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An Open Letter to ...

SENIORS IN CHEMICAL ENGINEERING

As a senior, you probably have some questions about graduate school. The following paragraphs may assist you in finding some of the answers.

Should you go to graduate school?

We invite you to consider graduate school as an opportunity to further your professional development. Graduate work can be exciting and intellectually satisfying, and at the same time can provide you with insurance against the ever-increasing danger of technical obsolescence in our fast-paced society. An advanced degree is certainly helpful if you want to include a research component in your career and a Ph.D. is normally a prerequisite for an academic position. Although graduate school includes an in-depth research experience, it is also an integrative period. Graduate research work under the guidance of a knowledgeable faculty member can be an important factor in your growth toward confidence, independence, and maturity.

What is taught in graduate school?

A graduate education generally includes a coursework component and a research experience. The first term of graduate school will often focus on the study of advanced-core chemical engineering science subjects (*e.g.*, transport phenomena, phase equilibria, reaction engineering). These courses build on the material learned as an undergraduate, using more sophisticated mathematics and often including a molecular perspective. Early in the graduate program, you will select a research topic and a research adviser and begin to establish a knowledge base in the research subject through both coursework and independent study. Graduate education thus begins with an emphasis on structured learning in courses and moves on to the creative, exciting, and open-ended process of research. In addition, graduate school is a time to expand your intellectual and social horizons through participation in the activities provided by the campus community.

We suggest that you pick up one of the fall issues of *Chemical Engineering Education (CEE)*, whether it be the current issue or one of our prior fall issues, and read some of the articles written by scholars at various universities on a wide variety of subjects pertinent to graduate education. The chemical engineering professors or the library at your university are both good sources for borrowing current and back issues of *CEE*.

Perusing the graduate-school advertisements in this special compilation can also be a valuable resource, not only for determining what is taught in graduate school, but also where it is taught and by whom it is taught. We encourage you to carefully read the information in the ads and to contact any of the departments that interest you.

What is the nature of graduate research?

Graduate research can open the door to a lifelong inquiry that may well lead you in a number of directions during your professional life, whether you pursue it within the confines of an industrial setting or in the laboratories of a university. Learning *how* to do research is of primary importance, and the training you receive as a graduate

student will give you the discipline, the independence, and (hopefully) the intellectual curiosity that will stand you in good stead throughout your career. The increasingly competitive arena of high technology and society's ever-expanding fields of inquiry demand, more than ever, trained and capable researchers to fuel the engines of discovery.

Where should you go to graduate school?

There are many fine chemical engineering departments, each with its own "personality" and special strengths. Choosing the one that is "right" for you is a highly personal decision and one that only you can make. Note, however, that there are schools that specialize in preparing students for academic careers just as there are those that prepare students for specific industries. Or, perhaps there is a specific area of research you are interested in, and finding a school or a certain professor with great strength or reputation in that particular area would be desirable. If you are uncertain as to your eventual field of research, perhaps you should consider one of the larger departments that has diversified research activity, giving you the exposure and experience to make a wise career choice later in your education. On the other hand, choosing a graduate school could be as simple as choosing some area of the country that is near family members or friends; or you may view the benefits of a smaller, more personal, department as more to your liking; or you might choose a school with a climate conducive to sports or leisure activities in which you are interested.

Many factors may eventually feed into your decision of where to go to graduate school. Study the ads in this special printing and write to or view the Web pages of departments that interest you; ask for pertinent information not only about areas of study but also about fellowships that may be available, about the number of students in graduate school, about any special programs. Ask your undergraduate professors about their experiences in graduate school, and don't be shy about asking them to recommend schools to you. They should know your strengths and weaknesses by this stage in your collegiate career, and through using that knowledge they should be a valuable source of information and encouragement for you.

Financial Aid

Don't overlook the fact that most graduate students receive financial support at a level sufficient to meet normal living needs. This support is provided through research assistantships, teaching assistantships, or fellowships. If you are interested in graduate school next fall, you should begin the application process early this fall since admission decisions are often made at the beginning of the new calendar year. This process includes requesting application materials, seeking sources of fellowships, taking national entrance exams (*i.e.*, the Graduate Record Exam, GRE, is required by many institutions), and visiting the school.

A resolution by the Council of Graduate Schools—in which most schools are members—outlines accepted practices for accepting financial support (such as graduate scholarships, assistantships, or fellowships). You should be aware that the agreed upon deadline for accepting offers of financial support for a fall-term start is April 15. The resolution states that you are under no obligation to respond to offers of financial support prior to April 15 (earlier deadlines for acceptance violate the intent of the resolution). Furthermore, an acceptance given or left in force after April 15 commits you to reject any other offer without first obtaining a written release from the institution to which the commitment has been made.

Historically, most students have entered graduate school in the fall term, but many schools do admit students for other starting dates. ❐

We hope that this special collection of chemical engineering graduate-school information proves to be helpful to you in making your decision about the merits of attending graduate school and assists you in selecting an institution that meets your needs.

Graduate Education in Chemical and Biomolecular Engineering

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Teaching and research assistantships as well as industrially sponsored fellowships available

◆

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◆

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◆

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S. T. LOPINA
BioMaterial Engineering and Polymer Engineering

S. S. C. CHUANG
Catalysis, Reaction Engineering, Environmentally Benign Synthesis, Fuel Cell

B.Z. NEWBY
Surface Modification, Biofilm and AntiFouling Coatings, Gradient Surfaces

J. R. ELLIOTT
Molecular Simulation, Phase Behavior, Physical Properties, Process Modeling, Supercritical Fluids

H. C. QAMMAR
Nonlinear Control, Chaotic Processes, Engineering Education

E. A. EVANS
Materials Processing and CVD Modeling Plasma Enhanced Deposition and Crystal Growth Modeling

J. Zheng
Computational Biophysics, Biomolecular Interfaces, Biomaterials

For Additional Information, Write

Chairman, Graduate Committee • Department of Chemical and Biomolecular Engineering
The University of Akron • Akron, OH 44325-3906
Phone (330) 972-7250 • Fax (330) 972-5856 • www.chemical.uakron.edu

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A dedicated faculty with state of the art facilities offer research programs leading to Doctor of Philosophy and Master of Science degrees.

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Faculty:

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D. W. Arnold, Ph.D. (Purdue)
C. S. Brazel, Ph.D. (Purdue)
E. S. Carlson, Ph.D. (Wyoming)
P. E. Clark, Ph.D. (Oklahoma State)
W. C. Clements, Jr., Ph.D. (Vanderbilt)
A. Gupta, Ph.D. (Stanford)
D. T. Johnson, Ph.D. (Florida)
T. M. Klein, Ph.D. (NC State)
A. M. Lane, Ph.D. (Massachusetts)
M. D. McKinley, Ph.D. (Florida)
S. M. C. Ritchie, Ph.D. (Kentucky)
C. H. Turner, Ph.D. (NC State)
J. M. Wiest, Ph.D. (Wisconsin)
M. L. Weaver, Ph.D. (Florida)

For Information Contact:

Director of Graduate Studies
Department of Chemical and Biological Engineering
The University of Alabama
Box 870203
Tuscaloosa, AL 35487-0203
Phone: (205) 348-6450

ChBE

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Chemical and Materials Engineering

Graduate Program

Faculty and Research

R. Michael Banish; Ph.D., University of Utah
Associate Professor
Crystal growth mass and thermal diffusivity measurements.

Ramón L. Cerro; Ph.D., UC Davis
Professor and Chair
Theoretical and experimental fluid mechanics and physicochemical hydrodynamics.

Chien P. Chen; Ph.D., Michigan State
Professor
Lab-on-chip microfluidics, multiphase transport, spray combustion, computational fluid dynamics, and turbulence modeling of chemically reacting flows.

Krishnan K. Chittur; Ph.D., Rice
Professor
Biomaterials, bioprocess monitoring, gene expression bioinformatics, and FTIR/ATR.

James E. Smith Jr; Ph.D., South Carolina
Professor
Ceramic and metallic composites, catalysis and reaction engineering, fiber optic chemical sensing, combustion diagnostic of hypergolic fuels, and hydrogen storage.

Katherine Taconi; Ph.D., Mississippi State
Assistant Professor
Biological production of alternative energy from renewable resources.

Jeffrey J. Weimer; Ph.D., MIT
Associate Professor
Adhesions, biomaterials surface properties, thin film growth, and surface spectroscopies.

David B. Williams; Sc.D., Cambridge
Professor and University President
Analytical, transmission and scanning electron microscopy, applications to interfacial segregation and bonding changes, texture and phase diagram determination in metals and alloys.

http://www.uah.edu
http://www.che.uah.edu

The Department of Chemical and Materials Engineering offers coursework and research leading to the Master of Science in Engineering degree. The Doctor of Philosophy degree is available through the **Materials Science Ph.D. program, the Biotechnology Science and Engineering Program,** or the option in **Chemical Engineering of the Mechanical Engineering Ph.D. program.**

The **range of research interests in the chemical engineering faculty is broad.** It affords graduate students opportunities for advanced work in processes, reaction engineering, electrochemical systems, material processing and biotechnology.

The proximity of the UAH campus to the **200+ high technology and aerospace industries** of Huntsville and **NASA's Marshall Space Flight Center** provide exciting opportunities for our students.

UAH

The University of Alabama in Huntsville
An Affirmative Action / Equal Opportunity Institution
Office of Chemical and Materials Engineering
130 Engineering Building
Huntsville, Alabama 35899
Ph: 256-824-6810 **Fax:** 256-824-6839

DEPARTMENT OF CHEMICAL AND MATERIALS ENGINEERING
UNIVERSITY OF ALBERTA

Our Department of Chemical and Materials Engineering offers students the opportunity to **study** and conduct **leading research** with **world-class academics** in the **top program** in Canada, and one of the very best in North America. Our graduate student population is culturally diverse, academically strong, innovative, creative, and is drawn to our challenging and supportive environment from all areas of the world.

► Degrees are offered at the MSc and PhD levels in **chemical engineering**, **materials engineering**, and **process control**.

► All full-time graduate students in **research programs** receive a **stipend** to cover living expenses and tuition.

Our graduates are sought-after professionals who will be international leaders of tomorrow's chemical and materials engineering advances. Research topics include:

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► The Faculty of Engineering has added more than **one million square feet** of **outstanding teaching, research, and personnel space** in the past six years. We offer **outstanding** and **unique experimental** and **computational facilities**, including access to one of the most technologically advanced nanotechnology facilities in the world – the **National Institute for Nanotechnology**, connected by pedway to the Chemical and Materials Engineering Building.

► Annual research funding for our Department is over **$14 million**. Externally sponsored funding to support engineering research in the entire Faculty of Engineering has increased to **over $50 million** each year—the **largest amount** of any Faculty of Engineering in Canada.

For further information, contact:

Graduate Program Office
Department of Chemical and Materials Engineering
University of Alberta
Edmonton, Alberta, Canada T6G 2G6
Phone: 780-492-1823 Fax: 780-492-2881
www.engineering.ualberta.ca/cme

A. Ben-Zvi, PhD (Queen's University)
S. Bradford, PhD (Iowa State University) *Emeritus*
R.E. Burrell, PhD (University of Waterloo)
K. Cadien, PhD (University of Illinois at Champaign-Urbana)
W. Chen, PhD (University of Manitoba)
P. Choi, PhD (University of Waterloo)
K.T. Chuang, PhD (University of Alberta) *Emeritus*
I. Dalla Lana, PhD (University of Minnesota) *Emeritus*
J. Derksen, PhD (Eindhoven University of Technology)
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J.A.W. Elliott, PhD (University of Toronto)
T.H. Etsell, PhD (University of Toronto)
G. Fisher, PhD (University of Michigan) *Emeritus*
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R. Gupta, PhD (University of Newcastle)
R.E. Hayes, PhD (University of Bath)
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B. Huang, PhD (University of Alberta)
D.G. Ivey, PhD (University of Windsor)
S.M Kresta, PhD (McMaster University)
S.M. Kuznicki, PhD (University of Utah)
J.M. Lee, PhD (Georgia Institute of Technology)
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Q. Liu, PhD (University of British Columbia)
J. Luo, PhD (McMaster University)
D.T. Lynch, PhD (University of Alberta) *Dean of Engineering*
J.H. Masliyah, PhD (University of British Columbia)
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K. Nandakumar, PhD (Princeton University)
J. Nychka, PhD (University of California, Santa Barbara)
F. Otto, PhD (University of Michigan) *Emeritus*
B. Patchett, PhD (University of Birmingham) *Emeritus*
J. Ryan, PhD (University of Missouri) *Emeritus*
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S.L. Shah, PhD (University of Alberta)
J.M. Shaw, PhD (University of British Columbia)
U. Sundararaj, PhD (University of Minnesota)
H. Uludag, PhD (University of Toronto)
L. Unsworth, PhD (McMaster University)
S.E. Wanke, PhD (University of California, Davis)
M. Wayman, PhD (University of Cambridge) *Emeritus*
M.C. Williams, PhD (University of Wisconsin) *Emeritus*
R. Wood, PhD (Northwestern University) *Emeritus*
Z. Xu, PhD (Virginia Polytechnic Institute and State University)
T. Yeung, PhD (University of British Columbia)
H. Zhang, PhD (Princeton University)

FACULTY / RESEARCH INTERESTS

ROBERT G. ARNOLD, Professor (CalTech)
Microbiological Hazardous Waste Treatment, Metals Speciation and Toxicity

PAUL BLOWERS, Associate Professor (Illinois, Urbana-Champaign)
Chemical Kinetics, Catalysis, Surface Phenomena, Green Design

JAMES C. BAYGENTS, Associate Professor (Princeton)
Fluid Mechanics, Transport and Colloidal Phenomena, Bioseparations

WENDELL ELA, Associate Professor (Stanford)
Particle-Particle Interactions, Environmental Chemistry

JAMES FARRELL, Professor (Stanford)
Sorption/desorption of Organics in Soils

JAMES A. FIELD, Professor (Wageningen University)
Bioremediation, Microbiology, White Rot Fungi, Hazardous Waste

ROBERTO GUZMAN, Professor (North Carolina State)
Affinity Protein Separations, Polymeric Surface Science

ANTHONY MUSCAT, Associate Professor (Stanford)
Kinetics, Surface Chemistry, Surface Engineering, Semiconductor Processing, Microcontamination

KIMBERLY OGDEN, Professor (Colorado)
Bioreactors, Bioremediation, Organics Removal from Soils

THOMAS W. PETERSON, Professor and Dean (CalTech)
Aerosols, Hazardous Waste Incineration, Microcontamination

ARA PHILIPOSSIAN, Professor (Tufts)
Chemical/Mechanical Polishing, Semiconductor Processing

EDUARDO SÁEZ, Professor (UC, Davis)
Polymer Flows, Multiphase Reactors, Colloids

GLENN L. SCHRADER, Professor & Head (Wisconsin)
Catalysis, Environmental Sustainability, Thin Films, Kinetics

FARHANG SHADMAN, Regents' Professor (Berkeley)
Reaction Engineering, Kinetics, Catalysis, Reactive Membranes, Microcontamination

REYES SIERRA, Associate Professor (Wageningen University)
Environmental Biotechnology, Biotransformation of Metals, Green Engineering

Chemical and Environmental Engineering at

THE UNIVERSITY OF ARIZONA

TUCSON ARIZONA

The Department of Chemical and Environmental Engineering at the University of Arizona offers a wide range of research opportunities in all major areas of chemical engineering and environmental engineering. The department offers a fully accredited undergraduate degree in chemical engineering, as well as MS and PhD degrees in both chemical and environmental engineering. A significant portion of research efforts is devoted to areas at the boundary between chemical and environmental engineering, including environmentally benign semiconductor manufacturing, environmental remediation, environmental biotechnology, and novel water treatment technologies.

Financial support is available through fellowships, government and industrial grants and contracts, teaching and research assistantships.

Tucson has an excellent climate and many recreational opportunities. It is a growing modern city that retains much of the old Southwestern atmosphere.

For further information

http://www.chee.arizona.edu

or write

Chairman, Graduate Study Committee
Department of Chemical and Environmental Engineering
P.O. BOX 210011
The University of Arizona
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Department of Chemical Engineering

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Program Faculty

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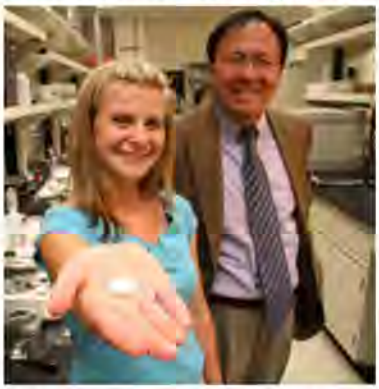
Atmospheric aerosol chemistry, single-particle measurement techniques, environmental fate of organic pollutants
Jean M. Andino, Ph.D., P.E., Caltech.
Atmospheric chemistry, gas-phase kinetics and mechanisms, heterogeneous chemistry, air pollution control
James R. Beckman, Ph.D., Arizona.
Unit operations, applied mathematics, energy-efficient water purification, fractionation, CMP reclamation
Veronica A. Burrows, Ph.D., Princeton.
Engineering education, surface science, semiconductor processing, interfacial chemical and physical processes for sensors
Jeffrey Heys, Ph.D., Colorado, Boulder.
Modeling of biofluid-tisue interaction, tissue and biofilm mechanics, parallel multigrid solvers
Jerry Y.S. Lin, Ph.D., Worcester Polytechnic Institute.
Advanced materials (inorganic membranes, adsorbents and catalysts) for applications in novel chemical separation and reaction processes
Gregory B. Raupp, Ph.D., Wisconsin.
Gas-solid surface reactions, interactions between surface reactions and transport processes, semiconductor materials processing, thermal and plasma-enhanced chemical vapor deposition (CVD), flexible displays
Kaushal Rege, Ph.D., Rensselaer Polytechnic Institute.
Molecular and cellular engineering, engineered cancer therapeutics and diagnostics, cellular interactions in cancer metastasis
Daniel E. Rivera, Ph.D., Caltech.
Control systems engineering, dynamic modeling via system identification, robust control, computer-aided control system design, supply chain management

For additional details see http://che.fulton.asu.edu/ or contact Paul Grillos at (480) 965-5558 or Paul.Grillos@asu.edu

Michael R. Sierks, Ph.D., Iowa State.
Protein engineering, biomedical engineering, enzyme kinetics, antibody engineering
Bryan Vogt, Ph.D., Massachusetts.
Nanostructured materials, organic electronics, supercritical fluids for materials processing, moisture barrier technologies
Joe Wang, Ph.D., Technion.
Biosensors, nanobiotechnology, electrochemistry, biochips.



Affiliate/Research Faculty

John Crittenden, Ph.D., N.A.E., P.E., Michigan.
Sustainability, catalysis, pollution prevention, physical chemical treatment processes modeling of fixed-bed reactors and adsorbers, surface chemistry and thermodynamics, modeling of wastewater and water treatment processes
Paul Johnson, Ph.D., Princeton.
Chemical migration and fate in the environment as applied to environmental risk assessment and the development, monitoring and optimization of technologies for aquifer restoration and water resources management
Robert Pfeffer, Ph.D., New York University.
Dry particle coating and supercritical fluid processing to produce engineered particulates with tailored properties; fluidization, mixing, coating and processing of ultra-fine and nano-structured particulates; filtration of sub-micron particulates; agglomeration, sintering and granulation of fine particles
Bruce E. Rittmann, Ph.D., N.A.E., P.E., Stanford.
Environmental biotechnology, microbial ecology, environmental chemistry, environmental engineering

Graduate Program in the Ralph E. Martin Department of Chemical Engineering

University of Arkansas

The Department of Chemical Engineering at the University of Arkansas offers graduate programs leading to M.S. and Ph.D. Degrees.

Qualified applicants are eligible for financial aid. Annual departmental Ph.D. stipends provide $20,000, Doctoral Academy Fellowships provide up to $25,000, and Distinguished Doctoral Fellowships provide $30,000. For stipend and fellowship recipients, all tuition is waived. Applications received before April 1 will be given first consideration.

Areas of Research

- Biochemical engineering
- Biological and food systems
- Biomaterials
- Electronic materials processing
- Fate of pollutants in the environment
- Hazardous chemical release consequence analysis
- Integrated passive electronic components
- Membrane separations
- Micro channel electrophoresis
- Supercritical fluid technology
- Phase equilibria and process design

Faculty

M.D. Ackerson
R.E. Babcock
R.R. Beitle
E.C. Clausen
J.A. Havens
C.N. Hestekin
J.A. Hestekin
J.W. King
W.A. Myers
W.R. Penney
S. L. Servoss
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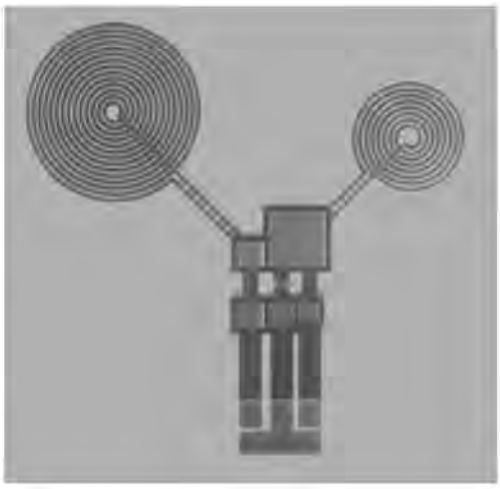
G.J. Thoma
R.K. Ulrich



For more information contact

Dr. Richard Ulrich <rulrich@uark.edu> or 479-575-5645
Chemical Engineering Graduate Program Information: http://www.cheg.uark.edu/graduate.asp

Vancouver *is the largest city in Western Canada, ranked the 3rd most livable place in the world*. Vancouver's natural surroundings offer limitless opportunities for outdoor pursuits throughout the year - hiking, canoeing, mountain biking, skiing... In 2010, the city will host the Olympic and paraolympic Winter Games.*

Department Head Kevin J. Smith; Assistant Profs Elod Gyenge and Naoko Ellis

The University of British Columbia is the largest public university in Western Canada and is ranked among the top 40 institutes in the world by *Newsweek* magazine, the *Times Higher Education Supplement* and Shanghai Jiao Tong University.

Faculty of Applied Science

CHEMICAL AND BIOLOGICAL ENGINEERING

www.chml.ubc.ca/progr/grad

MASTER OF APPLIED SCIENCE (M.A.SC.)
MASTER OF ENGINEERING (M.ENG.)
MASTER OF SCIENCE (M.SC.)
DOCTOR OF PHILOSOPHY (PH.D.).

Currently about 120 students are enrolled in graduate studies. The program dates back to the 1920s. Nowadays the department has a strong emphasis on interdisciplinary and joint programs, in particular with the Michael Smith Laboratories, Pulp and Paper Research Institute of Canada (PAPRICAN), Clean Energy Research Centre (CERC) and the BRIDGE program which links public health, engineering and policy research.

Faculty

Susan A. Baldwin (Toronto)
Chad P.J. Bennington (British Columbia)
Xiaotao T. Bi (British Columbia)
Bruce D. Bowen (British Columbia)
Richard Branion (Saskatchewan)
Sheldon J.B. Duff (McGill)
Naoko Ellis (British Columbia)
Peter Englezos (Calgary)
Norman Epstein (New York)
James Feng (Minnesota)
Bhushan Gopaluni (Alberta)
John R. Grace (Cambridge)
Elod Gyenge (British Columbia)
Savvas Hatzikiriakos (McGill)
Charles Haynes (California, Berkeley)
Dhanesh Kannangara (Ottawa)
Richard Kerekes (McGill)
Ezra Kwok (Alberta)
Anthony Lau (British Columbia)
Eric Legally (California, Santa Barbara)
C. Jim Lim (British Columbia)
Mark D. Martinez (British Columbia)
Madjid Mohseni (Toronto)
Colin Oloman (British Columbia)
Royann Petrell (Florida)
Kenneth Pinder (Birmingham)
James M. Piret (MIT)
Kevin J. Smith (McMaster)
Fariborz Taghipour (Toronto)
A. Paul Watkinson (British Columbia)
David Wilkinson (Ottawa)

Main Areas of Research

Biological Engineering
Biochemical Engineering • Biomedical Engineering • Protein Engineering • Blood research • Stem Cells
Energy
Biomass and Biofuels • Bio-oil and Bio-diesel • Combustion, Gasification and Pyrolysis • Electrochemical Engineering • Fuel Cells • Hydrogen Production • Natural Gas Hydrate
Environmental and Green Engineering
Emissions Control • Green Process Engineering • Life Cycle Analysis • Wastewater Treatment • Waste Management • Aquacultural Engineering
Particle Technology
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All students admitted to the graduate programs leading to the M.A.Sc., M.Sc. or Ph.D. degrees receive at least a minimum level of financial support regardless of citizenship. This amount is approximately $16,500/year and is intended to be sufficient to cover expenses for the year. This financial assistance is in the form of external fellowships or research assistantships. Teaching assistantships are also available (up to approximately $1,000 per year). Entrance scholarships worth $5,000 each are also available for highly qualified students.

The new CHBE building, opened in March 2006, houses world-class research and teaching activities. The top 2 floors are dedicated to graduate student offices and research labs - electrochemical, fuel cell, thermodynamics, polymer rheology, biomedical research, imaging and sensor development and fine particle, mixing and water treatment, bioprocessing, etc.

*2006 survey, the Economist magazine

Mailing address: 2360 East Mall, Vancouver B.C., Canada V6T 1Z3 • gradsec@chml.ubc.ca • tel. +1 (604) 822-3457

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Juan Hong *(Purdue University)*
Henry C. Lim *(Northwestern University)*
Martha L. Mecartney *(Stanford University)*
Farghalli A. Mohamed *(University of California, Berkeley)*
Ali Mohraz *(University of Michigan)*
Daniel R. Mumm *(Northwestern University)*
Andrew J. Putnam *(University of Michigan)*
Regina Ragan *(California Institute of Technology)*
Frank G. Shi *(California Institute of Technology)*
Vasan Venugopalan *(Massachusetts Institute of Technology)*
Szu-Wen Wang *(Stanford University)*
Albert F. Yee *(University of California, Berkeley)*

Joint Appointments:

William J. Cooper *(University of Miami)*
Steve C. George *(University of Washington)*
G. Wesley Hatfield *(Purdue University)*
G.P. Li *(University of California, Los Angeles)*
Noo Li Jeon *(University of Illinois)*
John S. Lowengrub *(New York University)*
Marc Madou *(Rijksuniversiteit)*
Roger H. Rangel *(University of California, Berkeley)*
Kenneth Shea *(The Pennsylvania State University)*
Lizhi Sun *(University of California, Los Angeles)*

Adjunct Appointments

Jia Grace Lu *(Harvard University)*

- Biomedical Engineering
- Biomolecular Engineering
- Bioreactor Engineering
- Bioremediation
- Ceramics
- Chemical and Biological Nanosensor
- Colloid Science
- Combustion
- Complex Fluids
- Composite Materials
- Control and Optimization
- Environmental Engineering
- Fuel Cell Systems
- Interfacial Engineering
- Materials Processing
- Mechanical Properties
- Metabolic Engineering
- Microelectronics Processing and Modeling
- Microstructure of Materials
- Multifunctional Materials
- Nanocrystalline Materials
- Nanoscale Electronic Devices
- Nucleation, Chrystallization and Glass Transition Process
- Polymers
- Power and Propulsion Materials
- Protein Engineering
- Recombinant Cell Technology
- Separation Processes
- Sol-Gel Processing
- Two-Phase Flow
- Water Pollution Control

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For further information and application forms, please visit http://www.eng.uci.edu/dept/chems/

or contact

Department of Chemical Engineering and Materials Science
School of Engineering • University of California • Irvine, CA 92697-2575

CHEMICAL AND BIOMOLECULAR ENGINEERING AT

UCLA

FOCUS AREAS

- Biomolecular and Cellular Engineering
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- Semiconductor Manufacturing and Electronic Materials

GENERAL THEMES

- Energy and the Environment
- Nanoengineering

FACULTY

J. P. Chang
(William F. Seyer Chair in Materials Electrochemistry)

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Y. Cohen

J. Davis
(Assoc. Vice Chancellor Information Technology)

R.F. Hicks

L. Ignarro
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J. C. Liao

Y. Lu

V.I. Manousiouthakis

H.G. Monbouquette
(Dept. Chair)

G. Orkoulas

T. Segura

S.M. Senkan

Y. Tang

PROGRAMS

UCLA's Chemical and Biomolecular Engineering Department offers a program of teaching and research linking fundamental engineering science and industrial practice. Our Department has strong graduate research programs in Biomolecular Engineering, Energy and Environment, Semiconductor Manufacturing, Engineering of Materials, and Process and Control Systems Engineering.

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CONTACT

Admissions Office
Chemical and Biomolecular Engineering Department
5531 Boelter Hall · UCLA · Los Angeles, CA 90095-1592
Telephone at (310) 825-9063 or visit us at www.chemeng.ucla.edu

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Bio- and Chemical Sensors
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Catalysis and Biocatalysis
Electrochemistry
Environmental Biotechnology
MEMS/NEMS, Bio-MEMS
Membrane Processes
Molecular Modeling
Nanostructured Materials
Site Remediation Processes
Sustainable Fuels and Chemicals
Water/Wastewater Treatment
Zeolites & Fuel Cells

Protein expression on cell surface

FACULTY

Wilfred Chen, *Caltech*
David R. Cocker, *Caltech*
David Cwiertny, *Johns Hopkins*
Marc A. Deshusses, *ETH Zurich*
Robert C. Haddon, *Penn State*
David Kisailus, *UC Santa Barbara*
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or you can write to the ***Graduate Advisor***
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Riverside, CA 92521

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UNIVERSITY OF CALIFORNIA
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FACULTY AND RESEARCH INTERESTS

SANJOY BANERJEE Ph.D. (*Waterloo*) • Environmental Fluid Dynamics, Multiphase Flows, Turbulence, Computational Fluid Dynamics

BRADLEY F. CHMELKA Ph.D. (*Berkeley*) • Molecular Materials Science, Inorganic-Organics Composites, Porous Solids, NMR, Polymers

PATRICK S. DAUGHERTY Ph.D. (*UT, Austin*) • Protein Engineering and Design, Library Technologies

MICHAEL F. DOHERTY Ph.D. (*Cambridge*) • Design and Synthesis, Separations, Process Dynamics and Control

FRANCIS J. DOYLE III Ph.D. (*Caltech*) • Process Control, Systems Biology, Nonlinear Dynamics

GLENN H. FREDRICKSON Ph.D. (*Stanford*) • Statistical Mechanics, Glasses, Polymers, Composites, Alloys

MICHAEL GORDON Ph.D. (*Caltech*) • Optical, Electrical, and Mechanical Interrogation of Nanoscale Systems, Scanning Probe Microscopy, Near-field Optics, Plasma Physics

G.M. HOMSY Ph.D. (*Illinois*) • Fluid Mechanics, Instabilities, Porous Media, Interfacial Flows, Convective Heat Transfer

JACOB ISRAELACHVILI Ph.D. (*Cambridge*) • Colloidal and Biomolecular Interactions, Adhesion and Friction

EDWARD J. KRAMER Ph.D. (*Carnegie-Mellon*) • Fracture and Diffusion of Polymers, Polymer Surfaces and Interfaces

L. GARY LEAL Ph.D. (*Stanford*) • Fluid Mechanics, Physics and Rheology of Complex Fluids, including Polymers, Suspensions, and Emulsions

GLENN E. LUCAS Ph.D. (*M.I.T.*) • Mechanics of Materials, Structural Reliability

ERIC McFARLAND Ph.D. (*M.I.T.*) M.D. (*Harvard*) • Combinatorial Material Science, Environmental Catalysis, Surface Science

SAMIR MITRAGOTRI Ph.D. (*M.I.T.*) • Drug Delivery and Biomaterials

BARON PETERS Ph.D. (*Berkeley*) • Statistical Mechanics, Informatics, and Electronic Structure Approaches for Nucleation, Electron Transfer, and Catalysis

SUSANNAH L. SCOTT Ph.D. (*Iowa State*) • Catalysis, Thin Films, Environmental Reactions

DALE E. SEBORG Ph.D. (*Princeton*) • Process Control, Monitoring and Identification

M. SCOTT SHELL Ph.D. (*Princeton*) • Molecular Simulation, Statistical Mechanics, Complex Materials, Protein Biophysics

TODD M. SQUIRES Ph.D. (*Harvard*) • Microscale Fluid Mechanics and Transport, Complex Fluids

MATTHEW V. TIRRELL Ph.D. (*Massachusetts*) • Polymers, Surfaces, Adhesion Biomaterials

T.G. THEOFANOUS Ph.D. (*Minnesota*) • Multiphase Flow, Risk Assessment and Management

JOSEPH A. ZASADZINSKI Ph.D. (*Minnesota*) • Surface and Interfacial Phenomena, Biomaterials

PROGRAMS AND FINANCIAL SUPPORT

The Department offers M.S. and Ph.D. degree programs. Financial aid, including fellowships, teaching assistantships, and research assistantships, is available.

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Contact information:
Director of Graduate Studies
Chemical Engineering 210-41
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Pasadena, CA 91125

FACULTY RESEARCH AREAS:

Frances H. Arnold Protein Engineering & Directed Evolution, Biocatalysis, Synthetic Biology, Biofuels

Anand R. Asthagiri Cellular & Tissue Engineering, Systems Biology, Cancer & Developmental Biology

John F. Brady Complex Fluids, Brownian Motion, Suspensions

Mark E. Davis Biomedical Engineering, Catalysis, Advanced Materials

Richard C. Flagan Aerosol Science, Atmospheric Chemistry & Physics, Bioaerosols, Nanotechnology, Nucleation

George R. Gavalas (emeritus)

Konstantinos P. Giapis Plasma Processing, Ion-Surface Interactions, Nanotechnology

Sossina M. Haile Advanced Materials, Fuel Cells, Energy, Electrochemistry, Catalysis & Electrocatalysis

Julia A. Kornfield Polymer Dynamics, Crystallization of Polymers, Physical Aspects of the Design of Biomedical Polymers

John H. Seinfeld Atmospheric Chemistry & Physics, Global Climate

Christina D. Smolke Biomolecular Engineering, Synthetic Biology, Cellular Engineering, Metabolic Engineering

David A. Tirrell Macromolecular Chemistry, Biomaterials, Protein Engineering

Nicholas W. Tschoegl (emeritus)

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Robert Edwards
Donald Feke
Daniel Lacks
Uziel Landau
Chung-Chiun Liu
J. Adin Mann
Heidi Martin
Peter Pintauro
Syed Qutubuddin
Mohan Sankaran
Robert Savinell
Thomas Zawodzinski

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Transport in Biological Systems

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For more information on Graduate Research, Admission, and Financial Aid, contact:

Graduate Coordinator
Department of Chemical Engineering
Case Western Reserve University
10900 Euclid Avenue
Cleveland, Ohio 44106-7217

E-mail: chemeng@case.edu
Web: http://www.case.edu/cse/eche

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Paul Phillips
Neville Pinto
Vesselin Shanov
Peter Smirniotis

Financial Aid Available

The University of Cincinnati is committed to a policy of non-discrimination in awarding financial aid.

For Admission Information
Director, Graduate Studies
Department Chemical and Materials Engineering
PO Box 210012
University of Cincinnati
Cincinnati, Ohio 45221-0012

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FACULTY RESEARCH:

Alexander Couzis: Polymorph selective templated crystallization; Molecularly thin organic barrier layers; Surfactant facilitated wetting of hydrophobic surfaces; soft materials

°**Morton Denn**∞≤: Polymer science and rheology; non-Newtonian fluid mechanics

Lane Gilchrist: Bioengineering with cellular materials; Spectroscopy-guided molecular engineering; Structural studies of self-assembling proteins; Bioprocessing

Ilona Kretzschmar: Materials science; Nanotechnology; Electronic materials

Leslie Isaacs: Preparation and characterization of novel materials; Application of thermo-analytic techniques in materials research

+Jae Lee: Theory of reactive distillation; Process design and control; Separations; Bioprocessing; Gas hydrates

°**Charles Maldarelli:** Interfacial fluid mechanics and stability; Surface tension driven flows and microfluidic applica- tions; Surfactant adsorption, phase be- havior and nanostructuring at interfaces

°**Jeff Morris:** Fluid mechanics: Fluid-particle systems

+Irven Rinard: Process design methodology; Process and energy systems engineering; Bioprocessing

David Rumschitzki: Transport and reaction aspects of arterial disease; Interfacial fluid mechanics and stability; Catalyst deactivation and reaction engineering

Carol Steiner: Polymer solutions and hydrogels; Soft biomaterials, Controlled release technology

Raymond Tu: Biomolecular engineering; Peptide design; DNA condensation; microrheology

Gabriel Tardos: Powder technology; Granulation; Fluid particle systems, Electrostatic effects; Air pollution

Sheldon Weinbaum•∞: Fluid mechanics, Biotransport in living tissue; Modeling of cellular mechanism of bone growth; bioheat transfer; kidney function

ASSOCIATED FACULTY:

°**Joel Koplik**: (Physics) Fluid mechanics; Molecular modeling; Transport in random media
°**Hernan Makse:** (Physics) Granular mechanics
°**Mark Shattuck:** (Physics) Experimental granular rheology; Computational granular fluid dynamics; Experimental spatio-temporal control of patterns

EMERITUS FACULTY:

°**Andreas Acrivos***∞≤
Robert Graff
Robert Pefter
+Reuel Shinnar∞
Herbert Weinstein

° *Levich Institute*
+Clean Fuels Institute
* *National Academy of Sciences*
∞ *National Academy of Engineering*
≤ *American Academy of Arts and Sciences*

CONTACT INFORMATION:

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New York, NY 10031
www-che.engr.ccny.cuny.edu
chedept@ccny.cuny.edu

Colorado

University of Colorado at Boulder

ChBE Faculty Research Areas:

- **Kristi Anseth**—biomaterials, photopoly-merization, tissue engineering, and drug delivery
- **Christopher Bowman**—biomaterials, photopolymerization, reaction kinetics, polymer chemistry
- **Stephanie Bryant**—functional tissue engineering, mechanical conditioning, mechano-transduction, photopolymerization
- **David Clough**—process control
- **Robert Davis**—fluid mechanics of suspensions, sedimentation, coagulation, filtration, particle collisions in fluids, microbial suspensions, biotechnology, membrane fouling
- **John Falconer**—heterogeneous catalysis, environmental catalysis, photocatalysis, zeolite membranes
- **Steven George**—surface chemistry and thin films, materials processing and environmental interfaces
- **Ryan Gill**—evolutionary and inverse metabolic engineering, genomics
- **Douglas Gin**—polymer science, liquid crystal engineering, and nanomaterials chemistry
- **Christine Hrenya**—gas-particle fluidization, granular flow mechanics, turbulent flows, computational fluid mechanics
- **Dhinakar Kompala**—recombinant mammalian and microbial cell cultures, high cell density bioreactors design, bioprocess engineering
- **Melissa Mahoney**—neural tissue engineering, pancreatic regeneration, drug delivery, biopolymers
- **Will Medlin**—surface chemistry, heterogeneous catalysis, solid-state chemical sensors, computational chemistry
- **Charles Musgrave**—theoretical studies of surfaces and reactions
- **Richard Noble**—reversible chemical complexation for separations, mass transfer, mathematical modeling, membranes, thin films
- **Theodore Randolph**—thermodynamics of protein solutions, lyophilization, supercritical fluid reaction engineering
- **Robert Sani**—fluid dynamics
- **Aaron Saunders**—colloidal nanocrystals, materials science
- **Daniel Schwartz**—interfacial phenomena, biomaterials, complex fluids, and nanoscale materials
- **Jeffrey Stansbury**—dental and biomedical polymeric materials, photopolymerization processes, network polymers, hydrogels, low shrinkage/expanding polymerizations
- **Mark Stoykovich**—block copolymer self-assembly and thin films
- **David Walba**—organic stereochemistry, photonic materials and ferroelectric liquid crystals
- **Alan Weimer**—reactor engineering, advanced ceramic materials, fluidization, environmental resource recovery

Image from: Casey A. Cass/University of Colorado

The Department of Chemical and Biological Engineering at the University of Colorado at Boulder offers an innovative graduate program and emphasizes the doctoral degree. Our outstanding national and international students take advantage of a high level of faculty-student collaboration and benefit from access to three interdisciplinary research centers. The department has won numerous awards both locally and nationally.

The Department of Chemical and Biological Engineering is one of the top research departments in the United States and maintains sophisticated facilities to support research endeavors. Although research in the department spans many diverse fields, there is a particular emphasis on research in biological engineering, functional materials, and renewable energy.

Biological engineering research areas span from the molecular scale (metabolites, genes, proteins) to the cellular and multicellular scales. Functional materials research includes polymers, zeolites, ultrathin films, catalytic materials, self-assembled monolayers, and liquid crystalline materials. The department has strength in studying materials problems at the nanometer and sub-nanometer length scales. Such fundamental investigations are directed toward technological applications. Finally, renewable energy studies range from the production and utilization of hydrogen to biorefining and biofuels research. The latter area has recently been strengthened by the formation of the Colorado Center for Biorefining and Biofuels (C2B2); a large collaborative research center led by faculty in the department and supported by university, state and industry funding.

We invite prospective graduate students to learn more about our department and ongoing research.

For information and online application:

Graduate Admissions Committee • Department of Chemical & Biological Engineering • University of Colorado at Boulder, 424 UCB • Boulder, CO 80309-0424
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Organic and inorganic membranes (Way)
Polymeric materials (Dorgan, Wu, Liberatore)
Colloids and complex fluids (Marr, Wu, Liberatore)
Electronic materials (Wolden, Agarwal)
Microfluidics (Marr)

Theoretical and Applied Thermodynamics

Natural gas hydrates (Sloan, Koh)
Molecular simulation and modelling (Ely, Wu)

Space and Microgravity Research

Membranes on Mars (Way)
Water mist flame suppression (McKinnon)

Fuel Cell Research

H_2 separation and fuel cell membranes (Way, Herring)
Low temperature fuel cell catalysts (Herring)
High temperature fuel cell kinetics (Dean)
Reaction mechanisms (McKinnon, Dean, Herring)

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Faculty

- S. Agarwal (UCSB, 2003)
- A.M. Dean (Harvard, 1971)
- J.R. Dorgan (Berkeley, 1991)
- J.F. Ely (Indiana, 1971)
- A. Herring (Leeds, 1989)
- C.A. Koh (Brunel, 1990)
- M. Liberatore (Illinois, 2003)
- D.W.M. Marr (Stanford, 1993)
- J.T. McKinnon (MIT, 1989)
- R.L. Miller (CSM, 1982)
- E.D. Sloan (Clemson, 1974)
- J.D. Way (Colorado, 1986)
- C.A. Wolden (MIT, 1995)
- D.T. Wu (Berkeley, 1991)

http://www.mines.edu/academic/chemeng/

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Graduate students in Chemical and Biological Engineering at Colorado State University work closely with scientists and engineers who have an international reputation for academic and research excellence. As a member of this community, you will have the oportunity to explore research interests, share ideas, and discuss new scientific directions with leaders in their fields—not only in chemical engineering but also in microbiology, chemistry, engineering, and other sciences. The interdisciplinary nature of the research carried out by the chemical and biological engineering faculty at CSU and the culture of cooperative research facilitate this access to experts across departments and colleges. Chemical and biological engineering faculty members and students work jointly with research groups in electrical, mechanical, and civil engineering, microbiology, environmental health sciences, chemistry, and veterinary medicine.

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- Cell and Tissue Engineering
- Environmental Biotechnology
- Environmental Engineering
- Genomics/Proteomics/Metabolomics
- Magnetic Resonance Imaging
- Membrane Technology
- Metabolic Engineering
- Molecular Simulation
- Nanostructured Materials
- Polymeric Materials
- Systems Biology

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Graduate Advisor, Department of Chemical & Biological Engineering
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Travis S. Bailey, Ph.D.
University of Minnesota

Laurence A. Belfiore, Ph.D.
University of Wisconsin

David S. Dandy, Ph.D.
California Institute of Technology

Matt J. Kipper, Ph.D.
Iowa State University

James C. Linden, Ph.D.
Iowa State University

Kenneth F. Reardon, Ph.D.
California Institute of Technology

Brad Reisfeld, Ph.D.
Northwestern University

David Wang, Ph.D.
University of Wisconsin

A. Ted Watson, Ph.D.
California Institute of Technology

Ranil Wickramasinghe, Ph.D.
University of Minnesota

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School of Engineering
Chemical Engineering Program
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Welcome to our new **Department of Chemical, Materials & Biomolecular Engineering**. The department was created from the fusion of the departments of Chemical Engineering and Materials Science & Engineering.

The Chemical Engineering Program offers opportunities for cross-cutting research in nanomaterials, biomolecules, energy and many traditional chemical engineering disciplines. Example research areas below.

Doug Cooper: Process Control Training, Tuning & Analysis, Adaptive Process Control, Intelligent Technologies and Pattern-Based Control

Can Erkey: Fuel Cells, Supercritical Fluids

Yu Lei: Biosensors, Bioremediation, Biopolymers and their Applications, Nanomaterials and their Application in Biosensing

Richard Parnas: Protein Based Plastics, Biofuels, Plant Design, Fiber Optic Sensors, Composites

Montgomery T. Shaw: Polymer Rheology & Processing, Phase Behavior in Polymer Solutions & Blends, Aging of Polymeric Dielectrics

Ranjan Srivastava: Biomolecular Networks, Systems Biology, Bioinformatics & Biosensors

Yong Wang: Nanomedicines for Cancer Therapy, Nanomedicines for Diagnosis, Nanomaterials for Controlling Cell Behaviors

Robert Weiss: Proton Exchange Membranes, Polymer Blends, Wetting of Thin Polymer Films, Electrically Conductive Polymers, Hydrophobically Modified Hydrogels

Benjamin Wilhite: Heat Integration in Microchannel Arrays for Fuel Reforming and Fuel Cells, Multiphase Flow in Fuel Cell Microchannels, Multifunctional Catalyst Design for Efficient Hydrogen Generation

Lei Zhu: Nano-confined Polymers using Block Copolymer as Templates Crystalline block copolymers are utilized as templates to investigate nanoconfinement effects on polymer phase transitions in the bulk and at surfaces, Block Copolymer/Inorganic Nanocomposites, Characterization of Polymer Membranes in PEM Fuel Cells

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Dartmouth and its affiliated professional schools offer PhD degrees in the full range of science disciplines as well as MD and MBA degrees. The Thayer School of Engineering at Dartmouth College offers an ABET-accredited BE degree, as well as MS, Masters of Engineering Management, and PhD degrees. The Chemical and Biochemical Engineering Program features courses in foundational topics in chemical engineering as well as courses serving our areas of research specialization:

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- **Materials science and engineering**
- **Process design and evaluation**

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Faculty & Research Areas

Ian Baker (Oxford) ▶ Structure/property relationships of materials, electron microscopy

John Collier (Dartmouth) ▶ Orthopaedic prostheses, implant/host interfaces

Alvin Converse (Delaware) ▶ Kinetics & reactor design, enzymatic hydrolysis of cellulose

Benoit Cushman-Roisin (Florida State) ▶ Numerical modeling of environmental fluid dynamics

Harold Frost (Harvard) ▶ Microstructural evolution, deformation, and fracture of materials

Tillman Gerngross (Technical University of Vienna) ▶ Engineering of glycoproteins, fermentation technology

Ursula Gibson (Cornell) ▶ Thin film deposition, optical materials

Karl E. Griswold (University of Texas at Austin) ▶ Protein Engineering

Francis Kennedy (RPI) ▶ Tribology, surface mechanics

Daniel R. Lynch (Princeton) ▶ Computational methods, oceanography, and water resources

Lee Lynd (Dartmouth) ▶ Biomass processing, pathway engineering, reactor & process design

Victor Petrenko (USSR Academy of Science) ▶ Physical chemistry of ice

Horst Richter (Stuttgart) ▶ Thermodynamics, multiphase flow, energy conversion, process design

Erland Schulson (British Columbia) ▶ Physical metallurgy of metals and alloys

Petia Vlahovska (Yale University) ▶ Rheology of complex fluids, biological fluid dynamics, membrane biophysics

For further information, please contact:

Chemical Engineering Graduate Advisor • Thayer School of Engineering • Dartmouth College • Hanover, NH 03755

http://engineering.dartmouth.edu/thayer/research/chemical.html

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Our department has a long, distinguished history as a vigorous and active center of research. The range of projects varies tremendously-from biochemical engineering to catalysis to thermodynamics-and there are important advances being made in each area at Delaware. A hallmark of our department has long been interaction with industry, and many of the research groups collaborate closely with local or other industrial laboratories. This is useful experience for pursuit of a career in either academic or industrial research.

UNIVERSITY of DELAWARE

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Maciek Antoniewicz
Assistant Professor

Mark Barteau
Robert L. Pigford Chair of Chemical Engineering

Antony Beris
Arthur B. Metzner Professor

Douglas Buttrey
Professor

Jingguang Chen
Professor; Director of CCST

Prasad Dhurjati
Professor

Thomas Epps, III
Assistant Professor

Eric Furst
Associate Professor

Eric Kaler
Elizabeth Inez Kelley Professor; Dean, College of Engineering

Jochen Lauterbach
Professor

Kelvin Lee
Gore Professor

Bramie Lenhoff
Gore Professor

Raul Lobo
Professor

Terry Papoutsakis
Eugene DuPont Chair of Chemical Engineering

Babatunde Ogunnaike
William L. Friend Professor; Center for Systems Biology

Christopher Roberts
Assistant Professor

Anne Robinson
Associate Professor

T.W. Fraser Russell
Allan P. Colburn Professor; Chief Engineer, Institute of Energy Conversion

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H.B. duPont Chair of Chemical Engineering; Director of CMET

Annette Shine
Associate Professor

Millicent Sullivan
Assistant Professor

Dionisios Vlachos
Professor

Norman Wagner
Alvin B. and Julia O. Stiles Professor; Department Chairperson

Brian Willis
Assistant Professor

Richard Wool
Professor

RESEARCH AREAS

Biochemical & Biomedical Engineering
- Computational Biology/ Bioinformatics
- Metabolic Engineering
- Proteins: adsorption, aggregation and folding
- Intracellular processing
- Biopolymers
- Functional genomics
- Molecular level processes

Catalysis & Reaction Engineering
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- Reaction pathways and kinetics
- Reaction simulation
- Reaction engineering
- Microchemical systems
- Combinatorial catalysis

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- Colloid phase behavior
- Rheology
- Protein interactions
- Self-assembly and nanocomposites
- Computer simulation

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- Microporous and mesoporous materials
- Composite materials
- Multiscale simulation

Polymer Science & Engineering
- Polymer processing
- Rheology and rheological modeling
- Non-equilibrium thermodynamics
- Molecular simulation
- Diffusion in polymers
- Conducting polymers

Thermodynamics & Phase Equilibria
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- Molecular thermodynamics and simulations
- Statistical mechanics of mixtures

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Chemical Engineering focus areas of research and the research groups are:

Applied Thermodynamics, Aerosol Technology, Bio Process Engineering, Catalysis, Combustion Processes
Emission Control, Enzyme technology, Membrane Technology, Polymer Chemistry & Technology
Process Control, Product Engineering, Oil and Gas Production, Systems Engineering, Transport Phenomena

BioEng CAPEC CHEC DPC IVC-SEP

The Department of Chemical Engineering (KT) is a leading research institution. The research results find application in biochemical processes, computer aided product and process engineering, energy, enhanced oil recovery, environment protection and pollution abatement, information technology, and products, formulations & materials.

The department has excellent experimental facilities serviced by a well-equipped workshop and well-trained technicians. The Hempel Student Innovation Laboratory is open for students' independent experimental work. The unit operations laboratory and pilot plants for distillation, reaction, evaporation, crystallization, etc. are used for both education and research. Visit us at http://www.kt.dtu.dk/English.aspx.

The starting point for general information about MSc studies at DTU is: http://www.dtu.dk/msc

Graduate programs at Department of Chemical Engineering:

Chemical and Biochemical Engineering — **Stig Wedel** sw@kt.dtu.dk
http://www.kt.dtu.dk/cbe

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Advanced and Applied Chemistry — **Georgios Kontogeorgis** gk@kt.dtu.dk
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Department of Chemical Engineering

Drexel University Department of Chemical and Biological Engineering

www.drexel.edu/chemeng/

Faculty

Cameron F. Abrams
PhD, University of California- Berkeley
multiscale molecular simulations, polymer thermodynamics, molecular and cellular biophysics

Jason B. Baxter
PhD, University of California – Santa Barbara
solar cells, nanowires

Richard A. Cairncross
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transport in polymers, biodegradable polymers, transport modeling, coatings, renewable energy

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gene and drug delivery, polymer nano-composites, complex fluids

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fuel cells, polymer membranes, diffusion in polymers, electrocatalysts

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pyrolysis of polymers, nanotube synthesis, safety analysis

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surface science, nanotechnology, polymer thin films and coatings, chemical vapor deposition

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biomaterials, drug delivery, hydrogels

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biochemical engineering, cellular metabolism in bioreactors, biosensors

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reacting polymer systems, nanostructured polymers, materials from renewable sources, composites and interfaces

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process systems engineering, polymer engineering, modeling simulation

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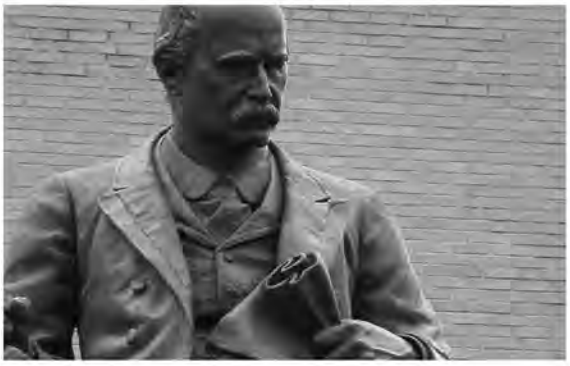
suspension rheology, fluid mechanics of multi-phase systems

Steven P. Wrenn
PhD, University of Delaware
biomedical engineering, biological colloids, intercellular phase separation and mass transfer



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MS and PhD Graduate Program

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Anil Oroskar, Adjunct Professor
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E-Mail: anil@orochem.com

RESEARCH AREAS

Transport Phenomena: Transport properties of fluids, Slurry transport, Multiphase fluid flow. Fluid mechanics of polymers, Ferro fluids and other Viscoelastic media.

Thermodynamics: Molecular simulation and Statistical mechanics of liquid mixtures, Superficial fluid extraction/retrograde condensation, Asphaltene characterization, Membrane-based separations.

Kinetics and Reaction Engineering: Gas-solid reaction kinetics, Energy transfer processes, Laser diagnostics, and Combustion chemistry. Environmental technology, Surface chemistry, and optimization. Catalyst preparation and characterization, Supported metals, Chemical kinetics in automotive engine emissions. Density fuctional theory calculations of reaction mechanisms.

Biochemical Engineering: Bioinstrumentation, Bioseparations, Biodegradable polymers, Nonaqueous Enzymology, Optimization of mycobacterial fermentations.

Materials: Microelectronic materials and processing, Heteroepitaxy in group IV materials, and in situ surface spectroscopies at interfaces. Combustion synthesis of ceramics and synthesis in supercritical fluids.

Product and Process Development and design, Computer-aided modeling and simulation, Pollution prevention.

Biomedical Engineering Hydrodynamics of the human brain, Microvasculation, Fluid structure interaction in biological tissues, Drug transport.

Nanoscience and Engineering Molecular-based study of matter in nanoscale, Organic nanostructures, Self-assembly and Positional assembly. Properties of size-selected clusters.

For more information, write to

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URL: http://www.uic.edu/depts/chme/

Javad Abbassian
Coal gasification; high temperature gas cleaning and process development

Hamid Arastoopour
Computational fluid dynamics of multi-phase systems: nanoparticle fluidization

Barry Bernstein
Fluid mechanics; polymer rheology

Donald Chmielewski
Design and control of energy systems

Ali Cinar
Modeling; analysis and control of complex distributed systems; diabetes; batch process supervision

David Gidalevitz
Membrane biophysics; biomaterials; nanoassemblies for controlled drug delivery

Dimitri Gidaspow
Hydrodynamics of multi-phase flow; coal gasification; fuel cells

Allan Myerson
Crystallization and molecular modeling for pharmaceutical processes

Satish Parulekar
Chemical and biochemical reaction engineering

Victor Perez-Luna
Surface chemistry; biomaterials; biosensors; hydrogels for biomedical applications; nanotechnology

Jai Prakash
Electrochemical characterization of novel materials for baterles; fuel cells

Vijay Ramani
Electrochemistry; fuel cell materials

Jay Schieber
Multiscale modeling of macromolecules; transport phenomena; statistical mechanics

Fouad Teymour
Complex systems; polymer engineering

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FACULTY

Gary A. Aurand
North Carolina State U. 1996
Supercritical fluids/ High pressure biochemical reactors

Audrey Butler
U. of Iowa 1989
Chemical precipitation processes

Greg Carmichael
U. of Kentucky 1979
Global change/ Supercomputing/ Air pollution modeling

Chris Coretsopoulos
U. of Illinois at Urbana-Champaign 1989
Photopolymerization/ Microfabrication/ Spectroscopy

Jennifer Fiegel
Johns Hopkins 2004
Drug delivery/ Nano and microtechnology/ Aerosols

C. Allan Guymon
U. of Colorado 1997
Polymer reaction engineering/UV curable coatings/Polymer liquid crystal composites

Stephen K. Hunter
U. of Utah 1989
Bioartificial organs/ Microencapsulation technologies

Julie L.P. Jessop
Michigan State U. 1999
Polymers/ Microlithography/ Spectroscopy

David Murhammer
U. of Houston 1989
Insect cell culture/ Bioreactor monitoring

Tonya L. Peeples
Johns Hopkins 1994
Bioremediation/ Extremophile physiology and biocatalysis

David Rethwisch
U. of Wisconsin 1985
Membrane science/ Polymer science/ Catalysis

Aliasger K. Salem
U. of Nottingham 2002
Tissue engineering/ Drug delivery/Polymeric biomaterials/Immunocancer therapy/Nano and microtechnology

Alec B. Scranton
Purdue U. 1990
Photopolymerization/ Reversible emulsifiers/ Polymerization kinetics

Charles O. Stanier
Carnegie Mellon University 2003
Air pollution chemistry, measurement, and modeling/Aerosols

Ramaswamy Subramanian
Indian Institute of Science 1992
Structural enzymology/Structure function relationship in proteins

Venkiteswaran Subramanian
Indian Institute of Science 1978
Biocatalysis/Metabolism/ Gene expression/ Fermentation/Protein purification/Biotechnology

John M. Wiencek
Case Western Reserve 1989
Protein crystallization/ Surfactant technology

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www.engineering.uiowa.edu/~chemeng/

IOWA STATE UNIVERSITY
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Iowa State University's Department of Chemical and Biological Engineering offers excellent programs for graduate research and education. Our cutting-edge research crosses traditional disciplinary lines and provides exceptional opportunities for graduate students. Our diverse faculty are leaders in their fields and have won national and international recognition for both research and education, our facilities (laboratories, instrumentation, and computing) are state of the art, and our financial resources give graduate students the support they need not just to succeed, but to excel. Our campus houses several interdisciplinary research centers, including the Ames Laboratory (a USDOE laboratory focused on materials research), the Plant Sciences Institute, the Office of Biotechnology, the Office of Biorenewable Programs, and the Institute for Combinatorial Discovery.

The department offers MS and PhD degrees in chemical engineering. Students with undergraduate degrees in chemical engineering or related fields can be admitted to the program. We offer full financial support with tuition coverage and competitive stipends to all our graduate students.

Faculty

Robert C. Brown, PhD
Michigan State University
Biorenewable resources for energy

Aaron R. Clapp, PhD
University of Florida
Colloidal and interfacial phenomena

Eric W. Cochran, PhD
University of Minnesota
Self-assembled polymers

Rodney O. Fox, PhD
Kansas State University
Computational fluid dynamics and reaction engineering

Charles E. Glatz, PhD
University of Wisconsin
Bioprocessing and bioseparations

Kurt R. Hebert, PhD
University of Illinois
Corrosion and electrochemical engineering

James C. Hill, PhD
University of Washington
Turbulence and computational fluid dynamics

Andrew C. Hillier, PhD
University of Minnesota
Interfacial engineering and electrochemistry

Kenneth R. Jolls, PhD
University of Illinois
Chemical thermodynamics and separations

Mark J. Kushner, PhD
California Institute of Technology
Computational optical and discharge physics

Monica H. Lamm, PhD
North Carolina State University
Molecular simulations of advanced materials

Surya K. Mallapragada, PhD
Purdue University
Tissue engineering and drug delivery

Balaji Narasimhan, PhD
Purdue University
Biomaterials and drug delivery

Michael G. Olsen, PhD
University Illinois at Urbana-Champaign
Experimental fluid mechanics and turbulence

Peter J. Reilly, PhD
University of Pennsylvania
Enzyme engineering and bioinformatics

Derrick K. Rollins, PhD
Ohio State University
Statistical process control

Brent H. Shanks, PhD
California Institute of Technology
Heterogeneous catalysis and biorenewables

Jacqueline V. Shanks, PhD
California Institute of Technology
Metabolic engineering and plant biotechnology

R. Dennis Vigil, PhD
University of Michigan
Transport phenomena and reaction engineering in multiphase systems

FOR MORE INFORMATION

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Graduate Study and Research in Chemical and Biomolecular Engineering at Johns Hopkins

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Dilipkumar N. Asthagiri, PhD • University of Delaware, Newark

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Michael J. Betenbaugh, PhD • University of Delaware

Molecular Thermodynamics • Adsorption Supercritical Processing • Self Assembly
Marc D. Donohue, PhD • University of California, Berkeley

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Konstantinos Konstantopoulos, PhD • Rice University

Molecular Bioengineering Protein Engineering • Molecular Evolution
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Stevin H. Gehrke *(Ph.D., Minnesota)*
Don W. Green, *(Ph.D., Oklahoma)*
Javier Guzman *(Ph.D., UC Davis)*
Colin S. Howat *(Ph.D., Kansas)*
Jenn-Tai Liang *(Ph.D., Texas)*
Trung V. Nguyen *(Ph.D., Texas A&M)*
Karen J. Nordheden *(Ph.D., Illinois)*
Russell D. Osterman *(Ph.D., Kansas)*
Aaron Scurto *(Ph.D., Notre Dame)*
Marylee Z. Southard *(Ph.D., Kansas)*
Susan M. Williams *(Ph.D., Oklahoma)*
Bala Subramaniam *(Ph.D., Notre Dame)*
Shapour Vossoughi *(Ph.D., Alberta, Canada)*
Laurence Weatherley, Chair *(Ph.D., Cambridge)*
G. Paul Willhite *(Ph.D., Northwestern)*

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Catalytic Materials and Membrane Processing
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Corrosion, Fuel Cells, Batteries
Electrochemical Reactors and Processes
Electronic Materials Processing
Enhanced Oil Recovery Processes
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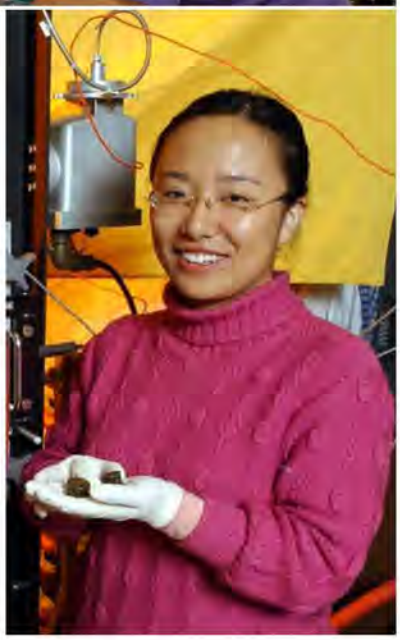
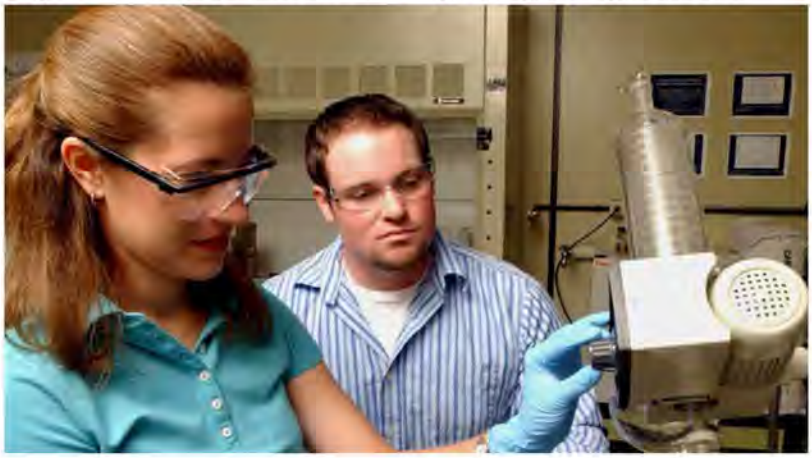
Kansas State University

Department of Chemical Engineering



Faculty, Ph.D. Institute, Research Areas

- Jennifer L. Anthony, *University of Notre Dame*, advanced materials, nanoporous molecular sieves, environmental separations, ionic liquids, solvent properties
- Vikas Berry, *Virginia Polytechnic Institute and State University*, bionanotechnology, nanoelectronics, sensors
- James H. Edgar, *University of Florida*, crystal growth, semiconductor processing and materials characterization
- Larry E. Erickson, *Kansas State University*, environmental engineering, biochemical engineering, biological waste treatment process design and synthesis
- L.T. Fan, *West Virginia University*, process systems engineering including process synthesis and control, chemical reaction engineering, particle technology
- Larry A. Glasgow, *University of Missouri*, transport phenomena, bubbles, droplets and particles in turbulent flows, coagulation and flocculation
- Keith L Hohn, *University of Minnesota*, catalysis and reaction engineering, natural gas conversion, and nanoparticle catalysts
- Peter Pfromm, *University of Texas*, polymers in membrane separations and surface science
- Mary E. Rezac (head), *University of Texas*, polymer science, membrane separation processes
- John R. Schlup, *California Institute of Technology*, biobased industrial products, applied spectroscopy, thermal analysis, intelligent processing of materials
- Walter Walawender, *Syracuse University*, activated carbon, biomass energy, fluid particle systems, pyrolysis, reaction modeling and engineering
- Krista S. Walton, *Vanderbilt University*, nanoporous materials, molecular modeling, adsorption separation and purification, metal-organic frameworks



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Department of Chemical & Materials Engineering

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J. Smart · *University of Texas*

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F. Yang · *University of Rochester*
T. Zhai · *University of Oxford*

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Additional information and application may be obtained by writing to:

Dr. James T. Hsu, Chairman • Graduate Committee
Department of Chemical Engineering • Lehigh University • 111 Research Drive • Iacocca Hall • Bethlehem, PA 18015
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LOUISIANA STATE UNIVERSITY

Cain Department of Chemical Engineering

THE CITY

Baton Rouge is the state capital and home of the state's flagship institution, LSU. Situated near the Acadian region, Baton Rouge blends the Old South and Cajun cultures. Baton Rouge is one of the nation's busiest ports and the city's economy rests heavily on the chemical, oil, plastics, and agricultural industries. The great outdoors provide excellent year-round recreational activities, especially fishing, hunting, and water sports. The proximity of New Orleans provides for superb nightlife, especially during Mardi Gras. The city is also only two hours away from the Mississippi Gulf Coast, and four hours from either Gulf Shores or Houston.

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GRADUATE COORDINATOR
Cain Department of Chemical Engineering
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Heterogeneous Catalysis, High-Pressure Separations

J.C. FLAKE
Cain Professor/Assc. Professor; PhD, Georgia Institute of Technology
Semiconductor Processing, Microelectronic Device Fabrication

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Nusloch Professor; PhD, Princeton University
Electronic Materials, Surface Chemistry, CVD

J.E. HENRY
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M.A. HJORTSØ
Nusloch Professor; PhD, University of Houston
Biochemical Reaction Engineering, Applied Math

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Transport and Reaction in Porous Media

K.T. VALSARAJ
Roddy Distinguished Professor; PhD, Vanderbilt University
Environmental Transport, Separations

D.M. WETZEL
Haydel Professor/Assc. Professor; PhD, University of Delaware
Hazardous Waste Treatment, Drying

M.J. WORNAT
Harvey Professor; PhD, Massachusetts Institute of Technology
Combustion, Heterogeneous Reactions

University of Maine

Department of Chemical and Biological Engineering

The University - The campus is situated near the Penobscot and Stillwater Rivers in the town of Orono, Maine. The campus is large enough to offer various activities and events and yet is small enough to allow for one-on-one learning with faculty. The University of Maine is known for its hockey team, but also has a number of other sports activities. Not far from campus is the Maine Coast and Acadia National Park. North and west are alpine and cross-country ski resorts, Baxter State Park, and the Allagash Water Wilderness area.

DOUGLAS BOUSFIELD PhD (UC Berkeley)
Fluid mechanics, printing, coating processes, micro-scale modeling

ALBERT CO PhD (Wisconsin)
Polymeric fluid dynamics, rheology, transport phenomena, numerical methods

WILLIAM DESISTO PhD (Brown)
Advance materials, thin film synthesis, porous thin film filters for chem./bio sensors

DARRELL DONAHUE PhD (North Carolina State)
Biosensors in food and medical applications, risk assessment modeling, statistical process control

JOSEPH GENCO PhD (Ohio State)
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JOHN HWALEK PhD (Illinois)
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MICHAEL MASON PhD (UC Santa Barbara)
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PAUL MILLARD PhD (Maryland)
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DAVID NEIVANDT PhD (Melbourne)
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Protein dynamics on cell surfaces, membrane transport, image analysis

HEMANT PENDSE PhD (Syracuse) *Chair*
Sensor development, colloid systems, particulate and multiphase processes

DOUGLAS RUTHVEN PhD ScD (Cambridge)
Fundamentals of adsorption and processes

ADRIAAN VAN HEININGEN PhD (McGill)
Pulp and paper manufacture and production of biomaterials and biofuels

M. CLAYTON WHEELER PhD (Texas-Austin)
Chemical sensors, fundamental catalysis, surface science

The department has a long history of interactions with industry. Research projects often come from actual industrial situations. Various research programs, such as the Paper Surface Science Program, have industrial advisory boards that give students key contacts with industry. We have formed an alliance with the Institute of Molecular Biophysics (IMB) that brings to us partnerships with The Jackson Laboratory (TJL) and Maine Medical Center Research Institute (MMCRI). New research directions in the area of forest biorefinery, biosensors, and molecular biophysics give students opportunities to do research at the interface between engineering and the biological sciences.

For information about the graduate program write to the . . .
Graduate Coordinator, Department of Chemical and Biological Engineering
University of Maine, Orono, ME 04469
call 207 581-2277 • e-mail gradinfo@umche.maine.edu *or* bousfld@maine.edu • visit www.umche.maine.edu

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Graduate Program Director
Chemical Engineering Department
Manhattan College
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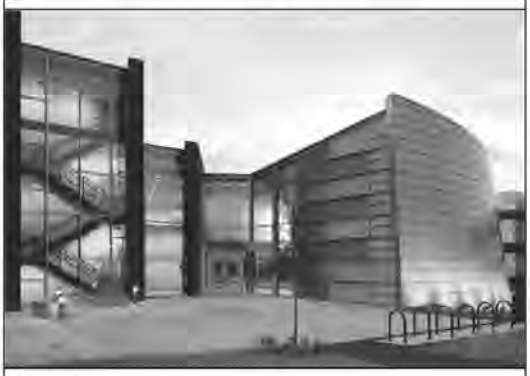
http://www.ecs.umass.edu/che

or contact:

Graduate Program Director
Department of Chemical Engineering
159 Goessmann Lab., 686 N. Pleasant St.
University of Massachusetts
Amherst MA 01003-9303



Facilities:
Instructional, research and administrative space are housed in close proximity to each other. In addition to space located in Goessmann Lab. which includes the ChE Alumni Classroom used for teaching and research seminars, additional space is located in the Conte National Center for Polymer Research. In May 2004 we proudly dedicated the brand new $25-million facilities of Engineering Lab II (ELab II) which includes 57,000-sq.ft of state-of-the-art laboratory facilities and office space.

FACULTY:

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Current areas of MS and PhD Research programs in the Chemical Engineering Department currently receive research support at a level of approximately $3 million per year through external research grants. Graduate students can expect to participate in projects falling into, but not limited to the following areas of faculty research.

- **Systems Design & Control** to include design, synthesis, and control of separation and reaction-separation systems; process design & control for polymer production and batch processing; nonlinear modeling and control of biochemical reactors; design and operation strategies for manufacturing pharmaceutical emulsions; and nonlinear process control theory
- **Materials Science and Engineering** a broad area to include characterization of catalytic materials; design of new catalytic materials for the polymerization and environmental industries; microwave engineering of catalytic materials; improvement of inorganic-organic functionalized mesoporous materials; thin film and nanostructured materials for microelectonics; polymeric materials processing and more
- **Molecular, Cellular, and Metabolic Bioengineering** with a focus on plant metabolic engineering for the production of medicinals via plant cell cultures; design and utilization of mammalian cell in vitro systems; systems biology applications; genetic circuit design to control biological systems and more...
- **Molecular and Multi-scale Modeling & Simulation** another broad research field includes computational quantum chemistry for chemical reaction kinetic analysis; applications of molecular modeling in nanotechnology; modeling of molecular level behavior of fluids confined in porous materials; molecular-to-reactor scale modeling of transport reaction processes in nano-structured materials synthesis with many other opportunities available

Chemical Engineering
at

MIT

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With the largest research faculty in the country, the Department of Chemical Engineering at MIT offers programs of research and teaching which span the breadth of chemical engineering with unprecedented depth in fundamentals and applications. The Department offers graduate programs leading to the master's and doctor's degrees. Graduate students may also earn a professional master's degree through the ***David H. Koch School of Chemical Engineering Practice****, a unique internship program that stresses defining and solving industrial problems by applying chemical engineering fundamentals. In collaboration with the Sloan School of Management, the Department also offers a doctoral program in Chemical Engineering Practice, which integrates chemical engineering, research, and management.*

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For more information, contact

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McGill Chemical Engineering

The department offers M. Eng. and PhD degrees with funding available and top-ups for those who already have funding.

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Montreal is a multilingual metropolis with a population over three million. Often called the world's second-largest French-speaking city, Montreal also boasts an English-speaking population of over 400,000. McGill itself is an English-language university, though it offers you countless opportunities to explore the French language.

McGill's Arts Building

For more information and graduate program applications:
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***Write*:**
Department of Chemical Engineering
McGill University
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Montreal, QC H3A 2B2 CANADA
***Phone*: (514) 398-4494**
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N. TUFENKJI, Canada Research Chair (Yale)
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V. YARGEAU, (Sherbrooke)
Environmental control of pharmaceuticals, biodegradation of contaminants in water, biohydrogen [viviane.yargeau@mcgill.ca]

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  R. H. Pelton, S. Zhu, K. Kostanski (Adjunct)
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- Centre for Advanced Polymer Processing & Design (CAPPA-D)
- McMaster Institute of Polymer Production Technology (MIPPT)

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Hamilton, ON L8S 4L7
CANADA

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Fax: 905-521-1350
Email: chemeng@mcmaster.ca
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Chemical Engineering at the
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Faculty

Main Areas of Research

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Omolola Eniola-Adefeso – *Cell Adhesion and Migration*
Erdogan Gulari – *DNA and Peptide Synthesis*
Jinsang Kim – *Smart Functional Polymers*
Joerg Lahann – *Surface Engineering*
Xiaoxia Lin – *Systems and Synthetic Biology*
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Energy and Environment

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Phillip E. Savage – *Sustainable Production of Energy and Chemical Products*
Johannes W. Schwank – *Catalysts, Fuel Cells, and Fuel Conversion*
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Ronald G. Larson, Chair – *Theoretical, Computational, and Experimental Complex Fluids*
Michael J. Solomon – *Experimental Complex Fluids*
Robert M. Ziff – *Theoretical and Computational Complex Fluids and Transport*

For more information contact:
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- *Reaction Engineering and Chemical Process Synthesis*
- *Theory and Computation*

Downtown Minneapolis as seen from campus

Northrup Auditorium

The Department of Chemical Engineering and Materials Science at the University of Minnesota-Twin Cities has been renowned for its pioneering scholarly work and for its influence in graduate education for the past half-century. Our department has produced numerous legendary engineering scholars and current leaders in both academia and industry. With its pacesetting research and education program in chemical engineering encompassing reaction engineering, multiphase flow, statistical mechanics, polymer science and bioengineering, our department was the first to foster a far-reaching marriage of the Chemical Engineering and Materials Science programs into an integrated department.

For the past few decades, the chemical engineering program has been consistently ranked as the top graduate program in the country by the National Research Council and other ranking surveys. The department has been thriving on its ability to foster interdisciplinary efforts in research and education; most, if not all of our active faculty members are engaged in intra- or interdepartmental research projects. The extensive collaboration among faculty members in research and education and the high level of co-advising of graduate students and research fellows serves to cross-fertilize new ideas and stimulate innovation. Our education and training are known not only for rigorously delving into specific and in-depth subjects, but also for their breadth and global perspectives. The widely ranging collection of high-impact research projects in these world-renowned laboratories provides students with a unique experience, preparing them for careers that are both exciting and rewarding.

Faculty:

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Frank S. Bates
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For more information contact:
Julie Prince, Program Associate
612-625-0382
prince@cems.umn.edu
URL: http://www.cems.umn.edu

Downtown Saint Paul

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Graduate Studies in Chemical Engineering

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Renewable Fuels, Bioremediation, Microreactor Technologies

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Biofuels (Bioethanol and Single-Cell Oil), Microbially Enhanced Oil Recovery

Clifford E. George, Professor
Ethanol from Alternative Renewable Sources, Corrosion in Aviation Fuel Systems

Rafael Hernandez, Assistant Professor
Integrated Remediation Technologies, Chemical/Physical Treatment Processes, Environmental Catalysis, Biofuels and Co-products

Priscilla J. Hill, Associate Professor
Crystallization, Process Design, Solids Processing

Adrienne R. Minerick, Assistant Professor
Electrokinetic Separations of Biofluids, Medical Diagnostic Microdevice Development, Nanoparticle Synthesis and Characterization

Rudy E. Rogers, Professor
Gas Hydrates: Natural Gas Storage, Transportation, Microbial Catalysis in Ocean Sediments, CO_2 Sequestering, Gas Separations

Kirk H. Schulz, Professor and Vice President for Research and Economic Development
Surface Science, Catalysis, Electronic Materials

Hossein Toghiani, Associate Professor
Composite Materials, Catalysis, Fuel Cells, Thermodynamics of Liquid Mixtures

Rebecca K. Toghiani, Associate Professor
Thermodynamics, Separations

Keisha B. Walters, Assistant Professor
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Mark G. White, Professor, Director and Deavenport Chair
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The Dave C. Swalm School of Chemical Engineering boasts an energetic faculty involved in a robust research program at the forefront of bioprocessing, sustainable energy research, and other cutting-edge technologies. These programs are supported by funds obtained from the Department of Energy, National Science Foundation, Environmental Protection Agency, and other national funding agencies.

The school offers both M.S. and Ph.D. degrees in Chemical Engineering.

For more information, contact

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Photocatalysis ♣ Transport

Stephen J. Lombardo, PhD *(California – Berkley)*
Ceramic & Electronic Materials ♣ Transport ♣ Kinetics

Sudarshan K. Loyalka, PhD *(Stanford)*
Aerosol Mechanics ♣ Kinetic Theory

Richard H. Luecke, PhD *(Oklahoma)*
Process Control ♣ Modeling

Thomas R. Marrero, PhD *(Maryland)*
Past-Vice President, IACChE
Coal Log Transport ♣ Conducting Polymers ♣ Fuels Emissions

David G. Retzloff, PhD *(Pittsburgh)*
Reactor Analysis ♣ Materials

Truman S. Storvick, PhD *(Purdue)*
Nuclear Waste Reprocessing ♣ Thermodynamics

Galen J. Suppes, PhD *(Johns Hopkins)*
Biofuel Processing ♣ Renewable Energy ♣ Thermodynamics

Dabir S. Viswanath, PhD *(Rochester)*
Applied Thermodynamics ♣ Chemical Kinetics

Hirotsugu K. Yasuda, PhD *(SUNY, Syracuse)*
Polymers ♣ Surface Science

Qingsong Yu, PhD *(Mizzou)*
Surface Science ♣ Plasma Technology

The University of Missouri - Columbia is one of the most comprehensive institutions in the nation and is situated on a beautiful land grant campus halfway between St. Louis and Kansas City, near the Ozark Mountains and less than an hour from the recreational Lake of the Ozarks. The Department of Chemical Engineering offers MS and PhD programs in addition to its undergraduate BS degree. Program areas include surface science, nuclear waste, wastewater treatment, biodegradation, air pollution, supercritical processes, plasma polymerization, polymer processing, coal transportation (hydraulic), fuels (alternative, biodiesel), chemical kinetics, protein crystallization, photocatalysis, ceramic materials, and polymer composites. Faculty expertise encompasses a wide variety of specializations and research within the department is funded by industry, government, non-profit, and institutional grants in many research areas.

For details contact:

Coordinator, Academic Programs
Department of Chemical Engineering
W2030 Lafferre Hall
Columbia, MO 65211

Tel: (573) 882-3563 ♣ Fax: (573) 884-4940
E-Mail: PreckshotR@missouri.edu

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che.missouri.edu

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Teaching and Research Apprenticeships available to M.S. and Ph.D. students.

For additional information:

Address: *Graduate Studies Coordinator*
Department of Chemical and Biological Engineering
University of Missouri-Rolla
Rolla, MO 65409-1230

Web: *http://chemeng.umr.edu/*

Online Application: *http://www.umr.edu/~cisapps/gradappd.html*

Neil L. Book
Associate Professor, Ph.D., Colorado
Computer-Aided Process Design; Chemical Process Safety; Engineering Data Management

Daniel Forciniti
Professor, Ph.D., North Carolina State
Bioseparations; Thermodynamics; Statistical Mechanics

David B. Henthorn
Assistant Professor, Ph.D., Purdue
Biomimetics; Drug Delivery; Biomaterials

Kimberly H. Henthorn
Assistant Professor , Ph.D., Purdue
Entrainment and Conveying of Fine Particles; Multiphase Computational Fluid Dynamics (CFD); Characterization of Interparticle Forces; Particles for Pulmonary Drug Delivery Applications

Sunggyu "KB" Lee
Professor , Ph.D., Case Western
Supercritcal Fluid Technology, Materials Processing, and Polymerization; Reactive Polymer Processing; Biodegradable Polymers; Polymer Blends; Scale-Up and Pilot Plant Studies; Environmental Technology

A.J. Liapis
Professor, Ph.D., ETH-Zurich
Transport Phenomena; Adsorption/Desorption; Fundamentals and Processes; Bioseparations; Chromatographic Separations; Capillary Electrochromatography; Chemical Reaction Engineering; Lyophilization

Douglas K. Ludlow
Professor, Ph.D., Arizona State
Surface Characterization of Adsorbents and Catalysts, Applications of Fractal Geometry to Surface Morphology

Parthasakha Neogi
Professor, Ph.D., Carnegie-Mellon
Interfacial Phenomena; Drug Delivery

Judy A. Raper
Professor and Chair, Ph.D., University of New South Wales
Particle Technology; Characterization of Fractal Aggregates; Measurement of Surface Roughness and Fractal Dimension of Dry Powder Pharmaceutical Aerosols; Fly Ash Characterization and Utilization; Waste Minimization

Oliver C. Sitton
Associate Professor, Ph.D., University of Missouri-Rolla
Bioengineering

Jee-Ching Wang
Assistant Professor, Ph.D., Penn State
Molecular Simulations of Transport in Confined Systems, Molecular Simulations of Surfactant Systems, Molecular Properties of Materials

Yangchuan Xing
Assistant Professor, Ph.D., Yale
Synthesis, Processing, and Characterization of Nanomaterials

Craig D. Adams*
Professor, Ph.D., University of Kansas
Effects and Control of Antibiotics and Other Organic Compounds in Water; Oxidative and Adsorption Technology for Water Treatment; Kinetic Modeling of Chemical Reactions in Aqueous Systems

David J. Westenberg*
Associate Professor, Ph.D., University of California-Los Angeles
Respiratory Enzymes; Quorum Sensing; Respiratory Genes; Antibacterial Glass
**Joint Appointment*

Effective January 1, 2008 UMR becomes Missouri University of Science and Technology (Missouri S&T).

The Program

The department offers graduate programs leading to both the Master of Science and Doctor of Philosophy degrees. Exciting opportunities exist for interdisciplinary research. Faculty conduct research in a number of areas including:

- **Polymer science/ engineering**
- **Membrane technology**
- **Hazardous waste treatment**
- **Particle technology**
- **Pharmaceutical engineering**
- **Nanotechnology**

Chemical Engineering

at New Jersey Institute of Technology

The Faculty:

P. Armenante: University of Virginia
B. Baltzis: University of Minnesota
R. Barat: Massachusetts Institute of Technology
R. Dave: Utah State University
E. Dreizin: Odessa University, Ukraine
C. Gogos: Princeton University
T. Greenstein: New York University
D. Hanesian: Cornell University
K. Hyun: University of Missouri-Columbia
B. Khusid: Heat and Mass Transfer Inst., Minsk USSR
H. Kimmel: City University of New York
D. Knox: Rensselaer Polytechnic Institute
N. Loney: New Jersey Institute of Technology
A. Perna: University of Connecticut
R. Pfeffer: (Emeritus); New York University
L. Simon: Colorado State University
K. Sirkar: University of Illinois-Urbana
R. Tomkins: University of London (UK)
M. Xanthos: University of Toronto (Canada)
M. Young: Stevens Institute of Technology

For further information contact:

Dr. Reginald P.T. Tomkins, Department of Chemical Engineering
New Jersey Institute of Technology
University Heights
Newark, NJ 07102-1982

Phone: (973) 596-5656 Fax: (973) 596-8436
E-mail: tomkinsr@adm.njit.edu

NJIT
New Jersey Institute of Technology

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The University of New Mexico

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The ChE faculty are leaders in exploring phenomena on the meso-, micro-, and nanoscales. We offer graduate research projects in biotechnology, biomaterials and biomedical engineering, catalysis and interfacial phenomena; microengineered materials and self-assembled nanostructures; plasma processing and semiconductor fabrication; polymer theory and modeling.

The department enjoys extensive interactions and collaborations with New Mexico's federal laboratories: Los Alamos National Laboratory, Sandia National Laboratories, and the Air Force Research Laboratory, as well as high technology industries both locally and nationally.

Albuquerque is a unique combination of old and new, the natural world and the manmade environment, the frontier town and the cosmopolitan city, a harmonious blend of diverse cultures and peoples.

Faculty	Research Areas
Plamen Atanassov	• Electroanalytical Chemistry, Biomedical Engineering
C. Jeffrey Brinker	• Ceramics, Sol-Gel Processing, Self-assembled Nanostructures
Heather Canavan	• Stimulus-responsive materials, cell/surface interactions, Biomedical Engineering
Joseph L. Cecchi	• Semiconductor Manufacturing Technology, Plasma Etching and Deposition
Eva Chi	• Protein interfacial dynamics, protein aggregation, protein misfolding diseases
John G. Curro	• Polymer Theory, Computational Modeling
Abhaya K. Datye	• Catalysis, Interfaces, Advanced Materials
Elizabeth L. Dirk	• Biomaterials, Tissue Engineering
Julia E. Fulghum	• Surface Characterization, 3-D Materials Characterization
Sang M. Han	• Semiconductor Manufacturing Technology, Plasma Etching and Deposition
Ronald E. Loehman	• Glass-Metal and Ceramic-Metal Bonding and Interfacial Reactions
Gabriel P. López	• Chemical Sensors, Hybrid Materials, Biotechnology, Interfacial Phenomena
Dimiter Petsev	• Complex fluids, Nanoscience, Electrokinetic phenomena
Timothy L. Ward	• Aerosol Materials Synthesis, Inorganic Membranes
David G. Whitten	• Biosensors, Conjugated polymer photophysics and bioactivity in films and interfacial assemblies, Multicomponent systems and their applications

For more information, contact:

Jeffrey Brinker, Graduate Advisor
Chemical and Nuclear Engineering • MSC01 1120 • The University of New Mexico • Albuquerque, NM 87131
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NEW MEXICO STATE UNIVERSITY

PhD & MS Programs in Chemical Engineering

NM STATE UNIVERSITY

Faculty and Research Areas

- **Paul K. Andersen,** Associate Professor, *University of California, Berkeley*
  Transport Phenomena, Electrochemistry, Environmental Engineering
- **Francisco R. Del Valle,** College Professor, *Massachusetts Institute of Technology*
  Food Engineering
- **Shuguang Deng,** Associate Professor, *University of Cincinnati*
  Adsorption, Nanostructured Materials, Fuel Cell Technology and Water Treatment
- **Abbas Ghassemi,** Professor and Institute for Energy and the Environment Director, *New Mexico State University*
  Risk-Based Decision Making, Environmental Studies Pollution Prevention, Energy Efficiency and Process Control
- **Charles L. Johnson,** Professor, *Washington University-St. Louis*
  High Temperature Polymers
- **Richard L. Long,** Professor and Associate Head *Rice University*
  Transport Phenomena, Biomedical Engineering, Separations, Kinetics
- **Martha C. Mitchell,** Associate Professor and Head, *University of Minnesota*
  Molecular Modeling of Adsorption in Nanoporous Materials, Thermodynamic Analysis of Aerospace Fuels, Statistical Mechanics
- **Stuart H. Munson-McGee,** Professor, *University of Delaware*
  Advanced Materials, Materials Processing
- **David A. Rockstraw,** Professor, *University of Oklahoma*
  Kinetics and Reaction Engineering, Process Design

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For Application and Additional Information

Internet • http://chemeng.nmsu.edu/ E-mail • chemeng@nmsu.edu

PO Box 30001, MSC 3805 • Department of Chemical Engineering
New Mexico State University • Las Cruces, NM 88003

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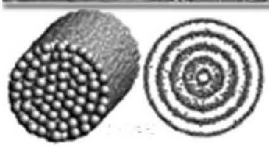
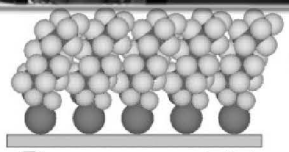



North Carolina State University

Department of Chemical Engineering

Faculty

Carbonell	Kelly
DeSimone	Khan
Dickey	Kilpatrick
Fedkiw	Lamb
Flickinger	Lim
Genzer	Ollis
Grant	Parsons
Gubbins	Peretti
Hall	Rao
Haugh	Spontak
Henderson	Velev

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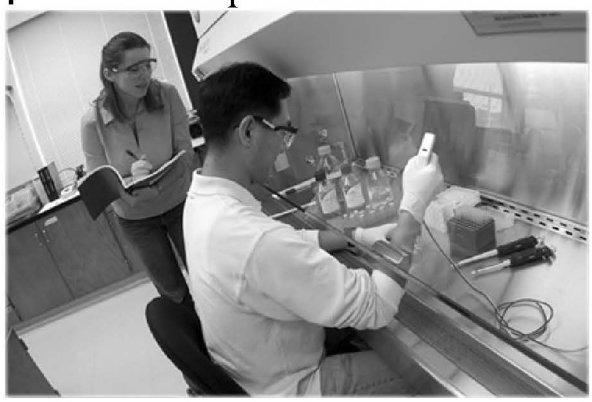
Research

Biomolecular Engineering
Catalysis, Electrochemical & Reaction Engineering
Electronic Materials
Green Chemistry & Engineering
Molecular Simulations
Nanotechnology & Interfacial Science
Polymers & Colloids
Supercritical Fluids

Graduate Study in Chemical Engineering

Northeastern UNIVERSITY

The Chemical Engineering Department is a community of scholars committed to research and discovery in the heart of Boston.
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Current research is funded from a variety of sources including the National Science Foundation, National Institutes of Health, Office of Naval Research, NASA and industry; the Chemical Engineering Department is also the home of the Center for Advanced Microgravity Materials Processing (CAMMP), a NASA-sponsored Research Partnership Center.

Research Areas

- **Advanced Materials**
- **Biochemical & Biomedical Engineering**
- **Electrochemical Engineering**
- **Multifunctional Materials**
- **Nanostructure Design**

Selected Research Topics

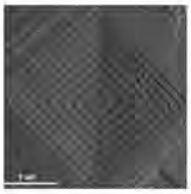
- Acid/Zeolite/Transition Metal Catalysis
- Biosensors/BioMEMS-BioNEMS
- Carbon Nanotubes
- Drug Delivery Systems
- Mixed-Matrix and Nanocomposite Membranes
- Pharmaceutical Compounds from Plant Cell Cultures
- Electrodeposition of Nanostructured Materials
- Extreme Responses in Functional Materials
- Tissue Engineering
- Solar Energy Conversion

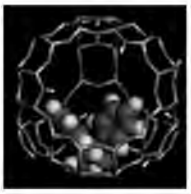
Faculty

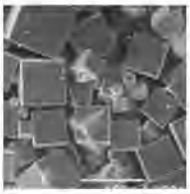
- Daniel D. Burkey
- Rebecca L. Carrier
- Carolyn Lee-Parsons
- Laura H. Lewis
- Shashi Murthy
- Elizabeth Podlaha-Murphy
- Al Sacco Jr. (Payload Specialist Astronaut)
- Ronald J. Willey
- Katherine S. Ziemer

For more information, please write to:

Chairman
Dept of Chemical Eng. 342 SN
360 Huntington Ave. Boston, MA 02115
www.coe.neu.edu/COE/grad_school/







Chemical and Biological Engineering at

Northwestern University

Luis A.N. Amaral, Ph.D., Boston University, 1996
Complex systems, computational physics, biological networks

Linda J. Broadbelt, PhD., Delaware, 1994
Reaction engineering, kinetics modeling, polymer resource recovery

Wesley R. Burghardt, Ph.D., Stanford, 1990
Polymer science, rheology

Kimberly A. Gray, Ph.D., Johns Hopkins, 1988
Catalysis, treatment technologies, environmental chemistry

Bartosz A. Grzybowski, Ph.D., Harvard, 2000
Complex chemical systems

Harold H. Kung, Ph.D., Northwestern, 1974
Kinetics, heterogeneous catalysis

William M. Miller, Ph.D., Berkeley, 1987
Cell culture for biotechnology and medicine

Justin M. Notestein, Ph.D., Berkeley, 2006
Materials design for adsorption and catalysis

Monica Olvera de la Cruz, Ph.D., Cambridge, 1984
Statistical mechanics in polymer systems

Julio M. Ottino, Ph.D., Minnesota, 1979
Fluid mechanics, granular materials, chaos, mixing in materials processing

Gregory Ryskin, Ph.D., Caltech, 1983
Fluid mechanics, computational methods, polymeric liquids

Lonnie D. Shea, Ph.D., Michigan, 1997
Tissue engineering, gene therapy

Randall Q. Snurr, Ph.D., Berkeley, 1994
Adsorption and diffusion in porous media, molecular modeling

John M. Torkelson, Ph.D., Minnestota, 1983
Polymer science, membranes

For information and application to the graduate program, write

Director of Graduate Admissions
Department of Chemical and Biological Engineering
McCormick School of Engineering
and Applied Science
Northwestern University
Evanston, Illinois 60208-3120

Phone: (847) 491-7398
or (800) 848-5135 (U.S. only)

E-mail:
admissions-chem-biol-eng@northwestern.edu

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www.chem-biol-eng.northwestern.edu

Graduate Studies in Chemical and Biomolecular Engineering

The University of Notre Dame

Faculty

Paul W. Bohn
Joan F. Brennecke
H.-Chia Chang
Davide A. Hill
Jeffrey C. Kantor
David T. Leighton, Jr.
Mark J. McCready
Paul J. McGinn
Edward J. Maginn
Alexander S. Mukasyan
William F. Schneider
Mark A. Stadtherr
William C. Strieder
Eduardo E. Wolf
Y. Elaine Zhu

For more information and application materials, contact us at

Director of Graduate Recruiting
Department of Chemical and Biomolecular Engineering
University of Notre Dame
Notre Dame, IN 46556 USA

• *On-Line Application* •
www.nd.edu/~gradsch/applying/appintro.html

http://www.nd.edu/~chegdept
chegdept.1@nd.edu

Phone: 1-800-528-9487
Fax: 1-574-631-8366

Research Areas

Atomistic Simulation of Materials
Catalyst Synthesis and Characterization
Chemical Sensing
CO2 Capture
Combinatorial Materials Development
Computational Heterogeneous Catalysis
Density Functional Theory
Ecological and Environmental Modeling
Electrokinetics
Fuel Cell Technologies
Genetic Diagnostics
Heterogeneous Phase Change Simulation
Ionic Liquids
Micro-and Nano-fluidics
Multiphase Flow Dynamics
Optoelectronic Materials
Oscillatory Separations
Process Systems Engineering
Soft Lithography
Suspension Mechanics

University of Notre Dame

The University

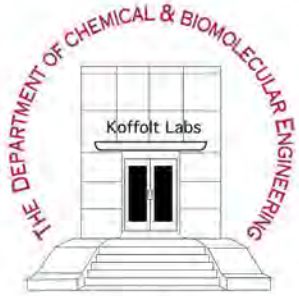
Notre Dame is an independent, national university ranked among the top twenty schools in the country. It is located adjacent to the city of South Bend, Indiana, approximately 90 miles southeast of Chicago. The scenic 1,250-acre campus is home to over 10,000 students.

The Department

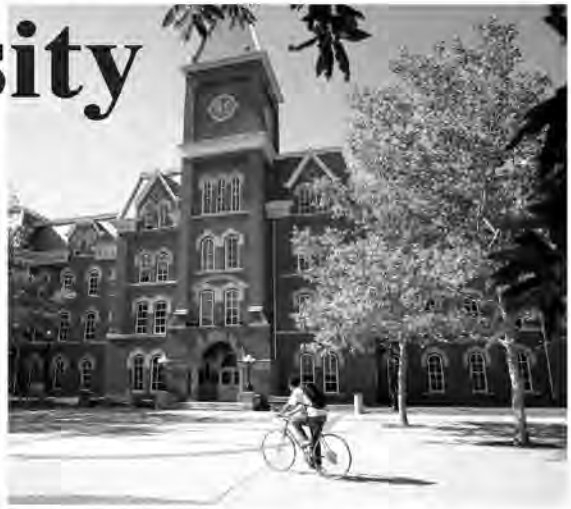
The Department of Chemical and Biomolecular Engineering is developing the next generation of research leaders. Our program is characterized by the close interaction between faculty and students and a focus on cutting-edge, interdisciplinary research that is both academically interesting and industrially relevant.

Programs and Financial Assistance

The Department offers MS and PhD degree programs. Financially attractive fellowships and assistantships, which include a full-tuition waiver, are available to students pursuing either degree.



The Ohio State University



- **Bhavik R. Bakshi,** *MIT*
  Industrial Ecology, Process Engineering, Analysis of Complex Systems
- **Robert S. Brodkey,** *Wisconsin*
  Experimental Measurements for Validation of Computational Fluid Mechanics and Applications to Mixing Process Applications
- **Jeffrey J. Chalmers,** *Cornell*
  Immunumagnetic Cell Separation, Effect of Hydrodynamic Forces on Cells, Interfacial Phenomena and Cells, Bioengineering, Biotechnology, Cancer Detection
- **Stuart L. Cooper,** *Princeton*
  Polymer Science and Engineering, Properties of Polyurethanes and Ionomers, Polyurethane Biomaterials, Blood-Material Interactions,Tissue Engineering
- **Liang-Shih Fan,** *West Virginia*
  Fluidization, Particle Technology, Particulates Reaction Engineering
- **Martin Feinberg,** *Princeton*
  Mathematics of Complex Chemical Systems
- **Winston Ho,** *Illinois-Urbana*
  Membrane Separations with Chemical Reaction and Fuel-Cell Fuel Processing
- **Kurt W. Koelling,** *Princeton*
  Rheology, Polymer Processing, Microfluidics
- **Isamu Kusaka,** *CalTech*
  Statistical Mechanics and Nucleation
- **L. James Lee,** *Minnesota*
  Polymer and Composite Processing, Micro/Nano-Fabrication, BioMEMS
- **Umit S. Ozkan,** *Iowa State*
  Heterogeneous Catalysis, Kinetics, Catalytic Materials
- **Andre F. Palmer,** *Johns Hopkins*
  Artificial blood substitutes, protein and tissue engineering, drug delivery, Rheo-optics of complex fluids
- **Michael Paulaitis,** *University of Illinois*
  Molecular simulations and modeling of weak protein-protein interactions: the role of hydration in biological organization and self-assembly phenomena; multiscale modeling of biological interactions
- **James F. Rathman,** *Oklahoma*
  Colloids, Interfaces, Surfactants, Molecular Self-Assembly, Bioinformatics
- **David L. Tomasko,** *Illinois-Urbana*
  Separations, Molecular Thermodynamics and Materials Processing in Supercritical Fluids
- **Jessica O. Winter,** *University of Texas at Austin*
  Nanobiotechnology, Cell and Tissue Engineering, Neural Prosthetics
- **Barbara E. Wyslouzil,** *CalTech*
  Nucleation, Aerosol Formation, Growth and Transport, Atmospheric Aerosols, Thermodynamics and Phase Equilibria
- **Shang-Tian Yang,** *Purdue*
  Biochemical Engineering, Biotechnology, and Tissue Engineering
- **Jacques L. Zakin,** *New York*
  Rheology, Drag Reduction, Surfactant Microstructures, and Heat Transfer Enhancement

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http://www.chbmeng.ohio-state.edu

or write

Graduate Program Coordinator
Department of Chemical Engineering
The Ohio State University • 140 West 19th Avenue
Columbus, Ohio 43210-1180

Phone: (614) 292-9076 • Fax: (614) 292-3769
E-mail address: che-grad@chbmeng.ohio-state.edu

The Ohio State University is an equal opportunity/affirmative action institution.

chemical, biological & materials
college of engineering university of oklahoma

Over the past several years, the School of Chemical, Biological and Materials Engineering at the University of Oklahoma has excelled in research and developed a broad base of external research support.

Faculty Members

M.J. Bagajewicz
Ph.D. California Institute of Technology, 1987

B.P. Grady
Ph.D. University of Wisconsin-Madison, 1994

R.G. Harrison Jr.
Ph.D. University of Wisconsin-Madison, 1975

J.H. Harwell
Ph.D. University of Texas, Austin, 1983

L.L. Lee
Ph.D. Northwestern University, 1971

L.L. Lobban
Ph.D. University of Houston, 1987

R.G. Mallinson
Ph.D. Purdue University, 1983

P.S. McFetridge
Ph.D. University of Bath, UK, 2002

M.U. Nollert
Ph.D. Cornell University, 1987

E.A. O'Rear III
Ph.D. Rice University, 1981

D.V. Papavassiliou
Ph.D. University of Illinois at Urbana-Champaign, 1996

D.E. Resasco
Ph.D. Yale University, 1983

J.F. Scamehorn
Ph.D. University of Texas, Austin, 1980

D.W. Schmidtke
Ph.D. University of Texas, Austin, 1997

R.L. Shambaugh
Ph.D. Case Western Reserve University, 1976

V.I. Sikavitsas
Ph.D. University at Buffalo, 2000

A. Striolo
Ph.D. University of Padova, Italy, 2002

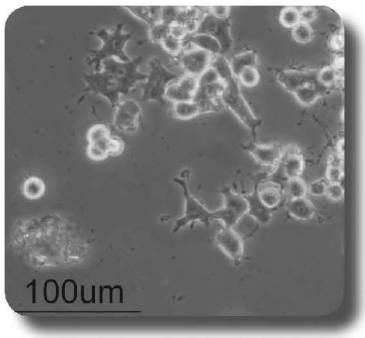
Research Areas

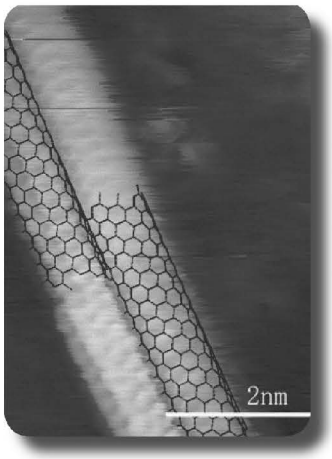
Bioengineering
Genetic engineering, protein production, bioseparations, vascular tissue engineering, cell adhesion, biosensors, orthopedic tissue engineering

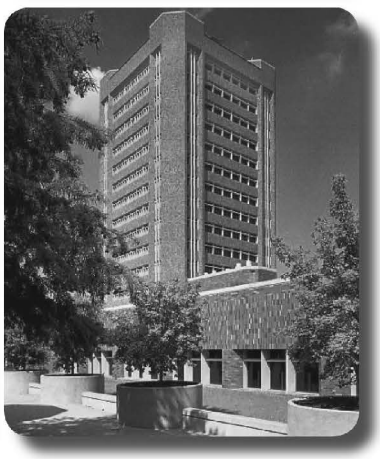
Energy and Chemicals
Catalytic hydrocarbon processing, natural gas conversion, novel fuel cell components, data reconciliation, hydrogen production, process design retrofit and optimization, molecular thermodynamics, computational modeling of turbulent transport and reactive flows, detergency, applied surfactant technologies

Materials Science and Engineering
Catalytic SWNT production and functionalization, polymer melt blowing, polymer characterization and structure-property relationships, polymer nanolayer formation and use

Environmental Processes
Photocatalytic oxidation, catalytic NOx reduction, zero-discharge process engineering, soil and aquifer remediation, surfactant-based water decontamination







For more information, call, fax, write or e-mail:

Chairman, Graduate Program Committee
School of Chemical, Biological and Materials Engineering
University of Oklahoma
T-335 Sarkeys Energy Center
100 E. Boyd St.
Norman, OK 73019-1004
Phone: (405) 325-5811
(800) 601-9360
Fax: (405) 325-5813
e-mail: chegrad@ou.edu

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Oklahoma State University

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Faculty

Heather Fahlenkamp (Ph.D., Oklahoma State University)
Gary L. Foutch (Ph.D., University of Missouri-Rolla)
K.A.M. Gasem (Ph.D., Oklahoma State University)
Karen A. High (Ph.D., Pennsylvania State University)
Martin S. High (Ph.D., Pennsylvania State University)
A.J. Johannes (Ph.D., University of Kentucky)
Sundarajan V. Madihally (Ph.D., Wayne State University)
R. Russell Rhinehart (Ph.D., North Carolina State University)
James E. Smay (Ph.D., University of Illinois)
D. Alan Tree (Ph.D., University of Illinois)
Jan Wagner (Ph.D., University of Kansas)
James R. Whiteley (Ph.D., Ohio State University)

Research Areas

Adsorption
Artificial Intelligence
Biochemical Processes
Biomaterials
Colloids/Ceramics
Environmental Engineering
Fluid Flow/CFD
Gas Processing
Hazardous Wastes
Ion Exchange
Molecular Design
Nanomaterials
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For more information contact
Dr. Khaled A.M. Gasem
School of Chemical Engineering
Oklahoma State University
Stillwater, OK 74078-5021
gasem@okstate.edu

University of Pennsylvania
Chemical and Biomolecular Engineering

Tobias Baumgart *Physical chemistry and mechanics of biological membranes, cell/surface interactions*

Russell J. Composto *Polymeric materials science, surface and interface studies*

John C. Crocker *Single-molecule biophysics, cell mechanics, soft glasses*

Scott L. Diamond *Protein and gene delivery, mechanobiology, blood systems biology, drug discovery*

Dennis E. Discher *Polymersomes, protein folding, stem cell rheology, gene and drug delivery*

Eduardo D. Glandt *Classical and statistical thermodynamics, random media*

Raymond J. Gorte *Heterogeneous catalysis, supported metals, oxide catalysis, electrodes for solid-oxide fuel cells*

David J. Graves *Biochemical and biomedical engineering, biotechnology*

Daniel A. Hammer *Cellular bioengineering, biointerfacial phenomena, adhesion*

Matthew J. Lazzara *Cellular engineering, cell signaling, molecular therapeutics*

Ravi Radhakrishnan *Statistical mechanics, quantum chemistry, biomolecular and cellular signaling*

Casim A. Sarkar *Biomolecular engineering, cellular engineering, biotechnology*

Warren D. Seider *Process analysis, simulation, design, and control*

Wen K. Shieh *Bioenvironmental engineering, environmental systems modeling*

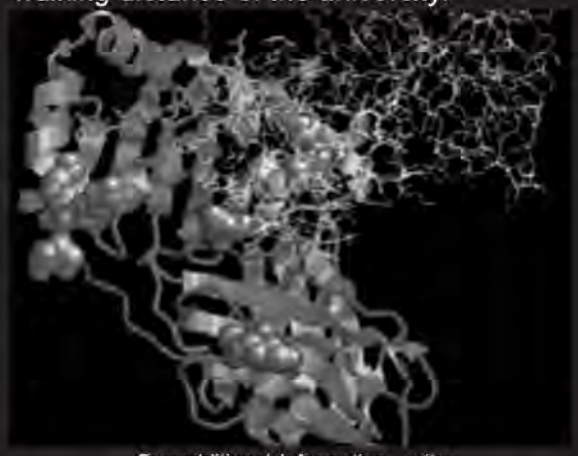
Talid R. Sinno *Transport and reaction, statistical mechanical modeling*

John M. Vohs *Surface science, catalysis, electronic materials processing*

Karen I. Winey *Polymer morphology, processing, and property interrelationships*

Shu Yang *Synthesis, characterization and fabrication of functional polymers, and organic/inorganic hybrids*

Penn's graduate program *in chemical and biomolecular engineering provides flexibility while emphasizing the fundamental nature of chemical and physical processes. Students may focus their studies in any of the research areas of the department. The full resources of this Ivy League university, including the Wharton School of Business and one of the country's foremost medical centers, are available to students in the program. The cultural advantages, historical assets, and recreational facilities of a great city are within walking distance of the university.*



For additional information, write:

Director of Graduate Admissions
Chemical and Biomolecular Engineering
University of Pennsylvania
220 South 33rd Street, Rm. 311A
Philadelphia, PA 19104-6393

chegrad@seas.upenn.edu
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Department of Chemical Engineering
The Pennsylvania State University
158 Fenske Laboratory
University Park PA 16802-4400

http://fenske.che.psu.edu/

Chemical Engineering

Antonios Armaou *(Univ of CA at Los Angeles)*—Process Control, System Dynamics

Aziz Ben-Jebria *(Univ. of Paris)*—Respiratory Fluid Flow and Uptake, Inhalation Toxicology

Ali Borhan *(Stanford)*—Fluid Dynamics, Transport Phenomena

Patrick Cirino *(Calif. Inst. of Technology)*—Biocatalysis, metabolic engineering, protein engineering and directed evolution

Wayne R. Curtis *(Purdue)*—Plant Biotechnology

Ronald P. Danner *(Lehigh)*—Polymers, Phase Equilibria, Diffusion

Kristen Fichthorn *(Michigan)*—Statistical Mechanics, Fluid-Solid Interfaces, Molecular Simulation

Henry C. Foley *(Penn State)*—Nanoporous Materials, Heterogeneous Catalysis, Adsorption and Permeation

Jong-in Hahm *(University of Chicago)*—Nano-Biotechnology

Michael Janik *(Univ. of Virginia)*—Fuel Cells, Electrochemistry, Alternative Energy Systems

Seong Han Kim *(Northwestern)*—Nano-Tribology and Nano-Materials

Costas D. Maranas *(Princeton)*—Computational Chemistry, Bioinformatics, Supply Chain Optimization

Janna Maranas *(Princeton)*—Molecular Simulation, Polymers, Thermodynamics, Network Glasses

Themis Matsoukas *(Michigan)*—Aerosol Processes, Colloidal Particles, Ceramic Powders

Joseph M. Perez *(Penn State)*—Tribology, Lubrication

James S. Ultman *(Delaware)*—Physiological Transport Processes, Respiratory Mass Transfer

Darrell Velegol *(Carnegie Mellon)*—Colloidal and Nanoparticle Systems, Bacterial Adhesion

James S. Vrentas *(Delaware)*—Transport Phenomena, Applied Mathematics, Diffusion in Polymers, Rheology

Andrew Zydney *(Massachusetts Institute of Technology)*—Biomedical Engineering, Bioseparations, and Membrane Processes

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Chemical Engineering
at the University of Pittsburgh

RESEARCH AREAS	FACULTY	
Biotechnology • Artificial Organs • Biocatalysis • Biomaterials • Controlled Drug Delivery • Metabolic Engineering • Modeling & Control • Nanoscale Biosensors • Tissue Engineering	Mohammad M. Ataai William Federspiel Steven R. Little John F. Patzer II William R. Wagner	Eric J. Beckman Di Gao Robert S. Parker Alan J. Russell
Catalysis • Surface Chemistry • Catalyst Deactivation • Chemical Promotion • Novel Materials • Organometallic Chemistry	Julie L. d'Itri Götz Veser	John W. Tierney Irving Wender
Energy and Environment • Bioremediation • Clean Fuels From Coal • Contaminated Soil Cleanup • Stack Gas Cleanup	Shiao-Hung Chiang Robert M. Enick Badie I. Morsi	James T. Cobb, Jr. Gerald D. Holder
Materials Engineering • Biocompatible Polymers • CO_2 as a Solvent • Interfacial Behavior • Polymer/Composite Modeling • Polymer Processing • Semiconductor Materials	Anna C. Balazs Robert M. Enick George E. Klinzing Steven R. Little Sachin Velankar	Eric J. Beckman Di Gao J. Thomas Lindt Joseph J. McCarthy
Multi-Scale Modeling • Molecular Modeling • Polymer-Fluid Interactions • Process Modeling & Control • Particulate Systems Transport	Anna C. Balazs Joseph J. McCarthy	J. Karl Johnson Robert S. Parker

---

Degree Programs: PhD and MS in Chemical Engineering
MS in Petroleum Engineering

Information on Fellowships and Applications:

Graduate Coordinator
Chemical and Petroleum Engineering
1249 Benedum Hall
University of Pittsburgh
Pittsburgh, PA 15261
412-624-9630

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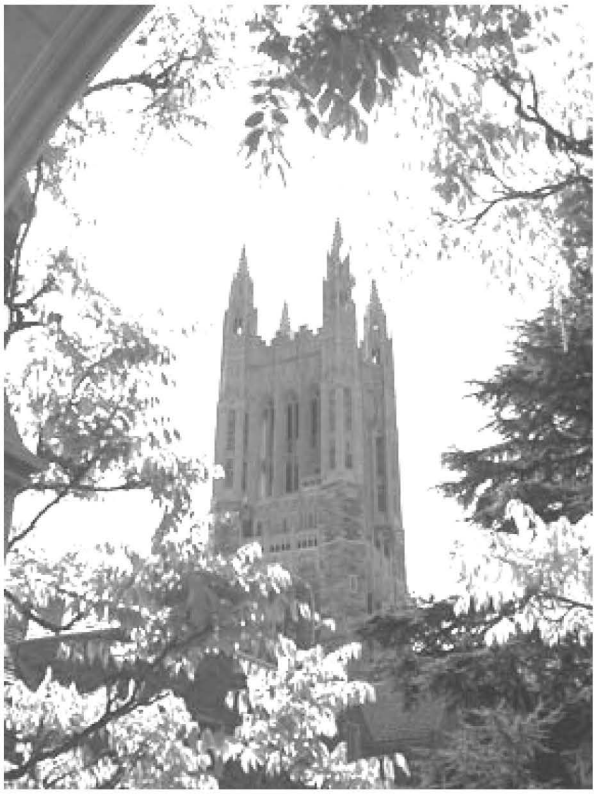
Princeton University

Ph.D. and M.Eng. Programs in Chemical Engineering



ChE Faculty

Ilhan A. Aksay	Athanassios Z. Panagiotopoulos
Jay B. Benziger	Robert K. Prud'homme
Pablo G. Debenedetti	Richard A. Register
Christodoulos A. Floudas	William B. Russel
Yannis G. Kevrekidis	Stanislav Y. Shvartsman
Morton D. Kostin	Sankaran Sundaresan
A. James Link	James Wei
Yueh-Lin (Lynn) Loo	David W. Wood
Celeste M. Nelson	T. Kyle Vanderlick (Chair)

Affiliate Faculty

Emily A. Carter (Mechanical and Aerospace Engineering)
George W. Scherer (Civil and Environmental Engineering)
Salvatore Torquato (Chemistry)

❑Applied and Computational Mathematics
Computational Chemistry and Materials
Systems Modeling and Optimization

❑Biotechnology
Biomaterials
Biopreservation
Cell Mechanics
Computational Biology
Protein and Enzyme Engineering
Tissue Engineering

❑Environmental and Energy Science and Technology
Art and Monument Conservation
Fuel Cell Engineering

❑Fluid Mechanics and Transport Phenomena
Biological Transport
Electrohydrodynamics
Flow in Porous Media
Granular and Multiphase Flow
Polymer and Suspension Rheology

❑Materials: Synthesis, Processing, Structure, Properties
Adhesion and Interfacial Phenomena
Ceramics and Glasses
Colloidal Dispersions
Nanoscience and Nanotechnology
Organic and Polymer Electronics
Polymers

❑Process Engineering and Science
Chemical Reactor Design, Stability, and Dynamics
Heterogeneous Catalysis
Process Control and Operations
Process Synthesis and Design

❑Thermodynamics and Statistical Mechanics
Complex Fluids
Glasses
Kinetic and Nucleation Theory
Liquid State Theory
Molecular Simulation

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Director of Graduate Studies
Chemical Engineering
Princeton University
Princeton, NJ 08544-5263

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or email:
chegrad@princeton.edu

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Osman A. Basaran
Stephen P. Beaudoin
James M. Caruthers
David S. Corti
W. Nicholas Delgass
Elias I. Franses
Robert E. Hannemann
Michael T. Harris
Hugh W. Hillhouse
R. Neal Houze
Sangtae Kim
Gil U. Lee
James D. Litster
Julie Liu
John A. Morgan
Joseph F. Pekny
R. Byron Pipes
D. Ramkrishna
G. V. Reklaitis
Fabio H. Ribeiro
Kendall T. Thomson
Arvind Varma (Head)
V. Venkatasubramanian
Nien-Hwa L. Wang
Phillip C. Wankat
You-Yeon Won

Research areas

- Biochemical Engineering • Biomaterials • Biomolecular Engineering
- Catalysis & Reaction Engineering • Clean & Renewable Energy
- Combustion Synthesis • Electronic Materials • Fluid Mechanics & Transport Phenomena
- Interfacial Engineering & Colloid Science • Micro- & Nanofluidics
- Molecular Modeling & Statistical Mechanics • Nanofabrication & Nanomaterials
- Pharmaceutical Engineering • Polymer Materials & Composites
- Product & Process Systems Engineering • Separation Processes • Surface Science

The School of Chemical Engineering (ChE), the College of Engineering (COE), and Purdue University have been undergoing exciting transformations befitting the dawn of a new century. These changes range from the creation of 95 and 300 entirely new faculty positions in the COE and the university, respectively, and the completion of Discovery Park, a new $350 million multidisciplinary home for research in signature areas of importance to society. In ChE, ten new faculty, a mix of freshly minted PhDs, senior academics, and renowned researchers, have joined our ranks since 2003. The current ChE faculty includes four members of the National Academy of Engineering. To house the expanded faculty, students, and research and teaching activities, a new building, the Forney Hall of Chemical Engineering, was completed in 2005 and the original one is undergoing full renovation. This year also saw the inauguration of a new National Science Foundation Engineering Research Center whose mission is to advance the science and engineering of pharmaceutical and related products.

For more information, contact:
Graduate Studies, Forney Hall of Chemical Engineering,
Purdue University,
480 Stadium Mall Drive,
West Lafayette, IN 47907.
Phone: (765) 494-4057.
Web: http://engineering.purdue.edu/ChE

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Chemical and Biological Engineering at

Rensselaer Polytechnic Institute

The Chemical and Biological Engineering Department at Rensselaer has long been recognized for its excellence in teaching and research. Its graduate programs lead to research-based M.S. and Ph.D. degrees and to a course-based M.E. degree. Programs are also offered in cooperation with the School of Management and Technology which lead to an M.E. in Chemical Engineering and to an MBA or the M.S. in Management. Owing to funding, consulting, and previous faculty experience, the department maintains close ties with industry. Department web site:
http://www.eng.rpi.edu/dept/chem-eng/

Located in Troy, New York, Rensselaer is a private school with an enrollment of some 6000 students. Situated on the Hudson River, just north of New York's capital city of Albany, it is a three-hour drive from New York City, Boston, and Montreal. The Adirondack Mountains of New York, the Green Mountains of Vermont, and the Berkshires of Massachusetts are readily accessible. Saratoga, with its battlefield, racetrack, and Performing Arts Center (New York City Ballet, Philadelphia Orchestra, and jazz festival) is nearby.

Application materials and information from:

Graduate Services
Rensselaer Polytechnic Institute
Troy, NY 12180-3590
Telephone: 518-276-6789
e-mail: grad-admissions@rpi.edu
http://www.rpi.edu/dept/grad-services/

Faculty and Research Interests

Elmar R. Altwicker, altwie@rpi.edu
Professor Emeritus • Spouted-bed combustion; incineration; trace-pollutant kinetics

Georges Belfort, belfog@rpi.edu
Membrane separations; adsorption; biocatalysis; MRI, interfacial phenomena

B. Wayne Bequette, bequette@rpi.edu
Process control; fuel cell systems; biomedical systems

Henry R. Bungay III, bungah@rpi.edu, *Prof.Emeritus*
Wastewater treatment; biochemical engineering

Marc-Olivier Coppens,
Nature-inspired chemical engineering; nano-biotechnology; mathematical & computational modeling; statistical mechanics; nanoporous materials synthesis; reaction engineering

Steven M. Cramer, crames@rpi.edu
Displacement, membrane, and preparative chromatography; environmental research

Jonathan S. Dordick, dordick@rpi.edu
Biochemical engineering; biocatalysis, polymer science, bioseparations

Arthur Fontijn, fontia@rpi.edu, *Professor Emeritus*
Combustion; high-temperature kinetics; gas-phase reactions

Shekhar Garde, gardes@rpi.edu
Macromolecular self-assembly, computer simulations, statistical thermodynamics of liquids, hydration phenomena

William N. Gill, gillw@rpi.edu
Microelectronics; reverse osmosis; crystal growth; ceramic composites

Ravi S. Kane, kaner@rpi.edu
Polymers; biosurfaces; biomaterials; nanomaterials

Pankaj Karande,
Drug Delivery, combintorial chemistry, molecular modeling

Howard Littman, littmh@rpi.edu, *Professor Emeritus*
Fluid/particle systems; fluidization, spouting, pneumatic transport

Lealon Martin, lealon@rpi.edu
Chemical and biological process modeling and design; optimization; systems engineering

E. Bruce Nauman, nauman@rpi.edu
Polymer blends; nonlinear diffusion; devolatilization; polymer structure and properties; plastics recycling

Joel L. Plawsky, plawsky@rpi.edu
Electronic and photonic materials; interfacial phenomena; transport phenomena

Susan Sharfstein, sharfs@rpi.edu
Biochemical engineering, mammalian cell culture, recombinant protein production

Peter M. Tessier, tessier@rpi.edu
Protein-protein interactions, protein self-assembly and aggregation

Hendrick C. Van Ness, vanneh@rpi.edu
Institute Professor Emeritus

Peter C. Wayner, Jr., wayner@rpi.edu
Heat transfer; interfacial phenomena; porous materials

RICE

FACULTY

Sibani Lisa Biswal
(Stanford, 2004)

Walter Chapman
(Cornell, 1988)

Ramon Gonzalez
(Univ. of Chile, 2001)

George Hirasaki
(Rice, 1967)

Nikolaos Mantzaris
(Minnesota, 2000)

Clarence Miller
(Minnesota, 1966)

Matteo Pasquali
(Minnesota, 2000)

Marc Robert
(Swiss Fed. Inst. Tech., 1980)

Laura Segatori
(UT Austin, 2005)

Michael Wong
(MIT, 2000)

Kyriacos Zygourakis
(Minnesota, 1981)

Joint Appointments

Cecilia Clementi
(Intl. Sch. of Adv.Studies, 1998)

Vicki Colvin
(UC Berkeley, 1994)

Anatoly Kolomeisky
(Cornell, 1998)

Antonios Mikos
(Purdue, 1988)

Ka-Yiu San
(Caltech, 1984)

Jennifer West
(UT Austin, 1996)

CHEMICAL AND BIOMOLECULAR ENGINEERING @ RICE

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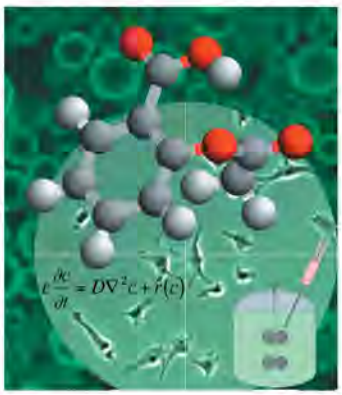
- Emphasizes interdisciplinary studies and collaborations with researchers from Rice and other institutions, the Texas Medical Center, NASA's Johnson Space Center, and R&D centers of petrochemical companies.



FACULTY RESEARCH AREAS

Advanced Materials & Complex Fluids

Synthesis and characterization of nanostructured materials, catalysis, nano- and microfluidics, self-assembling systems, hybrid biomaterials, rheology of nanostructured liquids, polymers, carbon nanotubes, interfacial phenomena, emulsions, colloids.

Biosystems Engineering

Cell population heterogeneity, metabolic engineering, systems biology, microbial fermentations, signal transduction and biological pattern formation, protein engineering, cellular and tissue engineering.

Energy & Sustainability

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For more information and graduate program applications, write to:

Chair, Graduate Admissions Committee
Chemical and Biomolecular Engineering, MS-362
Rice University
P.O. Box 1892
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Or visit our web site at: http://www.rice.edu/chbe/

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- Functional Polymers
- Inorganic/Organic Hybrids

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- Thin Film Devices
- Photonics & Optoelectronics
- Nanofabrication
- Display Technologies

Clean Energy

- Fuel Cells
- Solar Cells
- Biofuels
- Green Engineering

Biotechnology

- Biomass Processing
- Stem Cell Engineering
- Drug Delivery
- Biosensing

Faculty

M. ANTHAMATTEN, Ph.D., M.I.T., 2001
macromolecular self-assembly, shape memory polymers, vapor deposition, fuel cells

S. H. CHEN, Ph.D., Univ. of Minnesota, 1981
polymer science, organic materials for photonics and electronics, liquid crystal and electroluminescent displays

M. R. KING, Ph.D., Univ. of Notre Dame, 1999
cell adhesion, fluid mechanics, stem cell and cancer therapy

E. H. CHIMOWITZ, Ph.D., Univ. of Connecticut, 1982
supercritical fluid adsorption, molecular simulation of transport in disordered media, statistical mechanics

D. R. HARDING, Ph.D., Cambridge Univ., 1986
chemical vapor deposition, mechanical and transport properties, advanced aerospace materials

S. D. JACOBS, Ph.D., Univ. of Rochester, 1975
optics, photonics, and optoelectronics, liquid crystals, magnetorheology

J. JORNE, Ph.D., Univ. of California (Berkeley), 1972
electrochemical engineering, fuel cells, microelectronics processing, electrodeposition

L. J. ROTHBERG, Ph.D., Harvard Univ., 1984
organic device science, light-emitting diodes, display technology, biological sensors

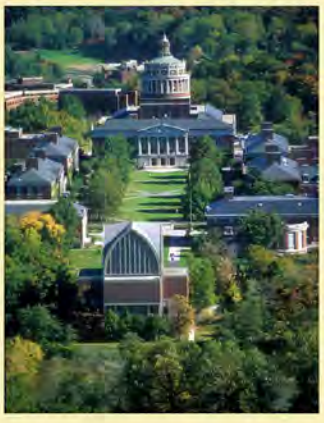
Y. SHAPIR, Ph.D., Tel Aviv Univ. (Israel), 1981
critical phenomena, transport in disordered media, scaling behavior of growing surfaces

C. W. TANG, Ph.D., Cornell Univ., 1975
organic electronic devices, flat-panel display technology

J. H. DAVID WU, Ph.D., M.I.T., 1987
bone marrow tissue engineering, stem cell and lymphocyte culture, enzymology of biomass energy process

H. YANG, Ph.D., Univ. of Toronto, 1998
nanostructured and mesoporous materials, magnetic nanocomposites, solids, and photonics and biophotonics

M. Z. YATES, Ph.D., Univ. of Texas (Austin), 1999
colloids and interfaces, supercritical fluids, microemulsions, molecular sieves, fuel cells



Chemical Engineering Graduate Studies

http://www.che.rochester.edu/Poster

Tiffany Markham
Graduate Program Coordinator
Department of Chemical Engineering
University of Rochester
Rochester, NY 14627
(585) 275-4913
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Faculty

Robert P. Hesketh, Chair · *University of Delaware*
Kevin Dahm · *Massachusetts Institute of Technology*
Stephanie Farrell · *New Jersey Institute of Technology*
Zenaida Gephardt · *University of Delaware*
Brian G. Lefebvre · *University of Delaware*
James Newell · *Clemson University*
Mariano J. Savelski · *University of Oklahoma*
C. Stewart Slater· *Rutgers University*

Research Areas

Membrane Separations · Pharmaceutical and Food Processing Technology · Biochemical Engineering · Controlled Release· Kinetic and Mechanistic Modeling of Complex Reaction Systems · Reaction Engineering · Novel Separation Processes · Modeling and Processing of High-Performance Polymers · Process Design and Optimization · Particle Technology · Renewable Fuels · Lean Manufacturing · Sustainable Design

For additional information

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Rowan University · 201 Mullica Hill Road · Glassboro, NJ 08028

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Faculty

► **Ioannis (Yannis) Androulakis,** Assistant Professor; Ph.D., Purdue University • *Systems biology, bioinformating, data mining, complex reaction modeling, optimization, system analysis*

► **Helen M. Buettner,** Associate Professor; Ph.D., University of Pennsylvania, 1987 • *Applied neurobiology, cell motility, cell-substrate interactions, crystallization of pharmaceuticals*

► **Yee C. Chiew,** Professor; Ph.D., University of Pennsylvania, 1984 • *Statistical thermodynamics of complex fluids, microscopic structures of fluids and particle systems, interfacial phenomena*

► **Alkis Constantinides,** Professor; D.E.Sc., Columbia University, 1970 • *Biochemical engineering, optimization and control of fermentation processes, applied numerical analysis, artificial intelligence*

► **Burton Z. Davidson,** Professor; Ph.D., P.E., Northwestern University, 1963 • *Systems simulation and optimization, environmental engineering, health and safety engineering management*

► **Panos G. Georgopoulos,** Associate Professor; Ph.D., California Institute of Technology, 1986 • *Atmospheric/environmental chemical engineering, turbulent transport, biochemodynamic modeling*

► **Benjamin J. Glasser,** Associate Professor; Ph.D., Princeton, 1995 • *Multiphase flows and reactors; granular materials and particulate suspensions; nonlinear dynamics of transport processes*

► **Masanori Hara,** Professor; Ph.D., Kyoto University, 1981 • *Polymer physics; polymer chemistry, polymer blends and composites, ionic polymers*

► **Marianthi G. Ierapetritou,** AssociateProfessor; Ph.D., Imperial College, 1995 • *Process systems engineering; process design, planning, and scheduling; uncertainty and environmental considerations; nonlinear and mixed integer optimization*

► **Johannes G. Khinast,** AssociateProfessor; Ph.D., Graz, 1995 • *Reaction and environmental engineering, reactive flows, numerical analysis of large dynamical systems*

► **Sobin Kim,** Assistant Professor; Ph.D., Columbia University • *Genotyping, DNA sequencing, MALDI-TOF mass spectrometry, DNA tagging, gene expression analysis, DNA pooling*

► **Michael T. Klein,** Dean and Board of Governors Professor of Engineering; Sc.D., MIT, 1981 • *Kinetics, catalysis and reaction engineering; automated kinetic modeling; hydrocarbon conversion; reactions in supercritical fluids*

► **Prabhas V. Moghe,** Associate Professor; Ph.D., University of Minnesota, 1993 • *Cell and tissue engineering; cell-biomaterial interactions; biomimetic materials*

► **Fernando Muzzio,** Professor; Ph.D., University of Massachusetts, 1991 • *Transport phenomena, mixing, chaotic flows, powder technology*

► **Henrik Pedersen,** Professor; Ph.D., Yale University, 1978 • *Biochemical engineering, immobilized enzymes, plant cell biotechnology, fiber-optic sensors*

► **Charles M. Roth,** Assistant Professor; Ph.D., University of Delaware, 1994 • *Nucleic acid biotechnology, molecular biophysics and bioengineering, bioseparations*

► **Jerry I. Scheinbeim,** Professor; Ph.D., University of Pittsburgh, 1975 • *Polymer electroprocessing, structure-electroactive properties relationships in polymeric materials, ferroelectric, piezoelectric, pyroelectric, dielectric and electrostrictive properties of polymers*

► **David I. Shreiber,** Assistant Professor; Ph.D., University of Pennsylvania • *Mechanotransduction, injury biomechanics, tissue and cellular engineering, nerve regeneration*

► **M. Silvina Tomassone,** Assistant Professor; Ph.D., Northeastern University, 1998 • *Molecular dynamics, interfacial analysis, phase transitions*

► **Shaw S. Wang**, Professor; Ph.D., Rutgers University, 1970 • *Kinetics and thermodynamics of food process engineering, and studies of biochemical and biological processes.*

► **Martin L. Yarmush,** Professor; Ph.D., Rockefeller University, 1979; M.D., Yale University, 1984 • *Applied immunology, artificial organs, bioseparations, protein engineering, biotechnology*

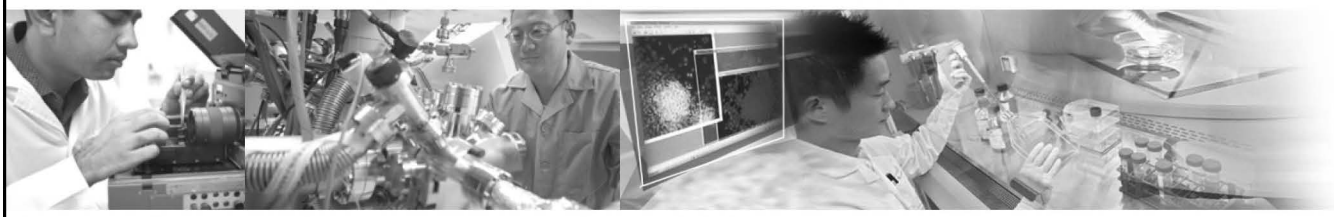
FELLOWSHIPS, TRAINEESHIPS, AND ASSISTANTSHIPS AVAILABLE

For further information contact:

Graduate Program in Chemical and Biochemical Engineering • Rutgers, The State University of New Jersey
School of Engineering • 98 Brett Road • Piscataway, NJ 08854-8058 • Phone (732) 445-4950 • Fax (732) 445-2421
Email: cbemail@sol.rutgers.edu • http://sol.rutgers.edu

Chemical & Biomolecular Engineering

NUS National University of Singapore



Chemical & Biomolecular Engineering as a profession and Singapore as a nation mirror each other in many ways. Both are dynamic, trend-setting and constantly evolving. And both represent an exciting and ever-changing interplay of complementary interpretations of the life around us, with the fusion of chemical/biological sciences and engineering sciences in the case of the former rivaling the symbiosis between the East and the West in our culturally vibrant island nation. Our Department is a microcosm of what surrounds us – locally as well as globally. Culturally, the Department is an amalgam of the East and the West. Intellectually, we span the many facets of the frontiers of our profession. We draw the best students from Singapore and the region to our undergraduate programs and compete successfully with overseas institutions for highly competent graduate students. We combine strengths with the finest institutions around the world through our international initiatives in education and research. Our faculty members come from world-class universities. Our facilities are enviable by anyone's standards. And our vision and ideas are as exciting as any you will find elsewhere. ***Come join us – and be a part of the future today!***

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- An MIT MS-CEP and an NUS PhD; or
- An NUS or NTU PhD degree with SMA Certificate

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For further details, please visit: http://web.mit.edu/sma/students/programmes/index.htm
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Department of Chemical Engineering

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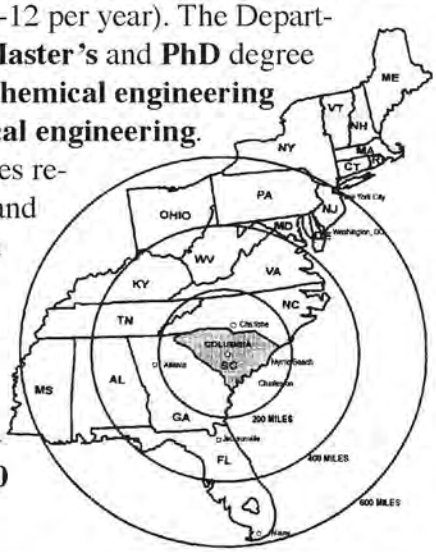
The Department of Chemical Engineering at USC has emerged as one of the top teaching and research programs in the Southeast. Our program ranks in the top twenty nationally in research expenditures (> $4 million) and annual doctoral graduates (10-12 per year). The Department offers **Master's** and **PhD** degree programs in **chemical engineering** and **biomedical engineering**. PhD candidates receive tuition and fee waivers, a health insurance subsidy, and highly competitive stipends starting at **$22,000 per year**.



For further information:
The Graduate Director, Department of Chemical Engineering,
Swearingen Engineering Center,
University of South Carolina, Columbia, SC 29208
Phone: 1-800-763-0527 • Fax: 1-803-777-0973
Web page: www.che.sc.edu

The University of South Carolina is located in Columbia, the state capital. Columbia is conveniently located in the center of the state and combines the benefits of a big city with the charm and hospitality of a small town. The area's sunny and mild climate, combined with its lakes and wooded parks, provide plenty of opportunities for year-round outdoor recreation. In addition, Columbia is only hours away from the Blue Ridge Mountains and the Atlantic Coast. Charlotte and Atlanta—cities that serve as Columbia's international gateways—are nearby.

Faculty

M.D. Amiridis, *Wisconsin*
J. Blanchette, *Texas*
J. Delhommelle, *Paris*
F.A. Gadala-Maria, *Stanford*
E.P. Gatzke, *Delaware*
A. Heyden, *Hamburg*
E. Jabbari, *Purdue*
M.A. Matthews, *Texas A&M*
M.A. Moss, *Kentucky*
T. Papathanasiou, *McGill*
H.J. Ploehn, *Princeton*
B.N. Popov, *Illinois*
J.A. Ritter, *SUNY Buffalo*
T.G. Stanford, *Michigan*
V. Van Brunt, *Tennessee*
J. W. Van Zee, *Texas A&M*
J.W. Weidner, *NC State*
R.E. White, *Cal-Berkeley*
C.T. Williams, *Purdue*

Research Programs

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Batteries and Fuel Cells	*Process Control*
Biomedical Engineering	*Rheology*
Biomaterials	*Separations*
Colloids and Interfaces	*Sol-Gel Processing*
Composite Materials	*Solvent Extraction*
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Faculty

W. Victor Chang Iraj Ershaghi Edward Goo Kristian Jessen Rajiv Kalia Atul Konkar
C. Ted Lee, Jr. Anupam Madhukar Florian Mansfeld Noah Malmstadt Steven R. Nutt
S. Joe Qin Richard Roberts Muhammad Sahimi Katherine Shing Theodore T. Tsotsis
Priya Vashishta Pin Wang Yannis C. Yortsos

Joint Appointments

John W. (Bill) Costerton Edward D. Crandall Daniel Dapkus Martin Gundersen
Michael Kassner Terence G. Langdon Aiichiro Nakano Armand R. Tanguay
Mark E. Thompson Peter Will

Major Research Areas

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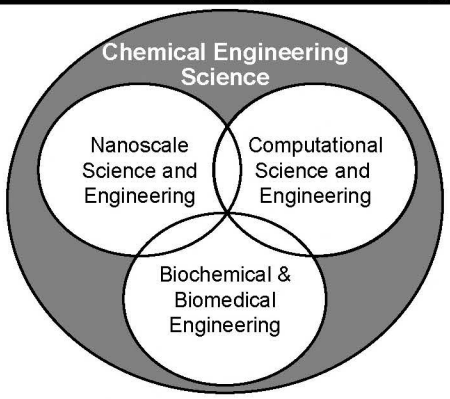

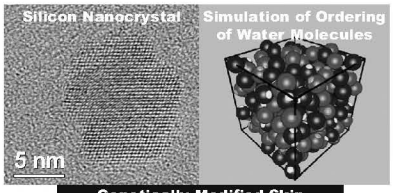

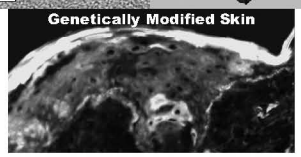

Faculty

Paschalis Alexandridis • *self-assembly, complex fluids, nanomaterials, amphiphilic polymers, biopolymers*
Stelios T. Andreadis • *stem cells, cardiovascular and skin tissue engineering, wound healing, controlled protein and gene delivery*
Michael E. Cain • *cardiac electrophysiology, biomedical engineering, translational research*
Chong Cheng • *polymer and nanomaterial synthesis, drug delivery*
Jeffrey R. Errington • *molecular simulation, statistical thermodynamics, biopreservation*
Vladimir Hlavacek • *reaction engineering, nanopowders, explosives and detonations, analysis of chemical plants*
Mattheos Koffas • *metabolic engineering, bioinformatics, evolutionary engineering*
David A. Kofke • *molecular modeling and simulation*
Carl R. F. Lund • *heterogeneous catalysis, chemical kinetics, reaction engineering*
Michael McKittrick • *molecularly engineered materials, catalysis, photochemistry*
Sriram Neelamegham • *biomedical engineering, cell biomechanics, vascular engineering*
Johannes M. Nitsche • *fluid mechanics, transport phenomena, bioactive surfaces, biological pores*
Sheldon Park • *protein engineering, molecular evolution, structural bioinformatics, and simulations*
Eli Ruckenstein • *catalysis, surface phenomena, colloids and emulsions, biocompatible surfaces and materials*
Michael E. Ryan • *polymer and ceramics processing, rheology, non-Newtonian fluid mechanics*
Harvey G. Stenger, Jr. • *environmental applications of catalysis, hydrogen production, fuel cells*
Mark T. Swihart • *nanoparticle synthesis and applications, chemical kinetics, modeling reacting flows*
Marina Tsianou • *molecularly engineered materials, crystallization, biomaterials, biomimetics*
E. (Manolis) S. Tzanakakis • *stem cell biotechnology, pancreatic cell and tissue engineering, biochemical engineering*

Adjunct Faculty

Athos Petrou (Physics) • *spectroscopy, semiconductor nanostructures*
Frederick Sachs (Biophysics) • *cellular mechanics and signaling*
Carel Jan van Oss (Microbiology and Immunology) • *colloidal stability in polar systems, DLVO theory extended for use in water*

Chemical and Biological Engineering faculty participate in many interdisciplinary centers and initiatives including The Center of Excellence in Bioinformatics and Life Sciences, The Center for Computational Research, The Institute for Lasers, Photonics, and Biophotonics, The Center for Spin Effects and Quantum Information in Nanostructures, The Center for Advanced Molecular Biology and Immunology, and The Center for Advanced Technology for Biomedical Devices

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All Ph.D. students are fully supported as research or teaching assistants. Additional fellowships sponsored by Praxair, Inc., The National Science Foundation, the State University of New York, and other organizations are available to exceptionally well-qualified applicants.

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Faculty

R. Besser (PhD, Stanford University)
G.B. DeLancey (PhD, University of Pittsburgh)
H. Du (PhD, Penn State University)
B. Gallois (PhD, Carnegie-Mellon University)
V. Hazelwood (PhD, Stevens Institute of Technology)
D.M. Kalyon (PhD, McGill University)
S. Kovenklioglu (PhD, Stevens Institute of Technology)
A. Lawal (PhD, McGill University)
W.Y. Lee (PhD, Georgia Institute of Technology)
M. Libera (ScD, Massachusetts Inst. of Technology)
A. Ritter (Ph.D. University of Rochester)
G. Rothberg (PhD, Columbia University)
K. Sheppard (PhD, University of Birmingham)
H. Wang (PhD, University of Twente)
X. Yu (PhD, Case Western)

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Faculty

Pedro E. Arce, *Professor and Chair*
Ph.D., Purdue University, 1990
Electrokinetics, Nano Structured Soft Materials for Electrophoresis, Tissue Scaffolds & Drug Delivery, Non-thermal Plasma High Oxidation Processes

Joseph J. Biernacki, *Professor*
Dr. Eng., Cleveland State University, 1988
Cementious Systems, Micro-fluidics, Electronic and Structural Materials

Ileana C. Carpen, *Assistant Professor*
Ph.D., California Institute of Technology, 2005
Microrheology of Materials, Flow Stability of Complex Fluids, Colloidal Dispersions, Transport in Biological Systems

Mario Oyanader, *Adjunct Professor*
Ph.D., Florida State University, 2004
Electrokinetic Soil Cleaning, Chemical Environmental Processes, Water Resource Management

Holly A. Stretz, *Assistant Professor*
Ph.D., Univ. of Texas at Austin, 2005
Nanocomposite Structure and Modeling, High Temperature Materials and Ablatives, Polymer Processing

Venkat Subramanian, *Assistant Professor*
Ph.D., University of South Carolina, 2001
Electrochemical Systems, Modeling and Control of Batteries and Fuel Cells in Hybrid Environments, Multiscale Simulation, Novel Symbolic Solutions

Donald P. Visco, Jr., *Associate Professor*
Ph.D., University at Buffalo, SUNY, 1999
Bioinformatics, Molecular Design, Thermodynamic Modeling

Chunsheng Wang, *Assistant Professor*
Ph.D., Zhejiang University, 1995
Fuel Cells, Energy Storage Systems, Hydrogen Storage Processes and Materials, Nanomaterials

Emeritus Faculty:
Dr. William D. Holland
Dr. Clayton P. Kerr
Dr. John C. McGee
Dr. David W. Yarbrough

TTU's Chemical Engineering Department blends scholarship and research with advanced studies, offering excellent opportunities to graduate students. Our program offers an M.S. in Chemical Engineering and a Ph.D. in Engineering with a concentration in Chemical Engineering. The relatively small size of the program and friendly campus atmosphere promote close interaction among students and faculty. Research is sponsored by NSF, DOE, NASA, DOD, and state and private sources among others. Faculty members work closely with colleagues in Electrical Engineering, Environmental and Civil Engineering, Mechanical Engineering, Chemistry, Biology, and Manufacturing and Industrial Technology at TTU, as well as maintain strong collaboration with TTU's Centers of Excellence and other leading institutions and national laboratories to build a unique and effective environment for graduate research, learning, and well-rounded training.

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Chemical Engineering at the University of Texas at Austin is an exciting, broad-based and interdisciplinary program, with faculty of diverse research interests. We are one of the leading programs in chemical engineering excelling in all aspects of scholarship, research and education. Both M.S. ChE and Ph.D. ChE degrees are offered. Fellowships and research assistantships are provided, including tuition and fees.

Faculty and their research

David T. Allen, Ph.D., Caltech, 1983 • environmental modeling, air pollution chemistry
Roger T. Bonnecaze, Ph.D., Caltech, 1991 • rheology of complex fluids, materials processing, computational fluid mechanics
James R. Chelikowsky, Ph.D., U of C. Berkeley, 1975 • computational materials science, simulation of complex systems
Thomas F. Edgar, Ph.D., Princeton U., 1971 • process modeling, control, optimization
John G. Ekerdt, Ph.D., U. of C. Berkeley, 1979 • electronic materials chemistry, surface science
R. Bruce Eldridge, Ph.D., U. of Texas, 1986 • separations research
Benny D. Freeman, Ph.D., U. of C. Berkeley, 1988 • polymer science, membranes, barrier materials, nanocomposites
Venkat Ganesan, Ph.D., MIT, 1999 • computer simulations, polymer physics, biological physics
George Georgiou, Ph.D., Cornell U., 1987 • microbial, protein biotechnology
Adam Heller, Ph.D., Hebrew U., 1961 • biosensors, bioelectrochemistry, bioengineering of diabetes management
Gyeong S. Hwang, Ph.D., Caltech, 1999 • multiscale modeling, nanostructuring, surface & interface science, defect-dopant engineering
Keith P. Johnston, Ph.D., U. of Illinois, 1981 • drug delivery, supercritical fluids
Miguel José-Yacaman, Ph.D., National University of Mexico, 1973 • materials science, electron microscopy, nanoparticles
Brian A. Korgel, Ph.D., U. of C. Los Angeles, 1997 • complex fluids, nanostructured materials
Douglas R. Lloyd, Ph.D., U. of Waterloo, 1977 • polymeric membrane formation, liquid separations
Jennifer Maynard, Ph.D., U. of Texas, 2002 • protein biotechnology, immune engineering, crytallography
C. Buddie Mullins, Ph.D., Caltech, 1990 • surface chemistry, nanostructured film growth
Donald R. Paul, Ph.D., U. of Wisconsin, 1965 • polymer blends and nanocomposites, membranes, barrier materials
Nicholas A. Peppas, Sc.D., MIT, 1973 • biomaterials, polymer physics, bionanotechnology, drug delivery
Danny Reible, Ph.D., Caltech, 1982 • environmental transport phenomena, assessment and remediation of contaminated sites
Gary T. Rochelle, Ph.D., U. of C. Berkeley, 1977 • CO_2 capture to control global warming, reactive mass transfer
Peter J. Rossky, Ph.D., Harvard U., 1978 • theoretical chemistry, liquids, condensed phase quantum dynamics
Isaac C. Sanchez, Ph.D., U. of Delaware, 1969 • statistical thermodynamics of polymer liquids and solutions
Christine E. Schmidt, Ph.D., University of Illinois, 1995 • biomaterials, neural engineering
Mukul M. Sharma, Ph.D., U. of Southern California, 1985 • surface and colloid chemistry
Thomas M. Truskett, Ph.D., Princeton U., 2001 • molecular-based modeling of protein solutions & nano-confined materials
C. Grant Willson, Ph.D., U. of C. Berkeley, 1973 • polymer synthesis, nanotechnology, materials for micro-electronics

Address Inquiries to: Graduate Advisor • Dept. of Chemical Eng. • The University of Texas • 1 University Station C0400 • Austin, TX 78712
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- *Process Systems*
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- *Thermo-Dynamic*

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Graduate Admissions Office
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Dwight Look College of Engineering
Texas A&M University • College Station, Texas 77843-3122
Phone (979) 845-3361 • Website http://www.cheweb.tamu.edu

R.G. Anthony • Ph.D., University of Texas, 1966, C.D. Holland Professor
Environmental remediation & benign processing kinetics, catalysis & reaction engineering

J. Appleby • Ph.D., Cambridge University, 1965 • *Electrochemistry*

P. Balbuena, • Ph.D., University of Texas, 1996, GPSA Professor
Molecular simulation and computational chemistry

J.T. Baldwin • Ph.D., Texas A&M University, 1968
Process, design, integration, and control

M.A. Bevan • Ph.D., Carnegie Mellon University, 1999
Colloidal Science

J.L. Bradshaw • B.S., Texas A&M University, 1960 • *Process safety*

D.B. Bukur • Ph.D., U. of Minnesota, 1974
Reaction engineering, math methods

J.A. Bullin • Ph.D., U. of Houston, 1972, Professor Emeritus

T. Cagin • Ph.D., Clemson University, 1988
Computational materials science and nanotechnology; functional materials for devices and sensors; surface and interface properties of materials

Z. Cheng • Ph.D., Princeton University, 1999 • *Nanotechnology*

R. Darby • Ph.D., Rice University, 1972, Professor Emeritus • *Rheology, polymers*

R.R. Davison • Ph.D., Texas A&M U., 1962, Professor Emeritus
Asphalt characterization

L.D. Durbin • Ph.D., Rice University, 1961, Professor Emeritus

M. El-Halwagi • Ph.D., Univ. of California, 1990, McFerrin Professor
Environmental remediation & benign processing, process design, integration, & control

P.T. Eubank • Ph.D., Northwestern University, 1961
Professor Emeritus • *Thermodynamics*

G. Froment • Ph.D., University of Gent, Belgium, 1957
Kinetics, catalysis, and reaction engineering

C.J. Glover, • Ph.D. Rice University, 1974
Materials chemistry, synthesis, and characterization, transport and interfacial phenomena

J. Hahn • Ph.D., University of Texas, 2002
Process modeling, analysis, and control; systems biology

M. Hahn • Ph.D., Massachusetts Institute of Technology, 2004
Vocal fold tissue engineering; cell-biomaterial interactions

K.R. Hall • Ph.D., Univ. of Oklahoma, 1967, Jack E. & Frances Brown Chair
Process safety, thermodynamics

C.D. Holland • Ph.D., Texas A&M Univ., 1953, Professor Emeritus
Separation processes, distillation, unsteady-state processes

J.C. Holste • Ph.D., Iowa State University, 1973 • *Thermodynamics*

M.T. Holtzapple • Ph.D., University of Pennsylvania, 1981 • *Biomedical/biochemical*

A. Jayaraman • Ph.D., University of California, 1998 • *Biomedical/biochemical*

H.-K. Jeong • Ph.D., University of Minnesota, 2004 • *Nanomaterials*

Y. Kuo • Ph.D., Columbia University, 1979, Dow Professor • *Microelectronics*

C. Laird • Ph.D., Carnegie Mellon University, 2006 • *Process systems analysis*

S. Mannan • Ph.D., University of Oklahoma, 1986, Mike O'Connor Chair I
Director, Mary Kay O'Connor Process Safety Center. Process safety

M. Pishko, Unocal Professor & Head • Ph.D., University of Texas at Austin,1992
Biosensors, biomaterials, drug delivery

J. Seminario • Ph.D., Southern Illinois University, 1988
Lanatter and Herbert Fox Professor. *Molecular simulation and computational chemistry*

D.F. Shantz, Assoc. Head • Ph.D., University of Delaware, 2000
Director, Materials Characterization Facility
Structure-property relationships of porous materials, synthesis of new porous solids

J. Silas • Ph.D., University of Delaware, 2002 • *Biomaterials*

V. Ugaz, Assoc. Head • Ph.D., Northwestern University, 1999
Microfabricated Bioseparation Systems

T.K. Wood • Ph.D., North Carolina State University, 1991
Mike O'Connor Chair II
Green chemistry and bioremediation; biofilms

L. Yurttas • Ph.D., Texas A&M University, 1988
Curriculum Reform, Education

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Contact Information

Dr. M. Nazmul Karim
Professor, Chair, and Graduate Advisor
Department of Chemical Engineering
Texas Tech University
P. O. Box: 43121
Lubbock, TX 79409-3121
e-mail: naz.karim@ttu.edu

GRADUATE PROGRAM IN CHEMICAL ENGINEERING

Texas Tech's Chemical Engineering Graduate Program offers an outstanding balance between theory and experiment and between research and practice. The Faculty represents a broad range of backgrounds that bring industrial, national laboratory and academic experiences to the future graduate student. External funding supports a diverse research portfolio including Polymer Science, Rheology and Materials Science, Process Control and Optimization, Computational Fluid Dynamics, Molecular Modeling, Reaction Engineering, Bioengineering and Nano-Biotechnology.

Key Features: We have fourteen faculty members with significant industrial experience and national recognition within their fields of expertise. There is a Process Control and Optimization Consortium with participation from eight key chemical industries. In 2005 the Department spent over $2.127 million in research expenditure to support graduate research projects. Based on an NSF published report, the Department ranks 46th among all the chemical engineering departments in the country based on research expenditure. Department has an NSF-funded Nanotechnology Interdisciplinary Research Team (NIRT) studying dynamic heterogeneity and the behavior of glass-forming materials at the nanoscale. More than 27,000 students attend classes in Lubbock on a 1,839 acre campus. Texas Tech University offers many cultural and entertainment programs, including nationally ranked football and basketball teams. Lubbock is a growing metropolitan city of more than 200,000 people and is located on top of the caprock on the South Plains of Texas. The city offers an upscale lifestyle that blends well with old fashioned Texas hospitality and Southwestern food and culture.

Admissions: Prospective students should provide official transcripts, official GRE General Test (verbal, quantitative written) scores, and should have a bachelor's degree in chemical engineering or equivalent. Students are urged to apply by the end of January for enrollment in the coming fall semester. Prospective students should apply online by filling out the forms at the website: http://www.depts.ttu.edu/gradschool/prospect.php

FACULTY

Dr. Lenore Dai
Assistant Professor; PhD: University of Illinois

Research:
Fundamentals of Pickering emulsions; Self-assembly of nanoparticles; Dynamics of solid particles at liquid/liquid interfaces; Dynamic wetting; Synthesis and characterization of polymer composites.

Dr. Micah Green
Assistant Professor; PhD: MIT

Research:
Rheology, phase behavior, and applications of carbon nanotubes; multiscale modeling of complex fluids and biological materials.

Dr. Karlene Hoo
Professor; PhD: University of Notre Dame

Research:
Integration of process design with operability; Hemodynamics of venous vein and valve; Embedded control; Intelligent control; Systems engineering.

Dr. Naz Karim
Chairman & Professor; PhD: University of Manchester, UK

Research:
Control and optimization of chemical and bio-processes; Bio-fuels production using recombinant microorganisms; Metabolic engineering; glyco-proteins in CHO cell culture; Diabetic and cardiovascular diseases; Vaccine production for flu viruses.

Dr. Rajesh Khare
Assistant Professor; PhD: University of Delaware

Research:
Nanofluidic devices for DNA separation and sequencing; Lubrication in human joints; Molecular dynamics and Monte Carlo simulations; Multiscale modeling methods; Properties of supercooled liquids and glassy polymers;

Dr. Jeremy Leggoe
Associate Professor; PhD: University of West. Australia

Research:
Modeling aerosol dispersion in the urban environment; Characterizing heterogeneity in multiphase materials; Modeling failure in multiphase materials; Predicting the ultimate strength of thermoplastic elastomers; Constitutive modeling of thermoplastic elastomers.

Dr. Uzi Mann
Professor; PhD: University of Wisconsin

Research:
Particulate technology and processes; Chemical reaction engineering; Chemical process analysis modeling and design; Formulation and synthesis of hollow micro and submicro particles; Biodiesel.

Dr. Greg McKenna
Professor; PhD: University of Utah

Research:
Small molecule interactions with glassy polymers; Torsion and normal force measurements; Nanorheology and nanomechanics; Melt and solution rheometry; Residual stresses in composite materials.

Dr. Jim Riggs
Professor; PhD: University of California at Berkeley

Research:
Process control; Process optimization; Mercury distribution in the human body.

Dr. Sindee Simon
Professor; PhD: Princeton University

Research:
The physics of the glass transition and structural recovery; Melting and Tg at the nanoscale; Cure and properties of thermosetting resins; Measurement of the viscoelastic bulk modulus; Dilatometry and calorimetry.

Dr. Mark Vaughn
Associate Professor; PhD: Texas A & M University

Research:
Nitric oxide in the microcirculation; Membrane transport of small molecules; Transport and reaction in concentrated disperse system.

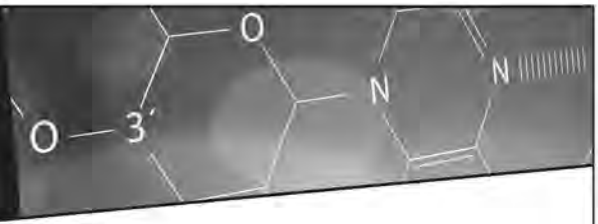
Dr. Brandon Weeks
Assistant Professor; PhD: Cambridge University, UK

Research:
Nanoscale phenomena in energetic materials including crystal growth, nanolithography, thermodynamics and kinetics.; Atomic Force Microscopy and small angle x-ray scattering; Scanning probe instrument design and microscale sensors.

Dr. Ted Wiesner
Associate Professor; PhD: Georgia Tech

Research:
Capturing the energy generated by the human body to power implanted medical devices; Robust control of rate-adaptive cardiac pacemakers; Wastewater treatment for long-duration manned spaceflight; Computer-based training for engineers.

CHEMICAL & ENVIRONMENTAL ENGINEERING



FACULITY

ABDUL-MAJEED AZAD, ASSOCIATE PROFESSOR
Ph. D., University of Madras, India
Nanomaterials & Ceramics Processing, Solid Oxide Fuel Cells

MARIA R. COLEMAN, PROFESSOR
Ph. D., University of Texas at Austin
Membrane Separations, Bioseparations

JOHN P. DISMUKES, PROFESSOR
Ph. D., University of Illinois
Materials Processing, Managing Technological Innovation

ISABEL C. ESCOBAR, ASSOCIATE PROFESSOR
Ph. D., University of Central Flordia
Membrane Fouling and Membrane Modifications

SALEH JABARIN, PROFESSOR
Ph. D., University of Massachusetts
Polymer Physical Properties, Orientation & Crystallization

DONG-SHIK KIM, ASSOCIATE PROFESSOR
Ph. D., University of Michigan
Biomaterials, Metabolic Pathways, Biomass Energy

STEVEN E. LEBLANC, PROFESSOR
Ph. D., University of Michigan
Process Control, Chemical Engineering Education

G. GLENN LIPSCOMB, PROFESSOR AND CHAIR
Ph. D., University of California at Berkeley
Membrane Separations, Alternative Energy, Education

BRUCE E. POLING, PROFESSOR
Ph. D., University of Illinois
Thermodynamics and Physical Properties

CONSTANCE A. SCHALL, ASSOCIATE PROFESSOR
Ph. D., Rutgers University
Biomass conversion, Enzyme kinetics, Crystallization

SASIDHAR VARANASI, PROFESSOR
Ph. D., State University of New York, Buffalo
Colloidal & Interfacial Phenomena, Hydrogels

The Department of Chemical & Environmental Engineering at The University of Toledo offers graduate programs leading to M.S. and Ph.D. degrees. We are located in state of the art facilities in Nitschke Hall and our dynamic faculty offer a variety of research opportunities in contemporary areas of chemical engineering.

SEND INQUIRIES TO:
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The University of Toledo
College of Engineering
2801 W. Bancroft Street
Toledo, Ohio 43606-3390

419.530.8080 www.che.utoledo.edu
cheedept@eng.utoledo.edu

UT
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THE UNIVERSITY OF TOLEDO

Tufts UNIVERSITY

Department of Chemical and Biological Engineering

Research Areas:

Metabolic Engineering, Biotechnology

Materials, Biomaterials, Colloids

Process Control

Reaction Kinetics, Catalysis

Energy and Environmental Engineering

Transport Phenomena

In 2000, Tufts became the first chemical engineering department in the nation to recognize the evolving interdisciplinary nature of the field by integrating biological engineering into its curriculum. Today, Tufts is nationally recognized for excellence in technological innovation, novel research, and superior faculty. Tufts offers ME, MS, and PhD degrees in chemical engineering or biotechnology engineering. Graduate students enjoy a broad arts and sciences environment with all the advantages of a research university, such as opportunities for interdisciplinary collaboration with the University's leading medical and veterinary schools.

Full-time Faculty

Linda Abriola, Dean of School of Engineering, Ph.D. Princeton University
Christos Georgakis Ph.D., University of Minnesota
Maria Flytzani-Stephanopoulos Ph.D., University of Minnesota
David L. Kaplan Ph.D., Syracuse University
Kyongbum Lee Ph.D., M.I.T.
Jerry H. Meldon Ph.D., M.I.T.
Blaine Pfeifer Ph.D., Stanford University
Daniel R. Ryder, Ph.D., Worcester Polytechnic Institute
Nak-Ho Sung, Department Chair, Ph.D., M.I.T.
Hyunmin Yi Ph.D., University of Maryland

Research and Emeritus Faculty

Gregory D. Botsaris Ph.D., M.I.T.
Aurelie Edwards Ph.D., M.I.T.
Howard Saltsburg Ph.D., Boston University
Ken Van Wormer Ph.D., M.I.T.

Tufts University is located just five miles north of the city of Boston and its myriad cultural, academic and recreational resources. Nearby subway stations provide students with quick and easy access to the city.

The Department and its laboratories are housed in the Science & Technology Center, a state of the art research and teaching facility which also houses the cutting-edge interdisciplinary research activities of our Bioengineering Center.

Visit our website!
http://ase.tufts.edu/chemical

For more information:

Tufts University
Chemical and Biological Engineering
Science & Technology Center
4 Colby Street, Room 148
Medford, MA 02155
Phone: 617-627-3900; Fax: 617-627-3991
E-mail: chbe@tufts.edu

Tulane University

Department of Chemical and Biomolecular Engineering

Faculty and Research Areas

Henry S. Ashbaugh • *Classical Thermodynamics and Statistical Mechanics • Molecular Simulation • Solution Thermodynamics • Multi-Scale Modeling of Self-Assembly and Nanostructured Materials*

Daniel C.R. DeKee • *Rheology of Natural and Synthetic Polymers • Constitutive Equations • Transport Phenomena and Applied Mathematics*

W T. Godbey • *Gene Delivery • Cellular Engineering • Molecular Aspects of Nonviral Transfection • Biomaterials*

Vijay T. John • *Biomimetic and Nanostructured Materials • Interfacial Phenomena • Polymer-Ceramic Composites • Surfactant Science*

Victor J. Law • *Modeling Environmental Systems • Nonlinear Optimization and Regression • Transport Phenomena • Numerical Methods*

Brian S. Mitchell • *Fiber Technology • Materials Processing • Composites*

Kim C. O'Connor • *Animal-Cell Technology • Organ/Tissue Regeneration • Recombinant Protein Expression*

Kyriakos D. Papadopoulos • *Colloid Stability • Coagulation • Transport of Multi-Phase Systems Through Porous Media • Colloidal Interactions*

Tulane is located in a quiet, residential area of New Orleans, approximately six miles from the world-famous French Quarter. The department currently enrolls approximately 40 full-time graduate students. Graduate fellowships include a tuition waiver plus stipend.

For Additional Information, Please Contact

Graduate Advisor
Department of Chemical and Biomolecular Engineering
Tulane University • New Orleans, LA 70118
Phone (504) 865-5772 • E-mail chemeng@tulane.edu

Engineering the World

The University of Tulsa

The University of Tulsa is Oklahoma's oldest and largest independent university. Approximately 4,200 students pursue more than 70 major fields of study and graduate programs in more than 25 disciplines.

Tulsa, Oklahoma

Off-campus activities abound in Tulsa, one of the nation's most livable cities. Our temperate climate, with four distinct seasons, is perfect for year-round outdoor activities. With a metropolitan population of 888,000, the city of Tulsa affords opportunities for students to gain internship and work experience in its dynamic data processing, petroleum, medical, and financial industries. One can also enjoy world-class ballet, symphony and theatre performances, and exhibits in the cultural community. Annual events include Mayfest, Oktoberfest, the Chili Cook-off and Bluegrass Festival, the Tulsa Run, and the Jazz and Blues festivals.

Chemical Engineering at TU

TU enjoys a solid international reputation for expertise in the energy industry, and offers materials, environmental and biochemical programs. The department places particular emphasis on experimental research, and is proud of its strong contact with industry.

The department offers a traditional Ph.D. program and three master's programs:

- Master of Science degree (thesis program)
- Master of Engineering degree (a professional degree that can be completed in 18 months without a thesis)
- Special Master's degree for nonchemical engineering undergraduates

Financial aid is available, including fellowships and research assistantships.

The Faculty

D.W. Crunkleton • Fuel cells, sensors, nanotechnology
L.P. Ford • Kinetics of dry etching of metals, surface science
K.D. Luks • Thermodynamics, phase equilibria
F.S. Manning • Industrial pollution control, surface processing of petroleum
C.L. Patton • Thermodynamics, applied mathematics
G.L. Price • Zeolites, heterogeneous catalysis
K.L. Sublette • Bioremediation, biological waste treatment, ecological risk assessment
K.D. Wisecarver • Multiphase reactors, multiphase flows

Further Information
Graduate Program Director • Chemical Engineering Department
The University of Tulsa • 600 South College Avenue • Tulsa, Oklahoma 74104-3189
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E-mail: chegradadvisor@utulsa.edu • Graduate School application: 1-800-882-4723

The University of Tulsa has an Equal Opportunity/Affirmative Action Program for students and employees.

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Located in Nashville, Tennessee, which is one of the most vibrant and cosmopolitan mid-sized cities in the United States, Vanderbilt is a selective, comprehensive teaching and research university. Ten schools offer both an outstanding undergraduate and a full range of graduate and professional programs. With a prestigious faculty of more than 2,200 full-time and 300 part-time members, Vanderbilt attracts a diverse student body of approximately 6,200 undergraduates and 4,800 graduate and professional students from all 50 states and over 90 foreign countries.

Peter T. Cummings *(Ph.D., University of Melbourne)*
Computational nanoscience and nanoengineering; molecular modeling of fluid and amorphous systems; parallel computing; cell-based models of cancer tumor growth

Kenneth A. Debelak *(Ph.D., University of Kentucky)*
Development of plant-wide control algorithms; intelligent process control; activity modeling; effect of changing particle structures in gas-solid reactions; environmentally benign chemical processes; mixing in bioreactors.

Scott A. Guelcher *(Ph.D., Carnegie Mellon University)*
Biomaterials; bone tissue engineering; polymer synthesis and characterization; drug and gene delivery.

G. Kane Jennings *(Ph.D., Massachusetts Institute of Technology)*
Molecular and surface engineering; polymer thin films; solar energy conversion; tribology; fuel cells.

Paul E. Laibinis *(Ph.D., Harvard University)*
Self-assembly; surface engineering; interfaces; chemical sensor design; biosurfaces; nanotechnology.

Yongsheng Leng *(Ph.D., Tsinghua University)*
Molecular modeling of self-assembly at organo-metallic interfaces; nanotribology.

M. Douglas LeVan *(Ph.D., University of California, Berkeley)*
Novel adsorbent materials; adsorption equilibria; mass transfer in nanoporous materials; adsorption and membrane processes.

Clare McCabe *(Ph.D., University of Sheffield)*
Molecular modeling of complex fluids and materials; biological self-assembly; molecular rheology and tribology; molecular theory and phase equilibria.

Ales Prokop *(Ph.D., Czechoslovak Academy of Sciences)*
Biotechnology; bioengineering; drug and gene delivery by means of self-assembled nanoparticles; pharmacokinetics of drug delivery

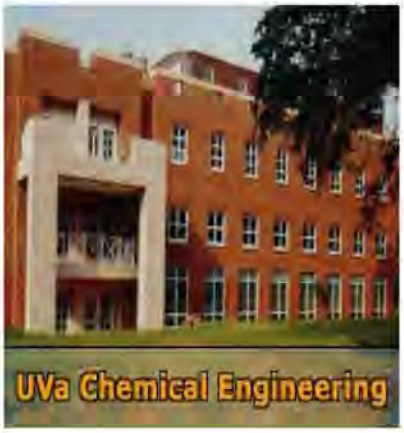
Bridget R. Rogers *(Ph.D., Arizona State University)*
Surfaces, interfaces, and films of microelectronic and ultra-high temperature materials; determination of process/property/performance relationships.

Karl B. Schnelle, Jr. *(Ph.D., Carnegie Mellon University)*
Turbulent transport in the environment; solution thermodynamics; supercritical extraction applied to soil remediation.

For more information:
Director of Graduate Studies
Department of Chemical Engineering
Vanderbilt University • VU Station B 351604
Nashville, TN 37235-1604
Email: chegrad@vanderbilt.edu

University of Virginia

Graduate Studies in Chemical Engineering



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Charlottesville, VA 22904-4741

PHONE:
434-924-7778

E-MAIL:
cheadmis@virginia.edu

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The educational philosophy of the department reflects a commitment to continuing the Jeffersonian ideal of students and faculty as equal partners in the pursuit of knowledge.

Giorgio Carta, *PhD, University of Delaware*
Adsorption, ion exchange, biocatalysis, environmentally benign processing

Robert J. Davis, *PhD, Stanford University*
Heterogeneous catalysis, characterization of metal clusters, reaction kinetics

Erik J. Fernandez, *PhD, University of California, Berkeley*
Purification of biological molecules, protein structure, magnetic resonance imaging and spectroscopy

Roseanne M. Ford, *PhD, University of Pennsylvania*
Environmental remediation, microbial transport in porous media

David L. Green, *PhD, University of Maryland, College Park*
Reaction engineering of nanoparticles, rheology of complex nanoparticle suspensions.

John L. Hudson, *PhD, Northwestern University*
Reaction system dynamics, chaos and pattern formation, electrochemistry

Donald J. Kirwan, *PhD, University of Delaware*
Mass transfer and separations, crystallization, biochemical engineering

Inchan Kwon, *PhD, California Institute of Technology*
(Joining the department in August 2008)
Molecular and cellular engineering in biopharmaceutical, gene delivery and stem cell research

Cato Laurencin, *MD, Harvard Medical School, PhD, Massachusetts Institute of Technology*
Biomaterials, tissue engineering, nanotechnology

Steven McIntosh, *PhD, University of Pennsylvania*
Solid oxide fuel cells, advanced materials, thin films

Matthew Neurock, *PhD, University of Delaware*
Molecular modeling, computational heterogeneous catalysis, kinetics of complex reaction systems

John P. O'Connell, *PhD, University of California, Berkeley*
Molecular theory and simulation with applications to physical and biological systems

Chemical Engineering at **Virginia Tech**

Gateways of Opportunity

Research Centers and Focus Areas

School of Biomedical Engineering and Science
Institute for Critical Technology and Applied Science
Macromolecules and Interfaces Institute
Macromolecular Science and Engineering Program
Biotechnology and Tissue Engineering
Surface Chemistry and Catalysis
Colloid and Surface Science
Computer-aided Design
Nanotechnology and Biomedical Devices
Supercritical Fluids and High Pressure Processing
Computational Science and Engineering

Faculty . . .

Luke E.K. Achenie (Carnegie Mellon)
Modeling of chemical and biological systems

Donald G. Baird (Wisconsin)
Polymer processing, non-Newtonian fluid mechanics

David F. Cox (Florida)
Catalysis, ultrahigh vacuum surface science

Richey M. Davis (Princeton)
Colloids and polymer chemistry, nanostructured materials

Stephen M. Martin (Minnesota)
Soft Materials, self-assembly, interfaces

Aaron S. Goldstein (Carnegie Mellon)
Tissue engineering, interfacial phenomena in bioengineering

Erdogan Kiran (Princeton)
Supercritical fluids, polymer science, high pressure techniques

Y. A. Liu (Princeton)
Pollution prevention and computer-aided design

Eva Marand (Massachusetts)
Transport through polymer membranes, advanced materials for separations

S. Ted Oyama (Stanford)
Heterogeneous catalysis and new materials

Amadeu K. Sum (Delaware)
Simulation of biorelated systems, complex fluids

John Y. Walz [Dept. Head] (Carnegie Mellon)
Colloidal stability, interparticle forces

Virginia Tech

For further information write or call the director of graduate studies or visit our web page

Department of Chemical Engineering
133 Randolph Hall, Virginia Tech, Blacksburg, VA 24061

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e-mail: chegrad@vt.edu • http://www.che.vt.edu

University of Washington
Chemical Engineering

Think big. Come to the UW to make your mark in molecular and nanoscale systems. Create the future.

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- Engineered Biomaterials (UWEB)
- Genetically Engineered Materials Science & Engineering Center (GEMSEC)
- Microscale Life Sciences Center (MLSC)
- National ESCA and Surface Analysis Center for Biomedical Problems (NESCA/BIO)
- National Nanotechnology Infrastructure Network (NNIN)

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- Live in a dynamic region that is a center of biotechnology, high-tech industry, visionary research, and entrepreneurship.

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Research Areas

Biomolecular and Nanoscale Engineering

- Biochemical engineering
- Biomaterial surface analysis
- Environmental biotechnology
- Immunobiosensing
- Interfacial phenomena
- Molecular bioengineering
- Nanomedicine
- Peptide drug delivery
- Polymer physics
- Protein technology
- Surface and colloid science

Energy at the Molecular/Nanoscale

- Electrochemical engineering
- Fuel cell electrocatalysis
- Process control and optimization
- Solid oxide and PEM fuel cells
- Solid state electrochemistry

Organic and Molecular Electronics

- Interfacial phenomena and nanotechnology
- Optoelectronic and photonic materials
- Polymer science and engineering

Core Faculty

Stuart Adler (UC Berkeley)
François Baneyx (Texas–Austin)
John C. Berg (UC Berkeley)
David G. Castner (UC Berkeley)
Bradley R. Holt (Wisconsin)
Thomas A. Horbett (Washington)
Samson A. Jenekhe (Minnesota)
Shaoyi Jiang (Cornell)
Mary E. Lidstrom (Wisconsin)
René M. Overney (Basel, Switz.)
Danilo Pozzo (Carnegie Mellon)
Buddy D. Ratner (Brooklyn Poly.)
N. Lawrence Ricker (UC Berkeley)
Daniel T. Schwartz (UC Davis)
Hong Shen (Cornell)
Eric M. Stuve (Stanford)

Graduate Admissions
Department of Chemical Engineering
University of Washington
Seattle, Washington 98195-1750

Phone: 206-543-2250
Fax: 206-543-3778

Graduate Programs in

Chemical Engineering

Master's and doctoral programs in WSU's School of Chemical Engineering and Bioengineering offer you a world-class environment for research and scholarship with a comprehensive graduate curriculum and highest quality faculty members to lead you. The program is closely aligned with industry and government interests that often lead to professional career opportunities.

Our emphases in bioengineering, environmental restoration, and hydrocarbon processing involve you in such projects as biotreatment of hazardous contamination, diagnostic medical devices, and conversion of natural gas to useful products. Our Center for Multiphase Environmental Research provides interdisciplinary opportunities to solve complex environmental problems at the interface of air, water, and earth.

Facilities

Facilities include the Engineering Teaching and Research Laboratory in Pullman, a state-of-the-art building that houses the O.H. Reaugh Advanced Processing Lab. Other venues are the Spokane Intercollegiate Research and Technology Institute and WSU Tri-Cities access to Hanford resources, such as the Environmental Molecular Science Lab and the Hanford Library.

Financial Assistance

All full-time ChemE graduate students at WSU receive financial support to help cover costs of education, living, and insurance.

Student Life

Pullman's residential campus offers single and family housing for graduate students. Families with children have access to highly rated K-12 schools.

Outdoor and recreational activities abound in the nearby mountains, rivers, and forests. Students may belong to the Graduate and Professional Student Association and numerous other student societies.

About WSU

Washington State University is a land-grant research university founded in Pullman in 1890. It enrolls more than 20,000 students at four campuses and numerous Learning Centers throughout the state. As many as 100 advanced degrees are offered from 70 graduate programs within its eight colleges.

Faculty

Nehal Abul-Lail, Ph.D. Worcester Polytechnic Institute, single-molecule spectroscopy of proteins and lateral force microscopy studies of polymers and lubricants

Haluk Beyenal, Ph.D. Hacettepe University, biofilms, microbial fuel cells, microsensors, and bioremediation

Su Ha, Ph.D. Illinois, electrochemical systems for energy conversion and storage, including Proton Exchange Membrane (PEM) fuel cells, bio fuel cells, fuel reforming for hydrgen production, catalysis

Cornelius Ivory, Ph.D. Princeton, bioprocessing, separations, modeling

James Lee, Ph.D Kentucky, bioprocessing, mixing

KNona Liddell, Ph.D. Iowa State, hazardous wastes, materials, electrochemistry, kinetics, chemical equilibria

James Petersen, Ph.D. Iowa State, bioremediation, bioprocessing, subsurface reactive flow and transport, optimization

Bernie Van Wie, Ph.D. Oklahoma, bioprocessing, biomedical engineering

Richard Zollars, Ph.D. Colorado, colloidal and interfacial phenomena, separations

Contacts

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Richard Zollars, Interim Director ChEBE, 509-335-4332

Bernie Van Wie, Graduate Studies Coordinator, 509-335-4103

WSU Graduate School
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Dept. of Energy, Environmental & Chemical Engineering

The department has a focus on environmental engineering science, energy systems, and chemical engineering. The department provides integrated and multidisciplinary programs of scientific education. Our mission is accomplished by:

- Instilling a tradition of "life-long learning"
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- Participation in cutting-edge research with faculty and industrial partners
- Access to state-of-the-art facilities and instrumentation

The basic degree is an undergraduate degree in chemical engineering. Graduate degrees (Master of Science, Doctor of Science, and Doctor of Philosophy) are offered in both chemical engineering and environmental engineering science on completion of a course of study and research work. A joint degree program with the School of Law allows interested students to obtain both a J.D. and M.S. in environmental engineering science. A minor is offered to undergraduate students interested in environmental engineering and can be selected by any engineering or science student. The program is also affiliated with the Environmental Studies Program.

M. Al-Dahhan - Chemical Reaction Engineering, Multiphase Reactors, Mass Transfer, Process Engineering
L. Angenent - Biological Waste Conversion, Bioareosol Control, Environmental Engineering
R. Axelbaum - Nanoparticle Synthesis, Combustion Engineering
P. Biswas - Aerosol Science & Technology, Environmental & Energy Nanotechnology
D. Chen - Particle Measurement & Instrumentation, Aerosol Science Technology
M. Dudukovic - Multiphase Reaction Engineering, Tracer Methods, Environmental Engineering
D. Giammar - Aquatic Chemistry, Water Quality Engineering, Fate & Transport of Inorganic Contaminants
J. Gleaves - Heterogeneous Catalysis, Surface Science, Microstructured Materials
R. Husar - Environmental Informatics, Aerosol Pattern & Trend Analysis
Y.S. Jun - Aquatic Processes, Molecular issues in Chemical Kinetics
C. Lo - Aquatic Processes, Biomineral Structure & Reactivity at Environmental Interfaces
P. Ramachandran - Chemical Reaction Engineering, Boundary Element Methods
R. Sureshkumar - Complex Fluids Dynamics, Interfacial Nanostructures, Multiscale Modeling & Simulations
J. Turner - Environmental Reaction Engineering, Air Quality Policy & Analysis, Aerosol Science & Technology

Graduate Admissions Committee, Washington University in St. Louis, **Department of Energy, Environmental and Chemical Engineering**
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RESEARCH GROUPS AND PROFESSORS:

1. **Biochemical and Biomedical Engineering:**
   Bill Anderson, Marc Aucoin, Pu Chen, Perry Chou, Eric Jervis, Christine Moresoli, Raymond Legge.
2. **Interfacial Phenomena, Colloids and Porous Media:**
   John Chatzis, Mario Ioannidis, Pu Chen, Mark Pritzker, Rajinder Pal.
3. **Green Reaction Engineering:**
   Bill Anderson, Amit Chakma, Eric Croiset, Bill Epling, Michael Fowler, Flora Ng, Garry Rempel, Qinmin Pan, Mark Pritzker.
4. **Nanotechnology:**
   Pu Chen, Dale Henneke, Leonardo Simon and Michael Tam.
5. **Process Control, Statistics and Optimization:**
   Hector Budman, Peter Douglas, Tom Duever, Ali Elkamel, Alex Penlidis, Mark Pritzker.
6. **Polymer Science and Engineering:**
   Tom Duever, Xianshe Feng, Mike Fowler, Neil McManus, Qinmin Pan, Alex Penlidis, Garry Rempel, Leonardo Simon, Joao Soares, Costas Tzoganakis.
7. **Separation Processes:**
   Amit Chakma, John Chatzis, Pu Chen, Xianshe Feng, Christine Moresoli, Flora Ng, Qinmin Pan, Mark Pritzker.

ADMISSION REQUIREMENTS:

- Undergraduate Degree in Engineering or Science.
- FOR SCIENCE STUDENTS: No additional courses are required from applicants with an undergraduate degree in Science.

For further information, write or phone

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or visit our website at http://cape.uwaterloo.ca

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Sushant Agarwal
West Virginia University

Brian J. Anderson
Massachusetts Institute of Technology

Eung H. Cho
University of Utah

Eugene V. Cilento, Dean
University of Cincinnati

Dady B. Dadyburjor, Chair
University of Delaware

Rakesh K. Gupta
University of Delaware

Elliot B. Kennel
Ohio State University

David. J. Klinke, II
Northwestern University

Edwin L. Kugler
Johns Hopkins University

Ruifeng Liang
Institute of Chemistry, CAS

Joseph A. Shaeiwitz
Carnegie Mellon University

Alfred H. Stiller
University of Cincinnati

Charter D. Stinespring
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Graduate Admission Committee
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304-293-2111 ex 2418
che-info@mail.wvu.edu

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JUAN J. DE PABLO • Molecular thermodynamics, statistical mechanics, polymer physics, nanotechnology, protein biophysics, protein and cell stabilization

JAMES A. DUMESIC • Kinetics and catalysis, surface chemistry, energy from renewable resources

MICHAEL D. GRAHAM (Chairman) • Fluid mechanics, complex fluids, applied and computational mathematics

DANIEL J. KLINGENBERG • Colloid science, complex fluids, suspension rheology

THOMAS F. KUECH • Semiconductor and advanced materials processing, solid-state, electronic, and nanostructured materials, interface science

DAVID M. LYNN • Polymer synthesis, biomaterials, functional materials, gene and drug delivery, controlled release, high-throughput synthesis/screening

CHRISTOS T. MARAVELIAS •
Process modeling and optimization, supply chain optimization, new product development, systems biology, scheduling

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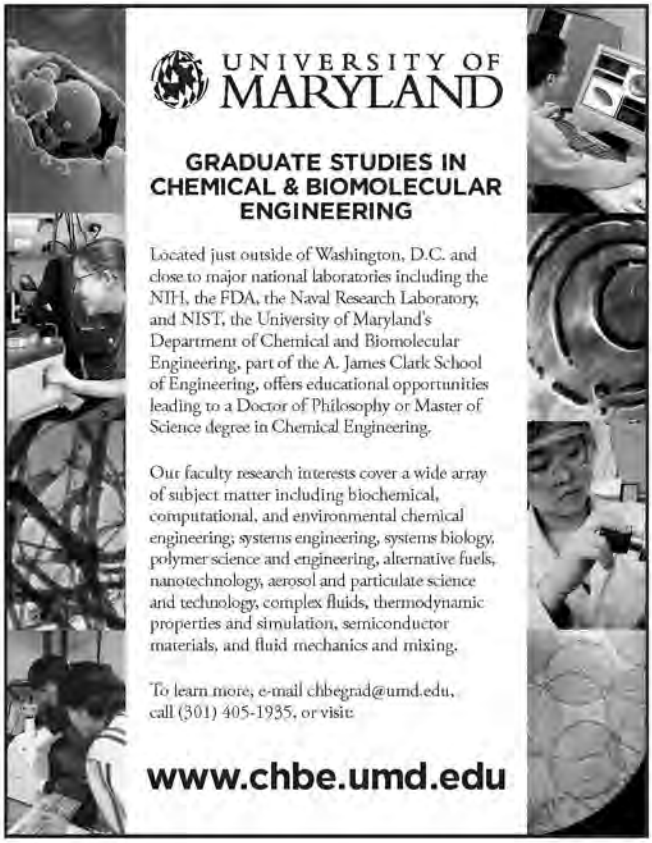

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