

UNIVERSITY *of* DELAWARE

Chemical & Biomolecular Engineering News

2012



PAST: The Department celebrates its heritage with two upcoming anniversaries. Pre-order your Heritage book today, see page 6.

PRESENT: We have a new name, recognizing our expanding technical scope. See page 2.

FUTURE: Meet some of our talented students, including a Goldwater Scholar, on page 33.

AICHE Delaware Alumni Reception

7–9 p.m. Monday, October 29, 2012
David L. Lawrence Convention Center
Room 301
Pittsburgh, Pennsylvania
www.iche.org/annual



College of Engineering
DEPARTMENT OF CHEMICAL
& BIOMOLECULAR ENGINEERING

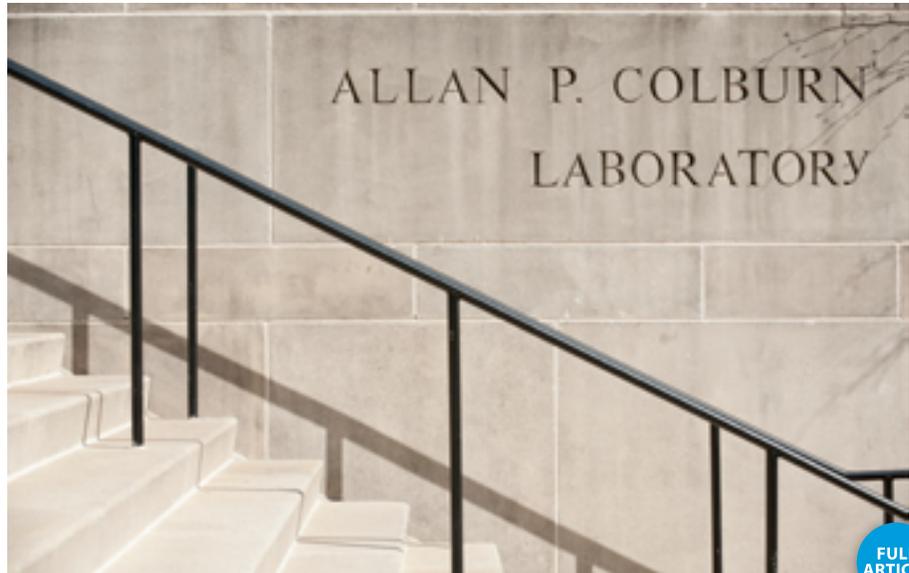
New department name acknowledges emergent role of biomolecular engineering

Our recent name change to the Department of Chemical and Biomolecular Engineering is the culmination of a decade-long evolution including significant activities in molecular-level engineering education and research rooted in the biological sciences.

Approved by the University Faculty Senate and effective December 2011, the name change reflects a growing national trend in engineering departments. Here at the University of Delaware, the new identity recognizes the excellence in which the flagship department is rooted, while acknowledging the emergent role of biomolecular engineering in transforming and improving today's world.

"This name change will improve our department's impact both within UD and globally," explained Norman J. Wagner, Alvin B. and Julia O. Stiles Professor and department chair. "It will enhance our competitiveness in attracting outstanding bio-oriented graduate and undergraduate students, and complement and strengthen the University's biomedical engineering degree program."

The department's focus to integrate the biological sciences into engineering has expanded significantly since 2004. One quarter of the department's faculty and students now identify with biomolecular engineering, while many more collaborate



on biomolecular- and biomaterials-related research. From Alzheimer's disease to zeolite catalysts, UD chemical and biomolecular engineers are leading challenging research, writing textbooks and educating the next generation of talent.

This research enterprise currently generates more than \$3.5 million in total research expenditures and supports more than 45 doctoral students and 10 post-doctoral fellows within the department. Nearly half of all students who graduated with a bachelor's degree in chemical engineering have completed a biochemical engineering minor since the minor's inception in 2003.

In 2010, the department added biological science as a fourth "scientific pillar" of the undergraduate curriculum, placing it on par

with chemistry, physics and mathematics, and making biological sciences a requirement for incoming students.

The change comes at a time of great anticipation, as the department looks forward to its centenary celebration in 2014. "Changing a department name is a rare occurrence; one not undertaken lightly," remarked Babatunde A. Ogunnaike, interim dean and William L. Friend Chair of Chemical and Biomolecular Engineering. "The timing is perfect as we reflect on our past excellence and forge ahead to realize our vision for the future—one that empowers our faculty and students to be leaders and innovators on the world stage."

Adapted from an article by Karen B. Roberts

INTRODUCTION

Check us out on Facebook:

*University of Delaware
Chemical Engineering*



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The “full article” circles are live links that will take you to the original, full-length story.

COVER PHOTO: Chemical Engineering Class of 2012 on the steps of Memorial Hall. Congratulations!

Department Chair: Abraham M. Lenhoff

Content Management: Megan Argoe

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Passing the Torch

In keeping with the tradition of five-year terms, I am pleased to congratulate the department's new chair, **BRAMIE LENHOFF**, Allan P. Colburn Professor of Chemical and Biomolecular Engineering. Bramie's teaching, scholarship and leadership are well known to many of you. He started his academic career at UD as an assistant professor in 1984 and he has been an important mentor for many of us. We look forward to his leadership as we approach the centenary celebration of UD's chemical and biomolecular engineering degree program in 2014.

In my inaugural message in the 2007 Alumni Bulletin, I stated that "Colburn Lab is bursting at the seams with creative activity." Today we are bursting at the seams in three different buildings across campus thanks, in part, to your generosity and engagement with our mission. As the largest research unit on campus, we are setting records with our undergraduate and graduate enrollments. Indeed, it's a very good time to be a chemical engineer at UD!

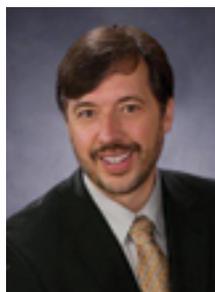
PRESIDENT HARKER's flagship building project, the Interdisciplinary Science and Engineering Laboratory (ISE-Lab)—scheduled for completion next spring—will provide desperately needed teaching laboratory space and a new home for the UD Energy Institute (UDEI), led by **MIKE KLEIN**. This will bring together leading faculty and students from across disciplines (many from CBE) to address society's need for affordable and clean energy. Co-locating faculty working on energy related research with UDEI and the UD public policy program illustrates the awesome scope of this challenge.

Similarly, the name change to chemical and biomolecular engineering establishes a third area of leadership in teaching and research that complements the department's traditional strengths in catalysis, thermodynamics, soft matter, transport science and allied areas of chemical

engineering with the engineering science of transforming matter via biomolecular routes and biomaterials. It also fosters the college's plans to embrace biological sciences across engineering disciplines, as evidenced by the establishment of a biomedical engineering degree program.

On behalf of the Colburn family, I thank you for your engagement over the past five years. One of the real benefits of serving as chair has been meeting and interacting with you, our alumni. Your continued generosity helps fuel the department's expansion, and provides critical guidance to the department, university and our students and graduates through teaching, mentoring and hiring, service on advisory councils and alumni committees, and support for the many activities needed by a world-class, top-ranked department. By working together, we have set the stage for the next 100 years of the "Delaware Tradition of Excellence."

As for me, I will spend the fall semester on sabbatical in Europe, catching up on my research program and reengaging with many former and new colleagues on the continent. Sabine, my wife, will also be on sabbatical leave from her high school, and we will enjoy visiting with her family in southern Germany. Afterward, I am eager to return to teaching and research at UD and to focus on STF-Armor™ and related technologies under development in my lab.



Best wishes to you and your families,

Norm Wagner

Alvin B. and Julia O. Stiles Professor

MESSAGE FROM THE INCOMING CHAIR

Embracing the Challenge

It is a privilege to assume the role of department chair, albeit a great challenge to fill the shoes of my accomplished predecessors. The most recent of these, **NORM WAGNER**, has earned a well-deserved sabbatical after an outstanding term, during what was, at times, a demanding period. His proactive leadership resulted in numerous initiatives, most obviously the department's name change this year, and I am sure that the Colburn Lab community joins me in acknowledging his dedication and contributions.

Additional thanks go to three invaluable faculty members who have continued the Delaware tradition of "missionary work" in moving to other institutions this year. **MARK BARTEAU**, **JINGGUANG CHEN** and **ANNE ROBINSON** each had a major effect on our department and programs, and all have provided formal and informal leadership at UD and in our profession. We wish them well and will always consider them part of our community.

Our department remains extraordinarily strong despite these departures, as the accomplishments of our faculty and students reported in this newsletter attest. Particularly noteworthy is the election of **TUNDE OGUNNAIKE** to the National Academy of Engineering. Additionally, we are proud of our junior faculty, including **THOMAS EPPS** who was promoted to associate professor, and others who earned noteworthy awards. Equally important are our dedicated staff and external teaching faculty.

Ultimately, however, our *raison d'être* is our students. I have always considered my faculty position to be a privileged one. My days are enlivened by the extremely capable students who pass through our programs. Our undergraduate and graduate programs continue to flourish, as do the alumni of the programs, as illustrated by the alumni successes reported in Jon Olson's alumni correspondent updates.

The central role of our alumni is especially apparent as we anticipate two major departmental anniversaries over the next two years—the centennial of UD's chemical engineering degree program (in 2014) and the 75th anniversary of **ALLAN COLBURN**'s joining UD as chair of Chemical Engineering (in 2013), which catapulted the program from a small unknown to one of the leading

programs in the nation, where it has remained. As we celebrate these milestones, we look forward to the involvement of many alumni and friends.

A book commemorating our department's history is currently being written by UD alumna and historian **REGINA LEE BLASZCZYK**. This will be a must-have for anyone interested in the department, its people and its accomplishments. Pre-order your copy early to ensure your name is included in the book! Additionally, visit the department website at www.che.udel.edu often to stay abreast of celebratory events and activities.

Finally, I am mindful that my term as chair started the day before the sesquicentennial of President Lincoln's signing the Morrill Land Grant Act into law, which precipitated the outstanding state universities that characterize today's modern higher education in the U.S.

The Morrill Act was intended to support education in "agriculture and the mechanical arts" (i.e., engineering), and indeed you will learn from the departmental history book that a century ago, almost 80 percent of UD students studied engineering. While engineers now represent a smaller fraction at UD and in higher education, our role is not diminished and the impact of our collective alumni is a great source of pride to us.

One of my goals as chair is to engage alumni directly with our current students, for whom you represent ideal role models. I look forward to contacting many of you during my term and working with you to extend the influence of our programs.

Many thanks for your continued interest in the department and for supporting its activities.



Best wishes,

Bramie Lenhoff

Allan P. Colburn Professor and Chair



Courtesy, University of Delaware Archives

Heritage Project

Commemorative book documents centennial history of Chemical Engineering degree program



H. Fletcher Brown

Courtesy, Special Collections, Morris Library

The department will celebrate two major anniversaries in the next two years, and we look forward to the active involvement of our alumni and friends in these commemorations. In 2014, UD marks the centennial of the establishment of a degree program in chemical engineering, and this will be the main focus of our celebrations. However, the chemical engineering program was a relatively small one for the first two decades. It was **ALLAN COLBURN**'s move from the DuPont Company to UD in 1938 as the first chair of what became the Department of Chemical Engineering that

launched UD into its leadership role in the profession nationally and internationally. For this reason, 2013—the 75th anniversary of Colburn's arrival at UD—also represents a major milestone for the department.

As part of the commemoration, we have commissioned historian and UD alumna **REGINA LEE BLASZCZYK (PH.D., 1995)** to write a book documenting the department's history. Blaszczyk's labors include extensive mining of UD, departmental and other archives and records, as well as coordination with a Heritage Committee comprising

Courtesy, University of Delaware Archives





Courtesy, University of Delaware Archives

Pre-order your Heritage Book at
www.che.udel.edu/100/order.html

NORM WAGNER, STAN SANDLER, FRASER RUSSELL, JON OLSON and BRAMIE LENHOFF.

We are delighted to offer the opportunity to pre-order copies of this must-have book at www.che.udel.edu/100/order.html. The names of all who pre-order by March 15, 2013 will be listed in the book as patrons or sponsors.

Various special events will mark the two anniversaries. Please watch our website for updates and information. We encourage all alumni and friends of the department to celebrate these major milestones with us.

Courtesy, University of Delaware Archives



Remembering Allan Colburn



UD's first chair of Chemical Engineering, **ALLAN COLBURN**, was born in Madison, Wis., on June 8, 1904. He graduated with high honors from the University of Wisconsin with a degree in chemical engineering in 1926; received his master's degree in 1927 and his PhD in 1929.

Colburn joined the faculty at the University of Delaware in 1938. He was appointed assistant to the president of the University in 1947

and as acting president in 1950. He then served as provost and coordinator of scientific research until his death in 1955.

In 2008, Colburn was designated one of "50 Chemical Engineers of the Foundation Age" in a list compiled by the American Institute of Chemical Engineers in conjunction with its centennial celebration. Colburn was recognized for his achievements as a pioneer of heat and mass transfer, including the Chilton-Colburn analogy.

UD alumnus **MILTON HARPER, 91**, who was advised by Colburn in the 1940s, recently shared memories with Babatunde Ogunnaike, interim dean of the College of Engineering.

Harper recalled that he was one of only about a half dozen students in the program—all males. The department was housed in a wing of Brown Laboratory, where there were no computers and the most modern piece of equipment was a distillation column. Some of his most vivid UD memories are of Professor Colburn, who he found to be caring and supportive.

"He was a terrific man. He didn't think he was way up there, and you were way down there. He was a good listener—if you could get him to hold still long enough to listen."

Harper recalls that Colburn would start a conversation, run down the hall for a few minutes, and then return to his office to pick up where he had left off. "I guess he had a lot of things going on in his head," Harper said. "He was always working on a dozen different problems at once."

"I respected him so much," Harper said. "As far as I'm concerned, he was the reason UD has such a good chemical engineering program. He started it, and he pushed it forward."

The Colburn Laboratory was dedicated in 1968 and rededicated following renovations in 1996.

**FULL
ARTICLE**

Adapted from article by Diane Kukich
Photo by Kathy F. Atkinson

Faculty Honors & Awards



MACIEK ANTONIEWICZ, DuPont Young Professor, received the College of Engineering's 2012 Outstanding Young Faculty of Engineering Award, recognizing excellence in

both teaching and research. Internationally recognized as an emergent leader in metabolic engineering, his research focuses on production of biofuels using microbes such as *E. coli*, yeast and thermophiles, and the study and manipulation of mammalian cell phenotypes in diabetes.



DOUG BUTTREY, professor of chemical and biomolecular engineering, received Purdue University's 2012 Chemistry Outstanding Alumni Award. Buttrey was also a featured speaker at UD's 2011 "Know

the Nobels" symposium, in which faculty members draw on their own areas of expertise to explain the work done by Nobel Prize winners. His talk focused on the discovery of quasi-crystals by chemistry Nobel Laureate Dan Shechtman.



Associate Professor **THOMAS H. EPPS, III**, has been named the Thomas and Kipp Gutshall Chair of Chemical and Biomolecular Engineering, the University's first endowed career development position

designed for a teacher/scholar at the assistant or associate professor level. Epps joined UD in 2006 as an assistant professor and was promoted to associate professor with tenure earlier this year. In 2011 he was selected by the University's Francis Alison Society to receive its Gerard J. Mangone Young Scholars Award. Epps was also selected by the University's Francis Alison Society to receive the 2011 Mangone Young Scholar Award.



ERIC M. FURST, professor and director of the Center for Molecular and Engineering Thermodynamics, authored a commentary in the Proceedings of the National Academy of Sciences

entitled "Directing Colloidal Assembly at Fluid Interfaces." The annotation reflects on work done by Kathleen Stebe at the University of Pennsylvania using directing fields to control the assembly of colloidal particles as a promising route to new nano- and microstructured functional materials. He was among 12 UD faculty promoted to full professor with tenure in May 2012.



MICHAEL T. KLEIN was selected as a 2011 American Chemical Society Fellow. Klein joined the UD faculty in 1981 and was department chair from 1991 to 1996. After 12 years

at Rutgers University, he returned to UD in 2010 as the Dan Rich Chair of Energy and director of the UD Energy Institute. His research has facilitated development of the modeling revolution now used as the contemporary approach in complex reaction systems, including the upgrading and conversion of energy sources to transportation fuels.



KELVIN LEE, director of the Delaware Biotechnical Institute, is the inaugural winner of the American Electrophoresis Society (AES) award. A special session at the 2011 annual AICHE meeting was held in Lee's honor.



E. TERRY PAPOUTSAKIS, Eugene du Pont Chair of Chemical and Biomolecular Engineering and a Delaware Biotechnology Institute Faculty Fellow, received the 2012 James

E. Bailey Award of the Society of Biological Engineering of the American Institute of Chemical Engineers (AIChE), and was selected as a 2011 American Chemical Society Fellow. Papoutsakis' research focuses on metabolic engineering and systems biology, particularly cell culture engineering, metabolic flux analysis, metabolic engineering of solventogenic clostridia and stem-cell engineering.

Affiliated faculty news



FULL ARTICLE

PAM COOK, associate dean of engineering, was named the University of Delaware's 2012 University Change

Agent. The national award, given by the Women in Engineering ProActive Network (WEPAN), recognizes Cook's efforts to improve the representation of women in science, technology, engineering and mathematics (STEM) fields.



FULL ARTICLE

KRISTI KIICK, professor of materials science and engineering is now deputy dean of the College of

Engineering. She was also elected to the American Institute for Medical and Biological Engineering (AIMBE) 2012 Class of Fellows.



MICHAEL HOCHBERG, associate professor, joined UD's Department of Electrical and

Computer Engineering this spring with a joint appointment in the Department of Chemical and Biomolecular Engineering. Hochberg, whose research interests focus on nanophotonics, was previously at the University of Washington, Seattle.

(continued)



FULL
ARTICLE

Ogunnaike elected to NAE

BABATUNDE A. OGUNNAIKE, William L. Friend Chair of Chemical and Biomolecular Engineering and interim dean of the College of Engineering, was elected to the prestigious National Academy of Engineering (NAE), acknowledging his contributions to advances in process systems, process engineering practice and systems engineering education.

Academy membership is among the highest professional distinctions accorded to an engineer, placing Ogunnaike among an elite group recognized for outstanding contributions to engineering research, practice or education. It recognizes engineers who pioneer new and developing fields of technology, lead major advancements in traditional fields of engineering, or develop innovative approaches to engineering education.

Ogunnaike joined the UD faculty in 2002 as a professor with dual appointments in the Department of Chemical Engineering (now the Department of Chemical and Biomolecular Engineering) and

the Delaware Biotechnology Institute's Center for Systems Biology. He was appointed William L. Friend Professor of Chemical and Biomolecular Engineering in 2004 and promoted to William L. Friend Chair in 2008. In 2010, he was named deputy dean of the College of Engineering and became interim dean in 2011.

The author or editor of four books and more than 75 papers and book chapters, Ogunnaike served as associate editor of the Institute of Electrical and Electronics Engineers' *IEEE Transactions on Control Systems Technology* and currently is associate editor of the American Chemical Society's Industrial & Engineering Chemistry Research.

He is the recipient of numerous awards, including the Donald P. Eckman Education Award from the International Society of Automation (ISA), the American Automatic Control Council's Control Engineering Practice Award and the College of Engineering's Excellence in Teaching Award. Most recently, he was inducted to the Nigerian Academy of Engineering's 2012 Class of Fellows at the University of Lagos, his undergraduate alma mater.

Adapted from article by Karen B. Roberts

Photo by Ambre Alexander

Faculty Honors & Awards



FULL ARTICLE

STANLEY I. SANDLER, the H.B. du Pont Chair of Chemical and Biomolecular Engineering, received the CACHE (Computer Aids in Chemical Engineering) award for excellence in chemical and

biomolecular engineering computing for his groundbreaking use of technology in the classroom. Blending technology with education, Sandler's fourth edition textbook, *Chemical and Engineering Thermodynamics*, includes disks enabling students to perform calculations with simulated thermodynamic models, and a website supporting student assignments and calculations.



MILLICENT O. SULLIVAN, assistant professor, was awarded the 2011 College of Engineering's Outstanding Young Faculty of Engineering Award. Sullivan's research covers the cells/materials

interface with a focus on understanding the physical and molecular fundamentals that drive engineering of nanoparticles for drug delivery and nanoresponsive materials for several biomedical applications.



NORMAN J. WAGNER, the Alvin B. and Julia O. Stiles Professor, co-chaired the 2012 Gordon Research Conference on Colloidal, Macromolecular and Polyelectrolyte Solutions. Other UD faculty participating

in the conference were Millicent O. Sullivan, Thomas H. Epps, III and Eric M. Furst.



FULL ARTICLE

RICHARD WOOL, professor of chemical and biomolecular engineering and director of UD's Affordable Composites from Renewable Sources (ACRES), was honored by the BioEnvironmental Plastic

Society (BPS) with a lifetime achievement award. The annual award recognizes his scientific and scholarly contributions in the fields of biopolymers, biobased materials and bioplastic related bioenergy systems.

Faculty and staff departures



MARK BARTEAU retired after a distinguished 30-year career with UD and is now the inaugural holder of the DTE Energy Professorship of Advanced Energy Research, professor of chemical and biomolecular engineering and director of the University of Michigan Energy Institute. Most recently senior vice provost for research and strategic initiatives, Barteau previously served the department as the Robert L. Pigford Chair of Chemical and Biomolecular Engineering and director of the Center for Catalytic Science and Technology. He was named one of the "One Hundred Engineers of the Modern Era" by the AIChE.



JINGGUANG CHEN, the Claire D. LeClaire Professor of Chemical and Biomolecular Engineering and co-director of the DOE Energy Frontier Research Center, left US this year after 13 years, first in Materials Science and then in Chemical and Biomolecular Engineering, and now holds an endowed chair of chemical engineering at Columbia University, with a joint appointment at Brookhaven National Lab. Chen served as UD's director of the Center for Catalytic Science and Technology and won both the 2011 Herman Pines Award in Catalysis, as well as a UD Excellence in Undergraduate Advising Award.



DAVID COWGILL, master machinist, has retired after 41 years of service to the Department of Chemical & Biomolecular Engineering, the College of Engineering and the University of Delaware. Dave is an avid motorcyclist, and George Whitmyre, lab manager, recalls "Dave was seen on more than one occasion in icy, snowy weather at the end of

the workday plugging in his heated riding leathers on his BMW motorcycle for the slippery ride home!"

Dave's plans during retirement are to travel with his wife on their motorcycle to see the country and to finish the car he is rebuilding in his garage.

Named lecture series

Klein presents inaugural lecture as Dan Rich Chair of Energy



FULL ARTICLE

MICHAEL T. KLEIN, the Dan Rich Chair of Energy and professor of Chemical and Biomolecular Engineering, delivered his inaugural lecture as a named professor in October 2011.

The UD alumnus, who has authored more than 200 technical papers and serves as lead author of the text,

Molecular Modeling in Heavy Hydrocarbon Conversions, spoke on "Colleagues in the Development of Kinetic Modeling Approaches and Tools."

Klein's research focuses on chemical reaction engineering, with special emphasis on the kinetics of complex systems. His work has facilitated development of the modeling revolution now used as the contemporary approach in complex reaction systems, including the upgrading and conversion of energy sources to transportation fuels.

Among his career honors are several national awards, including the R. H. Wilhelm Award in Chemical Reaction Engineering from the American Institute of Chemical Engineers (AIChE), the National Science Foundation's Presidential Young Investigator Award and the American Chemical Society (ACS) Delaware Valley Section Award. Klein, who is editor-in-chief of the ACS journal *Energy and Fuels*, was named an ACS Fellow in 2011.

Chen delivers inaugural lecture as Gore Professor of Chemical and Biomolecular Engineering



FULL ARTICLE

WILFRED CHEN, the Gore Professor of Chemical and Biomolecular Engineering, delivered his inaugural lecture, "Biomolecular Engineering for Profit and Fun" in November 2011.

An experienced researcher dedicated to the innovation of new technologies, Chen's work involves harnessing energy from biological

sources to cure diseases, purify protein pharmaceuticals and create bio-fuels. His research has been funded through the National Science Foundation, the U.S. Department of Energy and the Environmental Protection Agency, among others.

He has published more than 190 journal papers and delivered more than 50 invited lectures. He serves on the editorial board for eight scientific publications and is a reviewer for more than 40 journals.

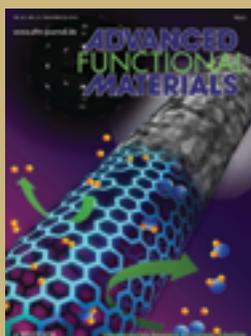
He is a fellow of the American Association for the Advancement of Science (AAA) and the American Institute for Medical and Biological Engineering (AIMBE); and a member of the American Institute of Chemical Engineers (AIChE), the American Chemical Society (ACS) and the American Society of Microbiology (ASM).

Chen joined UD in January 2011.

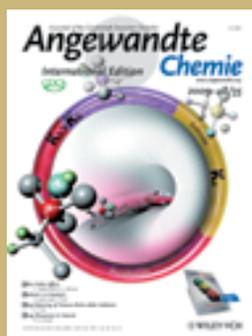
*Adapted from article by Alyssa Cella
Photo by Ambre Alexander*

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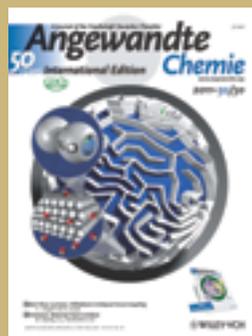
Books, monographs and journal articles that were highlighted on covers selected from more than 120 publications by our faculty this past year.



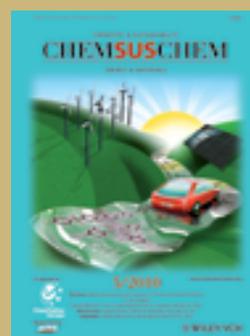
“Fuel Cells: Porous Platinum Nanotubes for Oxygen Reduction and Methanol Oxidation Reactions” by Shaun M. Alia, Gang Zhang, David Kisailus, Dongsheng Li, Shuang Gu, Kurt Jensen and Yushan Yan.



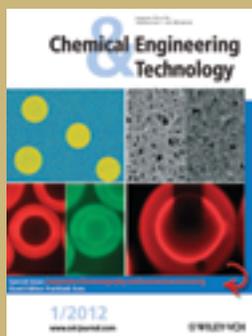
“A Soluble and Highly Conductive Ionomer for High-Performance Hydroxide Exchange Membrane Fuel Cells” by Shuang Gu, Rui Cai, Ting Luo, Zhongwei Chen, Minwei Sun, Yan Liu, Gaohong He and Yushan Yan.



“Supercapacitor Electrodes with High-Energy and Power Densities Prepared from Monolithic NiO/Ni Nanocomposites” by Qi Lu, Michael W. Lattanzi, Yunpeng Chen, Xiaoming Kou, Wanfeng Li, Xin Fan, Karl M. Unruh, Jingguang G. Chen and John Q. Xiao.



“Quaternary Phosphonium-Based Polymers as Hydroxide Exchange Membranes” by Shuang Gu, Rui Cai, Ting Luo, Kurt Jensen, Christian Contreras and Yushan Yan.



“Microscopy Methods used to Elucidate Protein Adsorption and Transport Behavior on Novel Chromatographic Media” by Brian D. Bowes, Steven J. Traylor, Steven M. Timmick, Kirk J. Czymmek and Abraham M. Lenhoff.



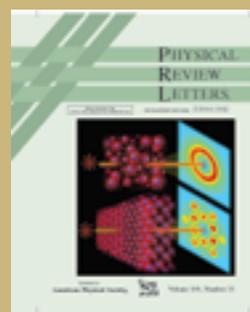
“A Simple Approach to Characterizing Block Copolymer Assemblies: Graphene Oxide Supports for High Contrast Multi-Technique Imaging” by Joseph P. Patterson, Ana M. Sanchez, Nikos Petzetakis, Thomas P. Smart, Thomas H. Epps, III, Ian Portman, Neil R. Wilson and Rachel K. O'Reilly.



“Sponge-to-Lamellar Transition in a Double-Tail Cationic Surfactant/Protic Ionic Liquid System: Structural and Rheological Analysis” by Carlos R. López-Barrón, Madivala G. Basavaraj, Leo DeRita and Norman J. Wagner.



“Directed Self-Assembly of Colloidal Crystals by Dielectrophoretic Ordering” by Jason M. McMullan and Norman J. Wagner.



“Dynamics of Melting and Recrystallization in a Polymeric Micellar Crystal Subjected to Large Amplitude Oscillatory Shear Flow” by Carlos R. López-Barrón, Lionel Porcar, Aaron P. R. Eberle and Norman J. Wagner.

Named lecture series

Lenhoff delivers inaugural lecture as Allan P. Colburn Professor of Chemical and Biomolecular Engineering



ABRAHAM LENHOFF, the University of Delaware's Allan P. Colburn Professor of Chemical and Biomolecular Engineering, delivered "The Colburn Papers" as his inaugural lecture in April 2012.

The presentation used the University of Delaware Library's collection of Colburn's early papers

to explore characteristics of chemical engineering education and research in the 1920s and 1930s.

Lenhoff, who joined UD in 1984, is known for his expertise in applying the principles of thermodynamics, transport phenomena, biophysics and colloid science to protein separations and phase behavior, especially chromatography and crystallization.

Since 2000, he has directed a National Institutes of Health-funded Center of Biomedical Research Excellence at UD that focuses on membrane protein production and characterization.

A fellow of the American Institute for Medical and Biological Engineering (AIMBE) and the American Association for the Advancement of Science (AAAS), Lenhoff holds membership in several organizations including the American Institute of Chemical Engineers (AIChE), the American Chemical Society (ACS) and the Protein Society.

FULL ARTICLE

Yan presents inaugural lecture as Distinguished Professor of Chemical and Biomolecular Engineering



YUSHAN YAN's inaugural lecture as Distinguished Professor of Chemical and Biomolecular Engineering, "Clean Energy: Flash without Flame," was presented in March 2012.

Yan is known for using nanomaterials to solve problems in energy engineering, environmental sustainability and electronics.

His current work involves development of new fuel cell catalysts and membranes to reduce the cost and improve the durability of fuel cells.

He is a fellow of the American Association for the Advancement of Science (AAAS) and is a member of the American Institute of Chemical Engineers (AIChE), American Chemical Society (ACS), Electrochemical Society (ECS), Materials Research Society (MRS), North American Membrane Society (NAMS) and the International Zeolite Association (IZA).

Yan joined UD in July 2011.

Adapted from article by Janie Sikes

Photo by Kathy F. Atkinson

FULL ARTICLE

Team develops cheaper, non-petroleum method to make plastics from biomass

Plants into plastics

A team of UD chemical and biomolecular engineers working with colleagues from the University of Massachusetts Amherst has discovered a new way to make plastic bottles from biomass rather than petroleum.

The discovery demonstrates an efficient, renewable way to produce the chemical p-xylene, necessary in creating certain plastic containers. Xylene chemicals are used to produce a plastic called polyethylene terephthalate (PET), which is currently used in many products including soda bottles, food packaging, synthetic fibers for clothing—even automotive parts.

The new process uses a zeolite catalyst capable of transforming glucose into p-xylene in a three-step reaction within a high-temperature biomass reactor. Researchers call this a major breakthrough since other methods of producing renewable p-xylene are either expensive or inefficient due to low yields.

“Our discovery shows remarkable potential for green plastics, particularly those used to distribute soft drinks and water,” said **DION VLACHOS**, director of the UD’s Catalysis Center for Energy Innovation (CCEI). “This technology could significantly reduce production costs for manufacturers of plastics from renewable sources.”

A key to the success of the new process is using a catalyst specifically designed to promote the p-xylene reaction over other less desirable reactions. The research was published in the journal *ACS Catalysis*.

The research team believes further modifying the process could potentially boost the yield and make it even more economically attractive.



This discovery is a part of a larger effort by the CCEI to create breakthrough technologies for the production of biofuels and chemicals from plant biomass. The center is funded by the U.S. Department of Energy as part of the Energy Frontiers Research Center program, which combines more than 20 faculty with

complementary research skills to collaborate on solving the world’s most pressing energy challenges.

Photo by Evan Krape



FULL
ARTICLE

“This technology could significantly reduce production costs for manufacturers of plastics from renewable sources.”

—Dion Vlachos, director of the University of Delaware’s Catalysis Center for Energy Innovation

UD researchers publish on CHO-K1 cell genome sequencing

The Chinese Hamster Ovary (CHO) cell is one of the most preferred hosts used to manufacture therapeutic proteins—genes added to "cell factories" to produce proteins that are later turned into medicines.

Protein therapeutics need a clean and controlled environment for growth, which the CHO cell provides. In addition, CHO cells are able to produce complex, human-like proteins for the treatment of disease. But what has eluded scientists until now is precisely how and why the CHO cell behaves as it does.

KELVIN LEE, director of the Delaware Biotechnology Institute and Gore Professor of Chemical and Biomolecular Engineering, explained, "The growth and behavior of the host cell can affect the protein being made, so figuring out how cells work at the genetic level will allow scientists to better

manufacture these medicines to treat a wide range of human diseases, such as Alzheimer's and cancer."

The father of all CHO cells, CHO-K1 has been sequenced and analyzed by a team of domestic and international partners including UD, Johns Hopkins University, Stanford University, BGI-Shenzhen, GT Life Sciences and many more. The collaborators discuss this first-ever genome sequencing of the CHO-K1 cell in a paper published in *Nature Biotechnology*.

"Knowing the complete sequence of a genome shows us all the capabilities and limitations of a cell. It helps us understand metabolism and protein production pathways of cells, amongst other important factors," says Stephanie Hammond, postdoctoral fellow in UD's Department of Chemical and Biomolecular Engineering. "We now have a foundation for understanding how the cell works."

Now that a baseline for the CHO-K1 genome has been established, the researchers hope to maximize the impact and dissemination of these data through an online database at UD allowing the international biotechnology community to store and update information about CHO cells.

"There is a \$77 billion global market for protein therapeutics, and 70 percent of them are made in CHO cells," said Lee. "This kind of collaboration and exploration will translate into better manufactured medicines that are affordable, while simultaneously stimulating economic growth."

Adapted from article by Laura Crozier



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AIChE

DELAWARE ALUMNI RECEPTION

Monday, October 29, 2012 | 7:00–9:00 p.m.

David L. Lawrence Convention Center | Room 301
Pittsburgh, Pennsylvania

For alumni, friends and special guests. No need to RSVP.



www.iche.org/annual

In search of new biofuels

UD wins \$2.2 million grant for bioenergy research

Unlike their non-renewable fossil fuel counterparts, such as oil, biofuels—which are made from renewables such as agricultural and forest products and byproducts—may help reduce pollution and U.S. dependence on foreign resources.

Their production, however, is problematic. Biofuels must be produced quickly and at high concentrations in order to make them economically feasible. Unfortunately, the process can be toxic to cells necessary in their manufacture.

ELEFThERIOS (TERRY) PApOUTSAKIS, Eugene du Pont Chair of Chemical and Biomolecular Engineering, is working to create hardy organisms for producing biofuels and chemicals from renewable sources—microorganisms that are more resistant to toxic chemicals and engineered to withstand the stress response that can inhibit cell growth and cause cell death.

“Our main goal is to improve the organism used to derive economically feasible biofuels by focusing on the genomic technology,” said Papoutsakis, principal investigator.

Previous biofuel production research has mainly focused on ethanol, but in the last three to four years, butanols have attracted considerable interest as biofuels because they exhibit superior chemical properties in terms of energy content, volatility and corrosiveness.

Papoutsakis has coordinated a strategic group of researchers—including five UD faculty members and one collaborator at Pennsylvania State University—with expertise in genetics and genomics; genomic tools and analysis; bioinformatics; biological model building and genome scale modeling to undertake this three-year study funded by a \$2.2 million grant from the U.S. Department of Energy.

“Coupling bioinformatics and computational modeling with advanced experimental systems biology methods, this project will establish a new research infrastructure at UD that can be leveraged for other multidisciplinary research collaborations that require such global-scale, systematic and integrative analyses for understanding of biological systems,” explained Cathy Wu, Edward G. Jefferson Chair and director of the Center for Bioinformatics and Computational Biology and professor in the departments of Computer and Information Sciences and Biologic Sciences, who is a co-principal investigator on the grant.



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Adapted from article by Karen B. Roberts
Photo by Kathy F. Atkinson

NSF IGERT grant supports work in systems biology of cells in engineered environments

A group of University of Delaware faculty have been awarded a five-year, \$3 million National Science Foundation grant under the Integrative Graduate Education and Research Traineeship (IGERT) program to train doctoral students in the area of systems biology of cells in engineered environments (SBE2).

Led by principal investigator **KELVIN LEE**, Gore Professor of Chemical and Biomolecular Engineering and director of the Delaware Biotechnology Institute, the grant draws together experts from the colleges of Engineering; Agriculture and Natural Resources; Earth, Ocean, and Environment; Arts and Sciences; and Business and Economics for a comprehensive, intense work/study program designed to create the science leaders of tomorrow.

“Our program brings together two groups of very productive faculty: those working on methods to profile molecules inside cells, and those working on cells in a variety of environments, such as in tissue engineering applications, and in understanding stem cell differentiation,” said Lee. “By encouraging collaboration, the program seeks to train a new type of Ph.D. student capable of working across traditional disciplinary boundaries while solving some of the most interesting and important problems in the life sciences.”

IGERT Scholars will rotate in faculty laboratories, do internships at partner companies and laboratories in Delaware and around the country, and design and implement solutions to important industry problems through an “innovation rotation.”

A new doctoral program in bioinformatics and systems biological, launched this fall, offers an exciting new interdisciplinary home for IGERT Scholars.

The program will immerse graduate students in a training program connecting biological systems and cells in engineered environments, while coupling novel computational approaches with cutting-edge experimental systems biology techniques.



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ARTICLE

Article by Laura Crozier
Photo by Evan Krape



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ARTICLE

Alexandra Bayles awarded prestigious Goldwater Scholarship

Chemical and biomolecular engineering senior **ALEXANDRA BAYLES** is one of 282 Goldwater Scholars to receive a 2012 scholarship from the Barry M. Goldwater Scholarship and Excellence in Education Foundation.

A University Honors Program student, Bayles studies the stability of partially crystalline particles within different emulsion systems. She plans to pursue her doctorate in chemical engineering concentrating on transport phenomena, potentially with a focus in fluid mechanics or rheology. Ultimately, she hopes to teach at a university and conduct renewable energy research.

For her success in being selected, Bayles thanked her research adviser **ERIC M. FURST**, professor of chemical and biomolecular engineering; **KELLY M. SCHULTZ**, a UD doctoral graduate, and the members of the Furst Research Group, for serving as “inspirational mentors” since her freshman year.

Additionally, she acknowledged UD alumnus **PATRICK SPICER**, technical section head, and the members of the Complex Fluids Microstructure Group at Procter and Gamble Co., who co-advised her undergraduate work, as well as the chemical and biomolecular engineering faculty and her parents and brother “for their encouragement and support.”

The scholarship program is the premier undergraduate award of its kind, providing awardees up to \$7,500 per year toward tuition, fees, books and room and board costs.

*Adapted from article by Karen B. Roberts
Photo by Kathy F. Atkinson*

Pagels' leadership earns him the Alexander J. Taylor Sr. Award



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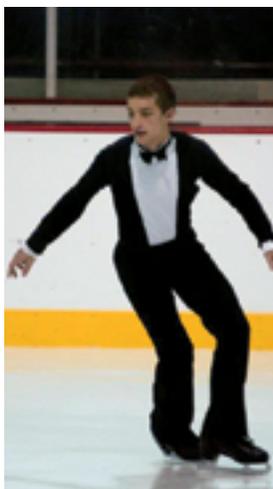
ROBERT PAGELS, who graduated in May with an honors bachelor's of chemical engineering degree and a minor in biochemical engineering, received the Alexander J. Taylor Sr. Award as the outstanding man in the 2012 graduating class. The award is given annually by the UD Alumni Association to recognize the senior man who best exemplifies leadership, academic success and community service.

A dean's list student every semester, Pagels maintained a 4.0 GPA and was one of a select group of students in the Class of 2012 to be awarded a Eugene du Pont Memorial Distinguished Scholarship.

Pagels showed leadership out of the classroom in addition to excelling academically. He served as sophomore representative, treasurer and was the president of the UD American Institute of Chemical Engineers student chapter, and was the Chemical and Biomolecular Engineering student representative with the Engineering Educational Activities Committee.

In the summer after his freshman year, wanting to do something meaningful and different, Pagels introduced himself online to an Indian woman who had 30 orphan children between 6 and 12 years of age living in her home. With the help of professors and friends, he organized a trip to Tiruvannamalai, India, and spent a month helping in the orphanage. He organized paperwork, filled out necessary government forms, put together a library and worked with the children on their English when they returned from school. After his time in India, Pagels continued his community service locally as vice president of Alpha Lambda Delta, an honors society with a focus on community service.

He is currently pursuing a doctoral degree in chemical engineering at Princeton University.



ENGINEER HELPS UD GLIDE TO GOLD

Sophomore **BRYAN SCHAEFFER** not only excels in his studies in chemical engineering, but he also is part of Delaware's Figure Skating Team (UDCFST). Bryan took home 2nd place in the preliminary men's competition at the UD Intercollegiate Competition in March.

CBE undergrad crafts special *Times* crossword puzzle to celebrate the date 11-11-11



November 11, 2011, or 11-11-11, is a date UD chemical engineering major and Honors Program student **ALEX VRATSANOS** won't soon forget, especially now that he has a keepsake copy of *The New York Times* bearing a crossword puzzle he crafted in tribute to the number 11.

The lucky eleven publication wasn't his first time published in *The New York Times*. His first crossword puzzle appeared there a few months earlier in June 2011.

He admits he's now tempted to do another date-celebrating puzzle for 12-12-12. "But, it would be similar to many movie sequels—they often aren't as good as the originals."

Besides, Dec. 12 falls on a Wednesday, and Vratsanos said a Wednesday puzzle would probably not be as much fun to construct. He likes Friday because that's the second-hardest puzzle of the week—only Saturday's is more difficult.

Adapted from article by Diane Kukich

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Five from CBE receive NSF Fellowships



Five chemical engineering students received prestigious National Science Foundation Graduate Research Program Fellowships granted to outstanding students pursuing research-based master's and doctoral degrees in science, technology, engineering or mathematics (STEM).

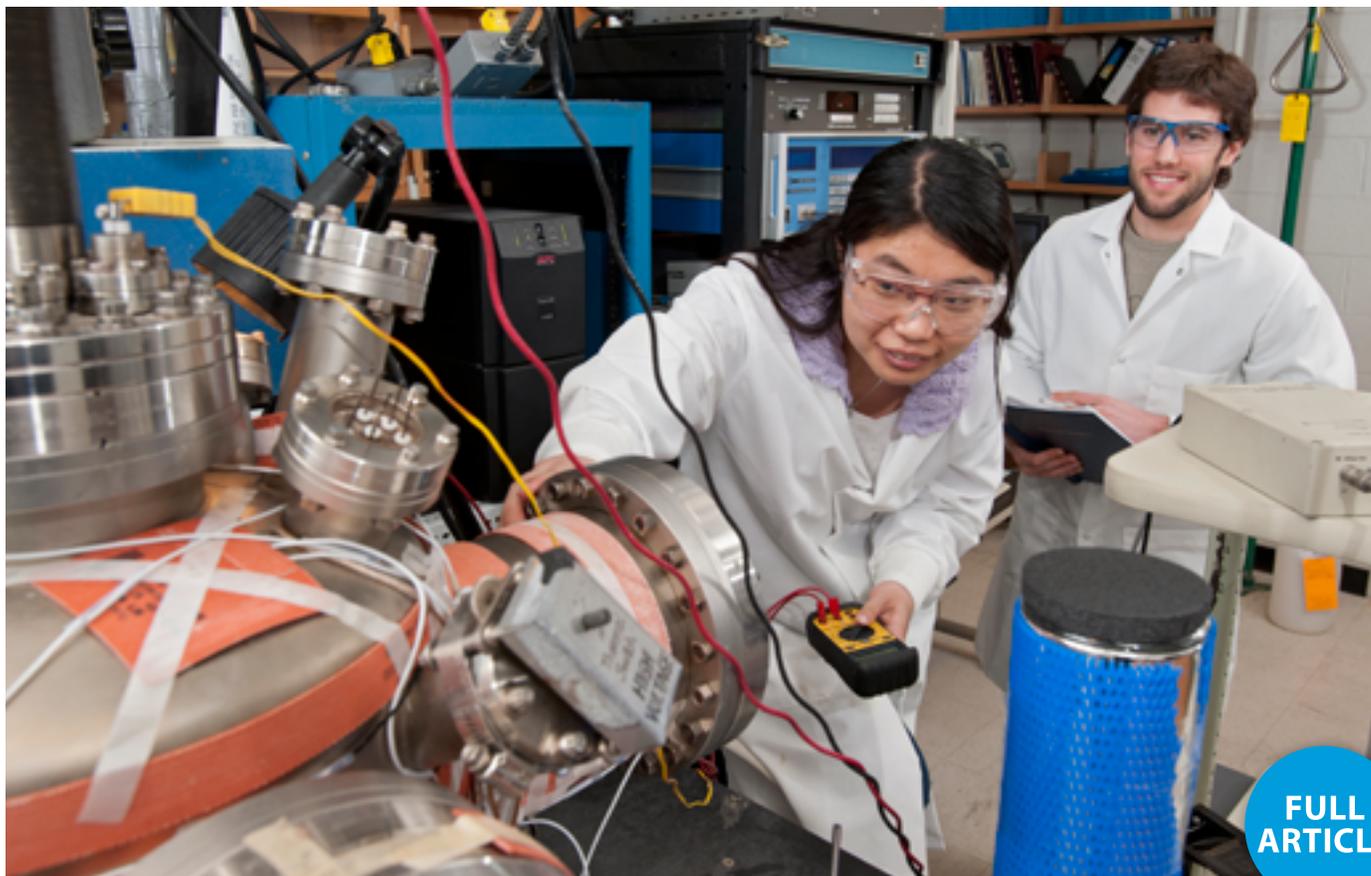
"I'm so excited to be an NSF Fellow, and more excited to be at UD!" said **ELIZABETH (LIZZY) MAHONEY**, a doctoral student in chemical engineering and one of three UD doctoral students in the department who received the award along with colleagues **TYLER JOSEPHSON** and **STEPHEN MA**.

Also winning graduate fellowships from UD were chemical engineering majors **JOEY D. KIM**, who now attends graduate school at the University of California, Santa Barbara, and **ROBERT PAGELS**, now at Princeton University.

Adapted from article by Tracey Bryant

Photo by Kathy Atkinson

FULL
ARTICLE



Advancing scientific discovery— early collaboration accelerates scientific progress

Fifth year doctoral student **MICHAEL SALCICCIOLI**'s research focuses on computational modeling of metal catalysts useful to the production of biofuels and biochemicals.

Salciccioli has developed a novel framework that uses fundamental data, combined with mathematical computation, to rapidly screen hundreds of potential catalysts made from solid metal materials, and select top performers that warrant further study.

Mathematical modeling, however, can only take the research so far. To learn more about how catalysts behave under reaction conditions, Salciccioli turned to fellow doctoral student **WEITING YU**, who uses experimental techniques and spectroscopy to visualize and characterize catalytic reactions.

Salciccioli and Yu are part of collaborative group of postdoctoral researchers and students from UD and the University of Pennsylvania who meet every other week to present their research, discuss challenges in their work and collaborate with peers and faculty through UD's Catalysis Center for Energy Innovation, an

Energy Frontier Research Center funded by the Department of Energy and directed by Dion Vlachos. The bi-weekly meetings nurture ingenuity and multidisciplinary teamwork at a highly synergistic level.

Yu's work contributes to understanding how catalysts cause different molecular bonds to break and produce different products, knowledge that is critical to creating effective chemicals, biofuels and fuel cells.

Yu's experiments helped Salciccioli validate the reactions he was studying computationally, while Salciccioli's research helped Yu predict the activity of catalysts critical to her work.

The collaborative effort resulted in a paper published in the *Journal of the American Chemical Society*. Ultimately, it may also enable a new class of catalysts in biofuel production.

*Adapted from article by Karen B. Roberts
Photo by Evan Krape*

Recycled cooking oil powers UD bus fleet

The University of Delaware bus fleet is more environmentally friendly now that it is powered by UDiesel, a biodiesel produced by undergraduate chemical and biomolecular engineering students recycling used cooking oil.

The project is a collaborative effort between transportation and engineering, inspired by the donation of a biodiesel processor by UD chemical and biomolecular engineering alumnus **JAMES SEFERIS 1977PH.D.** The generous gift this year of a gas chromatography system, along with columns and consumables, from Agilent Technologies allows reliable measurement of minute quantities of free glycerin, mono-, di- and triglycerides, as well as methanol in the final product.

Housed in Colburn Laboratory, the donated biodiesel processor is capable of recycling 130–150 gallons of cooking oil per batch to produce 100 gallons of biodiesel fuel, as well as glycerin, a syrupy byproduct with many uses in agriculture, pharmaceuticals and beauty products.

Undergraduates provide the sweat equity to render the oil into fuel through a method called transesterification, the process of separating the glycerin from the fat or vegetable oil. The project is part of the senior lab experience led by **ANTONY BERIS**, Arthur Metzner Professor of Chemical and Biomolecular Engineering.

The student team currently produces approximately one batch per week, which equals approximately 42 gallons of biodiesel and 11 gallons of glycerol.

Biodegradable and less toxic than table salt, biodiesel has lower emissions compared to petroleum diesel, and can be used in compression-ignition (diesel) engines with little or no modification.

“Since the waste oil and soy oil comes from local biorenewable sources, it also reduces UD’s carbon footprint; a win:win for both the University and the state,” notes Norman J. Wagner, Alvin B. and Julia O. Stiles Professor.

Adapted from article by Karen B. Roberts

Grad student named 2012 Laird Fellow



FULL ARTICLE

Chemical and biomolecular engineering doctoral student **TYLER JOSEPHSON** is the 2012 recipient of the Laird Fellowship, the prestigious award honoring the memory of University of Delaware mechanical engineering graduate George W. Laird, who died in an accident at the age of 35.

Josephson, also a 2012 recipient of a National Science Foundation Graduate Research Fellowship, is advised by Dion Vlachos, director of Catalysis Center for Energy Innovation and the Elizabeth Inez Kelley Professor of Chemical and Biomolecular Engineering.

His research focuses on using computer simulations to study molecular-scale behavior involved in producing biofuels. Comparing simulation results to experimental results, he explained, enables engineers to better understand the chemical reactions and the effects that are important in thermochemical biomass processing—items important to turning biomass into useful chemicals or chemical byproducts.

“With a fundamental understanding of the chemistry in these systems, these technologies can be made more efficient and economical,” he said. “One day, we might even see a farm-scale biorefinery that can process local biomass to meet local fuel, fertilizer or other chemical needs.”

This would not only stimulate local economies by creating locally derived products, it would also provide environmental benefits such as reduced transportation emissions.

Given since 1997, the fellowship is bestowed upon candidates who exhibit character, creativity, imagination and perseverance. The award encourages recipients to become engaged in a broadening intellectual pursuit that may or may not have direct applications to his or her chosen field of study.

Josephson is a member of the American Institute of Chemical Engineers (AIChE); the American Chemical Society (ACS) and Tau Beta Pi, an engineering honors society.

Adapted from article by Karen B. Roberts

Photo by Evan Krape

Air Products Fellowship now includes on-site company internship

Air Products and Chemicals has added an on-site company internship to the named Air Products Fellowship the company has generously funded through UD's Department of Chemical and Biomolecular Engineering since 2008. The addition ensures an even more valuable and pivotal experience for graduate students receiving the award.

FRANK PETROCELLI (*pictured in center*) is a senior research associate at Air Products involved in the company's recruitment and outreach efforts at the University of Delaware. As a UD engineering alumnus (Ph.D.1985), he is uniquely situated to appreciate the confluence of the department's and his industry's aims.

"The research and teaching in UD's engineering departments is directed at working on solutions to the scientific and technical challenges in our environment and our society today," Petrocelli said. "At its core, those are the challenges we are ultimately working on at Air Products, as well, and the internship is a great way for us to provide opportunities for



FULL ARTICLE

graduate students who want to gain experience in an industrial research setting."

ELIZABETH D'ADDIO (*at right in photo*), who held the fellowship for the 2008–09 academic year, now works for Air Products. Other winners from chemical engineering include **MAEVA TUREAU** (2009–10, *at left in photo*) and **THOMAS KELLY** (2010–11; *not pictured*).



Fyrwald leads Univar; presents Gerster Lecture at UD

J. ERIK FYRWALD, B1981, is now president of Univar, a leading distributor of industrial and specialty chemicals. Fyrwald was president of Nalco from 2008 until 2011, when Nalco was sold to Ecolab for \$8.4 billion and he became president of the combined company. He visited UD in May to present the Gerster Lecture, in which he discussed the challenges of providing adequate water supplies in different parts of the world.

FULL
ARTICLE

CBE alumnus Rakesh Agrawal among nation's top innovators

RAKESH AGRAWAL, M1977, Winthrop E. Stone Distinguished Professor of Chemical Engineering at Purdue University, is among five individuals named by President Barack Obama as a recipient of the National Medal of Technology and Innovation.

Administered for the White House by the U.S. Department of Commerce's Patent and Trademark Office, the award is the nation's highest honor for technological achievement, and recognizes individuals who "have made lasting contributions to America's competitiveness and quality of life and helped strengthen the nation's technological workforce."

Agrawal was selected for "an extraordinary record of innovations in improving the energy efficiency and reducing the cost of gas liquefaction and separation." He received the award at a White House ceremony earlier this year.

His research focuses on renewable energy, including improving the conversion of biomass to liquid fuels, low-cost solar cells and energy systems analysis.

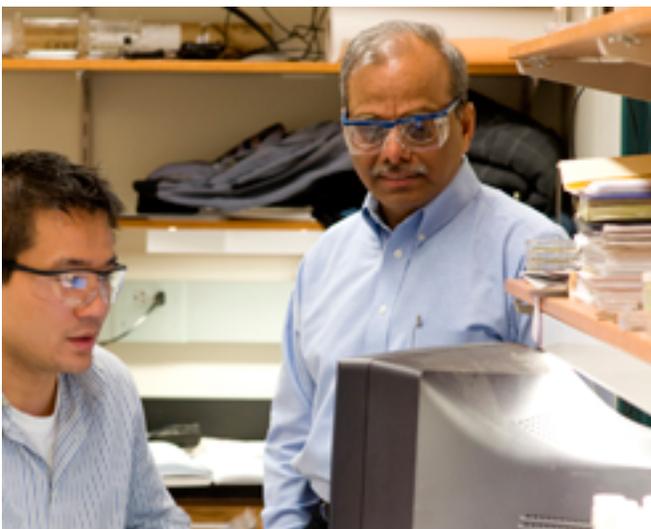


Photo courtesy Purdue University

Rakesh Agrawal (right)

FULL
ARTICLE

Gore gift funds two fellowships

Two new College of Engineering graduate fellowships are now available to incoming doctoral students with strong academic progress beginning in 2012, thanks to a generous \$1 million gift from Robert W. Gore.

Gore is a 1959 chemical and biomolecular engineering graduate of UD, who served as president of W.L. Gore and Associates, Inc. He was a member of the UD Board of Trustees and is now trustee emeritus. He is also a long-time member of the Department of Chemical and Biomolecular Engineering Advisory Council.

The annual fellowships will be awarded at the discretion of the dean and are intended to help new first-year graduate students support educational and living expenses.

"Rewarding and retaining our talented young faculty, and attracting high quality graduate students, are top priorities for us in the College of Engineering. This gift will go a long way in helping us to achieve these objectives," said Babatunde A. Ogunnaike, interim dean of engineering.

Adapted from article by Karen B. Roberts

Alumni Coordinator Remarks

This past academic year has been an excellent one for seniors and alumni in CBE (Chemical and Biomolecular Engineering—our new name). The seniors found an improved job market and many alumni won important professional awards or employment responsibilities.

The faculty described the 2012 class as an exceptional one both in the positive attitude of the students and in their superior academic performance. Two seniors, **JOEY KIM** and **ROBERT PAGELS**, won NSF Fellowships, and Robert Pagels also won the UD Taylor Award as the most outstanding male senior.

Employment opportunities for seniors were better this year than in the past three. Of the 66 seniors, 34 found industrial employment before graduation, 11 accepted admission to graduate school, and only 21 students were not employed at graduation. Of those still looking for employment, 10 began job searching late in the spring and had at least one interview; while the remaining 11 postponed their employment search until after graduation.

While salaries for industrial employment remained flat over the last three years: \$66K ± \$9K, the highest process industry salary was \$82.5K, much higher than last year. Graduate stipends remained similar to previous years at \$28.6K ± \$4K plus tuition.

With the goal of increasing alumni pride and support of UD, **PRESIDENT HARKER** has placed great emphasis on reunions. He was previously dean of the Wharton School at U Penn, where reunions are a longstanding tradition and alumni strongly supported the institution year to year.

YEAR	PERCENT				ANNUAL SALARIES	
	HIRED	GRAD SCHOOL	SEEKING	NO INFO	\$ Average	\$K Maximum
2012	51	17	32	0	66	82.5
2011	26	22	52	0	65	75
2010	33	43	21	3	66	85
2009	46	23	31	0	63	92
2008	64	18	18	0	60	79

In CBE, attendance by major reunion classes and the overall alumni attendance at the Engineering reception remain low. We look forward to increased alumni participation as we celebrate major anniversaries over the next two years and encourage alumni interested in helping with events to contact the department.

DONNA PRAISS PEY, B1986 made this effort for her class's 20th and 25th reunions, and **TOM GUTSHALL, B1960** was a major leader for his 50th reunion two years ago. Please consider supporting the department with your time and enthusiasm as we work to increase CBE alumni representation at alumni weekend and other university events.



—Jon Olson

P.S. JACK WEIKART continues to follow UD CBE alumni by careful reading and providing an informal clipping service. I thank him for this service and for the critical, but helpful comments on how this CBE newsletter could be improved.

KENNETH BELL, M1953, PH.D.1955—elsewhere in this issue you will find a discussion of the centennial celebration of the chemical engineering program at Delaware. Ken was contacted to gain his recollection on Colburn's contribution to the design and evaluation of heat exchangers, and he produced a beautifully written letter that described this work. The letter started with the sentence, "I am not quite 'The Oldest Living Grad' of the Department, but I come close, having received my Ph.D. in 1955." Small correction, Ken, you are not even close to the oldest living (two alumni are 100), but your memory and sense of history are unique.

Of Colburn's contributions, Ken tells us "In 1946, Allan Colburn and Ole Bergelin recognized the importance of heat exchangers to the process industries and the inadequacies of the existing design methods. They proposed a research program to ASME that was funded in 1947 and was continued through 1960. These studies resulted in many theses, dissertations, and three official Bulletins of the University of Delaware Engineering Experimental Station. While the Heat Transfer Research Institute continued and expanded this work, the Bell-Delaware Design Method lives on because it is instructive to students, can be done by hand (or with home-grown programs), does not incur the expense of proprietary design and rating methods, and is completely transparent."

ROBERT FEWKES, B1962, responded with the following description of his career: "After graduation in 1962, I was employed in petrochemicals process development by Gulf Research & Development Co. in Pittsburgh, PA. I entered grad school at MIT in 1970 and earned a SM in 1972, followed by a Ph.D. in 1976, both in Biochemical Engineering.

"After MIT I went into pharmaceutical process development at Lederle Laboratories in Pearl River, NY. I joined Kodak Research Laboratories in 1980, where I established an enzyme process development group in support of Kodak's clinical analyzer program. This group became the core of Kodak's Bioproducts Division (KPD). KPD was spun off into a

joint venture with Finn Sugar, eventually becoming Genencor International, where I remained and became a senior scientist. GCI is presently owned by DuPont.

"During the late 1980s and 1990s I sourced and helped acquire IE technology and integrated plants/processes (acquired from Solvay, Gist-Brocades, etc.) with GCI manufacturing. I continue to consult occasionally, most recently in bio-fuels and lake eutrophication. I am actively sailing, canoeing and playing tuba, and I have 6 grandchildren."

THOMAS R. ("RICK") JONES, B1962, went from Delaware to the Chemical Engineering Department at the University of Pennsylvania, where he obtained his Ph.D., interrupted for two years while he served his ROTC active duty commitment. He returned to Penn to complete his thesis, and met his future wife, Ginnie. They celebrated their 41st anniversary last November and have two children, Rick Jr., and Gwen.

Rick joined Union Carbide, and the first 14 years were in R&D. He switched to the commercial side for the next 17 years, eventually becoming business director in international business areas. Rick then took a position as COO at another trading company and two years later started Dauntless Chemical LLC, brokering and trading chemicals and polymers.

WILLIAM LUYBEN M1962, PH.D.1963, continues to teach at Lehigh (45th year), write books (13th published in 2011), and farm. He was honored by the Separations Division of the AIChE in 2011 for contributions to the field of distillation.

Bill's publications and research define the essential areas of chemical engineering. He has written extensively on the design of control systems for distillation separations, simulation and control of chemical reactors, plantwide process control, and recently on reactive distillation design and control. He led the creation of the Center for Process Modeling and Control at Lehigh. Bill has a lifetime knack for developing clear explanations of chemical processes and plant design, and he is deservedly loved by his students and colleagues.

JACK L. MESSMAN, B1962, has enjoyed spectacular careers as an engineer and business executive. He is currently chairman of Telogis, a software firm providing mobile Enterprise Resource Planning. Earlier he was CEO for nine years of Union Pacific Resources. While he was CEO a few UD chemical engineers had summer jobs with the firm. Prior to his service with UPR, he was CEO (also for nine years) of Novell, then a software company that invented local area networking for PCs.

He has a daughter, Valerie, a son, Kyle, and a stepson, Frank. He married his wife, Maggie, a native Texan, in 1997.

Jack and Maggie attended the 50th reunion, and Jack was a member of the class organizational committee. Jack wrote an article for the 1962 Memory Book from which most of this note was abstracted.

E. MARVIN STOUFFER, B1964, attended the 2012 reunion with his wife, Cynthia. They both worked for DuPont, and both ended their careers there working on industrial safety, a hot item at DuPont. They now live in Willow Valley Square, a retirement community in Lancaster, PA.

STANLEY HEARN, B1966, sent Fraser Russell a note that every older faculty member treasures. Stan wrote in part:

"I don't expect you to remember, but you taught me reaction engineering and were the director of my senior paper. In senior year I was working for Shell Chem in NJ and had neglected to write my final report in a timely fashion. You tracked me down and demanded that I bring this report to your house ASAP. I did so and managed to graduate with my class.

"Seeing that you recently received the W.K. Lewis award from AIChE and determining that you were still active in your work at U. of Del, I decided to share with you a couple reflections I have carried with me through my engineering career. First, I feel truly blessed by your teaching and by your caring to ensure that I got my degree. It was a short time later that I was drafted in the Army, and owing

Continued on next page.

to my degree in Chem. Engr., I received a two-year assignment in a research lab at Edgewood Arsenal, MD. Without this degree, I had a high chance of being assigned to Vietnam. After my Army duty, I received a MBA from U. of Washington, and then spent over 30 years of wonderful time working as a chemical engineer in various positions for Hooker Chem, Oxy Chem, Pioneer, and finally at Olin. I am now retired from the industry other than some occasional consulting.

“So, I have taken enough of your time, but I just want to thank you for teaching these many years and especially your special efforts in 1966 to prod a young kid to get his project paper finished and delivered to your house so he could begin a wonderful career in chemical engineering.”

JOHN L. ANDERSON, B1967, president of Illinois Institute of Technology, was given the National Engineering Award from the American Association of Engineering Societies in recognition of his lifetime achievements in engineering education.

JOHN SPEIDEL, B1967, retired from ARCO/ARCO Chemical/Lyondell/Basell in 2008 after 40 years. After dabbling in consulting, he took a position at Drexel teaching the senior design course. John now teaches what he did for 40 years: designing chemical plants.

John has three children and several grandchildren. His wife, also a UD grad, enjoys retirement from teaching elementary school.



ROBERT FLECK, B1971, gave a presentation titled “The Gift That Keeps Giving: Tales of Collectors and Their Library Beneficiaries in America” at the University of Delaware on October 26, 2011. Robert founded Oak

Knoll Books in 1976 as a chemical engineer by training who let his hobby get the best of him. Today, Oak Knoll Books, located in New Castle, DE, is a thriving antiquarian bookstore that maintains an inventory of about 23,000 titles.

ANTHONY J. MCHUGH, M1971, P1972, was named an AIChE Fellow. Anthony is the

Ruth H. and Sam Madrid Professor of Chemical Engineering at Lehigh University. He has delivered more than 250 seminars and published 200+ technical papers in his illustrious career.

RICHARD G. GROTYOHANN, B1974, had his art work, “The Engineer as Artist,” featured at the East Brunswick Public Library in November 2011. Richard lives in New Jersey and is completely self taught when it comes to his paintings.



THOMAS F. DEGNAN, PH.D. 1977, manager of Breakthrough and Leads Generation for Exxon Mobil Research and Development, and president of the CBE Advisory Council, was

given the 2011 Industrial Chemistry Award by ACS. He has previously worked for 3M Corporate Research (1976–1980) and the Mobil Technology Company (1980–1999).

He is a member of several other advisory boards, including those of the School of Chemical Engineering, Purdue University; Department of Chemical and Biochemical Engineering, John Hopkins University; and the Department of Chemical and Materials Engineering at Stevens Institute. He is currently chairman of the Research & Development Council of New Jersey.

Thomas. Degnan is the inventor or co-inventor listed on more than 100 issued United States patents. He was awarded the American Chemical Society Hero of Chemistry Award in 2007, and the AIChE Chemical Reaction Engineering Award in 2010 for his contributions to industrial catalysis. He and his wife, Anne, reside in Moorestown, NJ.

ZENAIDA OTERO GEPHARDT, M1979, PH.D. 1983, was honored this year by the American Institute of Chemical Engineers with the Delaware Valley Section of the 2011 Institute Volunteer Award. In addition, Latin American and Caribbean Consortium of Engineering Institutions, a non-profit organization, elected her as vice president.

Zenaida is an associate professor of chemical engineering at Rowan University. Previously she worked as a research

engineer at DuPont. She also served as a research associate and lecturer at UD.

GIORGIO CARTA, M1982, PH.D. 1984—After graduating as one of Bob Pigford’s last Ph.D. students in 1984, he joined the ChE department at the University of Virginia. Giorgio is currently the Lawrence R. Quarles Professor, and directs the undergraduate ChE program.

His research has been primarily in the bioseparations and biochemical engineering area, focusing on immobilized enzyme and cell biocatalysis and on biochromatography. He co-authored Section 16—Adsorption and Ion Exchange of Perry’s Handbook 7th and 8th editions and a recently published book, *Protein Chromatography—Process Development and Scale-up*. In 2009, 2011 and 2012, he chaired the International Symposium on Preparative and Process Chromatography (PREP). Last spring he spent a sabbatical as a fellow in the Biomolecular Interaction Centre at the University of Canterbury in Christchurch, New Zealand, including experiencing the major Christchurch earthquake.

Giorgio lives in Charlottesville with his wife Beth (a registered nurse). They have 23-year old twins, Julian and Anna, both of whom graduated last year from James Madison University.

MARK KOSKINIEMI, B1986, a Republican, joined the primary for the Arizona Congressional District 8 special election that was held in order to fill former Rep. Gabrielle Giffords’ seat. The topics he focused on in his bid for election were a sound budget, the debt crisis and border security.

Mark lives in Tuscon, AZ, with his wife and two children.

DONNA PRAISS PEY, B1986, is now an administrative patent judge, having been sworn in at the U.S. Patent and Trademark Office on March 1, 2012 in Washington, D.C. Her appointment stems from the Leahy-Smith America Invents Act (2011).

Previous to her appointment, Donna was of counsel at Michelman & Robinson in New York City, past president of the New York Women’s Bar Association (NYWBA) and

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treasurer of the Women's Bar Association of the State of New York (WBASNY).

KARENANNE O'BRIEN STEGMANN, B1989, describes her career: "After graduation I began my career with OxyChem (a subsidiary of Occidental Petroleum) in the process engineering group for production of PVC (polyvinyl chloride resin) at the Pasadena, TX plant. I progressed through process engineering roles: production supervisor, production superintendent, and then to production manager. I also completed my MBA from the University of Houston—Clear Lake in December 1997.

"After being engaged to Tom Stegmann in 1999, we moved to New Jersey where Tom worked for Pharmacia Upjohn, and I was appointed the first plant manager at the Oxy Vinyls, Pedricktown site. Tom and I were married in 2002 in Bordentown, NJ and lived in Chesterfield. We became parents in February 2003 to twins, Nathan and Colleen.

"While at Pedricktown I worked with UD alumni **TOM WUTKA, B1991**, **BRUCE BAKER, B1970**, and **CRAIG HORAK, B1998**. We were an all UD engineering team for a period of time. In September 2004 we were transferred back to Houston where I was appointed assistant plant manager—PVC over the two PVC manufacturing sites in our Houston complex.

"In August 2007, I was appointed plant manager for all the manufacturing sites in the Houston complex, OxyChem's largest manufacturing operations. We produce chlorine (Cl₂), caustic soda (NaOH), vinyl chloride monomer (VCM) and polyvinyl chloride resin (PVC).

"I am enjoying my engineering career and the diversity of what I do today. As plant manager I interact with employees at all levels and represent OxyChem to community members, industry leaders, local and state government agencies. I advocate the benefits of the chemical industry, educating others on the beneficial products we manufacture. I treasure the opportunity to work in the field, getting out of the office, and seeing progress on key projects."

UDIT BATRA, B1991, was named President and CEO of Consumer Healthcare for Merck

KGaA, also known as the German Merck or the Darmstadt Merck (EMD in the U.S.). At Merck KGaA, Udit will also be a member of the Pharmaceutical Executive Committee. He will remain in the U.S. in his new position with Merck.

He has enjoyed a spectacular career. He earned a Ph.D. at Princeton and then worked for the US Merck and rose (1996–2001) to become a research fellow. Next, he joined McKinsey and became a senior research manager (2001–2004), and then moved to J&J as the global brand director for wound care (2004–2005). Udit then held three different positions of growing responsibility at Novartis. In the first (2006–2008), he was head of corporate strategy where he set up two new business units and managed a major restructuring program that saved more than \$2.1 B in two years. His second job (2008–2009) was CEO and country president, Australia and New Zealand, where the business grew by 35 percent after declining in the previous four years. He was profiled in *CEO Forum* for this spectacular turnaround. His final position at Novartis was as head, Global Public Health & Market Access (2009–2011). During this period, he performed another turnaround, this one for the market structure and commercialization of the Vaccine and Diagnostics Division.

KATHY KRUEGER, B1992, began working as a process research engineer at Rohm and Haas Company in Bristol, PA. Kathy met her future husband Tim Donnelly (son of **JAMES DONNELLY, PH.D.1951**) at R&H and they were married in 1994. Kathy then moved out of technology and into Supply Chain.

In 1999, she graduated from Harvard Business School with an MBA. She rejoined Rohm & Haas in the Mergers & Acquisitions group, where she negotiated several deals, including a \$1B divestiture of a business unit. In 2001, she became an expert in apples and the first president of the AgroFresh subsidiary of R&H.

Their daughter Kiera was born in May of 2003 and son Liam in 2005. Kathy stayed home with the kids until they both started kindergarten. The family moved back to Pennsylvania in 2010, and Kathy started

working for Fundamental Labor Strategies as a general manager.

Jack Weikart sent a note identifying **DEREK LAPISKA, B2011** as the author of a CEP article, "An Introduction to Immunity and Vaccines" in the Nov. issue. Derek is now the "Society for Biological Engineering New Technology Associate—American Institute of Chemical Engineers," a title hard to fit on a business card.

Asked about his transition into a job with the AIChE, he replied:

"On my transition from UD to AIChE, I discovered the position on the AIChE job listing site. To be honest, I was unsure of whether to commit to industry or academia and found the role of new technology associate to be perfect for interacting with both sides while gathering contact information to make a move in a year or two. My job description is not the most technical, but to support the SBE section of the AIChE broadly. I get to write papers when potential authors miss deadlines."

TUCKER NORTON, B1993, M1998, received his Ph.D. from UVA and then joined DuPont and spent five years in engineering research at the Experimental Station. He received the UD Presidential Citation for Outstanding Achievement in 2003 and earned a MBA with honors at Darden (UVA) in 2010. He now works in DuPont Investor Relations, which is headed by **KAREN FLETCHER, B1981, M1982**.

Tucker and **KELLEY, HONORS BA1994**, live in Avondale, PA.

JAMES BUSHONG, B1994, describes his career thus far with: "I founded a small business and developed all the technology for specialized powder adsorbents used in cane sugar refineries. My scientific achievements and extensive global field travel culminated in sales of over 2 million pounds to the second largest sugar refinery in the world, located in Saudi Arabia. We have additional sales to other customers in 20+ countries spanning six continents. I am currently working on applying my material

Continued on next page.

science development skills to new energy technologies and plan to support a design group in mechanical engineering at UD next year."

"I enjoy fine wine and cooking with my wife, and raising our 8 year old son Henry. We all enjoy skiing; some of my freestyle-ski exploits can be seen in a short video on my Facebook page at 'James Bushong'."

STEVEN DEUTSCH, PH.D.1994, currently the Business Development and Marketing manager, Rare Earth Materials, Rhodia, gave a lecture titled "Rare Earths: How to Navigate the Rough Seas," for the Joseph Priestley Society in May at the Chemical Heritage Foundation in Philadelphia. The luncheon meeting was attended by **TOM ENGLISH, B1999**, who is a Rhodia colleague of Steve's, as well as faculty members Bramie Lenhoff, Jon Olson, Stan Sandler and Norman Wagner. Following his Ph.D. work with Bruce Gates, Steve had a post-doc appointment at Lawrence Livermore, and in 1996 joined Rhone-Poulenc as a researcher for application of rare-earth materials to emission control catalytic processes. His work has been with rare earths ever since, and expanded to other applications including phosphors, polishing powders and polymerization catalysts. Rhone-Poulenc became part of Rhodia, which was acquired by Solvay in 2011.

JOHN R. RICHARDS, PH.D.1994, was named an AIChE Fellow. John works at the DuPont Experimental Station as a research fellow.

He has also been a supplemental faculty member at UD in our department.

SARAH BANNISTER, B1995, is a lawyer at Covington & Burling LLP, in Washington, D.C., with a practice centered on investigations work. She writes, "I took some time off of work this year to visit with family and friends and travel. In early 2012, I spent five weeks in Moshi, Tanzania volunteering at a juvenile detention center. My morning commute included a beautiful view of Mount Kilimanjaro—much more peaceful and inspiring than my normal commute on the D.C. Metro."

BRIAN BAYNES, B1997, is now a venture capitalist helping small startup companies grow to robust and profitable operations. Upon completing his graduate work at MIT in 2004, Brian joined Flagship Ventures as a venture associate. In 2007, he founded Codon Devices, a synthetic biology company, and then became Codon's CTO and subsequently their CEO. The downturn of late 2008 was not kind to Codon Devices. While they built a reasonably sized business, the market didn't have the anticipated growth, and in April 2009 the company's assets were sold. It was a great learning experience, a "battlefield MBA".

Brian returned to Flagship Ventures as a partner. He is running two startups—Midori Renewables and Celexion—spending most of his time with Midori. They invented a catalyst that melts and digests cellulosic biomass into a sugar

mixture under very mild conditions and with unprecedented economics. Celexion is an applied synthetic biology company that develops technologies and products for partners in the pharmaceutical, industrial, agricultural and life science research sectors. Celexion achieved profitability early in its life, a rarity in this field.

In June 2009, he married Meegan LeMott, a Chem E, of course, and they have a one-year old daughter, Madelyn. So far Madelyn shows more interest in dogs and toys than thermodynamics, but Brian is working on the latter.

ANYI LU'S, B1997, path to becoming the CEO of Anyi Lu International appeared as a human interest piece in *The New York Times* on Aug 21, 2011. The story was titled "Farewell, Aching Feet." At graduation, she was hired by DuPont to work in a chemical plant in Plaquemine, LA. She then found employment with Chevron as a salesperson, but left Chevron in 2002 and married David Spatz, a business manager at the company.

While trying to decide what to do next, she returned to her artistic interests started by the Chinese brush painting she learned from her grandfather. During this period she met Taryn Rose, a shoe designer for the SF Arthur Beren store. This led to a marketing job in Rose's LA office where she worked for a year, learning the shoe business. Her sister's request for comfortable shoes to wear for dancing at her wedding led to Anyi's business plan: design high-fashion shoes that fit, are comfortable, and give arch support and cushioning. She found a factory in Italy that would make her "couture comfort" shoes, and she started with 12 styles. At her first trade show, Nordstrom gave her orders for five stores, and it remains a big customer along with Bloomingdales and independent sellers. In 2004 she became pregnant, and her husband became active in the business. The business now has 75 styles and sales of \$6 million in the last sales year with more expected this year.

She feels very fortunate that her husband abandoned a secure position to take on something very new and initially filled with uncertainty. She had five years in the

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chemical industry, one year of apprenticing in the shoe business, and nine years as a shoe entrepreneur. Indeed this is a unique career for a UD CHEG.

MEGAN AND DAVID OWEN, BOTH B1997, are working at Merck in West Point, PA. David is currently manager of Technical Operations for the product line, Varicella, which to the public is the chicken pox vaccine, Varivax, and the shingles vaccine, Zostavax. Megan is working in the same division and has management responsibilities for Training and Development, and Mindset and Behaviors.

They have three children, Kaelyn 10, Drew 8, and Jason 3 and are busy coaching soccer, gardening, and lately, biking. They see a few of the 1997 CHEG classmates, typically at weddings.

SUJATA BHATIA, B1999, M1999, accepted an appointment last year as an assistant director for UG Studies in Biomedical Engineering at Harvard and as professor of the Practice of Chemical and Biological Engineering at Tufts. In August, she was asked to join the Board of Freshman Advisers for Harvard College and to become a proctor at Harvard Matthews Hall. In addition, she became a faculty associate at Harvard Leverett House.

Sujata received the Marquand Award for Exceptional Advising and Counseling of Harvard Students, the highest award for student advising in Harvard College. Harvard recognized her unique skill package and has appointed her assistant dean of the Harvard Summer School.

TOM ENGLISH, B1999, describes the last five years of his life: "In 2008 I took a principal engineer position at Rhodia after three years at National Starch. Rhodia had just bought an alumina washcoat business from W.R. Grace and needed an engineer to help relocate the washcoat pilot plant from Columbia, MD to Cincinnati, OH where the commercial plant is also located. After the pilot was relocated, I began focusing on scale-up work from lab to pilot to plant, supplying customers with developmental (pilot made) and commercial samples, and serving as a technical resource for the

plant to help resolve processing issues. I have two technicians and an engineer in Cincinnati that help me accomplish this. However, I am based at Rhodia's North American R+D site in Bristol, PA.

"In my personal life, I married Keri Schantz in April 2012. **DAVE AND CHRISTINA SUTHERLAND (UD CHEG 1999)** and **MATT FUGA (1999)**, **DOUG O'DONNELL (1999)** and **MARY CUSHING DOHERTY (1975)** got to celebrate with us. We enjoy living in the Delaware Valley close to both of our families and friends."

JULIEN CRISNAIRE, B2002, was recently appointed president of AMG Aluminum after previously serving in the Corporate Development department of AMG and as operations director of AMG Conversion Ltd. He was instrumental in the acquisition of KB Alloys, LLC, an integral part of AMG Aluminum. He will focus on improving operational performance globally and customer service at AMG Aluminum.

Prior to joining AMG Aluminum Julien was working with Timminco Solar. (**JACK MESSMAN, B1962**, is a director of both AMG and Timminco.) Julien is married to April Smith Crisnaire, UD English 2003, and they have two children, Mathieu and Audrey.

SOUJANYA TALLAPRAGADA GIAMBONE, B2002, describes a recent move to Northern Virginia with: "My husband Alex and I are keeping busy with our almost-3 year old twin daughters, Meena and Maya.

"I am fortunate to be able to work from home, so my job was a smooth transition, from one home office to the next. I work as a capacity planning analyst for an Electronic Medical Records company called MModal. I manage physician dictation for all of our clients, and ensure that we have enough domestic and global supply of qualified medical transcriptionists to process this work. It's like a big manufacturing plant, but our "machines" are our transcriptionists and our "product" is an electronic medical record. It's actually pretty amazing how much happens behind the scenes in the healthcare industry to ensure that a patient's medical record is created and stored under the strictest privacy laws.

"We're really enjoying living in NoVA, as we are now closer to a lot of family and all the fun things D.C. has to offer."



JOHN KITCHEN, M2002, PH.D. 2004, associate professor at Carnegie Mellon University, was awarded a Presidential Early Career Award for Scientist and Engineers (PECASE) by President

Obama. This award is "the highest honor bestowed by the U.S. Government on science and engineering professionals in the early stages of their independent research careers."

After John graduated from North Carolina State University, he went into industry as a chemist for Lord Corp. After completing his Ph.D., he accepted a postdoctoral fellowship at the Fritz Haber Institut der Max Planck Gesellschaft in 2004. John accepted a position at Carnegie Mellon in 2005 and was appointed a Resident Institute Fellow at the National Energy Technology Laboratory in 2007.

ALEXIS (SIERY) MOONEY, B2002, still works at Merck and has had many different roles in technology, operations, quality, and most recently procurement.

Alexis got married in September 2008 to John Mooney and they had their first child, Madeline Clare (Maddie), in September 2010.

MATT PANZER, B2002, received his Ph.D. in chemical engineering from the University of Minnesota. After a postdoctoral appointment at MIT, Matt has, since September 2009, been teaching and running his own research group as an assistant professor in the Department of Chemical & Biological Engineering at Tufts University in Medford, MA. His group's focus is on the development of alternative materials and device architectures for thin film photovoltaics, electrochemical capacitors, and novel light-emitting structures. They recently received a grant from the Massachusetts Clean Energy Center Catalyst Award program to advance

Continued on next page.

their research on supported ionic liquids for supercapacitor applications. In 2011, he was named the Dr. Gerald R. Gill Professor of the Year at Tufts, which is a university-wide award voted on by the undergraduate student body.

MICHAEL STRANO, PH.D.2002, was a postdoc at Rice with Nobel Laureate Richard Smalley. In 2003, he was hired as an assistant professor at Illinois. He then moved to MIT in 2007 as an associate professor. In early spring, MIT announced that Michael was promoted to the rank of full professor.

Michael has had a distinguished career. In 2005, he was awarded a Presidential Early Career Award. He also won the Colburn Award from AIChE in 2008 and in 2011 the Kavli Frontiers of Science Fellowship from the National Academy of Science.

KATIE WHITEHEAD B2002, is now finishing up her postdoc at MIT and will be starting as an assistant professor in the Dept. of Chemical Engineering at Carnegie Mellon on December 1, 2012.

Katie works in the Langer Lab, and has been developing lipid-like materials for systemic siRNA delivery to various in vivo targets, including the liver, ovarian cancer and immune cells.

SUSANNE WOLFF, M2002, moved to Penn State and completed her Ph.D. there in 2005. She is now working for DuPont in Wilmington, DE as a separations specialist. She and Jason have two children, Sophia (5) and Alexis (3).

MICHAEL CHAJON, B2003, is now an associate at Fish and Richardson's Wilmington office. He worked for Sunoco for three years prior to earning his JD from George Washington Law in 2010. He was a judicial extern for Judge Sue Robinson and clerked with Judge Leonard Stark, both in the Wilmington U.S. District Court. Michael joined Fish and Richardson after his clerkship and practices intellectual property and patent litigation.

If you are on the Fish and Richardson web site, please look up **MARTINA TYREUS HUFNAGL, B2002**, also an associate with an impressive legal resumé.

KEVIN O'BRIEN, B2003, worked as an engineer for Terumo Cardiovascular Systems in Elkton, MD. He was there for three years before moving to Gore in June 2006. He worked for five years as process engineer in the Electronic Products Division and recently changed (October 2011) to an application engineer role where he interfaces with customers in the defense industry, supporting microwave cable assemblies for radio frequency signal transmission. Kevin is looking into MBA programs with the goal of moving away from a technical role.

His wife Lauren got her B.S. in Computer Science in 2003 and is currently the program manager leading up a Program Management Office in the IT department.

They live in Landenberg, PA, which is close to campus. Kevin doesn't get down to campus much, but he did visit Colburn Lab last fall for a resume workshop. It was set up by **MATT DECKER, B2006** (also works for Gore) with the student officers from AIChE.

ERIC PRIDGEN AND BENJAMIN TANG, B2003, competed in Hen Hatch, which is a business startup funding competition held at the University of Delaware. Their company, HapHunt, was successful and they were awarded \$1,250.



PETER TESSIER, PH.D.2003, presented the Colburn Lecture at UD on May 8. After completing his Ph.D., Pete was a postdoctoral fellow at the Whitehead Institute

for Biomedical Research at MIT (2003–2007) and subsequently was appointed assistant professor at RPI.

Pete's accomplishments include an NSF CAREER award, the Pew Scholar Award in Biomedical Sciences, and the RPI School of Engineering Research Excellence Award. Pete's talk was titled, "Antibodies by Design," and showed his group's excellent progress in developing designer antibodies.

CHARLES COLLINS-CHASE, B2004, has experienced a varied and impressive set of adventures since graduation. After UD, he

earned a MPhil at Cambridge in 2005 with a thesis titled, "Analysis of the Potential for Biodiesel Implementation in South Africa." He then spent three years at U. Penn Law School, where among his honors was being editor-in-chief of the law journal. Charles spent three years as an associate at Finnegan Henderson, a major intellectual property firm in D.C. He is now a law clerk to Kimberly A. Moore at the Federal Appeals Court, where he has served at this writing for about a year.

AMY VAN FOSSEN, B2004, went to NC State for her Ph.D.. Working with Robert M. Kelly, she wrote a dissertation with the mouth-filling title: "Functional Genomic, Microbiological and Biochemical Characterization of Plant Biomass Deconstruction by the Extremely Thermophilic Bacterium *Caldicellulosiruptor saccharolyticus*." After a relatively short postdoc period at NC State, she went to Boston to become a postdoc in process development with Agrivida, a start-up firm, where she is a bioengineer specializing in plants and their production of useful chemicals and feedstocks.

HOLLY LYNN SCHAEFFER SALERNO, B2005, graduated with her Ph.D. from Drexel in December 2011 and works at the DuPont Experimental Station in the Corporate Center for Analytical Science in the Thermal Analysis Lab (TGA, DSC, DMA, TMA, TGA-MS and thermal conductivity). She married Thomas Salerno Jr, a Drexel chemical engineering graduate, B2007, on May 22, 2010. They live in North Wilmington, Del.

YAKOV LAPITSKY, PH.D.2006, an assistant professor at the University of Toledo, was recently awarded an NSF Faculty Early Career Award. This is his second NSF award this year. The other was for his project "Mechanistic Analysis of Polyelectrolyte-Based Colloidal Drug Carriers."

ANDY MAY, B2007, is currently working on a Ph.D. in Mechanical Engineering at Carnegie Mellon University. His dissertation focuses on phase equilibrium of primary organic aerosol emissions from combustion sources such as biomass burning and motor vehicles. He is on track to graduate in December 2012.

Andy previously obtained a M.S. in Civil & Environmental Engineering from Clarkson University (Potsdam, NY).

ADITYA SINGH, PH.D.2007, returned to India from the U.S. in March 2007. Since then he has been helping with the family business, besides doing independent research. Aditya has 25 published single author articles in Science and Philosophy, available online for free at <http://www.indianfaculty.com>. There are also a few poems and short stories available there.

THOMAS F. SCHERR, B2008—after graduating, Tom continued as a research technician with Liyun Wang, associate professor, in the UD Center for Biomedical Research.

In January of 2010, he joined Krishnaswamy Nandakumar's computational fluid dynamics group at Louisiana State University (LSU), where he is currently collaborating with a research group in the Department of Biological and Agricultural Engineering, designing and optimizing a micro-total analysis system for the activation of cryopreserved cells.

Just recently, Tom was awarded the Clayton Engineering Excellence Award for Outstanding Graduate Student, an NSF-IGERT Fellowship, a Coates Research Grant and a Graduate School Scholars Program Award.

MARCO BEDOLLA, B2010, now at Wisconsin, cherishes his memories of UD, but is more thankful for the excellent education that he received here.

His undergrad research experience filled him with the curiosity needed to do graduate research, and the resilience and hard work that JLab required helps in writing papers, giving lectures and staying abreast of his experiments. Marco is aiming for a productive research career, and his preparation at Delaware has served him well to succeed at Wisconsin and wherever he goes beyond that.

TIM BOGART, B2010, says of his transition to graduate school:

"The transition from UD to UT-Austin was rather smooth. Despite its larger size, the department is rather close knit and there

are plenty of social events to allow graduate students in different research groups to get to know each other and exchange information, ideas, and collaborate.

"I study nanomaterials under the supervision of Dr. Brian A. Korgel. They are an exciting class of materials with the potential to have great impact in many fields. I synthesized bulk quantities of silicon nanowires with various surface coatings using a novel process unique to my research group. This process enabled me to form a macroscopic, non-woven nanowire fabric and study its optical, electrical, and mechanical properties for use as an anode material for lithium ion batteries as well as a flexible photovoltaic material."

CAROLYN SLUSSER HAMILTON, B2010, entered the DuPont Field Engineering Program after graduation. Her first assignment was in Wilmington, Del. in the DuPont Capital Asset Productivity (DuCAP) Group, where she works as a process engineer, providing front-end loading and detailed engineering and design for large DuPont capital projects.

Carolyn is also heavily involved in outreach programs, including FIRST Robotics and Explore Engineering, both helping to get high school students (specifically young women) interested in engineering.

She has been married to David Hamilton (CPEG '08) for a year. This June they celebrated his graduation for his Master's Degree in Electrical Engineering at UD. Carolyn and David have been enjoying life with two dogs, Riley and Bailey, riding motorcycles around the Maryland/Delaware areas, and competing in various 5K, 10K, and half marathon running races.

KATE WISEMAN, B2010, started in the Career Development Program (CDP) at Air Products at the end of June that same year. She writes: "As a CDP I have three, one-year rotations in different fields of the company before I roll-off to a more permanent position. My first rotation was in the Environmental group in Allentown, PA, where APCI's corporate headquarters are located. My second, and current, rotation is in production engineering for

our Pasadena, TX chemicals plant. I found the transition from student to employee to be pretty smooth overall, with waking up early being the biggest hurdle. Along with set hours, it was also hard to accept that as an employee you no longer get the college vacations. However, earning a salary does make up for the loss of summer and winter breaks. As for being prepared to enter the workforce right out of school, I found the biggest assets I gained from my time at UD weren't all the equations we learned, but rather the way we were taught to approach and solve a problem and how to work well in a group setting. Both of those techniques made the change from student to employee a lot easier.

"While working in Allentown, I had the benefit of getting to meet several UD graduates, both recent grads and those who have been out in the workforce for many years. Now that I am out in Texas, there aren't too many UD grads around, but I've found they're always available via email or IM. I found UD grads to be a great network, and I was able to gain valuable insight in both the Career Development Program and Air Products as a whole."

MARK WEIDMAN, B2011, was asked about the first-year experiences at MIT of his and his UD classmates, **SEAN HUNT** and **DARIUSZ MURAKOWSKI**. He responded: "In our first semester at MIT we were enrolled in three graduate level chemical engineering classes: Thermodynamics, Transport Phenomena, and Numerical Methods Applied to Chemical Engineering. These core classes served to strengthen as well as advance our understanding of fundamental chemical engineering principles. Outside of classes we each met with several of the MIT faculty and their graduate students to decide which lab and project we would choose for our thesis. In January we took our qualifying exams and were assigned to our respective lab groups. Sean joined Yuriy Roman's group, Dariusz joined **ARUP CHAKRABORTY'S, PH.D. 1989**, group, and Mark joined the lab of **WILL TISDALE, B2005**. For the spring semester we are all taking Chemical Reactor Engineering and various electives that apply to our research in addition to beginning our research projects."

In Memoriam

John "Jack" Curry, M1952

August 2011

John Curry, 85, died peacefully on August 13, 2011, surrounded by his family.

Born December 24, 1925 in Hazelton, PA, Jack graduated from Penn State with a bachelor's degree in Chemical Engineering. Upon graduating, he was recruited by the U.S. Army to work in Los Alamos, NM to use his talents in the development of the atomic bomb.

After WWII, he received a master's degree in Chemical Engineering from the University of Delaware. Later, he moved to Woodstown, NJ, where he raised his family and spent most of his career working for DuPont before retiring to South Carolina.

Paden Fasold Dismore

September 2011

Paden Fasold Dismore, age 89 years, of Seaford, Delaware, died on September 29, 2011.

Mr. Dismore was a chemist who retired from DuPont after 30 years of service at the Seaford Nylon Plant and at Chambers Works. After retirement, he worked part time in the Chemical Engineering Department of the University of Delaware. Following this, he consulted for the International Center for Diffraction Data in Newtown Square, PA.

He received a bachelor's degree in chemistry from the University of Illinois in 1943 and a doctorate in organic chemistry from Indiana University in 1948. He was a 50-year member of the American Chemical Society. He was also a 50-year 32nd degree Mason and received the Silver Beaver award from the DelMarVa Council of the Boy Scouts of America.

Courtesy of the News Journal

Sylvia M. Joanedis

April 2012

Sylvia M. Joanedis, wife of Charles Joanedis, B1950, died on April 29, 2012 in West Grove PA.

Born in Utica, NY on March 25, 1922, she was a graduate of the Faxton Hospital School of Nursing in Utica and served as a 2nd Lt.

in the U.S. Army Nurse Corps in WWII. She then worked as a nurse at Mohawk College, where she met Charles. After their marriage, they moved to Delaware where she worked at Delaware Hospital. Once her children were born Sylvia devoted herself to making a home for their family.

Sylvia and Charles established The Sylvia and Charles Joanedis Chemical Engineering Scholarship to support a student majoring in chemical engineering based on academic merit.

Courtesy of the News Journal

Gerald "Jerry" Minore, B1979

February 2012

Jerry Minore, 55, passed away on Friday, February 10, 2012.

Jerry was a graduate of the University of Delaware in Chemical Engineering. He worked for BASF as a marketing manager. He loved to travel and was able to visit many countries in Europe, Africa, Asia, and South America where he met his wife in Brazil.

Courtesy of Dignity Memorial

Saurabh A. Palkar, P1994

May 2012

Saurabh Palkar, 43, passed away on May 9, 2012, after an extended battle with colon cancer. Saurabh grew up in Bombay (now Mumbai) and received his undergraduate degree in chemical engineering from the University Department of Chemical Technology (UDCT) at the University of Bombay. He entered the UD CHEG graduate program in 1989 and completed his thesis in 1994. Following a productive period at Rohm and Haas, he was employed at Merck and then at Cordis (Johnson and Johnson).

Saurabh's academic brilliance was matched by his wisdom beyond his years, and he was a source of guidance to many students, especially graduate students newly arrived from India. A group of Saurabh's friends have established a fund in his memory to endow a graduate student award for excellence in mentoring undergraduate researchers. Gifts may be directed to the Office of University

Development or to the Department and designated for the Saurabh A. Palkar Memorial Fund.



Hari Pujar, Prasanna Joshi, Rajesh Khare, Shekhar Garde, Sachin Velankar, Jaydeep Kulkarni

On June 23, Saurabh's birthday, a group of his friends returned to Newark and to Saurabh's old haunts as a tribute, including lunch at Margherita's Pizza.

Elisabeth Papazoglou, M1988

August 2011

Elisabeth Papazoglou, 51, of Yardley, Pennsylvania, associate professor of biomedical engineering at Drexel University and an assistant professor in the surgery department at Drexel's College of Medicine, died of breast cancer Aug. 17, 2011.

Born in Kavala, Greece, she earned a bachelor's degree at Aristotle University in Thessaloniki, Greece, in 1982 and a master's at the University of Delaware in 1984, both in chemical engineering.

She earned her doctorate in macromolecular science and polymer engineering at Case Western Reserve University in 1988, where she continued postdoctoral studies in 1989.

Dr. Papazoglou was an R&D engineer at Arco Chemical in Newtown Square until 1992, where she earned the Excel Award in 1991 and 1992.

She began at Drexel as a research associate professor in the School of Biomedical Engineering from 2003 to 2005. She was an assistant professor there from 2005 to 2010 and an associate professor since 2010.

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Where did they go?

2012 placements at graduation

INDUSTRY 34	GRAD SCHOOL 11
Valspec 11	Colorado 1
Hospira 5	Cal Tech 1
Aspen Tech 4	Hopkins 1
DuPont 3	NYU 1
Gore 3	Penn 1
Air Products 2	Penn State 1
Braskem America 2	Princeton 1
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	UVa 1
	WVa 1

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 Andrew Marshall
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 Nikki Ross
 Jacob Weiner
 Jang Ho Yun

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