

SPRING 2012

CLEMSON

CHEMICAL AND BIOMOLECULAR ENGINEERING

Message from the Chair:



Dear Alumni and Friends of the Department:

Congratulations go to Prof. Amod Ogale, who this past April was named a Fellow of the Society of Plastics Engineers (SPE). This is the highest award that is bestowed on an SPE member and is given in recognition of the awardee's significant contributions to polymer science and engineering.

The spring semester began with the addition of our third new faculty member in the last two years – Dr. Sapna Sarupria. After completing a post-doctoral appointment at Princeton University, Prof. Sarupria began her faculty career here at Clemson and taught our sophomore-level course on Fluid Flow and Heat Transfer. Her research interests are molecular modeling, statistical mechanics, biological self-assembly, and water and hydration phenomena. This summer, Prof. Sarupria will have five undergraduates conducting research in her lab. In fact, our three newest faculty members – Professors Roberts, Getman, and Sarupria – will have a total of 13 undergraduates working in their labs this summer, and many will continue working on research projects through the subsequent academic year. And this does not include about a dozen additional undergraduates who will work in the labs of our senior faculty.

Moreover, Professors Scott Husson and Chris Kitchens will be leading a Research Experiences for Undergraduates (REU) program funded by the National Science Foundation. The REU program, now in its second year, is focused on Advanced Functional Membranes and involves 10 undergraduates per year from across the country. Additionally, it is noteworthy that seven out of our 36 seniors graduated in May with Departmental Honors, which requires two semesters of research documented in a senior thesis.

All of these experiences reinforce our commitment to providing “engagement” opportunities for students, a key feature of the University's Plan 2020.

Please enjoy all of the features in this newsletter.

Best regards,

Doug Hirt
Professor and Chair

New Faculty Member

Dr. Sapna Sarupria



We are pleased to announce the addition of Dr. Sapna Sarupria to the Department of Chemical & Biomolecular Engineering this Spring.

Dr. Sarupria received her B. Tech degree from Chaitanya Bharathi Institute of Technology in Hyderabad, India, M.E. degree from Texas A&M University, College Station, and Ph.D. degree from Rensselaer Polytechnic Institute, all degrees in Chemical Engineering.

She was a postdoctoral researcher at Princeton University before joining Clemson University in Spring 2012.

Dr. Sarupria's research focuses on studying problems relevant to bioengineering, energy, and the environment at the molecular level using molecular modeling and computer simulations. Her current work involves understanding liquid-to-solid transitions in aqueous systems, specifically nucleation of ice and gas hydrates, and developing computationally viable models to study the self-assembly of virus capsids.

Sustainable interest is the core of Dr. Sarupria's teaching philosophy. Sustainable interest involves sparking the interest of the students such that they acquire the confidence, enthusiasm, and intuition to tackle problems beyond the classroom, and think outside the box.

Her teaching interests include thermodynamics, statistical mechanics, and molecular modeling of complex systems. She recently finished teaching our Fluid Flow and Heat Transfer course to chemical engineering sophomores.



DR. JAMES GOODWIN RETIRES



The Department of Chemical & Biomolecular Engineering celebrated the retirement of Dr. James Goodwin on March 1st with a reception in his honor. Professor Goodwin joined our department in August 2000 and was our Department Chair until 2009. He is a Clemson alumnus and graduated with a B.S. in Chemical Engineering in 1967. From there, he received his Masters Degree at Georgia Tech and his Ph.D. from the University of Michigan. Before coming to Clemson in 2000, Dr. Goodwin was a Professor in the Chemical Engineering Department at the University of Pittsburgh for 21 years. Dr. Goodwin's research interests were heterogeneous catalysis and kinetics. During his tenure here at Clemson, he was awarded numerous major research grants, including a \$2 million grant from the U.S. Department of Energy to fund hydrogen R&D.



During his career, Dr. Goodwin mentored and graduated 40 Ph.D. students, and authored 230 peer-reviewed journal publications. As Department Chair, Dr. Goodwin worked with the faculty to achieve many significant accomplishments, including streamlining the undergraduate curriculum, transitioning to a graduate program that consists predominantly of Ph.D. students, and building new laboratory space for undergraduate and graduate researchers.

His expertise and talent will be sorely missed. We wish Dr. Goodwin and his wife, Carol, a very happy retirement!!



DR. OGALE RECEIVES SPE AWARD



Prof. Amod Ogale (Chemical Engineering) was awarded the status of Fellow by the **Society of Plastics Engineers (SPE)** at its recent Annual Technical Conference (April 2012, Orlando). He was presented the award by SPE President Russell Broome. The Fellow status is reserved for those individuals who have demonstrated outstanding contributions in the field of polymer science and engineering. The Society has only 289 Fellows out of its total membership of over 15,000. Prof. Ogale was one of only three members awarded the status this year for his contributions in polymer-derived films, fibers, and composites. Recently, he was also recognized as the *Graffin Lecturer* by the American Carbon Society. The award is in honor of George D. Graffin, a pioneer in natural graphite, and is awarded each year to an individual who has made distinguished contributions to the field of carbon science and engineering.

Prof. Ogale has been on the Clemson University Chemical Engineering faculty for over 25 years, and also serves as Director of the Center for Advanced Engineering Fibers and Films. He has published over 125 papers in refereed journals and conference proceedings, and has served as the PI or co-PI on more than 50 research grants worth over \$6 million.

FACULTY HIGHLIGHTS



Prof. David Bruce was recognized as Researcher of the Year for 2011-2012 by the Clemson Chapter of Sigma Xi. This award is in recognition for outstanding productivity in scientific research at Clemson University.



Prof. Scott Husson was appointed Associate Editor for the journal Separation Science and Technology. He also was elected as Treasurer for the North American Membrane Society.



Professor Chris Kitchens was recently promoted to **Associate Professor with tenure**. Dr. Kitchens joined our department in 2006 as an Assistant Professor. His teaching interests are in thermodynamics, nanotechnology, and green engineering, and his research involves design of advanced materials for clean and efficient energy applications through technological developments in nanotechnology, renewable resources, membranes, and smart materials. Congratulations to Dr. Kitchens on this significant accomplishment!

Prof. Anthony Guiseppi-Elie, has been named General Symposium Chair of the 15th IUPAC -ACS Symposium on MacroMolecular Complexes, which will be held in Greenville and Clemson on August 13-16, 2013. The conference will feature a plenary address by Prof. Cato Laurencin and features an invited lecture by Clemson's own Prof. Joe Thrasher (Chemistry). Prof. Guiseppi-Elie is assisted by Prof. Steve Creager (Chemistry) who serves as Chair of the MMC-15:2013 Local Organizing Committee. Also, Prof. Guiseppi-Elie has been named one of five distinguished lecturers by the IEEE - Engineering in Medicine and Biology Society (EMBS) for 2012-2013 and as such is designated to represent the IEEE-EMBS nationally in giving lectures in such frontier topics as molecular bioelectronics, implantable biosensors, and bio-interfaces for enabling bionics.



For 2011 High-Performance Fibers Conference organized by CompositesWorld (November 2011, Charleston), **Prof. Ogale** was invited to open the event by conducting a three-hour workshop on "Carbon Nanotubes and Nanofibers: Modification of Electrical Properties of Polyolefin and Thermotropic Liquid Crystalline Polymers". Prof. Ogale also presented an invited talk on the same topic at the International Multicomponent Polymers Conference IMPC 2012 (March 2012, Kottayam).

Profs. Mark Thies and Amod Ogale were this year's recipients of the College's Leadership and Service Award which was presented to them at the College faculty meeting on May 10th. They are recognized for their outstanding efforts in organizing and hosting the Carbon Conference.



ChBE PROFESSIONAL ADVISORY BOARD

The Department of Chemical and Biomolecular Engineering is proud to recognize the following members of our department's Professional Advisory Board. We would like to acknowledge and thank them for their time, efforts, and expertise in helping us define and refine our future goals and objectives. Thanks again!

Hunter Harris

Operations Director
MWV Specialty Chemicals
N. Charleston, SC
B.S. Clemson - 1978
M.S. Clemson - 1980

Doug Haugh

Executive VP and CIO
Mansfield Oil Company
Gainesville, GA
B.S. Clemson - 1994

Gary Hayes

Global Process Platform Leader
Sealed Air
Technology & Innovation
Duncan, SC
B.S. Missouri-Rolla - 1983
M.S. Clemson - 1989
Ph.D. Clemson - 1993

Monty Heins

Technology Director
Oxygenated Solvents &
Performance Monomers
Dow Chemical Company
Deer Park, TX
B.S. Clemson - 1986

Patrick Hickey

President and COO
Merichem Company
Houston, TX
B.S. Manhattan College - 1989
Ph.D. Clemson - 1993

Jackie Moxham

Principal Scientist
Global Regulatory Chemistry
Manufacturing & Controls
Pfizer Inc.
Groton, CT
B.S. Clemson - 1992
M.S. Clemson - 1994

Jennifer Peavey

Innovation Manager
Eastman Chemical Co.
Kingsport, TN
B.S. Clemson - 1992
M.S. Clemson - 1993

Deborah Savage

Independent Environment
Consultant
Arlington, MA
B.S. Clemson - 1984
Ph.D. MIT - 1992

Andrew Zydney

Department Head and
Walter L. Robb Family Chair
Dept. of Chemical Engineering
The Pennsylvania State Univ.
University Park, PA
Ph.D. MIT - 1985

STUDENT HIGHLIGHTS



Senior, Adam Klett, on graduation day, May 11th.

ChBE sophomore **Julie Robinson** was named **Honorable Mention for the Barry M. Goldwater Scholarship**. Julie works with Prof. Scott Husson on the development of adsorptive membranes for protein purification

Senior **Adam Klett** was invited to attend the **7th Annual Meeting of the Minds** at Virginia Tech and sponsored by the ACC. He gave an oral presentation titled "Liquid-Liquid Equilibrium Compositions of the Iodine-HI-Water System of the Sulfur-Iodine Cycle at Elevated Temperatures and Pressures". Adam conducts undergraduate research with Prof. Mark Thies.

Alexandra Kleven was this year's recipient of the **AIChE Donald F. Othmer Sophomore Academic Excellence Award** for the Clemson student member who attained the highest grade point average during the freshman and sophomore years.

ChBE senior **Scott Kwarsick** was the 2012 recipient of the **Western SC Section AIChE Scholastic Achievement Award** given to the graduating senior holding the highest grade point average.

The ChBE Department selected Ph.D. student **Mary Mitchell** as its **Outstanding Teaching Assistant** and Ph.D. student **Nolan Wilson** as its **Outstanding Graduate Researcher** for the 2011-12 academic year.

On June 8th, several of our PhD students traveled to Columbia, South Carolina, to participate in the Clemson University-University of South Carolina Chemical Engineering **Graduate Student Research Symposium**. The event, held at South Carolina's Swearingen Engineering Center, focused on several key areas in Chemical Engineering, including catalysis, biomaterials, thermodynamics, polymers, and nanomaterials. Presentations were given by Dr. Jeffery Miller, the keynote speaker and acclaimed researcher in catalysis from the Advanced Photon Source at Argonne National Lab, graduate students from South Carolina, and nine of our students: **David Esguerra, Fiaz Mohammed, Sam Lukubira, Jesse Kelly, Nolan Wilson, Bethany Carter, Mary Mitchell, Julian Velez, and Lizzie Bollman.**



ChBE Grad Students attended the Research Symposium at USC: (Pictured L-R) Sam Lukubira, Fiaz Mohammed, Bethany Carter, Julian Velez, Mary Mitchell, Nolan Wilson, Jesse Kelly, David Esguerra, and Lizzie Bollman.

SCIENCE CAREER EXPO



The Department of Chemical and Biomolecular engineering in collaboration with the Clemson SACNAS chapter participated in the Science Career Expo for the 33rd Annual Biology Merit Exam on April 18th. The SC Life Project organized this activity that hosted 220 middle and high school students. The event excited students and got them interested about science, with the goal of encouraging them to pursue higher education. Jose Orellana, David Esguerra, and Milagro Marroquin (SACNAS chapter members) volunteered at the expo and presented some cool science experiments to the attendees. Experiments included seeing the color of red cabbage juice change with a change in pH, and making CO₂- filled soap bubbles with dry ice. Our stand was one of the few with interactive participation, and it showed the students that science can be fun.



CLASS OF 2012



The Chemical & Biomolecular Engineering Department is proud to recognize the Senior Class of 2012. The students were honored at a Senior Reception on May 3rd at the Madren Center. On graduation day, May 11th, the department hosted an Open House for the graduates and their families. The faculty and staff of ChBE want to wish all of our graduates the best of luck in your future endeavors! Congratulations!

2012 Graduation Candidates Bachelor of Science Degree in Chemical & Biomolecular Engineering

Matthew D. Blackard
Seth A. Broster
Jordan L. Byrd
Scott D. Clary
Kristin M. Conrad
Thomas S. Dyer
Jeannie M. Flick
Charles T. Grimsley
John G. Howell
Benjamin D. Huffer
Michelle M. Huntley
Jeremy T. Kearns

Anne E. Kelly
Brent G. Klaphor
Adam S. Klett
Scott Kwargsick
Spencer C. Mason
George C. Mauger III
Michael A. Mautsar
Michael B. Minor
C. Daniel Mullin
Jeffrey P. Murphy
Thomas A. Odom IV
Malvika A. Ogale

Benjamin D. Rainey
J. Allan Randall, Jr.
Grant A. Robertson
Cyrus J. Saharkhiz
Brittany M. Sedziol
Travis S. Self
Tyler D. Smith
Devon T. Stevens
Scott D. Tryggestad
Austin B. Vernon
Jacob S. Waters
Daniel A. Wurst



ALUMNI REUNIONS



The Chemical & Biomolecular Engineering Department was honored to host the Class of 1962 for their 50th Anniversary Reunion on June 8th! They spent the day reminiscing, touring Earle Hall, and enjoying lunch and dinner together. Pictured above: (First Row, L-R) Wayne Hoard, Don Sheeley, Tommy Simpson, John Fogle; (Second Row, L-R) Gib Campbell, Wally Knox, and Braxton Wannamaker. Thank you for taking the time to visit - we hope to see you again soon!!



Henry Pittman (left) from the Class of 1949 enjoyed conversing with Dr. David Bruce during our Alumni Reception, June 8th.



Henry Savage (center) from the Class of 1961 is shown here enjoying the company of Dr. Doug Hirt and Dr. Bud Rice.



It was our pleasure to host the Class of 1963 again this year for their reunion on May 24th and 25th. Pictured (L-R): Wade Ponder, Al Tolson, Judi and Jim Rushton, and John and Carol Cromer. We hope to see you again next year on your 50th!!



Department of Chemical and Biomolecular Engineering
 127 Earle Hall, Box 340909
 Clemson, SC 29634-0909

www.clemson.edu/ces/chbe



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 Biosensors and Biochips
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 Energy
 Kinetics and Catalysis
 Molecular Modeling and Simulation

AICHE SOUTHERN REGIONAL CONFERENCE



Many of our AIChE Southern Regional Conference committee members are shown here after the Awards Banquet:
 (L-R) Dylan Bruckner, Anne Kelly, Dr. Hirt, Jeannie Flick, George Mauger, Ron Lindsey (speaker-Eastman Chemical), Malvika Ogale, Grant Robertson, and Hanna Aucoin.

Clemson University's AIChE Student Chapter hosted the 2012 Southern Regional Student Conference, which was held March 30th through April 1st at the Madren Conference Center. The event was represented by approximately 40 universities and companies encompassing 500 student, faculty, and industry participants. The events ranged from social and professional networking opportunities to ChemE Car, technical paper, and poster competitions.

Our AIChE Chapter received many compliments from the visiting universities and companies for putting on such a successful event!!



The University of Puerto Rico is shown here after winning the ChemE Car Competition.



Dr. David Bruce, Scott Kwargsick, and Grant Robertson helping out at the ChemE Car Competition.



All of the participants enjoyed the competitions and the chance to meet their peers from the universities in the Southern Region.

