



In Memoriam – Rebecca K. Toghiani



“ My Dove, my love, my colleague, my partner, my soul mate, my heart, my joy, my best friend, and mother of my beautiful daughters (Parisa & Parvaneh), my precious Becky flew to Heaven on September 3rd at 2:45 PM. On Parisa and Parvaneh, Becky’s sisters and brothers and my behalf, I would like to express our gratitude and heartfelt thanks to our friends, our alumni across the world, the MSU President, Provost, Dean of Engineering, Vice President of Research, Director of Chemical Engineering & Becky’s chemical engineering family, department heads and faculty across campus, directors of centers and graduate program, colleagues, undergraduate and postdocs and our Iranian friends: I would also like to thank you for your emails, your kind words

and fond memories of Becky and the contributions designated to the Dr. Rebecca Toghiani Memorial Scholarship through the Mississippi State University Foundation. Becky is and always will be with me, every femtosecond of my life. I visit her every day early in the morning and late in the evening at the memorial Garden Park. I talk to her about the most precious things, our daughters and our students. Becky always said, ‘my greatest accomplishment in my life are my daughters and educating young minds.’

God bless, and thank you again for your wonderful and incredible support during these hard times.

Dr. H

(Hossein Toghiani)

Tommy Joseph – Hunter Henry Lecturer for 2013

The Hunter Henry Lectureship is sponsored through gift and endowment funds from the Henry Family.

Tommy Joseph presented the Hunter Henry Lectureship on Tuesday, March 5, to an audience of University officials, ChE faculty, staff, graduate and undergraduate students. Mr. Joseph is the senior vice president, Manufacturing, Technology, EHS&S, and Global Sourcing for International Paper (IP).

Mr. Joseph began his career with IP in 1982 at the Natchez Mill, as a Process Engineer after receiving his B.S. degree in chemical engineering at MSU. Through a long career at IP he has served in Natchez, MS, Camden, AR, and Mansfield, LA, just to name a few. In 2004 he was made an officer of International Paper and named vice president of IP’s former Specialty Papers Business, and later became vice president of Technology.

He serves on the Board of Directors for the National Council for Air and Stream Improvement, Inc. (NCASI). He also serves on the Board of Directors for Ilim Pulp & Paper, a Russian company and joint venture with International Paper.



From left: Associate Dean Royce Bowden, President Mark Keenum, Kitty Henry, Hunter Henry Lecturer Tommy Joseph, Ticket Henry, School Director Jason Keith.





Dave C. Swalm School of Chemical Engineering



Spring 2013 Graduation Convocation

The Swalm School of Chemical Engineering held a Spring Convocation for its graduates on May 10, 2013. In addition to the recognition of 35 B.S. candidates, awards were presented for Outstanding Leadership in AIChE to **Sarah Heintz, Hannah Weems, Kelsey LeSaicherre, Alex Carrubba, Liza Nalley** and **Scott Adkins**. The following seniors were recognized for Excellence in Plant Design:

First Place

- **Lee Grimes, Ty Hillman, Kiefer Slaton, Jonathan Cole, and Edmond Wright**

Second Place

- **Brian Mays, Caterina Tran, and David Van Cott**

Third Place Tie

- **Pal Grewal, Ryan Johnston, and Brandon Moore**
- **Christopher Hicks, Brandon Moore, Jack Stogner**

Congratulations to Sherre Denson

Sherre Denson is retiring after 25 years of excellent service to the School of Chemical Engineering, where she served in multiple roles, most recently as Business Manager. Sherre's institutional memory spans the careers of everyone here and she has always been the "go to" person when one of us needed to recall an important date, person, event or policy. She will be greatly missed (though we will be tempted to email or call her up when we have forgotten some necessary detail we need to do our jobs!)

Spring 2013 Graduate Degrees (Advisor)



Spring 2013 - Tim Broussard, M.S.
Investigation into the Effect of Strong Oxidizers on the Electrokinetic Removal of Chromium, Copper and Arsenic from CCA Impregnated Wood Waste. (Bricka)

Spring 2013 - Ben Hartenbower, M.S.
Fermentation of Glycerol to Biogas under Isobaric and Variable Pressure Conditions. (French)



Summer 2013 - Maryam Dadgarmoghaddam completed requirements for a non-thesis M.S. degree. (Walters)

Summer 2013 - Ersan Eyiler, Ph.D.
Development of Degradable Renewable Polymers and Stimuli-responsive Nanocomposites. (Walters)



Summer 2013 - Erick Vasquez Guardado, Ph.D.
Surface Modification and Transport Modeling of Micron- and Nano-sized Materials. (Walters)

Fall 2013 - Adebola Coker, Ph.D.
Evaluation of Catalytic and Non-Catalytic Production of Biodiesel from Wet Microbial Media and Reaction Schemes. (Hernandez)





Dave C. Swalm School of Chemical Engineering

Donations to Chemical Engineering

We want to recognize the following corporate donors for support of academic programs and scholarships:

- Dow Chemical Company
- Society of Petroleum Engineers – Delta Section
- Chevron Corporation
- ExxonMobil
- Marathon Petroleum

Dr. Rudy Rogers and Dr. Guochang Zhang

were recognized at the MSU I³ day for their patent titled System for Stabilizing Gas Hydrates at Low Pressures.



Dr. Keisha Walters has been named the college's interim associate dean for strategic initiatives. This position was established to assist Dean Achille Messac in implementing newly developed programs meant to drive the mission of the college forward.

Dr. Priscilla Hill is currently serving as President of the Southeastern Section of the American Society of Engineering Education.



CHE Office Associate **Sandra Shumaker** has been appointed to the President's Council for the Status of Minorities at Mississippi State. She will serve for three years.



In Spring 2013, **Kelsey LeSaicherre** was inducted into the Bagley College of Engineering Student Hall of Fame.

Erick Vasquez recently was selected to present his work *Stimuli responsive biphasic-polymer Janus magnetic nanoparticles prepared via electrostatic*



interactions and surface-confined ATRP at the recent 2013 Excellence in Polymer Graduate Research Symposium in April at the 245th ACS National Meeting in New Orleans, LA.

Erick also received the Materials Certificate from the Bagley College of Engineering for completing materials related coursework.



Dr. Andro Mondala, Senior Research Associate, has taken a position as Assistant Professor in the Department of Chemical and Paper Engineering at Western Michigan University beginning Fall 2013.

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



Current Research Awards in Chemical Engineering

Dr. Mark Bricka:

US Department of Agriculture/Sun Grant – *Biomass Gasification: Development and Evaluation of a Cost Effective Bimetallic Clay Catalyst for Woody Biomass Syngas Tar Destruction*

Dr. Todd French:

US Department of Energy – Sustainable Energy Research Center: *Microbial Oil Research*

US Department of Energy – Sustainable Energy Research Center: *Biocrude Research*

Dr. Priscilla Hill:

National Science Foundation - *Multifunctional Nanostructures for Integrated Electrical, Chemical, Mechanical and Biological Applications: An Interdisciplinary Certificate Program*

Dr. Santanu Kundu:

National Science Foundation – *Mechanical Properties of Pulmonary Mucus*

MSU Raspet Flight Laboratory – *Organic/Inorganic Composites for EMI Shielding: A Molecular Design Approach*

Dr. Neeraj Rai:

National Science Foundation - *Collaborative Research: Developing First Principles Monte Carlo Methods for Reactive Phase and Sorption Equilibria in CP2K Software Suite*

Dr. Hossein Toghiani:

MSU Raspet Flight Laboratory – *LIGNIN-DERIVED MATERIALS: Ecofriendly Nanoreinforcements for Automotive, Aerospace and Wind Turbine Applications*

Dr. Keisha Walters:

US Department of Energy – Sustainable Energy Research Center: *BioOil Research*

National Science Foundation – *Multiscale Simulation of Biological Systems*

KiOR/MS Development Authority – *Mississippi Biofuels Operations Research Phase II*

School Statistics – Fall 2013

Chemical Engineering Undergraduate Enrollment – 338 students

Chemical Engineering Graduate Enrollment – 11 M.S. students and 14 Ph.D. students

Active Faculty – 2 at Professor, 5 at Associate Professor, 2 at Assistant Professor



Dave C. Swalm School of Chemical Engineering

Please welcome **Dana Lewis** as the newest member of the Chemical Engineering staff. Dana is now the Business Manager for the Swalm School of Chemical Engineering. She is taking over for **Sherre Denson** who retires on December 31, 2013, after 25 years with the School of Chemical Engineering.

Dana received her BBA in 2005 from MSU. She has been on campus for 10.5 years – 3.5 in Sponsored Programs Accounting (1.5 as Manager); 5 years at the Center for Advanced Vehicular Systems as Contracts & Grants Specialist/Research Administrator; 2 years at the High Performance Computing Collaboratory as Accountant.

Dana is a Certified Research Administrator, a designation earned in January 2011 from the National Council of University Research Administrators. She received the Bagley College of Engineering Professional Staff Award for Outstanding Service & Dedication in both 2011 and 2012.

Dana has been married to George Lewis for 10 years and they have two boys, Conner and Tucker, ages 7 and 5.



Dr. Jason Keith, Director of the Swalm School of Chemical Engineering, received the *David Himmelblau Award from the Computing and Systems Technology division of the*

American Institute of Chemical Engineers for his work on hydrogen fuel cell and energy modules at the 2013 annual meeting.

He has also been appointed to the Tennessee Valley Authority's new Regional Energy Resource Council to advise TVA on current and future energy activities.

Dr. Keith was recently elected chair of the Education Division of the American Institute of Chemical Engineers.



Dr. Neeraj Rai has joined the faculty of the Swalm School of Chemical Engineering and began his teaching and research program during the Fall 2013 semester. Dr. Rai has already

added two PhD students to his research group and has been awarded an NSF grant for a multi-institute/country collaborative project. He is also the recipient of XSEDE and NERSC startup allocations for supercomputing resources.

Dr. Rai has begun his publishing and service activities, having already published an article in the American Chemical Society Catalysis journal, co-chaired an AIChE area 1a poster session, and judged the undergraduate poster competition, both at the 2013 AIChE Annual Meeting in San Francisco.



Dave C. Swalm School of Chemical Engineering

Dr. Badamkhand Sukhbaatar recently joined the Swalm School of Chemical Engineering as a Postdoctoral Associate working on the project for production of biocrude from municipal and industrial wastewater, led by Dr. Todd French.



Dr. Neeraj Rai recently received 200,000 Service Units (SUs) of start up allocation of the Cray XT5 “Kraken” system located on the Oak Ridge National Laboratory Campus. This award is made through the Extreme Science and Engineering Discovery Environment Program. Dr. Rai’s research group will use this allocation to carry out NSF-funded research.



Dr. Erick Vasquez recently completed requirements for the Ph.D. and is working as a Postdoctoral Associate with Dr. Keisha Walters and Dr. Santanu Kundu in experimental and computational research on pulmonary biomaterials, particle transport, and functional polymers.



Ben Hartenbower (B.S. 2004) recently received his M.S. in Chemical Engineering and is working with Dr. Todd French as a Research Associate, running the biocrude pilot plant at the Energy Institute.



Dr. Hossein Toghiani was promoted to Professor in August 2013 and currently holds the Thomas B. Nusz Endowed Professorship.



Dr. Todd French has been appointed as a voting member of the University Radiation, Chemical, and Laboratory Safety Committee at MSU.

He also recently appeared on Mid Morning with Aundrea on WCBI-TV

Channel 4 to discuss natural resources with energy applications.

Dr. French completed a one-year term as Chair of the Energy Working Group.

Dr. Toghiani was recently profiled on the MSU website for the “People of the People’s University” and which can be viewed at <http://msstate.edu/web/people/detail.php?id=315>.



Dave C. Swalm School of Chemical Engineering



CHE Director Jason Keith and his wife Salvadora welcomed **Sophia Rose Keith** on February 5, 2013. Sophia joins her siblings Andrew, Maria, and Isabel and her parents as part of the Bulldog Nation!

Dr. Santanu Kundu and his wife Queenee were blessed with a baby boy, **Akash**, who was born on May 3. Akash means “the sky” in Sanskrit. He is a thriving and happy 6 month old who loves to smile and is now looking forward to his first Christmas celebration.



Dr. Kundu was invited to give a departmental seminar at the Department of Chemical Engineering at the University of Alabama in Tuscaloosa in February and at the City University of New York in November. He presented his work on large-strain deformation of polymer gels and the effect of temperature on the rheology of shear-thickening fluids.

On a more personal note, three of her graduate students were married during 2013, two of them to each other! Ashley Cornell and Zach Wynne were married in Charleston, SC, in March, and Laibao Zhang was married earlier this year.

Dr. Priscilla Hill has been awarded a two year NSF-NUE grant for \$200,000 for Multifunctional Nanostructures for Integrated Electrical, Chemical, Mechanical, and Geological Applications: A Multidisciplinary Laboratory Education Program. Co-principal investigators on this project are Dr. Brenda Kirkland, Dr. Oliver Myers, Dr. Yaroslav Koshka, and Dr. Carlen Henington.

This exciting program is a collaborative effort between the Colleges of Engineering and Arts & Sciences and builds upon the research collaborations of the faculty in an effort to integrate practical experience from laboratories and simulations with existing courses for a more comprehensive educational program.



In April 2013, Dr. Hill began a one year term as President of the Southeastern Section of the American Society for Engineering Education (ASEE-SE).



Dr. Keisha Walters and her Poly-Sel group have been very active in 2013. Dr. Walters and her students have given 16 research presentations at regional, national, and international venues. She has received research funding from KiOR and the National Science Foundation.



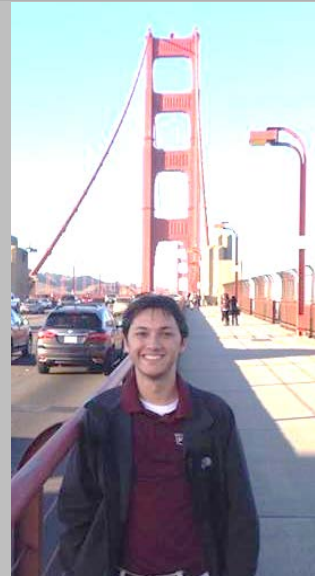
Dave C. Swalm School of Chemical Engineering

2013 AIChE News

Each semester, AIChE hosts a number of meetings for the School of Chemical Engineering. As the School approaches a record undergraduate enrollment (~350 at the beginning of the Fall 2013 term), these meetings serve a critical role in connecting company representatives with our outstanding students, many of whom select participation in the co-operative education program. Historically, around two-thirds of our CHE graduates have co-op experience.



A highlight of our year is the annual AIChE national student conference (this year held in San Francisco). Each year, AIChE chemical engineering student members have the opportunity to earn Service points to attend conferences the following year. Costs for attending are supported in large part from the gracious support of Hunter Henry and his family and a growing list of other donors. AIChE student members must have a long-range vision—participating in AIChE service projects one academic year prior to becoming eligible for attending conferences. This policy helps students to plan ahead and to understand that a commitment to AIChE and to the community is an extended commitment. Recent venues have included Pittsburgh, Salt Lake City, Philadelphia, Minneapolis, San Francisco, and Cincinnati. At conferences, we get to interact with CHE students from around the country and around the world. Great networking opportunities exist. Career workshops, research poster and paper competitions, the AIChE car competition, and more are just a sample of things going on—plus the chance to enjoy great cities and venues.



AIChE Mummy Wrap Booth October 2013.

AIChE participates in the annual community Halloween Carnival sponsored by MSU student activities and held at the Junction. We always host the “Mummy Wrap Booth” allowing Trick-or-Treaters to either wrap an AIChE member or be wrapped in tissue paper. It is always a BIG hit with both AIChE participants and the children in the community.





Dave C. Swalm School of Chemical Engineering

2013 AIChE News



AIChE sponsored a LEGO Robotics day for Camp Jigsaw—a summer camp for students on the autism spectrum. Fifteen camp participants greatly enjoyed the hands-on learning experience. Eight AIChE students and Dr. Elmore directed the mornings activities. AIChE provided refreshments for the camp participants and counselors.

AIChE students are active in many extracurricular activities. Our AIChE members span a wide array of activities across the MSU campus and community. For example, Rachael Fouason (a sophomore and AIChE representative to the Engineering Student Council—here shown throwing the frisbee) is an active leader on the women's Ultimate Frisbee team.



AIChE Sponsored a LEGO Robotics day for the West Point middle and high school Upward Bound program (a program for encouraging underserved minorities in STEM). Students enthusiastically participated in the day's activities. Five AIChE students and Dr. Elmore provided guidance for the program participants and served pizza for the student participants and counselors.

Each summer the Bagley College of Engineering hosts a three week engineering camp for rising seniors considering study in engineering (four pictured here with Dr. Elmore). These students participate in research activities throughout the college in degree programs of their choosing. For a number of years, AIChE has hosted these engineering campers at an AIChE picnic. This provides an excellent opportunity for our own chemical engineering students to mix with the Quest campus. As a result, several Quest campers have joined the School of Chemical Engineering over the years and have become some of our top chemical engineering graduates.



21 students participated in the MSU Maroon edition Habitat for Humanity house this fall.





Dave C. Swalm School of Chemical Engineering

Robert Green

B.S. 1982, M.S in Mechanical Engineering 1984

Robert, who currently serves as the Undergraduate Coordinator for the James Worth Bagley College of Engineering, was recently promoted to Captain in the US Navy Reserve. He is also the President of the National Society of Professional Engineers. However, for those of you who know him, he's proudest of his soon-to-be title as "Grandad".



Alumni News



Mike McCardle

B.S. 1991

Mike McCardle and kids participated in the Annual Warrior Dash in the Jackson area earlier this year. Mike is shown at far left with his daughter, Hannah, and his son, Nick, is shown at left. It would appear that they are all in need of a good "hose down"!



Lauren Welch

B.S. 2007

Lauren has been recognized by the Society of Manufacturing Engineers as one of "30 under 30". Please see the story at the web address:
<http://www.sme.org/welch/>.



John Harden

B.S 2002, Ph.D. 2006

It's been a busy year for the Harden family. I am still employed by Albemarle but recently accepted a September 2013 transfer from Magnolia, AR to Baton Rouge, LA. I am now a manager in the Technology Resources group at our Process Development Center site. And if a relocation alone wasn't enough excitement, we recently became a family of four. My wife Grace, my 2-year old daughter Ella, and I welcomed Mitchell John Harden into the world on October 18, 2013.



So it's all been chaotic but a lot of fun too. And we still managed to make it up to Omaha for the National Championship Series. Hail State!



Dave C. Swalm School of Chemical Engineering



Katherine Taconi
B.S. 2000, Ph.D. 2004

We are currently residing in The Woodlands, TX, and after three moves in less than three years, hope to make this our permanent home! Since December 2012, I have been working as a Patent Liaison in the intellectual property group at



Chevron Phillips Chemical Co. Who knew patent prosecution could be so exciting?!? My son Nikolos (age 8) and I are enjoying life in Texas. We were able to attend the MSU/OSU game at Reliant Stadium and the MSU/TAMU game in College Station. Our home is always open to CHE friends visiting the area, so please let me know if you are ever in the Houston area!

Alumni

News



Jacob Palmer
B.S. 2002

I continue to work for the Dow Chemical Company as the Chicago Hub's Responsible Care Leader. It has been a fun transition from working at a large Dow site on the US Gulf Coast for the past 10 years to moving up to the Chicago area working at 6 small sites. It has been a great growth opportunity for me and I'm proud to help ensure the environmental integrity of these sites and the safety of each and every employee!

The most exciting news for my family, though, has nothing to do with work. My wife and I welcomed our new TWINS in August. Benjamin and Abigail have completely changed our lives for the better. They are such a joy and a blessing and I've loved experiencing them grow and develop. I look forward to each of their "firsts" that will happen over the next several months and years. They are a handful but I certainly wouldn't go back to life without them for anything!



Director's Note

Dear Alumni and Friends - 2013 has been a year for family in the Dave C. Swalm School of Chemical Engineering. We were saddened by the passing of Dr. Rebecca Toghiani. She came to Mississippi State in 1989 and served as an excellent teacher, researcher, and mentor to the thousands of students who took her courses. Her contributions at Mississippi State have led to being named Professor of the Year, the Outstanding Faculty Woman Award, the John Grisham Master Teacher Award, and the Bagley College of Engineering Career Award. Her research grants spanned a range of chemical engineering subjects. These include the thermodynamics of mixtures, where she developed a state of the art facility for VLE measurement. She expanded our collective expertise in solubilities in inorganic systems, including double salt chemistry, high ionic strength solution chemistry, computational chemistry, density functional theory, and legacy nuclear waste remediation.

We also said good-bye to Dr. Rafael Hernandez who departed to become Department Head of Chemical Engineering at the University of Louisiana at Lafayette. During his MSU career, he had over three dozen journal publications, and supervised or co-supervised the completion of 6 PhD and 5 MS degrees. He will maintain his collaboration with the Renewable Fuels Laboratory at Mississippi State with his friend and colleague Dr. Todd French.

On a positive note, we welcomed the addition of Dr. Neeraj Rai as an Assistant Professor. Neeraj completed his PhD in chemical physics at the University of Minnesota and served two postdoctoral appointments at the University of Notre Dame and the University of Delaware. Neeraj has begun a \$195,138 project from the National Science Foundation on Monte Carlo Methods for Reactive Phase and Sorption Equilibria and is teaching the graduate level thermodynamics course during his first semester as a Bulldog.

A year ago, I reported that the school surpassed an undergraduate enrollment of 300 students. Our undergraduate family is now over 330 students. We continue to have excellent participation in the AIChE student chapter, and the chapter won the 13th consecutive Outstanding Student Chapter award from the institute due to their participation in university life and in community service projects. Our research and graduate programs have also seen growth in 2013. We presently have 11 MS and 14 PhD students in our program. In 2013, our alumni added to some existing endowments and pledged support for some new ones. If you would like to provide support, consider fund# 501668 for the AIChE student chapter endowment, fund #310502 CHE advancement fund for department operations, or fund # 402719 for the Rebecca Toghiani Memorial Scholarship.

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

