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University of Arkansas System



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OF AGRICULTURAL, FOOD & LIFE SCIENCES



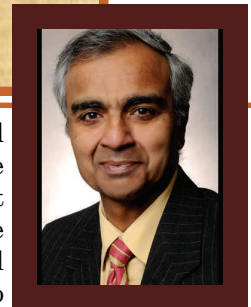
UNIVERSITY OF
ARKANSAS

COLLEGE OF
ENGINEERING

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From the Department Head Dr. Lalit R. Verma



It gives me great pleasure to share news and developments of the past few months in the Fall 2012 BAEG Newsletter. This is our first semester with the separation of the Biomedical Engineering program. We still have 77 undergraduates (sophomores to seniors) and 20 graduate students. Our revised curriculum in Biological Engineering of “*Healthy Planet Healthy People*” is designed to address the challenges in sustainable food, water and energy systems. We have senior design teams engaged in challenging real-world problems under the guidance of their coordinator Dr. Tom Costello and other faculty mentors. One senior design team placed third in the ASABE competition in July. Dr. Scott Osborn was awarded the Massey-Ferguson Educational Gold Medal at the 2012 ASABE meeting in Dallas. Drs. Jin-Woo Kim and Samy Sadaka won faculty awards. Dr. Marty Matlock has been named the Executive Director of Sustainability for the UA. He is also teaching a newly developed course entitled “Sustainable Agricultural Systems” that is open to all students at UA.

We welcome two new staff in our front office with a new Fiscal Manager, Ms. Staci Hudspeth and a new Fiscal Support Specialist, Ms. Vicki Martin. Our revamped academic, research and extension programs address problems relevant to our state and nation dealing with food and agriculture, and in sustaining ecological prosperity for a healthy planet. Our faculty, staff and students continue to deliver superior programs in support of the missions of UA and the Division of Agriculture. I look forward to serving as the current President-Elect and President for 2013-2014 of the American Society of Agricultural and Biological Engineers.

I hope you take some time to review our programs and continue to support our efforts. Please let us know how you can help us and do not hesitate to call (479-575-2351), e-mail (lverma@uark.edu) or if you are in the area, drop in for a visit. We would love to share our activities with you and help answer any questions you may have.

Lalit R. Verma
Professor and Department Head



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Dr. Karl VanDevender
Professor, dvan@uaex.edu

Significant Faculty Accomplishments

Jin-Woo Kim Wins Outstanding Publication Award

Jin-Woo Kim received the "John Imhoff Outstanding Publication" award by the UA Chapter of *Sigma Xi* (April 19, 2012) for his recent publication, which was not only selected as "Hot Paper" by the journal's editors but also featured as a "Back Cover" of the journal issue: **Kim, J.-W.**, Kim, J.-H. & Deaton, R. DNA-linked nanoparticle building blocks for programmable matter. *Angewandte Chemie International Edition* 50, 9185-9190 (2011).



It was his second time recognized by the award. The first award in 2010 was for his publication in *Nature Nanotechnology*: **Kim, J.-W.**, et al. Golden carbon nanotubes as multimodal photoacoustic and photothermal high-contrast molecular agents. *Nature Nanotechnology* 4, 688-694 (2009).

Samy Sadaka Receives Extension Excellence Award

Congratulations to Samy Sadaka upon receiving the Extension Excellence Award for Innovation: Novel Auger Gasification/Pyrolyzer System. Excellence awards are presented to recognize accomplishment on all levels—state, county, team, and individual—and to honor teamwork, innovation, and diversity.



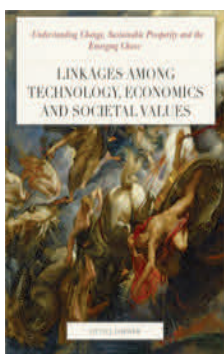
Dr. Sadaka will receive his award at the State Faculty Conference in Little Rock on Monday, December 10, 2012.

Significant Faculty Accomplishments



Scott Osborn Receives ASABE 2012 Gold Medal Award

Scott Osborn has received the Massey-Ferguson Educational Gold Medal, awarded for advancement of engineering knowledge and practice in agriculture soil. Osborn was selected in recognition of his exceptional achievements in teaching and for his leadership in developing new curricula in the rapidly developing area of biological engineering and in reform of engineering education to more fully integrate design and discovery-based learning. An associate professor of biological and agricultural engineering, Osborn has helped to create new biological engineering programs at Louisiana State University, Texas A&M University, and at the University of Arkansas. He led the University of Arkansas' departmental transformation from an agricultural engineering to a biological engineering curriculum, including the development of a very successful biomedical engineering component. These programs were formed to take advantage of advances in biology and to expand the application of agricultural engineering beyond traditional areas. He was named Ford Foundation Design Fellow for three years to work with the Dwight Look College of Engineering to implement engineering design into its existing curriculum.



Otto Loewer Publishes Electronic Textbook

Level: Grades 16 and Above, available on iPad.

Category: Textbooks

Published: Aug 27, 2012

Publisher: Apple Publishing Group

Print Length: 1314 Pages

Language: English

Requirements:

This book can only be viewed using on your computer using iTunes, iBooks 2 or later on an iPad with iOS 5 or later.

<http://itunes.apple.com/us/book/linkages-among-technology/id548532106?mt=13&ls=1>

Brian Haggard

is now President-Elect
of the National Institute
of Water Resources



Significant Faculty Accomplishments



Marty Matlock Named Executive Director of the Office for Sustainability

Marty Matlock, professor of biological and agricultural engineering, has been named as the first executive director of the campus-wide office for sustainability at the University of Arkansas. Provost Sharon Gaber and Associate Vice Chancellor for Facilities Mike Johnson appointed Matlock to demonstrate the increased emphasis on sustainability across all campus activities.

“Marty brings a broad and integrated perspective to the challenges of sustainability,” said Gaber. “He will engage students, staff, faculty, and the UA community around the world in implementing a common vision for sustainability programs at the University of Arkansas. The office for sustainability will play a central role in providing innovative solutions & perspectives to some of the most complex challenges we face on campus, in our communities, and across Arkansas.”

Matlock will coordinate program implementation and strategy development for sustainability activities across the U of A community. He will work with Johnson to coordinate the director and staff of the office for sustainability in a number of sustainability initiatives. The U of A Sustainability Council, composed of representatives of academic units & student groups, will advise the office for sustainability.

“Sustainability is a core principle at the University of Arkansas,” said Johnson. “Matlock will help bring the elements in place across campus together for increased impact.”

Matlock is a board certified environmental engineer in sustainable design & an internationally recognized expert in sustainability metrics and assessment. He joined the U of A in 2001, and serves as area director for the UA Division of Agriculture Center for Agricultural and Rural Sustainability. His collaboration with the university Community Design Center has resulted in more than 20 national and international sustainability design awards. Matlock also works with The Sustainability Consortium in the Sam M. Walton College of Business to develop a global platform for science-based metrics for sustainable production of consumer packaged goods. Matlock received the Distinguished Faculty Achievement Award for Service from the Arkansas Alumni Association in 2011.

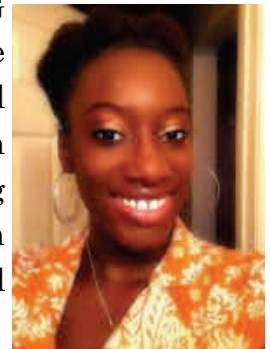
“Marty brings a broad and integrated perspective to the challenges of sustainability.”

Faculty and students with teaching, research and outreach interests in sustainability can reach Matlock at sustain@uark.edu for information and opportunities for collaboration.

Significant Student Accomplishments

A Great Year for Undergraduate Deandrae Smith

It has been a milestone year for Deandrae Smith, an undergraduate BENG major with minors in Mathematics & Sustainability. This summer she participated in a REU program entitled “Dynamics of Water and Societal Systems: An Interdisciplinary Research Program at the Virginia Tech StREAM Lab.” Her team traveled to the American Ecological Engineering Society conference in Syracuse where her team’s design to build a mesocosm for a crayfish won the design competition. She and her partner also presented their project poster at VTech’s first undergraduate research symposium.



In addition to this honor, Deandrae has been hired to work in The Sustainability Consortium at the Engineering Research Center—the first undergraduate to be hired by ENRC.

AABAE Recognizes 2012 Seniors



The Arkansas Academy of Biological and Agricultural Engineers celebrated the 2012 seniors at the annual banquet held on Friday, April 20, 2012. Five scholarships were awarded to 21 students.

Arkansas Academy Biological and Agricultural Engineers Scholarship: Anh Vu, Jackson Daniel

Biological & Agricultural Engineering Scholarship: Iain Bailey, Ashley Kiene, Colby McWhorter, Kristin Perrin, Nathan Redding, Heather Sandefur, Saumil Shah

Billy Bryan Scholarship: Colby McWhorter, Hannah Perkins, Kristin Perrin, Chris Randall, Lauren Tessaro

Riggs Tractor Scholarship: Shiloh Hurd, Christopher McDaniel, Charles Walker, Lauren Wilson

Xzin McNeal Scholarship: Alvaro Claire, Heather Sandefur, Lauren Wilson

Jacob Lum, Ph.D. student, won 2nd place in the Graduate Student Poster Contest at AAFP 2012 annual meeting in Fayetteville, AR, Sept. 11-12, 2012. His poster title was “Impedance aptasensor with microfluidic chips for rapid and specific detection of avian influenza H7N2.”

Significant Student Accomplishments

Katherine Atkins Receives Outstanding Student Award From ASABE

The American Society of Agricultural and Biological Engineers (ASABE) has awarded Katherine Atkins with the Outstanding Student Award (Arkansas Section) for 2012. A senior in Biological Engineering, Katie has an interest in biomedical engineering. Her goal is to attend medical school in the near future. During her time with the department, Katie has demonstrated a great attitude and quality of work in the classroom.

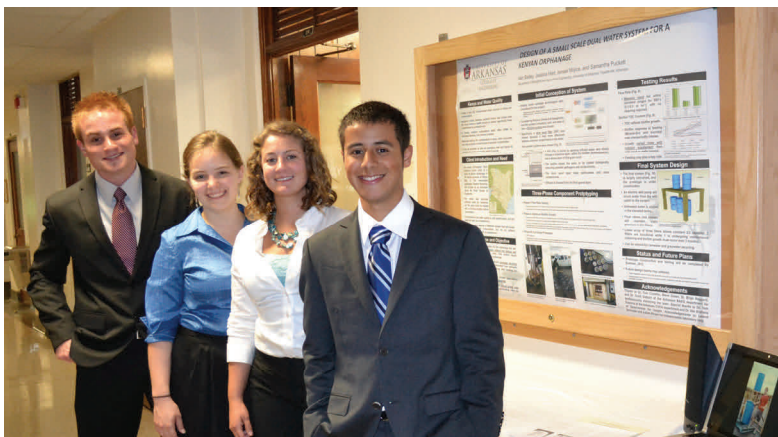
For the past year, Katie has worked as an undergraduate researcher in Dr. Jeff Wolchok's lab, where she has been observing the effects of molecular crowding on the amount of collagen produced by cells grown on scaffolds. Also, TGF- β is used to promote the amount of tissue formed. Katie has been researching the effect of TGF- β as a media supplement to determine whether or not there is a difference in tissue production for different TGF- β concentrations.

Katie is an active member in her sorority, Alpha Delta Pi. Over the past three years, she has held many leadership positions, including her current appointment as chapter president. Also, she served as a peer mentor in the Freshman Engineering Program for two years—a position she found very rewarding in regards to forming relationships with all of her mentees.

In her off time, Katie plays and watches sports, paints and crafts, and plays with her dog, Boss Dog.



Senior Design Team Wins Third Place at ASABE Gunlogson Competition



The Senior Design Team (pictured, left-to-right: Iain Bailey, Samantha Puckett, Jessica Hart, Ismael Mojica) was chosen to present their Design of a Small Scale Water System for a Kenyan Orphanage at the ASABE Gunlogson Competition in Dallas, Texas, July 29-August 1, 2012. The team placed third with their design.

Results of My 2012 Summer Internship

By Jana Hindman



This summer I worked for Ashland Water Technologies in Portland, Oregon. The water technologies group works to provide chemical solutions to the paper and packaging industry. My supervisor was responsible for several clients in the Pacific Northwest, including: West Linn Paper Company, SP Newsprint, and Longview Fibre. I was stationed at West Linn Paper Company, which runs 3 paper machines to produce 700 tons of coated paper every day. As an intern, my main focus was the biocide optimization program. Biocide is a chemical used to prevent bacterial growth. Preventing bacterial growth is an important part of the paper making process because holes form in the finished product when it is not controlled. Too much biocide, however, can cause accelerated wear in the machine parts, so finding the right balance in biocide dosage is essential. Over the summer, I successfully optimized the program saving WLPC \$38,000.

In addition to the biocide program, we also supplied 21 other chemicals to the facility, which I was responsible for monitoring and adjusting. Having a summer internship was a great experience for me because it allowed me to see what working a real job was like and I was able to live in an entirely different part of the country. The skills I learned during my internship can be applied to any future career I may have. I would highly recommend having an internship at some point during undergraduate coursework.

If anyone is interested in learning more about Ashland, I would be happy to discuss my experience with them or they can read more about it on Ashland's website: <http://www.ashland.com/>.

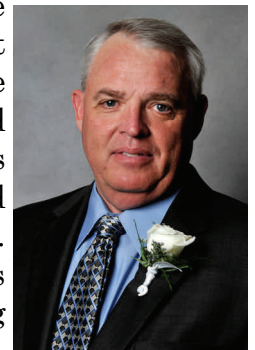
2012 Academy Inductees

INDUCTEES: Alumni Shawn Brewer of Conway AR, Jeff Keeter of Grady AR, and Billy Staton of Russellville AR were inducted into the Arkansas Academy of Biological and Agricultural Engineering during a ceremony on April 20, 2012, in Fayetteville AR.



Mr. Shawn Brewer graduated with a B.S. degree in Biological and Agricultural, M.S. in Biological and Agricultural Engineering from the University of Arkansas in 1994 and 1998. From 2006 to 2009, Shawn served an officer rotation for the Arkansas Section of the American Society of Agricultural and Biological Engineers, which culminated in the office of Chairman the final year. He has been employed by USDA Natural Resources Conservation Service since 2004.

Mr. Jeff Keeter graduated with a B.S. in Agricultural Engineering from the University of Arkansas in 1984. He is an owner/operator for a corporation that includes RJR Farms, Marje Farms, and Keeter Farms in Grady, Arkansas. The corporation farms cover 5000 acres that produce cotton, corn, soybeans, and rice. He has overseen implementation of major improvements to the farms working with the University of Arkansas System Division of Agriculture and other agricultural agencies and companies in order to keep up with technology. Through these relationships he is an early adopter of technology that improves production while preserving and protecting natural resources and advancing agriculture.



Mr. Billy Staton graduated with a B.S. degree in Agricultural, M.S. in Biological and Agricultural Engineering from the University of Arkansas in 1991 and 1995. He is a Certified Arkansas Nutrient Management Planner, and is a Registered Professional Engineer in Arkansas, Oklahoma, Texas, Missouri, Mississippi, North Carolina, and

Virginia. He is a former Chairman of the ASABE-Arkansas Section. He currently works for Terra Renewal Services (TRS), a Russellville, Arkansas based, nationally recognized wastewater residuals management company.



*Left to Right:
Shawn Brewer, Jeff Keeter, and Billy Staton*



Yi Liang
Assistant Professor

Step Into the Light

Yi Liang

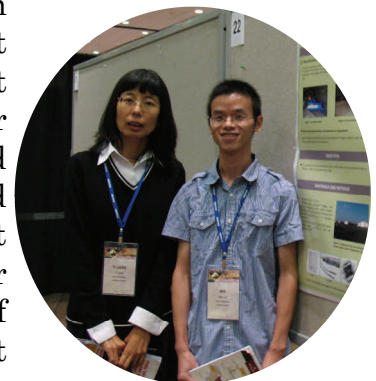
After joining the University of Arkansas System Division of Agriculture in 2007, Dr. Yi Liang has worked in several research and extension areas including nutrient retention and air emissions from alternative litter management practices, surface wetting cooling of broilers using sprinklers, and energy efficiency improvements from poultry productions.

Dr. Liang graduated with B.S. and M.S. degrees in Agricultural Engineering from China Agriculture University. She obtained her Ph.D. degree in Bioresource Engineering from the University of Alberta, Canada. Her post-doc work at Iowa State

University focused on effects of diet and manure handling practice on air emissions from laying hen operations. She also gained valuable experience in carbon sequestration modeling under different crop and soil management at a USDA ARS research station in Oregon.

One of Dr. Liang's current endeavors is to verify an alternative cooling method in the commercial facility. Cooling broiler chickens using sprinklers is not favored by the poultry industry due to potential wet litter conditions, although its concept has been proved in laboratory and small-scale trials by other researchers, including faculty from our own department, Drs. Thomas Costello and Ivan Berry (retired). By working closely with Dr. Susan Watkins, Professor of Poultry Science, and Dr. Tom Tabler, former farm manager, Dr. Liang conducted trials over numerous summers at the applied broiler research farm at the University of Arkansas System Division of Agriculture. Conducting field research can be challenging due to unforeseen conditions. However, commercial-scale trials not only allowed her to quantify the performance of a sprinkler system but also served as a demonstration ground for the industry.

Results revealed the differences in cooling mechanisms between traditional evaporative cooling and the new sprinkler cooling, but similar performance on the bird productivity and beddings. The biggest advantage of the sprinkler cooling system was up to 70% of summer cooling water savings over a traditional cooling system. By holding field days at the farm, presenting results at industry symposiums, and publishing in extension articles, sprinkler systems are slowly but gradually being adopted by the producers, who were pleased with their flock performance during the hot summer of 2012. The wide adoption of sprinkler cooling will greatly conserve water, especially during drought conditions, yet maintain good bird performance.



**Dr. Yi Liang and graduate student
Min Lei at ASABE conference 2012**

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Addressing industry's challenge has been the top priority of Dr. Liang's extension program. Poultry production in Arkansas has a long history and is the leading sector of Arkansas economy. However, poultry houses built a couple of decades ago either do not meet the requirement of the continual genetic and nutritional improvement or cost too much energy to achieve the optimal environment. In collaboration with Thomas Costello of Biological and Agricultural Engineering, Susan Watkins of Poultry Science, and Darin Nutter of Mechanical Engineering, Dr. Liang is leading an energy efficiency assessment and improvement program that serves contract producers and major poultry processors. The farm energy audit project identifies opportunities to reduce production energy consumption and brings the producers a step closer to leverage cost-share programs that implement the potential energy-saving opportunities. On-farm evaluations of alternative technologies aim to bring cost-effective solutions to reduce inputs and conserve natural resources in poultry operations.

Industry-oriented applied research is critical in delivering effective extension program. Dr. Liang will continue to work closely with industry groups, research and extension faculty to address issues regarding air quality and energy to improve production efficiency.

Step Into the Light

William "Ben" Pulman



Ben is a fifth-year undergraduate senior in Biological Engineering and is the president of the Biological Engineering Student Club and the Public Relations Officer for the UA Climbing Club. He is co-authoring a paper entitled, "Presence of Fecal Indicator Bacteria and Pathogenic Microorganisms at Recreational Swim Beaches in Beaver Lake in Northwest Arkansas" with Dr. Kristen Gibson, Ismael Mojica, and Dr. Steven Ricke. He is a recruiter for the College of Engineering and ran the Boston Marathon, twice!

Dr. Scott Osborn, Faculty Advisor to the ASABE Student Branch, said about Ben: "He has been an active leader of the student club. He has a broad array of interests, personally, and brings this mindset to leadership of the student club. Ben seeks to provide professional and extra curricular experiences to the students to expand their knowledge and encourage their commitment."

Outside of his undergraduate studies, he founded a 501(C)3 non-profit in 2011 to help fund public education in the area by encouraging physical activity, especially at a young age. It is called the Cow Paddy Foundation.

Ben's future plans include attending law school here at the U of A in the Fall, with a particular interest in intellectual property or environmental litigation.

Introducing Our New Graduate Students



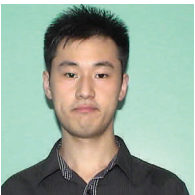
Jason M. Corral

Advisor: Dr. Brian Haggard



William M. McDougall

Advisor: Dr. Chris Henry



Yixiang Wang

Advisor: Dr. Yanbin Li



W. Morgan Welch

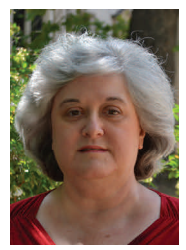
Advisor: Dr. Brian Haggard

New Staff in BAEG



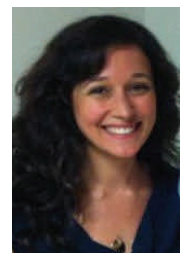
Staci Hudspeth is the new Fiscal Manager. She joined the office staff in October, 2012. She comes to us from a previous position as Deputy Treasurer for Washington County.

Vicki Martin is the new Fiscal Support Specialist. She joined the office staff at the end of August, 2012. Her previous state service was in the Department of Physics here at the U of A.



Prathamesh Bandekar came on board in July as a Program Associate working for Prof. Marty Matlock on sustainable agriculture and crop modeling.

Mary (Bonaduce) Fennel is a Program Technician for Prof. Brian Haggard, performing database analysis and web/info transfer support.



Scholarship Donation Opportunities

Yes, I would like to contribute!

Please accept my contribution to the following scholarship(s). My check for \$_____ is enclosed.

Billy Bryan Scholarship Fund _____ **Joel T. Walker** Memorial Scholarship Fund _____
Biological and Agricultural Engineering **General** Scholarship Fund _____

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

PHONE: _____ E-MAIL ADDRESS: _____

Remit Payment To:

*Dept of Biological & Agricultural Engineering
203 Engineering Hall
University of Arkansas
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