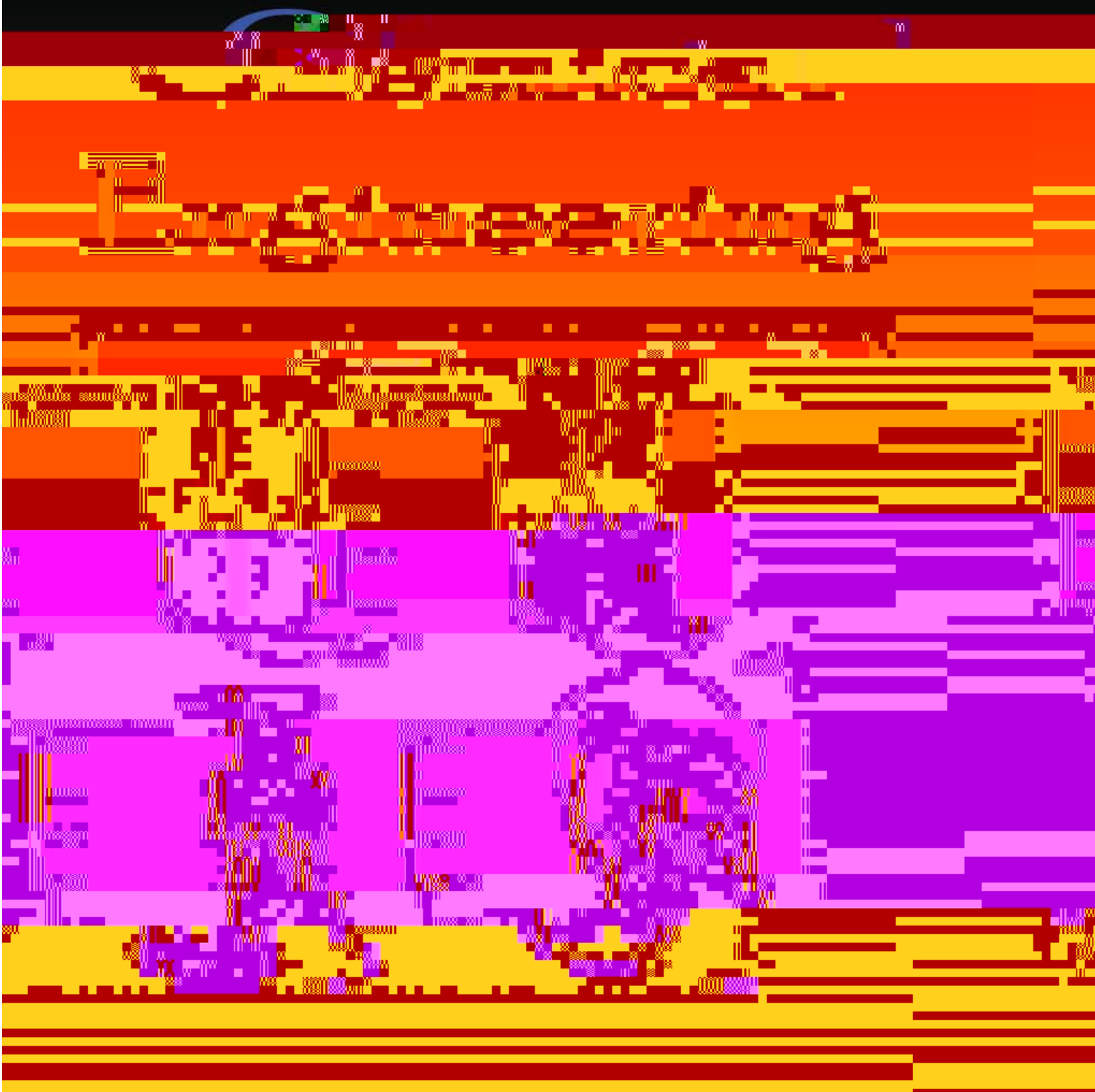


Alumni Newsletter
Volume 22
Fall 2005/Spring 2006



**CAIN DEPARTMENT OF
CHEMICAL ENGINEERING**

LOUISIANA STATE UNIVERSITY

Letter from the Chair



Air Products
Albemarle
American Geological Institute
BASF
Borden Melamine Chemical
BP Amoco
Celanese Chemicals
Chevron Texaco
Chevron Oronite Company
ConocoPhillips
The Dow Chemical Company
DuPont
Emerson Process Management

ExxonMobil
Gaylord Chemical Corporation
Honeywell
IMC Global



New Faculty

The Department is pleased to announce the hiring of **James E. Henry** as an assistant professor and Cain Professor #2. Henry comes to

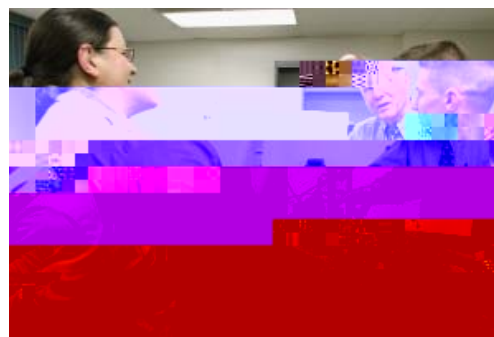
Professor Researches Green Propellant

Ever since the Columbia shuttle disaster in February 2003 (as well as other disasters like it), the U.S. military has embarked on a mission to discover a safer, more environmentally-friendly propellant. One of the major concerns following the Columbia tragedy was the potentially devastating affects of the debris on the people and environment in the areas of the wreckage, specifically the hydrazine. Hydrazine is a toxic, flammable liquid used in the shuttle's propellant and it can cause any number of unpleasant physical ailments according to the U.S. EPA.

One alternative to hydrazine is hydrogen peroxide, which has become the main focus of **Ralph Pike**-Horton Professor in Chemical Engineering and Director of the Minerals Processing Research Institute (MPRI). MPRI and Sierra Engineering, Inc. of Carson City, Nevada, were awarded a grant by the U.S. Army Space and Missile Defense Command to study the thermal decomposition of propellant grade hydrogen peroxide. A major advantage to hydrogen peroxide is that it leaves no pollution as it decomposes since it separates into water and oxygen. Another advantage is that it requires less equipment and parts on a rocket as opposed to other propellants. And, it allows the concentration of stabilizers and corrosion inhibitors to be focused on safer handling of the hydrogen peroxide.

Pike, along with his research team, monitor the rate of decomposition of hydrogen peroxide by heating a drop to 2,500

degrees Fahrenheit while suspended from a fiber optic filament. As the hydrogen peroxide begins to decompose from the heat, the team uses a high-tech camera to video the drop at 30 frames per second. In order to then measure the mass of the drop, a computer breaks down each frame and calculates the diameter changes in the drop. As Pike states, "to understand the behavior of one drop is to understand all drops and how it all works."



Sierra Engineering will take Pike's research and will begin building trial models, which will be built at LSU. After extensive testing and assessment, these models will eventually be incorporated into space vehicles and land-based systems.

Faculty News and Awards

F. Carl Knopf (PI) and **Kerry Dooley** (co-PI) have received funding from the National Science Foundation for their proposal, "Integrating a Cogeneration Facility into Engineering Education." Funding will be for one year (2006-07) in the amount of \$126,000. Kevin Kelly, an associate professor in the Department of Mechanical Engineering, will serve as co-PI as well.

Dooley also served as a co-PI on a NASA subcontract, "Applied Polymer Technology Extension Cooperative," (\$99,800) for the year 2005-06. Paul Russo served as PI for the project with David Spivak and Leslie Butler as co-PIs, all of whom are faculty members in the Department of Chemistry.

Elizabeth Podlaha is a recipient of the 2006 Alumni Association Faculty Excellence Award. This award recognizes faculty members for outstanding teaching, research, and/or service. It consists of a one-time cash award of \$1,000, funded by the LSU Alumni Association. Podlaha, along with other faculty award winners, will be honored by the University at a reception on May 9 at the Lod Cook Alumni Center.

Jerry Spivey

Faculty Publications and Presentations

Kerry Dooley has been involved in the following presentations and proceedings in the past year:

- **K.M. Dooley** (speaker), **A.K. Bhat**, A.D. Roy and **C.P. Plaisance**, “Ketones from Acid/Aldehyde Condensation Using Metal/CeO₂ Catalysts,” 19th North American Meetings, Catalysis Society, Philadelphia, Pennsylvania, 2005.
- J.A. Muss, R.C. Farmer, **R.W. Pike** (speaker), **C.E. O’Quin** and **K.M. Dooley**, “Decomposition Kinetics for Hydrogen Peroxide,” JANNAF 40th CS/28APS/22nd PSHS/4th MMS Joint Meeting, Charleston, South Carolina, 2005.
- **K.M. Dooley** (speaker), “Craft for Macromolecular Creativity - IGERT at LSU,” NSF Southeast IGERT Conference, Chapel Hill, North Carolina, 2005.
- **K.M. Dooley** (speaker), **H.J. Toups** and **D.B. Mowrey**, “Better Integration of Process Design/Control Principles in Engineering Labs,” 2005 AIChE Annual Meetings, Cincinnati, Ohio.
- **A.G. Bussard** (presenter) and **K.M. Dooley**, “Heterogeneous catalyzed polymer hydrogenation in an oscillating microreactor,” 2006 ACS Annual Meeting, Atlanta, Georgia.

Carl Knopf and **Yogesh Waghmare** (Ph.D. student under his direction) published two papers in the March 2006 issue of AIChE Journal and presented two papers at the AIChE meeting in Orlando, Florida in April 2006.

Elizabeth Podlaha and members of her research team have co-authored a book chapter in the newly released, “Nanomaterials Handbook” (edited by Yury Gogotsi). The chapter is entitled, “Electrochemical Deposition of Nanostructured Metals.” Her co-authors include current Ph.D. students-**Yutong Li**, **Alonso Lozano Morales**, **Despina Davis**; former students-**Qiang Huang (Ph.D., 2004)**, **Amrit Panda (Ph.D., 2003)**, and **Zhanhu Guo (Ph.D., 2005)**; and a former post-doctoral assistant, Jianqi Zhang.

Kalliat Valsaraj was an invited speaker at the University of California, Irvine, NSF Environmental Molecular Sciences Institute (EMSI) on atmospheric research in January 2006. His presentation was entitled, “The interactions of gas-phase organic species at the environmental air-water interface.”

Professors Co-author Paper on Hurricane Katrina Floodwaters

Louis Thibodeaux and **Kalliat Valsaraj** were co-authors of an article titled, “Chemical and Microbiological Parameters in New Orleans Floodwater Following Hurricane Katrina.” The article was published in the American Chemical Society’s (ACS) premier journal *Environmental Science and Technology* on chemistry and chemodynamics of New Orleans floodwaters.

Within one week of Hurricane Katrina, a team of LSU researchers in the Departments of Civil & Environmental Engineering and Chemical Engineering were sampling and testing the so-called “toxic soup” waters as seen on national television. In the final analysis the waters were relatively clean chemically with only one metal, Pb, indicating slightly elevated levels. The water sampling also captured the floating oil sheen, which was shown in many live televised images.

Expected to contain elevated benzene and ethylbenzene concentrations because of its suspected gasoline source, the levels were in fact very low. Chemodynamic model calculations indicate that the vaporization half-life of these constituents is of the order of 10 mmoles or less.

In the final analysis the waters were not unlike the chemistry observed in typical storm waters. It was slightly yellow in color with elevated salt content. However, the elevated pathogens counted made it non potable and unsafe for human contact.

The full article, which was one of the most accessed in 2005 on ACS’s website, can be found on the Internet at:
<http://pubs.acs.org/cgi-bin/sample.cgi/esthag/asap/pdf/es0518631.pdf>.

3rd Annual ChE Alumni Reunion

The 3rd Annual Chemical Engineering Alumni Reunion was held on April 1, 2006, outside of the Chemical Engineering Building. This year's menu featured bar-be-que chicken and brisket provided by Bayou Bistro's catering (located in Brusly, Louisiana). Alumni enjoyed visiting with each other as well as professors - both current and emeritus. Attendees were able to view the detailed plans for the new chemical engineering facility as well as tour our existing facilities.

We would like to thank those of you who were able to attend this year's festivities. The faculty and staff enjoyed visiting with you and your families. We hope to see more of you at the next reunion in 2008, which will coincide with the department's centennial celebration.

The following alumni were in attendance:

Nicholas Ashley (B.S., 2004)

Jennifer Bailey (B.S., 2003)

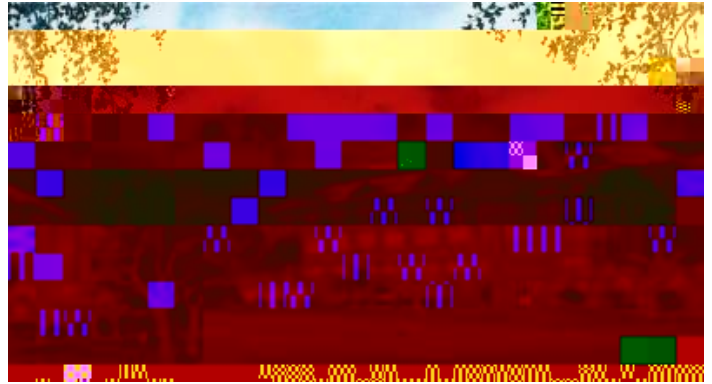
Matthew Balhoff (B.S., 21996; Ph.D, 2003) Themri Buie (I.S., 2198)

John Buie (I.S., 2198)

Robert Hamsn (I.S., 21950; T.J. Twiss (Ph.D, 21955) T.J. Twiss (I.S., 2198)

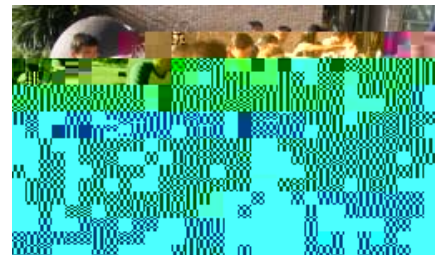
Thodd Marelo (I.S., 21993) Keith Maysux (B.S., 2003)

New Building



Crab Boil

The annual departmental crab boil was held on October 7, 2005. The crab boil is hosted by the graduate students each fall as a welcome to new students and new faculty. The weather was perfect, the food was good, and everyone who attended had a great time.



H. Henry Lamb, Ph.D.

Department of Chemical and Biomolecular Engineering, North Carolina State

Building devices at the nanoscale is challenging because of fundamental physical or material limits and the practical limits of "top-down" fabrication methods. My research focuses on developing new materials and processes to fabricate nanodevices and soft or "bottom-up" techniques that enable self-fabrication.

Nanoscale devices face several low dimensional and quantum effects that were not apparent at the micron scale. Consider the increased effective resistance of CMOS

Michael Janik, Ph.D.

Department of Chemical Engineering, University of Virginia
March 2, 2006

Density Functional Theory Studies of Acid Catalysis and Electrocatalysis

The ability to link the function of catalytic materials to their atomic level structure guides the rational design of new catalysts. Quantum-chemical methods, such as density functional theory (DFT), can be used to determine atomic structures, reaction energies and activation barriers directly from first-principles, thus enabling the creation of structure-function relationships. The application of DFT methods to the study of heteropolyacid catalysts and the electrocatalysis of methanol oxidation at the anode of a direct methanol fuel cell will be discussed.

Heteropolyacids (HPAs), or polyoxometalates, of the Keggin structure ($H_nXM_{12}O_{40}$) have the ability to act as acid and redox catalysts, and their catalytic properties can be tuned by altering the molecular composition. The correlation between different measurements of acid strength and the barriers to carbenium-ion formation were examined to provide perspective on designing an effective solid acid catalyst for the alkylation of isobutane and butene. The application of DFT methods was extended to modeling the electrocatalytic reaction occurring at the anode of a direct methanol fuel cell. The energetics of CO oxidation were explored employing a DFT-based method of simulating the potential drop across the electrochemical double-layer at the solution/electrode interface. This method allows explicit examination of the effects of solution and an applied potential on reaction energies and activation barriers. Once the key factors which impact anode performance are identified, a simpler model examining only gas-phase reaction

Student Highlights

Ph.D. Student Receives Two Travel Awards to Attend International Symposium

Michelle

**Two Graduate Students Receive Prestigious
Research Grant**

Student Awards

Nicholas Ashley, a Ph.D. student conducting his research under co-advisers **Kalliat Valsaraj** and **Louis Thibodeaux**, is a 2006 recipient of a Donald W. Clayton Award from the College of Engineering. This award is presented to engineering students who are pursuing a Ph.D. and also intend to enter academia upon graduation. It is a 3-year award, which provides a supplement of \$10,000 the first year, \$15,000 the second year, and \$20,000 the third year. In addition, Nick is the recipient of the 2006 Seip Award, which is given to the student who scores the highest on the department's Ph.D. Qualifying

2005-06

Scholarship Recipients

O. Dewitt Duncan Scholarship

John L. Bundrick
 William E. Geier
 Landon M. Marchand
 Omkar A. Namjoshi
 Alexander E. Sideris
 Luke J. Stein
 William B. Thomas

Gerard Family Undergraduate Scholarship

Yen Kim Tina Hoang
 Denis Marken
 James B. Michaels III
 Judith A. Udeke
 Andrew P. Wale
 Nadine Yougoubare

I.H. Gottlieb Memorial Scholarship

Christopher Hymel

Clara & Frank Groves, Sr. Undergraduate Scholarship

Jennifer M. Armstrong

R.L. Hartman Scholarship

Christopher H. Boudreaux
 Eric M. Dixon
 Timothy D. Krimmel

Paul M. Horton Undergraduate Scholarship

Daniel A. Fortier
 Richard C. Green

BP Amoco Scholarship

Matthew K. Desmond

Chevron/Texaco Chemical Engineering Scholarship

Matthew E. McCaughey

Summer 2005 Commencement

Bachelor of Science in Chemical Engineering

Denis Ernesto Escobar
 John Michael Holden III
 Charles Anthony Staton

Master of Science in Chemical Engineering

Melanie Krystle Harris
 Andre' Claude Marquette
 Craig Patrick Plaisance

Doctor of Philosophy in Chemical Engineering

Matthew Thomas Balhoff

Fall 2005 Commencement

Bachelor of Science in Chemical Engineering

Cortney Kim Amundson
 Creshaundra Shavan Burns
 Elizabeth Ashley Deshotel
 Daniel Joseph Doody
 William Edward Geier
 Ivan Lloyd Henry
 Christopher David Hymel
 Erica Del Carmen Mapel
 Marty Dustin Nichols
 Jennifer Marie Vicknair (*Cum Laude*)
 Andrew Patrick Wale



Master of Science in Chemical Engineering

Adedeji Ebenezer Agboola



Doctor of Philosophy in Chemical Engineering

Zhanhu Guo



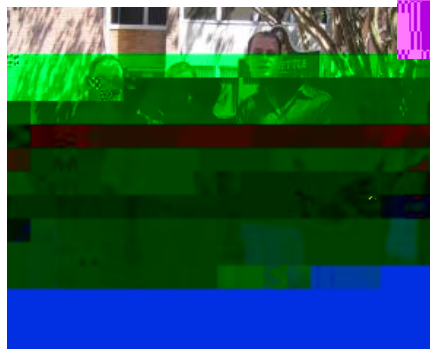
Spring 2005 Commencement

Bachelor of Science in Chemical Engineering

Justin Laine Achord
 Jennifer Michelle Armstrong (*Summa Cum Laude*)
 Michelle Anne Blakeney
 Travis Charles Boudreaux
 Timothy Paul Brignac
 Louis Davis Burton
 Garon Wayne Cadby
 Christopher Daniel Carrington
 Jeremy Michael Cash
 Chase Nicholas Chicola
 Sarah Kaye Christian
 Mark Daniel Cox
 Kurt Paul Davis
 Karan Rajkumar Dawra (*Cum Laude*)
 Courtney Grace Doolittle
 Ryan David Fontenot (*Summa Cum Laude*)
 Jennifer Ryan Friday
 Gabriel Hartman Gattle
 Lindsey Marie Gaunt
 Yasaman S. Ghorashi



Jordan John Guidry
 Gregory Nolan Hercules
 Brandon Jose Iglesias
 Roshaunda Latrice Jackson
 Brady Louis Littleton
 Matthew Edward McCaughey (*Magna Cum Laude*)
 Eric Ryan Merritt
 Jennifer Lynn Montz
 Donald Charles Morris (*Cum Laude*)
 Ashely McCarn Parker
 Scott James Piglia
 Mathew Dennis Rowe
 Alexander Edward Sideris
 William Brandon Thomas
 Mark Bradley Ulicsni
 Utkarsh Ramesh Vasaiwala
 Reid Michael Williams
 Natalie Miller Wood
 Nadine Claude Youghoubare
 Adele Zenide



Master of Science in Chemical Engineering

Marilou Montevirgin Nabatilan



Departmental Awards given at commencement reception:

Jennifer Armstrong (pictured below with Wetzel and Valsaraj) - American Institute of Chemists Award and High GPA Junior Year
Ryan Fontenot - High GPA Senior
Matthew Stephens - High GPA Sophomore

The following students received the Senior Award, which is given to students who complete their studies within four years without dropping a course - **Jennifer Armstrong, Ryan Fontenot, Lindsay Gaunt, Ashley McCarn, Matthew McCaughey, Natalie Miller, Scott Piglia, Mathew Rowe, and Mark Ulicsni.**



Alumni News

Joseph “Guy” Thibodaux, Jr. was one of two LSU engineering alumni to be inducted to the College of Engineering Hall of Distinction at the 27th annual awards banquet held on April 6 at the LSU Faculty Club. Thibodaux, who graduated in 1977, was a member of the Phi Kappa Phi Honor Society and the Eta Chapter of the National Society of Professional Engineers. He is currently a professor of chemical engineering at LSU.

Department Benefits from Sizable Donation

The department is deeply appreciative of the generous gift from **Earnest “Dare” Campbell** and his wife Janie, who donated \$75,000 to the LSU Foundation in order to establish a charitable remainder annuity trust dedicated to chemical engineering.

Campbell earned his chemical engineering degree from LSU in 1949 after serving in the Army Air Corps in World War II. He went to work at Dow Chemical Company following graduation and is now retired.

Alumnus Honored by American Chemical Society

In September 2005, **Kenneth L. Riley (B.S., 1963; M.S., 1965; Ph.D., 1967)** was one of 18 research chemists recognized by the ACS as a “Hero of Chemistry” at the ACS national meeting in Washington, D.C.

The “Heroes of Chemistry” award honors “chemical innovators whose work has led to the welfare and progress of humanity” in a significant way over the past decade. The individuals are nominated by their companies, and the winners are chosen by an ACS panel “in recognition of industrial work that has led to the successful development and commercial sale of a technological product.” This year’s winners are comprised of multidisciplinary teams from six national companies: Colgate-Palmolive, ExxonMobil and Albemarle, IBM, Johnson & Johnson Pharmaceutical Research & Development, and Novartis.

Riley is one of the eight members of the ExxonMobil and Albemarle team. They developed SCANfining and second-generation SCANfining II. These catalytic processes significantly lower the amount of sulfur in gasoline. When used in conjunction with advanced treatment of vehicle exhaust emissions, the processes aim to improve overall air quality. This is a very attractive prospect since government mandates are requiring even lower vehicle emissions and lower sulfur fuels. SCANfining “uses a novel, highly selective catalyst in a conventional hydrotreating process configuration to achieve increased hydrodesulfurization while minimizing alkene saturation and hydrogen consumption. In this way, SCANfining reduces octane loss by up to 80% versus traditional hydrotreating processes.” (*Chemical & Engineering News*, September 26, 2005, Vol. 83, No. 39, pp. 48-51)

The department congratulates Riley, as well as all of the other awardees, on receiving this prestigious award.

ChE Alum Winner of Business Award

Jim Huff (B.S., 1977) and his wife Nan were the 2005 winners of the 2nd annual “New Venture Business Plan Competition.” The Huffs are the founders and owners of *Hurricane Chemical*. Together they have created a patented process of applying a preservative agent to sugarcane immediately after it is cut, rather than applying the preservatives at the sugar mill as is most commonly done. According to the Huffs, the process of applying the chemical agent in the field decreases the rate of spoilage by

more than 50 percent, thereby increasing sugar yield for farmers. The product has been field tested and product demand has already been generated among numerous Louisiana mills.

The “New Venture Business Plan Competition” is sponsored by the E.J. Ourso College of Business and the Business Report. The winners are announced at the annual Top 100 Private Companies Luncheon of the Baton Rouge Business Report’s Louisiana Business and Technology Expo.

Two Alumni Receive Recognition for Generosity

Ron Cambre (B.S., 1960), and his wife Gail, were two of 13 individuals honored by the LSU Foundation with a President’s Award for Lifetime Support of LSU at the 46th Annual meeting in November 2005.

Robert J. Bujol (B.S., 1943) was honored by the LSU Alumni Association. He was one of 12 individuals to receive the Purple & Gold Award in 2005, which recognizes generous individuals who donate their time, energy, and resources to the Alumni Association to continue its mission to provide support to the University in various ways. Bujol was honored for his major gifts given to the Lod Cook Alumni Center, the LSU War Memorial, the Cook Conference Center and Hotel. In addition, he has endowed a departmental professorship and donates his time as a Lod Cook Alumni Center docent.

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In Memoriam

We were saddened
to learn of the
passing of the

