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◆

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◆

PhD students may get some incentive scholarships.

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

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

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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

P. WANG
Biocatalysis and Biomaterials (Adjunct)

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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Biomaterials, Catalysis and Reactor Design, Drug Delivery Materials and Systems, Electrohydrodynamics, Electronic Materials, Environmental Studies, Fuel Cells, Interfacial Transport, Magnetic Materials, Membrance Separations and Reactors, Molecular Simulations, Nanoscale Modeling, Polymer Processing and Rheology, Self-Assembled Materials, Suspension Rheology

Faculty:

G. C. April, Ph.D. (Louisiana State)
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)
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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 University
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.

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.

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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.

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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
Tucson, AZ 85721

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

University of Arkansas

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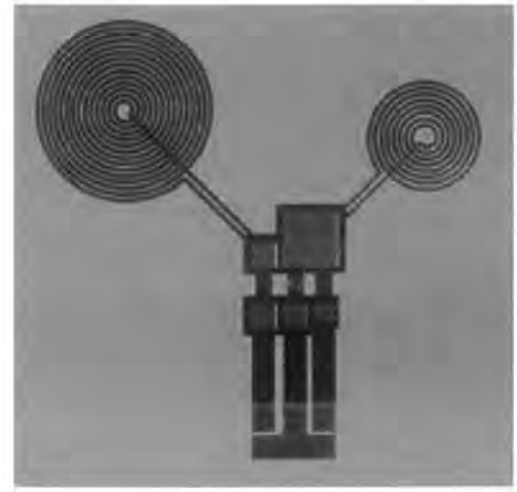
Areas of Research

- 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
- Mixing in chemical processes
- Phase equilibria and process design

Faculty

M.D. Ackerson
R.E. Babcock
R.R. Beitle
E.C. Clausen
R.A. Cross
J.A. Havens
C.N. Hestekin
J.A. Hestekin
J.W. King
W.A. Myers
W.R. Penney
T.O. Spicer
G.J. Thoma
J.L. Turpin
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

AUBURN UNIVERSITY

Chemical Engineering

Faculty

W. Robert Ashurst — *University of California, Berkeley*
Mark E. Byrne — *Purdue University*
Robert P. Chambers — *University of California, Berkeley*
Harry T. Cullinan — *Carnegie Institute of Technology*
Christine W. Curtis — *Florida State University*
Virginia Davis — *Rice University*
Steve R. Duke — *University of Illinois at Urbana-Champaign*
Mario R. Eden — *Technical University of Denmark*
Ram B. Gupta — *University of Texas at Austin*
Thomas R. Hanley — *Virginia Tech Institute*
Gopal A. Krishnagopalan — *University of Maine*
Yoon Y. Lee — *Iowa State University*
Glennon Maples — *Oklahoma State University*
Ronald D. Neuman — *The Institute of Paper Chemistry*
Timothy D. Placek — *University of Kentucky*
Christopher B. Roberts — *University of Notre Dame*
Arthur R. Tarrer — *Purdue University*
Bruce J. Tatarchuk — *University of Wisconsin*
Jin Wang — *University of Texas at Austin*

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- **Sustainable Engineering**
- **Thermodynamics**

For more information:

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Department of Chemical Engineering
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www.eng.auburn.edu/che
chemical@eng.auburn.edu

Financial assistance is available to qualified applicants.

UNIVERSITY OF CALIFORNIA, BERKELEY

The Chemical Engineering Department at the University of California, Berkeley, one of the preeminent departments in the field, offers graduate programs leading to the Master of Science and Doctor of Philosophy. Students also have the opportunity to take part in the many cultural offerings of the San Francisco Bay Area and the recreational activities of California's northern coast and mountains.

FACULTY RESEARCH INTERESTS

BIOCHEMICAL & BIOLOGICAL ENGINEERING
Blanch, Chu, Clark, Keasling, Muller, Prausnitz, Radke & Schaffer

CATALYSIS & REACTION ENGINEERING
Bell, Iglesia, Katz & Reimer

ELECTROCHEMICAL ENGINEERING
Cairns, Newman & Reimer

ENVIRONMENTAL ENGINEERING
Bell, Graves, Iglesia, Keasling, Newman & Prausnitz

MICROELECTRONICS PROCESSING & MEMS
Graves, Maboudian, Reimer & Segalman

POLYMERS & SOFT MATERIALS
Balsara, Chu, Fréchet, Muller, Prausnitz, Radke, Reimer & Segalman

FACULTY

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Alexis T. Bell
Harvey W. Blanch
Elton J. Cairns
Jhih-Wei Chu
Douglas S. Clark
Jean M.J. Fréchet
David B. Graves
Enrique Iglesia
Alexander Katz
Jay D. Keasling
Roya Maboudian
Susan J. Muller
John S. Newman
John M. Prausnitz
Clayton J. Radke
David V. Schaffer
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Arnold L. Grossberg
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PDP EXECUTIVE DIRECTOR

Keith Alexander

Chair: Jeffrey A. Reimer

Starting in Fall 2006, the Department of Chemical Engineering will initiate an innovative new **Product Development Program** (PDP) aiming to expose graduates of chemical engineering and related disciplines in the complex process of transforming technical innovations into commercially successful products. PDP students will gain exposure to real-world product development practice in a range of chemical process-intensive industries including biotechnology, microelectronics, nanoscience, and consumer products. PhD certificate and Master's degree programs will be offered. For more information, call PDP Executive Director Keith Alexander at (510) 642-4526, or go to: *http://cheme.berkeley.edu/PDP/overview.html*.

FOR FURTHER INFORMATION, PLEASE VISIT OUR WEBSITE:
http://cheme.berkeley.edu

Mark Asta, Professor • Ph.D., University of California, Berkeley, 1993 • *Computational materials science, surface and interface science, phase transformations, computer assisted materials design*

David E. Block, Associate Professor • Ph.D., University of Minnesota, 1992 • *Industrial fermentation, bioprocess optimization and artificial intelligence methods*

Roger B. Boulton, Professor and Endowed Chair • Ph.D., University of Melbourne, 1976 • *Wine technology, fermentatiion kinetics, biochemical*

Nigel D. Browning, Professor • Ph.D., University of Cambridge, U.K., 1992 • *Materials structure-property relationships at atomic-scale, atomic resolution and sensitivity imaging, electron microscopy*

Stephanie R. Dungan, Professor • Ph.D., Massachusetts Institute of Technology, 1992 • *Thermodynamics and transport in micellar and microemulsions systems, surfactant interactions with biological and food macromolecules*

Nael El-Farra, Assistant Professor • Ph.D., University of California, Los Angeles 2004 • *Process systems engineering, with emphasis on process control, dynamics and design, computational modeling, simulation*

Roland Faller, Associate Professor • Ph.D., Max-Planck Institute for Polymer Research, 2000 • *Molecular modeling of soft-condensed matter*

Bruce C. Gates, Distinguished Professor • Ph.D., University of Washington, Seattle, 1966 • *Catalysis, surface chemistry, catalytic materials, nanomaterials, kinetics, chemical reaction engineering*

Jeffery C. Gibeling, Professor • Ph.D., Stanford University, 1979 • *Deformation, fracture and fatigue of metals, layered composites and bone*

Joanna R. Groza, Professor • Ph.D., Polytechnic Institute, Bucharest, 1972 • *Plasma activated sintering, processing of nanostructured materials, and microstructure characterization*

Brian G. Higgins, Professor • Ph.D., University of Minnesota, 1980 • *Fluid mechanics and interfacial phenomena, sol gel processing, coating flows*

David G. Howitt, Professor • Ph.D., University of California, Berkeley, 1976 • *Forensic and failure analysis, electron microscopy, ignition and combustion processes in materials*

Alan P. Jackman, Professor Emeritus • Ph.D., University of Minnesota, 1968 • *Biochemical engineering, bioreactor design and kinetics, plant cell cultures, environmental engineering, modeling transport in the environment, environmental sorption process, bioremediation*

Sangtae Kim, Assistant Professor • Ph.D., University of Houston, 1999 • *Transport kinetics in advanced oxides, solid oxide fuel cell, gas separation, membrane reactors*

Tonya L. Kuhl, Associate Professor • Ph.D., University of California, Santa Barbara, 1996 • *Biomaterials, membrane interactions, intermolecular and intersurface forces in complex fluid systems*

Enrique J. Lavernia, Professor • Ph.D., Massachusetts Institute of Technology, 1986 • *Synthesis of structural materials and composites, nanostructured materials and composites, thermal spray processing*

Marjorie L. Longo, Associate Professor • Ph.D., University of California, Santa Barbara, 1993 • *Hydrophobic protein design for active control, surfactant microstructure, and interaction of proteins and DNA with biological membranes*

Karen A. McDonald, Professor • Ph.D., University of Maryland, College Park, 1985 • *Biochemical engineering, plant cell cultures, cyanobacterial cultures*

Amiya K. Mukherjee, Distinguished Professor • D.Phil., University of Oxford, 1962 • *Mechanical behavior, creep, superplasticity, nanocrystalline metals and ceramics*

Zuhair A. Munir, Distinguished Professor • Ph.D., University of California, Berkeley, 1963 • *Synthesis and processing of materials, field effects in mass transport, nanostructures, composites and FGMS, simulation of field-activated synthesis*

Alexandra Navrotsky, Distinguished Professor and Endowed Chair • Ph.D., University of Chicago, 1967 • *Thermodynamics of solid materials, nanomaterials, phase equilibria and metastability, high-temperature calorimetry*

Ahmet N. Palazoglu, Professor • Ph.D., Rensselaer Polytechnic Institute, 1984 • *Process control, process design, automatic control, control systems*

Ronald J. Phillips, Professor • Ph.D., Massachusetts Institute of Technology, 1989 • *Transport processes in bioseparations, Newtonian and non-Newtonian suspension mechanics*

Robert L. Powell, Professor and Chair • Ph.D., Johns Hopkins University, 1978 • *Rheology, suspension mechanics, magnetic resonance imaging of suspensions*

Subhash H. Risbud, Professor • Ph.D., University of California, Berkeley, 1976 • *Semiconductor quantum dots, high T_c superconducting ceramics, polymer composites for optics*

Dewey D.Y. Ryu, Professor • Ph.D., Massachusetts Institute of Technology, 1967 • *Biochemical engineering, biomolecular process engineering and biotechnology*

Julie M. Schoenung, Associate Professor • Ph.D., Massachusetts Institute of Technology, 1987 • *Materials systems analysis, pollution prevention and waste minimization, process economics*

Sabyasachi Sen, Associate Professor • Ph.D., Stanford University, 1996 • *Structure-property relationship, glass, nanocrystalline, glass-ceramic, high temperature liquids, quantum dots, spectroscopy, computer modeling*

James F. Shackelford, Professor • Ph.D., University of California, Berkeley, 1971 • *Structure of materials, biomaterials, nondestructive testing of engineering materials*

J.M. Smith, Professor Emeritus • Sc.D., Massachusetts Institute of Technology, 1943 • *Chemical kinetics and reactor design*

Pieter Stroeve, Professor • Sc.D., Massachusetts Institute of Technology, 1973 • *Membrane separations, self-assembly, colloid and surface science, nanotechnology, surface modification, biotechnology*

Yayoi Takamura, Assistant Professor • Ph.D., Stanford University, 2004 • *Thin film growth and characterization, pulsed laser deposition, new magnetic and electronic materials for spintronic applications, nanoscale patterning techniques*

Stephen Whitaker, Professor Emeritus • Ph.D., University of Delaware, 1959 • *Multiphase transport phenomena*

Department of Chemical Engineering & Materials Science

UCDAVIS

The multifaceted graduate study experience in the Department of Chemical Engineering and Materials Science allows students to choose research projects and thesis advisers from any of our faculty with expertise in chemical engineering, biochemical engineering, and materials science and engineering.

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James C. Earthman *(Stanford University)*
Stanley B. Grant *(California Institute of Technology)*
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:

Nancy L. Allbritton *(Massachusetts Institute of Technology)*
Steve C. George *(University of Washington)*
G. Wesley Hatfield *(Purdue University)*
Noo Li Jeon *(University of Illinois)*
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
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- Water Pollution Control

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For further information and application forms, please visit http://www.eng.uci.edu/dept/chems/
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Department of Chemical Engineering and Materials Science
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UNIVERSITY of CALIFORNIA Riverside

Department of Chemical and Environmental Engineering

Offering degrees at the M.S. and Ph.D. levels in frontier areas of Chemical, Biochemical, Biomedical, Advanced Materials, and Environmental Engineering, we welcome your interest and would be delighted to discuss the details of our graduate program and your application. We have outstanding faculty, research facilities and well supported infrastructure, and offer competitive fellowship packages to qualified applicants.

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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*
Marc A. Deshusses, *ETH Zurich*
Robert C. Haddon, *Penn State*
Mark R. Matsumoto, *UC Davis*
Ashok Mulchandani, *McGill*
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Riverside, CA 92521
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UNIVERSITY OF CALIFORNIA
SANTA BARBARA

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

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

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*) • Fluid Mechanics and Transport on the Microscale, including Microfluids, Electrokinetics, Complex Fluids, and Biomechanics

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.

THE UNIVERSITY

One of the world's few seashore campuses, UCSB is located on the Pacific Coast 100 miles northwest of Los Angeles. The student enrollment is more than 18,000. The metropolitan Santa Barbara area has more than 150,000 residents and is famous for its mild, even climate.

For additional information and application process,visit our Web site at www.chemengr.ucsb.edu or write to:

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

FACULTY RESEARCH AREAS:

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

Anand R. Asthagiri Cellular & Tissue Engineering, Systems & Synthetic 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, Nanotechnology

George R. Gavalas (emeritus)

Konstantinos P. Giapis Plasma Processing, Ion-Surface Interaction Dynamics, Nanoparticle Synthesis, Nanotube Mechanics & Nanofluidics

Sossina M. Haile Advanced Materials, Energy, Reactors, Kinetics & Catalysis

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)

Zhen-Gang Wang Statistical Mechanics, Polymer Science, Biophysics

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- The Chemical Engineering Faculty

Faculty Members

John Anderson
John Angus
Harihara Baskaran
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

Research Opportunities

Energy Systems

Fuel Cells and Batteries
Micro and Bio Fuel Cells
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Membrane Transport, Fabrication

Biological Engineering

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Neural Prosthetic Devices
Cell & Tissue Engineering
Transport in Biological Systems

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Coatings, Thin Films and Surfaces
Sensors
Fine Particle Science and Processing
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Electrochemical Microfabrication
Molecular Simulations
Microplasmas and Microreactors

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

CASE
CASE SCHOOL OF ENGINEERING

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

Chemical Engineering at The City College of New York - CUNY

(The City University of New York)

A 155-year-old urban University, the oldest public University in America, on a 35-acre Gothic and modern campus in the greatest city in the world

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

+Reuel Shinnar∝: Advanced process design methods; Chemical reactor control; Process economics; Energy and environment systems

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 Peffer
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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City College of New York
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cheihr@aol.com

COLORADO SCHOOL OF MINES

Golden, Colorado 80401

Evolving from its origins as a school of mining founded in 1873, CSM is a unique, highly-focused University dedicated to scholarship and research in materials, energy, and the environment.

The Chemical Engineering Department at CSM maintains a high-quality, active, and well-funded graduate research program. Funding sources include federal agencies such as the NSF, DOE, DARPA, ONR, NREL, NIST, NIH as well as multiple industries. Research areas within the department include:

Material Science and Engineering

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)

Finally, located at the foot of the Rocky Mountains and only 15 miles from downtown Denver, Golden enjoys over 300 days of sunshine per year. These factors combine to provide year-round cultural, recreational, and entertainment opportunities virtually unmatched anywhere in the United States.

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/

Colorado State University

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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 engineering faculty at CSU and the culture of cooperative research facilitate this access to experts across departments and colleges. Chemical engineering faculty members and students work jointly with research groups in electrical, mechanical, and civil engineering, microbiology, environmental health sciences, chemistry, and veterinary medicine.

RESEARCH IN . . .

- Biochemical Engineering and Biorefining
- Biomaterials
- Biomedical Engineering
- Biosensors
- 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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or write:

Graduate Advisor, Department of Chemical & Biological Engineering
Colorado State University • Fort Collins, CO 80523-1370

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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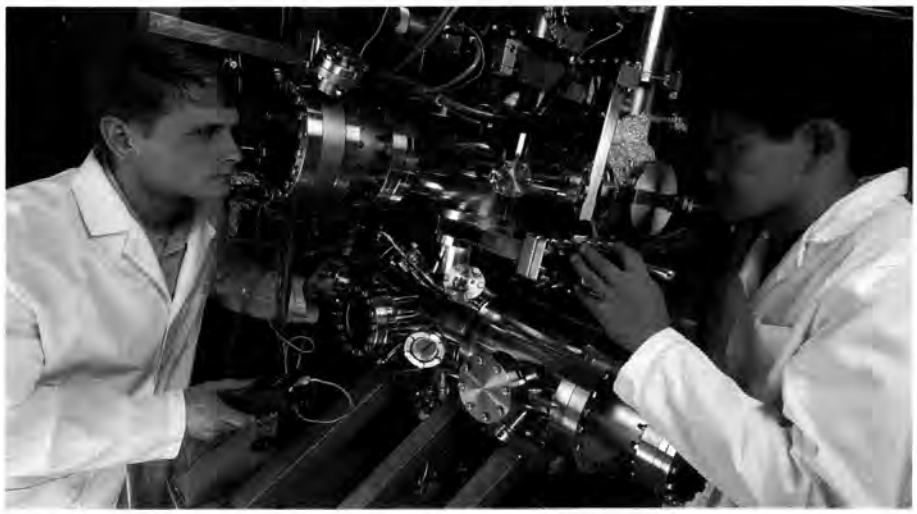
Chemical and Biomolecular Engineering



At Cornell University, graduate students in chemical engineering have the flexibility to design research programs that take full advantage of Cornell's unique interdisciplinary environment and enable them to pursue individualized plans of study.

Cornell graduate programs may draw upon the resources of many excellent departments and research centers such as the Biotechnology Center, the Cornell Center for Materials Research, the Cornell Nanofabrication Facility, the Cornell Supercomputing Facility, and the Nanobiotechnology Center .

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Lynden A. Archer
Paulette Clancy
Claude Cohen
Lance Collins
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T. Michael Duncan
James R. Engstrom
Fernando A. Escobedo
Emmanuel P. Giannelis
Yong Lak Joo
Brian Kirby
Donald L. Koch
Kelvin H. Lee
Leonard W. Lion
Christopher K. Ober
William L. Olbricht
David Putnam
Michael L. Shuler[†,‡]
Paul H. Steen
Abraham D. Stoock
Jeffrey D. Varner
Larry Walker
Ulrich Wiesner

[†] *member, National Academy of Engineering*
[‡] *member, American Academy of Arts & Science*

Research Areas

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- Complex Fluids and Polymers
- Electronic Materials and Microchemical Systems
- Energy and Sustainable Environment

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For further information, write:

Director of Graduate Studies, School of Chemical Engineering, Cornell University, 120 Olin Hall, Ithaca, NY 14853-5201, e-mail: DGS@CHEME.CORNELL.EDU, or "visit" our World Wide Web server at: http://www.cheme.cornell.edu

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at

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- **Environmental science and engineering**
- **Fluid mechanics**
- **Materials science and engineering**
- **Process design and evaluation**

These important research areas are representative of those found in chemical engineering departments around the world. A distinctive feature of the Thayer School is that the professors, students, and visiting scholars active in these areas have backgrounds in a variety of engineering and scientific subdisciplines. This intellectual diversity reflects the reality that boundaries between engineering and scientific subdisciplines are at best fuzzy and overlapping. It also provides opportunities for students interested in chemical and biochemical engineering to draw from several intellectual traditions in coursework and research. Fifteen full-time faculty are active in research involving chemical engineering fundamentals.

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

CHEMICAL ENGINEERING

University of Delaware

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.

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Phone: 302.831.4061

Fax: 302.831.3009

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Mark A. Barteau /computational, spectroscopic and reaction studies of metal oxide surfaces and catalysts; selective oxidation; scanning probe microscopy of ordered arrays containing complex chemical functions.

Antony N. Beris /development and application of numerical methods to fluid mechanics, transport phenomena, polymer physics and materials processing; modeling and simulation of complex systems; use of vector and parallel computer architectures.

Douglas J. Buttrey /chemical synthesis and characterization of advanced oxide materials.

Jingguang G. Chen /synthesis and characterization of alternative electrocatalysts for fuel cells; surface science studies of novel materials for environmental catalysis; nanoparticles for chemical sensors and photocatalysis.

Prasad S. Dhurjati /intelligent process monitoring and online fault diagnosis; bioinformatics, data mining, mathematical modeling of metabolism and regulation.

Thomas H. Epps, III /polymer science; synthesis, structure and phase behavior of block copolymers.

Eric M. Furst /structure, phase behavior, and rheology of complex fluids; cellular mechanics and motility; polymer physics, interfacial phenomena, and colloid science; applications to microfluidics, biosensors, and photonics.

Eric W. Kaler /colloidal materials and properties, design and characterization of surfactant-based complex fluids, including microemulsions and vesicles; equilibrium and dynamic microstructure and properties of colloidal systems — statistical mechanics, neutron- and light-scattering; synthesis of novel polymers and lattices; supercritical fluids; critical phenomena, crystallization of proteins.

Jochen A. Lauterbach /combinatorial catalysis and highthroughput screening, fabrication of conducting polymer nanofilms, non-linear phenomena in heterogeneous catalysis (rate oscillations, spatio-temporal pattern formation, spatiotemporal forcing of non-linear systems), spectral imaging of diffusion processes in polymers.

Abraham M. Lenhoff /protein crystallization and phase behavior, adsorption on surfaces, protein surface interactions, separation and purification of biological macromolecules; colloidal modeling and experimental verification of protein-surface interactions.

Raul F. Lobo /design and characterization of novel catalytic materials, structure-property relationships in microporous materials and the design of adsorbents for gas separations.

Babatunde Ogunnaike /process control, modeling and simulation, systems biology, applied statistics.

Christopher J. Roberts /kinetics and statistical thermodynamics of liquids, amorphous solids (glasses), and proteins; stability prediction, design, and preservation in glasses; kinetics and thermodynamics of protein degradation; prediction of physical and chemical stability of proteins.

Anne S. Robinson /molecular and cellular engineering: understanding protein-protein interactions, both in isolation and in the complex environment of the cell; engineering cellular systems for improved production or drug screening applications; designing novel or more robust proteins.

T.W. Fraser Russell /design and interpretation of laboratory scale experiments to obtain critical information for the design, operation and control of commercial scale equipment; reactors for photovoltaic modules and multi-phase mass contactors.

Stanley I. Sandler /molecular thermodynamics and simulations; statistical mechanics; phase equilibria; bioseparations.

Annette D. Shine /polymer biodegradation kinetics; rheological characterization and relation to structure; processing property for polymer blends; liquid crystalline polymers, and fiber composites during processing; coupled rate processes in polymer-compressed gas systems; supercritical fluids.

Millicent O. Sullivan /biomolecular engineering, nanostructures for delivery of therapeutics.

Dionisios G. Vlachos /surface chemistry, combustion, pollution abatement, reactor design; nucleation and growth of ceramic and metal-composite-based nanophase materials and membranes; numerical methods, multiscale modeling, bifurcation theory, patterning of materials.

Norman J. Wagner /colloid and polymer science, nonequilibrium statistical mechanics, with testing of predictions of thermodynamic, mechanical and optical properties by neutron- and light-scattering; rheology in a wide variety of complex fluids; molecular simulation of polymers and Brownian dynamics; transport properties; parallel simulations.

Brian G. Willis /chemical-physical mechanisms of copper metalization and semiconductor interconnect materials, surface chemistry and experimental investigations of reaction pathways of chemical vapor deposition (CVD) growth systems, computational chemistry models of CVD growth mechanisms, processing of compound semiconductor materials for system-on-a-chip integration.

Richard P. Wool /polymers, composite materials, polymers and composites from biorenewable resources.

FACULTY HIGHLIGHTS

✔11 Presidential/NSF Young Investigators/CAREER Awards

✔3 Members of the National Academy of Engineering

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

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

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- **CAPEC**
- **CHEC**
- **DPC**
- **IVC-SEP**
- **Membrane Group**

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 unit operations laboratory and pilot plants for distillation, reaction, evaporation, drying, crystallization, etc., are used for both education and research.

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Graduate programs at Department of Chemical Engineering:

Chemical and Biochemical Engineering
http://www.kt.dtu.dk/English/Uddannelse/Uddannelser/CBE_retning_DTU_K.aspx **Stig Wedel** sw@kt.dtu.dk

Petroleum Engineering
http://www.ivc-sep.kt.dtu.dk/petroleum/ **Erling H. Stenby** ehs@kt.dtu.dk

Polymer Engineering
http://www.dtu.dk/Centre/DPC/Edu/MSc_Polymer_Eng.aspx **Ole Hassager** oh@kt.dtu.dk

Advanced and Applied Chemistry
http://www.dtu.dk/English/education/msc/prospective/aa_chem.aspx **Georgios Kontogeorgis** gk@kt.dtu.dk

The starting point for general information is: http://www.dtu.dk/English/education/msc.aspx

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
PhD, University of Minnesota
transport in polymers, biodegradable polymers, transport modeling, coatings, renewable energy

Nily R. Dan
PhD, University of Minnesota
gene and drug delivery, polymer nano-composites, complex fluids

Yossef A. Elabd
PhD, Johns Hopkins University
fuel cells, polymer membranes, diffusion in polymers, electrocatalysts

Elihu D. Grossmann
PhD, University of Pennsylvania
pyrolysis of polymers, nanotube synthesis, safety analysis

Kenneth K.S. Lau
PhD, Massachusetts Institute of Technology
surface science, nanotechnology, polymer thin films and coatings, chemical vapor deposition

Anthony M. Lowman
PhD, Purdue University
biomaterials, drug delivery, hydrogels

Raj Mutharasan
PhD, Drexel University
biochemical engineering, cellular metabolism in bioreactors, biosensors

Giuseppe R. Palmese, Head
PhD, University of Delaware
reacting polymer systems, nanostructured polymers, materials from renewable sources, composites and interfaces

Masoud Soroush
PhD, University of Michigan
process systems engineering, polymer engineering, modeling simulation

Charles B. Weinberger
PhD, University of Michigan
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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Faculty

P.A. Jennings, Ph.D.
J.R. Brenner, Ph.D.
M.E. Pozo de Fernandez, Ph.D.
R.G. Barile, Ph.D.
S. Dutta, Ph.D.
M.M. Tomadakis, Ph.D.
J.E. Whitlow, Ph.D.

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- **Materials Science**
- **Membrane Technology**
- **ISRU**
- **Hydrogen Technology**

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Florida Institute of Technology
College of Engineering
Dept. of Chemical Engineering
150 West University Boulevard
Melbourne, Florida 32901-6975
(321) 674-8068

http://che.fit.edu

Georgia Institute of Technology

this is Chemical & Biomolecular Engineering

FACULTY & THEIR RESEARCH INTERESTS: Pradeep Agrawal: hetereogenous catalysis, surface chemistry, reaction kinetics; Mark Allen: microsystems, MEMS; Sujit Banerjee: environmental issues related to the forest products industry; Sven Behrens: interfacial and colloidal science; Sue Ann Bidstrup Allen: microelectronics, polymer processing; Andreas Bommarius: biocatalysis, bioprocessing; Victor Breedveld: complex fluids, microfluids; Ronald Chance: energy utilization; Rachel Chen: biocatalysis and bioprocessing; Yulin Deng: colloid and surface science, polymer synthesis; Charles Eckert: molecular thermodynamics, chemical kinetics, separations; Jeff Empie: chemical and energy recovery; Larry Forney: mechanics of aerosols, buoyant plumes and jets; Jim Frederick: sustainable process technology, kraft chemical recovery; Tom Fuller: electrochemical systems for energy conversion and storage; Martha Gallivan: process control, interfacial science; Clifford Henderson: microelectronics processing, patterning, imaging materials, thin films; Dennis Hess: microelectronics processing, thin film science and technology, plasma processes; Jeffery Hsieh: pulp and paper; Christopher Jones: catalyst development for polymer synthesis, organo-metallic chemistry; Paul Kohl: photochemical processing, chemical vapor deposition; William Koros: structure-permeability relationships for polymers, ceramics, polymer-ceramic hybrid substrates, formation of composite and integrally skinned asymmetric membranes; Jay Lee: process control, integrated sensing, system identification; Charles Liotta: synthesis and properties of polymeric materials, computer modeling of chemical processes; Hang Lu: biological systems, MEMS; Peter Ludovice: molecular modeling of synthetic and biological macromolecules; Larry McIntire: bioengineering, cellular & tissue engineering; Carson Meredith: colloid and polymer science, technology related to thin films and nanotechnology; John Muzzy: polymer engineering, energy conservation, economics; Sankar Nair: novel materials, nanoscale systems; Athanasios Nenes: atmospheric modeling; Robert Nerem: biomechanics, mammalian cell structures; Mark Prausnitz: bioengineering, drug delivery, tissue permeabilization; Matthew Realff: optimal process design and scheduling; Ronald Rousseau: separation processes, crystallization; Athanassios Sambanis: biochemical engineering, microbial and animal cell structures; Daniel Tedder: process synthesis and simulation, chemical separation, waste management, resource recovery; Amyn Teja: thermodynamic and transport properties, phase equilibria, crystallization & nanomaterials; Ajit Yoganathan: biofluid dynamics, rheology, transport phenomena

Graduate Degree Programs

- M.S. in Chemical Engineering
- Ph.D. in Chemical Engineering
- M.S. in Bioengineering
- Ph.D. in Bioengineering
- M.S. in Paper Science and Engineering
- Ph.D. in Paper Science and Engineering
- M.S. in Polymers

School Home Page

www.chbe.gatech.edu

On-line Graduate Application

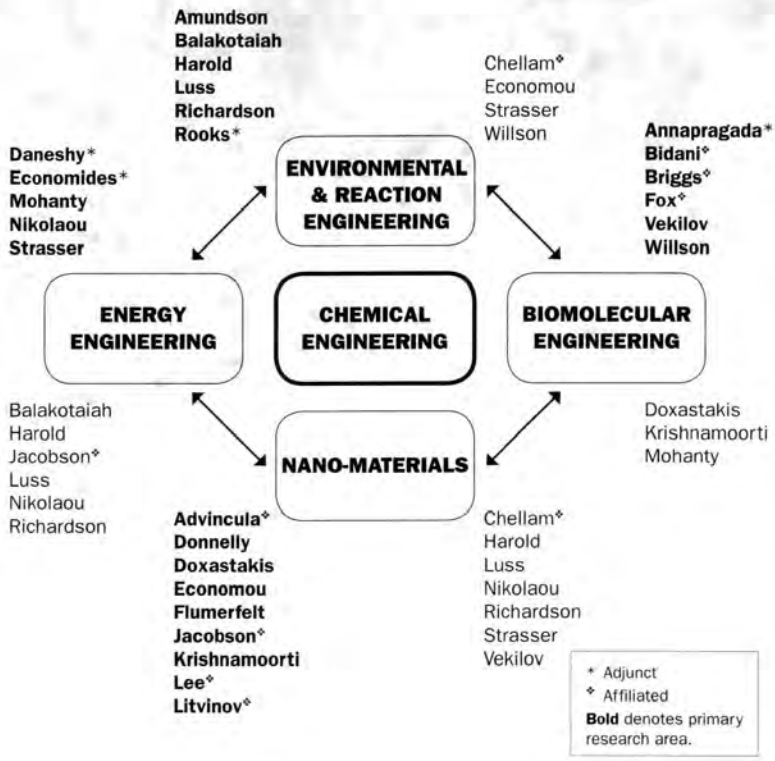
www.gradadmiss.gatech.edu

Contact Information

Dr. Amyn Teja, Associate Chair for Graduate Studies
School of Chemical & Biomolecular Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332-0100
grad.info@chbe.gatech.edu

UNIVERSITY *of* HOUSTON

CHEMICAL & BIOMOLECULAR ENGINEERING GRADUATE PROGRAM



HOUSTON—
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Department of Chemical Engineering

MS and PhD Graduate Program

FACULTY

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Andreas A. Linninger, Associate Professor
Ph.D., Vienna University of Technology, 1992
E-Mail: Linninge@uic.edu

G. Ali Mansoori, Professor
Ph.D., University of Oklahoma, 1969
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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.

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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.

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Supercritical fluids/ High pressure biochemical reactors

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Chemical precipitation processes

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

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Photopolymerization/ Microfabrication/ Spectroscopy

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Polymer reaction engineering/UV curable coatings/Polymer liquid crystal composites

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Bioartificial organs/ Microencapsulation technologies

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Bioremediation/ Extremophile physiology and biocatalysis

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Membrane science/ Polymer science/ Catalysis

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Tissue engineering/ Drug delivery/Polymeric biomaterials/Immuno-cancer therapy/Nano and microtechnology

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

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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
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Protein crystallization/ Surfactant technology

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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 Biorenewables, and the Institute for Combinatorial Discovery.

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Biorenewable resources for energy

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- James H. Edgar, *University of Florida*, semiconductor processing and 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 and their applications to biological systems, environmental control, and novel materials
- 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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Cain Department of Chemical Engineering

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TO APPLY, CONTACT

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University of Maine

Department of Chemical and Biological Engineering

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ALBERT CO PhD (Wisconsin)
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Graduate Study in BIOCHEMICAL ENGINEERING For Engineering and Science Majors

EMPHASIS

The Department of Chemical and Biochemical Engineering at UMBC offers graduate programs leading to M.S. and Ph.D. degrees in Chemical Engineering. Our research is heavily focused in biochemical, biomedical, and bioprocess engineering and covers a wide range of areas including fermentation, cell culture, downstream processing, drug delivery, protein engineering, and bio-optics. Unique programs in the regulatory-engineering interface of bioprocessing are offered as well.

FACILITIES

The Department offers state-of-the-art facilities for faculty and graduate student research. These modern facilities have been developed primarily in the last six years and comprise 6,000 square feet of laboratory space in the Technology Research Center plus 7,000 square feet of departmental laboratories in the new Engineering and Computer Science building.

LOCATION

UMBC is located in the Baltimore-Washington corridor and within easy access to both metropolitan areas. A number of government research facilities such as NIH, FDA, USDA, NSA, and a large number of biotechnology companies are located nearby and provide excellent opportunities for research interactions.

FOR FURTHER INFORMATION CONTACT:

Graduate Program Coordinator
Department of Chemical and Biochemical Engineering
University of Maryland Baltimore County
1000 Hilltop Circle
Baltimore, Maryland 21250
Phone: (410) 455-3400
FAX: (410) 455-1049

FACULTY

T. BAYLES, Ph.D. *Pittsburgh*
Engineering education; k-12 Outreach

M. CASTELLANOS, Ph.D. *Cornell*
Mathematical modeling of biological systems; Biocomplexity; Molecular systems engineering

D. D. FREY, Ph.D. *California-Berkeley*
Biochemical separations; Chromatography of biopolymers

T. GOOD, Ph.D. *University of Wisconsin-Madison*
Cellular Engineering; Protein Aggregation; In Vitro Models of Disease

J. LEACH, Ph.D. *University of Texas at Austin*
Biomaterials; Cell and Tissue Engineering

M. R. MARTEN, Ph.D. *Purdue*
Proteome analysis; Cellular, bioprocess, and biomedical engineering.

A. R. MOREIRA, Ph.D. *Pennsylvania*
rDNA fermentation; Regulatory issues; Scale-up; Downstream processing

G. F. PAYNE, Ph.D.* *Michigan*
Biomolecular engineering; Biopolymers; Renewable resources.

G. RAO, Ph.D. *Drexel*
Fluorescence-based sensors and instrumentation; Fermentation and cell culture.

J. M. ROSS, Ph.D. *Rice*
Cellular and biomedical engineering; Cell adhesion; Tissue engineering

* *Joint appointment with the University of Maryland Biotechnology Institute*

University of Massachusetts - Amherst

Experience our program in Chemical Engineering

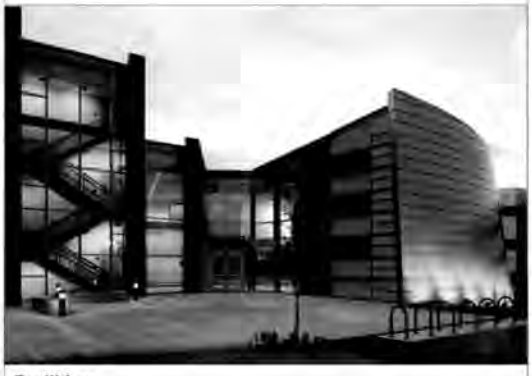
Amherst is a beautiful New England college town in Western Massachusetts. Set amid farmland and rolling hills, the area offers pleasant living conditions and extensive recreational facilities, and urban pleasures are easily accessible.

For application forms and further information on fellowships and assistantships, academic and research programs, and student housing, see:

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:

Surita R. Bhatia *(Princeton)*
W. Curtis Conner, Jr. *(Johns Hopkins)*
Jeffrey M. Davis *(Princeton)*
James M. Douglas, Emeritus *(Delaware)*
Neil S. Forbes *(Berkeley)*
David M. Ford *(Univ. of Pennsylvania)*
Michael A. Henson *(UC Santa Barbara)*
George W. Huber *(Wisconsin, Madison)*
Robert L. Laurence Emeritus *(Northwestern)*
Michael F. Malone *(Univ. of Massachusetts)*
Dimitrios Maroudas *(MIT)*
Peter A. Monson *(London)*
T. J. "Lakis" Mountziaris, Head *(Princeton)*
Susan C. Roberts *(Cornell)*
Lianhong Sun *(CalTech)*
Phillip R. Westmoreland *(MIT)*
H. Henning Winter *(Stuttgart)*

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

Research in . . .

Biochemical Engineering • Biomedical Engineering
Biotechnology • Catalysis and Chemical Kinetics
Colloid Science and Separations
Energy Engineering • Environmental Engineering
Materials • Microchemical Systems, Microfluidics • Nanotechnology
Polymers • Process Systems Engineering
Thermodynamics, Statistical Mechanics, and Molecular Simulation
Transport Processes

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.*

MIT is located in Cambridge, just across the Charles River from Boston, a few minutes by subway from downtown Boston and Harvard Square. The area is world-renowned for its colleges, hospitals, research facilities, and high technology industries, and offers an unending variety of theaters, concerts, restaurants, museums, bookstores, sporting events, libraries, and recreational facilities.

R.C. Armstrong, *Head*	**W.H. Green**	**H.H. Sawin**
P.I. Barton	**P.T. Hammond**	**K.A. Smith**
D. Blankschtein	**T.A. Hatton**	**Ge. Stephanopoulos**
A. Chakraborty	**K.F. Jensen**	**Gr. Stephanopoulos**
R.E. Cohen	**R.S. Langer**	**J.W. Tester**
C.K. Colton	**D.A. Lauffenburger**	**B.L. Trout**
C.L. Cooney	**N. Maheshri**	**P.S. Virk**
W.M. Deen	**G.J. McRae**	**D.I.C. Wang**
P.S. Doyle	**K.J. Prather**	**K.D. Wittrup**
K.K. Gleason	**G.C. Rutledge**	

For more information, contact

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URL • http://web.mit.edu/cheme/index.html

McGill Chemical Engineering

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

Downtown Montreal, Canada

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:
***Visit*: www.mcgill.ca/chemeng/**
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McMaster University
ENGINEERING

Graduate Studies in Chemical Engineering

We offer a Ph. D. program and three Master's options (Thesis, Project, Internship) in the following research areas:

- **Biomaterials:** Tissue engineering, biomedical engineering, blood-material interactions
  J.L. Brash, K. Jones, H. Sheardown,
- **Bioprocessing:** Membranes, environmental engineering, bioseparation
  C. Filipe, R. Ghosh,
- **Transport Phenomena:** Heat transfer, experimental & computational fluid mechanics, membranes
  J. Dickson, A. N. Hrymak, P.E. Wood
- **Polymer Science:** Pulp & paper science, polymerization, polymer characterization, synthesis
  A. E. Hamielec (Emeritus), R. H. Pelton, S. Zhu, K. Kostanski (Adjunct)
- **Polymer Engineering:** Polymer processing, rheology, CAD/CAM methods, extrusion
  A. E. Hamielec (Emeritus), A. N. Hrymak, M. Thompson, J. Vlachopoulos, S. Zhu
- **Process Systems Engineering:** Multivariate statistical methods, computer process control, optimization
  J. F. MacGregor, T. E. Marlin, P. Mhaskar, C. L. E. Swartz, P. Taylor, T. Kourti (Adjunct)

We will provide financial support to any successful applicant who does not already have external support. In addition we have a limited number of teaching and research assistantships.

Why choose McMaster?

Hamilton is a city of over 400,000 situated in Southern Ontario. We are located about 100 km from both Niagara Falls and Toronto. McMaster University is one of Canada's top 8 research intensive universities. An important aspect of our research effort is the extent of the interaction between faculty members both within the department itself and with other departments at McMaster. Faculty are engaged in leading edge research and we have concentrated research groups that collaborate with international industrial sponsors:

- Centre for Pulp and Paper Research
- Centre for Advanced Polymer Processing & Design (CAPPA-D)
- McMaster Institute of Polymer Production Technology (MIPPT)
- McMaster Advanced Control Consortium (MACC)

FOR ON-LINE APPLICATION FORMS AND INFORMATION PLEASE CONTACT

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CANADA

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Http://www.chemeng.mcmaster.ca

Chemical Engineering at the
University of Michigan

Faculty

Main Areas of Research

Life Sciences Biotechnology

Mark A. Burns – *Microfabricated Chemical Analysis*
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*
Jennifer J. Linderman – *Receptor Dynamics*
Michael Mayer – *Biomembranes*
Henry Y. Wang – *Bioprocess Engineering*
Peter J. Woolf – *Biomathematics*

Energy and Environment

H. Scott Fogler – *Flow and Reactions*
Erdogan Gulari – *Reactions at Interfaces*
Suljo Linic – *Catalysis, Surface Chemistry, Fuel Cells*
Phillip E. Savage – *Sustainable Production of Energy and Chemical Products*
Johannes W. Schwank – *Catalysts, Fuel Cells, and Fuel Conversion*
Levi T. Thompson – *Catalysts, Fuel Cells, Microreactors*
Walter J. Weber, Jr. – *Environmental Process Dynamics and System Sustainability*
Ralph T. Yang – *Adsorption, Reactions, Hydrogen Storage*

Complex Fluids and Nanostructured Materials

Sharon C. Glotzer – *Computational Nanoscience and Soft Materials*
Nicholas Kotov – *Nanomaterials*
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*

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FACULTY

Eray Aydil
Reaction engineering of electronic materials, thin film deposition and etching, photovoltaics

Frank S. Bates
Thermodynamics and dynamics of polymers and polymer mixtures

C. Barry Carter
Defects and interfaces in semiconductors, metals and ceramics, growth of thin films, nanomaterials, glass, reactions TEM, AFM, and SEM

Matteo Cococcioni
Theory and computation, materials design, nanoparticles, transition metal compounds, and molecular chemistry for renewable energies.

Edward L. Cussler
Mass transfer, novel separation processes

Prodromos Daoutidis
Nonlinear process control, process analysis and design

H. Ted Davis
Colloid and interface science, statistical mechanics

Jeffrey J. Derby
High performance computing, materials processing

Kevin D. Dorfman
Transport phenomena, microfluidics, electrophoresis, biophysics

Lorraine F. Francis
Coatings, ceramic and composite processing

C. Daniel Frisbie
Molecular materials and interfaces, organic semiconductors, molecular electronics, atomic force microscopy

William W. Gerberich
Fracture micromechanics and deformation nanomechanics

Russel J. Holmes
Electrical and optical properties of organic/molecular materials, organic semiconductor devices and optoelectronics, exciton-microcavity physics, nanophotonics

Wei-Shou Hu
Biochemical engineering

Yiannis Kaznessis
Computational bioengineering, bioinformatics, statistical mechanics

Efrosini Kokkoli
Bioengineering, biomimetic surface science, biopolymers, biomaterials, targeted drug delivery, colloidal interactions

Satish Kumar
Transport and interfacial phenomena, complex fluids, nanofluidics, and microfluidics

Chris Leighton
Magnetic and electronic properties of thin film magnetic materials and heterostructures

Timothy P. Lodge
Polymer structure and dynamics, polymer characterization

Christopher W. Macosko
Rheology and polymer processing, polymer blends, interfaces and networks

Alon V. McCormick
Reaction engineering of materials synthesis, spectroscopy and cryo-microscopy, molecular simulation

David C. Morse
Statistical mechanics and dynamics of polymer fluids

David J. Norris
Optical materials, colloids

Christopher Palmstrøm
Epitaxial growth processes and heterostructure formation, properties of thin film

Lanny D. Schmidt
Reaction engineering, surface chemistry, heterogeneous catalysis

L. E. Scriven
Fluid mechanics and rheology, colloid and interface science, transport reaction and stress phenomena, materials processing: coatings

David A. Shores
High temperature corrosion, aqueous corrosion of bio-medical materials

William H. Smyrl
Electrochemical engineering, modeling electrochemical systems, microvisualization of reactive surfaces

Friedrich Srienc
Biochemical engineering, systems biology, metabolic networks, single-cell physiology, biodegradable polymers

Robert T. Tranquillo
Cardiovascular and neural tissue engineering

Michael Tsapatsis
Nanoscale engineering of materials for separation, reaction, and energy applications

Renata M. Wentzcovitch
Theory of materials at high pressure and temperature

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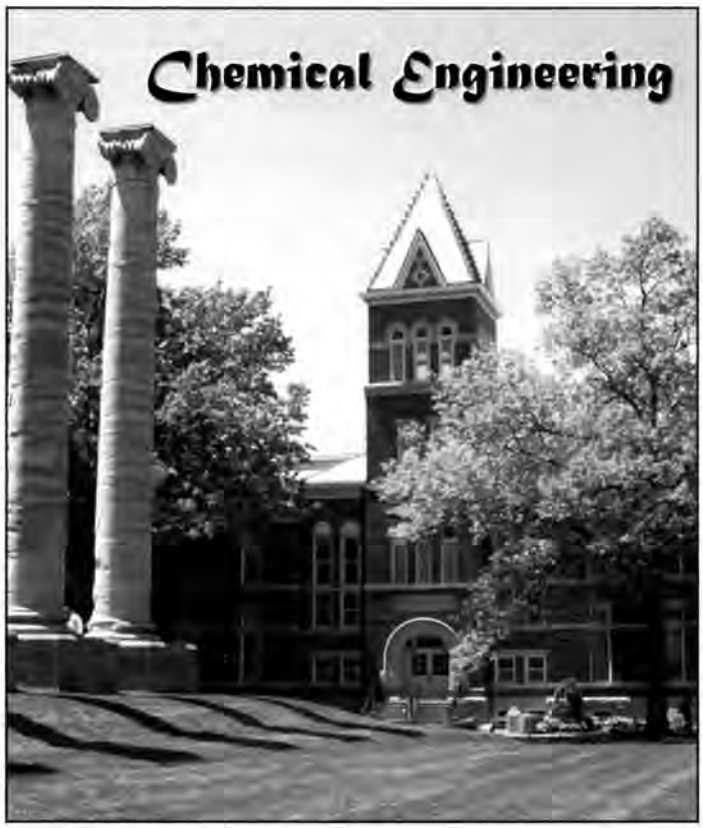

Rakesh K. Bajpai, PhD *(IIT, Kanpur)*
Biochemical Engineering ♣ Hazardous Waste

Paul C. H. Chan, PhD *(CalTech)*
Reactor Analysis ♣ Fluid Mechanics

Eric Doskocil, PhD *(Virginia)*
Catalysis ♣ Reaction Engineering

William A. Jacoby, PhD *(Colorado)*
Photocatalysis ♣ Transport

Sunggyu Lee, PhD *(Case Western)*
Supercritical Fluids ♣ Polymers ♣ Fuels

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)*
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, 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
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E-Mail: PreckshotR@missouri.edu

Scholarships are available in the form of teaching/research assistantships and fellowships.

See our website for more information:
www.missouri.edu/~chewww

University of Missouri-Rolla

Graduate Studies in Chemical Engineering

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Established in 1870 as the University of Missouri School of Mines and Metallurgy, UMR has evolved into Missouri's technological university. UMR is a medium-sized campus of about 5,000 students located along Interstate 44 approximately 100 miles from St. Louis and Springfield. Its proximity in the Missouri Ozarks provides plenty of scenic and recreational opportunities.

The University of Missouri-Rolla's mission is to educate tomorrow's leaders in engineering and science. UMR offers a full range of experiences that are vital to the kind of comprehensive education that turns young men and women into leaders. UMR has a distinguished faculty dedicated wholeheartedly to the teaching, research, and creative activities necessary for scholarly learning experiences and advancements to the frontiers of knowledge.

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/*
E-mail: *umrcbe@umr.edu*

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

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Computer-Aided Process Design; Chemical Process Safety; Engineering Data Management

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

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Biomimetics; Drug Delivery; Biomaterials

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

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Supercritcal Fluid Technology, Materials Processing, and Polymerization; Reactive Polymer Processing; Biodegradable Polymers; Polymer Blends; Scale-Up and Pilot Plant Studies; Environmental Technology

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Transport Phenomena; Adsorption/Desorption; Fundamentals and Processes; Bioseparations; Chromatographic Separations; Capillary Electrochromatography; Chemical Reaction Engineering; Lyophilization

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Bioengineering

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Molecular Simulations of Transport in Confined Systems, Molecular Simulations of Surfactant Systems, Molecular Properties of Materials

Yangchuan Xing
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Synthesis, Processing, and Characterization of Nanomaterials

Craig D. Adams*
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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

Kai-Tak Wan*
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Cellular Biomechanics; Mechanical Characterization and Adhesion Measurement of Single Cell and Biomembranes; Fracture/Mechanical Characterization of Thin Visco-Elastic Polymer Films; Molecular Dynamics Simulation

David J. Westenberg*
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Respiratory Enzymes; Quorum Sensing; Respiratory Genes; Antibacterial Glass

**Joint Appointment*

GRADUATE RESEARCH AT THE FRONTIER

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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 and biomaterials; 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 the very old and the highly contemporary, the natural world and the manmade environment, the frontier town and the cosmopolitan city, a harmonious blend of diverse cultures and peoples.

Join us! Be part of this future!

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
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

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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, Separations, and Fuel Cell Technology
- **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
- **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, Separations
- **David A. Rockstraw,** Professor, *University of Oklahoma*
  Separations, Environmental Engineering, Kinetics

LOCATION

Southern New Mexico
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For Application and Additional Information

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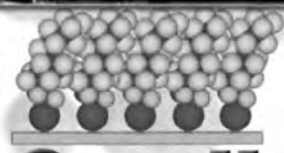

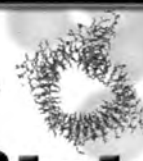

North Carolina State University

Department of Chemical & Biomolecular Engineering

Faculty

Carbonell
DeSimone
Fedkiw
Genzer
Grant
Gubbins
Hall
Haugh
Kelly
Khan
Kilpatrick
Lamb
Lim
Ollis
Overcash
Parsons
Peretti
Roberts
Rao
Spontak
van Zanten
Velev

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Research

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


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Research Areas

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Biological and Physical Interfaces
Biomedical Engineering
Catalysis
Nanocomposite Membranes
Semiconductor Materials

Faculty

Gilda Barabino
Daniel D. Burkey
Rebecca L. Carrier
Carolyn Lee-Parsons
Shashi K. Murthy
Albert Sacco Jr.
Ronald J. Willey
Katherine S. Ziemer

Selected Research Topics

Pharmaceutical compounds from plant cell cultures
Carbon Nanotubes
Mixed-Matrix Membrane Separation
Sickle Cell Adhesion
Surface Acidity of Ti-silicas
Tissue Engineering
Thin Film Heterostructures
Biosensors

Northeastern University Chemical Engineering Department is the home of CAMMP (Center for Advanced Microgravity Materials Processing)—a NASA-sponsored Commercial Space Center. It is one of 16 NASA centers at major universities nationwide and the only one exclusively focused on materials.

For more information write
Chairman
Dept of Chemical Eng. 342 SN
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Boston, MA 02115

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Chemical and Biological Engineering at

Northwestern University

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

Annelise E. Barron, Ph.D., Berkeley, 1995
Bioseparations, biopolymer engineering

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

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

Buckley Crist, Jr., Ph.D., Duke, 1966
Polymer science, thermodynamics, mechanics

Joshua S. Dranoff, Ph.D., Princeton, 1960
Chemical reaction engineering, chromatographic separations

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

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

E. Terry Papoutsakis, Ph.D., Purdue, 1980
Biotechnology of animal and microbial cells, metabolic engineering, genomics

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

Or visit our website at
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
Albert E. Miller
Alexander S. Mukasyan
Andre F. Palmer
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

Biomaterials
Biological Photonic Devices
Blood Rheology
Catalysis and Reaction Engineering
Combinatorial Materials Synthesis
Combustion Synthesis
Drug Delivery
Electrochemical Processes
Environmentally Conscious Design
Enzyme Encapsulation
Inorganic Membranes
Ionic Liquids
Molecular Modeling
Multiphase Flows
Nanostructured Materials
Nonlinear Dynamics
Parallel Computing
Polymeric Materials
Superconducting Materials
Tissue Engineering

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.

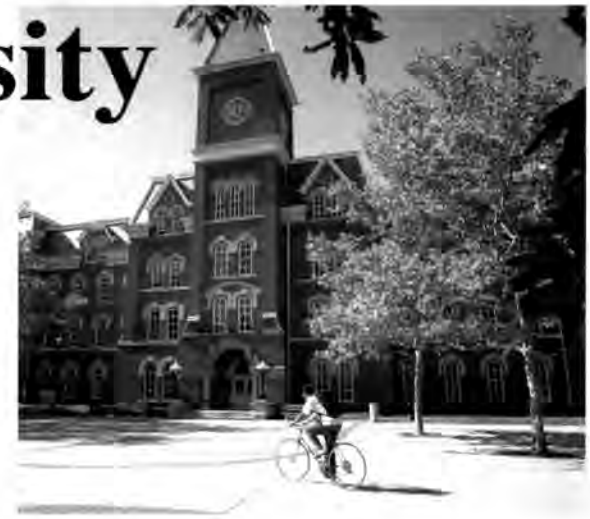
The Department

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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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

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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

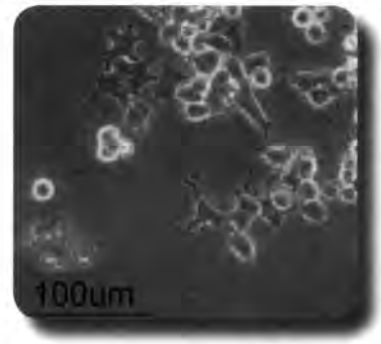
Research Areas

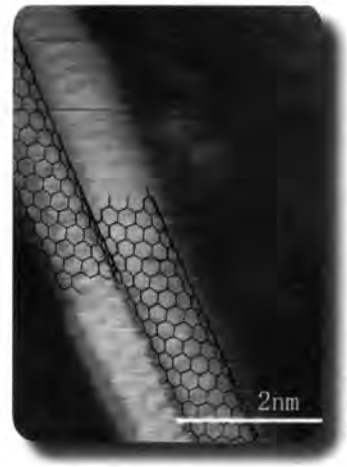
Bioengineering
Genetic engineering, protein production, bioseparations, vascular tissue engineering, cell adhesion, biosensors, orthopedic tissue engineering

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:

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

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OSU's School of Chemical Engineering offers programs leading to M.S. and Ph.D. degrees. Qualified students receive financial assistance at nationally competitive levels.

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
Phase Equilibria
Polymers
Process Control
Process Simulation
Solid Freeform Fabrication
Tissue Engineering

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For more information contact
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Stillwater, OK 74078-5021
gasem@okstate.edu

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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

J. Larry Duda *(Delaware)*—Polymers, Diffusion Thermodynamics, Tribology, Fluid Mechanics, Rheology

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

Michael Pishko *(Texas)*—Bio-materials, Bio-sensing, and Tissue Engineering

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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Professor **Jovan Mijovic**, head
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J. Pinto
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S. Sofou
Engineering principles of drug delivery for cancer cure

L. Stiel
Thermodynamics and transport properties of fluids

E. Ziegler
Air pollution control engineering

W. Zurawsky
Plasma polymerization, polymer thin films

Polytechnic UNIVERSITY

Princeton University

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Computational Chemistry and Materials
Systems Modeling and Optimization

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Biomaterials
Computational Biology
Protein and Enzyme Engineering

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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
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**
Glasses
Kinetic and Nucleation Theory
Liquid State Theory
Molecular Simulation

ChE Faculty

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

Affiliate Faculty

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

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

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Faculty

Rakesh Agrawal
Chelsey D. Baertsch
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
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

These are exciting times at Purdue, in Chemical Engineering (ChE) and in the entire university. The College of Engineering (COE) and the university have created 95 and 300 new faculty positions, respectively, in the last five years. In the COE, most of these positions are cluster hires in signature areas of great importance to society. Nine new faculty, including three members of the National Academy of Engineering, have joined ChE since 2003. A new ChE building was completed in 2005, and the original is undergoing full renovation. The university has recently completed Discovery Park, a new $150 million facility that houses interdisciplinary researchers and equipment in nanotechnology, biotechnology, and other signature areas. More recently, ChE faculty have teamed up with others from Purdue, as well as several universities and industrial partners, to win a national competition and have been awarded $15 million of funding to start an NSF Engineering Research Center for Structured Organic Composites for pharmaceutical and other product applications.

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
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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

Timothy S. Cale, calet@rpi.edu
Semiconductor materials processing; transport and reaction analyses

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
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

Sanat K. Kumar, kumar@rpi.edu
Polymer nanostructures, nanocomposites, dynamics of glasses and gels, thermodynamics of complex fluids

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

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

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

RICE

CHEMICAL AND BIOMOLECULAR ENGINEERING @ 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 (Effective 7/1/2007)
(UT Austin, 2005)

Michael Wong
(MIT, 2000)

Kyriacos Zygourakis
(Minnesota, 1981)

Joint Appointments

Vicki Colvin
(UC Berkeley, 1994)

Anatoly Kolomeisky
(Cornell, 1998)

Antonios Mikos
(Purdue, 1988)

Ka-Yiu San
(Caltech, 1984)

Jennifer West
(UT Austin, 1996)

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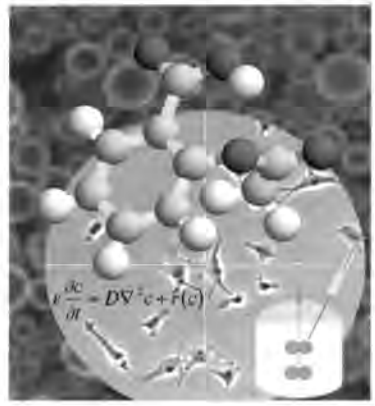

FACULTY RESEARCH AREAS

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

Gas hydrates, statistical mechanics, transport and thermodynamic fluid properties, enhanced oil recovery, reservoir characterization, aquifer remediation, pollution control.

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Department of Chemical Engineering

University of Rochester

M. L. ANTHAMATTEN, Ph.D. 2001, M.I.T.
Macromolecular Self-Assembly • Associative and Functional Polymers • Nanostructured Materials • Optoelectronic Materials • Vapor Deposition Polymerization • Interfacial Phenomena

S. H. CHEN, Ph.D. 1981, Minnesota
Polymer Science and Engineering • Glass-forming liquid crystals • Mesomorphic conjugated polymers • Photonic and electronic devices

E. H. CHIMOWITZ, Ph.D. 1982, Connecticut
Critical Phenomena • Statistical Mechanics of Fluids • Computer-Aided Design

D. R. HARDING, Ph.D. 1986, Cambridge (England)
Thin-film deposition • Properties of Films and Composite Structures • Developing Cryogenic Fuel Capsules for Nuclear Fusion Experiments

S. D. JACOBS, Ph.D. 1975, Rochester
Optical Materials for Laser Applications • Liquid-Crystal Optics • Electrooptic Devices • Optics Manufacturing Processes • Magnetorheological Finishing • Polishing Abrasives and Slurries • Optical Glass

J. JORNE, Ph.D. 1972, California (Berkeley)
Electrochemical Engineering • Fuels Cells • Microelectronics Processing • Ecosystems • Sustainable Energy

M. R. KING, Ph.D. 1999, Notre Dame
Dynamics of Leukocyte and Platelet Adhesion, Computational Bioftuid Mechanics • Cell and Tissue Engineering

L. J. ROTHBERG, Ph.D. 1984, Harvard
Polymer Electronics • Optoelectronic Devices • Light-Emitting Diodes • Thin Film Transitors • Organic Photovoltaics and Solar Cells • Biomolecular Sensors • Plasmon-enhanced Devices

Y. SHAPIR, Ph.D. 1981, Tel Aviv (Israel)
Critical Phenomena • Transport in Disordered Media • Scaling Behavior of Growing Surfaces

C.W. TANG, Ph.D. 1975, Cornell
Organics Electronic Devices • Organic Light-Emitting Diodes • Solar Cells • Photoconductors • Image Sensors • Photoreceptors • Metal-Organic and Organic-Organic Junction Phenomena • Flat-Panel Display Technology

J. H. D. WU, Ph.D. 1987, M.I.T.
Biochemical Engineering • Fermentation • Biocatalysis • Bone Marrow Tissue Engineering • Molecular Control of Hematopoiesis • Stem Cell and Lymphocyte Culture • Enzymology of Biomass Degradation and Energy Utilization • Molecular Biology

H. YANG, Ph.D. 1998, Toronto
Nanostructured Materials • Magnetic Nanoparticles and Nanocomposites • Mesoporous Solids • Micro- and Nanofabrication • Synthesis of Nanoparticles in Ionic Liquid • Methanol and Hydrogen Fuel-Cell Catalysts • Porous Solids • Functional Nanomaterials for Photonic and Biological Applications

M. YATES, Ph.D. 1999, Texas (Austin)
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Located in southern New Jersey, the nearby orchards and farms are a daily reminder that this is the Garden State. Cultural and recreational opportunities are plentiful in the area. Philadelphia and the scenic Jersey Shore are only a short drive, and major metropolitan areas are within easy reach.

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 · Green 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 · Environmental Engineering

For additional information

Dr. Mariano J. Savelski · Graduate Student Advisor · Department of Chemical Engineering · Rowan University · 201 Mullica Hill Road · Glassboro, NJ 08028

Phone: (856) 256-5310 · Fax: (856) 256-5242 E-mail: savelski@rowan.edu · Web: http://engineering.eng.rowan.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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Strategic Research & Educational Thrusts

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- Chemical and Biological Systems Engineering
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Our Graduate Programs

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- An MIT MS-CEP and an NUS PhD; or
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Department of Chemical Engineering

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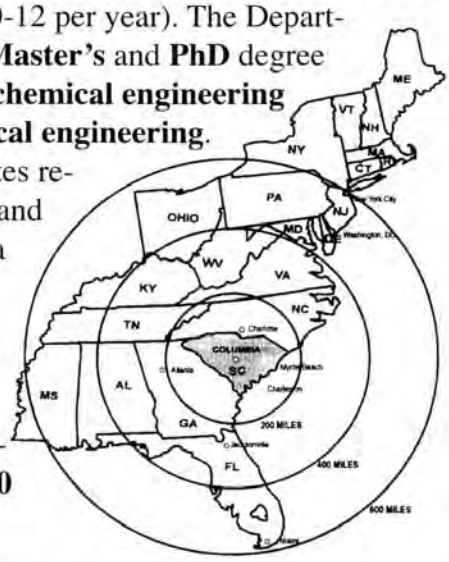

For further information:

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

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Faculty

M.D. Amiridis, *Wisconsin*
J.W. Bender, *Delaware*
J. Delhommelle, *Paris*
F.A. Gadala-Maria, *Stanford*
E.P. Gatzke, *Delaware*
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

Adsorption Technology
Batteries and Fuel Cells
Biomedical Engineering
Biomaterials
Colloids and Interfaces
Composite Materials
Corrosion Engineering
Electrochemistry
Heterogeneous Catalysis
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Numerical Methods
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MATERIALS SCIENCE, AND PETROLEUM ENGINEERING

FACULTY

W. Victor Chang • (Ph.D., Chemical Engineering, California Institute of Technology, 1976) • Physical properties of polymers and composites; adhesion; finite element analysis

Iraj Ershaghi • (Ph.D., Petroleum Engineering, University of Southern California, 1972) • Formation evaluation and characterization of subterranean reservoirs; smart oilfield technologies; geostatistical methods; fractured flow systems

Kristian Jessen • (Ph.D., Chemical Engineering, Technical University of Denmark, 2000) • Flow and transport in porous media, Phase behavior and transport properties of non-ideal mixtures, CO2 sequestration, High order accurate numerical schemes for systems of conservation equations, Analytical methods for systems of hyperbolic conservation equations, Compositional streamline simulation

Edward Goo • (Ph.D., Materials Science, Stanford, 1985) • Microstructural characterization; transmission electron microscopy; phase transformations; crystal defects

Rajiv Kalia • (Ph.D., Physics, Northwestern University, 1976) • multidisciplinary research includes large-scale computer stimulations of novel materials and biomedical systems, procedures and techniques for the interaction of worldwide supercomputer networks, and software tools for interactive visualization environments

Atul Konkar • (Ph.D., Materials Science, University of Southern California 1999) • Electron and Scanning Probe Microscopies, Nanoscale Structural and Electrical Studies of Integrated Nanostructures

C. Ted Lee, Jr. • (Ph.D., Chemical Engineering, University of Texas, Austin, 2000) • Responsive surfactant systems; templated nanomaterials; protein folding; gene transfection; drug delivery; biosurfaces

Anupam Madhukar • (Ph.D., Materials Science and Physics, California Institute of Technology, 1971) • Electronic/ Photonic Materials & Nanostructures --Growth, In-situ processing, Electrical, Optical and Structural Properties, and Devices

Florian B. Mansfeld • (Ph.D., Physical Chemistry, University of Munich, Germany, 1967) • Electrochemistry, corrosion science and technology, electrode-position, batteries and fuel cells.

Steven Nutt • (Ph.D., Materials Science, University of Virginia, 1982) • Mechanical behavior and manufacture of fiber-reinforced composites and sandwich structures; nanocomposite synthesis and properties; synthesis and properties of fiber-reinforced foams; electron microscopy of composite interfaces

Richard Roberts • (Ph.D., Biophysical Chemistry, Yale University, 1993, Postdoctoral fellow Harvard Medical School 1997) • Combinatorial peptide, protein, and drug design, mRNA display, signal transduction, origin of life.

Muhammad Sahimi • (Ph.D., Chemical Engineering, University of Minnesota, 1984) • Membrane separation; heterogeneous materials; atomistic modeling of transport and separation of fluid mixtures in nanaporous materials; flow, transport, reaction and wave propagation in large-scale porous media; percolation theory; massively-parallel computations

Katherine S. Shing • (Ph.D., Chemical Engineering, Cornell, 1982) • Thermodynamics and statistical mechanics; supercritical extraction; protein adsorption

Theodore T. Tsotsis • (Ph.D., Chemical Engineering, University of Illinois, Urbana, 1978) • Chemical reaction engineering; membrane separation processes

Priya Vashishta • (Ph.D., Indian Institute of Technology, Kanpur, India 1967) • Computing technology, realistic simulations of complex systems and processes in the areas of materials, nanotechnology, and bioengineered systems.

Pin Wang • (Ph.D., Chemical Engineering, California Institute of Technology, 2004) • Protein biosysthesis; bimolecular engineering; biomaterials engineering and microfluidic devices for biological application

Yannis C. Yortsos • (Ph.D., Chemical Engineering, California Institute of Technology, 1979) • Flow, transport and reaction in porous media

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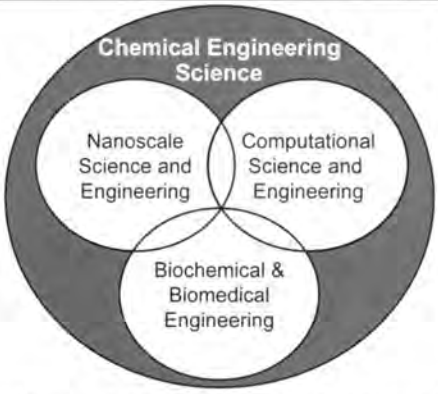

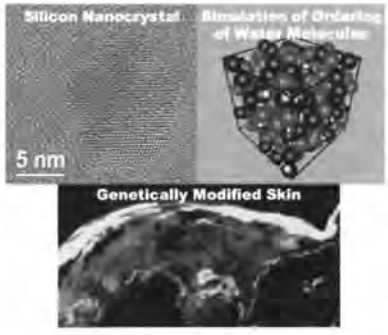

Faculty

Paschalis Alexandridis (MIT) • *self-assembly, complex fluids, nanomaterials, interfacial phenomena, amphiphilic polymers*
Stelios T. Andreadis (Michigan) • *gene therapy, tissue engineering of skin & blood vessels, controlled protein and gene delivery*
Jeffrey R. Errington (Cornell) • *molecular simulation, statistical thermodynamics, biopreservation*
Vladimir Hlavacek (ICT -Prague) • *reaction engineering, nanopowders, explosives and detonations, analysis of chemical plants*
Mattheos Koffas (MIT) • *metabolic engineering, bioinformatics, evolutionary engineering*
David A. Kofke (Pennsylvania) • *molecular modeling and simulation*
Carl R. F. Lund (Wisconsin) • *heterogeneous catalysis, chemical kinetics, reaction engineering*
Michael McKittrick (Georgia Tech) • *molecularly engineered materials, catalysis, photochemistry*
Sriram Neelamegham (Rice) • *biomedical engineering, cell biomechanics, vascular engineering*
Johannes M. Nitsche (MIT) • *fluid mechanics, transport phenomena, bioactive surfaces, biological pores, transdermal transport*
Sheldon Park (Harvard) • *biomolecular engineering, molecular evolution, structural bioinformatics and simulations*
Eli Ruckenstein (Bucharest) • *catalysis, surface phenomena, colloids and emulsions, biocompatible surfaces and materials*
Michael E. Ryan (McGill) • *polymer and ceramics processing, rheology, non-Newtonian fluid mechanics*
Mark T. Swihart (Minnesota) • *nanoparticle synthesis, modeling of reactive flows, computational chemistry, chemical kinetics*
E. (Manolis) S. Tzanakakis (Minnesota) • *stem cell technology, 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) • *colloids and interfaces*
Yaoqi Zhou (Biophysics) • *protein folding, simulation of biomolecules*

Emeritus Faculty in Residence

Robert J. Good (Michigan) • *adhesion and interface science, philosophy of science*
Thomas W. Weber (Cornell) • *process control*
Sol W. Weller (Chicago) • *catalysis, coal liquefaction, history of chemical engineering*

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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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)
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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The Faculty

Paul R. Bienkowski (Ph.D., Purdue, 1975)
Bioprocessing, Thermodynamics

Duane D. Bruns (Ph.D., Houston, 1974)
Process Control, Modeling

John R. Collier (Ph.D., Case Institute, 1966)
Polymer Processing and Properties

Robert M. Counce (Ph.D., Tennessee, 1980)
Green Engineering, Design, Separations

Brian J. Edwards (Ph.D., Delaware, 1991)
Non-Newtonial Fluid Dynamics

Paul D. Frymier (Ph.D., Virginia, 1995)
Biochemical Engineering, Biosensors

David J. Keffer (Ph.D., Minnesota, 1996)
Molecular Modeling of Adsorption, Diffusion and Reaction in Zeolites

Charles F. Moore (Ph.D., Louisiana State, 1969)
Process Control

Tsewei Wang (Ph.D., M.I.T., 1977)
Process Control, Bioprocessing

Frederick E. Weber (Ph.D., Minnesota, 1982)
Radiation Chemistry, Engineering Pedagogy

The Next Step

For additional information contact:
Department of Chemical Engineering
University of Tennessee-Knoxville
419 Dougherty Hall
Knoxville, TN 37996-2200
Phone: (865) 974-2421
Email: cheinfo@utk.edu
World Wide Web: *http://www.che.utk.edu*

The nearby Oak Ridge National Laboratory provides additional cutting-edge opportunities for graduate student research and post-graduation employment. Many of our graduate students conduct research in collaboration with both ORNL scientists and UT faculty. In turn, many ORNL scientists hold adjunct faculty appointments in our department. The result of these collaborative efforts is an exciting research environment in fields such as biotechnology, nanotechnology and high performance computing and simulation.

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Faculty

Pedro E. Arce, *Professor and Chair*
Ph.D., Purdue University, 1990
Electrokinetics, Non-thermal Plasma High Oxidation Processes, Nano Structured Materials

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
Macrorheology of Materials, Flow Stability of Complex Fluids, Colloidal Suspensions

John D. Eliassen, *Adjunct Professor*
Ph.D., University of Minnesota, 1963
Process Design

Holly A. Stretz, *Assistant Professor*
Ph.D., University 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

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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
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 structures, processing and properties
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 • electrochemical biosensing, environmental photoelectrochemistry
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
Yueh-Lin Loo, Ph.D., Princeton U., 2001 • polymer physics & chemistry, organic electronics, patterning
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
S. Joseph Qin, Ph.D., U. of Maryland, 1992 • process control, monitoring & optimization, process modeling & system identification
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
John M. White, Ph.D., U. of Illinois, 1966 • chemical reactions on surfaces, electronic materials

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Process Safety ***Process Systems***

Reaction Engineering ***Thermo-Dynamic***

For More Information

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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, Assoc. Head • 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, , Assoc. Head • 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*

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

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

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

D.F. Shantz • 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 • 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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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.

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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. 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. Jong-Shik Shin
Assistant Professor; PhD: Soeul National University

Research:
Nanobiotechnology; Biological circuit engineering; Protein design and engineering; Biotransformation.

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. Easan Sivaniah
Assistant Professor; PhD: Cambridge University, UK

Research:
The manipulation of self assembly in synthetic and natural macromolecular systems.; Systems of study include, block copolymers, colloidal assemblies, 2 beam interference lithography, and surface initiated polymerization; Applications of these studies extend to membrane separation and sensors.

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**

FACULTY

MARTIN A. ABRAHAM, PROFESSOR
Ph.D., University of Delaware
Catalysis and Reaction Engineering, Hydrogen Production, Fuel Cell Systems, Sustainability

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

KENNETH J. DEWITT, DISTINGUISHED PROFESSOR
Ph.D., Northwestern University
Transport Phenomena, Modeling & Numerical Methods

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

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

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

DONG-SHIK KIM, ASSISTANT 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 at 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.

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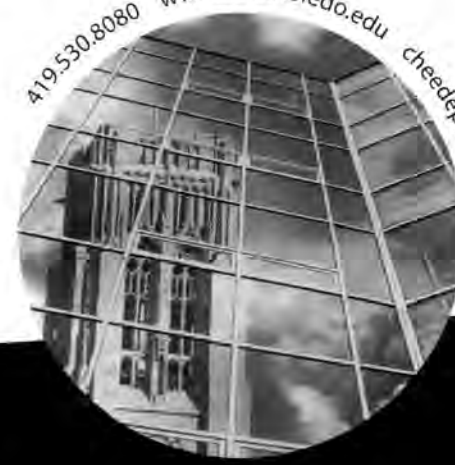

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Tufts University

DEPARTMENT OF CHEMICAL & BIOLOGICAL ENGINEERING

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.

The Department and its laboratories are housed in the Science and Technology Center, a state of the art research and teaching facility which also houses the cutting-edge interdisciplinary research activities of our Bioengineering Center. The Tufts campus is only minutes away from Boston's myriad cultural, academic and recreational resources.

Full-time Faculty

Christos Georgakis Department Chair, Ph.D., University of Minnesota
Reactor modeling, control of complex processes, pharmaceutical process engineering

Maria Flytzani-Stephanopoulos Ph.D., University of Minnesota
Environmental catalysis, clean energy, pollution prevention

David L. Kaplan Ph.D., Syracuse University
Bioengineered polymers related to self assembly, biomaterials and tissue engineering

Kyongbum Lee Ph.D., M.I.T.
Metabolic engineering, biotechnology, bioinformatics

Jerry H. Meldon Ph.D., M.I.T.
Membrane science and technology, mass transfer with chemical reaction & mathematical modeling

Blaine Pfeifer Ph.D., Stanford University
Biotechnology, biomaterials, drug and gene delivery for cancer therapy

Daniel R. Ryder, Ph.D., Worcester Polytechnic Institute
Materials science, advanced process control applications

Nak-Ho Sung Ph.D., M.I.T.
Polymers and composites, interface science, polymer diffusion, surface modification

Kenneth A. Van Wormer Sc.D., M.I.T.
Optimization, reaction kinetics, VLSI fabrication

Hyunmin Yi Ph.D., University of Maryland
Nanobiofabrication, engineered biomaterials, biotechnology, bioMEMS

Adjunct & Research Faculty

Gregory D. Botsaris Ph.D., M.I.T.
Crystallization, nucleation, applied surface science

Aurelie Edwards Ph.D., M.I.T.
Biomedical engineering, role of microcirculation in the renal medulla

Dale Gyure Ph.D., University of Colorado
Novel therapeutics and nutrition supplements

Walter Juda Ph.D., University of Lyons
Electrochemistry and chemical reaction engineering

Brian Kelley Ph.D., M.I.T.
Novel methods for protein purification, large-scale purifications, high-density bacterial fermentation

Department of Chemical and Biological Engineering

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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*

Yunfeng Lu • *Nanostructured and Microelectronic Materials • Sol-Gel Processes and Organic/Inorganic Hybrid Materials • Membrane Separations and Catalysts • Chemical Sensors and Biosensors*

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

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- 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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http://www.che.vanderbilt.edu/

Located in Nashville, Tennessee, 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; computer-aided process design and optimization; bacterial migration in *in situ* bioremediation.

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)*
Surface modification; experimental molecular engineering; corrosion inhibition; microelectronics processing.

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

M. Douglas LeVan *(Ph.D., University of California, Berkeley)*
Fixed-bed adsorption; adsorption equilibria; adsorption processes (pressure-swing adsorption, temperature-swing adsorption, adsorptive refrigeration): process design.

Clare McCabe *(Ph.D., University of Sheffield)*
Molecular modeling of complex fluids, nanomaterials, biological systems, molecular rheology, molecular theory, phase equilibria.

Bridget R. Rogers *(Ph.D., Arizona State University)*
Nucleation and microstructure evolution of thin films; fundamentals of thin film processing for microelectronic applications (mass transport, kinetics, and effects of substrate topography on CVD, sputter deposition and etch processes).

Karl B. Schnelle, Jr. *(Ph.D., Carnegie Mellon University)*
Turbulent transport in the environment, control of toxic emissions and SO_2 and NO_x from coal fired boilers, solution thermodynamics, applications of process simulation to microcomputers, supercritical extraction applied to soil remediation.

For more information:

Director of Graduate Studies
Department of Chemical Engineering
Vanderbilt University • VU Station B 351604
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University of Virginia

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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 Pennsylvnaia*
Environmental remediation, microbial transport in porous media

David Green, *PhD, University of Maryland*
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 separtions, crystallization, biochemical engineering

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

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

James P. Oberhauser, *PhD, University of California, Santa Barbara*
Polymer solution flow and microstructure

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

R. Michael Raab, *PhD, Massachusetts Institute of Technology*
Medical and industrial biotechnology, bioinformatics, systems biology

Chemical Engineering at **Virginia Tech**

Gateways of Opportunity

Research Centers and Focus Areas

Polymer Materials and Interface Laboratory
Center for Composite Materials and Structures
Center for Adhesives and Sealant Science
Center for Biomedical Engineering
Center for Self-Assembled Nanostructures and Devices
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 . . .

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

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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.

AUTHOR GUIDELINES

This guide is offered to aid authors in preparing manuscripts for *Chemical Engineering Education (CEE)*, a quarterly journal published by the Chemical Engineering Division of the American Society for Engineering Education (ASEE).

CEE publishes papers in the broad field of chemical engineering education. Papers generally describe a course, a laboratory, a ChE curriculum, research program, machine computation, special instructional programs, or give views and opinions on various topics of interest to the profession. (Note: Articles for the special series on outstanding ChE departments and ChE educators are invited articles.)

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COPY REQUIREMENTS • Submit the manuscript electronically as a pdf, Word, or tif file that includes all graphical material as well as tables and diagrams. Send an additional copy of the manuscript on standard letter-size paper through regular mail channels and include original drawings (or clear prints) of graphs and diagrams on separate sheets of paper. Label ordinates and abscissas of graphs along the axes and outside the graph proper. Figure captions and legends will be set in type and need not be lettered on the drawings. Number all illustrations consecutively. Supply all captions and legends typed on a separate page. Authors should also include brief biographical sketches with the manuscript.

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