2013 ANNUAL REPORT
Dear Alumni and Friends of the Department:

By the time you read this the “polar vortex” will be old news, and indeed we survived it, although two days of classes at the beginning of the term were cancelled.

We chose as our cover photo the image of our summer unit operations class, which shows at a glance the real news of the department and the profession. Enrollment has continued to surge and will likely require a campus ceiling on engineering admissions in order to keep things under control. Large enrollments are occurring across the board in other engineering majors and in other colleges across the nation. It is a nice problem to have, considering the roller coaster of enrollment trends that we have seen since the 70’s. In the past, recessions have greatly suppressed engineering enrollment.

However, the great recession of 2008 has had the opposite effect. My take on what is happening is that students and families are looking to engineering and science majors as more assured pathways to careers that will justify the high cost of a college education. Beyond benefitting resurgent chemical process and energy production industries, more chemical engineers contribute to a more scientifically literate public -- a very good end in itself.

Last year we had a record of 535 majors and 118 B.S. graduates. 190 students, another record, went through our Unit Ops summer lab. A change starting next year will be our teaching this laboratory course during the academic year in two and three-credit blocks. We expect this will allow better use of the summer break for our juniors and seniors seeking summer internships and co-op opportunities. Currently we have 79 graduate students in residence and 13 students received their PhD degrees last year. Our research expenditures rebounded to $8.2M. Finally, our US News and World Report 2015 national ranking increased significantly, from 29 to 23.

This year we welcome Nicholas Brunelli, our 21st faculty member, and John Clay, our second professor of practice. Nicholas joins us after obtaining his PhD at Cal Tech and a postdoctoral appointment at Georgia Tech, and John, who received his PhD at Ohio State with Kurt Koelling, arrived after a 15-year career with Battelle.

Our faculty continues to receive considerable recognition. Some highlights include L. S. Fan receiving the AIChE Wilhelm Award, being named a National Academy of Inventors Fellow, and being elected to Fellowship in the Australian Academy of Technological Sciences and Engineering. As a continuation of the ACS symposium honoring Umit Ozkan, a special volume of Topics in Catalysis was published in December, 2013, with 35 contributions from researchers in the US and around the world. Jessica Winter, Lisa Hall and Barbara Wyslouzil received a $1.2M grant from NSF for nanocomposite production, and David Wood received a $1M DARPA grant to improve drug manufacturing efficiency.

Our new Koffolt Laboratories is moving toward completion, and all those receiving this report will be invited to the upcoming “Ribbon Cutting” (invitations mailed later). We are in the home stretch to achieve our goal of raising $17.5M of the $126M total cost of the building, and thanks to all of our alumni and friends who have so generously contributed. If others step up, we should achieve our goal. We expect to begin teaching in the new building in January 2015.

Best regards from all our faculty, staff and students.

Stuart L. Cooper
Professor and Chair
cooper.1682@osu.edu
614-247-8015
Approximately 75 ChemE Alums returned to campus on October 25-26, 2013 for the first CBE All-Class Alumni Reunion. Alums enjoyed a group lunch, caught up over dinner, and then celebrated with a special tailgate and game-watching party in Knowlton Hall. For more Reunion pictures and stories, visit http://CBE2013ReunionRecap. Photos by Geoff Hulse
Koffolt Laboratories National Campaign Committee

The Koffolt Laboratories National Campaign Committee gathered at 2 pm on Friday, October 25, 2012. Chairman Bill Lowrie opened the meeting, followed by Department Chairman Stuart Cooper’s departmental overview. Recent faculty awards and honors, undergraduate enrollment and growth, research expenditures, faculty productivity, and graduate rankings were highlighted.

Guests Faye Bodyke and Brett Meyer gave an update on the construction progress of the CBEC building (Chemical and Biomolecular Engineering and Chemistry). During peak construction times, there are 275 employees on site. Safety is a priority, and safety measures are strictly enforced.

The project was budgeted for $89M in construction dollars and a $3.8M in bid overage has been reduced to $1.1M.

The building was enclosed in the fall of 2013 and interior work, starting with the basement, is expected to continue into spring. The entire interior should be complete by mid-July, with the building contract complete by November 15, 2014.

New faculty member Nicholas Brunelli gave an overview of his background and a brief introduction to his research on catalytic material design.

Director of Development Jessica Schmitt led a closed session discussing campaign issues, updates, and strategies.

The meeting adjourned at 3:50 pm for a tour of the building site.
CBE Faculty Awards and Honors

NAE member L.S. Fan received AIChe’s 2013 Wilhelm Award and was also elected a Fellow of the Australian Academy of Technological Sciences and Engineering (ATSE). ATSE is an independent body of 800 eminent Australian engineers and scientists which this year named 26 high-ranking public figures, innovators, academics, and business people fellows. Fan was the only foreign fellow elected. Fan was also named a Fellow of the National Academy of Inventors in recognition of his invention of coal-direct chemical looping, the leading clean-coal technology in the United States.

Topics in Catalysis, a premier journal in the field of catalysis, honored Umit Ozkan with a special volume published December 2013 (volume 56, issues 18-20). The volume included articles detailing catalysis innovations in many areas, from 35 different research groups and 12 countries. The preface states that “the breadth of topics covered and the global input into this special issue highlight the diverse and important problems that Professor Ozkan has addressed in her career, the impact that she has made, and the people whom she has positively influenced.”

Jessica Winter was featured in the January 17, 2014 edition of Business First-Columbus in their “People to Know in Technology” series. Winter, still early in her career, has become well-known in the bio/nanotechnology field for the development of a high-caliber magnetic fluorescent nanoparticle which can be used in cancer detection and treatments and significantly reduce costs for researchers. Winter was also included in StateStat’s list of Top 25 STEM Professors in Ohio.

In August, 2014, Jessica Winter and CBE co-PIs Lisa Hall and Barbara Wyslouzil received a $1.2M National Science Foundation grant to begin scale-up of the nanocomposites for biomedical applications at increased volume for direct translation to industry. New synthesis methods such as electrospray and self-assembly will be evaluated for their commercial potential. If successful, critical roadblocks in nanocomposite commercialization will be addressed.
Using technology developed between OSU and Cleveland Clinic, the Chalmers lab in collaboration with the breast cancer program at The James Cancer Hospital have established that specific, atypical cell types are associated with overall patient survival.

The graph below is a Kaplan Meier plot of the overall survival of patients (measured as the percent of the original patient population) as a function of elapsed days after sample was taken.

The green line across the top represents the percent survival of patients when there is less than 100 of these specific cells per ml of blood present, while the red line represents patients with greater than 100 of these specific cells per ml of blood.

While “circulating tumor cells” (CTCs) have received significant research and clinical interest, in addition to popular press, these cells DO NOT fit the classical definition of CTCs. It is highly likely that they are a new type of circulating tumor cell.

These initial results, in press in the journal Breast Cancer Research, potentially open new avenues to not only develop blood-based prognostic markers giving a patient quantitative information on the status of their disease, but shed more light on a disease that has proven lethal to many women.
Remembering Ed Smith

Professor Emeritus Ed Smith (right) and former CBE faculty Peter Krumin in the 1950s.

The department was sorrowed to learn of the death of Edwin Earle Smith, 90, Ohio State CBE professor emeritus of chemical engineering, on June 16, 2013.

Professor Smith, a genial, gentle, and well-liked colleague, was a football star at Sugarcreek-Shoesville High School. He received his Ohio State chemical engineering degrees in 1944 (BS), 1947 (MS), and 1949 (PhD), respectively. He was a member of the Ohio State Marching Band, and served in the US Navy during World War II.

Smith was sought as an expert on fire resistant materials by architects of sky scrapers, sports arenas, and other large buildings. He often testified as an expert witness in major deadly fires, including the 1977 Beverly Hills Supper Club in Florence, KY and the MGM Grand Hotel in Las Vegas in 1980.

The combustion chamber test that he developed in his fire research studies was adopted as a standard by the American Society for Testing Materials and is often referred to as the “Ohio State rate of heat release apparatus.” It was adapted by the Federal Aviation Administration in 1986 and many other groups to screen flammable materials in order to develop improved combustion-resistant materials for confined locations.

He retired from teaching in 1988, and continued his research for several more years.

Meet John Clay

With a burgeoning Unit Ops enrollment of over 190 students for last Maymester’s intensive hands-on course, John Clay was hired as an additional clinical professor.

John obtained his PhD from Ohio State in 1997 as Kurt Koelling’s first graduate student. Upon graduation, he joined Battelle Memorial Institute, a contract research and development organization.

John has a passion for teaching and was an adjunct faculty member at Ohio State for the past 11 years before taking on the larger role of clinical professor.

John will work with Carlo Scaccia to run the last summer Unit Ops laboratory in old Koffot Labs, before transitioning to the new building next year. He will be teaching in the senior design area and also in some of our core courses. In addition, he maintains a fractional appointment at Battelle.

Spouse Kristy Clay is an Ohio State veterinary medicine grad, and together they manage the sports and extracurricular activities of children Luke and Natalie, both 12, and Meredith, age 9.
Undergraduate Program
2013 Cooperative Learning Experiences

The Engineering Cooperative Education & Internship Program (ECIP) helps undergraduate students obtain career-related employment of two types: cooperative education (co-op) positions and internships. A co-op experience provides an opportunity to apply what is learned in the classroom in career-related positions by alternating quarters of full-time coursework with periods of paid, full-time employment. An internship involves one work period with an employer. A work period may last for one quarter or for two consecutive quarters. Summer internships are the most popular among students and employers.

Students meet with advisors Brian Endres and Katie Bush-Glenn to evaluate different schedule arrangements before interviewing because many employers hire for specific “rotations.” For instance, students may work full-time during the summer, attend full-time classes in autumn, and return to their employer for full-time work in the spring. The most popular term to work is the summer. Last year, CBE students completed 73 co-op rotations and 118 internship or part-time work experiences.

The following is a list of companies who hired OSU undergraduates in our program and the students who were hired by those companies:

Access Midstream Partners: Adam Neu
Adsorption Research Inc: Patrick Kehn
Americal Electric Power: Dameon Medley, Katharine Raftery
AMETEK Solid State Controls: Frances Lin
Americal Municipal Power (AMP): Eric Marko
Anheuser-Busch: Derrick Thomin
Anomatic Corp: Christopher Bruening, Jacquelyn Daugherty, Jason Ezzell, Pratishtha Singh
Archer Daniels Midland: Tyler Hilston
Ashland Inc: Courtney Bareswilt, Oliver Weaver
ASK Chemicals: Katie Gregg
Avery Dennison: Rob Russell
Batelle Memorial Institute: Philip Kester, Aleesha Martin, Aaron Plumley, Jacob Ratcliffe
Belami Fine Chemicals: Nihar Vakil
Boehringer Ingelheim-Roxane Laboratories: Timothy Oliver
BP: Mitchell Guenther
TMW Systems Inc: Orest Danylewycz
Toyota: Faith Carver, Jason Ezzell, Mitchell Gower
UDRI (University of Dayton Research Institute): Rachel Busse
Unilever: Nicholas Collinger, Chloe Higgins, Erin McLean
University of Texas at Austin: Sai Uppati
Valero: Matthew Kimmel, Frank Sweterlitsch, Justin Thomas
Valspar: Alexandria Chen, Stefan Heglas, Brandon Isaacs, Kathryn Maltry
Veyance Technologies Inc: Trent Daubenmire, Anthony Kaiser, Lewis Moser, Scott Reinhart, Lucas Rodriguez
Wright Patterson Air Force Base: Regina Gallagher.

L-3 Communications: Kevin Asper
Limited Brands: Taylor Ourada
Louis Perry & Assoc Inc: Jeffrey Gahan
Lubrizol Corp: Matthew Konderson, Michael Mospens
MACtac: MacKenzie Carlson
Marathon Petroleum Corp: Alison Boyd, Nathan Fahrenkamp, Lily Glick, Adam Kalivoda, Mitchell Louis, Radhika Madhavan, Ibrahim Musa, Ashley Sandlin, Colin Schumaker, Robert Warburton
Materion: Dona Blowes
Matrix Technologies Inc: Caitlin Parke
Medicomp Inc: Christopher Chang
MedImmune: Matthew Cox
Momentive Specialty Chemicals: Erik Solberg
Monsanto Co: Keith Stump
Nanotech West: Samantha Stephens
Navicor Group: Guk Hee Youn
NBTY: Marie Cotter
Nestle USA: Kevin Asper, Jeremy Barlage, Andrea Detwiler, Lydia Griffith, Aileen Seitz
Niagara Bolting LLC: Ronald Lechner, Daniel Weckstein
Nikon Metrology Inc: Katie Jones
Oak Ridge Institute for Science and Education: Nicholas Braun
Ohio Department of Transportation: Jacob Whited
Ohio State University: Stephanie Chastang, Jamesha Ford, Brian Goldfarb, Jack Jones, Philip Kester, Natasha Khawaja, Deepthi Koralla, Alex Miller, Alvin Taylor, Adam Withers
Owens Corning: Parth Patel
PCC Airfoils: Kevin McNulty, Alex Royer, Eric Watkins, Olivia Wetta
PH Matter LLC: Mark Ferris, Kenneth Izbicki
Philips: Robert Kirian
Pittsburgh Glass Works: Keith Johnson
PPG Industries: Alexis Uber
Precision Castparts Corp-PCC: Joseph Ioni
Procter & Gamble: Scott Hochberg, Carmen Keeton, Matthew Van Avermaete
PSARA Technologies: Emily Diersing
Rich Products Corp: Christopher Bailey
Rockwell Automation: Ibrahim Musa, Jessica Stibora
RoviSys: Michael Guyrn
Scotts Miracle-Gro Co: Daniel Adkins, Taylor Angle
Shell: Loan Bui
Sherwin-Williams Co: Morgan Doty, Emily Helber
St. Bernard Soap Co: Noah Cave
Stanley Electric US: Mitchel Garrison
Terumo Cardiovascular Systems: Kristi Olesik
Textron Inc: Cailin Buchanan
Graduates of our program continue to have a strong placement record both within industry and within graduate and professional programs. The percentages provided here are based on senior exit surveys at the time of graduation.

Most of our graduates will be going directly to industry with their BS degrees (as reported upon graduation). About 9% of our students will be going on to graduate or professional school. Approximately 25% of our students have accepted positions in Ohio and will stay in the state to pursue their post graduation plans. Students will be working at various corporations such as Exxon Mobil, the Dow Chemical Company, Procter and Gamble, and DuPont.

A number of our graduates received Latin Honors, With Distinction Honors or With Honors in Engineering. Latin honors are defined as follows: a cumulative grade point average (GPA) of 3.5-3.69 is Cum Laude; 3.70-3.89 is Magna Cum Laude; and 3.90-4.00 is Summa Cum Laude.

A student who graduates “With Honors Research Distinction” is an honors student (greater than a 3.4 GPA) who has completed a senior honors research thesis. A student who graduates “With Research Distinction” is a student (GPA between 3.0-3.39) who has completed a senior research thesis. A student who graduates “With Honors in Engineering” has completed a three-prong program consisting of completing a required number of honors courses, participation in community service, leadership and outreach as well participation in “investigational studies” which typically includes completing a research paper or thesis or completing a minor. Fifteen students graduated with Honors in Engineering and ten students graduated With Distinction in various disciplines.

Engineering Career Services (ECS) welcomes all employers to register, to recruit Ohio State engineering students and graduates. There is no cost to register and no fees for ECS services. If you, or someone you know, is interested in hiring Ohio State students for co-op experiences, internships or for full-time placement, please contact Amy Thaci, Director of Engineering Career Services at (614) 292-6651. You can read more about the services offered through ECS by visiting their webpage: http://ecs.osu.edu.

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### 2013 BS Graduates - Employment Status and Location (State)

#### Autumn 2012 (December 2012)

<table>
<thead>
<tr>
<th>Name</th>
<th>Employment Details</th>
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<tbody>
<tr>
<td>Nicole Bayona</td>
<td>Hired by General Mills, IL.</td>
</tr>
<tr>
<td>John Bieber</td>
<td>Graduated Cum Laude; Pursuing JD, Cincinnati College of Law.</td>
</tr>
<tr>
<td>Eric Boruszewski</td>
<td>No information given.</td>
</tr>
<tr>
<td>Lukas Brooks</td>
<td>Graduated with Honors in Engineering, Magna Cum Laude; Hired by Mettler Toledo, OH.</td>
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<tr>
<td>Paolo Brunello</td>
<td>No information given.</td>
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<tr>
<td>Nicholas Clare</td>
<td>No information given.</td>
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<tr>
<td>Edward Dcruz</td>
<td>Hired by Accenture, DC.</td>
</tr>
<tr>
<td>Frank Dembia</td>
<td>Currently serving in the United States Navy.</td>
</tr>
<tr>
<td>Michael Dressler</td>
<td>Hired by ARC Document Solutions, OH.</td>
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<tr>
<td>Patrick Heasley</td>
<td>Hired by Epic Systems, WI.</td>
</tr>
<tr>
<td>Theo Hicks</td>
<td>No information given.</td>
</tr>
<tr>
<td>Olivia Kindschuh</td>
<td>Graduated with Honors in Engineering, Cum Laude; Hired by Procter &amp; Gamble, OH.</td>
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<tr>
<td>Nicholas Koenig</td>
<td>Graduated with Honors in Engineering, Summa Cum Laude; Hired by Trinity Consultants, OH.</td>
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<tr>
<td>Chau Lam</td>
<td>No information given.</td>
</tr>
<tr>
<td>Nahyun Lee</td>
<td>No information given.</td>
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<tr>
<td>Sudono Lie</td>
<td>Graduated Cum Laude; Career employment accepted, Employer unknown.</td>
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<tr>
<td>Eric Mank</td>
<td>No information given.</td>
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<tr>
<td>Aaron Nimrick</td>
<td>Hired by Procter and Gamble, OH.</td>
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<tr>
<td>Nicholas Ohanian</td>
<td>Pursuing MS in Chemical Engineering, The Ohio State University.</td>
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<tr>
<td>Eric Perko</td>
<td>No information given.</td>
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<tr>
<td>Jacquelyn Pittman</td>
<td>Graduated Cum Laude; Hired by General Mills, TN.</td>
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<tr>
<td>Chelsea Quinn</td>
<td>No information given.</td>
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<tr>
<td>Paul Robertson</td>
<td>Graduated Cum Laude; Hired by SABIC Innovative Plastics, AL.</td>
</tr>
<tr>
<td>Monica Roser</td>
<td>Hired by HB Fuller, MN.</td>
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<tr>
<td>Sydney Rush</td>
<td>Hired by Regeneron Pharmaceuticals, NY.</td>
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<tr>
<td>Tyler Russell</td>
<td>Graduated Magna Cum Laude; Hired by Rockwell Automation, OH.</td>
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<tr>
<td>Mandy Sheridan</td>
<td>Hired by Accenture, OH.</td>
</tr>
<tr>
<td>Matthew Small</td>
<td>Hired by Cornerstone Controls, IN.</td>
</tr>
<tr>
<td>Leslie Vanderkolk</td>
<td>Hired by Unilever, VA.</td>
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<tr>
<td>Efrain Vasquez</td>
<td>Hired by Accenture, OH.</td>
</tr>
<tr>
<td>Ashley Ward</td>
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<tr>
<td>Kristin Weisser</td>
<td>Graduated Cum Laude; Hired by NAVAIR, MD.</td>
</tr>
<tr>
<td>Kevin Young</td>
<td>Hired by Archer Daniels Midland, IL.</td>
</tr>
<tr>
<td>Name</td>
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<tr>
<td>Humaid Alghassani</td>
<td>No information given.</td>
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<tr>
<td>Jeffrey Buckman</td>
<td>No information given.</td>
</tr>
<tr>
<td>Dina Cahyadi</td>
<td>Pursuing MS in Management, Peking University.</td>
</tr>
<tr>
<td>Mehak Chawla</td>
<td>Graduated with Honors in Engineering, Magna Cum Laude; Pursuing PhD in Chemical Engineering, Carnegie Mellon.</td>
</tr>
<tr>
<td>David Chen</td>
<td>Graduated Cum Laude; Pursuing MS in Chemical Engineering, Northwestern University.</td>
</tr>
<tr>
<td>Hao Chi</td>
<td>Graduated Cum Laude; Pursuing PhD in Chemical Engineering, University of Pittsburgh.</td>
</tr>
<tr>
<td>Cornelius Cilliers</td>
<td>Graduated with Honors Research Distinction in Chemical Engineering, Summa Cum Laude; No information given.</td>
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<tr>
<td>Robert Dugan</td>
<td>Hired by Marathon Petroleum, KY.</td>
</tr>
<tr>
<td>Alex Elchert</td>
<td>Graduated Cum Laude; Hired by Goodyear Tire &amp; Rubber Co., OH.</td>
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<tr>
<td>Jamesha Ford</td>
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<tr>
<td>Ryan Gallagher</td>
<td>Graduated Summa Cum Laude; Pursuing MD, Wright State University.</td>
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<tr>
<td>Robert Pitman</td>
<td>Pursuing MS in Chemical Engineering, The Ohio State University.</td>
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<tr>
<td>Joanna Gobeille</td>
<td>Graduated Magna Cum Laude; Hired by EcoLab Inc, WV.</td>
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<tr>
<td>Stephen Gould</td>
<td>Graduated Summa Cum Laude; Hired by Reynolds and Reynolds, OH.</td>
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<tr>
<td>Katherine Groseclose</td>
<td>Hired by Yachiyo of America, OH.</td>
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<tr>
<td>Amanda Hansen</td>
<td>No information given.</td>
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<tr>
<td>Kyle Hatton</td>
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<tr>
<td>Alexander Hirsch</td>
<td>Hired by AMG Inc., OH.</td>
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<tr>
<td>Steven Hoover</td>
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<tr>
<td>Lianwan Huang</td>
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<td>Joseph Huntley</td>
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<tr>
<td>Katie Jones</td>
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<tr>
<td>Jessica Jude</td>
<td>Graduated Magna Cum Laude; Hired by Ashland, Inc., KY.</td>
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<tr>
<td>Gannon Kast</td>
<td>Hired by Accenture, IL.</td>
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<tr>
<td>Philip Kotich</td>
<td>Graduated Cum Laude; Hired by Arkema Inc., IL.</td>
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<tr>
<td>Karl Kroll</td>
<td>Graduated Cum Laude; Hired by Wexner Medical Center, OH.</td>
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<td>Karen Kwong</td>
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<tr>
<td>Molly Langhenry</td>
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<td>Chenxi Li</td>
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<td>Joshua Lisheid</td>
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<td>Kristin Malhotra</td>
<td>Graduated Cum Laude; Hired by Cornerstone Controls, OH.</td>
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<td>Brian Marshall</td>
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<td>Derek Mason</td>
<td>Hired by JP Morgan Chase OH.</td>
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<tr>
<td>Lucas McBride</td>
<td>No information given.</td>
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<tr>
<td>Zekiel McVey</td>
<td>Hired by Halliburton, PA.</td>
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<tr>
<td>Daniel Morris</td>
<td>Graduated Cum Laude; Hired by DuPont, WV.</td>
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<tr>
<td>Andrew Motz</td>
<td>Graduated Cum Laude; Pursuing PhD in Chemical Engineering, Colorado School of Mines, CO.</td>
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<tr>
<td>Robert Neu</td>
<td>Hired by Sherwin-Williams Co, OH.</td>
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<tr>
<td>Hui Peng</td>
<td>Pursuing PhD in Chemical Engineering, Cornell University.</td>
</tr>
<tr>
<td>Pengpeng Qi</td>
<td>Graduated with Honors Research Distinction in Chemical Engineering, Pursuing PhD in Petroleum Engineering, University of Texas at Austin.</td>
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<tr>
<td>Adam Reckless</td>
<td>Graduated with Honors in Engineering, Hired by PolyOne Corporation, OH.</td>
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<tr>
<td>Terhi Reponen</td>
<td>Graduated Cum Laude; Hired by Epic, WI.</td>
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<tr>
<td>Westley Russell</td>
<td>Hired by Trutec Industries Inc., OH.</td>
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<td>Hemondeeep Sahota</td>
<td>No information given.</td>
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<td>Jonathan Sanders</td>
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<td>Patrick Shoemaker</td>
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<tr>
<td>Alexander Shumar</td>
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<tr>
<td>Michael Simmons</td>
<td>Hired by JP Morgan Chase.</td>
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<tr>
<td>Adrian Stalnaker</td>
<td>Hired by Bridgestone Americas Inc., OH.</td>
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<td>Andrew Toro</td>
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<td>Frank Trebar</td>
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<td>Eric Watkins</td>
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<td>Nicholas Wood</td>
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<tr>
<td>Binbin Wu</td>
<td>Hired by Shell, LA.</td>
</tr>
<tr>
<td>Zonglin Yang</td>
<td>No information given.</td>
</tr>
<tr>
<td>Xiaoxiao Yu</td>
<td>Graduated Magna Cum Laude; Pursuing PhD in Chemical Engineering, Carnegie Mellon.</td>
</tr>
<tr>
<td>Chen Yu</td>
<td>Graduated Cum Laude; Pursuing PhD in Chemical Engineering, University of Houston.</td>
</tr>
<tr>
<td>Katherine Zorc</td>
<td>Hired by Braskem America, WV.</td>
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</table>
Students work on site at the 2013 AIChE ChemE Car competition at the Cincinnati Regionals, where Ohio State’s car placed second. Participation was sponsored by Dow.
<table>
<thead>
<tr>
<th>Name</th>
<th>Information Provided</th>
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<tbody>
<tr>
<td>Andrea Adam</td>
<td>No information given.</td>
</tr>
<tr>
<td>Eunice Alade</td>
<td>No information given.</td>
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<tr>
<td>Derek Anderson</td>
<td>Hired by Halliburton, OH.</td>
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<tr>
<td>Christopher Bailey</td>
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<td>Aditi Bansal</td>
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<td>Courtney Bareswilt</td>
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<td>Nicole Chittum</td>
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<td>Morgan Doty</td>
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<td>James Emmenecker</td>
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<td>Nathan Fahrenkamp</td>
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<td>Jeremy Fichtenbaum</td>
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<td>Biomedical Nanotechnology</td>
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Undergraduate Enrollment Graphs

**Undergraduate Enrollment**

(number of students)

- **Pre-Majors**
- **Majors**
- **Total**

*Data taken in January 2014*

**Tracking CBE 200/2200 Enrollment**

CBE 2200 is the department's first major course. This table shows total enrollment in that course and the breakdown of enrollment of women and ethnic minority students. Previous years include only students who passed the course with a C- or better.

- **2010**
  - Women: 137
  - Ethnic Min: 49
  - Total: 186

- **2011**
  - Women: 168
  - Ethnic Min: 53
  - Total: 221

- **2012**
  - Women: 193
  - Ethnic Min: 53
  - Total: 246

- **2013**
  - Women: 260
  - Ethnic Min: 81
  - Total: 341

- **2014**
  - Women: 22
  - Ethnic Min: 15
  - Total: 37

**Number of B.S. Degrees Per Year**

Shows Total Students, Number Granted to Women and Number Granted to Ethnic Minorities

**Female and Ethnic Minority Trends in Total Department Enrollment**

**Percentage of Women & Ethnic Minorities Versus Number of Total Students Over Time**

Includes Majors & Premajors

**Percentage of Women or Ethnic Minority Students**

- Women: 24.50%
- Ethnic Min: 29.03%
- Total Population: 30.50%

**Total Number of CBE Students**

Includes Majors & Premajors

**Academic Year**

- 2009-2010
- 2010-2011
- 2011-2012
- 2012-2013
- 2013-2014

*Data taken in January 2014*
A total of 161 students were awarded undergraduate scholarships in the Chemical & Biomolecular program. The vast majority of those students were current majors, although a small amount went to recruit high ability first year students as well. A total of $179,500 was awarded to students heading into the 2013-2014 school year. The average award was $1114 this year compared to $955 the previous year.

Trends in data from financial aid show that the number and amount of both student and parent loans have been increasing. Both Ohio State tuition and University financial support have been increasing. However, since the increase in scholarship support hasn't been able to keep up with tuition increases, engineering students and their families have had to increase their debt levels to cover the additional costs. In the Chemical & Biomolecular Engineering Department, department scholarships from alumni and corporate donors help defray a small part of the loan burden for many of our students.

Department scholarships are determined mainly by merit. However, when a scholarship specifies that a student's need be considered, both merit and need are taken into account.

We thank all of our alumni and corporate donors who have established scholarship endowments or support scholarships on an annual basis.

---

**Robert W. Adams Memorial Scholarship**
Asper, Kevin Robert; Blum, Nicholas Thomas; Hesse, Mary Elizabeth; Maltry, Kathryn Grace; Ruffley, Jonathan P.

**Harold W. Almen Scholarship**
Alkhatib, Hussein Badr; Chesser, Ryan James; Lewis, Devyn Patrick; Llewellyn, Killian Jon; Miller, Patrick Ryan; Montjoy, Doug Gordon; Nowicki, Kevin Michael; Patel, Parth A.; Rodriguez, Lucas Moses; Short, Andrew Michael; Smith, Michael Jonathan; Traine, Samantha Marie; Vasquez V, Gabrielle Marie.

**Paul Bates Scholarship**
Boon, Jordan Tyler; Claytor, Alexandra Renee; Johnson Jr., Keith Allen; McNeil, Janee; Sanford, Rayvion Aleisha.

**The George S. Bonn Scholarship**
Cheng, Zezhen; Lu, Luhe; Mao, Xinpei; Na, Jing; Pan, Jie; Uppati, Sai Pranav Reddy; Wang, Ziwei; Wang, Ka Heen Gary; Yang, Wenian.

**J.R. Boothe Scholarship Fund**
Zins, Zachary Paul Eskay.

**William I. Burt Memorial Scholarship Fund**
Bonamer, Daniel George; Brackman, Erica Lynn; Braun, Nicholas Aloysius; Bresson, Julianne Noel; Cambraia, Jody; Cutting, Jordan Dean; Fahrenkamp, Nathan Joseph; Fouasnon, Joshua Benjamin; Forkey, Jarrett Reno; Gallagher, Regina Christine; Helber, Emily Marie; Jokerst, Mitchell Allen; Justus, Nicholas Ronald; Kolliopoulos, Panayiotis Konstantinou; Labrecque, Kacie Nicole; Lacher, Paul Stephen; Logan, Alison Nicole; Lyon, Peter Daniel; Martin, Aleesha Kay; McHugh, Marissa Kathleen; Mesch, Kendel M.; Molitoris, Kathryn Marie; Newmyer, Andrew Grant; Oliver, Timothy Joseph; Pangilinan, Nicole Malto; Sabol, David Michael; Schwertner, Alexandra Leona; Stockton, Douglas Samuel; Strickland, Aaron Alexander; Summerlin, Bryan John; Turco, Michael John; Westfall, Jesse James.

**The James F. and Patricia C. Dietz Engineering Scholarships Fund**
Fletcher, Charles C.; Glick, Lily Rebecca; Piening, Eric Michael; Zierden, Hannah Christine.
Student preparing the water-diluted acetic acid charge for the activated carbon fixed bed adsorption experiment in the Unit Ops Lab.

Dorothy J. & Herbert L. Fenburr Scholarship
Anderson, Christina Lucille; Anderson, Derek Michael; Barlage, Jeremy Joseph; Borror, John Thomas; Braswell, Nathan Brian; Carver, Faith Anne; Chen, Alexandria Ying; Cohen, William Fredric; Cooper, Steven Michael; Danylewycz, Orest Andrij; Daubenmire, Trent; Davies, Sean Michael; Davis, Jonathan T.; DeVita, Derek James; Gerges, George Anthony; Guan, Gar Wai; Hamayel, Mohannad Mutee; Jordan, Bradley David; Kimmel, Matthew Allen; Lechner Jr., Ronald Scott; McCaffrey, Marisa Anne; McNulty, Kevin Michael; Mohammad, Mohammad Hashem; Ng, Enoch Joshua; Nimon, Kyle Anthony; Nystrom, Steven Vernon; Ratcliffe, Jacob Michael; Schneider, Kyle Phillip; Shah, Deep Bhumendra; Stewart, Kevin Allen; Streng, Maria Anne; Strutz, Jonathan Robert; Thomas, Chelsea Denese; Thompson, Zechariah David; Wegman, Kevin Robert; Whitman, Andrew J.; Volchko, Nathan William; Zins, Zachary Paul Eskay.

David H. George Chemical Engineering Scholarship
Anil II, Nana; Cummings, Thomas; De Leon, Jr., Rafael; Ellis, Jonathan; Hagenmaier, Audrey; Hang, Nathaniel; Kell, Sabrina; Lyons, Sarah; Sandvik, Peter; Taylor, Micaela.

Allan I. Gordon Undergraduate Scholarship for Study in Biochemical Engineering
Luppino, William.

Todd David Harris Memorial Scholarship
Hochberg, Scott; Kaufman, Nicole.

William R. & Doris M. Harris Scholarship in Chemical Engineering
Guenther, Mitchell Douglas; Holloway, Clinton Robert; Kleimeyer, Geoffrey David; Lee, Jason J.; Louis, Mitchell Alan; Mog, Brian Joseph; Vishnepolsky, Vadim.

Milton & Karen Hendricks Scholarship
Chen, Angela.

Smith E. Howland Scholarship
Gower, Mitchell Walton; Luo, Wei.

The Samuel S. and Grace Hook Johnston Memorial Chemical Engineering Scholarship Fund
Amatulli, Ryan; Collinger, Nicholas John.

Webster B. Kay Scholarship in Chemical Engineering
Bui, Loan My; Dorfi, Anna Elisabeth; Higgins, Chloe Ann.

Lubrizol Foundation Scholarship
Konderson, Matthew Christopher; McLean, Erin Leigh.

The Tom and Gail Reardon Chemical Engineering Scholarship Fund
Alade, Eunice Oluwadamilola; Brown, Josh William; Kennie, Whitney.

The Howard R. Steele Memorial Scholarship in Chemical Engineering
Chabrier, Santiago; Clarson, Heather; Costa, Manuara; Seibel, Nicole.

Aldrich Syverson Scholarship
Neu, Adam Russell; Dellon, Lauren Danielle.

H. Richard Unkel Chemical Engineering Class of 1941
Baker, Hillary; Empfield, Abbey Mae; Gauthier Jr., Joseph Allen; Kriner, Robert Joseph; Steffan, Lisa M; Whitten, Jane Amelia.

Harry B. Warner Scholarship
Butler, Brittney A.

William H. Whirl Scholarship
Pangilinan, Nicole Malto.

The Michael D. Winfield Scholarship
Hughes, Maya Christine.

Fred H. Winterkamp Memorial Scholarship
Coates, Zachary Alan; Czecatul, Nathaniel Raymond; Detwiler, Andrea Marie; Hudson, Paul Wesley; Lapp, Cole Thomas; Weisgarber, Ethan Lloyd.
1941 David Thomas;
1943 James C. Wynd;
1944 Wallace L. Bostwick;
1945 Arch G. Rosbin;
1947 Dalton F. Drake;
1948 Dick F. Hoffman, David E. James, Henry B. Lange, Richard M. Morrow estate, Manuel Ramos, George R. Secrist, Robert M. Tarr;
1950 R.B. Ritter, Richard L. Scott, Ralph E. Sieber;
1951 Charles L. Dornbusch, Richard N. Eilerman, Bruce E. Hill, John R. Parkinson, Norbert F. Reinert, Donn P. Rice, David B. Speed;
1952 James F. Froning, Donald E. Haupt, C.R. Heil, Robert H. Hill, Charles J. Schmitz;
1954 Paul M. Engle;
1958 Edward H. Bollinger, James R. Face, Barry C. Hartley, Jon D. Helms;
1962 Jerri B. Comer, Roy L. Comer, Nancy C. Dawes, Ronald A. Gibson, Douglas V. Lenz, William E. Naseem, James A. Telljohann;
1966 Paul R. Bigley, Richard B. Cooper, Clyde W. Folk, Ronald L. Follmer, Ted Hanson, Ronald D. Harris, Gordon R. Howard, John N. Rapach;
1970 Oliver L. Davies, Frederick H. Flor, John P. Geggner, Frederick J. Rerko, Michael C. Royer, Fred A. Shaftall, William A. Smith, Eugene N. Wheeler;
1973 John C. Bost, Charles N. Carpenter, David A. Dargen, Mark E. Forry, Robert C. McKe, George L. Ott;
1974 John T. Erikson, Wayne R. Fontaine, Stephen L. Grant, John E. Myers, Michael A. Patterson, James Watt;
1975 Dale F. Arnold, James M. Delabar, Lawrence R. Latta;
1976 Douglas J. Hallenberg, David M. Muller;
Giving...

2013 Alumni Donors

The students and faculty of CBE thank you for joining in supporting them.


Corporate and Organizational Donors


~Step into the circle of giving and receiving~

Students Xiang Zhang, Witopo Salim, & Cheng Chung
Graduate Program

Ranking

The 2015 US News and World Report rankings of engineering graduate programs placed the Lowrie Department of Chemical and Biomolecular Engineering at #23. While the college rankings are based in good part on objective measures such as research funding, number of PhD graduates, number of publications, etc., the departmental rankings are based on subjective surveys of deans of engineering and industrial executives.

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Engineering Specialties:

| Aerospace | 22 | 19 | 19 | 22 | 25 | 22 |
| Biological/Agriculture | 11 | 12 | 12 | 14 | 14 | 11 |
| Biomedical | - | 35 | 35 | 42 | 36 | 45 |
| Chemical | 27 | 27 | 27 | 28 | 29 | 23 |
| Civil | 36 | 36 | 36 | 38 | 35 | 36 |
| Computer Engineering | 20 | - | 23 | 23 | 19 | 18 |
| Computer Science | - | 28 | - | 28 | - | 34 |
| Electrical | 20 | 22 | 22 | 19 | 18 | 18 |
| Environmental/Env. Health | 39 | 42 | 42 | 48 | 48 | 55 |
| Industrial/Manufacturing | 21 | 16 | 16 | 21 | 17 | 17 |
| Materials | 16 | 15 | 15 | 17 | 15 | 18 |
| Mechanical | 22 | 21 | 21 | 18 | 24 | 23 |
| Nuclear | 13 | 15 | 15 | 13 | 13 | 14 |

Faculty Productivity

The following table relating to faculty research and our PhD program attests to our faculty’s productivity. In the past five years the average graduation rate was 15 PhD students per year and a ratio of 0.78 PhD degrees per faculty member. 2012 shows a decline in research expenditures to $7.3M, reflecting the end of substantial funding from the State of Ohio’s “Third Frontier” program.

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Research Expenditures

During the past seven years the research expenditures for the department have been outstanding. While we experienced a decline to $7.2M in fiscal year 12, we had a modest increase in 2013 to $8.2M. On a per-capita basis, expenditures averaged over $580K per year during fiscal years 2009-2013. Our faculty are among the most productive at Ohio State and near the top of all chemical engineering departments in the nation.
### Graduate Degrees Granted

#### Spring 2013

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#### Summer 2013

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#### Autumn 2013

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Graduate Program Seminars

Spring 2013

1/10  Nicholas Brunelli, Postdoctoral Fellow, School of Chemical & Biomolecular Engineering, Georgia Institute of Technology, “The Sub-Nanometer Length Scale: Exploring Fundamental Challenges in Aerosols & Catalysis.”

1/31  Elijah Thimsen, Postdoctoral Associate, Chemical Engineering and Materials Science and Mechanical Engineering, University of Minnesota, “Atomic Layer Deposition of Cu2ZnSnS4 (CZTS) For Nanostructured Solar Cells and Fundamental Materials Research.”

2/7   Jason Burdick, Associate Professor, Department of Bioengineering, University of Pennsylvania, “Injectable Hydrogels with Engineered Properties and Molecule Release for Cardiac Repair.”

2/14  Qing Peng, Research Scientist, Electrical and Computer Engineering Department, Duke University, “Chemical Assembly of Materials at the Molecular Level.”

2/21  James A. Dumesic, Steenbock Professor and Michel Boudart Professor, Chemical and Biological Engineering, University of Wisconsin-Madison, “Strategies for Catalytic Conversion of Lignocellulosic Biomass to Fuels and Chemicals.”

2/28  Jim Wallace, Professor Emeritus, Director, Burgers Program for Fluid Dynamics, Department of Mechanical Engineering, University of Maryland, “Highlights of Fifty Years of Turbulent Boundary Layer Research.”

3/7   Nisat Balsara, Professor, Department of Chemical Engineering, University of California, Berkeley, “Nanostructured Block Copolymers for All-Solid Lithium Batteries.”

3/21  Linda Broadbelt, Sarah Rebecca Roland Professor and Chair, Department of Chemical and Biological Engineering, Northwestern University, “Designing Reaction Pathways to Novel Chemicals and Materials Using Kinetic Modeling.”

4/4   Mark Davis, Lowrie Lecture I, Warren and Katharine Schlenger Professor, California Institute of Technology, Chemical Engineering, Member, City Hope Comprehensive Cancer Center, Experimental Therapeutics Program, “Fighting Cancer with Nanoparticle Medicines: The Nanoscale Matters!”

4/5   Mark Davis, Lowrie Lecture II, “The Rise and Realization of ‘Molecular’ Chemical Engineering.”

4/11  Monica Burdick, Assistant Professor, Chemical and Biomolecular Engineering, Ohio University, “Identification of E-selectin Ligands on Breast Cancer Cells: Implications for Bloodborne Metastasis.”

4/18  Peter Tessier, Assistant Professor, Chemical & Biological Engineering, Rensselaer Polytechnic Institute, “Antibodies by Design.”

Autumn 2013

8/22  Dan Luss, Cullen Professor of Engineering, Department of Chemical and Biomolecular Engineering, University of Houston, “Application of Chemical Reaction Engineering to Reducing Automobile Emissions.”

8/29  Celeste Nelson, Associate Professor, Department of Chemical and Biological Engineering, Princeton University, “Forcing Tissues to Build Themselves.”

9/5   Laura Segatori, Assistant Professor, Chemical and Biomolecular Engineering, Bioengineering, Biochemistry and Cell Biology, Rice University, “Reprogramming the Proteostasis Network to Enhance Cellular Clearance Pathways.”

9/19  Mahmoud El-Halwagi, Professor and Holder of the McFerrin Professorship, Artie McFerrin Department of Chemical Engineering, Texas A&M University, “Sustainable Process Design Through Mass and Property Integration.”

9/26  Sanat Kumar, Professor and Chair, Department of Chemical Engineering, Columbia University, “Nanoparticle Amphiphiles.”

10/3  Jodie Lutkenhaus, Assistant Professor, Artie McFerrin Department of Chemical Engineering, Texas A&M, “Temperature-Responsive Polyelectrolyte Multilayer Films and Microtubes.”

10/10 Michael Boehm, Postdoctoral Research Fellow, School of Chemical Engineering, The University of Queensland, Brisbane, “The Physics of Eating: How Do We Research Oral Processing?”

10/17 Sheldon Park, Assistant Professor, Department of Chemical and Biological Engineering, University of Buffalo, “Engineered Molecular Recognition in Biotechnology and Medicine.”

10/24 Doraishwami Ramkrishna, H.C. Peffer Distinguished Professor, School of Chemical Engineering, Purdue University, “On Dynamic Modeling of Metabolism. The Cybernetic Approach.”


11/14 Randall Winans, Senior Scientist, X-ray Science Division, Advanced Photon Source, Argonne National Laboratory, “In Situ X-ray Scattering of Catalytic Transformations.”

11/21 Susannah Scott, Professor, Chemical Engineering, Chemistry and Biochemistry, University of California Santa Barbara, “Creating Catalytically Active Sites on Oxide Surfaces with Molecular Precision.”
Photos by Geoff Hulse

Graduate Student Awards

Katja Binkley: NSF-funded Partnership in International Research and Education (PIRE) Fellowship to attend the 10th Congress on Catalysis Applied to Fine Chemicals and the PIRE Summer School in Turku, Finland (Summer 2013).

Deepika Singh: Kokes Award at the North American Catalysis Society meeting (June 2013), and an AIChE Catalysis and Reaction Engineering (CRE) Division Travel Award (November 2013).

Ilgaz Soykal: Kokes Award at the North American Catalysis Society meeting (June 2013).

Lin Zhao: 2nd Place Poster Presentation Award at the Fuel Cell Seminar & Energy Exposition, Columbus, OH (October 2013) for his poster, CO$_2$-Selective Membranes for H$_2$ Purification for Fuel Cells.

Graduate Student University Fellowships

Paul Garman
Nitish Deshpande
Aamena Parulkar

“Engineers train to be excellent problem solvers. As Ohio State students, you should be among the best,” said Rich Brandon (‘83; Dow Chemical), 2013’s Ohio State CBE Graduate Research Symposium keynote speaker.

Rich also made the point that complex problems require diverse teams and a multidisciplinary approach. He has found that learning how to collaborate across disciplines is key to success.

The full-day event, sponsored by Dow Chemical, attracted 26 representatives from 17 different companies, including Dow, DuPont, ExxonMobil, General Mills, and Shell.

“This was an excellent event,” said Ellen Silva (‘80, ‘93, ‘97; General Mills). “Quite professionally done and the caliber of research presentations and posters was quite good,” she added.

Forty students (including one undergrad) showcased their research in a variety of posters and presentations. Below, Michael Coolbaugh (left), from David Wood’s research group, presents his research in protein engineering, and Niranjani Deshpande (right), from L.S. Fan’s research group, discusses a novel application of calcium looping technology for flue gas cleanup with Tom Burns (‘83, ‘85, Dow).

Please visit http://go.osu.edu/GRS2013 for more info and a keynote transcript.
On the need for clean and safe energy: “Harmonize with nature before it’s too late.”

Paul Chungmoo Auh (’70 MS-ChE, ’75 PhD-ChE) and Heyeun Kang.

One of Ohio State University’s three “Discovery Themes” addressing the technological, social, and environmental stresses that define today’s global world is Energy and Environment – an area of interest to many ChemEs.

We spoke to alumnus Paul Chungmoo Auh, whose career involved developing scientific responses to the global need for energy and the associated effects on the environment, particularly in the field of solar energy and water pollution.

Auh began his career at Columbia Gas, developing new types of heating and cooling equipment such as a compact absorption refrigeration unit for use as a heating and cooling system. During this time, he also attended Ohio State as a grad student.

“Western education gave me a strong technical background and a global mind, which deeply impacted and benefitted my career,” Auh recalls.

“I had left Korea in the early 60s, after the devastation of the Korean War. People were eager for better education, because they thought that advanced knowledge would be the key for a better future for both themselves and their country,” he explained.

After graduating from Ohio State, Auh worked in the Solar Technology Group of the Energy and Environment Department at Brookhaven National Laboratory in Upton, NY to improve the performance of solar-operated air conditioning systems.

“For most of my career, my main research interest has been solar energy, specifically, solar air-conditioning and passive solar technologies. I believe that passive solar technologies are economically viable in many instances at present,” he said.

“It’s unavoidable that we must find new and renewable energy for a sustainable environment,” he added. “The problem is that it is not easy to procure appropriate new energy options that are economically viable when compared to conventional energy resources. Solar electric, wind, and biomass appear to be compatible at the moment, as well as many other new energy options, however.”

“The world would be safer without nuclear energy, for example, but many countries would not survive without it at the present time. The economics of clean and safe energy options will control the extent of nuclear energy usage in the future. Meanwhile, nuclear accidents will continue causing harm.”

“We must choose a variety of new, economically viable, energy options, not just one specific one, because no single option would be able to significantly replace the current energy resources. That is why the formulation of a mixed energy plan may be necessary for each country or region. Since air, water, and land pollution is all inter-connected, a variety of advanced technologies - including bio - should be developed focusing on acid rain, waste chemicals, and animal wastes, etc., especially for water pollution,” he observed.

After retiring, Auh taught new and renewable energy technologies at Hanbat National University in Korea, and serves as president of the Green Industry Angel Club, which provides technical assistance and connections to both technology owners and investors in new and renewable energy areas. The major goal of the 25-member club is to help entrepreneurs create new businesses with the help of club members’ technical assistance.

Auh, who has authored 370+ technical research papers and reports, and authored or co-authored five technical books on solar energy, received the National Order of Mokryun-Chang award from the president of Korea in 1990, and the Distinguished Alumnus Award from Ohio State University in 1993. In 1989 he received the Korean Ministry of Science and Technology’s Outstanding R&D Project Award, and the Korean Solar Energy Society’s main Academic Award.

He served as Distinguished Senior Researcher at the Korea Institute of Energy Research for six years.
Faculty

Aravind Asthagiri

Associate Professor, PhD, Carnegie Mellon, 2003. Computational materials science, energy & sustainability.

Awards and Honors

Article on CO$_2$ electroreduction on Cu(111) surface features on the inside cover of Angewandte Chemie.

Books and Book Chapters


Refereed Papers


Current Grants/Contracts

$354,300 - Aravind Asthagiri (co-PI Jason Weaver) (2009-2013). Tailoring enantiospecific properties of chiral metal nanoclusters on chiral metal oxides, National Science Foundation.


$600,000 - Aravind Asthagiri (PI Jason Weaver) (2012-2015). Growth and reactivity of oxide phases on crystalline Pd and Pt surfaces, DOE-BES.


Robert Brodkey

Professor Emeritus, PhD, University of Wisconsin, 1952. Validation of computational fluid dynamic codes with experimental measurements that involve full field, time-resolved, velocity vector measurements.

Awards and Honors


“Bob Brodkey: Then and Now” is a fun, CBE-made video tribute highlighting “The Brodkey’s” 50-year career at CBE. Watch it on YouTube at http://go.osu.edu/brodkey
Bhavik Bakshi

Professor, PhD, M.I.T., 1992. Sustainability science and engineering, process systems engineering.

Awards and Honors

Best Paper Award, second place at the International Symposium on Sustainable Systems and Technology, Cincinnati, OH, 2013, with Rebecca Hanes, Nathan Cruze, Prem Goel, Bhavik R. Bakshi.

Refereed Papers


Current Grants/Contracts

$418,965 - Yebo Li (co-PIs Bhavik R. Bakshi and Rudy Buchelt) (2012-2014). Development and demonstration of a low VOC polyurethane coating system using biopolyol derived from crude glycerol.

$6,000,000 - Yebo Li (co-PIs Bhavik R. Bakshi and several others) (2013-2017). US Department of Agriculture, BRDI program, Bioenergy and Biofuels Production from Lignocellulosic Biomass via Anaerobic Digestion and Fisher-Tropsch Reaction.


Jeffrey Chalmers

Professor, PhD, Cornell, 1988. Biochemical engineering, bioengineering, biomedical engineering.

Refereed Papers


Patents


Left: A worker in the hallway of old Koffolt Labs enjoys a moment as “Robot Man!”
Current Grants/Contracts


Magnetic technologies for microalgal biofuel production. GRT00025262 (PI of sub-contract: Chalmers). NSF Phase II SBIR awarded to Phycal, Inc. 4/31/12- 3/31/14


Stuart Cooper

University Scholar Professor and Department Chair, PhD, Princeton University, 1967. Polymer science and engineering, properties of polyurethanes and ionomers, biomaterials interactions, tissue engineering.

Awards and Honors


Refereed Papers


L.S. Fan

Distinguished University Professor and C. John Easton Professor in Engineering, PhD, West Virginia University, 1975. Fluidization, multiphase flow, particulate reaction engineering, energy and environmental engineering, process tomography.

Awards and Honors


Elected to Fellow, National Academy of Inventors, October 14, 2013.

Elected to Foreign Member, Australia Academy of Technology Science and Engineering (ASTE), November 22, 2013.

Chemical Engineering Academy Lecture, Missouri Science and Technology, Chemical Engineering Department, April 18-19, 2013.

Provost’s Bold Aspirations Lecture, University of Kansas, Chemical Engineering Department, April 29-30, 2013.

Reuel Shinnar Lecture, The City College of The City University of New York, December 9, 2013.

Plenary Lecturer, 7th World Congress in Particle Technology, Beijing, China, May 19-22, 2014.

Plenary Lecturer, 11th International Conference on Gas-Liquid and Gas-Liquid-Solid Reactor Engineering (in conjunction with the 9th World Congress of Chemical Engineering), Seoul, Korea, August 19 – 22, 2013.

Plenary Lecturer, Ohio Coal Association Annual Meeting, Columbus, Ohio, September 26, 2013.


Plenary Lecturer, 2014 Chinese Academy of Engineering, Beijing, China, June 2, 2014.

Book Chapters


Refereed Papers

Andrew Tong, Deepak Sridhar, Zhenchao Sun, Hyung R Kim, Liang Zeng, Fei Wang, Mandar V Kathre, Siwei Luo, Yuhao Sun, and L.S. Fan, “Continuous High Purity Hydro-


Patents

Current Grants/Contracts

$1000 - L. S. Fan (2012-2013). Undergraduate Research Award, Dow Chemical.

$2,100,000 – L. S. Fan (PI) (2012-2014). Syngas Chemical Looping Demonstration at NCCC – II, DOE-ARPA-E.

$1,800,000 – L. S. Fan (PI) (2012-2014). Syngas Chemical Looping Demonstration at NCCC – II, OCDO.

$1,400,000 - L. S. Fan (co-PI) (2012-2013). CDCL-Phase I Demonstration, Department of Energy (DOE).

$300,000 - L. S. Fan (co-PI) (2012-2015). Microfluidics for Cell Entrapment, NSF.

$300,000 - L. S. Fan (Pi) (2012-2015). Biomass Tar Interaction with Metal Oxide Oxygen Carriers, NSF.


$1,200,000 – L. S. Fan (Pi) (2013-2014). Chemical Looping Gasification for Hydrogen Enhanced Syngas Production with In-Situ CO2 Capture, Department of Energy (DOE).

Martin Feinberg
Richard Morrow Professor of Chemical and Biomolecular Engineering and Professor of Mathematics, PhD, Princeton University, 1968. Complex chemical systems, behavior of chemical and biochemical reaction networks.

Refereed Papers


Software

Current Grants/Contracts

Lisa Hall
Assistant Professor, PhD, University of Illinois Urbana-Champaign, 2009. Polymer physics, theory and stimulation, statistical thermodynamics.

Refereed Papers

Current Grants/Contracts


W.S. Winston Ho
Professor, PhD, University of Illinois, Urbana, 1971. Molecularly based membrane separations, fuel-cell fuel processing and membranes, transport phenomena in membranes, separations with chemical reaction, reverse osmosis.

Awards and Honors
Distinguished Alumnus Award and Keynote Speech, Centennial Celebration of Wan-Li Elementary School, Wan-Li, New Taipei City, Taiwan, March 31, 2013.


Books and Book Chapters
Elise B. Fox, Héctor R Colón-Mercado, Yuanxin Chen, and W.S. Winston Ho, “Development and Selection of Ionic Liquid Electrolytes for Hydroxide Conducting Polybenzimid-

Refereed Papers


Current Grants/Contracts

$302,000 - W.S. Winston Ho (2010-2013). Advanced CO₂- and H₂S-Selective Membranes, OSURF Project No. 60025821, National Science Foundation.

$6,000 - W.S. Winston Ho (2012-2013). Advanced CO₂- and H₂S-Selective Membranes, REU Supplement, OSURF Project No. 60037177, National Science Foundation.

$150,000 - W.S. Winston Ho (2011-2013). Carbon Dioxide and Hydrogen Sulfide Clean-up of Gases, OSURF Project No. 60030576, National Science Foundation.

$8,000 - W.S. Winston Ho (2012-2013). Carbon Dioxide and Hydrogen Sulfide Clean-up of Gases, REU Supplement, OSURF Project No. 60030576, National Science Foundation.

$183,519 - W.S. Winston Ho (2009-2014). Center for Affordable Nanoengineering of Polymer Biomedical Devices, NSEC Project sponsoring one PhD Student, with L. James Lee (PI), OSURF Project No. 60030348 & 60028680, National Science Foundation.


Kurt Koelling

Professor, PhD, Princeton University, 1993. Polymer processing and rheology, polymer nanocomposites, bio-based Polymers, micro/nanofluidics.

Refereed Papers


Current Grants/Contracts

$50,000 - Yael Vodovozt, Katrina Cornish, Kurt Koelling (2013-2014). Biobased PHBV/Hevea Natural Rubber Blends for Packaging Applications, CAPPS.
$10,000 - Yael Vodovotz, Katrina Cornish, Kurt Koelling (2013-2014). Biobased Polymer Films for Food Packaging Applications, CAPPS.

Isamu Kusaka
Associate Professor, PhD, Caltech, 1998. Statistical mechanics, atomistic and mesoscopic simulations.

Refereed Papers

L. James Lee
Professor, PhD, University of Minnesota, 1979. Polymer and composite engineering, micro/nanotechnology, BioMEMS/NEMS.

Refereed Papers


Patents


Right: CBE Koffolt Campaign Committee Member
Karen Hendricks (’71) enjoys a tour inside new Koffolt Labs.

Current Grants/Contracts


$30,000 - L. James Lee (PI) (2012-2013). Graphene Based Polymer Nanocomposites and Coating, LCY.

- Photo by Geoff Hulse
Umit Ozkan

College of Engineering Distinguished Professor, PhD, Iowa State University, 1984. Catalysis, electro-catalysis and catalytic materials, and application of catalysis in the areas of energy conversion and emission control.

Awards and Honors
Honored by a special volume of Topics in Catalysis (Volume 56, issues 18-20), 2013.

Refereed Papers


Current Grants/Contracts


Andre Palmer


Refereed Papers


Current Grants/Contracts

Michael Paulaitis

Professor and Ohio Eminent Scholar, PhD, University of Illinois, 1976. Molecular thermodynamics, role of hydration in biological organization, self-assembly and molecular recognition, multi-scale modeling of biological interactions.
Awards and Honors
OSU College of Engineering Harrison Faculty Award for Excellence in Engineering Education (2012).

Refereed Papers


Current Grants/Contracts
$1.5M ($5,000 - Michael Paulaitis) (Tom Schmittgen PI) (2013-2016). Targeted delivery of microRNA-loaded microvesicle for cancer therapy, NIH.

James Rathman

Refereed Papers


Current Grants/Contracts
$148,000 – James Rathman (2011-2013). Development and implementation of chemoinformatics and statistical methods for assessing chemical toxicity evidence from multiple sources, Altamira, LLC.

David Tomasko
Professor, PhD, University of Illinois Urbana-Champaign, 1992. Molecular thermodynamics, supercritical fluid processing, polymer processing, engineering education.

Refereed Papers

Current Grants/Contracts
Human Connect: Scholarships in science, technology, engineering and math, National Science Foundation, DUE-1259709, Project 60042813.


$120,000 - David Tomasko (Co-PI), (PI: Brian Randolph, University of Toledo) (2013). Ohio Workforce Accelerator Network, Ohio Board of Regents – Ohio Means Internships and Coops, Projects 60038088 and 60042806.


Jessica Winter
Associate Professor, PhD, University of Texas at Austin, 2004. Bionanotechnology, neural biomimetics, drug delivery.

Awards and Honors
TechColumbus Inventor of the Year.

Top 25 STEM Professors in Ohio.
OSU College of Engineering Harrison Award.
Ohio Stem Ability Alliance Archer Award.

Book Chapters

Refereed Papers


Current Grants/Contracts


$50,000 - J. Otero, J.O. Winter, C. Askwerth (2012-2013). Induced pluripotent stem cell modeling of respiratory neural development, National Institutes of Health, OSU CCTS.


David Wood
Associate Professor, PhD, Rensselaer Polytechnic Institute, 2000. Biotechnology, bioseparations, biosensors, protein engineering.

Refereed Papers


Barbara Wyslouzil
Professor, PhD, Caltech, 1992. Aerosol science, nucleation, nanoparticle growth and structure, biomedical applications of aerosols.

Refereed Papers


Current Grants/Contracts


$224,956 - Barbara E. Wyslouzil (2009-2014). Multifunctional nanoparticles: Formation and fundamental studies, National Science Foundation (OSU NSEC, subaward).


$335,000 - Jessica Winter, Jeffrey Chalmers, Gang Ruan, Barbara E. Wyslouzil (2012-2015). Micellar Electrospay Synthesis of Magnetic Quantum Dots, National Science Foundation.

$478,000 - Barbara E. Wyslouzil (2012-2015). Nanodroplets to nanoparticles: Integrated studies of freezing, National Science Foundation.

$1,174,000 - Jessica Winter, Carol Lynn Alpert, Lisa Hall, Barbara E. Wyslouzil (2013-2017). SNM: Continuous, large-scale nanocomposite production via micellar electrospay, National Science Foundation-CMMI.


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$478,000 - Barbara E. Wyslouzil (2012-2015). Nanodroplets to nanoparticles: Integrated studies of freezing, National Science Foundation.

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Refereed Papers


D. Wei, X. Liu, S.-T. Yang, Butyric acid production from sugarcane bagasse hydrolysate by Clostridium tyrobutyricum immobilized in a fibrous-bed bioreactor, Bioresource Technol., 129: 553-560 (2013).


$1,063,605 - Shang-Tian Yang (2010-2013). Production of Propionic Acid and Propanal from Biomass, Dow Chemical.


In recognition of Professor Zakin’s long and illustrious career of nearly 40 years with the Department of Chemical and Biomolecular Engineering, CBE created a short tribute video. Watch it on YouTube at http://go.osu.edu/ZakinTribute

Current Grants/Contracts

Faculty & Staff

Professors
Bhavik Bakshi
Jeffrey Chalmers
Stuart Cooper
Liang-Shih Fan
Martin Feinberg
Winston Ho
Kurt Koelling
L. James Lee
Umit Ozkan
Andre Palmer
Michael Paulaitis
James Rathman
David Tomasko
Barbara Wyslouzil
Shang-Tian Yang

Associate Professors
Aravind Asthagiri
Isamu Kusaka
Jessica Winter
David Wood

Assistant Professors
Nicholas Brunelli
Lisa Hall

Clinical Faculty
Carlo Scaccia
John Clay

Emeritus Professors
Robert S. Brodkey
Harry C. Hershey
Thomas L. Sweeney
Jacques L. Zakin

Research Scientists
Iraj Ghazi
Richard Lease

Research Associates
Dawei Wang
William Kane Wang
Qiang Zhou

Visiting Scholars
Abdelrahman, Asmaa Abdella Abdelaal
Samar Zaim Alsharawi
Paul L. Edmiston
Hongxin Fu
Pengfei He
Meimei Liu
Aleksandra Mostrag-Szlichtyng
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Right: A construction worker straddles a pylon on the fourth floor exterior of the new Koffolt Labs building. The building will open in Fall 2014.
Varsha Gopalakrishnan, from Bhavik Bakshi’s research group, presents research on the Design of Techno-Eco Networks for Sustainable Systems at the 2013 Ohio State CBE Graduate Research Symposium, which she helped organize under the lead of Viraj Modak and Matt Gallovic.

Other students who helped put together the 2013 Symposium were Hrishikesh Munj, Sumant Patankar, Niranjani Deshpande, Elif Miskioglu, and Ankita Majumdar.

Varsha and Matt Gallovic will lead organizational efforts for the 2014 Symposium. -Photo by Geoff Hulse