



## Dave C. Swalm School of Chemical Engineering



### Don Taylor presents Henry Lectureship for 2012

Don Taylor, Vice President for Global Purchasing and Global Supply Chain for the Dow Chemical Company, presented the Hunter Henry Lectureship on Tuesday, March 6, to an audience including University officials and CHE faculty, staff, graduate and undergraduate students. Mr. Taylor joined Dow as a production engineer in 1983 after receiving his bachelor's degree in chemical

engineering from Clemson University. During his speech, Mr. Taylor highlighted the challenges that await chemical engineers and the preparation needed to face those challenges head on.

*Pictured above: Henry Lecturer, Don Taylor*

*Pictured at right: President Mark Keenum, Kitty Henry, Provost and Executive Vice President Jerry Gilbert, Director of the Swalm School of Chemical Engineering Jason Keith, Henry Lecturer Don Taylor, Ticket Henry*



### Southern Ionics Supports New Endowed Chair

Southern Ionics Incorporated, headquartered in West Point, MS, has agreed to provide a gift of \$1,500,000 to fund the Southern Ionics Chair in Chemical Engineering. The School is extremely grateful to Southern Ionics for their support and investment in the education of future chemical engineers. We will begin a search for the chair holder during the next academic year.



### Dr. Hossein Toghiani named Thomas B. Nusz Endowed Professor

**Dr. Hossein Toghiani** has been named the Thomas B. Nusz Endowed Professor for excellence in teaching, research, and service to Mississippi

State University. Dr. Toghiani's teaching excellence led to his induction into the Bagley College of Engineering Academy of Distinguished Teachers in 2007 and his research in materials and energy engineering has resulted in significant levels of external funding.



### Spring 2012 Graduation Convocation

The Swalm School of Chemical Engineering held a Spring Convocation for its graduates on May 11, 2012. B.S. degrees were conferred upon 43 graduates in addition to 1 MS and 1 PhD graduates. The photo from the convocation ceremony is also in the CHE office.



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### Dr. Neeraj Rai Accepts Faculty Position

Dr. Rai received his B.E. degree in Chemical Engineering from Mangalore University, India and his Ph.D. degree in Chemical Physics from the University of Minnesota. He carried out postdoctoral work at the University of Notre Dame, and is currently a postdoctoral researcher in the Catalysis Center of Energy Innovation at the University of Delaware. He will be joining MSU in August 2013.

Dr. Rai's research interest is in the area of computational modeling and simulation. He is interested in developing advanced computational tools to understand chemical and physical processes at molecular level and design novel materials for meeting our future energy needs in a sustainable manner. Dr. Rai's teaching interests are thermodynamics, statistical mechanics, and molecular modeling.



Dr. Rai is married to Dr. Aswathy Rai, who received her Ph.D. in Bio-

chemistry, Molecular Biology, and Biophysics from the University of Minnesota. She is currently working as a postdoctoral researcher at the Wistar Institute. Along with their four year old daughter, Anya, they are looking forward to joining the Bulldog family.

### Hill Elected President of ASEE-SE



**Dr. Priscilla Hill** was elected as the President Elect of the Southeastern Section of the American Society for Engineering Education (ASEE-SE) at the April 2012 Conference. She will serve in this capacity until March 2013 when she will begin serving a one-year term as the President of ASEE-SE.

For the past several years, **Dr. Jason Keith** has served as a trustee of the non-profit organization, CACHE, (Computer Aids in Engineering), leading a task force that has been developing modules to



introduce concepts of hydrogen and hydrogen fuel cells into the chemical engineering undergraduate curriculum. To date, about four dozen modules have been developed for most of the core CHE curriculum. These efforts were expanded recently to include general energy modules for alternative energy, with an emphasis on solar energy during the past year. Modules have been developed by undergraduate students working with Dr. Keith, supported by the Deavenport Chair endowment. The modules are located at the following site:

<http://tinyurl.com/h2bulldog>

# 2012 ChE News



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## Advanced Degrees Awarded

- **Jaclyn Hall** defended her PhD dissertation, *Cultivation of Oleaginous Microorganism Consortium on Municipal Wastewater for the Production of Lipids*. She was advised by Dr. Todd French and Dr. Rafael Hernandez.
- **Ashley Cornell** defended her MS thesis, *Studies in Applied Materials Science: Drug-Biofluid Interactions and Light-Emitting Polymer Films*. She was advised by Dr. Keisha Walters.

## Southeast Biofuels and Renewable Energy Conference

The Southeast Biofuels and Renewable Energy Conference was held in August in Jackson, MS. The conference was organized in part by **Dr. Rafael Hernandez** and **Dr. Todd French**. At this meeting, academic researchers connected with private business and government to discuss issues of mutual interest.

**Dr. Hernandez, along with Dr. Patrisha Pham, Dr. Andro Mondala, Dr. Emmanuel Revellame, and Mr. Bill Holmes**, helped organize two biofuels camps as part of the conference – one camp was for 6-12 year olds and the other was for teenagers. Participants were introduced to production of biodiesel and ethanol from soybean oil and corn, respectively, as well as other feedstock alternatives. These educational materials were presented in the form of games, videos, and experiments.

## *Dave C. Swalm School of Chemical Engineering*

**Mr. Bill Holmes**, Director of the Advanced Instrumentation and Mass Spectrometry Lab was named recipient of the **2012 Staff Research Award** by the Bagley College of Engineering.

An interdisciplinary team of students won **3<sup>rd</sup> place** in an **Energy Business Plan Competition**. The team consisted of CHE graduate students, **Adebola Coker** and **Hien Nguyen**, ChE exchange student, **Luis Gutierrez**, and biological sciences graduate student, **Sara Shields-Menard**.

**Twenty-four Winston Academy chemistry students** participated in a day-long outreach event to learn about alternative energy. The event was hosted by **Dr. Rafael Hernandez, Dr. Todd French, and Mr. Bill Holmes**.

**Donations to Chemical Engineering** for scholarships or general academic programs were received from **Chevron, Delta Section of the Society of Petroleum Engineers, Dow Chemical, Marathon Oil, International Paper, ExxonMobil, Citgo, and Omnova**.

**Stay informed about news in the Swalm School of Chemical Engineering by following us at:**

**CHE Webpage** at

<http://www.che.msstate.edu>

**Facebook Page** at

<http://www.facebook.com/msuswalmche>

**Director's Twitter Updates** at

[http://twitter.com/msu\\_swalm\\_director](http://twitter.com/msu_swalm_director)



## **OUTSTANDING AIChE Student Chapter—AGAIN!**

Congratulations to **Dr. Bill Elmore** and the Student Chapter of AIChE for winning the Outstanding Student Chapter Award for the 12<sup>th</sup> year in a row! This is a tremendous accomplishment and we are grateful for the financial support of the Henry Family as well as the leadership of the chapter advisor, Dr. Bill Elmore.

## **Faculty Research Awards for 2012**

**Dr. Todd French:**

US Department of Energy – *Microbial Oil Research*

**Dr. Todd French and Dr. Rafael Hernandez:**

National Science Foundation – *2012 Southeast Biofuels and Renewable Energy Conference*

**Dr. Rafael Hernandez:**

KiOR/MS Development Authority – *Use of Biomass to Remove Organics from Waters Generated during Bio-Oil Production*

US Department of Energy - *Biocrude Research*

**Dr. Santanu Kundu:**

National Science Foundation – *Mechanical Properties of Pulmonary Mucus*

**Dr. Hossein Toghiani:**

Institute for Clean Energy Technology – *Cooperative Agreement with US Department of Energy*

**Dr. Rebecca Toghiani:**

Institute for Clean Energy Technology – *Cooperative Agreement with US Department of Energy*

**Dr. Keisha Walters:**

KiOR/MS Development Authority – *Characterization of KiOR ReCrude Oils Produced from Pine Clear Wood, Bark, Clear Wood/Bark Mixtures, and other Blend Feedstocks*

US Department of Energy – *BioOil Research*

National Science Foundation – *Multiscale Simulation of Biological Systems*

## ***Dave C. Swalm School of Chemical Engineering***

### **Steen Endowed Scholarship**

Mr. and Mrs. William C. Steen of Fredericksburg, TX, have pledged to endow a freshman scholarship in Chemical Engineering. The \$40,000 endowment will award \$1,600 per year. The first of the Steen scholarships was awarded to CHE freshman, **Logan Williams**, for Fall 2012.

### **Undergraduate Awards**

- CHE seniors **Lennon Martin** and **Glyn Freeman** (May 2012 graduates) were awarded scholarships from the Mississippi Engineering Society.
- **Mary Ann Murdock** and **Phillip Jamison** were elected to the Bagley College of Engineering Student Hall of Fame.
- 2012 CHE graduates **Mary Ann Murdock** and **Kyle Barfield** are volunteer leaders in the AIChE Young Professionals Group.
- Undergraduate student, **Alison Cuevas**, was awarded a national scholarship from the Buick Achievers Scholarship Program.



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**Dr. Keisha Walters** has been selected to serve as MSU's faculty representative in the Phase V Federal Demonstration Partnership ([www.thefdp.org](http://www.thefdp.org)), comprised of 120 institutions with at least 10 federal agencies. The emphasis of Phase V of the FDP is to streamline the processes of research administration to allow the researcher to concentrate on their science and to be less burdened with administrative issues.



### Graduate Student Awards

**Adebola Coker** - Scholarship for the Southern Automotive Women's Forum; BCA Scholar Award from National Society of Black Engineers;

Tim and Christy Duncan Young Entrepreneurs Scholarship from the Office of Entrepreneurship and Technology Transfer.

**Maryam Dadgarmoghaddam** - selected for a Bagley Engineering Graduate Fellowship for 2012-13.



**Erick Vasquez** - application to the Study Mississippi International Student of the Year was selected for the statewide competition; also selected to the "Excellence in Graduate Polymer Research" Symposium at the 245th ACS national meeting, to be held in New Orleans, Louisiana. (Poster Presentation)



**Kamal Lamichhane** - awarded 2<sup>nd</sup> place in the student poster session of the 2012 Southeast Biofuels and Renewable Energy Conference.



### Henry Family Endowments to Benefit CHE

The Hunter W. Henry, Jr. Family has established 4 endowments for sustained support for the following CHE initiatives:

- **The Atly and Bette Jefcoat AIChE Student Leadership Awards** to support students in recognition of excellence in service and leadership.
- **AIChE Support Fund Honoring Dr. Atly Jefcoat and Dr. Bill Elmore** to support the AIChE Student Chapter.
- **Henry Lecture Series Fund** to support an external industrial speaker to talk about their career path and inspire CHE students.
- **Hunter W. Henry, Jr. Memorial Teaching Fellowship** to provide teaching support for the chemical engineering program and to support educational based scholarship.

CHE undergraduate student **Kelsey LeSaicherre** was chosen as **the 2012 Epting/Mathews Co-Op Student of the Year!** Kelsey served three co-op terms with Marathon Petroleum Co.



### Heat Transfer for Students App for iPhone/iPad

**Dr. Jason Keith** worked with an MSU student-run business, Nimbus Mobile, to develop a free App for the iPhone and iPad called *Heat Transfer for Students*. The app focuses on visualization of one-dimensional unsteady state heat conduction. Download it today at the Apple Store!





### AIChE Kicks Off Another Big Year



Following on the heels of twelve consecutive years of recognition by AIChE nationals as one of fifteen Outstanding Student Chapters (of over 160 national and international chapters), we again launched into a full semester of activities surrounding our core values—Scholarship, Leadership, and Service. We held eleven full chapter meetings—many hosted by industries long supportive of our co-operative education students and ChE graduates. Job opportunities appear strong across the various industries hiring our graduates—with many seniors having already accepted positions before the Christmas break.

AIChE Chapter community service activities have included projects at Habitat for Humanity, the Palmer Home for Children Thrift Store and Several K-12 outreach activities—including a Boy Scout Merit Badge day held in the Swalm School of Chemical Engineering. Thirty-six boys (and several siblings) participated—completing both the Robotics and Engineering Merit Badges during the event.



For a second consecutive year, the Swalm School of Chemical Engineering placed an incredibly close second in the annual Engineers Week competition on campus. Our AIChE students competed fiercely in Mardi Gras-themed events, placing first in a number of competitions (and ALWAYS having a great time, regardless of the event).

### Fall 2012 Undergraduate Scholarships

83 undergraduates were awarded Swalm Scholarships

13 undergraduates were awarded freshmen scholarships (supported by Mr. and Mrs. William Steen, Citgo, and the Society of Petroleum Engineers





## PolySEL Group Directed by Dr. Keisha Walters

### **Maryam Dadgarmoghaddam**

- Presented her work for the first time in the 'Micro- and Nano-systems Forum' at the ASME conference Nov. 9-15, 2012 in Houston, Texas; "Thickness, Morphology, and Hydrolytic Stability of Aminosilane Layers on Silicon Substrates," Maryam Dadgarmoghaddam, I-Wei Chu, Keisha B. Walters

### **Erick Vasquez:**

- Vasquez, E.S.; Ding, S.; Walters, K.B., "A Study of the pH- and Thermo-responsive Behavior of a Series of Amino (Meth)acrylate Polymer Brushes on Silicon Substrates," National Graduate Research Polymer Conference (NGRPC), Case Western Reserve University, OH, May 23-24, 2012.

### **Ersan Eyiler**

- Received a 2012 Society of Plastics Engineers (SPE) travel award.

### **Zach Wynne**

- Planned MS thesis defense in January-February 2013 with graduation in May 2013. Zach was hired by Ashland Chemical in Piedmont, SC in December 2012 as a Process Engineer.



### **Clay Adkison**

- Welcome a new member to the group, Clay Adkison, a new MS student co-advised by Dr. Santanu Kundu (primary advisor).

### **Philip Polk (BS graduate in May 2012)**

- Philip was an UG researcher in the PolySEL group. He started working for Ergon as a R&D Analyst in August 2012. He married Keating in October 2012 and they have been busy getting settled into their new home.

### **Dr. I-Wei Chu**

- Accepted a position as a Research Associate with MSU's Institute of Imaging and Analytical Technologies (I<sup>2</sup>AT) starting in January 2013.

### **Dr. Keisha B. Walters**

- Received the 2012 Raymond W. Fahien Award from the Chemical Engineering Division of the American Society of Engineering Education (ASEE).

- Received the 2012 Outstanding Woman Faculty award from the Mississippi State University President's Commission on the Status of Women (PCSW).

- Completed the David Carlisle Hull Faculty Leadership Program at Mississippi State University (2011-2012).

### **Ashley Cornell (May 2012 MS)**

Ashley is working at Milliken Chemical R&D (Spartanburg, SC). She was hired as a Research Specialist in July 2012 and then promoted to Development Engineer in Milliken Performance Products in December 2012. Ashley and Zach Wynne (MS expected in May 2013) are engaged. They moved to Greenville, SC and will be getting married in Charleston, SC in March 2013

**Dr. Mat Rowe (May 2010 PhD)** continues at Halliburton in Lafayette, LA, now in a Scientific Advisor and Petrophysical Support position.

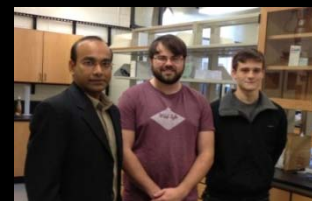
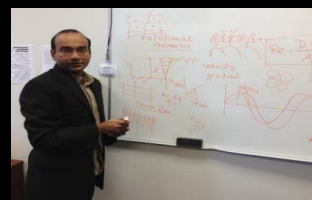
### **Caitlin Naske (December 2010 MS)**

- Naske, C.D.; Speed, J.; Wynne, Z.; Polk, P.; Crosby, S.; Williams, A.; Rodriguez, J.; Holmes, W.E.; Walters, K.B. "Post-condensation Filtration of Pine and Cottonwood Pyrolysis Oil and Impacts on Accelerated Aging Reactions" *Energy & Fuels*, 2012, 26 (2), pp 1284-1297.



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**Dr. Santanu Kundu** joined the department as an Assistant Professor in January, 2012. His research interest is in 'Soft Materials' and his research group is investigating the fundamental behavior of various soft materials towards addressing challenges related to human health, clean water, energy storage, etc. Dr. Kundu is presently building his lab with the help of 1 graduate student and 1 undergraduate student. Recently, he has been awarded a seed-grant by NSF-EPSCoR for characterizing the mechanical properties of pulmonary mucus. This research will help to understand the pathogenesis of various pulmonary diseases.



During this summer he attended the ASEE-Chemical Engineering summer school at University of Maine, Orono. He also attended the AIChE Annual meeting at Pittsburgh and delivered two presentations on synthesis and characterization of soft materials.



**Dr. Rafael Hernandez and Dr. Todd French** were recognized in February by MSU at the first [MSU Investing in Innovation Conference](#) for their patent, *Production of Biodiesel and Other Valuable Chemicals from Wastewater Treatment Plant Sludges*. They have formed the company, BioEnergy Spectrum Solution LLC, to commercialize the technology.

- 2012 has been an excellent year for the Drs. French and Hernandez research group. The team will finish 2012 with at least 5 peer reviewed publications and over 20 technical presentations. Dr. Hernandez has been an invited speaker to several biofuel related forums this year: (1) Mississippi Society of American Foresters, April 10-12; (2) 2012 Southeast Biofuels and Renewable Energy Conference: Networking for a Sustainable Future, August 8-9; (3) The Fall Forestry Field Day, October 13, organized by the Forrest-Lamar Country Forestry Association.
- In September 2012, Dr. Hernandez was named a recipient of the 2012 Hearin Faculty Excellence Award. He has received this award for the last three years for his contributions to research and economic development activities.
- Dr. French has been elected the 2012-2013 leader of the Bagley College of Engineering Energy Working Group.
- Dr. Hernandez has accepted a position as Department Head and the J. Madison Nelson/BORSF Professorship in Chemical Engineering at the University of Louisiana (UL) at Lafayette. The official start date for this position is May 15, 2013. He will continue his efforts at MSU in research, service and graduate student training until his departure to UL.





*Dave C. Swalm School of Chemical Engineering*



Some of you may recognize 1991 alum **Mike McCardle** (left). Mike is currently a Plant Manager for Georgia Gulf. Mike and his wife, Lydia, have three children: Nic, 16; Hannah, 14; and Abby, 13. They are active at Crossgates UMC in Brandon, MS and can be seen at the ballfield most any time: Nic is involved in baseball and Hannah and Abby play basketball and fastpitch softball.

## Alumni News

Happy Holidays from the  
**Ron Pitman** Family!

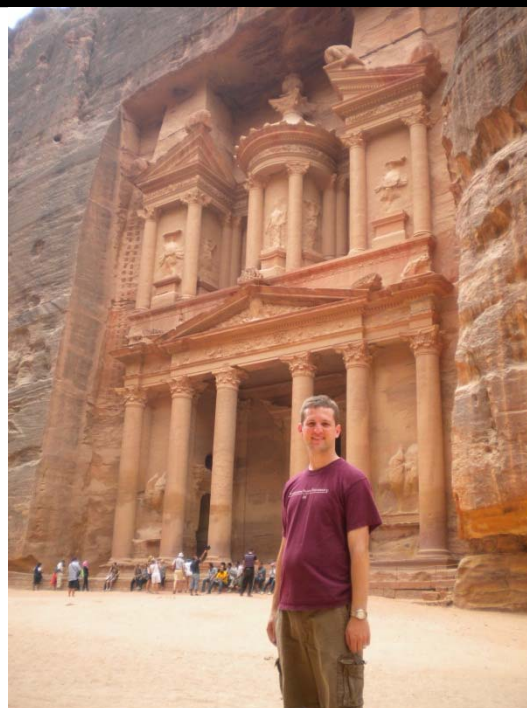


**Brian Hocutt** (right) is a 2001 BS in ChE. He started work in Summer 2001 with Chevron North America Exploration and Production in New Orleans as a Facilities Engineer. Since that time, he has worked in Houston, TX, and Lafayette, LA. In February 2011, He accepted a 28/28 rotational job in Angola, West Africa as a Sr. Project Engineer and have recently transitioned into a Lead Operations Support Engineer role. He indicates that the rotational work is challenging, but very rewarding! His time off is spent at the family residence near Hattiesburg, MS, with wife, Nancy, and 3 children, Anna (11), Dane (8), and Everett (5).



**John Harden** (right). I continue to be employed by Albemarle at our manufacturing plant in Magnolia, AR. After completing a successful 2011 start-up to expand our joint venture facility on the Dead Sea in Jordan, I was promoted to Process Technology Supervisor in January 2012. I manage a team of several engineers that is dedicated to providing technical support to seven operating units at the Magnolia site. I made one trip back to Jordan this year that took place in April. The picture is an attempt to get MSU some representation at Petra.

Our daughter Ella has brought a lot of fun to mine and Grace's life over the past year. She is now almost 14 months old and has started walking all over the place in the last month. So she keeps us fairly busy at home chasing her around. We are really looking forward to her first Christmas season in which she'll be actively interacting with family.





Dear Alumni and Friends - 2012 has been a fast but enjoyable year at Mississippi State, and especially in the Dave C. Swalm School of Chemical Engineering. My core passion has always been teaching, and in 2012 I enjoyed getting in the classroom and teaching MSU students. In the spring I taught an elective course on hydrogen energy and fuel cells which was based upon a curriculum I developed on a Department of Energy grant. In the fall, I taught the Advanced Process Computations course, which is required for our entering graduate students. One of the main facets of my courses is the assignment of a project. In the hydrogen energy course, for this project I asked students to develop their own homework problems. All of the students were very creative in their problems and solutions, some with very focused applications and others with a futuristic vision.

I would like to touch briefly on a few of the highlights from 2012. In the fall semester, the school surpassed an undergraduate enrollment of 300 students. This presents us with some challenges but we remain committed to providing an education of the highest quality. We are making efforts as a college to improve overall retention and graduation rates, and chemical engineering is providing significant leadership in these initiatives. We had very high participation in the AIChE student chapter, and their efforts on external service and outreach was a component in their winning the 12th consecutive Outstanding Student Chapter award from the institute. Our undergraduate students also received individual recognition for their performance in academics, co-op, and service.

Our research and graduate programs have also had successes in 2012. We had \$5.8M of expenditures with \$5.3M from federal sources, and presently have 7 MS and 12 PhD students in our program. As our current students make progress on their degrees, we have had new graduate students begin in both the spring and fall semesters. Several of our current graduate students received recognition for their research and service. I am also pleased to report that in 2012 we established six new endowments and also received donations to existing endowments as well. If you would like to provide support, consider fund# 501668 for the AIChE student chapter endowment or fund #310502 CHE advancement fund for department operations.

On behalf of our students, staff, and faculty, I appreciate your continued support of Mississippi State chemical engineering. There are three things you can do to help MSU - CHE in our quest for excellence:

1. *Tell Others About MSU – CHE*
2. *Financially Support MSU – CHE*
3. *Encourage Others To Participate*

Happy Holidays!

*Jason*

Jason M. Keith  
Professor and Director  
Earnest W. Deavenport, Jr. Chair

