# 2010 Chemical Engineering ***News***

AIChE Delaware Alumni Reception
7–10 p.m. Monday, November 8, 2010
Salt Palace Convention Center, Room 250 E/F
Salt Lake City, UT

*www.aiche.org/annual*

University of Delaware | College of Engineering
CHEMICAL ENGINEERING

# Message from the Chair

Welcome to the 2010 Chemical Engineering News Magazine! This has been a remarkable year of growth and achievement for our faculty, students, and alumni comprising the extended Colburn family.

We are undergoing a "big squeeze" as we all consolidate to welcome our new faculty hires and grow our undergraduate and graduate programs. Thankfully, construction has started on the new Interdisciplinary Science and Engineering Building "ISE lab" across Academy St. from Colburn Lab. We have near record incoming freshmen and first year graduate student classes, and despite the economy, our graduates continue to find good employment opportunities. (However, please note, if you and/or your company are hiring, there are excellent candidates still looking and a banner group of young bachelors and doctoral students starting their job search this fall.) New textbooks by our faculty (Ogunnaike) help spread the Delaware Tradition of Excellence around the globe, and the Russell Undergraduate Enrichment Fund that many of you so generously supported, now enables more students to work together with our faculty toward solving some of the greatest challenges facing society today.

Energy remains a major strategic focus for the department and we welcome the return of alumnus and former department chair Mike Klein (Dan Rich Chair in Energy) as our new director of the University of Delaware Energy Institute. Mike's new office is on the first floor of Colburn and his research group also joins him on-site. Assistant Professor Feng Jiao will broaden our world-class catalysis center's research into electrochemistry and battery technology. Wilfred Chen, Gore Professor of Chemical Engineering, arrives this academic year from the University of California, Riverside, bringing with him new tools of molecular biology to address challenges in biofuels and protein production. New hires in biochemical engineering will also support the emerging biomedical engineering undergraduate program including assistant professor David Colby, who brings his new biochemical engineering lab online to tackle the molecular causes of prion diseases. Our world-class biochemical engineering group is further complemented by the anticipated arrival next spring of assistant professor April Kloxin, who will work on materials for tissue regeneration and research professor Chris Kloxin, whose expertise is in self-healing polymeric materials. These six new colleagues enhance and grow an already vibrant and excellent faculty. I will also take this opportunity to wish Jochen Lauterbach success in his new role as leader of Strategic Environmental Approaches to Electricity Production from Coal at South Carolina. Jochen will be missed, but we expect to see him often as he continues many research collaborations.

Please join us at the UD alumni reception at AIChE national in Salt Lake City (Salt Palace Convention Center, Room 250 E/F), where we will introduce our six new faculty and celebrate the many achievements documented herein and on our web page. Especially noteworthy events include Fraser Russell's AIChE Warren K. Lewis Award for Excellence in Engineering Education and Stan Sandler's 70th birthday technical symposium.

We, the entire family of Colburn laboratory, sincerely thank you for your continued support, which is especially critical to enabling the many achievements of our faculty and students described on the pages to follow.

Best wishes to you and your families for the year to come!

Norm Wagner
Alvin B. & Julia O. Stiles
Professor & Chair
Department of Chemical
Engineering

*P.S. We do welcome alumni engagement, including your suggestions. And as always, we enjoy hearing from you!*

## Looking for an old friend?

Want to share your latest news? Searching for information on upcoming alumni events such as Homecoming? Now you can do it all in one place, ***www.UDconnection.com***. Read more on p.27.

Check us out on Facebook:
*University of Delaware*
*Chemical Engineering*




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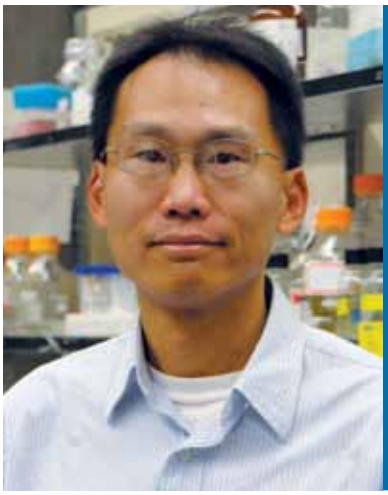
Photography: Ambre Alexender, Kathy Atkinson, Doug Baker, Jon Cox, Dawn Fiore, Tyler Jacobson, Evan Krape, Kevin Quinlan

Printing: University Printing

# Six New Faculty Members

*The Department of Chemical Engineering is pleased to announce the addition of six new faculty members, including two internationally recognized researchers coming in as named professors and four outstanding junior faculty beginning their careers with us.*

**Michael T. Klein** returned to UD on July 1, 2010 as director of UD Energy Institute, Dan Rich Chair in Energy, and professor of chemical engineering. Klein is an expert in chemical reaction engineering, with special emphasis on the kinetics of complex systems. He received his bachelor's degree from UD in 1977 and his doctorate from MIT in 1981. While on the UD faculty from 1981 to 1998, he served as associate dean, director of the Center for Catalytic Science and Technology, and chair of the Department of Chemical Engineering. He was appointed Elizabeth Inez Kelley Professor of Chemical Engineering before leaving UD to become dean of engineering at Rutgers. Ranked among the top 100 authors for citations in Industrial and Engineering Chemistry Research, Klein has written over 200 research articles and has received a number of awards throughout his career.



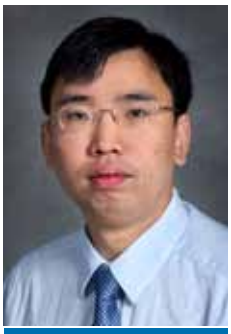
**Wilfred Chen** will join UD faculty in January 2011 as Gore Professor of Chemical Engineering. He currently holds the Presidential Chair at the University of California Riverside, where he is a professor of chemical and environmental engineering. Chen's research interests are in cellular and metabolic engineering, synthetic biology for biofuel production, protein therapeutics, viral detection, drug discovery and protein purification. He earned his bachelor's degree at the University of California, Los Angeles in 1988 and his doctorate at California Institute of Technology in 1993. After a one-year postdoctoral appointment in Switzerland, Chen joined UC Riverside in 1994. He has authored more than 150 journal papers and 10 book chapters.

**PhD '05**
MIT

## David Colby

### Assistant Professor

David uses cellular and molecular engineering approaches to study diseases of the nervous system. Among his interests are the many aspects of engineering cells and proteins for biomedical applications focused on protein misfolding diseases, such as those caused by prions (infectious proteins).



**PhD '07**
University of St. Andrews

## Feng Jiao

### Assistant Professor

Feng's research focuses on design and synthesis of nanostructured materials for solving critical issues in the production of solar fuels through artificial photosynthetic systems and the development of next-generation lithium-ion batteries.

**PhD '09**
University of Colorado at Boulder

## April Kloxin

### Assistant Professor

To meet the need for complex, dynamic cell culture environments, April is developing materials with highly controlled properties for spatiotemporal regulation of the cell niche and utilizing biological techniques to characterize and exploit these materials for cell culture and tissue regeneration.

**PhD '06**
North Carolina State University

## Christopher Kloxin

### Research Professor, joint with MSEG

Chris' primary research focus is on stimuli-responsive materials, including light-actuated, environmentally adaptable, and self-healing materials, for applications ranging from low stress and healable dental restoratives to photo-induced delivery of gene therapeutics.

For more photos and information about our growing team of faculty, visit www.che.udel.edu/directory/faculty.

# Faculty Honors & Awards

**MARK BARTEAU**, Robert L. Pigford Chair of Chemical Engineering and senior vice provost for research and strategic initiatives at the University of Delaware, has been appointed co-chair of the Chemical Sciences Roundtable of the National Research Council (NRC). "This appointment attests to Mark's national reputation in the field of chemical engineering," says Michael Chajes, dean of the UD College of Engineering. "He has been recognized not only for his own research accomplishments, but also for the value of his insights into future research directions for the nation as a whole."

Barteau was also recently named a fellow of the American Institute of Chemical Engineers (AIChE). Election to the grade of fellow is based on contributions to the professional advancement of chemical engineers and the engineering profession, as well as on valuable service to the institute. Barteau previously served as associate editor of the institute's flagship publication, the AIChE Journal.

Barteau was quoted in an article entitled "UD hosts media workshop on energy issues" on April 28, 2010. "We are not going to have energy independence as long as the United States relies on the internal combustion engine," he said. "Fossil fuels will continue to be important through the rest of the century, while renewable energy is growing rapidly, but from a very small base." Barteau stressed that the need to develop new resources does not rest with scientists alone. "We also need to think about how the media can convey this kind of information and the consequences of our energy choices back to the people", he said.

**ANTONY BERIS**, the Arthur B. Metzner Professor of Chemical Engineering was presented the Outstanding Doctoral Graduate Student Advising and Mentoring Award by Debra Hess Norris. Norris quoted from a student who nominated the professor for the award, saying, "Beris provides the right kind of research environment. Under his advisement, student ideas are never discouraged. He ensured that I never lost sight of the basics. He instilled a habit of exercise in the highest form of ethics while presenting data."

**JINGGUANG CHEN** was quoted in an April 28, 2010 article "UD host media workshop on energy issues" as saying, "scientists and academics must recognize the need to help media relate the process of biomass conversion research to the public."

**PRASAD DHURJATI** was listed as one of the faculty members instrumental in the design of the curriculum and new courses for the Bachelor of Science in Quantitative Biology. Dhurjati is noted for teaching courses for the program, helping biology faculty include more math in biology courses, and both advising students in the major and mentoring them in undergraduate research.

**THOMAS H. EPPS, III**, assistant professor of Chemical Engineering, was part of an elite group of young scientists and engineers honored by President Barack Obama at the White House January 13, 2010. Epps and 99 others from across the United States received the Presidential Early Career Award for Scientists and Engineers (PECASE), the highest award bestowed by the U.S. government upon scientists and engineers in the early stages of their independent research careers.

In a letter to the winners, Obama wrote, "You have been selected for this honor not only because of your innovative research, but also for your demonstrated commitment to community service and public outreach. Your achievements as scientists, engineers and engaged citizens are exemplary, and the value of your work is amplified by the inspiration you provide to others."

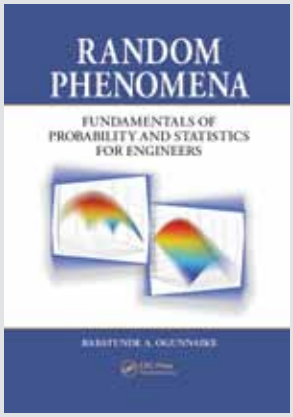
**MICHAEL KLEIN**, director of UDEI, was quoted in the article "UD host media workshop on energy issues" April 28, 2010. "About 25 percent of the world's coal supply is located in the United States, and is greater than the world's reserves of oil. It is the workhorse of the American electrical power industry," Klein said. "Clean coal technology, including a new generation of energy processor, can reduce emissions and other pollutants from coal-burning power plants."

**KELVIN LEE**, Kelvin Lee, Gore Professor of Chemical Engineering and director of the Delaware Biotechnology Institute has been honored with American Institute for Medical and Biological Engineering (AIMBE) fellowships. Lee was recognized for his contributions in applying proteomic technologies to problems in biotechnology and human health, as well as his professional leadership in biochemical engineering

**BRAMIE LENHOFF**, Allan P. Colburn Professor of Chemical Engineering, was recognized for his 25 years of service. President Harker expressed his gratitude, saying, "On behalf of the entire administration, I thank you for your loyalty, your longevity and the critical contributions you make every day - contributions that seed UD's growth in academic excellence, in prominence and international acclaim."

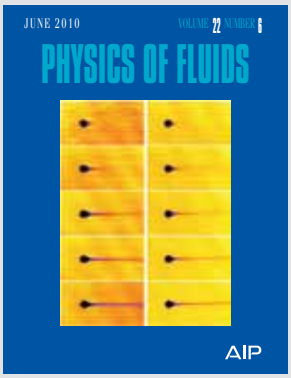
*Continued on page 8.*

# Published




**TEXTBOOK:**

Tunde Ogunnaike's "Random Phenomena: Fundamentals of Probability and Statistics for Engineers."

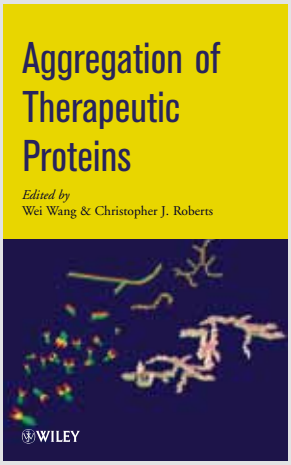



**JOURNAL COVER:**

"Active microrheology of a colloidal suspension in the direct collision limit" by Indira Sriram, Alexander Meyer and Eric M. Furst


**JOURNAL COVER:**

"A systematic study of equilibrium structure, thermodynamics, and rheology of aqueous CTAB/NaNO(3) wormlike micelles" by Helgeson ME, Hodgdon TK, Kaler EW, Wagner NJ.




**MONOGRAPH:**

Chris Robert's "Aggregation of Therapeutic Proteins."

# Faculty Honors & Awards
(continued)

**TUNDE OGUNNAIKE**, William L. Friend Chair of Chemical Engineering, was named a fellow of the American Institute of Chemical Engineers (AIChE). Election to the grade of fellow is based on contributions to the professional advancement of chemical engineers and the engineering profession, as well as on valuable service to the institute.

Ogunnaike became deputy dean of the UD College of Engineering July 1, 2010. Upon announcing the appointment, Dean Michael Chajes referred to Ogunnaike as "an outstanding scholar and mentor."

Ogunnaike also recently published a book "Random Phenomena: Fundamentals of Probability and Statistics for Engineers."

**ELEFTHERIOS PAPOUTSAKIS**, Eugene du Pont Chair of Chemical Engineering, received the Elmer Gaden, Jr. Award from the journal of *Biotechnology and Bioengineering* for his December 2008 paper "Genome-scale Model for Clostridium acetobutylicum."

This annual award recognizes "a high-impact paper reflecting exceptional innovation, creativity, and originality." The award was established in honor of the journal's founder Elmer Gaden, Jr., who is widely known as the father of biochemical engineering. Papoutsakis served six years as the journal's editor-in-chief in the 1990s.

Papoutsakis was selected to receive the 2010 International Metabolic Engineering Award "for his great accomplishments and leadership in metabolic engineering of clostridia and his dedication to the metabolic engineering community." Papoutsakis leads a research group at the Delaware Biotechnology Institute (DBI) focused on genomic and metabolic engineering studies of microbial systems, as well as stem-cell differentiation. He is also founder and president of Elcriton Inc., a start-up company that addresses next generation of alternative fuels. Elcriton, which is housed in DBI, conducts research supported by Small Business Innovation Research Grants from both the National Science Foundation and the US Department of Energy. "National policy is moving us towards alternative fuels. The bioengineering work in our lab, and the opportunity to pursue this important direction through a new enterprise is very exciting," said Papoutsakis.

**T.W. FRASER RUSSELL**, UD alumnus, administrator and the Allan P. Colburn Professor Emeritus of Chemical Engineering, was recognized with an honorary doctor of science degree at the UD's 161st Commencement ceremonies, held May 29, 2010 at Delaware Stadium. The honorary degree is the highest honor bestowed by the university and is reserved as a recognition of true distinction, according to Gil Sparks, chairman of the University's Board of Trustees. President Harker made special mention of Fraser during his speech, noting that Fraser is "the longest serving retiree, with 48 years of service."

Russell also won the AIChE Warren K. Lewis Award.

**STANLEY SANDLER**, Henry Belin du Pont Chair of Chemical Engineering, was presented the Properties and Phase Equilibrium for Process and Product Design (PPEPPD) Eminence Award during the International PPEPPD meeting, held in Suzhou, China. This is the first such award given in the 37-year history of the meeting. Xiaohau Lu, chairman of the PPEPPD international organizing committee and professor at Nanjing University of Technology, made opening remarks at a dinner honoring Sandler on May 17, 2010.

**DION VLACHOS**, Elizabeth Inez Kelley Professor of Chemical Engineering, has been named a fellow of the American Association for the Advancement of Science (AAAS). Vlachos was cited for his outstanding work on multiscale modeling and application to development, design, and elucidation of catalytic reaction mechanisms, nanotechnological processes, and signaling pathways in cancer.

**RICHARD WOOL** has developed a method to mitigate oil spills using chicken feather fibers. Wool discovered that when the fibers are cut to an optimal size, surface tension forces drive them to form self-assembled percolating networks that attract and trap oil spilled on a water's surface. Although reports of feather use for oil spill remediation exist, UD researchers have discovered how to maximize the self-assembly of the oil-soaked feathers for absorption efficiency and effective subsequent removal. The size of the fibers is critical, says Wool, "too long and the fibers will fail to assemble; too short and they won't assemble correctly."

# Student Modifies Car to Run on Cooking Oil

Colin Sweeney is used to hearing one particular question when he tells people about his car: "Does it smell like french fries?"

He drives a 1986 Mercedes SDL, which he has converted to run on cooking oil. His answer? "No, it actually smells kind of sweet."

A senior chemical engineering major, Sweeney commutes to campus from Townsend, Del., every day, a 60-mile round trip. The price of gas motivated him to initiate the project, he says, but it was his passion for working on engines and his knowledge of fluid mechanics and heat transfer that enabled him to carry it out.

"I found kits that you can buy to convert a car to run on cooking oil, but they seemed overly complicated mechanically and at the same time overly simplistic for the user," he says. "I decided to design my own so that I would have control over every aspect. If there was a problem, I wanted to be able to look at the gauges and know immediately what was wrong."

He started on the conversion process. The trunk of the car is now outfitted with a 20-gallon tank for the oil, matching the capacity of the existing diesel tank. Using both sources of fuel, the car has a range of about 1,100 miles.

When it is first started, the Mercedes runs on diesel fuel, as the cooking oil has to reach a temperature of about 120 degrees Fahrenheit before it can power the engine. Sweeney's system employs counter-current heat exchangers so that the coolant from the engine can be used to heat the oil.

"The biggest challenge is to heat the oil as rapidly as possible," he says.

Although most people who convert their vehicles get the used cooking oil from restaurants that have used it for frying and would then throw it away, Sweeney obtains his fuel from the discards of a processing plant that tests cooking oil.

For Sweeney, who has been working on cars and engines since he was in middle school, the project was well worth the time he put into it. "It's a pretty crude estimate at this point, but I think I can get about 100 miles to the gallon," he says. The project has not only saved him money but also contributed to his education.

A new coat of bright blue paint lets the Mercedes hide its age well. With 375,000 miles on its odometer, the vehicle is three years older than its owner.

# Student Honors & Awards

**JULIE ALBERT**, a doctoral candidate, has been selected as a finalist for the 2010 AkzoNobel Student Award in Applied Polymer Science. She presented her work at the 2010 American Chemical Society National Meeting in Boston Aug. 22–26. Albert's research seeks to understand the self-assembly of block copolymer thin films, which can be used for nanotemplates and nanoporous membranes among other things.

"I hope to conduct related work with a slant toward sustainable and alternative energy applications as a postdoctoral researcher, upon which I can develop a foundation for my career," she said. Albert also commented on her desire to teach, saying, "I look at a career in academia as an opportunity for me to give to future generations of chemical engineers the same guidance and support I have received from my adviser and other faculty members, my collaborators and my research group."

**MARCO BEDOLLA** received a graduate research fellowship from the National Science Foundation to complete a thesis on propylene epoxidation using silver catalysts.

"Propylene oxide, which is among the most widely produced chemicals in the world, is an important intermediate for the manufacture of plastics, fuel additives, antifreeze, foams and so on," Bedolla said. "Unfortunately, current methods to make this valuable chemical also yield large amounts of environmentally hazardous salts, solvents and other byproducts."

Under the supervision of Mark Barteau, Robert L. Pigford Professor of Chemical Engineering, Bedolla is studying how propylene oxide can be produced using silver in an environmentally sustainable manner.

**SCOTT CROWN** received a graduate research fellowship from the National Science Foundation. He will conduct research aimed at improving our understanding of metabolic pathway regulation to enable manipulation of the obese and diabetic phenotypes.

**ELIZABETH D'ADDIO**, a doctoral candidate, has been selected to participate in the Leadership Skills Workshop sponsored by the Council for Chemical Research (CCR). The workshop aims to enhance students' professional development by providing opportunities to improve their leadership skills, interact with research leaders from industry, academia, and government, and be exposed to high-level discussions about important national research issues.

"While I look forward to the challenge of motivating an interdisciplinary team," she says, "I have little experience in this area because of the solitary nature of much of my graduate work. My hope is that while continuing to hone my interpersonal skills on a professional level, I will learn techniques to help me be effective as a leader in my future career."

**DAN ESPOSITO** was awarded the 2010 Bill N. Baron Fellowship in recognition of his contributions to the renewable energy field at UD. The award is given to two graduate or recent graduate students from UD with a cumulative index of 3.0 or greater. Esposito's thesis work focuses on the development of electrocatalysts for applications in photo-electrochemical devices and in the electrolysis of water to produce hydrogen. He is conducting his renewable energy research at the Institute of Energy Conversion as part of a group led by Dr. Jingguang Chen. His is currently pursuing a patent for work related to the design of a photovoltaic-electrolysis device for hydrogen production.

**DANIELLE HANSGEN**, a fourth-year doctoral candidate, and her advisers Dion Vlachos, Elizabeth Inez Kelley Professor and Jingguang Chen, Claire D. LeClaire Professor, have developed a computational framework for screening potential bimetallic catalysts. The finding was published online in Nature Chemistry on April 25, 2010. Both faculty members give full credit for the work to Hansgen, with Vlachos providing support on the computational side and Chen on the experimental side.

**ELIZABETH KELLEY**, a second-year doctoral candidate, has been selected to receive a 2010 National Defense Science and Engineering Graduate (NDSEG) Fellowship. The NDSEG fellowship program is aimed at increasing the number of U.S. citizens and nationals trained in science and engineering disciplines of military importance. The fellowships are sponsored and funded by the Department of Defense and administered by the American Society for Engineering.

"This is a very prestigious fellowship," says department chairperson Norman Wagner. "Only about 200 are awarded nationwide each year to top doctoral students."

**PETER MILLILI** won the 2009 Graduate Student Poster Competition for the Delaware Valley Chapter of the International Society of Pharmaceutical Engineers. He also was

*Continued on page 12.*

Kameron Conforti (top), Professor Millie Sullivan (middle) and T.W. Fraser Russel (bottom).

# Kameron Conforti conducts summer research under T.W. Russell Undergraduate Enrichment Endowment

Kameron Conforti, an undergraduate ChE student, learned valuable research skills this summer while working in the laboratory of Millie Sullivan, assistant professor in chemical engineering. Conforti's project was broadly aimed at assembling new therapeutic delivery vehicles for short interfering RNAs (siRNAs).

"One challenge for siRNA delivery is transporting siRNA across the plasma membrane of cells," Sullivan explained. Thus, one focus of Conforti's project was synthesizing peptides with established abilities to cross the cellular membrane. He also identified reaction conditions for linking this peptide onto new polymer scaffolds that carry siRNA.

Future work in this area will be directed at exploring the pathways by which Conforti's vehicles enter cells and at modulating or improving subcellular trafficking of the vehicles. This will be accomplished by coupling the peptides Conforti synthesized with other peptides that can facilitate transport of siRNAs into the cellular cytoplasm, said Sullivan.

This summer experience, which complements Conforti's classroom education, was made possible by the T.W. Fraser Russell Undergraduate Enrichment Endowment.

"I am pleased Kameron was chosen for this enrichment award," said T.W. Fraser Russell, Allan P. Colburn Professor of Chemical Engineering. "Based on my informal talks with him as he passed my office en route to the laboratory, as well as his formal review of the experience, I am convinced that he was effectively introduced to research by doing it. Equally important, the experience taught him more about himself and what he needs to consider as he educates himself in the years to come."

# Student Honors & Awards
(continued)

awarded the Department of Chemical Engineering Teaching Fellowship for 2009.

**MARK PANCZYK**, a doctoral student, was recognized by the American Chemical Society's Division of Colloid and Surface Chemistry for an outstanding poster contribution at the fall 2009 ACS national meeting in Washington, D.C.

Panczyk is co-advised by Eric Furst, associate professor and Norman Wagner, the Alvin B. and Julia O. Stiles Professor and department chairperson.

"It's very unusual for a first-year graduate student to receive this kind of recognition at a national meeting, but Mark's award demonstrates the level of the grad students recruited to UD's Department of Chemical Engineering," said Furst. "Grad students are the lifeblood of our department, and we're always pleased when one of our students is recognized by a national professional organization."

**KATHY PHILLIPS** received the C. Ellen Gonter Environmental Chemistry Award from the ACS Division of Environmental Chemistry, the highest award given to students by the division. She presented her award-winning paper, entitled "Reduction Rate Constants for Nitroaromatic Compounds Estimated from One-Electron Reduction Potentials," and co-authored with Chiu and Sandler, at the C. Ellen Gonter Environmental Chemistry Awards Symposium, during the fall ACS meeting in Boston.

"I am honored to receive such a competitive award and to have my work recognized at this level by the Division of Environmental Chemistry of the ACS," said Phillips. "I am excited to have been invited to present my paper at the ACS National Meeting in Boston in August, where I will have the opportunity to interact with some of the leading researchers and practitioners in the field of environmental chemistry."

**MANUEL RAFAEL DIAZ JIMENEZ**, an Honors Program senior in chemical engineering won first place in the McNair Scholars Program poster competition. The University's McNair Scholars Program, which is designed to prepare talented and diverse students for graduate school, is the only program among 179 in the country to have achieved a perfect record of placing 100 percent of its students in competitive graduate schools around the world since it began 10 years ago.

**MEGHAN REILLY** was accepted to present a talk and poster at St. Jude Children's Research Hospital's annual National Graduate Student Symposium. She also received a Student Travel Award Recognition (STAR) honorable mention for the Society for Biomaterials Annual Meeting and Exposition.

**KELLY SCHULTZ** participated in the American Chemical Society's Excellence in Graduate Polymer Research Symposium. Schultz is focusing her work on the development of high-throughput microrheology to screen biomaterial hydrogels over a large composition space. The techniques she has developed enable her to rapidly identify hydrogelation conditions while conserving these scarce materials, which have therapeutic applications in areas such as wound healing and tissue regeneration, according to associate professor Eric Furst. Schultz plans to work as a postdoctoral researcher after she finishes her doctorate and then seek a faculty position.

**MAEVA TUREAU**, a fourth-year Ph.D. candidate, received the Air Products Graduate Fellowship for the 2009–10 academic year.

"Maeva is studying the assembly of nanostructured polymeric materials that can ultimately be used as porous network templates for the capture and concentration of small molecules, such as metabolites, in aqueous systems," said Thomas H. Epps, III, assistant professor of Chemical Engineering. "Among her many contributions, she has performed excellent work on the synthesis and characterization of novel block copolymer materials, collaborated with researchers at national laboratories and chaired a session as an invited participant at a conference in Brazil."

Tureau also "has taken a leadership role in many group activities, including undergraduate and graduate student mentoring, safety training and equipment design," Epps added.

"I believe that my work will provide an experimental framework for the generation of tailored network structures and create a foundation for further development in block copolymer materials for various nanotechnology and advanced materials applications," said Tureau, whose other applications of interest include porous membrane design, sustainable energy processes and nanotechnology.

*Continued on page 14.*

# ChE Student Volunteers at Indian Orphanage

While most of his friends were doing summer research or working for pay at restaurants, beaches and stores, Robby Pagels, a junior chemical engineering major at the University of Delaware, spent the summer of 2009 volunteering at an orphanage in India.

Pagels, a UD Honors Program student, taught English, did paperwork and helped with homework, but he is convinced that he got more than he gave and learned more than he taught.

"When I got to the orphanage," he says, "it was 4 a.m. All 36 of the kids were asleep on the floor in a room about the size of two small offices here at UD. They were lying on top of one another without blankets, sheets or pillows."

Reality hit Pagels immediately. "It made me realize how much we have here," he says.

He was also soon to realize that in some ways, it didn't matter to the children in the orphanage how little they had. "They taught me games," he said. "When you have nothing, you become really creative about how you play. I learned hundreds of things you can do with rocks and sticks."

Pagels' experiences over the five weeks he spent living at the orphanage included riding in an auto-rickshaw with 16 other people, discovering that having squirrels and lizards in the house is normal and juggling lightbulbs from one fixture to another to trick antiquated wiring into working. He got involved with the children and families, attending a wedding, sorting out arguments and comforting troubled kids. He learned about daily power outages and the role of bribes in conducting business.

A modern "Renaissance man," Pagels is also trying to sort out how his interests, his education and his experience in India can be integrated into a meaningful career goal. He is interested in music, art, silversmithing and running, and he is being trained as an engineer.

"I think I want to be a professor after I get my doctorate," he says, "and work abroad so that I can help to disseminate knowledge about engineering where it's not currently accessible."

# Student Honors & Awards
(continued)

**VASSILI VOROTNIKOV** received a Graduate Research Fellowship from the National Science Foundation. Studying under Dionisios G. Vlachos, Elizabeth Inez Kelley Professor of Chemical Engineering, Vorotnikov's work focuses on multiscale modeling of catalyst nanoparticles applied to specific reaction networks. He is particularly interested in ammonia decomposition for its potential use in fuel cells as a source of hydrogen. Vorotnikov plans to pursue a career in academia after finishing his doctoral degree.

**SHARON WEAVER**, an undergraduate student, received third place in research talks in a competition sponsored by the UD chapter of Sigma Xi.

**MARK CLAYTON WEIDMAN**, an Honors Program student, was awarded the Goldwater Scholarship. "I was very excited and felt honored to be chosen for the scholarship. I felt grateful to all the people who had supported me and encouraged me at UD and, of course, to my family," he said.

Upon finishing his undergraduate study and research on fuel cell catalysis, Weidman plans to earn his doctorate in the field of alternative energy technology. He hopes to eventually lead a research group in either industry or academia to "find effective, abundant and reliable catalysts for fuel cell technologies."

**CARISSA YOUNG** was awarded the Bessie B. Collin's Award, which is given annually to a woman graduate student that maintains academic and civic excellence while overcoming special difficulties. Carissa returned to graduate school to pursue a degree in engineering after an academic hiatus. Anna Skaja Robinson, professor of Chemical Engineering, nominated Young because a very small percentage of students come back to graduate school for engineering after leaving for an extended period of time and the transition is often quite difficult. Young's drive to learn made a major impression on Robinson, who said Young "has an innate curiosity and willingness to question dogma that is unmatched by most of my current and former students and leads her in many interesting and novel research directions."

Young also received national recognition for biomedical research at the third biennial National IDeA Symposium of Biomedical Research Excellence, held June 16–18 in Bethesda, Maryland. Young's research paper is titled "Single Cell Analysis of Endoplasmic Reticulum Quality Control in S. cerevisiae."

# Alumni Coordinator Jon Olson's Remarks

Our newest alumni, the class of 2010, face an especially stormy and uncertain economy in which many firms have stopped or greatly diminished hiring. Average starting salaries are marginally higher than last year, but those seeking employment are competing in a market flush with talent owing to high unemployment.

Having worked hard for their engineering degree, the payout for this effort is now uncertain. At graduation, 28 percent of the college's graduates had permanent employment, 28 percent were looking for employment, 31 percent were going to graduate school in chemical engineering and 13 percent were headed to graduate school in other disciplines (see list on p.17). These conditions are forcing graduates to take stock of their connections and use them to ferret out opportunities, an idea worthy of consideration for all alumni.

I encourage all of you to keep your UD alumni records up-to-date using www.udconnection.com. The reward for this—you will be able to search for and send messages to classmates, network with UD alumni, learn about alumni events and stay connected to your UD roots. If you prefer to update your information by phone, call 302-831-8155 to review your record with a staff member.

Having this information also helps us keep track of alumni achievements. Many chemical engineering alumni work for esteemed organizations such as Air Products, Exxon Mobile, Merck or other organizations that have long been supportive of our department. Others find career opportunities outside chemical engineering. Please read on for recent updates on the activities and achievements of our esteemed alumni.

As always, our thanks to Jack Weikart (UD ChE alumni coordinator, *retired*) for keeping us abreast of the contributions of our alumni. Although he claims that "getting old ain't for sissies," we thank him for remaining our faithful "Energizer Bunny" of information.

# Alumni Honors & Awards

**RICHARD E. EMMERT, M 1952** received The Hancher Finkbine Alumni Medal from the University of Iowa where he received his Bachelor of Science degree in Chemical Engineering in 1951. He then went on to complete his Master of Science and doctoral degrees in chemical engineering from UD. Richard has worked at DuPont Co. for 34 years, where he has excelled in leadership positions. He was recognized for his contributions by the National Academy of Engineers by being elected a member of their organization. This is the highest honor to be received as an engineer.

**WAYNE ELBAN, BCHE 1969; PHD 1977,** professor at Loyola University, supervised 5 students conducting a study to determine if liquid matter in aluminum bottles can stay slightly colder than the liquid matter found in glass bottles. The study is causing a big stir in the science community because aluminum is considered a good conductor, while glass is considered a good insulator.

The experiment used identical thermocouples to measure temperature change. Overnight the bottles, filled with 12oz of water, cooled to 6 degrees centigrade. The results came two and a half hours later when the bottle temperature registered 20.9 degrees centigrade versus 20.2 degrees centigrade for the water in the aluminum bottle.

In an article by CCL Container, Wayne was asked if he was surprised by his students findings. He replied, "I conducted this same experiment myself on three different occasions last summer after aluminum bottles first came to my attention, and obtained readings in the same hierarchy within one-half to one degree each time. To me, the results of this student work are reassuring."

**JAMES SPEAROT, MCHE 1970; PHD 1972** reviewed the use of hydrogen produced from solar energy in proton-exchange- membrane fuel cells as a power source for light vehicles in his October 2010 Gerster Lecture, "Materials Challenges in Developing Fuel Cell/Hydrogen Propulsion Systems." Jim has served as director of the Chemical and Environmental Sciences laboratory for General Motor's R&D center since 1998.

**STEVEN M. KESSLER, BCHE 1971** was recently named a partner at Dempsey Partners LLC. His main focus will be managing the Houston office and MegaLoss Disaster Recovery practice. Steven will also coordinate the firm's property damage claims consulting practice.

**MICHAEL E. MACKAY, BCHE 1979** has been named Distinguished Professor of Materials Science and Engineering. The distinguished professorship recognizes deserving senior members of the UD faculty. Mackay joined the UD faculty in 2008. His current research focuses on polymer-based solar cells, with an emphasis on controlling and measuring their structure and nanoscale phenomena within polymer nanocomposites to create the next generation of materials. Prior to joining UD, Mackay held appointments at Michigan State University, Stevens Institute of Technology and the University of Queensland in Australia. His work has been supported by the National Science Foundation, the Department of Energy, the National Institute of Standards and Technology, several national laboratories, and industry. Mackay earned a bachelor's degree with distinction in chemical engineering at UD and his Ph.D. at the University of Illinois-Urbana Champaign.

**EDWARD NG, BCHE 1979** was appointed executive vice president for Applications Lifecycle Services and a member of the executive management team for Freeborders, Inc. Freeborders, Inc. specializes in technology and outsourcing solutions to the financial services and technology based industry and is a global provider of consultations. Edward has been in the global IT industry for more than 25 years. His main focus is in systems integration, e-commerce and enterprise management solutions.

**RAKESH GUPTA, PH.D. 1980** was named chair of the Department of Chemical Engineering at West Virginia University on July 1, 2010. Rakesh has been a faculty member in the department since 1991 and holds the title of George and Carolyn Berry Chair of Chemical Engineering. Gupta is quoted in an article by the Lincoln Journal as saying, "I am honored to accept this position and the challenges that come with it" and "I look forward to working with the faculty in the department and college to provide high-quality educational programs, to further knowledge through research and to contribute to the wellbeing of our state, nation and world." Gupta received his B. Tech degree from the Indian Institute of Technology (IIT) and his Ph.D. in chemical engineering from UD.

*Continued on page 18.*

Congratulations to T.W. Fraser Russell for winning the 2010 Warren K. Lewis Award from AIChE! Fraser will be honored at the AIChE Annual Meeting on Sunday, November 7, 2010 at 4:30p.m. at the Salt Palace Convention Center.



## Class of 2010: Where did they go?

**INDUSTRY . . . . . 9**

Air Products . . . . . 2
BlackRock . . . . . 1
DuPont . . . . . 1
Hexel . . . . . 1
International Latex . . . . . 1
KBR . . . . . 1
Schlumberger . . . . . 1
Air Products . . . . . 1

**GRAD SCHOOL . . . . . 10**

CMU . . . . . 1
Illinois . . . . . 1
Lehigh . . . . . 1
New Mexico . . . . . 1
Purdue . . . . . 1
Texas-Austin . . . . . 1
UVa . . . . . 1
Va.Tech . . . . . 1
Wisconsin . . . . . 2

**OTHER GRAD SCHOOL . . . . . 4**

Johns HopkinsSAIS . . . . . 1
MBA@UD . . . . . 1
MEd NC State . . . . . 1
Villanova Law . . . . . 1

**UNKNOWN/LOOKING . . . . . 9**

**NOT PARTICIPATING . . . . . 1**

Total = 33

# Alumni Honors & Awards
(continued)

**ERIK FYRWALD, BCHE 1981**, chairman and CEO of Nalco, played a significant role in the cleanup of the oil spill off the coast of Louisiana. Fyrwald spoke on both Fox Business and CNBC about Nalco's oil spill response technologies. Nalco provided oil dispersants and support to BP and the responders dealing with the spill in the Gulf of Mexico.

When asked to explain the technology in layman's terms, Fyrwald said, "It's a dispersant that breaks down oil into small enough particles that it becomes nutrition for the naturally occurring bacteria in the water."

**JOYE L. BRAMBLE, BCHE 1984** is now Vice President for Pilot Plant Operations. Her responsibilities include management and operations of Morphotek's new pilot manufacturing plant. This plant will manufacture biologics to support the company's early stage clinical trials. In March 2010, the company started building an $80 million facility, slated to open in 2012.

**MICHAEL BETENBAUGH, PH.D. 1988** of Johns Hopkins, won the 2010 Cell Culture Engineering Award from Engineering Conferences International. The Cell Culture Engineering Award recognizes contributions to the field of cell culture technology and engineering, as well as significant service and dedication to the field. Betenbaugh is best known for his work in metabolic engineering for a cell's glycosylation machinery, which controls the enzymatic process that produces glycans, a key component in protein folding reactions.

**CHRISTOPHER PAPILE, PH.D. 1991** was recognized for inventing a process called "magnetobaric power," which is expected to harvest and convert low-temperature heat (less than 150˚F above ambient) to electricity without releasing $CO_2$ or other pollutants. Chris is quoted in an article by Mass High Tech saying, "The process is based on the same physics seen in both naturally occurring astrophysical phenomena, like pulsars, and electromagnetic pulse weapons used by the military."

He goes on to say, "The process uses a magnetic pressure flux to induce mechanical pressure in a gas. The physics indicate such a magnetic-mechanical shift can be used to induce high pressure in an ambient-temperature gas. When coupled with a heat source, it generates electricity."

**THOMAS KOVACH, BCHE 1992** was elected to his first term in the Delaware State House of Representatives.

**JIM REKOSKE, PH.D. 1998** was appointed vice president and general manager for Honeywell's UOP Renewable Energy and Chemicals business. He previously held various UOP positions including senior manager in Catalysis Research and Development, engineer manager and technical director of UOP's CAS (Catalysts, Adsorbents and Specialties) business. Jim received the 2010 Herman Pines Award from the Chicago Catalysis Club for his outstanding work in catalysis.

**SUJATA BHATIA, MCHE 1999** recently published a book "Biomaterials for Clinical Applications." The book is currently being used in CHEG 667 taught by Professor Millie Sullivan and Sujata.

Sujata also recently received the Strong, Smart and Bold award from the Delaware Chapter of Girls Inc. for her work with the Delaware Commission for Women and her involvement with UD's Women in Engineering mentor program. Girls Inc. encourages girls to become financially independent, socially responsible and resistant of following stereotypes laid out by others. Sujata is a research assistant at DuPont Central Research & Development and holds both a Ph.D. and an M.D.

**DANIEL SHANTZ, PH.D. 2000**, of Texas A&M, gave a seminar entitled, "Engineering areas of research Nanospaces: Designing Organic-Inorganic Hybrid Materials" in April 2010. The lecture described three related areas of his research, which explores the synthesis and characterization of hybrids to yield unique properties. Dan is the William and Ruth Neely Fellow of Chemical Engineering and the associate department head for Graduate Programs.

**MICHAEL STRANO, 2002** was named one of the "Ten Young Geniuses Shaking Up Science Today" by Popular Science magazine. Strano is a tenured professor at the Massachusetts Institute of Technology (MIT), where he holds the title of Charles and Hilda Roddey Associate Professor of Chemical Engineering.

In its "Brilliant 10" profile of Strano, titled "Master of the Small," the magazine heralds the young chemical engineer as "one of the world's leading researchers of quantum-confined materials, a field of nanotechnology

*Continued on page 20.*

CHEMICAL ENGINEERING

# DELAWARE ALUMNI RECEPTION

Monday, November 8, 2010
7-9 p.m.
Salt Palace Convention Center, Room 250 E/F
Salt Lake City, UT

10AIChE

www.aiche.org/annual

# AIChE

For alumni, friends, and special guests. No RSVP necessary.

Congratulations to **T.W. Fraser Russell** for winning the Warren K. Lewis Award for Chemical Engineering Education.

We will also be celebrating **Stanley I. Sandlers'** 70th birthday!

# Alumni Honors & Awards
(continued)

that has the potential to transform cancer medicine, solar power, electronics and more." The article says Strano is particularly fascinated by the medical potential of carbon nanotubes which, once injected into cells, "could be used as biological sensors so sensitive they could detect a single molecule of a potentially harmful chemical." Strano's wife Sally also has a UD connection. She received a master of science in mathematics from UD in 1997.

**PETER M. TESSIER, PH.D. 2003** assistant professor of Chemical and Biological Engineering at Rensselaer Polytechnic Institute, has found an organic compound in red wine called resveratol. This compound is able to neutralize the toxic properties that are connected to Alzheimer's disease.

Peter was quoted in the May 28 edition of the Journal of Biological Chemistry as saying, "We've shown how resveratrol has very interesting selectivity to target and neutralize a select set of toxic peptide isoforms. Because resveratrol picks out the clumps of peptides that are bad and leaves alone the ones that are benign, it helps us to think about the structural differences between the peptide isoforms. It is not clear, according to Peter, that resveratrol is able to cross the blood-brain barrier. However, "the molecule has garnered interest in recent years for its potential impact on cancer and aging," he said.

Tessier was also named the 2010 Pew Scholar in the Biomedical Sciences by the Pew Charitable Trust. As a part of this honor, Peter will receive $240,000 over four years. Other Pew scholars include 3 Noble Prize winners, three MacArthur Fellows and two recipients of the Albert Lasker Medical Research Award, according to the Pew Charitable Trust. David Rosowsky, dean of the School of Engineering at Rensselaer, congratulated Peter in a Newswise article saying it was "an honor reserved for the most promising young faculty in the biomedical field."

Tessier was also awarded a Faculty Early Career Development Award (CAREER) from the National Science Foundation. This included a five-year $411,872 award which he plans to use to help further his research in protein thermodynamics and aggregation.

Tessier has a new research program called "Loop engineering of protein surfaces for tunable self-association and phase behavior," which he hopes will help explain how the behavior of antibodies may be better controlled and utilized for treating human disease. This research has the potential to help prevent disease associated with protein aggregation. This will enable the creation of more stable therapeutic proteins, and manipulating assembly of protein crystals.

**JOHN KITCHIN, PH.D. 2004**, assistant professor at Carnegie Mellon University, was awarded a five-year, $750,000 grant by the U.S Department of Energy. His research will focus on developing new materials to produce hydrogen and oxygen from water using electrochemistry. Andrew Gellman, head of Carnegie Mellon's Chemical Engineering Department was quoted in an article by Carnegie Mellon as saying, "This research has unlimited potential for helping the United States become more energy efficient as Kitchin and his research team work to find more efficient ways to store energy."

**DANIEL ZAK, PH.D. 2006** received the Young Early Career Investigator Recognition award. While at UD, Daniel worked closely with Tunde Ogunnaike, William L. Friend Chair of Chemical Engineering. Daniel went on to the Daniel Baugh Institute for Functional Genomics and Computational Biology at Thomas Jefferson University where he worked with Dr. James Schwaber. Daniel completed his graduate studies and started work in Dr. Alan Aderem's lab at the Institute for Systems Biology as a research scientist.

**JENNIFER O'DONNELL, PH.D. 2007** was awarded a $750,000 Early Career Award by the Department of Energy's Early Career Research Program. This award is to be used over five years. Jennifer is an assistant professor at Iowa State University in the department of Chemical and Biological Engineering.

Jennifer has been working on a research project titled "Templating of Liquid Crystal Microstructures by Reversible Addition Fragmentation Chain Transfer Polymerization. In an article by Eric Dieterle, Jennifer explains that the design and synthesis of polymer nanoparticles with internal microstructures identical to those of liquid crystals. "Such nanoparticles," she said, "could be used for catalysis or for drug delivery, and even have implications for renewable energy."

# In Memoriam

## Judith Colburn Gehret

Surrounded by her loving family on September 2, 2009 Judith "Judy" Colburn Gehret of Sparks, MD succumbed to congestive heart failure.

Judy was formerly of Newark, DE and a graduate of Newark High School, class of 1951. She continued her education at Smith College, graduating in 1955 with a degree in mathematics.

Judy, daughter of the late Allan P. and Evelyn S. Colburn, is survived by her loving husband of 53 years Edward F. Gehret; beloved children Catherine E. McCaslin of Seattle, WA; Robert S. Gehret of Hampstead, MD; Carolyn A. Gehret of Sparks, MD; and the late Elizabeth G. Starling of Timonium, MD; brother Willis S. Colburn of Champaign, IL and sister Carolyn C. Narasimhan of Chicago, IL. She is also survived by seven grandchildren and four great grandchildren.

*Courtesy of: Delaware online.*

## James I. Thompson, Jr.

Thompson, of Arnold, MD. (previously of Claymont, Del.) August 2009.

James graduated from the University of Delaware with a Bachelor's of Science in Chemical Engineering and served in the U.S. Army during World War II. He was employed by Atlas Chemical, ICI America and finally, Astra Zeneca from which he retired in 1981.

*Courtesy of: coloradoan.com.*

## William H. Manogue

Manogue, PhD57, May 2010.

In his career as a chemical engineer, Bill was a strong advocate for bringing better science and engineering into process development. This desire propelled him into research where he built a lasting reputation for careful and complete analysis of experimental work with the DuPont Company. When the Montreal protocol prohibited Freons containing chlorine, Bill discovered a catalyst free, high temperature pathway known as Freon 134, which became the preferred replacement commercialized by DuPont.

Bill's academic contributions include teaching in the UD Extension division 1957-1971 and serving as an adjunct professor thereafter. He also served on the advisory committee for many PhD candidates and was a visiting lecturer at University of Colorado 1967-68

*Courtesy of: spicer-mullikin funeral homes.*

## James L. White

White, M62, PhD65, November 2009

James' work at UD included assisting Art Metzner to develop a sophisticated representation of viscoelastic mechanics and rheology. After UD, Jim developed a passion for connecting engineering science to rubber processing in his role as a research engineer for U.S. Rubber/Uniroyal. In 1983, he founded the Department of Polymer Engineering at University of Akron where his work led to successful modeling of industrial equipment using realistic constitutive models of the rubber mixtures. James was also a prolific researcher with 500+ publications and eight books.

*Courtesy of: rubbernews.com.*

# 2010 Notes from Alumni

**JAMES M. DOUGLAS, PH.D. 1960,** enjoyed a productive teaching and research career, then he was elected to the National Academy of Engineers in 1996. After earning his Ph.D. with Jack Gerster, Jim had a five-year career at ARCO, an industrial sabbatical with D.W.T. Rippin at Imperial College, a year at UD working closely with Mort Denn, and a three-year stint at Rochester as an associate professor. During this period he wrote the two-volume book, Process Dynamics and Control, a work which brought physical understanding to the mathematics of control. When he moved to U Mass Jim's focus changed to process design. At the time, process design was an artisan's trade which was a black art without guiding principles. Jim corrected this with his book Conceptual Design of Chemical Processes, which showed how the chemistry of the process leads to rational approach to design. He showed how short cut design heuristics are critical to developing plant-wide design. Today, the reduction of pollution, energy conservation, better raw material utilization, and plant-wide control are issues that students can master using Douglas' design insights. Jim and his wife, Betsy, live in Amherst, MA where Jim is semi-retired as professor emeritus.

**TOM GUTSHALL, B 1960,** has been a generous contributor to the university with his time and gifts. Tom's productive career includes specialty chemicals (Mallinckrodt), pharmaceuticals (Syntex), and diagnostics (Cepheid). From 1996 to 2002, Tom was founder and CEO of Cepheid, which makes diagnostic systems that are fast, reliable and relatively rugged. He continues as chairman of the board at Cepheid as well as serving on three additional boards. He has served on the advisory council for the chemical department. This year, he was a leader in organizing the 1960 class reunion for Forum and Reunion Weekend.

**FRASER RUSSELL, PH.D. 1964,** was awarded an honorary Ph.D. at UD's May commencement.

**MICHAEL KLEIN, B 1972,** returns to Delaware as the director of the UD Energy Institute and the Dan Rich Chair of Energy.

**PATRICK MOORE, B 1975,** currently works for the Process Instruments Division (PID) of Thermo Fisher Scientific as a senior applications engineer in Houston, TX. His division manufactures analytical instrumentation that is designed to operate 24/7/365 in process units such as, but not limited to, refineries and petrochemical facilities. He provides support to the production, service, sales, marketing, engineering and technical support functions on a worldwide basis. Presently, he is working on a master's degree in chemistry, focusing on analytical chemistry at the University of Houston. He expects to graduate in December 2010.

**MARK J. MCCREADY, B 1979,** is the chair of Chemical and Biomolecular Engineering at the University of Notre Dame. He was selected as the Outstanding Teacher of the College of Engineering for 2010 for teaching sophomore students mass and energy balances. While the emphasis and examples now transcend the chemical process industries, the basic approach is taught with the same level of rigor that was found in the course (CHE 212, now CHEG 112) he took from professor Fraser Russell in the fall of 1976. In addition to classroom teaching and occasional blogging (http://ndcbechair.blogspot.com), his educational activities are devoted to an electronic portfolio project that is intended to help students advance their professional development. Mark's research interests include molecular dynamics simulation of vapor-liquid phase change, computation of multiphase flows and experimental development of processes to capture carbon dioxide from flue gas using ionic liquids.

**KAREN A. FLETCHER, B 1981, M 1982,** currently is the vice president for DuPont Investor Relations, a position she has held since 2008. Her group provides information and data to institutional investors in a factual and timely way. These distributions include earnings releases, annual DuPont investor events, and other special communications, news items and activities that may have a financial impact. In 1980, she was the first UD graduate to win a Truman Scholarship, an award given to college juniors who demonstrate leadership qualities and have a record of public service. She earned her master's degree in the Industrial Intern Program in the Heat, Mass and Momentum group of the DuPont Engineering Division. She was mentored by Allan Jones, the adjunct professor of the UD graduate heat transfer course. In 1990, she became a research manager in the Central Research division, and in 1994, began a five year stint in the Lycra business in technical marketing, product management and global sales. In 1999, she moved to the nonwovens business as technology director from which she became the global business manager for Tyvek in 2001. In 2004, she transferred to the Titanium Technologies business as global marketing director and Six Sigma Champion. With all of this experience, in 2007 she became director of Investor Relations and a year later was named vice president.

**JOYE BRAMBLE, B 1984,** is now a vice president at Morphotek. The May 18, 2010 announcement of her appointment reads in part: "Dr. Bramble will have full responsibility for the management and operation of Morphotek's new pilot manufacturing plant, which will produce biologics to support the company's early-stage clinical trials."

Joye most recently served as executive director of Business and Research Integration in Research Planning and Integration at Merck Research Labs (MRL). She led a staff of 150 at six sites in three countries that provided business operations support to the president of MRL and his management team. This included the development of therapeutic area and capability strategies, long-range operational and capital plans, and portfolio and pipeline management methodologies. Over the course of her tenure with Merck, which began in 1990, Joye assumed positions of increasing responsibility in Vaccine Technology and Engineering, Project Planning and Management, Bioprocess Research and Development, and Bioprocess Clinical Manufacturing and Technology. She also was part of the Merck/Schering Plough Research Integration Team that was charged with developing organizational structures, value capture targets, and execution time lines to support the merger as well as the governance structures for the new company's product development activities moving forward.

**GREG ALEXANDER, PH.D. 1985,** worked at Monsanto Company for 12 years after he left Delaware. In 1997, he joined McWhorter Technologies where he has survived three subsequent company name changes (Eastman, Resolution, and most recently Hexion Specialty Chemicals). Most of his career at both Monsanto and Hexion has been in product and process development. Greg is now a Six Sigma Black Belt and Master Black Belt candidate, specializing in Design for Six Sigma.

**JEFFREY BROWN, B 1985,** is currently a plant manager for Bio Energy Washington, a one of a kind facility that takes landfill gas from the county landfill and purifies the methane through absorption processes, molecular sieves and semi-permeable membranes to pipeline grade specification. This process provides a significant energy resource in this community from a stream that was previously flared to the atmosphere.

**LISA CAIN, B 1985,** earned her MBA from Delaware and a Ph.D. in Marketing from Wharton. She is the principal for PagePoint Web Solutions (pagepointwebsolutions.com) and her firm provides free web site audits.

**ROBERT CAIRNCROSS, B 1985,** has been working for Caterpillar, Inc since 1989 and is currently a Six Sigma Black Belt.

**DOUG CLARKE, B 1985,** is a unit manager at the DuPont plant in Niagara Falls, NY.

**MONICA LANZILLOTTI GALLAGHER, B 1985,** is the president of Affinity Logo, LLC.

**LAURA KRUMWIEDE HARTWELL, B 1985,** is the director of Safety, Environmental and Security at ATK Propulsion and Controls, Elkton Operations.

**LISA LAFFEND, B 1985,** earned a Ph.D. from Cornell in 1991 and then joined DuPont. Her current job title is senior research associate with DuPont in Wilmington, DE.

**SUSAN WIKOFF LOTTER, B 1985,** is a senior project manager for Kraft Foods.

**LINDA E. SMIDDY NELSON, B 1985,** earned her MD degree from the University of Maryland. She now works as a staff anesthesiologist at Union Memorial Hospital in Baltimore, MD.

**FRANK PETROCELLI, PH.D. 1985,** is about to complete his 22nd year at Air Products. He has recently been promoted to senior research associate. After a number of years as a manager, he returned to an individual contributor role, conducting research in support of Air Products' Energy businesses. He is also now his company's Ph.D. recruiter at UD, and greatly enjoys his periodic return visits to campus. To commemorate his 25th anniversary in April, he visited his thesis advisor, Mike Klein. In reflecting on his career to this point, he has come to realize how influential Mike was in his decision to pursue a Ph.D. and how that decision has propelled his career forward in a very satisfying and rewarding way.

When asked for a short description of his views of the future for solutions to the energy problems, he responded: "Solutions to today's energy issues promise to be many and varied, as a comprehensive "one size fits all" technology "fix" isn't evident. As new feedstocks, conversion processes (both energy and material) and chemical separations will be required, chemical engineers are uniquely positioned to play a central role in providing the innovations that will enable a new energy future for generations to come."

*Continued on next page.*

# 2010 Notes from Alumni *(continued)*

**DARRELL SCHIMMOLLER, B 1985,** retired in 2002 when his wife Carol went back to work full time. He has enjoyed spending time with his kids. In his previous job, he had traveled frequently so this was a good change.

**ALISON PRATT SPOONMORE, B 1985**, is currently employed at Eli Lilly and Company. She had a wonderful visit to Newark, hosted by Kathy Haines Bender.

**SARAH BANNISTER, B 1995,** is an associate at Covington & Burling LLP in Washington, DC. Despite the overall slowdown in the legal market, she has had a busy year preparing for a patent trial in May 2010 (held in District Court, Wilmington, DE).

**SURITA BHATIA, B 1995,** is an associate professor in the department of Chemical Engineering at the University of Massachusetts, Amherst. Surita's research at UMass involves studying the structure and rheology of complex fluids, colloidal dispersions, polymeric gels and biomaterials. She runs a Research Experiences for Undergradautes (REU) program and is co-PI on a graduate training program (IGERT), both in the area of cellular engineering. Surita has received a number of awards for research, including an NSF Career Award, a 3M Award and a Dupont Young Professor Award. Recently Surita was an invited participant in the NAE's Frontiers of Engineering Education Symposium based on her work on diversity in science and engineering.

**BRIAN BOCKRATH, B 1995,** just celebrated a 15-year anniversary as an engineer at W. L. Gore & Associates in Elkton, MD. Brian's primary commitment at Gore involves managing a portfolio of projects for Gore's four divisions and leading an engineering team in the execution of projects aimed primarily at developing and commercializing new materials. Additionally, he is actively involved in recruiting new graduates and facilitating validation training seminars. Brian has spent time working in new product development, process engineering and project engineering across areas of polymer processing, coatings, particle science, emulsions and polymerization.

**SCOTT SILLS, B 1985,** earned a Ph.D. at the University of Washington and a post doctorate at IBM. He then joined Micron Technology in Boise, ID. He has been with Micron for almost five years. With the recession, business down turn and three rounds of layoffs at Micron, the R&D department and the Advanced Technology Group became the Emerging Memory Group. He is currently a senior technologist in this group and is leading a team of about 20 scientists and engineers to develop and integrate new memory technologies.

**HELEN YEN, B 1995,** is a section head of Research & Development at Procter & Gamble, currently working in the Beauty & Grooming division on Gillette/Venus. Her 15-year career has been spent in P&G Beauty, starting in Color Cosmetics in Hunt Valley, MD and transferring to Boston two years ago to work on their Gillette business.

**JIM REKOSKE, PH.D. 1998,** earned his bachelor's and master's degrees in chemical engineering at the University of Wisconsin and a doctorate in chemical engineering from the University of Delaware. He also earned an MBA from the University of Chicago. Rekoske joined Honeywell's UOP in 1996 and has served in a number of R&D and business positions, including engineering manager; technical director for UOP's Catalysts, Adsorbents and Specialties business in the area of petrochemicals; director of technology for Universal Pharma Technologies (a UOP joint venture); and most recently, senior manager, catalysis research and development. He is the inventor or co-inventor named on 20 U.S. patents, with another 10 patent applications pending. He was also recently awarded the 2010 Herman Pines Award from the Chicago Catalysis Club in recognition of his numerous technical breakthroughs in catalysis science. The following Business World announcement featured Jim: Honeywell's UOP announced that James Rekoske has been named vice president and general manager for its Renewable Energy and Chemicals business.

**MELONY P. ANDERSON, ESQ., B 2000,** is now an attorney with Balick & Balick LLC, a small firm in Wilmington, DE. She states: "My practice is almost exclusively civil litigation, but of various types - everything from corporate and commercial contracts to medical malpractice."

**ROB DEITCHER, B 2000,** worked for Merck in manufacturing at the Stonewall, VA plant after graduation. While working there, he completed a non-thesis master's degree from Lehigh in 2005. He found that he enjoyed working on scientific problems much more than issues of manufacturing and left Merck to attend grad school at Virginia full time. His research there is in bioseparations and biophysics. At UVA, he won the Outstanding Teaching Assistant Award for which he was nominated by UD alum Giorgio Carta, Ph.D. 1985. He is also the winner

of the W.H. Peterson Award from ACS for giving the best student presentation at the fall 2009 meeting. Last summer, he worked for the biotech company, Biogen Idec in research collaboration.

**MATT FORD, B 2000,** passed his Principles and Practices exam and has become a professional engineer licensed in the state of Maryland.

**CRAIG HORAK, B 2000,** is a Production Superintendent for Oxy Vinyls, LP. He is working on his MBA at Rice.

**KEN LO, B 2000,** earned his Ph.D. from University of Pennsylvania in 2005. At the time he was working for Pfizer but anticipated a job change since R&D was exiting his site.

**DAVID MORIN, B 2000,** went into the U.S. Navy after graduation. He served through two deployments on USS Pittsburgh as a Navy nuclear submarine officer. He did a shore tour developing training courses for the newest Virginia Class attack submarines, earned a master's degree in Engineering Management from Old Dominion University, and left the Navy as a Lieutenant in 2007. He then joined Zachry Nuclear Engineering, where he has been designing and implementing control and protection system upgrades to civilian power plants. While at Zachry, he also worked for a year with General Electric-Hitachi on their newest reactor design, the Economic Simplified Boiling Water Reactor.

**MATTHEW WOOLLEY, B 2000,** is now vice president-senior analyst, Credit Policy, of Moody's Investment Services in London. He expects to be there at least three years. He decided by senior year that he would leave chemical engineering for economics. He earned a Ph.D. in Economics at UNC-Chapel Hill. After graduation Matt joined Moody's Investment Services in NYC, where he received several promotions which led to his transfer to London.

**BRAD TAYLOR, B 2001,** is now senior research engineer with ConocoPhillips in Bartlesville, OK. On October 5th, he was awarded with the ConocoPhillips Outstanding Young Scientist award for his internally and externally published work on paraffin isomerization and benzene reduction in gasoline. He continues to work with the Advanced Hydrocarbon Fuels group in the area of benzene reduction along with a number of regulation driven long term research related to fuel reformulation. This year he was made the lead recruiter for advanced degrees at UD, which should bring him to town a couple times of year in search of job applicants.

**MARTINA TYERUS, B 2002,** has joined the firm Fish & Richardson as an associate in its Intellectual Property Litigation Group in Wilmington, DE. Before joining Fish, Tyreus was a patent litigation associate at Womble Carlyle Sandridge & Rice for four years. Prior to that, she served as a law clerk for then Chief Judge Sue L. Robinson. Tyreus is admitted to practice in the Supreme Court of Delaware, the U.S. Court of Appeals for the Federal Circuit, the U.S. District Court for the District of Delaware and is registered to practice before the U.S. Patent and Trademark Office. Tyreus received her doctoral degree in law from Washington University School of Law in 2005, where she was executive notes editor of the Washington University Law Quarterly. She received her B.ChE. in chemical engineering from UD in 2002.

**KRISTINA GONSER WEAVER, B 2002,** is an at-home mom living in Knoxville, TN with her husband and daughter.

**COLLEEN GENDRON, B 2004,** is a project development engineer in the Commercialization at Merck. More specifically, she works in the area of hot melt extrusion and spray drying as a means of solubilization enhancement and then scale these processes (with others) to give the final dosage forms. She earned a Master of Science in Chemical Engineering from UConn last fall. She appreciates her Delaware education during her master's classes which prepared her for the higher level of education, and found that she covered almost as much as the graduate courses.

**NIKKI ENNIS, B 2007,** started working out of Fairfax, VA in 2007, at the Central Engineering Office for ExxonMobil Research and Engineering. Her position is in Process Design, where she mainly works on developing design specifications for large downstream capital projects for different sites around the world.

**ANDY KORINDA, B 2007,** is still at Northwestern working for Justin Notestein and on track to graduate in 2012. He has joined the Northwestern cycling team and raced with them this spring in the Midwestern Collegiate Cycling Conference. He is pursuing teaching and has been accepted into the Northwestern Searle Center for Teaching Excellence Graduate Teaching Certificate Program. He has also applied to his department's Teacher Apprenticeship Program.

*Continued on next page.*

# 2010 Notes from Alumni *(continued)*

**JENNIFER LAMARCHE, B 2007,** is now a Ph.D. graduate student at University of Florida, Gainesville working with Jennifer Curtis. These two, along with two others, Peter Liever and Philip Metzger, wrote a successful proposal to conduct lunar G experiments to validate models for the craters formed when space vehicles land on the moon or on Mars. " The liberation of debris caused by spacecraft landing and launches on the lunar or Martian soil threatens to be one of the highest risks facing exploration system architectures." Sinclair has extensive experience in modeling and measuring complex particle flows.

**ROB NEHRING, B 2007,** accepted a job as a process engineer for ConocoPhillips working in a project group in Ponca City, OK. He rotated through several assignments in the group before taking a new assignment closer to UD at the Trainer Refinery near Marcus Hook, PA. He has since moved to Hockessin and has been trying to get reacclimated to the area.

**JENNIFER O'DONNELL, PH.D. 2007,** is an assistant professor of chemical and biological engineering at Iowa State University. She was awarded $750,000 over five years as part of DOE's new Early Career Research Program. Her research project, titled "Templating of Liquid Crystal Microstructures by Reversible Addition Fragmentation Chain Transfer Polymerization," involves the design and synthesis of polymer nanoparticles with internal microstructures identical to those of liquid crystals. O'Donnell, who did her postdoctoral work at the prestigious Key Centre for Polymer Colloids at the University of Sydney (in Australia), describes the work as a "new direction" for her and her research group. "We actually started the work this summer and I was really incredibly lucky," she said. "I have an undergraduate student, Todd Thorson (ChemE), who was phenomenal in the lab. He collected all the preliminary data for this project." Her award was funded as a part of the $85 million American Recovery and Reinvestment Act. "Five years to get my research program going here, and the guarantee of two graduate students for that five years, is just amazing," O'Donnell said.

**PAUL BRIGANDI, B 2008,** has been working for Dow Chemical in the Wire and Cable R&D division in Piscataway, NJ. His projects include formulating and testing semi-conductive compounds for power transmission and distribution cables, development of manufacturing processes using these formulations and introduction of these products to customers. "In this work I am using the knowledge gained in my undergraduate research on block copolymers directed by Professor Thomas Epps," he said. His future plans include pursuing an advanced degree in Polymer Science and Engineering.

**MICHAEL DIGNAN, B 2008,** is a law student at Columbia. This summer he worked as an intern in Tampa, FL in the prosecutors' office. When asked about the transition to law he responded: "the transition to law was rather smooth; I am surprised two years has passed so quickly. I remember encountering a lot of the IP law material in my current classes in Uebler's CHEG 595 class. Law school isn't as all-consuming as some students make it out to be, so I still have some free time to see and experience things in the city. I really enjoy living in New York and would ideally like to get a job there upon graduation in '11. I am leaning toward the practice of criminal law, but am open to other types of law, especially with the contraction in the job market since '08."

**BRIAN ROSEN, B 2008,** is currently finishing his second graduate year of Chemical Engineering at the University of Illinois at Urbana-Champaign and was recently named a Department of Energy Office of Science Graduate Fellow.

**MIKE ZEBERKIEWICZ, B 2008,** continues his education at UD in the Engineering Outreach program working toward a Masters in Material Science and Engineering. He works for Boeing in Ridley Park, PA in the Materials Engineering department, where he is developing composite and polymeric materials, their applications, and processes of these materials for production of helicopter rotor blades. According to Mike, the flow of his job is not much different from the Junior Lab with regard to how experiments are designed, executed, and reported. "I have found that the Junior Lab has distinguished my performance among many others who were not as adequately prepared from their university education."

**DAN MILLER, B 2009,** is doing really well at the University of Wisconsin-Madison. He feels his experience at UD really prepared him well for the classes and research environment at UW.

**MATT PETROFF, B 2009,** completed his first year at Merck. According to Matt, it has been a fantastic experience. He spent most of the last year working in a protein-purification group that handles biologic

process development, from lead optimization to scale up for Phase III production campaigns. Recently, he was volunteered/chosen for a 3-month training in microscale automation at Merck, West Point. He has been learning the ins-and-outs of Tecan and laboratory automation, with an emphasis on technologies that can be used for high-thruput micro-scale chromatographic process development. The technology is extremely promising, and he is excited to be part of the team that develops it. Matt is very satisfied with his UD education. It gave him the ability to stand out amongst intelligent and hardworking cowokers.

**ZACK ULISSI, B 2009,** spent the summer on a research project at Imperial College, London with the UD/Imperial College exchange. Since then he has completed a master's degree in Applied Mathematics at Cambridge University (outside of London), mainly studying fluid mechanics and transport phenomena. The fluids program has been especially exciting as the department was home to many of the founders of the field (Newton, Stokes, Rayleigh, Kelvin, etc). This fall he'll be starting a Ph.D. at MIT.

**ZACK WENDELL, B 2009,** completed his first year working at ExxonMobil. Currently, he is working in the Project Development Group as a Process Design Engineer. He designs and plans projects for both the Beaumont Refinery and Chemical Plant. These projects vary in nature from safety systems to environmental compliance projects to those that improve overall plant profitability. Typically, he is developing projects from $1 to $4 million, most with compressed schedules or fast-approaching deadlines. The recent spotlight on the petroleum industry has made the safety and environmental part of his job all the more crucial.

## UDconnection

Looking for an old friend? Want to share your latest news? Searching for information on upcoming alumni events such as Homecoming? Now you can do it all in one place, ***www.UDconnection.com***. UD and the UD Alumni Association (UDAA) have collaborated to bring alumni a vibrant online community—so register and get active! The online community allows you to search the alumni directory, post class notes, update your contact information, and see if there are any upcoming alumni events in your area. You can also take advantage of networking opportunities and ways to get involved with your alma mater! Visit ***www.UDconnection.com*** today!

# Meet our growing team of faculty

The Department of Chemical Engineering's accomplished faculty are involved in a wide variety of research pursuits. The matrix (pictured near right) explains each faculty members area of expertise.

| | Biochemical/Biomedical | Catalysis/Reactions | Colloids/Interfaces | Energy/Sustainability | Environmental | Materials | Polymers/Composites | Process Control/Systems Analysis | Thermodynamics | Transport Separations |
|---|---|---|---|---|---|---|---|---|---|---|
| Maciek Antoniewicz | ● | | | | | | | | | |
| Mark Barteau | | ● | ● | ● | ● | ● | | | | |
| Antony Beris | ● | | | | | | ● | | | ● |
| Douglas Buttrey | | ● | | ● | ● | ● | | | ● | |
| Jingguang Chen | | ● | ● | ● | ● | ● | | | | |
| Wilfred Chen | | | | | | | | | | |
| David Colby | ● | | | | | | | | | |
| Pamela Cook | | | | | | | | | | |
| Prasad Dhurjati | | | | | | | | ● | | |
| Thomas Epps, III | | | ● | ● | ● | ● | ● | | ● | ● |
| Eric Furst | ● | | ● | | | | ● | | | |
| Feng Jiao | | | | | | | | | | |
| Michael Klein | | | | | | | | | | |
| April Kloxin | | | | | | | | | | |
| Christoper Kloxin | | | | | | | | | | |
| Kelvin Lee | ● | | | | | | | | | |
| Abraham Lenhoff | ● | | ● | | | | | | ● | ● |
| Raul Lobo | | ● | | ● | ● | ● | | | | |
| Babatunde Ogunnaike | ● | | | ● | | | ● | ● | | |
| Terry Papoutsakis | ● | | | | | | | | | |
| Christopher Roberts | ● | | | | | ● | | | ● | |
| Anne Robinson | ● | | | | | | | | | |
| Stanley Sandler | ● | | | | ● | | | | ● | ● |
| Annette Shine | ● | ● | | ● | | ● | ● | | | ● |
| Millicent Sullivan | ● | | ● | | | ● | | | | ● |
| Dionisios Vlachos | ● | ● | ● | ● | ● | ● | | | | ● |
| Norman Wagner | | | ● | | | | ● | | ● | ● |
| Richard Wool | | | ● | | ● | ● | ● | | | |

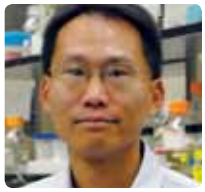

Maciek R. Antoniewicz
DuPont Young Professor,
Assistant Professor


Mark A. Barteau
Senior Vice Provost for
Research & Strategic
Initiatives, Robert L.
Pigford Chair


Antony N. Beris
Arthur B. Metzner
Professor


Douglas J. Buttrey
Associate Chair,
Undergraduate Studies,
Professor


Jingguang G. Chen
Claire D. LeClaire
Professor


Wilfred Chen
Gore Professor

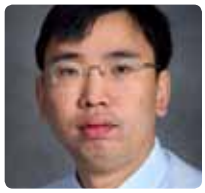

David W. Colby
Assistant Professor


Pamela L. Cook
Associate Dean,
Engineering,
Joint Professor of
Mathematics


Prasad S. Dhurjait
Professor


Thomas H. Epps, III
Assistant Professor


Eric M. Furst
Associate Professor,
Director of CMET


Feng Jiao
Assistant Professor


Michael T. Klein
Dan Rich Chair of
Energy, Director of UDEI


April Kloxin
Assistant Professor


Christopher Kloxin


Kelvin H. Lee
Gore Professor, DBI
Faculty Fellow


Abraham M. Lenhoff
Gore Professor


Raul F. Lobo
Professor


Babatunde A.
Ogunnaike
Deputy Dean, College of
Engineering, William L.
Friend Chaired Professor


Jon H. Olson
Professor Emeritus


E. Terry Papoutsakis
Eugene duPont Chair,
DBI Faculty Fellow


Chris J. Roberts
Associate Professor


Anne S. Robinson
Director of Graduate
Program for Bioengineering,
Associate Chair for
Biochemical Engineering,
Professor


T.W. Fraser Russell
Allan P. Colburn
Professor Emeritus


Stanley I. Sandler
H.B. duPont Chair of
Chemical Engineering


Jerold M. Schultz
Professor Emeritus


Millicent O. Sullivan
Assistant Professor


Dionisios G. Vlachos
Elizabeth Inez Kelley
Professor, Director of
CCCST, Director of CCEI


Norman J. Wagner
Alvin B. and Julia
O. Stiles Professor,
Department Chair


Richard P. Wool
Professor

# Delaware Biotechnical Institute

Delaware's Congressional delegation announced $1.2 million in federal funding to the University of Delaware July 20, 2009 at a press conference at the Delaware Biotechnology Institute (DBI). The funding, through the Omnibus Appropriations Act of 2009, supports research in environmental science, avian influenza, biomedicine, and substance abuse.

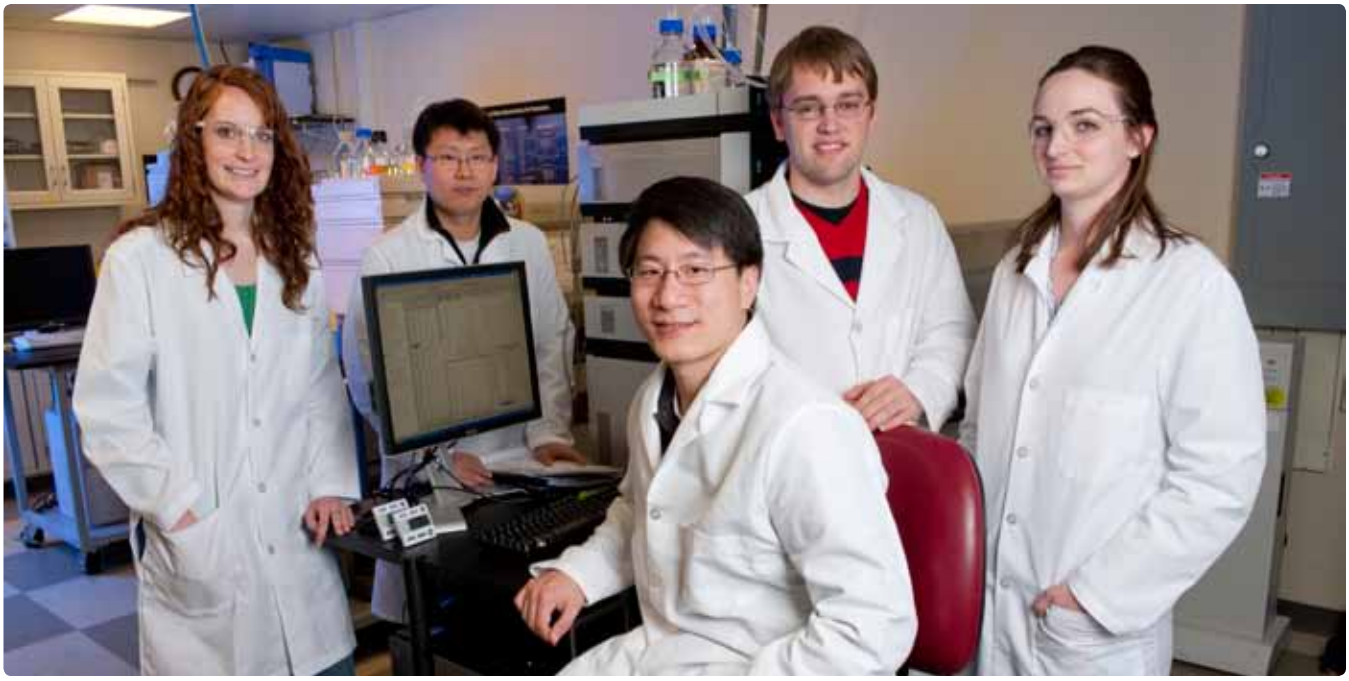
Specifically, the federal dollars will provide facilities upgrades for avian influenza monitoring critical to the state's poultry industry, programs and equipment for "critical zone" research on soil and environmental quality, infrastructure for cancer and neuroscience research, an expansion of the Delaware School Survey project to assess prescription drug use among teens, and a satellite receiving station at the Hugh R. Sharp Campus in Lewes for accessing real-time data on the Delaware Bay corridor.

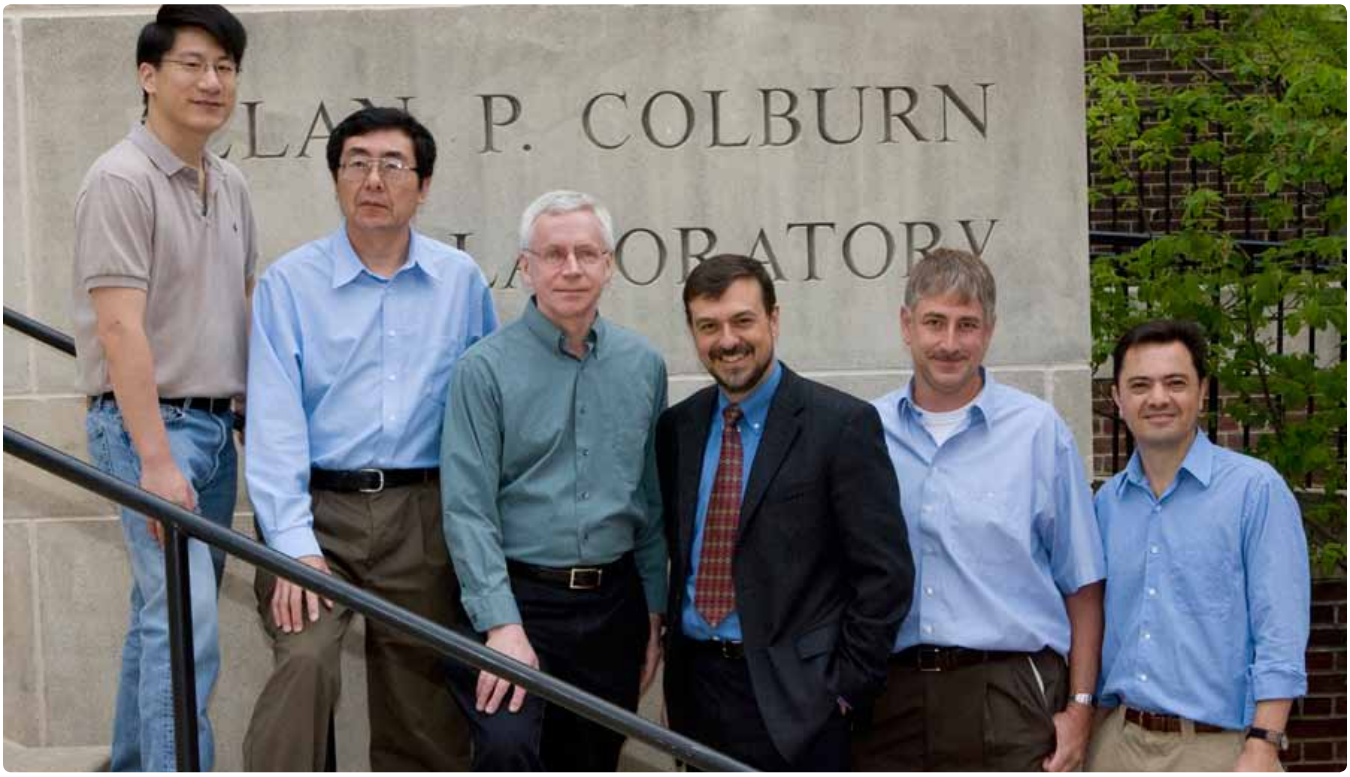
The funded programs directly involve five of the University's seven colleges and have interdisciplinary implications for all seven, according to University President Patrick Harker.

"That's important to us because this kind of collaboration isn't just the way of the future; it's how the University of Delaware is doing business today," Harker noted.

Delaware Biotechnology Institute, headed by director Kelvin Lee, Gore Professor of Chemical Engineering, received $190,000 to strengthen Delaware's biomedical research capability by building on existing programs in cancer research and bioinformatics, and building new infrastructure in cardiovascular and neuroscience research. The research includes investigators in the colleges of Health Sciences, Arts and Sciences and Engineering.

Founded in 2001, the Delaware Biotechnology Institute is a major center for life sciences research at UD, focusing on human health, agriculture and the environment.






## Energy Frontiers Research Center

**Energy Frontiers Research Center (EFRC) at the University of Delaware will receive $400,000 over the next four years to conduct research on the conversion of biomass to fuels through the National Science Foundation's Emerging Frontiers in Research and Innovation (EFRI) program.**

EFRI offers interdisciplinary teams of researchers the opportunity to embark on rapidly advancing frontiers of fundamental engineering research. This year's program funded 43 projects in two areas: BioSensing and BioActuation (BSBA) and Hydrocarbons from Biomass (HyBi).

Dion Vlachos, Elisabeth Inez Kelley Professor of Chemical Engineering at UD, is co-principal investigator on an EFRI-HyBi project led by the University of Minnesota that will investigate the conversion of biomass to fuels using molecular sieve catalysts and millisecond contact time reactors. Only eight HyBi proposals were funded.

While several processes for biomass utilization have been proposed, none meets the productivity, scalability, product distribution and economic requirements for commercial implementation. The objective of the new research is to develop a continuous and scalable autothermal catalytic process for the "one-pot" conversion of lignocellulosic biomass to fuels using multifunctional catalysts in a short-contact-time stratified reactor.

The work will capitalize on the infrastructure provided by the Institute on the Environment at the University of Minnesota and the Center for Catalytic Science and Technology at UD.

## GRADUATING CLASS OF 2010
### Honors Degree with Distinction

The Honors Degree with Distinction recognizes a student's completion of the research requirements for the Degree with Distinction in addition to the successful completion of 30 credits in Honors courses through the degree program.

**David E. Barlaz** *(Advisor: Anne Robinson)*

**Marco A. Bedolla-Pantoja** *(Advisor: Raul Lobo)*

**Timothy D. Bogart** *(Advisor: Anne Robinson)*

**Kevin W. Brew** *(Advisor: Anne Robinson)*

**Manuel R. Jiménez Diáz** *(Advisor: Anne Robinson)*

**Aaron D. Reinicker** *(Advisor: Anne Robinson)*

**Daniel J. Walls** *(Advisor: Anne Robinson)*

**Megan A. Zagrobelny** *(Advisor: Anne Robinson)*

Sadly, we mourn the loss of ChE undergraduate student ***David Buck***, who recently lost his fight with cancer. The family is establishing a scholarship in his honor and donations can be made in his name at:

www.udel.edu/udaily/2011/aug/memorial081210.html

## 2010–2011 New Graduate Students

**James Angelo**
Rensselaer Polytechnic Institute

**Jonathan Louis Bauer**
University of Michigan

**Jillian Emerson**
Johns Hopkins

**Alan Gregory Fast**
Northwestern University

**Robert Vincent Forest**
Louisiana State

**Paul Douglas Godfrin**
University of Viriginia

**Kwame Heyward**
Florida State University

**Angela Leann Holmberg**
University of Minnesota

**Gregory Sherman Hutchings**
University of Florida

**Abhinav Rabindra Jain**
Indian Institute of Technology

**Heejae Kim**
California Institute of Technology

**Benjamin Gerald Kremkow**
Michigan State

**Ming Luo**
Zhejiang University-China

**Kyle McHugh**
University of Buffalo

**Christopher J. O'Brien**
Rensselaer Polytechnic Institute

**Trong Dinh Pham**
Vietnam National University

**Marc David Porosoff**
Johns Hopkins

**Devesh Radhakrishnan**
University of Mumbai

**Matthew Stephen Rehmann**
University of Pennsylvania

**Theodore Dallas Swift**
Northwestern University

**Chia-Hung Tsai**
National Taiwan University

**Kathryn Anne Whitaker**
Rowan University

**Zachary Stange Whiteman**
Rensselaer Polytechnic Institute

**Ke Xiong**
Zhejiang University-China

**Bryan Thomas Yonemoto**
Tulane University

**Seif Momen Yusuf**
Carnegie Mellon

**Brian Moreno**
Transfer with Michael Klein

**Kristen Valente**
Returning Merck student

# 2010 Seminar Series

## March 19, 2010

**James Trainham** (Gerster Lecture)—
Sr. Vice President, Engineering,
Sundrop Fuels
*"The Renewable Fuel Challenge: Harnessing the Power of the Sun"*

## April 9, 2010

**Gregory Stephanopoulos**
(Pigford Lecture)—
Professor, Department of Chemical Engineering, Massachusetts Institute of Technology
*"Biofuels and Metabolic Engineering"*

## April 16, 2010

**Kathleen Stebe** (Wohl Lecture)—
Richer and Elizabeth Goodwin Professor of Engineering and Applied Science
Chair, Department of Chemical and Biomolecular Engineering,
University of Pennsylvania
*"Orientation and Assembly of Anisotropic Particles by Capillary Interactions"*

## April 23, 2010

**Daniel Shantz**—
Ray Nesbitt Development Professorship III in Chemical Engineering,
Department of Chemical Engineering,
Texan A & M University
*"Engineering Nanospaces: Designing Organic-Inorganic Hybrid Materials"*

## April 30, 2010

**Todd Squires** (Colburn Lecture)—
Associate Professor, Department of Chemical Engineering, University of California, Santa Barbara
*"Microrheology of Fluid Interfaces: Visualization, Viscoelasticity, Yielding and Slow Recovery of Phospholipid Monolayers"*

## May 14, 2010

**Carson Meredith**—
Associate Professor, School of Chemical & Biomolecular Engineering, Georgia Institute of Technology
*"Particle Adhesion to Surfaces: Implications in Nanotechnology and the Environment"*

## September 10, 2010

**Josephe DeSimone** (Pigford Lecture)—
Chancellor's Eminent Professor of Chemistry, Department of Chemistry,
University of North Carolina, Chapel Hill;
William R. Kenan, Jr.—
Professor of Chemical Engineering,
Department of Chemical and Biomolecular Engineering, North Carolina State University
*"Top-down Nano-fabrication Technologies for the Production of Uniform, Shape-Specific Carriers for Vaccines, Biologics and Small Molecule Drugs"*

## October 1, 2010

**Theresa Good**—
Program Director, Biotechnology, Biochemical & Biomass Engineering,
National Science Foundation;
Professor, Department of Chemical and Biochemical Engineering, University of Maryland, Baltimore County
*"Engineering new strategies for the treatment of Alzheimer's disease"*

## October 22, 2010

**Hank Ashbaugh**—
Associate Professor, Department of Chemical and Biomolecular Engineering, Tulane University
*"Disentangling the Stability and Function of Natively Unfolded Proteins"*

## October 29, 2010

**Kristi Anseth** (Wohl Lecture)—
Tisone Professor of Chemical and Biological Engineering,
Howard Hughes Medical Institute Investigator, University of Colorado at Boulder
*"Goodbye Flat Biology? Hello Hydrogels"*

## November 5, 2010

**Vassily Hatzimanikatis**—
Associate Professor, Ecole Polytechnique Federale de Lausanne
*"Retrofitting Complex Systems for Green Growth"*

## December 3, 2010

**Richard Register**—
Chair and Professor, Chemical and Biological Engineering, Department of Chemical and Biological Engineering,
Princeton University
*"Block Copolymer Thin Films: Shear Alignment and Applications in Nanopatterning"*

# Allan P. Colburn

Allan Colburn was born and educated in Wisconsin and was the first employee of the DuPont Company to be hired as a research engineer rather than an engineer charged with carrying out process development functions. This research group, organized in 1929 by Thomas Chilton, brought these two very productive people into a close contact, though one which lasted less than a decade because of problems with Allan Colburn's failing health. The Chilton-Colburn contributions to understanding the similarities between rates of heat, mass and momentum transfer appeared in 1930 in a rough form and, in the final polished form, in a paper authored by Colburn alone in 1933.

This "Colburn analogy" paper was followed by one on design of cooler-condenser systems and another which developed the concept of a "height of a transfer unit" of HTU. Both these papers were actually presented by Chilton at meetings because Colburn was not well enough to attend. Two other frequent co-workers were William McAdams (MIT) and Thomas Drew (Columbia) who served as DuPont consultants during these years, and Colburn authored a large number of papers on heat and mass transfer which reflected their input as well; the Colburn-Drew paper of 1937, on condensation of mixed vapors, is perhaps his second most important contribution to chemical engineering science. In addition to authoring good scientific analyses, he also published a large number of pragmatic papers on heat transfer in a variety of geometries, on distillation and on fluid metering.

In 1938 Allan Colburn's tuberculosis had sufficiently weakened him that he had to resign his industrial position and look for part-time employment under conditions that might enable him to choose his own working hours. This was how he arrived at the University of Delaware; but he did not really retire. The wartime chemical engineering curriculum for Army Officers (the Army ASTP program of WWII) which enrolled many thousands (perhaps five to ten thousand students) was written by Allan Colburn and Barnett Dodge of Yale.

Colburn became Acting-President of the University of Delaware in 1950 and was Provost from 1950 until his death from cancer in 1955. He was the first recipient of the Walker Award of the AIChE in 1935 and also the first recipient of the Professional Progress Award in 1948. He was Chairman of the heat transfer division of ASME and a director of AIChE from 1942 to 1947 and served on numerous governmental advisory committees.

He was Director of the Delaware Chapter of the American Red Cross from 1946 until his death and served as a member of the research committee of the American Cancer Society. In summary, he was a most distinguished engineer and a very humble, compassionate and most helpful human being who was seriously ill throughout his professional career.

The reason for the Annual Allan Colburn Lectureship is to recognize those young faculty or engineers who best exemplify Allan Colburn's scholarly abilities on pragmatic as well as theoretical problems and his interest in all humanity.

# Past Colburn Memorial Lecturers

2010
**Todd Squires**
University of California, Santa Barbara

2009
**Matthew DeLisa**
Cornell University

2008
**Michael Strano**
Massachusetts Institute of Technology

2006
**Patrick Doyle**
Massachusetts Institute of Technology

2005
**Michael D. Graham**
University of Wisconsin-Madison

2004
**Sharon C. Glotzer**
University of Michigan

2002
**Jay Keasling**
University of California, Berkley

2000
**Linda Broadbelt**
Northwestern University

1999
**K. Dane Wittrup**
Massachusetts Institute of Technology

1998
**Julia Kornfield**
California Institute of Technology

1997
**Wesley R. Burghardt**
Northwestern University

1996
**John M. Vohs**
University of Pennsylvania

1994
**Yannis Kevrekidis**
Princeton University

1993
**Arup Chakraborty**
University of California, Berkeley

1992
**Doros Theodorou**
University of California, Berkeley

1991
**Glenn Fredrickson**
University of California, Santa Barbara

1990
**Alice Gast**
Stanford University

1989
**Sangtae Kim**
University of Wisconsin, Madison

1988
**H. Chia Chang**
University of Notre Dame

1987
**Julio Ottino**
University of Massachusetts

1986
**Robert A. Brown**
Massachusetts Institute of Technology

1985
**Klaus Jensen**
University of Minnesota

1984
**Matt Tirrell**
University of Minnesota

1983
**Rakesh K. Jain**
Carnegie-Mellon University

1982
**Michael Shuler**
Cornell University

1981
**A. C. Payatakes**
University of Houston

1981
**T. W. Fraser Russell**
University of Delaware

1980
**James Dumesic**
University of Wisconsin, Madison

1978
**Clark K. Colton**
Massachusetts Institute of Technology

1978
**L. Gary Leal**
California Institute of Technology

1976
John H. Seinfeld
California Institute of Technology

1975
**Louis Hegedus**
General Motors

1974
**James White**
University of Tennessee

1973
**Dale Rudd**
University of Wisconsin

1972
**Edward L. Cussler**
Carnegie-Mellon University

# Class Reunions

Homecoming is ***November 5–7, 2010***. Please see UD's Alumni Relations website, ***www.UDconnection.com/homecoming*** for details about Homecoming Weekend. We hope to see you!

## Class of 1960

Mr. John F. Buckley ('60/EG)
Dr. Francis J. Eastburn ('60/EG)
Mr. William A. Hudson ('60/EG)
Mr. William J. Fleming ('59/EG)
Mr. Clifford L. Kirk ('60/EG)
Mr. Merritt C. Kirk, Jr. ('60/EG)
Mr. Joseph R. Whiteoak, Jr. ('60/EG)
Mr. William L. Payne, Jr. ('60/EG)
Mr. R. Theodore Fields ('60/EG)
Mr. Thomas L. Gutshall ('60/EG)

## Class of 1985

Mr. Himanshu R. Patel ('85/EG)
Dr. Brian E. Farrell ('85/EG)
Mr. Theodore J. Owens ('85/EG)
Mrs. Barbara A. Tatum ('85/EG)
Mr. James M. Pando ('85/EG)
Mr. Jonathan R. Nicholls ('85/EG)
Mr. John C. Kisko ('85/EG)
Mrs. Susan A. Lotter ('85/EG)
Mrs. Patricia A. Oakinghaus ('85/EG)
Mr. Robert F. Cairncross ('85/EG)
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