Mission and Vision

To educate undergraduate and graduate students in Chemical and Biomolecular Engineering and foster cross-fertilization of allied fields.

To advance the state-of-the-art knowledge of Chemical and Biomolecular Engineering and allied fields through novel and sustained research.

To serve the public, academic, industrial and governmental communities through consultation, collaborative efforts and dissemination of research results.

To value diversity as defined broadly in scholarship, approach to teaching and in student, faculty and staff make-up.

Goals

To develop a high-quality education program at both the undergraduate and graduate levels ranked among the top twenty programs in the nation.

To develop a high-quality research program ranked among the top twenty programs in the nation.

To serve as a valued technical resource for the public, industry and all levels of government.

To have our innovations in education, research and successes in diversity serve as models for other departments, colleges and universities.

Photography by Geoffrey Hulse
Editor, Sherry D. Stoneman
614/292-7907; stoneman.3@osu.edu
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Dear Alumni and Friends of the Department of Chemical and Biomolecular Engineering:

I and my colleagues of the Department of Chemical and Biomolecular Engineering are pleased to send you a copy of our Annual Report. This past year has been a busy and productive time for the Department. We recruited two new faculty who will eventually bring our numbers up to 16 and continued to produce impressive numbers of highly qualified graduates: 57 Bachelor of Science, 2 Master of Science and 7 Doctor of Philosophy. More details of our continuing and graduating students’ accomplishments are included in the following pages. In April of this past year our name change to Chemical and Biomolecular Engineering was approved by the Board of Trustees, after a process led by L. S. Fan that took about two years from beginning to end. This name change reflects the changing nature of our profession and also the teaching and research interests of a substantial number of our faculty. We will continue with only one degree in Chemical Engineering but there will be a coursework concentration in biomolecular engineering for those students who have an interest in this direction.

Our two new faculty are Jessica Winters and Michael Paulaitis. Jessica Winters received her Ph.D. from the University of Texas-Austin and will join our faculty in July 2006 after a two-year postdoctoral experience at Harvard. Jessica’s thesis was on the topic of quantum dots with their application as biosensors. It turns out that her expertise fits very well with a special success that Jim Lee has had this year in leading an effort that brought a $12.9 million Nanostructure Science and Engineering Center to OSU. This five-year NSF Center will greatly benefit our interdisciplinary activities in this important technology and is a great win for Jim and the University. The theme of the center is to create affordable nanostructure-based biomedical devices. More than 30 faculty are involved in the center, from different departments and colleges, with more than a quarter of them coming from our Department. Our second faculty member hired involved the recruitment of an Ohio Eminent Scholar, a very special and prestigious appointment. The endowed professorship is provided partly by the Regents and partly through donor participation and currently there are only about 10 of these positions across the University. We were very fortunate to recruit Michael Paulaitis, the former Department Chair at Johns Hopkins University, for this position. Michael joined us on January 1, 2005 and brings with him expertise in molecular thermodynamics. Michael is recognized internationally for his research on hydrophobic effects, self-assembly in aqueous solution and the role of hydration in protein folding and protein–protein interactions in solution and at interfaces. With Michael and Jessica on our faculty we will be in a much better position to expand our curricular offerings and achieve greater national recognition.

As you may be aware we have been planning for some time for an expansion and renovation of Koffolt Laboratories. We have activated a National Committee for this
project chaired by Bill Lowrie which will, among other things, begin to organize a fund raising effort for what we expect will be about a $60 million project. Our challenge will be to raise about 25% of the total cost to complement support expected from the State of Ohio. This request to the state originates in a campus-wide competition for “Capital Budget” items. Fortunately we have been the College of Engineering’s top priority in both the last biennium and in the 2005-07 request. If all goes well we should receive at least $1 million in planning money in 2007. It is hoped that the project could be completed by 2012 or so. We are also beginning early stage planning with an architect regarding conceptual aspects of the expansion and remodeling. With the guidance of our National Committee we have established a Koffolt Expansion and Remodeling Fund and have even begun to receive some initial gifts. This project will obviously be a top priority for the Department over the next several years and one in which we hope all our alumni and friends of the Department will become involved.

Best wishes for a happy and prosperous 2005.

Sincerely,

[Signature]

Stuart L. Cooper

Architect’s rendering of Koffolt labs, utilizing a “green building” option, one of many being considered during the early phases of planning.
Department Faculty and Staff

Professors
Jeffrey J. Chalmers
Stuart L. Cooper
Liang-Shih Fan
Martin Feinberg
Winston Ho
L. James Lee
Umit Ozkan
James F. Rathman
Shang-Tian Yang

Emeritus Professors
Robert S. Brodkey
Christie J. Geankopolis
Edward R. Haering
Harry C. Hershey
H.C. (Slip) Slider
Edwin E. Smith
Thomas L. Sweeney
Jacques L. Zakin

Associate Professors
Bhavik R. Bakshi
Kurt W. Koelling
David L. Tomasko
Barbara Wyslouzil

Assistant Professor
Isamu Kusaka

Instructor
John Corn

Post Doctoral and Research Associates
Chang, Cheng-yi - Research Associate Engineer
Chen, Wen-Shiang - Post Doctoral Researcher
Gupta, Himanshu - Research Scientist
Han, Xiangmin - Post Doctoral Researcher
Lau, Waiman - Post Doctoral Researcher
Li, Yanpeng - Post Doctoral Researcher
Melnik, Kristie - Research Associate Engineer
Tanimura, Shinobu - Post Doctoral Researcher
Tong, Xiaodong - Post Doctoral Researcher
Wang, Xueqin - Post Doctoral Researcher
Wang, Liping - Post Doctoral Researcher
Warsito - Post Doctoral Researcher
Watson, Rick - Senior Research Associate
Xia, Cao - Research Associate Engineer
Xie, Yubin - Post Doctoral Researcher
Xu, Guojun - Post Doctoral Researcher
Yi, Heui Seok - Post Doctoral Researcher
Zeng, Changchun - Post Doctoral Researcher
Zhao, Yang - Research Associate Engineer

Academic Advisor
Mary Lamont

Assistant to the Chair & Alumni Liaison
Sherry D. Stoneman

Graduate Studies Coordinator
Angela Jones

Building Coordinator
Carl Scott

Design Engineer
Leigh Evrard

Fiscal & Human Resources Administrator
Ibrahima Ndoye

Laboratory Supervisor
Paul Green

ChBE/MSE Joint Computing Lab
Geoff Hulse - Director
Mike Davis – Systems Analyst
Dave Jones – Systems Engineer

NSEC/IGERT/CAPCE
Paula Stevenson - Administrator
Martha Lening – Fiscal Administrator
Keri Bantz – Administrative Assistant
Undergraduate Program

Undergraduate Curriculum and Enrollment

The Department of Chemical and Biomolecular Engineering provides a curriculum combining chemical and biological sciences with engineering analysis and design to produce graduates capable of applying problem solving skills to a wide variety of industries ranging from traditional chemical manufacturing and consumer products to advanced materials, nanotechnology, and biotechnology.

Areas of study within the Department include:

- Bioprocessing, bioseparations, biocatalysis, metabolic engineering
- Consumer products
- Drug design, discovery and delivery
- Electronics
- Functional genomics and proteomics, bioinformatics
- Gene therapy, cell and tissue engineering
- Petrochemicals
- Pharmaceuticals
- Pulp and paper products
- Specialty chemicals
- Preparation for medical and law school

With the addition of “Biomolecular” to the Department name, the Department has instituted a new elective, ‘Biomolecular Option.” The option is designed to give interested majors significant exposure to biological science and engineering. The curriculum combines chemical and biological sciences with engineering analysis and design to produce graduates capable of applying problem solving skills to a wide variety of industries ranging from traditional chemical manufacturing and consumer products to advanced materials, nanotechnology, and biotechnology. The option is designed to prepare students for careers in pharmacy, medicine, biochemical engineering and biomedical engineering.

First Year Experience

Professor David Tomasko and IGERT Administrator Paula Stevenson, along with colleagues in the First-year Engineering Program, have developed a new laboratory project to introduce freshmen engineers to microfabrication and nanotechnology. Students in the “nano” section of Eng 183 –
Introduction to Engineering II, work on a quarter-long project to design, fabricate, and test a polymer-based lab-on-a-chip device. The chip detects the presence of a biological antibody in a sample via antigen-antibody binding and fluorescence emission. Students are exposed to nanotechnology through the course with modules written by faculty around campus (including our own Jim Lee and Jim Rathman) and through tours of several nanotechnology research labs at OSU. The work was supported by a NSF grant from the Nanotechnology in Undergraduate Education program.

Freshman Introductory Course

Engineering 100
University Survey for Pre-Chemical Engineers

Engineering 100 is a one-hour survey course intended to give incoming freshmen the opportunity to learn about their future major and understand University rules, regulations and procedures. In winter of 2004 we did an email survey of all of the students that have left the Chemical Engineering program and asked them why they left. Many students had different reasons; however, a theme running throughout the responses was a concern that the survey course did not provide enough information on their future careers if they continued in Chemical Engineering.

In light of this feedback, with the leadership of Mary Lamont and the undergraduate studies committee (Rathman, Tomasko, and Chalmers), we decided to make some major changes in our Engineering 100 course. The course was revitalized using various panel discussions with faculty, undergraduate students and industrial participants. A second major change was that students spent four class sessions involved in hands-on projects and demonstrations. Based on the evaluations that we received from students, the course was a success. The panels were enthusiastically received and informative and the students indicated this in their final papers. This is the model that the Department intends to keep using and hopefully will be reflected in increased matriculation of freshmen into a Chemical Engineering major.

Courses Offered

Autumn 2003

Chemical Engineering 200 – Chemical Processes and Calculations I
Umit Ozkan, 34 students

Chemical Engineering 508 – Thermodynamics I
Isamu Kusaka, 57 students
Chemical Engineering 521 – Transport Phenomena II  
Winston Ho, 58 students

Chemical Engineering 624 – Process Dynamics and Controls I  
Bhavik Bakshi, 63 students

Chemical Engineering 694A – Chemical and Biological Informatics for Engineers  
Chihae Yang, 15 students

Chemical Engineering 760 – Engineering Economics and Strategy  
Ted Thomas, 60 students

Chemical Engineering 761 – Chemical Process Plants  
Jack Zakin, 12 students

Chemical Engineering 765 – Principles of Biochemical Engineering  
S.T. Yang, 34 students

Chemical Engineering 773 – Introduction to High Polymer Engineering  
Donald Bigg, 16 students

Undergraduate Research

Bhavik Bakshi – 1 student  
Robert Brodkey – 2 students  
L.-S. Fan – 6 students  
L. James Lee- 4 students  
Jim Rathman – 2 students plus 1 honors research student  
David Tomasko – 1 honors research student  
S.T. Yang – 4 students  
Jack Zakin – 3 honors research students

Winter 2004

Chemical Engineering 200 – Chemical Processes and Calculations I  
David Tomasko, 19 students

Chemical Engineering 201 – Chemical Processes and Calculations II  
Kurt Koelling, 32 students

Chemical Engineering 509 – Thermodynamics II  
Isamu Kusaka, 32 students

Chemical Engineering 522 – Transport Phenomena III  
S.T. Yang, 56 students
Chemical Engineering 764 – Process Design  
Bhavik Bakshi, 63 students

Chemical Engineering 771 – Air Pollution  
Barbara Wyslouzil, 25 students

Chemical Engineering 776 – Polymer Conversion Operations  
Jim Lee, 8 students

Chemical Engineering 779 – Experimental Design  
Jim Rathman, 49 students

Undergraduate Research

Robert Brodkey – 2 students  
John Corn – 1 student  
L.-S. Fan – 6 students  
L. James Lee- 3 students  
Umit Ozkan – 1 student  
Jim Rathman – 3 students plus 1 honors research student  
S.T. Yang – 1 student  
Jack Zakin – 1 student plus 2 honors research students

Spring 2004

Chemical Engineering 201 – Chemical Processes and Calculations II  
Jack Zakin, 20 students

Chemical Engineering 420 – Transport Phenomena I  
Martin Feinberg, 63 students

Chemical Engineering 523 – Unit Operations  
Barbara Wyslouzil, 55 students

Chemical Engineering 610 – Chemical Engineering Kinetics  
Jim Rathman, 56 students

Chemical Engineering 694- IGERT Seminar for Molecular Engineering of Microdevices  
L. James Lee, 35 students

Chemical Engineering 694I – Group Studies – Industrial Ecology  
Bhavik Bakshi, 14 students
Chemical Engineering 694J – Group Studies – Polymer Membranes  
Winston Ho, 8 students

Chemical Engineering 750 – The Profession of Chemical Engineering  
Stuart Cooper, 51 students  
Chemical Engineering 762 – Process Development  
John Corn, 57 students

Chemical Engineering 766 – Biotechnology and Bioprocess Engineering  
Jeff Chalmers, 21 students

Chemical Engineering 769 – Biomedical Nanotechnology  
Stephen Lee, 8 students (cross-listed with Biomedical Engineering)

Chemical Engineering 775 – Rheology of Fluids  
Kurt Koelling, 14 students

Undergraduate Research

Robert Brodkey – 2 students  
L.-S. Fan – 7 students  
L. James Lee- 3 students  
Umit Ozkan – 1 student  
Jim Rathman – 3 students plus 1 honors research student  
David Tomasko – 1 student  
Jack Zakin – 1 student plus 2 honors research students

Summer 2004

Chemical Engineering 630 – Unit Operations Laboratory  
John Corn, 66 students

Chemical Engineering 715 – Particle Technology  
Alissa Park, 14 students

Undergraduate Research

L.-S. Fan – 9 students  
L. James Lee- 6 students  
Jim Rathman – 1 student  
David Tomasko – 1 student  
Jack Zakin – 3 students
Bachelor of Science Degrees

Bachelor Degree Graduates

**Autumn 2003**
Jason Ankumah-Saikoom *Magna Cum Laude*
Thomas Harold Hackett
Christopher B. Harto
Khay Fuk ie
Abhijeet Prabhakar Konduskar
Patrick Delbert Lake
Timothy David Smith

**Winter 2004**
Sarah Eileen Kendall
Nicholas L. Klinedinst
Michael R. Leesburg
Tulani Leola Marcus
Hocheol Song

**Spring 2004**
Leslie Anne Bailey
* Cum Laude with Distinction in Chemical Engineering *
Jaret Rae Boothe (degree awarded posthumously)
Nicholas A. Brunelli
* Summa Cum Laude *
Shelley Ann Buchholz
* Cum Laude *
Scott Christopher Burdine
Matthew Jeffersis Canan
Angela N.D. Carlson
Debby Cokro-Setyo
Anthony Joseph Cornell
Jeffrey Le Clair Ellis
* Magna Cum Laude with Distinction in Chemical Engineering *
Brittany Lynn Eshbaugh
Jonathan Paul Eshbaugh *Magna Cum Laude *
Kurt E. Frey
* Summa Cum Laude with Distinction in Chemical Engineering and with Honors in Engineering *
Zachary David Friedrich
Josef E. Guzman
Christopher Alan Hansen
Gary Michael Koenig
* Summa Cum Laude *

Employer (if known)

MD, University of Illinois, Chicago
Battelle Memorial Institute
Sunoco Inc
Procter & Gamble
PhD program in Chemical Engineering, USC
NA
PhD program in Chemical Engineering, Caltech
OSU 1st Year Engineering Pgm.
Boeing Company
Trane
PhD program in Chemical Engineering, OSU
Ecolab Inc
Battelle Memorial Institute
PhD program in Chemical Engineering, MIT
James Hardie Building Products
Saint Gobain Abrasives
Micron Technology Inc
PhD program in Chemical Engineering, U. of Wisconsin
Marisa A. LaPalomento
Andrew Scott Loge
Megan Christine Miller
**Summa Cum Laude with Distinction in Chemical Engineering**
Christopher Ryan Morley
Erik Christopher Olson
Joseph Lee Ott
**Magna Cum Laude**
Matthew S. Potok
Patrick Joseph Rensing
**Cum Laude**

C.J. Roebuck
Zachary Wilk Schank
Mary Ellen Shea
Joseph W. Stekli
Jeffrey Gary Strempel

Michael Jacob Swickrath
Mark William Tornow
Nzinga Mali Turner
Todd Benton Warnock
Kevin Nicholas Witte
**Magna Cum Laude**
Amanda Kate Yowler
Abdullahi Yusuf

Matthew James Ziegler

**Summer 2004**
Alicia Denise Adams
Madeline Allen
**Cum Laude**
Annette Bryan
**Magna Cum Laude**
Daron Anne Diener
**Magna Cum Laude**
Matthew John Ducay
**Summa Cum Laude**
Lori Ann Engelhardt
**Magna Cum Laude**
David DeWayne Hefferman
Jeremy Scott Irwin

AEP (American Electric Power)
United States Navy

Ecolab Inc
Entrotech

University of Cincinnati College of Medicine

PhD program in Chemical Engineering, Col. Sch. of Mines
MS program in Civil & Environmental Engineering, OSU
MS program in Pharmacology, OSU
Ecolab Inc
Micron Technology Inc

PhD program in Chemical Engineering, Case Western Reserve

PhD program in Chemical Engineering, Purdue

PhD program in Chemical Engineering, OSU

Taylor’s Industrial Services
BP
Procter & Gamble
General Mills
Ecolab Inc
DuPont
RMT Inc
New Eezy Gro
Erica Nicole Jones  
Abdul Matin Khan  
David Wayne Linville  
Julie A. Makutonin  
Justin Manuel Montaño  
Alaina Meta Fenton (Schmidt)  
Sylena Elizabeth Smith  
Christopher Emery Williams  
Patrick Ryan Zuchegno  
MS, Environmental Health Engineering, Johns Hopkins  
Cargill Steel  
Honeywell  
Owens Corning  
Dow Chemical  
CC Technologies  
Quest Diagnostics  

Row 1 (right to left): Nzenga M. Turner, Lauren Brinkman, Mandy Yowler, Alicia Adams, Nuttha Thongchul, Supaporn Suwannakham, Clayt Robinson  
Row 2 (right to left): Daron Diener, Erica Jones, Marisa Lapalomento, Mary Ellen Shea, C.J. Roebuck, Shubhayu Basu  
Row 3 (right to left): Garrett Pavlovicz, Gary Seto, Andrew Maynard, Scott Wendell, Zach Friedrich, Todd Warnock, Thomas K. Abraham  
Row 4 (right to left): Chris Williams, Joe Guesman, Matt Canan, Abdullah Yusuf, Jeremy Irwin, David Heffernan, Professor David Tomaske  
Row 5 (right to left): Professor James Rathman, Instructor John Corn, Raymond C. Newlin IV, Abdul Khan, Gary Koenig, Chris Morley, Scott Burdine, Matt Ducay, Kurt Frey
Our undergraduate Chemical Engineering students have for many years been trained in analysis of unit operations, both through lectures and through an intense summer laboratory experience. This approach has led to class after class of graduates having an acknowledged fundamental understanding of the Chemical Engineering discipline (e.g. thermodynamics, fluid mechanics, reaction engineering, etc.) and having a hands-on laboratory based learning experience with specific application oriented problems. The current situation is that the Unit Operations Laboratory class needs to evolve while maintaining the strength of the traditional Chemical Engineering education.

This challenge is to be addressed by revising the Chemical Engineering Unit Operations Laboratory to mesh with the general evolution of the Department curriculum. Methods for integrating biological sciences into many of the exercises are being addressed and approaches to integrating electronic data collection into the body of each lab procedure are being implemented.

We have begun a five-year program to upgrade and evolve the Unit Operations Lab into a model program that would make our current and future alumni proud.
AIChe Student Chapter

The goals of the AIChe Student Chapter at OSU are to foster the interests of students in Chemical Engineering and to promote their welfare as prospective members of the profession through programs and relations with other Student Chapters and National AIChe; to promote fellowship among the members through various outings, activities, and trips; and to contribute to the development of Chemical Engineering at OSU through activities involving both students and faculty. In 2004 the AIChe student chapter participated in the AIChe National Conference in San Francisco, the AIChe Regional Conference in Chicago, and several AIChe Central Ohio Section meetings. The chapter also competed in the ChemE car competition with Dr. Ted Thomas serving as Advisor, published quarterly newsletters, maintained an AIChe activities website, volunteered to organize Science Day and Science Olympiad events, organized the spring picnic and senior banquet, and hosted numerous speakers from industry and academia to discuss new technologies and career opportunities. The AIChe officers are as follows:

Andy Maynard, President  
Brian Chapman, Vice President  
Heath Litt, Treasurer  
Elizabeth Curry, Secretary  
Heath Litt, Chem E Car President  
John Daulton, Chem E Car VP  
Gary Seto, Chem E Car Treasurer  
Scott Wendell, Membership Chair  
Meghan Ward, Historian

Grady Marcum, Philanthropy Chair  
Liz Fanton, Publications Chair  
Bryan Rumbaugh, Social Chair  
John Daulton, Webmaster  
Brian Chapman, E-Council Rep  
Samuel Koshan, Senior Rep  
Imogen Pryce, Senior Rep  
Duane Gotro, Junior Rep  
Sandy Abraham, Sophomore Rep

The AIChe Student Chapter advisor is Professor Kurt Koelling.
Trends in Enrollment

Undergraduate Enrollment

- Chem, E Students in Major
- Chem, E Pre-Majors
- Chem, E Undergraduate Enrollment


BS Degrees Granted in Chemical Engineering

- Bachelors Degrees Granted


Percentage of BS Degrees Granted to Female and Ethnic Minority Students

- Ethnic Minority
- Women

Co-Op Students

Co-op Placement – Autumn 2003 through Summer 2004

The Engineering Cooperative Education & Internship Program (ECIP) helps undergraduate students to obtain career-related employment of two types: cooperative education (co-op) positions and internships.

A co-op experience provides the best 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. Internship involves one work period with an employer. A work period may last for one quarter or for two or more consecutive quarters. Summer internships are the most popular among students and employers; however, some employers offer internships in autumn, winter, or spring quarters as well.

The following is a list of companies that hired students for co-ops or internships, the students who accepted the offers and the quarters they were with each company.

*Abbott Laboratories*
Lauren Brinkman - Summer  
Laurel French - Summer

*Akzo Nobel Functional Chemicals LLC*
Zachary Friedrich - Autumn, Winter & Spring

*Anheuser Busch*
Alaina Fenton - Full Year  
Douglas French - Autumn  
Emily Jordan - Full Year

*Battelle Memorial Institute*
Jeffrey Ellis - Autumn & Summer  
Jonathan Esbaugh - Winter & Spring  
Nicole Florea - Summer

*BP*
Lauren Klap - Autumn  
Elizabeth Fanton - Winter  
Angela Sparks - Spring

*Cargill Inc*
Scott Wendell - Autumn

*CDM (Camp Dresser & McKee)*
Katherine Nettler - Winter, Spring & Summer

*Chemical Abstracts Service*
Anthony Cornell - Autumn, Winter & Spring  
Jonathan Esbaugh - Autumn & Winter

*Clean Water Ltd*
Duane Grotto - Winter & Spring  
Copeland Corp  
Elizabeth Curry - Autumn

*Dow Chemical*
Angela Sparks - Autumn  
Caroline Yang - Winter

*DuPont*
Charles Benore - Autumn  
Diana Snelling - Autumn & Summer  
Laura Kunes - Winter & Spring  
Sarah Huff - Winter & Spring
Undergraduate Scholarships

**Aldrich Syverson Scholarship**

- Robert Harman
- Jessica Huber
- Nzinga Turner
- Scott Turner
- Dieter Von Deak
- Todd Warnock

**Allan I. Gordon Undergraduate Scholarship for Study in Biochemical Engineering**

- Annette Bryan
- Lori Engelhardt

**David H. George Chemical Engineering Scholarship**

- Mark Brazis
- Katie Martin
- Robert Messinger
- Maren Seibold
- Meghan Ward
- Sherry Wunderle

**Dorothy J. & Herbert L. Fenburr Scholarship**

- Madeline Allen
- Russell Baird
- Megan Boreman
Julie Makutonin
Zachary Schank
Diana Snelling

Smith E. Howland and Aristech Chemical Corporation Scholarship
Michael Leesburg
Andrew Maynard
Scott Wendell

H. Richard Unkel Chemical Engineering Class of 1941
Nicholas Brunelli
Phillip Deis
Jeff Joyner

The Howard R. Steele Memorial Scholarship in Chemical Engineering
Brian Chapman
Patrick Rensing
Samantha Ticchi
Jeremy Wilneff

Lubrizol Foundation Scholarship in Chemical Engineering
Ashley Fotheringham
Shannon Quinn
 Jiapeng Xu

The Harry Warner Scholarship in Chemical Engineering
Susan Fleming
Todd Longendelpher

Milton & Karen Hendricks Scholarship
Shelley Buchholz
Joseph Ott
Imogen Pryce
Robert Walters

The Michael D. Winfield Chemical Engineering Endowment
Jason Baker
Eugenia Wang

Raymond D. Hammond Chemical Engineering Scholarship
Alan Degenhart
Jonathan Eshbaugh
Nathan Ford
Kurt Frey
Khay F Le
Gary Koenig
Marisa LaPalomento
Marcus Leatherberry
Garrett Pavlovicz
Alaina Schmidt
Aaron Walker
Christopher Williams

The Samuel S. and Grace Hook Johnston Memorial Chemical Engineering Scholarship
Man-Leung Wong

Webster B. Kay Scholarship in Chemical Engineering
Erica Jones
Andrew Loge
Angela Sparks
The James W. Label Scholarship in Chemical Engineering

Andrea Barger
Shawn Freer
Emily Jordan

William R. & Doris M. Harris Scholarship in Chemical Engineering

Charles Benore
Nicole Florea
Zachary Friedrick
Raymond Newlin
C.J. Roebuck
Mary Shea
Stefanie Sparks
Ee Hui Tan
Mark Tornow
Jack Witt
Caroline Yang
Amanda Yowler
Yusuf Abdullahi

Professor Dave Tomasko presents the Chemical and Biomolecular Engineering Alumni Society Outstanding Senior Award for Academic Excellence to Matt Ducay, Nicholas Brunelli, Megan Miller and Kurt Frey
Graduate Program

Master’s of Science Degree Program

Program of Study

Candidates for the Master’s of Science (MS) Degree in Chemical and Biomolecular Engineering will develop, with the advice and approval of their advisor, a program of study which satisfies the student’s goals, subject to the requirements of the Graduate Studies Committee and the Graduate School. The minimum requirement for the MS degree is 45 credit hours beyond the Bachelor’s of Science (BS) degree. The total academic course requirement, not including research or special project problems, is 36 credit hours. A minimum of nine (9) credits of Research ChBE 999 are required.

Doctor of Philosophy
Degree Program

Ph.D-Degree Requirements

A minimum of 130 graduate credit hours are required beyond the Bachelor’s degree of which 58 hours are for courses, not including ChBE 999. Course credit hours should normally be divided about equally among (1) Chemical and Biomolecular Engineering, (2) basic sciences, and (3) area of specialization. Students shall develop their course of study in consultation with their respective advisors and the other members of each student’s Graduate Advisory Committee. The course work shall provide a concentration in a specific area, yet allow reasonable breadth of subject matter, being designed to foster both productive scholarship and knowledge of Chemical and Biomolecular Engineering in relation to allied fields.

Graduate Degrees Granted

Winter Quarter 2004 – March 2004

Doctor of Philosophy
Xu, Guojun, Kai, Kang, Lau, Wai Man,
Lara Velasco, Oscar, Zeng, Changchun

Master of Science
None
Spring Quarter 2004 – June 2004

Doctor of Philosophy
Chen, Wen-shiang
Yu, Liyong

Master of Science
Gharibeh, Murad A
Yin, Hsiu-Yin

Trends in Enrollment and Degrees Granted

Graduate Student Awards

- Mike Triplett: Ray Travel Award
- Sittichai Natesakhamat: AIChE Catalysis and Reaction Engineering Division Student Travel Award
- Ying Zhang: Alumni Grants for Graduate Research and Scholarship – Ohio State University; Outstanding Graduate Student Majoring in Chemical Engineering –
The American Institute of Chemists Foundation; Presidential Fellowship – Ohio State University Graduate School
- Paul Matter: Second Place Award at the 2004 Ohio Air Quality Symposium
- Erik Holmgreen and Matt Yung: Third Place Award at the 2004 Ohio Air Quality Symposium

Graduate Student Fellowships

- Daniel Heath: Distinguished University Fellowship
- Xiaoxia Jin: Distinguished University Fellowship
- Vikas Khanna: University Fellowship
- Clayt Robinson: Presidential Fellowship - Ohio State University Graduate School; Outstanding Graduate Student – The American Institute of Chemists Foundation; Alumni Grant for Graduate Research and Scholarships (AGGRS)
- Hua Song: University Fellowship
- Manish Talreja: University Fellowship
- Nandan Ukidwe: Presidential Fellowship – Ohio State University Graduate School
- Liqun Xu: Presidential Fellowship – Ohio State University Graduate School
- Yong Yang: Presidential Fellowship – Ohio State University Graduate School; Outstanding Graduate Award for Academic Achievement – The American Institute of Chemist Foundation
- Chi Yen: University Fellowship
- Zhao Yu: University Fellowship
- Chaofang Yue: University Fellowship
- An Zhang: University Fellowship
- Ying Zhang: Presidential Fellowship – Ohio State University Graduate School

Graduate Students by Advisor

<table>
<thead>
<tr>
<th>Bhavik Bakshi</th>
<th>Jeffrey Chalmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daniel Arthur</td>
<td>M.S.</td>
</tr>
<tr>
<td>Hongshu Chen</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Jorge Hau</td>
<td>Ph.D.</td>
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23
Shang-Tian Yang  
Yunling Bai  Ph.D.  
Xiaoguang Liu  Ph.D.  
Robin Ng  Ph.D.  
Anli Ouyang  Ph.D.  
Suwattana Pruksasri  Ph.D.  
Clayt Robinson  Ph.D.  
Juan Sanz-Valero  Ph.D.

Supaporn Suwannakham  Ph.D.  
Nutthi Thongchul  Ph.D.  
Yuan Wen  Ph.D.  
An Zhang  Ph.D.  
Jacques Zakin

Wu Ge  Ph.D.  
Ying Zhang  Ph.D.

Seminar Program

Winter 2004

1/29/04  Millicent Sullivan, The Hope Heart Institute, “Nanoparticle Formulations for Gene Delivery”

2/5/04  Kam W. Leong, Johns Hopkins University School of Medicine, “Polymeric Controlled Gene Delivery”

2/12/04  Graduate Student Seminar, Presentations by current Grad Students

2/19/04  Sarah C. Heilshorn, Division of Chemistry and Chemical Engineering, California Institute of Technology, “Protein Engineering: A Novel Approach to Creating New Biomaterials”

2/26/04  Jessica Winter, Department of Chemical Engineering University of Texas, Austin, “Quantum Dots for Neuronal Stimulation”


Spring 2004

4/1/04  David A. Kofke, Department of Chemical Engineering, University at Buffalo, The State University of New York, “Free Energy and All That”
<table>
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<tr>
<th>Date</th>
<th>Speaker, Affiliation, Title</th>
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<tr>
<td>4/8/04</td>
<td>Pablo Debenedetti, Department of Chemical Engineering, Princeton University, “Recent Developments in the Theory of Glasses and Supercooled Liquids”</td>
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<td>4/15/04</td>
<td>David Allen, Department of Chemical Engineering, and Center for Energy and Environmental Resources University of Texas, “The Texas Air Quality Study: State of the Science of Air Quality in Texas and Implications For Air Quality Policy”</td>
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<td>4/29/04</td>
<td>John H. Seinfeld, Louis E. Nohl Professor - Divisions of Chemistry and Chemical Engineering and Engineering and Applied Science at California Institute of Technology, “Aerosols and Climate” (Lowrie Lecturer)</td>
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<td>5/6/04</td>
<td>Octave Levenspiel, Department of Chemical Engineering, Oregon State University, “Making Friends with Chemical Reactors”</td>
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<td>5/13/04</td>
<td>Ishi Talmon, Department of Chemical Engineering, Technion; Department of Chemical Engineering and Materials Science, University of Minnesota, “Developments and Limitations of Cryo-TEM in the Study of Complex Fluids”</td>
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<tr>
<td>5/20/04</td>
<td>Daniel Wang, Department of Chemical Engineering, Massachusetts Institute of Technology; Bioprocessing Technology Centre, National University of Singapore, “Biotechnology of Mammalian Cells: Present Status and Future Perspectives”</td>
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<td>5/27/04</td>
<td>Ron Larson, Deptartment of Chemical Engineering, University of Michigan, “DNA in Micro-Flows”</td>
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<td>6/03/04</td>
<td>Orlin D. Velev, Department of Chemical Engineering, North Carolina State University, “On-Chip Dielectrophoretic Manipulation and Assembly of Nanoparticles, Microparticles and Droplets”</td>
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<td>Autumn 2004</td>
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<td>9/23/04</td>
<td>Yushan Yan, Associate Professor, University of California, “Zeolite Thin Films: From Computer Chips to Space Station”</td>
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<td>9/30/04</td>
<td>Mathias Lösche, Department of Biophysics, John Hopkins University, CNBT at the NIST Center for Neutron Research, “Membranes, Proteins and Interfaces – X-ray and Neutron Scattering Studies”</td>
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<td>10/7/04</td>
<td>Rachel Chen, Associate Professor, School of Chemical and Biomolecular Engineering, Georgia Tech, “Molecular Engineering in Whole-cell Biocatalysis”</td>
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</table>
10/14/04 Stephen B. Jaffe, Composition-Based Modeling, ExxonMobil Research and Engineering, "Composition Based Modeling"

10/21/04 Robert Simha, Professor Emeritus, Macromolecular Science, Case Western Reserve University, "Thermal and Pressure Properties of Polymer Nanocomposites: Experiment and Theory"

10/28/04 Norman N. Li, NL Chemical Technology, Inc., "Development of Advanced Membranes for Water Treatment"

11/4/04 GRIP

11/11/04 AICHE – holiday

11/18/04 James Y. Oldshue, Oldshue Technologies International, "The Role of Macro Scale and Scale Mixing in the Scale of Fluid Mixers"

11/25/04 Thanksgiving

12/2/04 Richard McClurg, Department of Chemical Engineering and Materials Science, University of Minnesota, "Nucleation of Droplets and Bubbles"
CEGC (Chemical Engineering Graduate Council) Report

The mission of the Chemical Engineering Graduate Council is to foster the professional and personal development of graduate students by providing a forum for graduate students to interact with each other and faculty in professional and social environments. CEGC supports the mission and goals of the Department as well as the entire University. In addition, CEGC upholds standards of integrity and academic excellence, recruits top students from diverse backgrounds, and promotes the development of clean and professional laboratories.

CEGC hosts and organizes an assortment of events and activities throughout the year, including:

- Orientation for new graduate students.
- Seminars presented by chemical engineering graduate students as practice for important conferences and to promote the exchange of ideas.
- Quarterly luncheons and awards to reward teaching assistants.
- The first annual graduate recruiting weekend in February 2005.
- Semi-annual lab and office cleaning competitions.
- Department participation in intramural sporting events such as basketball, softball, soccer, and volleyball.
- Many social events such as the holiday potluck luncheon, bowling, movie and hockey nights and chess and ping pong tournaments.

Chemical Hygiene Committee

Renewed Laboratory Safety Focus – A Proactive Initiative

In response to increased University wide laboratory safety initiatives the Department formed a new Chemical Hygiene Committee in April 2003. The committee’s purpose is to serve as the Department’s primary resource for both student education regarding safety, and as the organizer of new safety initiatives. The committee is comprised of graduate students under the supervision of the Department OSHA Coordinator John Corn. Monthly meetings are planned and led by the two graduate student Chemical Hygiene Officers, and attended by student representatives of each research group. Since its formation the committee has organized semiannual safety inspections of all departmental laboratories. In addition the group has overseen the training of undergraduate researchers, regularly updated the Department’s chemical hygiene plan (an OSHA requirement), and organized the disposal of unused chemicals. Under the direction of the Chemical Hygiene Committee the Department has continually met with the University’s new lab standard compliance standards.
Faculty Activities

Research Areas


**Cooper, Stuart L.**, University Scholar Professor and Department Chair, Ph.D., Princeton University, 1967. Polymer Science and Engineering, Properties of Polyurethanes and Ionomers, Blood-Materials Interactions, Tissue Engineering.

**Corn, John**, Instructor, M. Engr., Union University (Schenectady, NY), 1976. Undergraduate Unit Operations Laboratory, Process Safety Analysis, Process Design.


Koelling, Kurt W., Associate Professor, Ph.D., Princeton University, 1992. Advanced Polymer Processing, Microfluidics, Bubble and Drop Dynamics, Rheology of Complex Fluids, Biocompatible Polymers, Nanocomposite Foams, Gas-assisted and Thin-wall Injection Molding, Two-phase and Interfacial Flows of Viscoelastic Fluids, Shear and Extensional Rheology of Polymer Solutions and Nanoparticle Suspensions, Microfluidics of Macromolecular Solutions, Simulation of Fiber Spinning and Injection Molding Processes.

Kusaka, Isamu, Assistant Professor, Ph.D., Caltech, 1998. Statistical Mechanics of Phase Transition.

Lee, L. James, Professor, Ph.D., University of Minnesota, 1979. Polymer and Composite Engineering, Nanotechnology, Micro/Nanofluidics, BioMEMS.

Ozkan, Umit S., Associate Dean for Research and Professor, Ph.D., Iowa State University, 1984. Heterogeneous Catalysis and Catalytic Reactions, Energy and Environment-related Applications of Catalysis.

Tomasko, David L., Associate Professor, Ph.D., UIUC, 1992. Molecular Thermodynamics, Supercritical Fluid Technology, Separations, Polymer Processing.

Wyslouzil, Barbara, Associate Professor, Ph.D., Caltech, 1992. Aerosol Science, Nucleation, Biomedical Applications of Aerosols.

Yang, Shang-Tian, Professor, Ph.D., Purdue 1984. Biochemical Engineering, Bioprocess Engineering and Biotechnology, Metabolic Engineering, Tissue Engineering.


Awards and Honors

Cooper, Stuart L.


Fan, Liang-Shih


Visiting Professorship (honorable appointment) to University of Manchester Institute of Science and Technology (UMIST), 2004 – 2006.


**Ho, W.S. Winston**


**Lee, L. James**


Best Paper Award, Thermoset Division, 2004 Society of Plastics Engineers Annual Meeting in Chicago, IL, May, 2004.


Ozkan, Umit S.
Ohio State University, College of Engineering Scott Faculty Award.

Tomasko, David L.

College of Engineering Charles E. MacQuigg Outstanding Teaching Award (2004).

**Special Activities**

*Lowrie Lecturer*

John H. Seinfeld was the 2004 Lowrie Lecturer. Dr. Seinfeld is the Louis E. Nohl Professor in the Divisions of Chemistry and Chemical Engineering and Engineering and Applied Science at the California Institute of Technology. Professor Seinfeld is widely acknowledged for his research on the chemistry and physics of the atmosphere. Through both experimental and theoretical studies, he has made numerous contributions to our knowledge of the chemistry of the urban atmosphere, the formation, growth, and dynamics of atmospheric aerosols, and the role of aerosols in climate. Professor Seinfeld has received numerous honors and awards.

**LECTURE I: Aerosols and Climate**

The accumulation of greenhouse gases in the earth’s atmosphere is leading to global climate change. Particles in the air and aerosols exert complex and important effects on climate as well. In order to more accurately predict future climate, the aerosol effects must be understood.

**LECTURE II: Both Sides Now: The Art and Science of Clouds**

Clouds have preoccupied artists, poets, and playwrights throughout the ages. Clouds are the most visible manifestation of the ceaseless flow of water between the earth and sky. Clouds and water ultimately will determine the direction and severity of climate change on the planet.
2004 Advisory Board Meeting

The meeting was attended by Rich Brandon, Jack Hammond, Larry and Linda Jarrett, Scott Joublanc, Sunil Satija, and Mike Winfield as well as ChE Faculty Members and Rosemary Hill of the College of Engineering Co-Op and Career Services Program. Dean Williams of the College of Engineering spoke to the group at lunch. Topics discussed included: increasing enrollment, evolving curriculum, faculty recruitment, name change, curriculum changes, ABET review, Koffolt renovation, Third Frontier Project, Master of Engineering degree, Career Services, and Unit Operations.

2004 National Organizing Committee for the Renovation and Expansion of Koffolt Laboratories

Bill Lowrie (Chair)  Ronald D. Harris
Richard A. Arnold  Edward A. Slowter
Paul E. Bates  Michael D. Winfield
David R. Grove  Stuart L. Cooper

National Organizing Committee Meeting
Wednesday, May 12, 2004

The inaugural meeting of this Committee was held in dinner format at the Blackwell Hotel on May 12, 2004. Bill Lowrie chaired the Committee and in attendance were Richard Arnold, Paul Bates, Ron Harris, Ed Slowter and Michael Winfield. Karen Hendricks, a member of the Ohio State University Board of Trustees, attended as an observer. Most members of the Department attended a pre-dinner reception. The formal part of the meeting had several presentations and much discussion. Stuart Cooper talked about Department goals and presented a brief departmental situation analysis. Jack Zakin reviewed the plans for the Koffolt Laboratories renovation and expansion as far as they have been developed. Finally Dave McCarthy, Development Officer in the College of Engineering, described the path forward regarding the University process for capital budget decisions, likely competing projects, timelines and what it would require in
private sector fund-raising to complement the state contribution to the project cost. It appears likely that this Committee will have to organize a campaign to raise anywhere from $12-$14M should the projected total costs of the project reach $60M as roughly estimated by the University. The Committee members were enthusiastic about taking on this challenge which will assure new generations of Chemical Engineers a quality environment for a top-quality education.

Attendees of the National Organizing Committee inaugural meeting, from left to right: Stuart Cooper, Mike Winfield ('62), Dick Arnold ('48), Paul Bates ('49), Karen Hendricks ('71), Bill Lowrie ('66), Ron Harris ('61), Ed Slowter ('34), Jack Zakin

National Organizing Committee Meeting
Friday, October 8, 2004

Participants: George Acock, Dave Chapman, Ed Slowter, Paul Bates, Ron Harris, Dick Arnold, Bill Lowrie, Bud Baeslack, David McCarthy, Stuart Cooper, Umit Ozkan, Marty Feinberg, S.T. Yang, L.-S. Fan, Jack Zakin, John Corn, and Isamu Kusaka. Dean Baeslack stated that Koffolt needs to be renovated to attract superior students and future faculty members. George Acock presented three different possible approaches for the renovation. Stuart Cooper suggested first renovating Unit Operations and then building an addition so that the additional space and the renovated Unit Operations area could be used as swing space. Jack Zakin passed out copies of the updated *Rationale for Koffolt Expansion and Rebuilding*. Dave McCarthy spoke about fund raising details.
Alumni Donors 2004

1934
Edward E. Slowter

1936
Richard A. Miller
Robert N. Miller
Joseph G. Mravec

1937
Andrew E. Chute
Nicholas Fatica
Fred R. Pullen
George H. Sheets

1939
Dillard W. Kuhlman
Ralph E. Quigley
Charles A. Rohrmann
Clayton W. Weber

1940
Charles Boardman III
Loren F. Grandey
Arthur G. Mayer
Everett H. Strobel
Walter C. Wendschuh

1941
Thomas F. Lavery
George L. Myers, Jr.
David Thomas

1942
Donald S. Arnold
Randal E. Bailey
R. Richard Midlam
Richard R. Whiston

1943
Melvin F. Browning
Halvor S. Christianson
Dalton F. Drake
R. Marvin Garrett
Glenn L. Gifford
Leonard A. Harris
James R. Randall
Roy E. Schneider
Carlyle E. Shoemaker
Hong T. Yee
James C. Wynd

1944
Wallace L. Bostwick
Edward W. Powell
Grover C. Strickler, Jr.

1945
Robert S. Atkinson

1946
Kenneth A. Brandstetter

1947
Kurt M. Dubowski
William K. Fell
Thurman L. Graves
Lewis C. Hullinger
John M. Kolbas
Herbert G. Krane
J. Bruce Martin
Bryce H. McMullen
Donald F. Stauffer
Aloysius M. Sebian
Leroy P. Streett

1948
Richard A. Arnold
Earl W. Goodman
William L. Gray
Robert E. Kraus
William J. Mead
Cloyd P. Reeg
R. Ted Scharenberg
Jack C. Stewart
Fred M. Warzel

1949
Paul E. Bates
Gordon G. Cross
Edward E. Galloway, Jr.
Raymond D. Hammond
J. Howard Kerstetter, Jr.
Frederick A. MacDougall
Theodore A. Rado
Donald R. Roberts
Glen D. Schaaf
Aloysius M. Sebian
Roland I. Spencer

1950
Walter E. Donham
Verne R. Rinehart
Jean Maurer Scharenberg
Richard L. Scott
Harold L. Stelzer, Jr.
Robert E. Thompson
David W. Wilson
Alfred E. Withrow

1951
Richard N. Eilerman
James H. Hoorman
Paul J. Kienholz
Rob R. MacGregor
John R. Parkinson
Ralph E. Sieber
David B. Speed
David A. Strang
Bruce W. Wilkinson

1952
Donald E. Haupt
M. Frank Rummel
Charles J. Schmitz
David G. Stephan
Philip A. Walden

1953
Robert A. Bates
G. Clyde Bazell
Roger L. Briggs
Louis O. Elsaesser
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| 1954 | Edgar W. Fasig, Jr.  
                  Orville Gruebmeier, Jr.  
                  George M. Hauswirth  
                  Gordon R. Howard  
                  Marion H. Marshall  
                  Warren E. McAdams  
                  Lee R. Stewart  
                  Irwin Weinstock  
                  Russell L. Wilt |
| 1955 | William F. Deerhake  
                  Thomas E. Fitz, Sr.  
                  Glenn L. McKee |
| 1956 |  
                  W.B. Hammond, Jr.  
                  Phillip J. McAttee |
| 1957 |  
                  Robert A. Cody |
| 1958 |  
                  Walter R. Andrews, Jr.  
                  Walter A. Flack.  
                  Jon D. Helms  
                  Paul J. Kienholz |
| 1959 |  
                  Edward H. Bollinger  
                  James R. Facer  
                  Dan M. Hayes, Jr.  
                  Albert W. Krock  
                  Werner S. Lichtenstein  
                  Valdis E. Petritis  
                  Richard M. Smith  
                  Harold A. Sorgenti  
                  James W. Stark |
| 1960 |  
                  Guy A. Crossley |
| 1961 |  
                  Paul R. Bigley  
                  Richard B. Cooper  
                  Edward R. Corino  
                  Jack A. Hammond  
                  Ronald D. Harris  
                  James H. McMicking  
                  Larry E. Woodworth |
| 1962 |  
                  David E. Bidstrup  
                  Kenneth J. Fulk  
                  James C. Opatrny  
                  C. David Osbun  
                  Dean Snider |
| 1963 |  
                  Nelson W. Barnhill  
                  Myers G. Hammond  
                  Kay Logan Snider |
| 1964 |  
                  Wayne R. Fontaine  
                  Kerry G. Hertenstein  
                  Jeffrey L. Kosch |
| 1965 |  
                  Christopher Bost  
                  Norman F. Lucas  
                  Johnny O. Wright |
| 1966 |  
                  Steve Irwin  
                  John E. Myers  
                  Michael A. Patterson  
                  Michael J. Pedersen |
| 1967 |  
                  Dennis W. Hurley  
                  Martin R. Okos  
                  Graham F. Painter, Jr.  
                  John M. Yacher |
| 1968 |  
                  Bradford F. Dunn  
                  David R. Grove  
                  Richard B. Strait  
                  Rosa Uy |
| 1969 |  
                  James F. Dietz  
                  Smith E. Howland  
                  M. Anandha Rao  
                  Steven E. Russell  
                  John W. Toussant |
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                  Wayne R. Fontaine  
                  Kerry G. Hertenstein  
                  Jeffrey L. Kosch |
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                  Christopher Bost  
                  Norman F. Lucas  
                  Johnny O. Wright |
| 1972 |  
                  Steve Irwin  
                  John E. Myers  
                  Michael A. Patterson  
                  Michael J. Pedersen |
| 1973 |  
                  John T. Erikson |
1976
James M. Delabar

1977
Robert L. Collins

1978
Douglas T. Brown
Janet Lyons Inkrott
Neil P. Stuber
Paul W. Vance, Jr.
Thomas E. Winkler

1979
Darice Majowski Davis

1980
Frederick T. Clark
Paul Dubetz
Fred D. Ehrman
Daniel R. Schweagerle
Debra Simpson Warfield
Mark R. Warfield

1981
Nancy Coultrip Dawes
James A. Telljohann

1982
Victoria M. Green

1983
Thomas D. Burns
Mark D. Dieringer
Ronald A. Howdyshell
Jeffrey W. Patterson
Clark B. Wade

1984
John A. Bohlmann
Gregory M. Masica
George W. Miller
Jagannadh V. Satyavolu

1985
Roger G. Facer
Mark J. Hogan
Timothy A. Johnson
David J. Moonay

1986
Edward Bochenek
Rajeev L. Gorowara

1987
Jeffrey D. Adams
Denise Davis Burcham
Daniel B. Hartley
Mark Hogan
Martin D. Legg
D. Brian Noe
Maureen McClain
Visneski

1988
Amy Schmidt Doty

1989
Stuart F. Doty

1990
Craig M. Kehres
James V. Lombardi

1991
Kristan Kissell Latham
Richard L. Wright

1992
Pamela Jean Archer
Julie Vander Meer Joehlin
Scott A. Joehlin
Matthew Stefanowicz

1993
Frank E. Seipel

1994
Kumar K. Sravana

Christopher W. Voight

1995
Jason P. Chamberlain

1996
Beth Gibson
Liping Zhang

1997
Erin Glaser Arlinghaus
Xukun Luo

1998
Erin C. Bennett
David M. Bressler
Steven J. Solomon
Matthew J. Tessman
Michael T. Timko
Likun Zhang

2000
Kirk D. Card
Regis P. Geisler III

2001
Shannon Lynae
Lashbrook
Marcin J. Telko
Jason R. Vititoe

Friends of CBE
Betty Bartels Bates
Audrey Bowser Bazler
Robert S. Brodkey
Douglas E. Detterman
Charles F. Porter
James H. Flynn III
Marilyn Elizabeth George
Doris Whitman Harris
Beatrice Getz Hayes
Frederick W. Hessman
Christine Hudale Howland
Linda Irwin
Karl Mandry
Financial Summary

Numerical Data for 2003-2004

R & D in Chemical & Biomolecular Engineering - Ranked 13th in the Country, up from 17th

Source: Chemical & Engineering News

Department Budget

Department Budget (Fiscal Year)
Sponsors of Research

Agency for International Development
Air Products & Chemicals Inc.
American Chemical Society
Ashland Chemical Company, Petroleum Research Fund
Battelle Memorial Institute
Bell Helicopter Textron Inc.
Bioprocessing Innovative Company Incorporated
Case Western Reserve University
Cleveland Clinic Foundation
Consortium of Plant Biotechnology Research Incorporated
Cooperative State Research, Education and Extension Service
Department of Energy
Dreyfus (C&H) Foundation
Dupont (EL) De Nemours & Company
Environ Energy
Exxon Corporation
H2 Fuel LLC
Honda Research Institute USA, Inc.
Honda of America Manufacturing Inc.
Janssen Pharmaceutical Products Lp
Kimberly-Clark Corporation
Leadscope Inc.
National Institute of Diabetes & Digestive & Kidney Diseases
National Institute of General Medical Sciences
National Cancer Institute
National Science Foundation
National Energy Technical Laboratory
National Institute of Allergy & Infectious Diseases
New Energy & Industrial Technical Development Organization (Japan)
Office of Naval Research
Ohio Coal Development
Ohio Department of Development
Ohio Board of Regents Action Fund
Ohio University
Ohio Board of Regents Investment Fund
Owens Corning Corporation
Polymer Industrial Consortium
Space Hardware Optimization Technology
Sud-Chemie Incorporated
University of Nebraska
University of North Dakota
L.-S. Fan Retires as Chair

Three Chairs in a row: Jack Zakin, L.-S. Fan and Stuart Cooper.

Emeritus Faculty Tom Sweeny, Harry Hershey and Slip Slider attended the reception.
Appendix A – Publications and Patents

Bakshi, Bhavik R.

Books and Book Chapters


Refereed Papers


Brodkey, Robert S.

Books and Book Chapters


Papers

Chalmers, Jeffrey J.

Refereed Papers


Cooper, Stuart L.

Refereed Papers


Fan, Liang-Shih

Books and Book Chapters


Refereed Papers


Patents


Feinberg, Martin

Books and Book Chapters

Refereed Papers


Ho, W.S. Winston

Refereed Papers


Patents


Koelling, Kurt W.

Books and Book Chapters


Refereed Papers


**Patents**


**Kusaka, Isamu**

**Referenced Papers**


**Lee, L. James**

**Books and Book Chapters**


Lee, L.J., “Nanoscale Polymer Fabrication for Biomedical Applications,” in “Biomedical and Biological Nanotechnology” in the Kluwer Series of “BioMEMS and Biomedical Nanotechnology,” Edited by M. Ferrari, to be published.
Refereed Papers


Patents


Ozkan, Umit S.

Books and Book Chapters


Refereed Papers


Wang, X., Saleh, R., and Ozkan, U.S., “Effect of S-compounds and CO on Hydrogenation of Aldehydes Over Reduced and Sulfided Ni-Mo/Al2O3 Catalysts” submitted to Applied Catalysis.

Patents


Rathman, James F.

Refereed Papers

Rathman, J.F.; Sun, P., Faraday Discussions, accepted for publication. “Biocomposite Films Synthesized at a Fluid/Fluid Interface.”


Tomasko, David L.

Refereed Papers


Patents


Wyslouzil, Barbara E.

Books and Book Chapters


Refereed Papers


Yang, S.T.

Books and Book Chapters


Refereed Papers


Patents


Zakin, Jacques L.

Books and Book Chapters


Refereed Papers


Zhang, Y., Qi, Y., and Zakin, J.L., “Head Group Effect on Drag Reduction and Rheological Properties of Micellar Solutions of Quaternary Ammonium Surfactants,” accepted for publication in Rheologica Acta.

**Patents**

### Appendix B — Current Projects and Grants

<table>
<thead>
<tr>
<th>Amount</th>
<th>Investigator</th>
<th>Project Description</th>
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</thead>
<tbody>
<tr>
<td>$267,382</td>
<td>Bakshi, Bhavik R.</td>
<td>A Systems Ecology Approach to Life-Cycle Product Assessment and Process Design, National Science Foundation/Environmental Protection Agency Program on Technology for a Sustainable Environment</td>
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<tr>
<td>$430,121</td>
<td>Bakshi, Bhavik R.</td>
<td>Bayesian Rectification of Nonlinear Dynamic Chemical Process Systems, (co-PI Prof. Prem Goel), National Science Foundation</td>
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<tr>
<td>$120,000</td>
<td>Bakshi, Bhavik R.</td>
<td>BE-MUSES: Multiscale Bayesian Approach for Life Cycle Assessment - The Case of Transportation Fuels, (co-PIs Prof. R. Fortner, P.K. Goel; T. Haab, National Science Foundation</td>
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<tr>
<td>$82,000</td>
<td>Bakshi, Bhavik R.</td>
<td>Bayesian Analysis of High Throughput Screening Data, Arkema Inc.</td>
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<tr>
<td>$45,000</td>
<td>Bakshi, Bhavik R.</td>
<td>Life Cycle Assessment of Ionic Liquids versus Other Solvents, Environmental Protection Agency</td>
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<tr>
<td></td>
<td>Chalmers, J.J.</td>
<td>NSEC Proposal for a Center for Affordable Nanoelectronics of Polymer Biomedical Devices. NSF, J. Lee, P.I.</td>
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<tr>
<td>$209,000</td>
<td>Chalmers, J.J.</td>
<td>Magnetic Separation of Liberated Islets During Isolation</td>
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<td>$310,000</td>
<td>Chalmers, J.J.</td>
<td>Cell Selection by Magnetic Flow Sorting</td>
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<tr>
<td>$3,200,000</td>
<td>Chalmers, J.J.</td>
<td>QMS Technology to Deplete T Cell Alloreactivity (co-PI Farag, S.)</td>
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<td>$25,000</td>
<td>Chalmers, J.J.</td>
<td>Magnetic Sorter Channels for Rare Cancer Cells (SHOT/Paul Todd, PI; Chalmers PI of sub-contract)</td>
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<tr>
<td>$2,098,000</td>
<td>Chalmers, J.J.</td>
<td>High Performance Magnetic Cell Sorting, National Cancer Institute</td>
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<td>$481,121</td>
<td>Chalmers, J.J.</td>
<td>The Development of Theoretical and Experimental Characterizations of the Magnetophoretic Mobility of Immunologically Labeled Cells, National Science Foundation (co-PI Zborowski, M.)</td>
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<td>$151,000/yr</td>
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<td>$360,639</td>
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<td>2002-2005</td>
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<td>2003-2004</td>
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<td>$309,166</td>
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<td>$580,635</td>
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<td>$360,000</td>
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<td>$20,000</td>
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<td>$240,000</td>
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<td>2002-2005</td>
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<td>Amount</td>
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| $2,100,000 | Koelling, K.W. 2003- 2004  
| $365,000 | Koelling, K.W. 2002-2007  
Industry/University Cooperative Research Center (I/UCRC) for Advanced Polymer and Composite Engineering (CAPCE), Phase II Operating Grant, co-PIs: Lee, Luscher, and Castro, National Science Foundation Research Center Program |
| $25,000 | Koelling, K.W. 2003-2004  
Suspension Polymerization of Polystyrene Nanocomposite Foams |
| $80,000 | Kusaka, Isamu 2003-2005  
Simulation-Based Study of Crystal Nucleation in Binary Mixtures, Petroleum Research Fund |
| $240,000 | Lee, L. James, co-PI 2002-2005  
(with Dave Tomasko and Kurt Koelling) Polymer Nanocomposite Foams Prepared by Environmentally Benign Supercritical Fluids, National Science Foundation |
| $365,000 | Lee, L. James, PI 2002-2007  
(with Kurt Koelling, Dave Tomasko, Jose Castro and Tony Luscher) Operating Grant for an Industry/University Cooperative Research Center for Advanced Polymer Engineering, Phase II, National Science Foundation |
| $3,500,000 | Lee, L. James, PI 2002-2007  
(with Henk Verweij and 22 participants) Integrated Graduate Education and Research Training: Molecular Engineering of Micro-Devices, National Science Foundation |
| $600,000 | Lee, L. James, PI 2002-2005  
(with Kurt Koelling and Dave Tomasko) Environmentally Benign Micro-Cellular Nanocomposite Foam for Structural and Insulation Market, National Institute of Standards and Technology Advanced Technology Program |
| $2,000,000 | Lee, L. James, PI 2003-2005  
(with Kurt Koelling and Dave Tomasko) Low Cost Nanocomposite Foams, Ohio Department of Development |
| $830,000 | Lee, L. James, PI 2003-2006  
(with Derek Hansford, C-H Meng, Jim Rathman and L.-S. Fan) Robust Manufacturing Protocol for Particulate-like Nanoporous Micro devices (NMDs) for Biomedical and Biochemical Applications, National Science Foundation |
| $2,000,000 | Lee, L. James, PI 2003-2005  
(with 10 participants) Affordable Polymer Manufacturing at the Nanoscale, Ohio Board of Regents |
| $169,681 | Lee, L. James 2003-2005  
(with S-T Yang) Low Cost Biochips and Sensors for Medical Diagnostics and Chem/Bioweapon Detection, Ohio Department of Development |
| $42,000 | Lee, L. James, PI 2004-2005  
(with S-T Yang) CD-ELISA Biochips, National Science Foundation |
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<th>Amount</th>
<th>Investigator(s)</th>
<th>Title</th>
<th>Years</th>
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<tr>
<td>$12,900,000</td>
<td>Lee, L. James</td>
<td>Nanoscale Science and Engineering Center for Affordable Nanoengineering of Polymer Biomedical Devices, National Science Foundation</td>
<td>2004-2009</td>
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<td>$300,000</td>
<td>Lee, L. James</td>
<td>Center for Advanced Polymer and Composite Engineering Membership Fees, Polymer and Composite Industry</td>
<td>2004</td>
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<tr>
<td>$575,600</td>
<td>Ozkan, Umit S.</td>
<td>Fundamental Studies of OXO Aldehyde Hydrogenation Reactions, Exxon Chemical</td>
<td>1998-2005</td>
</tr>
<tr>
<td>$600,000</td>
<td>Ozkan, Umit S.</td>
<td>Two-Stage Catalytic Reduction of NO with Methane from Lean-Burn Natural Gas Reciprocating Engines, U.S. Department of Energy</td>
<td>2002-2005</td>
</tr>
<tr>
<td>$775,830</td>
<td>Ozkan, Umit S.</td>
<td>Wright Center of Innovation for Fuel Cells, Ohio Department of Development (Total Award: $4,950 with Drs. Rizzoni, Verweij, Lannuti, Fan and Ho)</td>
<td>2003-2006</td>
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<tr>
<td>$194,479</td>
<td>Rathman, James F.</td>
<td>Chemical Genomics Discovery Platform with Novel Informatics Methods to Link Genes to Drugs, Ohio Technology Action Fund (TAF), collaboration with Leadscope, Inc., co-PI, PI: Bhavik Bakshi</td>
<td>2002-2004</td>
</tr>
<tr>
<td>Amount</td>
<td>Name, Title</td>
<td>Year(s)</td>
<td>Description</td>
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<tr>
<td>$830,000</td>
<td>Rathman, James F.</td>
<td>2003-2006</td>
<td>NIRT: Robust Manufacturing Protocol for Particulate-like Nanoporous Micro-devices (NMDs) for Biomedical and Biochemical Applications (Manufacturing Processes at the Nanoscale), National Science Foundation, co-PI, PI: L. James Lee</td>
</tr>
<tr>
<td>$240,000</td>
<td>Tomasko, David (PI)</td>
<td>2002-2004</td>
<td>Polymer Nanocomposite Foams Prepared by Environmentally Benign Supercritical Fluids, National Science Foundation, co-PIs: L.J. Lee, K.W. Koelling</td>
</tr>
<tr>
<td>$100,000</td>
<td>Tomasko, David (PI)</td>
<td>2003-2004</td>
<td>NUE: Lab-on-a-Chip Nanomanufacturing for Freshman Engineering, National Science Foundation, co-PIs: P. Stevenson, J. Merrill</td>
</tr>
<tr>
<td>$188,000</td>
<td>Tomasko, David (PI)</td>
<td>2000-2004</td>
<td>Application of Supercritical or Subcritical CO₂ in Pharmaceutical Polymer Processing, Janssen Pharmaceutica</td>
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<tr>
<td>$600,000</td>
<td>Tomasko, David (Co-PI)</td>
<td>2003-2005</td>
<td>Environmentally Benign Microcellular Nanocomposite Foams for Structural and Insulation Market, NIST-ATP (Subcontract from Owens-Corning, PI: L.J. Lee, co-PI: K.W. Koelling</td>
</tr>
<tr>
<td>$2,670,000</td>
<td>Wyslouzil, Barbara E.</td>
<td>2000-2005</td>
<td>Fundamental Studies of Nanoparticle Formation in Air Pollution, National Science Foundation</td>
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<tr>
<td>$16,000</td>
<td>Wyslouzil, Barbara E.</td>
<td>2001-2005</td>
<td>Collaborative Experimental Investigation of Vapor Phase Nucleation, National Science Foundation – International Division</td>
</tr>
<tr>
<td>$356,000</td>
<td>Wyslouzil, Barbara E.</td>
<td>2001-2005</td>
<td>Nanodroplet Aerosols: Formation and Structure, National Science Foundation</td>
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<tr>
<td>$80,000</td>
<td>Wyslouzil, Barbara E.</td>
<td>2003-2005</td>
<td>Nucleation Rate Measurements in a Supersonic Nozzle: A SAXS Challenge, American Chemical Society – Petroleum Research Fund</td>
</tr>
<tr>
<td>Amount</td>
<td>Investigator</td>
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<td>Years</td>
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<tr>
<td>$500,000</td>
<td>Yang, S.T.</td>
<td>Production of Butyric Acid and Butanol from Biomass, Department of Energy – Small Business Technology Transfer (STTR) Phase II ($250,000 subcontract with Environmental Energy, Inc.)</td>
<td>2001-2004</td>
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<td>$136,758</td>
<td>Yang, S.T.</td>
<td>Production of Galacto-oligosaccharides from Whey Lactose by Immobilized Enzyme on Cotton Cloth and Nanofiltration, U.S. Department of Agriculture – CSREES</td>
<td>2002-2004</td>
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<tr>
<td>$296,000</td>
<td>Yang, S.T.</td>
<td>Production of Galacto-oligosaccharides from Lactose by Immobilized Enzyme on Cotton Cloth, U.S. Department of Agriculture, SIBR Phase II ($140,000 subcontract with Bioprocessing Innovative Company, Inc.)</td>
<td>2002-2004</td>
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<td>$50,000</td>
<td>Yang, S.T.</td>
<td>Microfluidic CD-ELISA for Fast Detection of Food-borne Pathogens and Toxins, Midwest Advanced Food Manufacturing Alliance (MAFMA)</td>
<td>2003-2004</td>
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<td>296,000</td>
<td>Yang, S.T.</td>
<td>Extractive Fermentation for Production of Lactic Acid from Corn Starch by Filamentous Fungi Immobilized in Fibrous Bed Bioreactor, U.S. Department of Agriculture, SBIR Phase II ($145,000 subcontract With Environmental Energy, Inc.</td>
<td>2003-2005</td>
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<td>$100,000</td>
<td>Yang, S.T.</td>
<td>Microfluidic CD Biochips for Enzyme-Linked Immunosorbent Assays, National Science Foundation, STTR Phase I</td>
<td>2004-2005</td>
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$20,000  Zakin, J.L.
Dreyfus Foundation Proposal for Undergraduate Research Studies,
RF 742348  2001-2005

$48,361  Zakin, J.L.
NSF Travel Grant for 3rd Chemical Engineering Conference for
Collaborative Research in Eastern Mediterranean (Thessaloniki, Greece),
RF 744357  2003-2005

$68,000  Zakin, J.L.
Second Eastern Mediterranean Chemical Engineering Conference for
Collaborative Research (Ankara, Turkey), RF 740850  2001-2004

Unit Ops Lab 2004

Instructor: John Corn