Dear Friends,

We look back on a busy and eventful year. The biggest event of the year was the April 20 Deepwater Horizon incident leading to the Macondo well blowout. Several Tulane departments, with Chemical & Biomolecular Engineering prominent among them, worked energetically to address both immediate and long-term research issues in response.

Campus-wide planning for the research required by this accident included meetings with federal officials and external research collaborators. CBE faculty appeared on local media discussing the basic technical issues for the public.

Vijay John, with Arijit Bose of the University of Rhode Island, organized a National Science Foundation funded workshop in September 2010 involving about 50 scientists and engineers in defining research needs for dispersant materials employed in such spills.

As the year 2010 closes, we look forward to a culmination of the planned Gulf of Mexico Research Initiative based on a ten-year commitment of funding by BP for scientific research at academic institutions of the US Gulf Coast states.

In more local news, Hank Ashbaugh and W T. Godbey were promoted to the rank of Associate Professor with tenure. This is a well-deserved recognition of their contributions in teaching, research, and service to our community, university, and department. We appreciate the hard work their accomplishments reflect, and look forward to more growth for them and for the department.

Finally, the Francis M. Taylor Laboratory project, [now the Donna and Paul Flower Hall], seems more tangible than ever. With additional donations and in-kind contributions, plans have expanded and intensified over the past year, and we look forward to ground-breaking in a matter of months. As this project enters an official active stage, we continue to seek funding from our alumni to bring it to completion.

Lawrence Pratt
Interim Chair

Vijay John, Kyriakos Papadopoulos, Lawrence Pratt and Noshir Pesika teamed up with LSU professors Louis Thibodeaux and Kalliat Valsaraj, to draft an article that explores key issues related to the April 2010 Gulf of Mexico Macondo well oil spill. The paper “Marine Oil Fate: Knowledge Gaps, Basic Research and Development Needs; A Perspective Based on the Deepwater Horizon Spill” was published in the Feb. 1, 2010 edition of Environmental Engineering Science. It focuses on what chemical engineers and environmental engineers can do to identify and solve problems related to the spill and proposes the need for predictive modeling tools to direct oil remediation resources, for risk assessment and to project ecological damage.

Read more at - http://tulane.edu/news/newwave/022311_disaster.cfm
Faculty News

**Hank Ashbaugh** developed a service learning class "Chemistry and Engineering Science in the Community," with Scott Grayson (Chemistry). Tulane undergraduates who participate in the class explain everyday uses of the scientific method to 10th to 12th graders at New Orleans School of Science and Math high school. Hank also serves on the executive board of the Center for Public Service advising on service learning activities across the university.

**Vijay John** was honored as a School of Science and Engineering Outstanding Researcher during a ceremony in April 2010.

The Award is given according to the following criteria:

- The quality and quantity of publications, with particular emphasis given to archival publications, research treatises and citations of published work.
- The total amount of research funding.
- The contributions to the mission of the university in graduate education, training and mentoring, including graduate students and post-doctoral scholars.
- National and international recognition as evidenced by honors and awards, journal editorships and participation in editorial boards, national and international scientific committees and boards, and professional patents.

**Vijay** arranged a workshop for the National Science Foundation at the AIChE Annual Meeting. And in Dec. 2010, he attended the US-India Collaborative Workshop on Chemical Engineering Aspects of Energy and Environmental Security in New Delhi.

**Brian Mitchell** was elected to the Executive Boards of the Association of Graduate Schools (AGS) and the Conference of Southern Graduate Schools (CSGS), and to the Nominating Committee of the Oak Ridge Associated Universities (ORAU).

**Kim O’Connor** and her graduate students published their research on adult stem cells in the journals Stem Cells, and In Vitro Cellular and Developmental Biology. The former was among the top 50 downloaded articles in Stem Cells in March 2010. She presented these results at an invited seminar on this topic at City College of New York, a speech at the American Institute of Chemical Engineers, and poster at the International Society for Stem Cell Research in San Francisco.

**Vijay John** organized a workshop on the Science and Technology of Dispersants, in Arlington, VA, sponsored by the National Science Foundation in September 2010.

The workshop was attended by 37 formal attendees representing researchers from academia, industry and government laboratories. In addition, program directors from the National Science Foundation and the Environmental Protection Agency were invited to attend.

According to John, all academic participants are now conducting research that will lead to improved dispersants.

Read more on Research.gov
**Undergraduate Awards**

CBE junior, **Daniel Fagnant**, won the **AIChE Activity Award** for outstanding services to the profession.

The **AIChE Senior Scholarship Award** was presented to **Adam Pocsi**, the senior with the highest scholastic average.

**Stephanie Childress and Jason Hulin**, won the **AIChE award for a junior with the Highest Scholastic Average**.

Senior, **Jennifer Staton**, won the **Francis M. Taylor Award** for outstanding citizenship.

**Eric V. Schexnayder** and **Andrew Kronfol** received the **Randall K. Nichols Award** for juniors with talents worthy of recognition and encouragement.

Omega Chi Epsilon members chose **Kyle Schiber** as the member who best exemplifies the ideals of OCE.

Lalitanand Surampudi, was chosen by undergraduate students as the **Outstanding Teaching Assistant**.

**Bryan Yonemoto** was presented the **American Institute of Chemists outstanding senior award**.

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**Virginia A. Davis** (MSE ’93), an associate professor in the Department of Chemical Engineering in Auburn University’s Samuel Ginn College of Engineering, is among 85 researchers named by President Barack Obama to receive the prestigious Presidential Early Career for Scientists and Engineers Award, the highest honor bestowed by the U.S. government on early-career researchers.

Davis, who earned a doctoral degree in chemical and biomolecular engineering from Rice University in 2006, joins 18 other National Science Foundation recipients of the 2010 PECASE Award.

Davis is recognized for innovative research to advance the understanding of nanomaterials as well as their dispersion, microstructure, processing and properties on a macro scale. She was also honored for engaging in outreach activities involving K-12 students from underrepresented groups.

*Adapted from Auburn University Samuel Ginn College of Engineering News*

**Mohit Singh** (PhD ’04), was the recipient of the 2010 **School of Science and Engineering Outstanding Young Alumnus** award. The [SSE alumni awards](#) honor graduates who through “exemplary accomplishments and recognition epitomize the potential of a Tulane education and thereby bring credit and honor to the university and school.

“Singh is the founder, and Director of Technology at Seeo, a Berkeley start up developing a new class of high-energy rechargeable lithium batteries that offer unprecedented safety and lifetime. With support from Silicon Valley’s top venture firms (Khosla Ventures, Google.org) and the US Department of Energy, the team at Seeo is moving toward revolutionizing electricity storage and delivery.”

The awards were presented during a ceremony at the Lavin-Bernick Center for University Life in April 2010.

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**Byran Yonemoto** (BS ’10), a graduate student in chemical engineering at the University of Delaware is a winner of the [National Science Foundation’s Graduate Research Fellowship](#).

“The NSF Graduate Research Fellowship is among the nation’s premiere awards for outstanding graduate students and a great predictor of future success in the scientific, technology, engineering and mathematics workforce,” says Charlie Riordan, vice provost for graduate and professional education at UD.

The prestigious fellowship includes a three-year annual stipend of $30,000 along with a $10,500 cost-of-education allowance for tuition and fees, opportunities for international research and professional development, and the freedom to conduct research at any accredited U.S. institution of graduate education.

*Adapted from UDaily News, University of Delaware, April 19, 2011*
Staff Accolade

CBE staff member, **Brett Tribou**, received a **Tulane Staff Excellence Award** for humanitarianism in Dec. 2010. Tribou received a unanimous nomination from members of the CBE department as well as nominations from other staff members in the School of Science and Engineering.

CBE Alumni in Public Service

**Scott Eklund** (BS ’02) and **Carrie Giordano Eklund** (BS ’03) returned to the states last fall following two years with the Peace Corps in Jamaica. After graduating from Tulane the couple worked several years in industry, then decided it was time to contribute in another way.

“We wanted to do something that would be giving back,” Scott said.

They worked on a variety of projects within fishing and agriculture communities near the Caribbean Sea, including some areas that were extremely poverty stricken.

Carrie partnered with a local school where she implemented and ran adult literacy classes, developed materials to promote health education and designed and began construction on a bathroom for the school.

Scott’s responsibilities included making improvements to drinking water and sanitation systems and working with the Ministry of Health to track disease outbreaks using Geographic Information Systems and data analysis.

His most substantial project involved obtaining more than $100,000 in U.S. grant funding to build four 100,000-gallon reservoirs to collect rainwater and one to harness spring water. Scott and Carrie settled in Kalispell, Mont., where Carrie is a high school math teacher, and Scott works as an environmental specialist with the Montana Department of Environmental Quality. In October 2010, they welcomed a son, Oliver James, into their family.

**June Naiki** returned to the US in the summer of 2010 from a year in service with the Japan Exchange & Teaching (JET) program, an initiative to promote internationalization in local Japanese communities.

At Hitachi First Senior High School in Hitachi City, Naiki taught English classes, emphasizing conversation skills necessary for communication with a global community, and coached students in preparation for speech and essay contests.

Naiki said he never imagined himself as an English teacher in Japan, but found the experience very rewarding.

One of Naiki’s first assignments was to train students for the 2009 Model United Nations (MUN) in London, England. He helped students research, organize papers and notes, and write and practice speeches.

During his assignment, Naiki enjoyed learning the culture and language of his parents, who are both from Japan, and spending time with family members still living there.

Now that he’s back in the New Orleans area he plans to pursue his career goals in the field of chemical engineering.
W T. Godbey has developed a treatment for cancer using an expression-targeted gene delivery method which causes apoptosis in cancer cells while sparing surrounding healthy cells.

The method takes a gene from a cancer cell, extracts the current DNA message and replaces it with a code that instructs the cell to kill itself.

Tumors are destroyed layer by layer from the outside in and because his method targets only the COX-2 expressing genes in cancer cells there are no bystander effects that result in damage to healthy tissue.

The targeted treatment has been proven successful on several carcinomas. Most recently, the gene therapy was shown to have exceptional cancer-killing actions when tested on bladder cancer in mice.

Vijay John is among more than 150 recipients of National Science Foundation Rapid Response Research (RAPID) grants to study the impact of oil that spewed from the Macondo oil field into the Gulf of Mexico after the explosion of the Deepwater Horizon drilling rig.

John is studying the characteristics of the tiny droplets that form when dispersants are used to break up oil under the high pressures and low temperatures in the deep water at the well head.

John also will test biodegradable surfactants and novel particles for possible use as dispersants, and the implementation of emulsions that would deposit the oil as sediment to the ocean floor where it could be biodegraded.

Read more at - http://tulane.edu/news/newwave/091010_oilresearch.cfm

Noshir Pesika has developed a new type of reusable polymer-based dry adhesive structure that mimics the gecko adhesive system. Geckos attach with fine protein based fibers that extend from the skin on their toes. These setae are approximately 20 times thinner than human hair and branch off into 100-1,000 pad-like spatulae.

Geckos have been found to stick not by suction, or capillary forces, or by sticky substances on their toes, but by weak electromagnetic forces called van der Waals interactions.

Pesika’s technology uses soft plastic fibers, five times thinner than a human hair that extend from a surface. The ends of the fibers have pad-like structures that are as thin as the gecko setae.

An innovative and simple technique Pesika designed incorporates tilt in the hairy fibers. The angled fibers more closely duplicate the natural curve of the gecko hairs, which exploits friction forces to enhance adhesion.

It is the force of millions of nanoscale "split hairs" contacting a surface at once that gives the gecko a grip so strong it can hold its own body weight by a single toe.

Pesika anticipates dry adhesives may be used as self-stick notes and page tabs that would not leave a residue, as bandages that would not fall off when wet, and a novel use – as adhesive pads on astronaut’s shoes.

Dry adhesives have an advantage over traditional "sticky" adhesives, Pesika says, because they are a solid material that would not collect dirt and would still adhere in water or in space, where glue would evaporate.

Spring 2011 Undergraduate Awards

CBE senior, Kristy L. Nguyen, won the AIChE Activity Award for outstanding services to the profession.

The AIChE Senior Scholarship Award was presented to Jason Hulin, the senior with the highest scholastic average.

Beau Pritchett, won the AIChE award for a junior with the Highest Scholastic Average.

Senior, Rachel Simmons, won the Francis M. Taylor Award for outstanding citizenship.

Robert Debenedictis and Shin (Michelle) Park, received The Randall K. Nichols Award for juniors with talents worthy of recognition and encouragement.

Omega Chi Epsilon members chose Stephanie Childress and Andrew Kronfol as the members who best exemplify the ideals of OCE.

Jaspreat Arora, was chosen by undergraduate students as the Outstanding Teaching Assistant.

Eric V. Schexnayder was presented the American Institute of Chemists outstanding senior award.

Professor John Prindle, Jr. was chosen by CBE undergraduates as the R.V. Bailey Teacher of the Year for 2010 and 2011.
Outreach

In April 2011, about 80 high-school students were involved in events organized by Noshir Pesika and Lawrence Pratt as part of a National Science Foundation EPSCoR, LA-SiGMA grant.

CBE graduate students demonstrated the use of research tools involved in the grant to 9th, 10th and 11th grade students from Abramson Science and Technology Charter School. More photos and information can be found on the LA-SiGMA Facebook page - http://www.facebook.com/pages/LA-SiGMA/181832115184988.

Program Offers Lab Experience to Minority Students

Noshir Pesika, Brian Mitchell and Vijay John hosted undergraduates from New York, Tennessee and Louisiana through the Louis Stokes Louisiana Alliance for Minority Participation in the Summer of 2010. The students got hands-on research experience in School of Science and Engineering laboratories during the ten-week summer program that was funded by the National Science Foundation and Louisiana Board of Regents.

Kejia Jin (right), a graduate student in Noshir Pesika’s lab, hosted Ashley Scott, a junior at the University of Tennessee, during the summer program.

Ashley (left) won 1st place in the LS-LAMP program’s poster presentation for her poster, "The Effect of Polymer Stiffness on Adhesion and Friction of Gecko-like Adhesives."
Graduate Degrees Conferred

2009-2010
Bonnie L. Barrilleaux (Ph.D.)
Qingkai Meng (Ph.D.)
Ashishvikas Sangwai (Ph.D.)
Jingjing Zhan (Ph.D.)
Xiujuan Zhang (Ph.D.)

2010-2011
Stephen Hallmann, (Ph.D.)
Joy St. Dennis, (Ph.D.)

Class of 2010
Michael Armbruster
Christopher B. Bickham
Christopher A. Boustany
Elizabeth A. Bowers
Nicholas J. Collett
LaTaura T. Davis
Daniel Fagnant
Marian K. Gager
Robert M. Gardner
Kyle J. Hoerger
Barry C. Jackson
Arthur C. Manikin
Adam P. Pacsi
Corey E. Pratt
Kyle B. Schiber
Jennifer A. Staton
Arman S. Talwar
Bryan T. Yonemoto

Class of 2011
Redmond Anderson
Stephen Ashe
Cecilia Burns
Stephanie Childress
Jason Hulin
Heather Johnston
Andrew Kronfol
Camilla Munson
Kristy Nguyen
Sarah Oertling
Bryan Raubenolt
Eric Schexnayder
Rachel Simmons
The Distinguished Graduate Student Award was presented to seven CBE graduate students whose research resulted in a first-authored journal publication in calendar year 2010.

At a ceremony in Dec. 2010, Prof. W Godbey presented the award to (L-R) Bhanu Sunkara, Katie Russell, Mangesh Chaudhari, Daniel Balazs, Steffen Hallmann, Yuly (Andrea) Jaimes-Lizcano and Joy St. Dennis (not shown).

Steffen Hallmann and Bhanu Sunkara received the Outstanding Research Award, presented to graduate students who have demonstrated creativity, independence, self-motivation and productivity.

Katie Russell and Joy St. Dennis received the American Institute of Chemists Outstanding Graduate Student award.