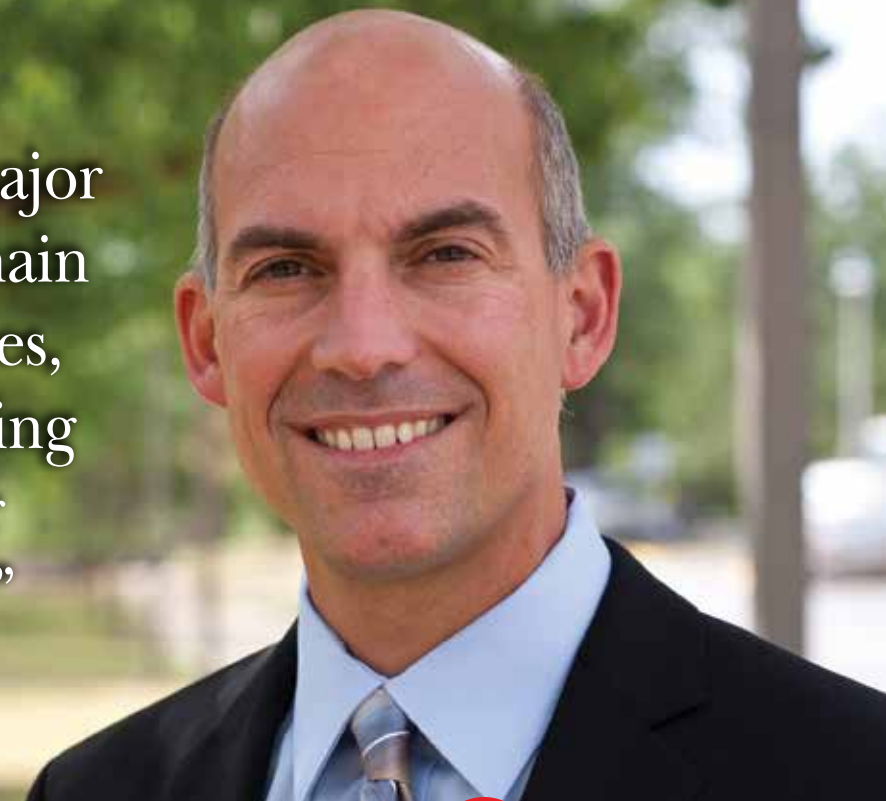


Photo by Russell Cothen



Above left and this image: <http://walmartstores.com/pressroom/Photos/>

“Only a handful of major retailers use supply chain management practices, which is kind of baffling when you consider Wal-Mart’s success.”



Matt Waller

For one, he decided to share sales and other information with department managers with the hope that these individuals would use the information responsibly to improve overall performance. It worked. The information enabled managers to see beyond their department and empowered them to make decisions that served the customer and benefitted the company.

Walton then took one step further and expanded this concept outside the company. To better manage inventory, he decided he needed more information from suppliers, and, likewise, they needed more information from his stores. So at Walton’s behest, Wal-Mart bucked convention and started working closely with major suppliers, particularly Proctor & Gamble. Then, against the advice of venerable business leaders outside the company and directors within, Walton took a big risk in the early ’90s and began providing point-of-sale data with all suppliers.

Critics feared suppliers would share the sales information with competitors, which would cause Wal-Mart to lose its competitive edge. Walton listened but held firm and followed his instincts. In fact, he did not mind if suppliers shared the information with other retailers. This plan also worked, perhaps more so than he imagined.

In addition to the desired effect of increased profits and satisfied customers, Walton’s radical idea created a revolution in supply-chain management practices. No longer did suppliers have to

wait for manual orders from store managers. Relying on raw sales data, suppliers could forecast consumer demand independently. Walton gave them the freedom to ship more goods that were selling and less that weren’t. And because all parties had access to the same information, Wal-Mart, as long as their analysts were sharp, did not have to tolerate greedy or unscrupulous suppliers. While Walton’s idea may not have eliminated human error from supply-chain management processes, it did render them more scientific.

Waller was working on a doctorate in business logistics at Penn State when all this Wal-Mart business was going on. He remembers reading a story about it in a business magazine. Like others, he was surprised at Wal-Mart’s direction, but he also sensed that something big would come out of it. He did not know that it would lead to the company becoming the “most sophisticated supply chain management organization in the history of the world.”

A year later, 1994, Waller was teaching at the University of Arkansas, and since then he has monitored and occasionally analyzed Wal-Mart’s supply-chain management practices. He and other researchers have studied the practice of retailers sharing point-of-sale data, which industry practitioners have dubbed a “bottom-up” approach to forecasting consumer demand. As Wal-Mart’s stock continued to rise – in large part because of the company’s command of logistics and supply-chain management – and as more and more studies demonstrated the general superiority of sharing point-of-sale data, Waller expected every retailer to follow Wal-Mart’s example and adopt the bottom-up approach. But this has not happened.

“It still hasn’t caught on,” he says. “Only a handful of major retailers use it, which is kind of baffling when you consider

A “bottom-up” approach to forecasting consumer demand — that is, the sharing point-of-sale data with suppliers — has helped Wal-Mart Stores and other large retailers move products through the supply chain more efficiently. This practice has led to fewer out-of-stock items and more satisfied customers.



Photo by Russell Cochran

“Clearly, sharing the right data in appropriate contexts leads to greater accuracy when forecasting demand in the retail supply chain.”

Brent Williams

Wal-Mart’s success. I think these other stores still worry they’ll lose a competitive edge if they share private information. But the main thing that holds them back, I think, is a basic lack of knowledge about supply-chain management practices.”

This condition – the general lack of knowledge, despite many studies showing that the bottom-up approach outperforms basic retailer order history – has driven much of Waller’s research focus over the past several years. The fundamental question is: How can suppliers improve accuracy of order forecasting, regardless of the amount of point-of-sale data? He says the inability to do this is the greatest obstacle to establishing and maintaining an appropriate amount of goods on retail shelves.

In late 2009, Waller and Brent Williams, professor at Auburn University at the time but now a member of the Sam M. Walton College of Business new department of supply chain management (see related story), released findings from a major study of the retail and consumer-packaged goods supply chain. (A previous Grocery Manufacturers of America study reported that half all retail out-of-stocks in the consumer goods industry were linked to poor ordering, replenishing and forecasting processes.)

To try to reconcile forecasting discrepancies between the point-of-sale approach and forecasting based on store orders – also called “top-down” forecasting – Waller and Williams applied something called vector error correction model, or VECM, to logistics. Frequently used in macroeconomics and other disciplines, VECM is a dynamic system that adds error-correction features to performance models that have multiple variables. A critical function of VECM is that it moderates deviations of the current state with long-term results and then applies this equilibrium to short-term dynamics.

Would VECM improve the accuracy of short-term forecasting

orders? Armed with 104 weeks of data from a global consumer packaged-goods company, Waller and Williams tested the performance of the error-correction model in the ready-to-eat cereal, canned soup and yogurt categories. They first found a relationship – a “long-run equilibrium” – between forecasting based on point-of-sale data versus store orders to distribution centers. Establishing theoretical evidence for this implied that variables within the relationship followed an error-correction process and allowed the researchers to empirically examine whether conventional statistical conditions for using the error-correction model were useful.

“We found several combinations where point-of-sale and distribution-center orders were co-integrated,” says Waller.

However, in a majority of the combinations in which point-of-sale information was non-stationary – meaning statistical properties of sales data changed over time – orders remained stationary. The researchers applied the model under these conditions and found that it improved accuracy for short-term forecasting of orders. Their analysis demonstrated that the model generally improved forecast accuracy even when some of the statistical conditions for applying it did not hold.

The findings, Waller says, will improve important supply-chain measurement standards, such as inventory turnover, gross margin return on inventory investment and in-stock levels. Improvements in these areas will lead to greater service and convenience for consumers and increased profits for retailers.

“Clearly there are benefits to be gained from use of the model,” Waller says. “From a statistical perspective, it isn’t complicated, and it can be integrated into most commercial logistics software packages. The only problem is that it requires both order history and point-of-sale data, which, as we know, must be obtained from the retailer. So

in this sense, this study just adds to the body of research suggesting that there is substantial benefit to incorporating point-of-sale information into an order forecast.”

In a subsequent study, “Top-Down vs. Bottom-Up Demand Forecasts: The Value of Shared Point-of-Sale Data in the Retail Supply Chain,” Waller and Williams dug deeper into top-down versus bottom-up debate by examining specific contexts in which either approach might be appropriate. Although findings from this study did not refute previous statements about superiority of sharing point-of-sale data, they did illuminate the limitations of working solely off point-of-sale data and highlighted several situations in which a top-down approach led to greater forecasting accuracy and other benefits.

Analyzing point-of-sale and order data for 10 ready-to-eat cereals from 18 regional U.S. grocery distribution centers, Waller and Williams confirmed that relying on retail point-of-sale data can increase the accuracy of predictions and reduce forecasting error, especially when the supplier is trying to predict consumer demand. However, the researchers quickly pointed out that a top-down approach works better when point-of-sale data is not readily available and when suppliers are trying to forecast demand at the account level, meaning forecasting for specific clients and their distribution centers.

Before a further explanation of how forecast demand works at the account level, it is important to mention what demand forecasts mean to suppliers. Most importantly, forecasts enable suppliers to establish and adjust production schedules, plan and procure transportation, and position inventory across the distribution network. In the long-term, demand forecasts help suppliers determine projected inventory requirements, create production schedules, determine capacity requirements and procure raw materials. In short, forecasting demand means everything to suppliers.

For something as critical as transportation planning, suppliers forecast demand for “ship-to” locations, which generally are retailer-owned distribution centers. This bottom-up approach, referred to as “ship-to demand forecasts,” dictates that the supplier creates demand forecasts for each ship-to location. However, because a few large retailers may account for a large portion of the total retail market share and require different management techniques, many suppliers create “account-level demand forecasts.” These represent the total expected demand across all of the retail customer’s ship-to locations, rather than individual totals for each location. At the account level, the supplier creates a single forecast for the customer’s total demand, which includes all distribution centers, and then disaggregates the total forecast into individual forecasts for each ship-to location.

Because suppliers must effectively distribute inventory throughout their network, as well as make customer-specific marketing and sales plans, they must forecast at both ship-to and account levels, Waller says. He and Williams found that if a supplier forecasts retailer orders or actual demand at the ship-to level, the use of point-of-sale data can reduce forecast error. However, at the account level, forecasts based on basic order data appeared can achieve more accurate forecasts for large retailers. The findings also questioned the overall value of point-of-sale data when demand forecasts pertained to broader decisions, such as production or capacity planning. Still, for short-term decisions such as inventory or transportation planning, point-of-sale data increased forecast accuracy and improved performance.

An important insight gleaned from the study was that large retailers share point-of-sale data with suppliers because they have the technology and resources to do so. But, says Waller, this type of sharing may be even more beneficial for small retailers.

“The bottom line is that the choice of a method – top-down or bottom-up forecasting – really should depend on the availability of shared, point-of-sale data,” Waller says. “Clearly, sharing the right data in appropriate contexts leads to greater accuracy when forecasting demand in the retail supply chain.” ■

Logistics Department A Logical Outcome

Matt Waller sits in his office and marvels at the concentration of transportation leaders in Arkansas: J.B. Hunt, the world’s largest truckload carrier, in Lowell; FedEx Freight, the world’s largest less-than-truckload carrier, in Harrison; ABF Freight System in Fort Smith; USA Truck in Van Buren; PAM Transport in Tontitown; Willis Shaw Express in Elm Springs; Maverick in Little Rock. And these are only the major players. Include the smaller companies, and the list goes on and on.

Their presence, combined with Wal-Mart and logistics-intensive suppliers such as Tyson Foods, make Northwest Arkansas a supply chain management mecca of sorts, not only a physical hub but an incomparable locus of opportunity and knowledge. Waller knows there is perhaps no better place to study logistics and supply chain management.

“We have something really special here,” he says. “These companies – many of which have our graduates as senior executives – and Wal-Mart, the most innovative supply-chain management organization in history of the world, make this area a truly unique business environment. And that’s forgetting many logistics-oriented suppliers and manufacturers. For me, it’s exciting to have a part in educating supply chain leaders for these companies.”

Considering the convergence of major industry players and intellectual capital, it makes sense that one of the nation’s preeminent supply-chain management programs exists at the University of Arkansas. And as Waller alluded to above, these are indeed heady times. In late March, the *U.S. News & World Report’s* “2012 America’s Best Graduate Schools” guide recognized the university’s supply-chain management and logistics program by ranking it tied for ninth place among all public graduate business schools and tied for 14th place among all universities.

The announcement above came only two weeks after university officials, responding to market demands and following through on an idea that had been discussed for many years, announced that the supply chain management program had been elevated to official department status within the Sam M. Walton College of Business. The change became effective July 1. Waller, holder of the Garrison Chair in Supply Chain Management, was appointed department chair.

“As the United States moves toward a more competitive global economy, there will be an increasing demand for more efficient logistics systems and highly qualified people to manage them,” Walton College Dean Dan Worrell said at the time.

Waller concurs. He says there is high demand for logistics expertise, for graduates who understand supply-chain management practices and how distribution, transportation and retail work together to move goods from the manufacturer to consumer.

“Compared to other disciplines, supply-chain management is young,” he says. “But it’s been around for some time now – on this campus and others – and many academics have offered findings that have increased efficiency and improved business processes. So it’s gratifying to be recognized and to be acknowledged as a formal academic discipline.”



Photo by Russell Connors

THE SIGHTS AND SOUNDS OF LITERATURE

**GRAPHIC NOVELS, MUSIC GIVE PROFESSORS
COMPETITIVE EDGE IN REACHING STUDENTS**

by Heidi Stambuck

Sean Connors studies the way adolescents understand and interact with graphic novels, the more sophisticated successor to comic books. Chris Goering examines how students' writing improves when English teachers ask them to analyze their favorite song lyrics and relate the lyrics to their personal history and other, more traditional forms of literature.

The two assistant professors of secondary education at the University of Arkansas focus in their research and instruction on two areas previously not given much credence as teaching tools in junior high and high school classrooms. For Connors, it's the genre described as multimodal texts such as graphic novels that incorporate visual elements. For Goering, it's song lyrics and music popular with teens, including rock, country and rap.

Connors and Goering both teach in the English education program of the College of Education and Health Professions. They also share a common belief in expanding the definition of what is valued as text.

"I read comic books as a kid," Connors explained, "and I had a negative experience with a teacher who discouraged me. From an

early age, I realized there were some forms of reading that were not acceptable and that some forms of writing were privileged. Teachers think some forms of literature such as comics and graphic novels are not 'real reading.'"

Connors hopes to change that by teaching Master of Arts in Teaching students at the university how to use multimodal texts in their classrooms and by sharing what he learns with a wider audience through research publications.

"With graphic novels, teachers can have students discuss such literary elements as theme, symbolism and foreshadowing like in more traditional literature, and the discussion can go further into how the artist's use of lines and color and white space gives the text more meaning," he said. "There's a language of these concepts my M.A.T. students can use in such analyses."

"We tend to devalue images because they appear transparent," Connors continued. "You look at a picture and you 'get it,' you understand the meaning. But with a deeper understanding of graphic design, teachers can help their students learn more from the text."



Students in professor Chris Goering's class write stories to the tunes of their favorite music, then share each story with a partner. Inset: Brenda Hedrick and Theresa Thompson listen to music as part of a class assignment.



Top left: Chris Goering looks at what Sheila Nance has written about her song. Lower left: Aterra Lowe and Mike Thomas discuss their songs. Right: Students Stephanie Pierce and Jamie Highfill are writing for the class assignment, "The Soundtrack of Your Life."

NOVEL TEACHING METHODS

Goering teaches M.A.T. students a lesson plan called Soundtrack of Your Life that he began using as a high school teacher in Kansas. It appealed to Goering because, as a high school student struggling to stay motivated, he was identified as a writer only after a teacher assigned an analytical essay about his favorite rock tune.

By connecting his love for music by such bands as Motley Crüe and Warrant to reading and writing, this teacher gave Goering's life new direction. He went on to teach high school English himself before earning a doctorate at Kansas State University.

Now, because their teachers learned the technique while in the M.A.T. program, some area high school students start the year with this assignment – first identifying pivotal events in their lives, then choosing a song to illustrate that event and writing about the two. Students are asked to share a part of what they have written with their classmates.

"Locally, Soundtrack of Your Life caught fire. Teachers take it and make it their own because their students react to it," Goering

said. "Even parents react positively. That's the same experience I had as a teacher. It transforms the way kids think about English and writing. It takes something 'lame' in their eyes – writing a personal narrative – and makes it theirs; it involves their music."

PUSHING BOUNDARIES

"One of our program's stated goals is to broaden the definition of what is valued as text at a time when that can mean anything in the world," Goering said. "People we are preparing to become teachers typically come to us with a traditional sense of what text means."

By traditional thinking, text is a poem, short story, novel or play. "It's all of those things, but we leave too many stones unturned when we take that comfortable view instead of also considering YouTube clips, bumper stickers, graffiti and gang signs," Goering said. "As Brazilian educator Paulo Friere said, we must prepare to read the world, not just the word."

According to Connors and Goering, when students analyze components in multimodal literary texts or the lyrics of a song on

their iPod, they practice skills with these short texts that ultimately transfer to longer pieces such as Steinbeck and Hemingway.

In addition to their own prolific writing for research journals and scholarly books, each professor also engages with students and teachers on the Internet, Goering through www.LitTunes.com, an open-access educational outreach initiative that includes a Soundtrack of Your Life lesson plan, and Connors through a blog called The Chronic Reader on which he posted his reviews of literature for teens last fall. Archives can be accessed at youngadulthoodliteratureark.blogspot.com/.

MEANING THROUGH IMAGES

After he spent 12 years as a high school English teacher, Connors earned a doctorate at Ohio State University. His primary scholarly interest is semiotics, which is the study of signs, and specifically how symbols and words interact to provide meaning in texts that employ multiple literacy modes.

"The graphic novel has become one of the fastest-growing realms of the publishing world in the past few years for young adults and adolescents," he said. "They have become much more

sophisticated than the tales of superheroes I read as a kid."

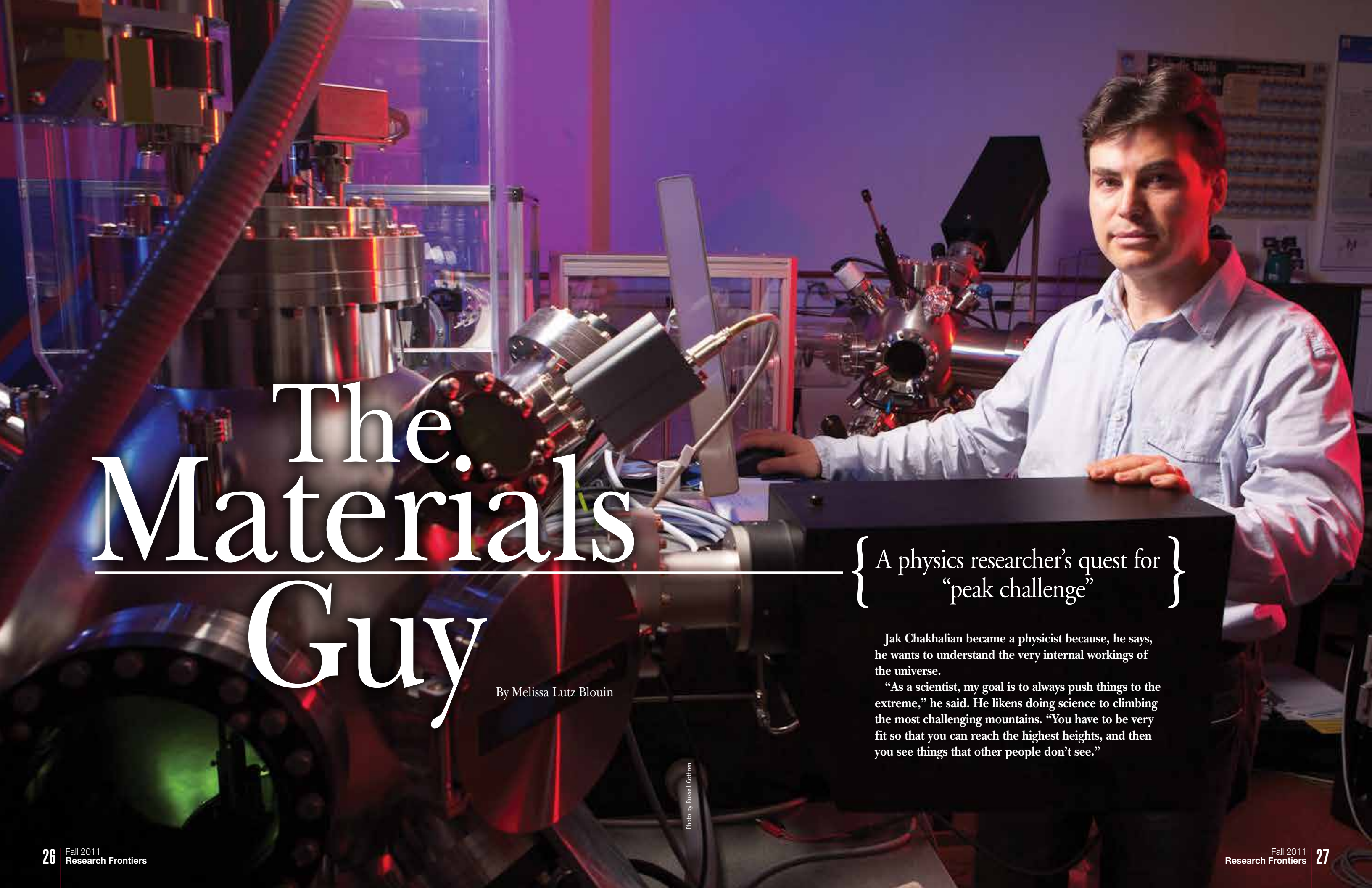
One example Connors gave was Marjane Satrapi's award-winning *Persepolis: The Story of a Childhood*, which describes the author's childhood in Iran and her adolescence in Europe.

"What I'm looking at with my students is how images convey meaning and influence understanding of the story," he said. "Most of them come through traditional English departments, and they struggle with this new definition of literature."

University of Arkansas students planning to teach in a content area on the secondary level first earn a bachelor's degree in that content area, such as English language arts, before entering the Master of Arts in Teaching program.

"Outside the school door, this is an incredibly visual world, much of it – such as advertisements – thoughtfully constructed to persuade the critical consumer," Connors said. "In class, we look at visual texts, how they are designed and how effective they are in conveying meaning."

"Today's adolescents are a visual generation," he continued. "But even though they are being exposed to so many images, that doesn't mean they think critically about them."



The. Materials Guy

By Melissa Lutz Blouin

{ A physics researcher's quest for
"peak challenge" }

Jak Chakhalian became a physicist because, he says, he wants to understand the very internal workings of the universe.

"As a scientist, my goal is to always push things to the extreme," he said. He likens doing science to climbing the most challenging mountains. "You have to be very fit so that you can reach the highest heights, and then you see things that other people don't see."

Photo by Russell Cothren



A ferromagnet hovers suspended over a sliver of superconducting material surrounded by liquid nitrogen. Physicist Jak Chakhalian seeks to create materials that are superconductors at room temperature: “With room temperature superconductivity you can levitate trains, cars, cranes — anything, really — with no friction and no motor, no oil or gas.”



Photo by Russell Cothren

Chakhalian already has seen things others have never seen. In 2007, he created an artificial material using a ferromagnet and a high-temperature superconductor, two of the most complex materials among modern functional materials. He found that when he combined these two poorly understood materials into something that does not occur in nature, he could learn some things about the two materials otherwise not possible to understand by studying them individually. *Science* magazine cited his findings as one of the top 10 scientific breakthroughs of the year.

However, the mountain remains to be scaled. Chakhalian seeks the “peak challenge” in condensed matter physics: room-temperature superconductivity. To explain the challenges of understanding the possibility of room-temperature superconductivity, he points to rust as an example.

Rust, or iron oxide, has a lot in common with most of the interesting materials pursued by today’s scientists. In rust, if one electron does something, all of the other electrons “know” it. This phenomenon, called correlated electrons, to a much lesser degree exists in semiconductors, magnets, and other materials that run computers, televisions and complex medical equipment, drive cell phones and keep the electricity on in your home.

“In normal materials used today, electrons don’t care about the movement of one another,” Chakhalian said. “We can predict their properties practically on the ‘back of an envelope’ with the help of powerful computers.” However, with correlated materials, the calculations for the movement of one electron involve tracking the interactions with billions of electrons.

“Imagine that by telling you something, the other six billion people would react to it collectively,” Chakhalian said. “You just can’t calculate this.”

To understand correlated materials, scientists face two challenges: First to understand these materials experimentally and

second to describe them with the ultimate goal to control their properties. To do that, Chakhalian creates artificial materials at the atomic scale to shed light on the properties of these extremely correlated materials. At the nanoscale, the proportion of surface to bulk dramatically decreases, and scientists can study interactions that occur at the interface between these materials, which may result in new quantum phenomena.

So in 2007, Chakhalian put together a superconductor and a ferromagnet, a combination of materials never found in nature now known as a never-seen-before superconducting ferromagnet.

“Surprisingly, we found that you could use two very complex materials and make something that is easier to understand,” he said. He and a colleague at Argonne National Laboratory also invented a novel way to look at single atomic orbitals at the interface between the two materials.

“On the top of very complex experiments, the theoretical challenge is how can you describe the ‘gazillions’ of electrons in an artificial crystal that are strongly correlated,” Chakhalian said. “If you did, basically there would be no limit to what we could do with these materials.”

Take a Prius, for instance, which runs in part on thermoelectric power of correlated oxide of cobalt. Chakhalian and his team have created an artificial material that increases the efficiency of thermoelectric power five-fold. New thermoelectric superstructures also could potentially be used to cool CPUs in computers. Modern computers have multiple core processors because faster speeds mean hotter temperatures and eventually at great speeds processors would melt. However, the thermoelectric layers of nanomaterial will ‘self-cool’, and if placed nearby a computer’s central processing unit could allow for ever faster computer processing. That means that once again, computers could become smaller, faster and smarter than they are today.

Chakhalian’s lab also investigates phase change materials, which are materials that become something different under external stimuli. For example, you can create a phase change material called a non-Newtonian liquid at home by combining equal parts of cornstarch and water in a pie tin. The substance looks gooey and sloshes around like a liquid. However, if you apply pressure by banging the liquid with a hammer, it shatters like glass.

“Under pressure all of a sudden the liquid becomes solid,” Chakhalian said. Right after the pressure lifted, it begins to pool again.

No less dramatic phase changes also take place in materials with correlated electrons. Chakhalian has found that by shining a laser beam on such materials, scientists can make conducting metals change into insulators in a few femtoseconds – 10,000 times faster than the current reaction time of any used in today’s computer materials. This could radically change the response time of microelectronic devices and speed up calculations that could solve today’s complex scientific problems.

“It is incredible to realize that light, or an electric field, can freeze or unfreeze the electrons, which allow us to turn the very same material from a conductor to insulator,” Chakhalian said.

But Chakhalian downplays these findings. His focus remains on what he sees as the ultimate summit in condensed matter physics: room temperature superconductivity.

“I’m after the big thing,” he said. “With room temperature superconductivity you can levitate trains, cars, cranes – anything, really – with no friction and no motor, no oil or gas.”

Room temperature superconductivity would change the world’s economy, Chakhalian contends. To start, superconductors can carry electricity without losing energy to heat, which the current materials used at room temperature cannot do. Today’s power grid loses almost 15 percent of its energy to heat. That may not

seem like a high number, but it translates into a multi-billion dollar loss. Scientists have looked at many solutions to increase energy efficiency, but Chakhalian seeks radical energy solutions, like a material that acts as a room temperature superconductor.

“With a superconductor, you could redistribute energy around the globe with zero loss,” he said.

In Japan, high-temperature superconductors drive experimental trains called Maglev at speeds close to the speed of airplanes. However, the logistics of cooling these superconductors to lower temperatures using liquid nitrogen make using them on a large scale logistically impossible.

Chakhalian currently has \$1.2 million from the Army Research Laboratory to aid him in his quest. To get there, he will continue to look at the interfaces and surfaces of artificial complex oxide materials that he creates at the nanoscale.

“The interface is the new playground. It is a powerful control tool,” he said.

Like the first humans to ascend a mountaintop, Chakhalian doesn’t know yet what he will find.

“It’s a scientific endeavor. It’s not a factory,” he said. “What’s at the end of the production line? I don’t know.”

But if it is room temperature superconductivity, Chakhalian knows one thing: “If we ever achieve this, the world will change very rapidly.”

Chakhalian knows that he may not find what he is looking for. However, he feels he owes it to society to seek the radical solution to today’s problems.

“You’re risking everything” trying to address problems that may have no solution. “But as a scientist, my goal is to always push to the extreme of unknown.” ■



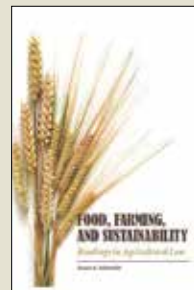
Confronting America: The Cold War Between the United States and Communists in France and Italy

Alessandro Brogi
University of North Carolina Press

Throughout the Cold War, the United States encountered unexpected challenges from Italy and France, two countries with the strongest and most anti-American Communist parties in Western Europe.

Based primarily on new evidence from communist archives in France and Italy, as well as research archives in the United States, history professor Alessandro Brogi's original study reveals how the United States was forced by political opposition within these two Western countries to reassess its anticommunist strategies, its image, and the meaning of American liberal capitalist culture and ideology.

Brogi shows that resistance to Americanization was a critical test for the French and Italian communists' own legitimacy and existence. The staunchly anticommunist United States, Brogi argues, found a successful balance to fighting the communist threat in France and Italy by employing diplomacy and fostering mild dissent in both countries. Ultimately, French and Italian communists failed to adapt to the forces of modernization that stemmed both from within and from American influence. *Confronting America* illuminates the political, diplomatic, economic, and cultural conflicts behind the U.S.-communist confrontation.



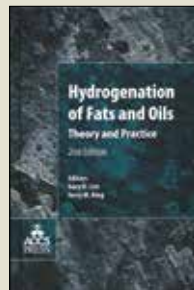
Food, Farming and Sustainability: Readings in Agricultural Law

Susan Schneider
Carolina Academic Press

Agricultural law is the study of the unique network of laws that apply to the production, marketing, and sale of agricultural products, including the food we eat, the natural fibers we wear, and increasingly, the bio-fuels that run our vehicles. It is the law as applied to one of the largest and most regulated industries in our economy. In recent years, agricultural law has expanded beyond its traditional scope to include issues of food safety and sustainability. Popular interest in agriculture has increased as consumers seek to know more about their food and where it comes from.

The book provides an issues-based study of these complex topics. It is designed to introduce some of the critical legal issues facing the industry and consumers today including: agricultural commercial law, environmental law, federal farm policy, labor law, food labeling, farm animal welfare and other topics. Each is presented in the context of a current issue. The book provides a mix of law, policy and the analysis of both.

Susan Schneider is a professor at the School of Law and serves as the director of the LL.M. program in agricultural and food law.



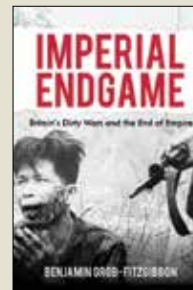
Hydrogenation of Fats and Oils: Theory and Practice

Jerry W. King
AOCS Press

Jerry W King, professor of chemical engineering, recently published the second edition of *Hydrogenation of Fats and Oils: Theory and Practice*. King co-edited the book with G.R. List, and contributed a chapter to the tome entitled, "Hydrogenation Using Critical Fluids."

As in the first edition, discussion is not confined to vegetable oil hydrogenation. The hydrogenation technique is considered in detail with respect to reaction engineering, synthesis and food technology. Aside from King's chapter, some of the topics addressed include: The hydrogenation reaction, hydrogenation processing techniques, safety during hydrogenation and quality control of hydrogenated products.

King has worked on hydrogenation of edible oils ultimately intended for margarine production as well as the production of oleochemical intermediates, such as fatty alcohols used in detergent manufacture. Using both hydrogenation and carbon dioxide at high pressures has allowed the synthesis of low-fatty acid compositions desired by consumers. King holds the Ansel & Virginia Condray Endowed Professorship in Chemical Engineering and is an adjunct professor in the department of food science.



Imperial Endgame: Britain's Dirty Wars and the End of Empire

Benjamin Grob-Fitzbillon
Palgrave Macmillan

The story of the British Empire in the 20th century is one of decline, disarray, and despondency. Or so we have been told. In this fresh and controversial account of Britain's end of empire, historian Benjamin Grob-Fitzgibbon rejects this consensus, showing instead that in the years 1945-1960 the British government developed a successful imperial strategy based on devolving power to indigenous peoples within the Commonwealth. This strategy was calculated to allow decolonization to occur on British terms rather than those of the indigenous populations, and to thus keep these soon-to-be former colonies within the British and Western spheres of influence during the Cold War. To achieve this, the government had to rely upon the use of illiberal dirty wars. Spanning the globe from Palestine to Malaya, Kenya to Cyprus, these dirty wars represented Britain's true imperial endgame.

"*Imperial Endgame* is a controversial and important book. Benjamin Grob-Fitzgibbon has no time for conventional pieties," said Richard Aldous, author of "The Lion and the Unicorn" and Eugene Meyer of Bard College, New York. "It's a bold re-telling of the decolonisation story, pulled off with great style and panache."

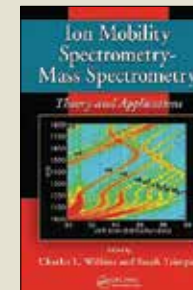


Lovely Asunder: Poems

Danielle Cadena Deulen
University of Arkansas Press

Winner of the 2011 Miller Williams Poetry Prize, Danielle Cadena Deulen's debut collection, *Lovely Asunder*, is filled with beautiful dangers. These poems, sharp and graceful, brutal and vulnerable, create from language a kind of chiaroscuro-both light and dark made more vivid by their juxtaposition. Throughout the collection, the poet appraises ancient myths through a feminine and feminist perspective, evincing the ways in which narratives transform personal experience and vice versa. The figure of the fruit, in all its implied and literal lushness, recurs like a chorus, and the speakers of these poems are haunted by the Fall-confined by the body, the mind, and the irrevocable past. Yet there is a certain abundance to Deulen's style that keeps darkness or mere cynicism from overwhelming-a distinctly maximalist aesthetic that echoes the lost opulence for which the speakers of the poems yearn. Worldly but never mundane, this collection exists in the boundary between the physical and metaphysical, revering both.

Deulen is a doctoral candidate in English at the University of Utah. Her book of essays, *The Riots*, is the winner of the 2010 AWP Award Series in Creative Nonfiction.



Ion Mobility Spectrometry - Mass Spectrometry: Theory and Application

Charles Wilkins
CRC Press

The analytical power of ion mobility spectrometry-mass spectrometry (IMS-MS) instruments is poised to advance this technology from research to analytical laboratories. This book covers the tools, techniques and applications involved when molecular size and shape information is combined with the well-known analytical advantages of high-performance mass spectrometry.

This work helps readers unfamiliar with IMS-MS to understand its fundamental theory and practical applications. It also encourages them to investigate the potential analytical uses of IMS-MS and further explore the power of this method.

The book is co-edited by Sarah Trimpin, assistant professor of chemistry at Wayne State University, Detroit.

Wilkins's current research interests include mass spectrometry of polymer and copolymer materials, Fourier transform mass spectrometry, and the development of new methods to improve the utility of analytical mass spectrometry. He is the editor or author of eight previous books and the author of more than 235 scientific papers and 21 book chapters.

What is Cloud Computing?

Susan Gauch, professor and chair of the computer science, computer engineering department, replies:

Cloud computing refers to computer applications and data that are run and stored on someone else's servers. Using local devices (laptops, MP3 players, smart phones), cloud computing users connect to their applications and data over the Internet. Some examples of cloud computing services are Windows Live, Google Docs, and iCloud, Apple's newly announced service.

With cloud computing, each person is relieved of the burden of installing and maintaining the applications on their local device or making backups of their important files. The applications "in the cloud" take care of that for you! As the number of computer devices in the average home climbs,

cloud computing could be an alternative to every family having a "system administrator" at home or a tech service on speed dial.

In the near future, cloud services could also interact, allowing your social network site to automatically "friend" everyone in your address book, or your calendar application to show you as "busy" whenever you book a vacation.

No technological advance is without its downside, however, and there are serious issues regarding privacy and security that computer scientists and policy makers need to address. If all of your data is in the cloud and the company goes under, what happens to that data?

In addition, letting an outside organization maintain your data means giving that organization potential access to personal information, and data stored on the Internet is vulnerable to criminal activity.

Cloud computing technology is likely to evolve over time to meet the needs of users and minimize risk, but with all the benefits it has to offer, the cloud is definitely here to stay. ■

How Does the Government Decide Whether or Not to Raise and Lower Interest Rates?

Kathy Deck, director of the Center for Business and Economic Research in the Sam M. Walton College of Business, replies:

As the central bank of the United States, the Federal Reserve is tasked with conducting monetary policy to support the dual mandates of price stability and domestic economic growth. One of the most important ways that the Federal Reserve supports the U.S. economy is by setting the federal funds rate, the interest rate that banks use to lend to other banks overnight. Many other interest rates are tied to the federal funds rate, both implicitly and explicitly. A low federal funds rate encourages investment because the cost of money is low. On the other hand, a high federal funds rate discourages new economic activity, as the rate of return that a business generates must be sufficient to warrant borrowing at a high cost.

The Federal Open Market Committee is the part of the Federal Reserve that implements monetary policy. When the committee examines the latest data and determines that the economy is weak, lowering the federal funds rate — and by extension, many other interest rates — can provide monetary stimulus to the economy. When the committee observes the economy to be overheated, primarily in terms of unacceptably high inflation or inflation expectations, it may raise the federal funds rate to promote price stability.

Since the onset of the latest recession, the Federal Reserve has engaged in a policy known as quantitative easing. Quantitative easing involves the direct purchase of longer term government bonds by the Federal Reserve in an attempt to lower longer term interest rates than those tied directly to the federal funds rate. ■