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For Additional Information, Write

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For Information Contact:

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

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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.

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For further information, contact:
Graduate Program Officer
Department of Chemical and Materials Engineering
University of Alberta
Edmonton, Alberta, Canada T6G 2G6
Phone: (780) 492-1823 Fax: (780) 492-2881
chemical.engineering@ualberta.ca
www.engineering.ualberta.ca/cme

* This ranking is against 177 programs in the U.S. and Canada and is based on total refereed publications over a five-year period as listed in the Science Citation Index of ISI.

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Microbiological Hazardous Waste Treatment, Metals Speciation and Toxicity

PAUL BLOWERS, Assistant 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, Associate 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 and Interim Head (Colorado)
Bioreactors, Bioremediation, Organics Removal from Soils

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

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

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

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

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Chairman, Graduate Study Committee
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James Beckman, Ph.D., Arizona. Unit operations, applied mathematics, energy-efficient water purification, fractionation, CMP reclamation

Veronica Burrows, Ph.D., Princeton. Surface science, environmental sensors, semiconductor processing, interfacial chemical and physical processes in sensor processing

Jeffrey Heys, Ph.D., Colorado, Boulder. Modeling of biofluid-tisue interaction, tissue and biofilm mechanics, parallel multigrid solvers

Jerry Y.S. Lin, Ph.D., Worcester Polytechnic Institute. Advanced materials (inorganic membranes, adsorbents and catalysts) for applications in novel chemical separation and reaction processes

Chan Beum Park, Ph.D., POSTTECH, South Korea. Bioprocess *in extremis*, novel cell-free protein synthesis, biolab-on-a-chip technolgy

Gregory Raupp, Ph.D., Wisconsin. Gas-solid surface reactions mechanisms and kinetics, interactions between surface reactions and simultaneous transport processes, semiconductor materials processing, thermal and plasma-enhanced chemical vapor deposition (CVD)

Daniel Rivera, Ph.D., Caltech. Control systems engineering, dynamic modeling via system identification, robust control, computer-aided control system design

Michael Sierks, Ph.D., Iowa State. Protein engineering, biomedical engineering, enzyme kinetics, antibody engineering

Joe Wang, Ph.D., Israel Institute of Technology. Nanomaterial-based bioelectronics, biosensors and biochips, electrochemistry

Materials Science and Engineering

James Adams, Ph.D., Wisconsin. Atomistic stimulation of metallic surfaces, adhesion, wear, and automotive catalysts, heavy metal toxicity

Terry Alford, Ph.D., Cornell. Electronic materials, physical metallurgy, electronic thin films

Nikhilesh Chawla, Ph.D., Michigan. Lead-free solders, composite materials, powder metallurgy

Sandwip Dey, Ph.D., Alfred. Electro-ceramics, MOCVD and ALCVD, dielectrics: leakage, loss mechanisms and modeling

Cody Friesen, Ph.D., MIT. Surface/Interface physics, nanomechanics, nanostructured materials, thin film growth, novel approaches to catalysis and sensing, electrochemical processes

Ghassan E. Jabbour, Ph.D., Arizona. Development of materials for optical and electronic applications

Stephen Krause, Ph.D., Michigan. Characterization of structural changes in processing of semiconductors

Subhash Mahajan (Chair), Ph.D., Berkeley. Semiconductor defects, high temperature semiconductors, structural materials deformation

James Mayer, Ph.D., Purdue. Thin film processing, ion beam modification of materials

Nathan Newman, Ph.D., Stanford. Growth, characterization, and modeling of solid-state materials

S. Tom Picraux, Ph.D. Caltech. Nanostructured materials, epitaxy, and thin-film electronic materials

Karl Sieradzki, Ph.D. Syracuse. Fracture of solids, thin-film deposition and growth, corrosion

Mark van Schilfgaarde, Ph.D. Stanford. Methods and applications of electronic structure theory, dilute magnetic semiconductors, GW approximation

For details concerning graduate opportunities in Chemical and Materials Engineering at ASU, please call Paul Grillos at (480) 965-5558, or write to Subhash Mahajan, Chair, Chemical and Materials Engineering, Arizona State University, Tempe, Arizona 85287-6006 (smahajan@asu.edu), or visit us at http://www.fulton.asu.edu/~cme.

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Faculty

M.D. Ackerson
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R.A. Cross
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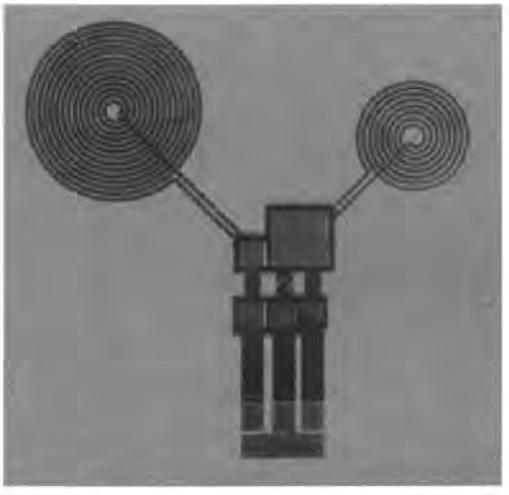

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Chemical Engineering Graduate Program Information: http://www.cheg.uark.edu/graduate.asp

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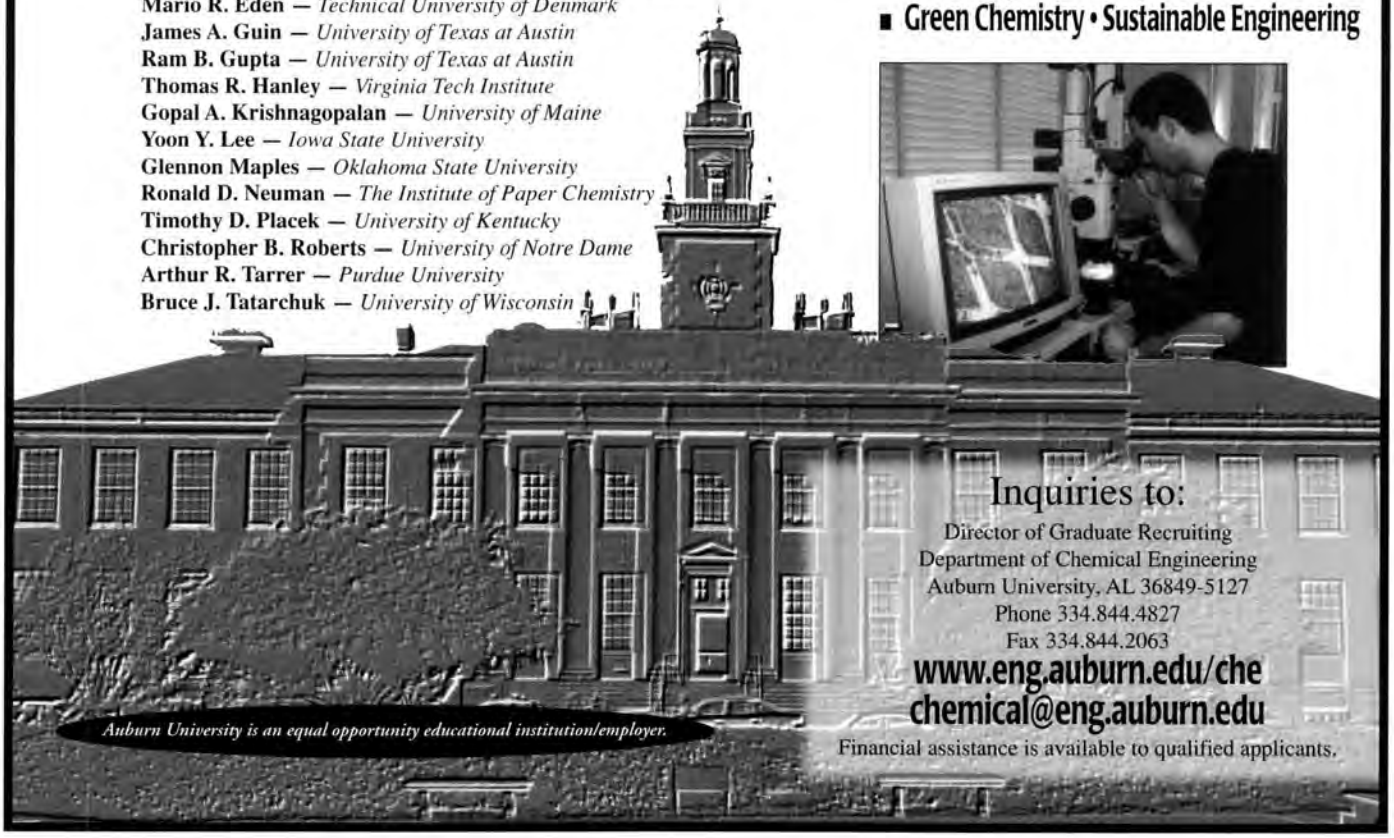
- Green Chemistry • Sustainable Engineering



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• ***For Additional Information Contact*** •
Dr. J. Azaiez • Associate Head, Graduate Studies
Department of Chemical and Petroleum Engineering
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E-mail: gradstud@ucalgary.ca

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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, fermentation 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, Assistant 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 • 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*

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

Department of Chemical Engineering & Materials Science

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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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Frank G. Shi *(California Institute of Technology)*
Vasan Venugopalan *(Massachusetts Institute of Technology)*
Szu-Wen Wang *(Stanford University)*
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Joint Appointments:

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Roger H. Rangel *(University of California, Berkeley)*
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- Mechanical Properties
- Metabolic Engineering
- Microelectronics Processing and Modeling
- Microstructure of Materials
- Multifunctional Materials
- Nanocrystalline Materials
- Nanoscale Electronic Devices
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CHEMICAL AND BIOMOLECULAR ENGINEERING AT

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FOCUS AREAS

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- Process Systems Engineering (Design, Optimization, Dynamics, and Control)
- Semiconductor Manufacturing and Electronic Materials

GENERAL THEMES

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

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CONTACT

Admissions Office
Chemical and Biomolecular Engineering Department
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- Electrochemistry
- Zeolites & Fuel Cells
- Membrane Processes
- Aerosol Physics
- Atmospheric Chemistry
- Renewable Fuels
- Advanced Vehicle Technology
- Water/Wastewater Treatment
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- Site Remediation Processes

FACULTY

Wilfred Chen, *Caltech*
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FACULTY AND RESEARCH INTERESTS

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

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

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

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

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

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

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

ORVILLE C. SANDALL Ph.D. (*Berkeley*) • Transport Phenomena, Separation Processes

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

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

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

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RESEARCH INTERESTS

Aerosol Science
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Biomaterials
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Graduate Coordinator
Department of Chemical Engineering
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Sun-Tak Hwang
Yuen-Koh Kao
Soon-Jai Khang
William Krantz
Paul Phillips
Neville Pinto
Peter Smirniotis

Financial Aid Available

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

For Admission Information
Director, Graduate Studies
Department Chemical and Materials Engineering
PO Box 210012
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E-mail:
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FACULTY RESEARCH:

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

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

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

Ilona Kretzschmar: Materials science; Nanotechnology; Electronic materials

Leslie Isaacs: Preparation and characterization of novel optical materials; Recycling of pavement 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 applications; Surfactant adsorption, phase behavior 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; Spinodal decomposition of binary solvent mixtures; Process economics; Energy and environment systems

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

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*
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∞ *National Academy of Engineering*
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CONTACT INFORMATION:

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City College of New York
Convent Avenue at 140th Street
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Cleveland State University

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CSU Faculty

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N. Holland (Case Western Reserve University)
R. Lustig (Institute of Thermo- and Fluiddynamics of the Ruhr-University Bochum, Germany)
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For more information, write to:

Graduate Program Director
Department of Chemical and Biomedical Engineering
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Adsorption Processes
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Environmental Pollution Control
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  Functional Tissue Engineering, Mechanotransduction, Photopolymerization
- **David E. Clough**
  Process Control, Applied Statistics
- **Robert H. Davis**
  Fluid Mechanics, Biotechnology, Membranes
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  Catalysis, Zeolite Membranes
- **Steven M. George**
  Surface Chemistry, Thin Films, Nanoengineering
- **Douglas L. Gin**
  Polymers, Liquid Crystals, Nanomaterials
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  Metabolic Engineering, Genomics
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  Fluidization, Granular Systems, Fluid Mechanics
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  Biotechnology, Animal Cell Cultures, Metabolic Engineering
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  Biotechnology, Supercritical Fluids
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  Transport Phenomena, Applied Mathematics
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  Interfacial and Colloid Science
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The Department of Chemical and Biological Engineering at the University of Colorado is a world-class department with outstanding faculty, graduate students, facilities, and research and educational opportunities. In the past few years department faculty have received one NSF Alan T. Waterman Award, two AIChE Allan P. Colburn Awards, two ASEE Curtis W. McGraw Awards, and one ASEE Dow Lectureship Award. Each of these awards is given nationally to a single person in the field each year.

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For information and application

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Faculty

- S. Agarwal (UCSB, 2003)
- A.L. Bunge (Berkeley, 1982)
- A.M. Dean (Harvard, 1971)
- J.R. Dorgan (Berkeley, 1991)
- J.F. Ely (Indiana, 1971)
- 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)

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- Colloids and complex fluids (Marr, Wu)
- Electronic materials (Wolden)
- Fuel cell membranes (Way)

Theoretical and Applied Thermodynamics
- Natural gas hydrates (Sloan)
- Molecular simulation and modelling (Ely)

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- Dermal absorption (Bunge)
- Microfluidics (Marr)

Space and Microgravity Research
- Membranes on Mars (Way)
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Reacting Flows
- Flame kinetics (McKinnon, Dean)
- Reaction mechanisms (McKinnon, Dean)
- High-T fuel cell kinetics (Dean)

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.

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Knowledge to Go Places

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.

M.S. and Ph.D. programs in chemical and biological engineering

RESEARCH IN . . .

- Biochemical Engineering
- Biomedical Engineering
- Chemical Vapor Deposition
- Environmental Biotechnology
- Environmental Engineering
- Genomics/Proteomics/Metabolomics
- Magnetic Resonance Imaging
- Membrane Separations
- Metabolic Engineering
- Molecular Simulation
- Nanostructured Materials
- Polymeric Materials
- Permeable Media
- Systems Biology
- Thin Films

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For applications and further information, see
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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

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

Vincent G. Murphy, Ph.D.
University of Massachusetts

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

CORNELL
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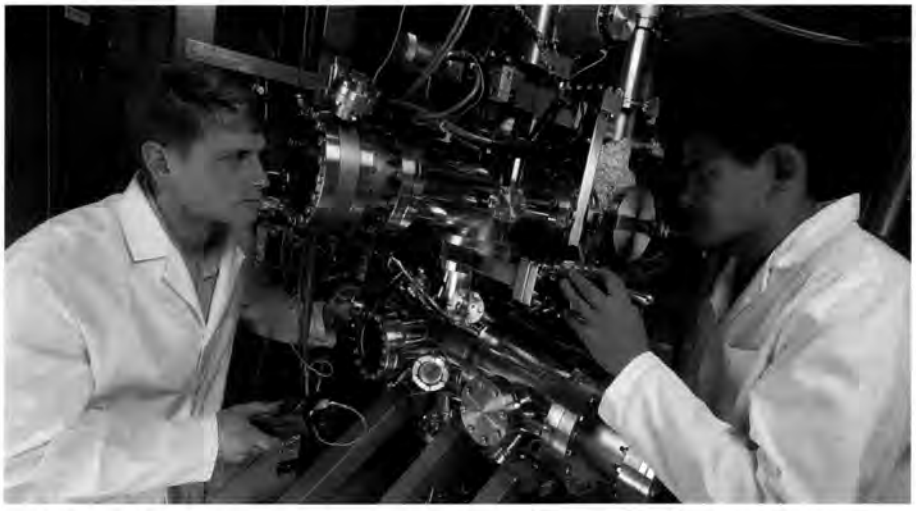
Chemical and Biomolecular Engineering



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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Distinguished Faculty

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Lynden A. Archer
Paulette Clancy
Claude Cohen
Lance Collins
Matthew P. DeLisa
T. Michael Duncan
James R. Engstrom
Fernando A. Escobedo
Emmanuel P. Giannelis
Yong Lak Joo
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

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

Situated in the scenic Finger Lakes region of New York State, the Cornell campus is one of the most beautiful in the country. Students enjoy sailing, skiing, fishing, hiking, bicycling, boating, wine-tasting, and many other activities.

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

Graduate Study & Research in Chemical Engineering

at

Dartmouth's Thayer School of Engineering

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

- **Biotechnology and biocommodity engineering**
- **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

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://thayer.dartmouth.edu/thayer/research/chem-biochem

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.

CONTACT US

Phone: 302.831.4061

Fax: 302.831.3009

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WWW.CHE.UDEL.EDU

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 M. Ow 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
✔5 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

- **Aerosol/ICAT**
- **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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A satisfactorily completed MSc program is a requirement for admission to the PhD programs at DTU. The Department of Chemical Engineering offers the following graduate programs:

Chemical Engineering Contact: coordinator **Stig Wedel** sw@kt.dtu.dk
http://www.kt.dtu.dk/English/Uddannelse/Uddannelser/International_master/Chemical_Engineering.aspx

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

Polymer Engineering and Science Contact: coordinator **Ole Hassager** oh@kt.dtu.dk
http://www.polymers.dk/education/intl-master/

General information and on-line application forms: http://www.dtu.dk/English/education/admission/msc.aspx

Department of Chemical Engineering

Department of Chemical and Biological Engineering

Research Areas and Programs

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Polymer Science and Engineering

Multiscale Modeling and Process Systems Engineering

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- **BS/MS in Chemical Engineering**
- **BS/PhD SuperNOVA program in Chemical Engineering**
- **MS in Chemical Engineering**
- **MS in Biochemical Engineering**
- **PhD in Chemical Engineering**

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Faculty

Abrams, Cameron F., Ph.D., University of California-Berkeley
Multiscale molecular simulation; polymer thermodynamics; molecular and cellular biophysics.

Baxter, Jason, Ph.D., University of California-Santa Barbara
Nanomaterials; solar energy conversion systems; materials chemistry. *To join in fall 2006.*

Cairncross, Richard A., Ph.D., University of Minnesota
Fluid structural interactions; moisture transport in polymers; biodegradable polymers; transport modeling.

Dan, Nily, Ph.D., University of Minnesota
Gene and drug delivery; polymer nano-composites; complex fluids.

Elabd, Yossef A., Ph.D., Johns Hopkins University
Fuel cells; polymer membranes; diffusion in polymers.

Grossmann, Elihu, Ph.D., University of Pennsylvania
Pyrolysis of polymers; nanotube synthesis; safety analysis.

Lowman, Anthony M., Ph.D., Purdue University
Biomaterials; drug delivery systems; hydrogels.

Mutharasan, Raj, Ph.D., Drexel University
Biochemical engineering; cellular metabolism in bioreactors; biosensors.

Palmese, Giuseppe R., Ph.D., University of Delaware
Department Head
Reacting polymer systems; nanostructured polymers; materials from renewable sources; composites and interfaces.

Soroush, Masoud, Ph.D., University of Michigan
Process systems engineering; polymer engineering; modeling and simulation.

Weinberger, Charles B., Ph.D., University of Michigan
Suspension rheology; fluid mechanics of multi-phase systems.

Wheatley, Margaret, Ph.D., University of Toronto
Drug delivery; development of new class of ultrasound contrast agents.

Wrenn, Steven P., Ph.D., University of Delaware
Biomedical engineering; biological colloids; membrane phase behavior and cholesterol transport.

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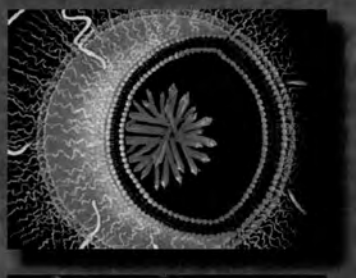
Process Control and Optimization
Fuel Cell Technology
Bioengineering
Computational Engineering and Chemical Transport Processes
Advanced Environmental Oxidation Methods

MS/PhD in BIOMEDICAL ENGINEERING

Stem Cell and Tissue Engineering
Cellular Transport Processes
Imaging and Spectroscopy
Biointerfacial and Biomedical Engineering
Computational Biomedical Engineering



For more information contact:
Department of Chemical and Biomedical Engineering
Florida A&M University and Florida State University Joint College of Engineering
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R.G. Barile, Ph.D.
M.M. Tomadakis, Ph.D.
J.E. Whitlow, Ph.D.

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- NASA
- Department of Energy
- Florida Solar Energy Center
- Florida Institute of Phosphate Research
- Florida Space Grant

Graduate Student Assistantships and Tuition Remission Available

Research Interests

- Spacecraft Technology
- Alternative Energy Sources
- Materials Science
- Membrane Technology
- ISRU
- Hydrogen Technology

For more information, contact

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 Tech School of Chemical & Biomolecular Engineering

Pradeep Agrawal: hetereogenous catalysis, surface chemistry, reaction kinetics; Mark Allen: microsystems, MEMS; Sujit Banerjee: environmental issues related to the forest products industry; Sue Ann Bidstrup Allen: microelectronics, polymer processing; Andreas Bommarius: biocatalysis, bioprocessing; Victor Breedveld: complex fluids, microfluids; 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; Joseph Schork: reactor engineering, process control, polymerization, reactor dynamics; Daniel Tedder: process synthesis and simulation, chemical separation, waste management, resource recovery; Amyn Teja: thermodynamic and transport properties, phase equilibria, crystallization & nanomaterials; Mark White: catalysis, kinetics, reactor design; 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.grad.gatech.edu/admissions

Contact Information

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Georgia Institute of Technology
Atlanta, Georgia 30332-0100
grad.info@chbe.gatech.edu

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Chemical Engineering Graduate Program

Faculty and Their Research

N. R. AMUNDSON (CULLEN PROFESSOR)
Chemical Reactions; Transport; Mathematical modeling

A. ANNAPRAGADA (ADJUNCT PROFESSOR)
Respiratory drug delivery; Computational biology

V. BALAKOTAIAH (JOHN & REBECCA MOORES PROFESSOR)
Chemical Reaction Engineering; Applied mathematics

A. BIDANI (ADJUNCT PROFESSOR)
Mechanisms and kinetics of microvascular gas and ion transport

A. T. CAPITANO (ASSISTANT PROFESSOR)
Tissue Engineering: In Vitro Toxicology

A. DANESHY (ADJUNCT PROFESSOR, DIRECTOR PETROLEUM ENGG)
Technology development in oil & gas recovery

V. M. DONNELLY (PROFESSOR)
Plasma Processing: Electronic Materials

M. J. ECONOMIDES (PROFESSOR)
Petroleum Engineering; Energy

D. J. ECONOMOU (JOHN & REBECCA MOORES PROFESSOR)
Electronic Materials; Composites and ceramics

R. FLUMERFELT (PROFESSOR & DEAN OF ENGINEERING)
Polymeric Materials

M. P. HAROLD (DOW PROFESSOR, CHAIRMAN)
Catalytic Engineering; Environment & Clean Energy

E. J. HENLEY (EMERITUS PROFESSOR)
Reliability Engineering; Biomedical engineering

R. KRISHNAMOORTI (PROFESSOR, ASSOC. DEAN FOR RESEARCH)
Polymeric Materials; Biomaterials

D. LUSS (CULLEN PROFESSOR)
Chemical Reaction Engineering

K. K. MOHANTY (PROFESSOR)
Fluid flow in porous media; Biomaterials

M. NIKOLAOU (ASSOCIATE PROFESSOR)
Computer-aided process engineering

J. T. RICHARDSON (PROFESSOR)
Catalysis & reaction engineering

C.W. ROOKS (ADJUNCT PROFESSOR)
Diesel Emission Technology

P. STRASSER (ASSISTANT PROFESSOR)
Electrochemical systems, materials synthesis, fuel cells

V. TRAN (ASSISTANT PROFESSOR)
Cellular engineering; Surface modification of materials

P. VEKILOV (ASSOCIATE PROFESSOR)
Protein crystallization & Phase transitions

R. C. WILLSON (PROFESSOR)
Biomolecular Recognition; Environmental biotechnology

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Write: University of Houston
Chemical Engineering
Graduate Admission
Houston, TX 77204-4004

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Department of Chemical Engineering

MS and PhD Graduate Program

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

RESEARCH AREAS

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

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

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

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

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

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

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

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

For more information, write to

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University of Illinois at Chicago • 810 S. Clinton St. • Chicago, IL 60607-7000 • (312) 996-3424 • Fax (312) 996-0808
URL: http://www.uic.edu/depts/chme/

ILLINOIS INSTITUTE OF TECHNOLOGY

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Core Competencies, Research Centers and Facilities

Faculty members conduct numerous projects in the department's core areas of research competency:

- Biological, biochemical and biomedical engineering
- Computational fluid dynamics and fluidization
- Crystallization and particulate technology
- Electrochemical engineering
- Energy, sustainability and renewable resources
- Environmental engineering
- Food processing and safety
- Fuel cells and batteries
- Interfacial science
- Multiphase flow
- Polymer science and engineering
- Process monitoring and control
- Waste remediation and wastewater treatment

Research facilities include the laboratories of the department's four research centers:

- Center of Excellence in Polymer Science and Engineering
- Center for Electrochemical Science and Engineering
- Energy + Power Center
- Particle Technology and Crystallization Center

Other laboratories include:

Air Quality Lab; Bioengineering Labs; Particle Technology Lab; Computational Fluid Dynamics Lab; Environmental Engineering Analytical Lab; Interfacial Phenomena Lab; Multiphase Flow and Fluidization Lab; Organic Degradation Lab; Pharmaceutical and Crystallization Lab; Physical and Chemical Processes Lab; Porous Media and Core Analysis Lab; Process Modeling, Monitoring, and Control Lab.

THE UNIVERSITY

Mission: To educate people from all countries for complex professional roles in a changing technological world and to advance knowledge through research and scholarship.

- Private, coeducational and research university
- 2100 undergraduate students, 4300 graduate students
- Diverse student body and faculty from more than 100 countries
- Campus recognized as an architectural landmark
- Three miles from downtown Chicago, one mile west of Lake Michigan

THE DEPARTMENT

Mission: To meet the present and future needs of society and industry by providing state-of-the-art education and research programs.

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- 20 full-time faculty members and 8 research and teaching faculty
- Merger of the chemical and environmental engineering departments in 1995 created state-of-the-art, interdisciplinary research and education programs
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APPLICATION INFORMATION ›› Coordinator, Academic Affairs
Department of Chemical and Environmental Engineering • Illinois Institute of Technology
10 W. 33rd Street • Chicago, Illinois • 60616 • USA
tel. 312.567.3040 • fax. 312.567.8874 • chee@iit.edu • www.chee.iit.edu

Graduate program for M.S. and Ph.D. degrees in Chemical and Biochemical Engineering

FACULTY

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

Audrey Butler
U. of Iowa 1989
Chemical precipitation processes

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

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

Vicki H. Grassian
U. of California-Berkeley 1987
Surface chemistry/ Heterogeneous processes

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

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

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

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

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

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

V.G.J. Rodgers
Washington U. 1989
Transport phenomena in bioseparations/ Membrane separations

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

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

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

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

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

For information and application:

THE UNIVERSITY OF IOWA

Graduate Admissions
Chemical and Biochemical Engineering
4133 Seamans Center
Iowa City IA 52242-1527

1-800-553-IOWA
(1-800-553-4692)
chemeng@icaen.uiowa.edu
www.engineering.uiowa.edu/~chemeng/

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

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.

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

Faculty

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

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

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

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

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

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

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

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

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

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

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

Balaji Narasimhan, PhD
Purdue University
Biomaterials and drug delivery

Marc D. Porter, PhD
Ohio State University
Analytical surface chemistry and miniaturization

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

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

Glenn L. Schrader, PhD
University of Wisconsin
Heterogeneous and homogeneous catalysis

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

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

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

FOR MORE INFORMATION

Graduate Admissions Committee
Department of Chemical and Biological Engineering
Iowa State University
Ames, Iowa 50011
515 294-7643
Fax: 515 294-2689
chemengr@iastate.edu
www.cbe.iastate.edu

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

The Johns Hopkins University's Department of Chemical and Biomolecular Engineering, established in 1936, features a low student-to-faculty ratio that fosters a highly collaborative research experience. The faculty are internationally known for their contributions at the forefront of emerging technologies such as nanotechnology, recombinant DNA technology, cell and tissue engineering, computational biology, molecular bioengineering, and electronic materials as well as in core chemical engineering areas such as thermodynamics and interfacial phenomena.

Mammalian, Insect Cell, and Stem Cell Culture
Metabolic Engineering and Biotechnology
Apoptosis • Glycosylation and Glycomics
Michael J. Betenbaugh, PhD • University of Delaware

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

Transport Phenomena in Micro and Nano-Fluidic Systems • Molecular Dynamics Simulations
German M. Drazer, PhD • Universidad de Cuyo and Instituto Balseiro

Active Control of Interfaces • Surface Forces and Adhesion
Electrochemistry and Interfacial Electrostatics
Joëlle Fréchette, PhD • Princeton University

Micro/Nanotechnology
Self-Assembly • Surface Science of Soft Materials
David Gracias, PhD • University of California, Berkeley

Biomolecular Modeling • Protein-Protein Docking
Protein-Surface Interactions
Self-Assembled Nanomaterials and Devices
Jeffrey J. Gray, PhD • University of Texas at Austin

Biomaterials Synthesis
Targeted Drug Delivery • Biotransport Phenomena
Justin S. Hanes, PhD • Massachusetts Institute of Technology

Nucleation • Crystallization • Ouzo Effect
Flame Generation of Ceramic Powders
Joseph L. Katz, PhD • University of Chicago

Cell and Molecular Engineering • Functional Genomics
Fluid Mechanics in Medical Applications • Cancer Metastasis
Thrombosis and Inflammation/Bacterial Infection
Konstantinos Konstantopoulos, PhD • Rice University

Molecular Bioengineering
Protein Engineering • Molecular Evolution
Marc Ostermeier, PhD • University of Texas at Austin

Surfactants and Interfaces
Growth and Assembly of Nanoparticles • Marangoni Effects
Kathleen J. Stebe, PhD • The City University of New York

Cell Adhesion and Migration • Cytoskeleton
Receptor-Ligand Interactions • Cancer
Epstein-Barr Virus Infection • New Proteomics Tools
New Microscopies
Denis Wirtz, PhD • Stanford University

For further information contact:

Johns Hopkins University
Whiting School of Engineering
Department of Chemical and Biomolecular Engineering
3400 N. Charles Street • Baltimore, MD 21218-2694
410-516-7170 • che@jhu.edu • http://www.jhu.edu/~cheme

JOHNS HOPKINS

Graduate Study in Chemical and Petroleum Engineering at the

UNIVERSITY OF

KANSAS

The University of Kansas is the largest and most comprehensive university in Kansas. It has an enrollment of more than 28,000 and almost 2,000 faculty members. KU offers more than 100 bachelors', nearly 90 masters', and more than 50 doctoral programs. The main campus is in Lawrence, Kansas, with other campuses in Kansas City, Wichita, Topeka, and Overland Park, Kansas.

Graduate Programs

- M.S. degree with a thesis requirement in both chemical and petroleum engineering
- Ph.D. degree characterized by moderate and flexible course requirements and a strong research emphasis
- Typical completion times are 16-18 months for a M.S. degree and 4 1/2 years for a Ph.D. degree (from B.S.)

Faculty

Cory Berkland *(Ph.D., Illinois)*
Kyle V. Camarda *(Ph.D., Illinois)*
Michael Detamore *(Ph.D., Rice)*
Stevin H. Gehrke *(Ph.D., Minnesota)*
Don W. Green, *(Ph.D., Oklahoma)*
Colin S. Howat *(Ph.D., Kansas)*
Jennifer Laurence *(Ph.D., Purdue)*
Jenn-Tai Liang *(Ph.D., Texas)*
Trung V. Nguyen *(Ph.D., Texas A&M)*
Karen J. Nordheden *(Ph.D., Illinois)*
Russell D. Osterman *(Ph.D., Kansas)*
Aaron Scurto *(Ph.D., Notre Dame)*
Marylee Z. Southard *(Ph.D., Kansas)*
Susan M. Williams *(Ph.D., Oklahoma)*
Bala Subramaniam *(Ph.D., Notre Dame)*
Shapour Vossoughi *(Ph.D., Alberta, Canada)*
Laurence Weatherley, Chair *(Ph.D., Cambridge)*
G. Paul Willhite *(Ph.D., Northwestern)*

Research

Catalytic Kinetics and Reaction Engineering
Catalytic Materials and Membrane Processing
Controlled Drug Delivery
Corrosion, Fuel Cells, Batteries
Electrochemical Reactors and Processes
Electronic Materials Processing
Enhanced Oil Recovery Processes
Fluid Phase Equilibria and Process Design
Liquid/Liquid Systems
Molecular Product Design
NanoTechnology for Biological Applications
Process Control and Optimization
Protein and Tissue Engineering
Supercritical Fluid Applications
Waste Water Treatment

Financial Aid

Financial aid is available in the form of research and teaching assistantships and fellowships/scholarships. A special program is described below.

Madison & Lila Self Graduate Fellowship

For additional information and application:
http://www.unkans.edu/~selfpro/home/index.html

Research Centers

Tertiary Oil Recovery Program (TORP)
30 years of excellence in enhanced oil recovery research

Center for Environmentally Beneficial Catalysis (CEBC)
New NSF Engineering Research Center

Contacts

Website for information and application:

http://www.cpe.engr.ku.edu/

Graduate Program
Chemical and Petroleum Engineering
University of Kansas—Learned Hall
1530 W. 15th Street, Room 4132
Lawrence, KS 66045-7609

phone: 785-864-2900
fax: 785-864-4967
e-mail: **cpeinfo@ku.edu**

Graduate Studies in
Chemical Engineering at

Kansas State University

Research Areas

Advanced materials
Semiconductor crystal growth and epitaxy
Molecular sieves
Fluid dynamics
Applications of ionic liquids
Environmental engineering
Nanoscale catalysis
Polymers and membranes

For additional information
visit our website at:
http://www.che.ksu.edu/
or write to
J.H. Edgar
Kansas State University
Department of Chemical Engineering
Manhattan, KS 66506-5102

University of Kentucky

Department of Chemical & Materials Engineering

- Catalysis
- Environmental Engineering
- Biopharmaceutical & Biocellular Engineering
- Materials Synthesis
- Advanced Separation & Supercritical Fluids Processing
- Membranes & Polymers
- Aerosols

The Chemical Engineering Faculty

Tate Tsang, Chair • *University of Texas*
K. Anderson • *Carnegie-Mellon University*
D. Bhattacharyya • *Illinois Institute of Technology*
A. Geertsema • *University of Karlsruhe*
E. Grulke • *Ohio State University*
Z. Hilt • *University of Texas*
D. Kalika • *University of California, Berkeley*
M. Keane • *National University of Ireland*
R. Kermode • *Northwestern University*
B. Knutson • *Georgia Institute of Technology*
S. Rankin • *University of Minnesota*
A. Ray • *Clarkson University*

Paducah, KY, Program

P. Dunbar • *University of Tennessee*
R. Lee-Desautels • *Ohio State University*
D. Silverstein • *Vanderbilt University*
J. Smart • *University of Texas*

For more information:

Web: http://www.engr.uky.edu/cme E-mail: cme-admit@engr.uky.edu
Address: Department of Chemical & Materials Engineering
Director of Graduate Studies, Chemical Engineering
177 Anderson Hall • University of Kentucky • Lexington, KY 40506-0046
Phone (859) 257-8028 Fax (859) 323-1929

LEHIGH UNIVERSITY

Synergistic, interdisciplinary research in . . .

- Biochemical Engineering
- Catalytic Science & Reaction Engineering
- Environmental Engineering
- Interfacial Transport
- Materials Synthesis Characterization & Processing
- Microelectronics Processing
- Polymer Science & Engineering
- Process Modeling & Control
- Two-Phase Flow & Heat Transfer

. . . leading to M.S., M.E., and Ph.D. degrees in Chemical Engineering and Polymer Science and Engineering

Highly attractive financial aid packages, which provide tuition and stipend, are available.

Philip A. Blythe, *University of Manchester*
fluid mechanics • heat transfer • applied mathematics

Hugo S. Caram, *University of Minnesota*
high temperature processes and materials • environmental processes • reaction engineering

Manoj K. Chaudhury, *SUNY-Buffalo*
adhesion • thin films • surface chemistry

Mohamed S. El-Aasser, *McGill University*
polymer colloids and films • emulsion copolymerization • polymer synthesis and characterization

James F. Gilchrist, *Northwestern University*
particle self-organization • mixing • microfluidics

James T. Hsu, *Northwestern University*
bioseparations • applied recombinant DNA technology

Anand Jagota, *Cornell University*
biomimetics • mechanics • adhesion • biomolecule-materials interactions

Andrew Klein, *North Carolina State University*
emulsion polymerization • colloidal and surface effects in polymerization

Mayuresh V. Kothare, *California Institute of Technology*
model predictive control • constrained control • microchemical systems

Ian J. Laurenzi, *University of Pennsylvania*
chemical kinetics in small systems • biochemical informatics • aggregation phenomena

William L. Luyben, *University of Delaware*
process design and control • distillation

Anthony J. McHugh, *University of Delaware*
polymer rheology and rheo-optics • polymer processing and modeling • membrane formation • drug delivery

Padma Rajagopalan, *Brown University*
cellular engineering • biomaterial design • cell-biomaterial interactions

Arup K. Sengupta, *University of Houston*
use of adsorbents • ion exchange • reactive polymers • membranes in environmental pollution

Cesar A. Silebi, *Lehigh University*
separation of colloidal particles • electrophoresis • mass transfer

Shivaji Sircar, *University of Pensylvania*
adsorption • gas and liquid separation

Harvey G. Stenger, Jr., *Massachusetts Institute of Technology*
reactor engineering

Kemal Tuzla, *Technical University of Istanbul*
heat transfer • two-phase flows • fluidization

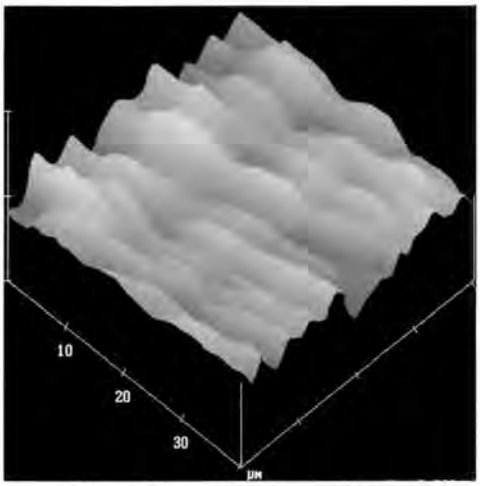
Israel E. Wachs, *Stanford University*
materials characterization • surface chemistry • heterogeneous catalysis • environmental catalysis

Additional information and application may be obtained by writing to:

Dr. James T. Hsu, Chairman • Graduate Committee
Department of Chemical Engineering • Lehigh University • 111 Research Drive • Iacocca Hall • Bethlehem, PA 18015
Fax: (610) 758-5057 • E-Mail: inchegs@lehigh.edu • Website: www3.lehigh.edu/engineering/cheme/

UNIVERSITY OF LOUISIANA *Lafayette*

MS in Engineering — Chemical Engineering



Atomic Force Microscopy of Deformed High Density Polyetheylene

Faculty

C.S. Fang, PhD, University of Houston, TX (1968)

F.F. Farshad, PhD, University of Oklahoma, OK (1975)

J.D. Garber (Head), PhD, Georgia Institute of Technology, GA (1971)

A.G. Hill, PhD, Louisiana Technical University, LA (1980)

R.D.K. Misra, PhD, University of Cambridge, UK (1984)

B.L. Newman, PhD, University of Virginia, VA (1988)

A.B. Ponter, DSc, Birmingham University, UK (1986) PhD, Manchester (1966)

J.R. Reinhardt, PhD, University of Arkansas, AR (1977)

Research Centers

Corrosion Research Center • Dr. J.D. Garber, Director

Center for Metals, Polymers and Composites Research • Dr. R.D.K. Misra, Director

Edith Garland Dupré Library

Research Areas

- **Corrosion**
  - Gas and Oil Well Modeling
  - Pipeline Steels
  - Hydrogen-Induced Cracking
- **Materials: Structure/Processing/Performance**
  - Irradiation of Polymers with UV/Ozone
  - Deformation Behavior of Polymers and Composites
  - Formability and Fracture Toughness of High-Strength Steels
  - Cold Work Embrittlement of Interstitial-Free Steels
  - Casting of Precious Metals and Alloys
- **Fluid Flow and Transport Phenomena**
  - Phase Inversion
  - Drop Coalescence
  - Liquid Spreading
  - Multiphase Flow
  - Surface Roughness
- **Thermodynamics and Process Engineering**
  - Phase Equilibria in Multiphase Systems
  - Chemical Reactor Design, Stability and Dynamics
  - Process Simulation and Design

Department of Chemical Engineering
University of Louisiana at Lafayette
PO Box 44130
Lafayette, LA 70504-4130

For more information:
http://chemical.louisiana.edu *or* e-mail: dmisra@louisiana.edu (Graduate Coordinator)

LOUISIANA STATE UNIVERSITY

Gordon A. and Mary Cain Department of Chemical Engineering

THE CITY

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

THE DEPARTMENT

- M.S. and Ph.D. Programs
- Approximately 60 Graduate Students
- Average research funding more than $2 million per year

DEPARTMENTAL FACILITIES

- Departmental computing—with more than 80 PCs
- Extensive laboratory facilities, especially in reaction and environmental engineering, transport phenomena and separations, polymer, textile and materials processing, biochemical engineering, thermodynamics

FINANCIAL AID

- Assistantships at $17,500 - $29,200, with full tuition waiver

TO APPLY, CONTACT

GRADUATE COORDINATOR
Gordon A. and Mary Cain Department of Chemical Engineering
Louisiana State University
Baton Rouge, LA 70803
Telephone: 1-800/256-2084 FAX: 225/578-1476
e-mail: gradcoor@lsu.edu

LSU IS AN EQUAL OPPORTUNITY/ACCESS UNIVERSITY

FACULTY

K.M. DOOLEY
BASF Professor; Ph.D., University of Delaware
Heterogeneous Catalysis, High-Pressure Separations

G.L. GRIFFIN
Nusloch Professor; Ph.D., Princeton University
Electronic Materials, Surface Chemistry, CVD

D.P. HARRISON
Voorhies Professor; Ph.D., University of Texas
Fluid-Solid Reactions, Hazardous Waste Treatment

J.E. HENRY
Assistant Professor; Ph.D., Texas A&M University
Biochemical Engineering

M.A. HJORTSØ
Chevron Professor, Eidt Professor; Ph.D., University of Houston
Biochemical Reaction Engineering, Applied Math

F.C. KNOPF
Anding Professor; Ph.D., Purdue University
Supercritical Fluid Extraction, Ultrafast Kinetics

R.W. PIKE
Horton Professor; Ph.D., Georgia Institute of Technology
Fluid Dynamics, Reaction Engineering, Optimization

E.J. PODLAHA
Eidt Professor; Ph.D., Columbia University
Electrical Phenomena, Alloy and Composite Materials

J.A. ROMAGNOLI
Cain Chair Professor; Ph.D., University of Minnesota
Process Control

J.J. SPIVEY
Shrivers Professor; Ph.D., Louisiana State University
Catalysis

L.J. THIBODEAUX
Coates Professor; Ph.D., Louisiana State University
Chemodynamics, Hazardous Waste Transport

K.E. THOMPSON
Lowe Professor; Ph.D., University of Michigan
Transport and Reaction in Porous Media

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

D.M. WETZEL
Haydel Professor; Ph.D., University of Delaware
Hazardous Waste Treatment, Drying

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

University of Maine

Department of Chemical and Biological Engineering

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

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

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

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

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

JOSEPH GENCO PhD (Ohio State)
Oxygen delignification, refining, pulping, pulp bleaching

JOHN HWALEK PhD (Illinois)
Process information systems, heat transfer

MICHAEL MASON PhD (UC Santa Barbara)
Laser scanning confocal microscopy, time-resolved imaging of molecular nanoprobes for biological systems

PAUL MILLARD PhD (Maryland)
Microbial biosensors, physiological genomics, fluorescence technology

DAVID NEIVANDT PhD (Melbourne)
Conformation of interfacial species, surface spectroscopies/ microscopies

ANJA NOHE PhD (Theodor Boveri Inst.)
Protein dynamics on cell surfaces, membrane transport, image analysis

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

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

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

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

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

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

MANHATTAN COLLEGE

This well-established graduate program emphasizes the application of basic principles to the solution of modern engineering problems, with new features in engineering management, environmental management, and biochemical engineering

▼

Financial aid is available,
including industrial fellowships in a one-year program
sponsored by the following companies:

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BOC Group
ConocoPhillips
Consolidated Edison Co.
Kraft Foods
Merck & Co., Inc.
Panolam Industries
Pfizer, Inc.

▲

For information and application form, write to

Graduate Program Director
Chemical Engineering Department
Manhattan College
Riverdale, NY 10471

chmldept@manhattan.edu
http://www.engineering.manhattan.edu

Offering a Practice-Oriented Master's Degree Program in Chemical Engineering

Manhattan College is located in Riverdale, an attractive area in the northwest section of New York City.

CHEMICAL and BIOMOLECULAR ENGINEERING

UNIVERSITY OF MARYLAND

Faculty and Research Areas

Raymond A. Adomaitis (IIT) • *Systems modeling and simulation methodologies; semiconductor manufacturing*
Mikhail A. Anisimov (Moscow) • *Critical phenomena and phase transitions in fluids and fluid mixtures*
Timothy A. Barbari (Texas-Austin) • *Membrane science, polymer science, biomaterials*
William E. Bentley (Colorado) • *Biochemical/metabolic engineering, applications of molecular biology*
Richard V. Calabrese (Massachusetts) • *Multiphase flow, turbulence and mixing*
Kyu Yong Choi (Wisconsin) • *Polymer reaction engineering*
Panagiotis Dimitrakopoulos (Illinois-Urbana) • *Biofluid mechanics, biophysics and microrheology*
Sheryl H. Ehrman (UCLA) • *Aerosol and nanoparticle technology*
J. Helim Aranda Espinoza (U. San Luis Potosi) • *Cardiovascular engineering, neuroengineering, cellular mechanics*
John P. Fisher (Rice) • *Tissue engineering, biomaterials*
James W. Gentry (Texas-Austin) • *Aerosol science and engineering*
Sandra C. Greer (Chicago) • *Physical chemistry, polymer science, biomacromolecules, phase equilibria*
Peter Kofinas (MIT) • *Polymer science and engineering*
Thomas J. McAvoy (Princeton) • *Process control, fault detection*
Jan V. Sengers (U. Amsterdam) • *Critical phenomena, thermophysical properties of fluids and fluid mixtures*
Srinivasa R. Raghavan (N.C. State) • *Polymers, colloids, complex fluids, self-assembly*
Nam Sun Wang (Caltech) • *Biochemical engineering*
William A. Weigand (IIT) • *Biochemical engineering, bioprocess control and optimization*
Evanghelos Zafiriou (Caltech) • *Process control, identification and optimization*

Location: The University of Maryland is located in close proximity to the nation's capital, Washington, D.C., and a number of government laboratories, including NIST, NIH, NRL, ARL, USDA, and FDA.

For Applications and Further Information, Write

Graduate Admissions Director • Department of Chemical and Biomolecular Engineering
Room 2113 • Building 090 • University of Maryland • College Park, MD 20742-2111
http://www.ench.umd.edu

UMBC

University of Maryland
Baltimore County

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*

Come to Chemical Engineering at the University of Massachusetts Amherst

Amherst is a pretty 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.

Faculty

S.R. Bhatia *(Princeton)*
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- Kinetics and reaction engineering:
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- Fluid mechanics and polymer rheology
- Bioengineering and biomaterials
- Supercritical fluid processing

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Graduate Program Director
Department of Chemical Engineering
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Heather Canavan	• Stimulus-responsive materials, cell/surface interactions, Biomedical Engineering
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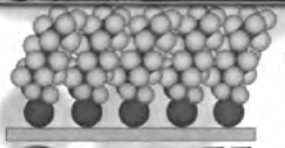

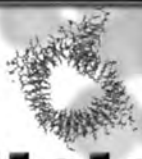

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Chemical and Biological Engineering at

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

Vassily Hatzimanikatis, Ph.D., Caltech, 1996
Computational biotechnology, functional genomics, bioinformatics

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

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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)

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admissions-chem-biol-eng@northwestern.edu

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The University of Notre Dame

Faculty

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
Agnes E. Ostafin
Andre F. Palmer
William F. Schneider
Mark A. Stadtherr
William C. Strieder
Eduardo E. Wolf
Y. Elaine Zhu

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

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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

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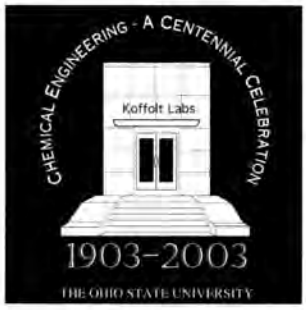
The Department

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 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 Cooper,** *Princeton*
  Polymer Science and Engineering, Properties of Polyurethanes and Ionomers, Polyurethane Biomaterials, Blood-Material Interactions,Tissue Engineering
- **L.S. 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. Koellnig,** *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
- **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 Procesing in Supercritical Fluids
- **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

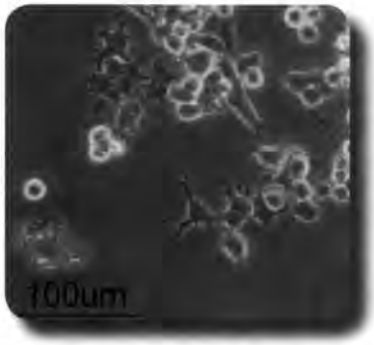
Research Areas

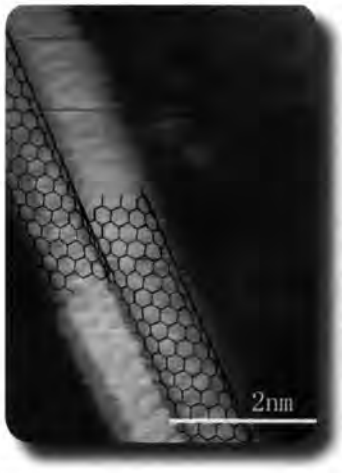
Bioengineering
Genetic engineering, protein production, bioseparations, vascular tissue engineering, cell adhesion, biosensors, orthopedic tissue engineering

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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University of Oklahoma
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Norman, OK 73019-1004
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(800) 601-9360
Fax: (405) 325-5813
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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

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)
Randy Lewis (Ph.D., Massachusetts Institute of Technology)
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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Stillwater, OK 74078-5021
gasem@okstate.edu

University of Pennsylvania
Chemical and Biomolecular Engineering

Eric T. Boder *Biomolecular engineering*

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

John C. Crocker *Microrheology of biopolymers, recA searching, 3-D microscopy, device biophysics*

Scott L. Diamond *Endothelial cell mechanobiology, drug and gene delivery, biotransport phenomena*

Dennis E. Discher *Cell and molecular mechanics, biomembrane and biopolymer mesostructures and functions*

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

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

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

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

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

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

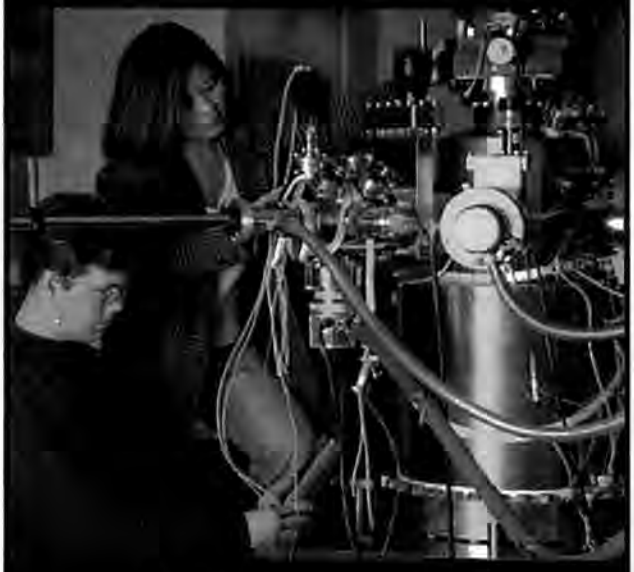
Talid R. Sinno *Transport and reaction, statistical mechanical modeling*

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

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

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

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



For additional information, write

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

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158 Fenske Laboratory
University Park PA 16802-4400

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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

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

M. Albert Vannice *(Stanford)*—Heterogeneous Catalysis

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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Catalysis • Surface Chemistry • Catalyst Deactivation • Chemical Promotion • Novel Materials • Organometallic Chemistry	Julie L. d'Itri John W. Tierney Irving Wender	Vladimir Kovalchuk Götz Veser
Energy and Environment • Bioremediation • Clean Fuels From Coal • Contaminated Soil Cleanup • Stack Gas Cleanup	Shiao-Hung Chiang Robert M. Enick Badie I. Morsi	James T. Cobb, Jr. Gerald D. Holder
Materials Engineering • Biocompatible Polymers • CO_2 as a Solvent • Interfacial Behavior • Polymer/Composite Modeling • Polymer Processing • Semiconductor Materials	Anna C. Balazs Robert M. Enick George E. Klinzing Steven R. Little Sachin Velankar	Eric J. Beckman Di Gao J. Thomas Lindt Joseph J. McCarthy
Multi-Scale Modeling • Molecular Modeling • Polymer-Fluid Interactions • Process Modeling & Control • Particulate Systems Transport	Anna C. Balazs Joseph J. McCarthy	J. Karl Johnson Robert S. Parker

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B. Garetz
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M. Green
Chirality of macromolecules, liquid crystals

R. Gross
Biosynthesis, biocatalysis and biotechnology

K. Levon
Conductive polymers, biosensors

J. Mijovic
Relaxation dynamics in polymers and biological systems

J. Pinto
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L. Stiel
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I. Teraoka
Separation of polymers, confined systems

E. Ziegler
Air pollution control engineering

W. Zurawsky
Plasma polymerization, polymer thin films

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  - *Computational Chemistry, Biology, and Materials*
  - *Systems Modeling and Optimization*
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  - *Protein and Enzyme Engineering*
- Environmental and Energy Science and Technology
  - *Art and Monument Conservation*
  - *Fuel Cell Engineering*
- Fluid Mechanics and Transport Phenomena
  - *Biological Transport*
  - *Electrohydrodynamics*
  - *Flow in Porous Media*
  - *Granular and Multiphase Flow*
  - *Microfluidics*
  - *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*

Faculty

Ilhan A. Aksay	Richard A. Register
Jay B. Benziger	William B. Russel
Jeffrey D. Carbeck	Dudley A. Saville
Emily A. Carter	George W. Scherer
Pablo G. Debenedetti	Stanislav Y. Shvartsman
Christodoulos A. Floudas	Sankaran Sundaresan
Yannis G. Kevrekidis	Salvatore Torquato
Morton D. Kostin	Sandra M. Troian
Athanassios Z. Panagiotopoulos	James Wei
Robert K. Prud'homme	David W. Wood

T. Kyle Vanderlick (Chair)

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School of Chemical Engineering

Faculty

Rakesh Agrawal
Ronald P. Andres
Chelsey D. Baertsch
Osman A. Basaran
Stephen P. Beaudoin
Gary E. Blau
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
George T. Tsao
Arvind Varma (Head)
V. Venkatasubramanian
Nien-Hwa L. Wang
Phillip C. Wankat
You-Yeon Won

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- 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 is in the midst of adding 95 new faculty positions, most of which are cluster hires in signature areas of great importance to society. University wide, 300 new faculty positions are being filled. Nine new faculty, including three members of the National Academy of Engineering, have joined ChE since August 2003. A new ChE building was completed in January 2005, and the current one is being fully renovated. The university is nearing completion of Discovery Park, a new $150 million facility to house interdisciplinary researchers and equipment in nanotechnology, biotechnology, information sciences, and advanced manufacturing techniques.

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

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/

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Application materials and information from:

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

Faculty and Research Interests

Michael M. Abbott, abbotm2@rpi.edu, *Prof. Emeritus*
Thermodynamics; equations of state; phase equilibria

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

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Process modeling, control, and drug delivery

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

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Semiconductor materials processing; transport and reaction analyses

Steven M. Cramer, crames@rpi.edu
Acting Department Chair
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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

FACULTY

Constantine Armeniades
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Walter Chapman
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Ramon Gonzalez
(Univ. of Chile, 2001)

George Hirasaki
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Paul Laibinis
(Harvard, 1991)

Nikolaos Mantzaris
(Minnesota, 2000)

Clarence Miller
(Minnesota, 1966)

Matteo Pasquali
(Minnesota, 2000)

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

Michael Wong
(MIT, 2000)

Kyriacos Zygourakis
(Minnesota, 1981)

Joint Appointments

Vicki Colvin
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Antonios Mikos
(Purdue, 1988)

Ka-Yiu San
(Caltech, 1984)

Jennifer West
(UT Austin, 1996)

Mark Wiesner
(Johns Hopkins, 1985)

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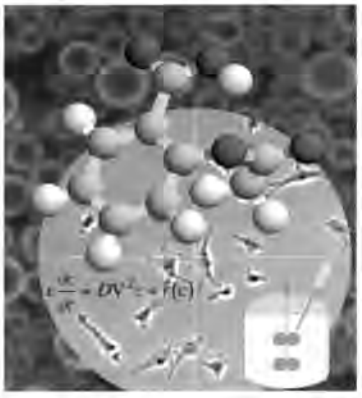

FACULTY RESEARCH AREAS

Advanced Materials & Complex Fluids:

Synthesis and characterization of nanostructured materials, catalysis, surface engineering, rheology of nanostructured liquids, polymers, carbon nanotubes, interfacial phenomena, emulsions, colloids.

Biosystems Engineering:

Cell population heterogeneity, metabolic engineering, signal transduction and biological pattern formation, 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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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 • Theoretical Biology

M. R. KING, Ph.D. 1999, Notre Dame
Dynamics of Leukocyte and Platelet Adhesion, Computational Biofluid 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

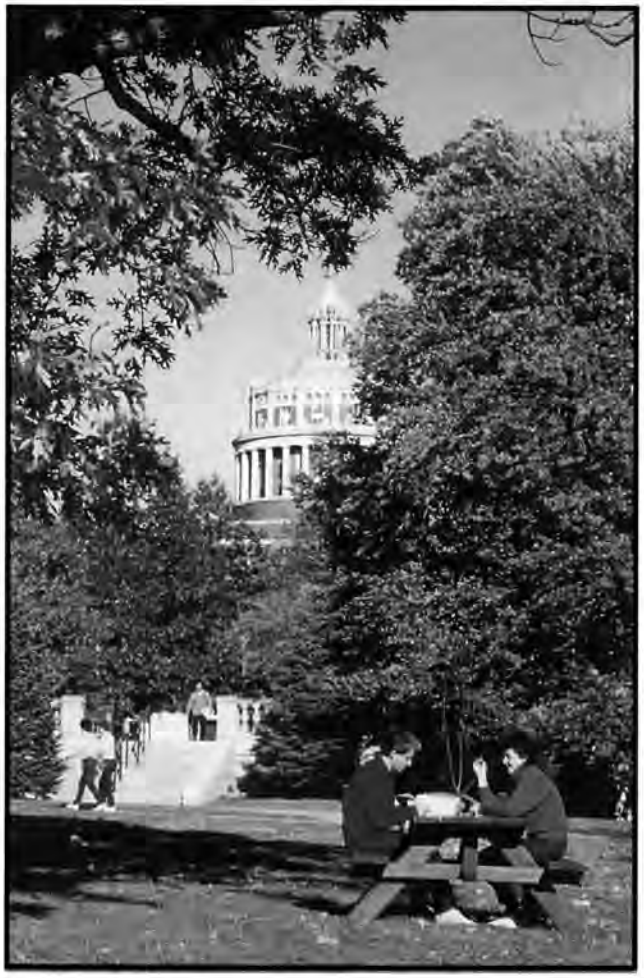
Y. SHAPIR, Ph.D. 1981, Tel Aviv (Israel)
Critical Phenomena • Transport in Disordered Media • Scaling Behavior of Growing Surfaces

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)
Colloids and Interfaces • Materials Synthesis in Microemulsions • Nanoparticle/Polymer Composites • Supercritical Fluids • Microencapsulation



For further information and application, write

Graduate Admissions
Department of Chemical Engineering
206 Gavett Hall • Box 270166
University of Rochester • Rochester, New York
14627-0166

Phone: (585) 275-4913
Fax: (585) 273-1348
e-mail: burrows@che.rochester.edu

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Faculty

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

Research Areas

Membrane Separations · Pharmaceutical and Food Processing Technology · Biochemical Engineering · 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

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RUTGERS

Graduate Program in

Chemical & Biochemical Engineering

Research Areas

Biotechnology • Reaction Engineering • Process Systems Engineering • Pharmaceutical Engineering • Polymers

Faculty

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

FELLOWSHIPS, TRAINEESHIPS, AND ASSISTANTSHIPS AVAILABLE

For further information contact:

Graduate Program in Chemical and Biochemical Engineering • Rutgers, The State University of New Jersey
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Email: cbemail@sol.rutgers.edu • http://sol.rutgers.edu

Department of Chemical Engineering

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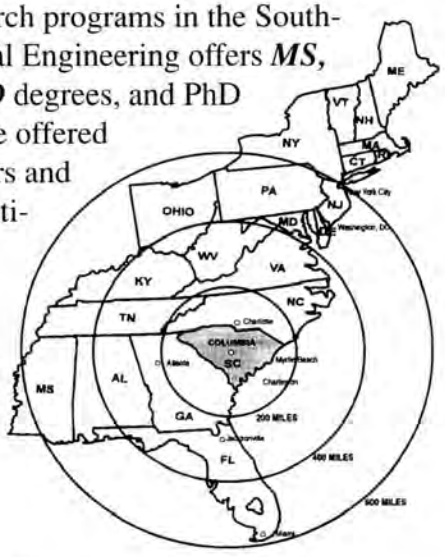

For further information:
The Graduate Director, Department of Chemical Engineering,
Swearingen Engineering Center,
University of South Carolina, Columbia, SC 29208
Phone: 1-800-763-0527 • Fax: 1-803-777-8265
Web page: www.che.sc.edu

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

Faculty

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

Research Programs

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Biomedical Engineering
Biomaterials
Colloids and Interfaces
Composite Materials
Corrosion Engineering
Electrochemistry
Heterogeneous Catalysis
Nanotechnology
Numerical Methods
Pollution Prevention
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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

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 • (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, electrodeposition, 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

Ching-An Peng • (Ph.D., Chemical Engineering, University of Michigan, 1995) • Bio-based products; cellular and tissue engineering; drug and gene delivery; fluorinated materials; nanomaterials

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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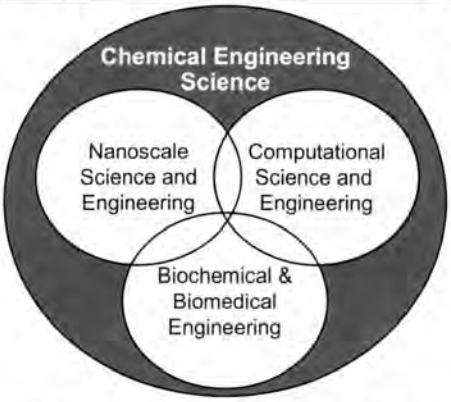

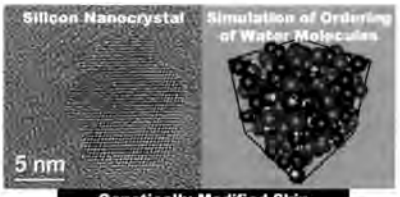

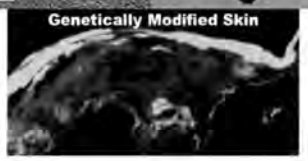

Faculty

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*
Sriram Neelamegham (Rice) • *biomedical engineering, cell biomechanics, vascular engineering*
Johannes M. Nitsche (MIT) • *fluid mechanics, transport phenomena, bioactive surfaces, biological pores, transdermal transport*
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 formation, modeling of reactive flows, computational chemistry, chemical kinetics*
E. (Manolis) S. Tzanakakis (Minnesota) • *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 engineering faculty participate in many interdisciplinary centers and initiatives, including The Center for Advanced Molecular Biology and Immunology, The Center for Computational Research, The Institute for Lasers, Photonics, and Biophotonics, The Institute for Bioinformatics, The Center for Advanced Technology for Biomedical Devices, and The Center for Spin Effects and Quantum Information in Nanostructures.

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

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Faculty

R. Besser (PhD, Stanford University)
G.B. DeLancey (PhD, University of Pittsburgh)
H. Du (PhD, Penn State University)
B. Gallois (PhD, Carnegie-Mellon University)
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)

Research in

Micro-Chemical Systems
Polymer Rheology and Processing
Processing of Electronic and Photonic Materials
Processing of Highly Filled Materials
Chemical Reaction Engineering
Biomaterials and Thin Films
Polymer Characterization and Morphology
High Temperature Gas-Solid and Solid-Solid Interactions
Environmental and Thermal Barrier Coatings

For application, contact:
Office of Graduate Studies
Stevens Institute of Technology
Hoboken, NJ 07030
201-216-5234

For additional information, contact:
Chemical, Biomedical, and Materials Engineering Department
Stevens Institute of Technology
Hoboken, NJ 07030
201-216-5546

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The University

Founded in 1794 as Blount College, the first non-sectarian college west of the Appalachians, The University of Tennessee today is the state's largest university and Land-Grant institution with about 20,000 undergraduates, 5,700 graduate and professional students, and a faculty of 1,200. The University of Tennessee is located in Knoxville near the headwaters of the Tennessee River. Within an hour's drive are six Tennessee Valley Authority lakes and the Great Smoky Mountains National Park. The Knoxville metropolitan area has a population of 600,000 but enjoys a pleasant, generally uncrowded atmosphere and consistently ranks among the nation's top ten metropolitan areas in surveys on quality of life. East Tennessee has a four-season climate, ranging from warm summer temperatures to winter temperatures cold enough for snow skiing in nearby mountain resorts.

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-Newtonian 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

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
http://www.che.utk.edu

Adjunct and Part-Time Faculty from Oak Ridge National Laboratory

Hank D. Cochran (Ph.D., M.I.T.) *Thermodynamics, Statistical Mechanics*
Brian H. Davison (Ph.D., Caltech) *Biochemical Engineering*

Tennessee Tech

NSF-Funded Environmental Scanning Electron Microscope (ESEM)

Research areas

Electrical Field-Based Processes and Systems

Energy conversion (fuel cells) and energy storage systems (rechargeable batteries and supercapacitors); hydrogen storage processes; modeling and simulation of power sources; AC impedance spectroscopy for transport properties in batteries; microfluidics, field flow fractionation and bio-micro electrophoresis; electrokinetics in soil remediation and bioseparation; cold plasma high oxidation methods.

Nanoscale-Based Engineered Materials and Systems

Multi-scale approach for the design, synthesis and characterization of advanced materials; micro- and nano-scale engineering of cementeous materials and soft, gel materials for bioseparation, i.e. colloidal and biodegradables, controlled-drug delivery, tissue engineering, and contact lenses; micro-rheology of bio-macromolecules in fibrous and porous matrices; visualization of bio-macromolecule micro-flows; design and characterization of foam blowing agents.

Biological-Based Processes and Systems

Intelligent-based computational approaches (Signature) for drug design; drug delivery; bioinformatics; biological microflows in the human body; micro-separation of biological macromolecules; micro-biosensors; dynamics of environments for biogrowth.

Computational Mathematics and Modeling

Methods of lines; design of complex fluid mixtures; Monte-Carlo, molecular dynamic and integral-spectral approaches in multi-scale environments with and without electro/chemical/biological reactions; novel methods for phase-equilibrium calculations; micro-flows in drops at low Reynolds No.; averaging methods in multi-scale and field sensitive systems; particle flows in micro-channels.

Engineering Education

System-based learning and high performance (student-centered) learning environments; problem-based learning; social learning approaches; ABET-based models of assessments; research-based methods for undergraduate education.

Tennessee Tech University's Chemical Engineering Department blends scholarship and research with advanced studies, offering excellent opportunities to graduate students. The dynamic and flexible program offers an M.S. in Chemical Engineering and a Ph.D. in Engineering with a concentration in Chemical Engineering. The program's interdisciplinary nature lends itself to relevant projects in current areas of research. Core faculty members enhance student opportunities by working closely with faculty in Electrical Engineering, Environmental and Civil Engineering, Mechanical Engineering, Chemistry, Biology, and Manufacturing and Industrial Technology to build a unique and effective environment for graduate research and learning. The relatively small size of the program and friendly campus atmosphere promote close interaction among students and faculty. Opportunities to mentor undergraduate students in research and in the use of instruments such as NMR, electron microscopy, x-ray diffraction and microflow visualization lead to well-rounded training, as does the department's partnership with TTU's Centers of Excellence.

TTU's ChE faculty conduct research sponsored by NSF, DOE, NASA, and state and private sources among others, and are actively involved in national and regional organizations including the AIChE, American Electrophoresis Society, American Ceramic Society, American Concrete Institute, Electrochemical Society, ACS, and ASEE. They conduct their research in close collaboration with leading regional and/or international institutions such as Florida State, Georgia Tech, Texas A&M, UT-Space Institute, University of Michigan, University of South Carolina, UCN (Antofagasta, Chile), and Oak Ridge, Sandia and Brookhaven National Laboratories, in addition to TTU's Centers of Excellence in Manufacturing Research, Water Resources, and Energy Systems. This environment brings unique opportunities for graduate students interested in frontier areas of research.

Core Faculty in Chemical Engineering

Pedro E. Arce, Chair, Ph.D., Purdue
Joseph J. Biernacki, Dr. Eng., Cleveland State
John Ellassen, Ph.D., Minnesota
Holly Stretz, Ph.D., U. of Texas, Austin
Venkat Subramanian, Ph.D., Univ. of S. Carolina
Donald P. Visco, Jr., Ph.D., Univ. at Buffalo-SUNY
Chunsheng Wang, Ph.D., Zhejiang University

Collaborating Faculty

Jeffrey O. Boles, Chemistry, Ph.D., Univ. of S. Carolina
Glen Cunningham, Mechanical Eng., Ph.D., Tennessee Tech
Ahmed ElSawy, Industrial and Manufacturing, Ph.D., Cairo Univ.
Dennis George, Environmental Systems, Ph.D. Clemson
Satish M. Mahajan, Electrical Eng., Ph.D., Univ. of S. Carolina
Martha J.M. Wells, Chemistry, Ph.D., Auburn
Mona C. Wells, Chemistry, Ph.D., Texas A&M

Located in one of the most beautiful regions of Tennessee, Cookeville is the home of Tennessee Tech University. A warm and welcoming community surrounded by parks, lakes, and mountains, Cookeville is located a little more than an hour from three of Tennessee's metro areas: Nashville, Chattanooga and Knoxville.

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The University of Texas at Austin

☆

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. Chelikowski, 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 • statistical mechanics, simulations of self-assembly in complex fluids
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 science, molecular beams, 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 • polymer physics, biomaterials, controlled drug delivery
S. Joseph Qin, Ph.D., U. of Maryland, 1992 • process control, monitoring & optimization, process modeling & system identification
Gary T. Rochelle, Ph.D., U. of C. Berkeley, 1977 • CO2 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 • cell and tissue 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
C. Grant Willson, Ph.D., U. of C. Berkeley, 1973 • polymer synthesis, nanotechnology, materials for micro-electronics

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RESEARCH AREAS

- ***Process Control and Systems Analysis***
- ***Process Integration and Intensification***
- ***Process Optimization*** ■ ***Process Safety***
- ***Computational Chemistry Engineering***
- ***Biochemical Engineering***
- ***Advanced Materials/Electronics***
- ***Microfluidics*** ■ ***Electrochemical Engineering***
- ***Reaction Engineering/Kinetics/Catalysis***
- ***Interfacial Phenomena***
- ***Environmental Engineering*** ■ ***Thermodynamics***

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 • Ph.D., University of Texas, 1996
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, Assoc. Head • Ph.D., Univ. of California, 1990, McFerrin Professor
Environmental remediation & benign processing process, design, integration, & control

P.T. Eubank • Ph.D., Northwestern University, 1961
Joe M. Nesbitt Professor • *Thermodynamics*

D.M. Ford • Ph.D., University of Pennsylvania, 1996
Molecular simulation & computational chemistry, thermodynamics, transport and interfacial phenomena

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

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

J. Hahn • Ph.D., University of Texas, 2002
Process, design, integration, and control

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

K.R. Hall, Head • 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
Director, Mary Kay O'Connor Process Safety Center. Process safety

J. Seminario • Ph.D., Southern Illinois University, 1988
Molecular simulation and computational chemistry

D.F. Shantz • Ph.D., University of Delaware, 2000
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
Green chemistry and bioremediation; biofilms

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

Faculty

Martin A. Abraham, Professor
Ph.D., University of Delaware
Green Eng., Catalysis, Hydrogen Production, Fuel Cells

Abdul-Majeed Azad, Associate Professor
Ph.D., University of Madras, India
Materials & Ceramic 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, Assistant 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

Arunan Nadarajah, Professor
Ph.D., University of Florida
Characterization of Surfaces, Nanotechnology

Bruce E. Poling, Professor
Ph.D., University of Illinois
Thermodynamics and Physical Properties

Constance A. Schall, Associate Professor
Ph.D., Rutgers University
Enzyme Kinetics, Crystallization, Paraffin Deposition

Sasidhar Varanasi, Professor
Ph.D., State University of New York at Buffalo
Colloidal & Interfacial Phenomena, Hydrogels

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Chemical & Environmental Engineering

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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 chemical reactors and complex processes

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

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

Howard Saltsburg Ph.D., Boston University
Catalysis, materials science

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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*

For Additional Information, Please Contact

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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.

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The University of Tulsa

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Chemical Engineering at TU

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

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

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

Financial aid is available, including fellowships and research assistantships.

The Faculty

D.W. Crunkleton • Fuel cells, sensors
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
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E-mail: chegradadvisor@utulsa.edu • Graduate School application: 1-800-882-4723

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Vanderbilt University

DEPARTMENT OF CHEMICAL ENGINEERING

Graduate Study Leading to the M.S. and Ph.D. Degrees

Graduate work in chemical engineering provides an opportunity for study and research at the cutting edge - to contribute to shaping a new model of what chemical engineering is and what chemical engineers do. Formal course work for the Ph.D. essentially doubles the exposure to chemical engineering principles that students receive as undergraduates. Thesis research gives unparalleled experience in problem solving, the key to challenging research assignments in industry and admission to the worldwide community of scholars.

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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

R. Robert Balcarcel *(Ph.D., Massachusetts Institute of Technology)*
Biotechnology and bioengineering; mammalian cell cultures; cell life cycles; pharmaceutical production.

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:
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Department of Chemical Engineering
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University of Virginia

Graduate Studies in Chemical Engineering

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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

Kimberly E. Forsten-Williams (Illinois)
Computational bioengineering and cell and tissue engineering

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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Department of Chemical Engineering
Box 351750
Seattle, Washington 98195-1750
Phone: (206) 543-2250 Fax: (206) 543-3778
E-mail: grad.admissions@cheme.washington.edu
Web Page: http://depts.washington.edu/chemeng/

Chemical Engineering Faculty • Research Areas

Materials and Interfacial Phenomena

Stuart Adler, Ph.D., California (Berkeley) • Solid Oxide Fuel Cells; Solid-State Electrochemistry
G. Graham Allan (Joint), Ph.D., D.Sc., Glasgow • Fiber and Polymer Science
John C. Berg, Ph.D., California (Berkeley) • Interfacial Phenomena; Surface and Colloid Science
E. James Davis, Ph.D., Washington • Colloid Science; Environmental and Aerosol Science; Electrokinetics
Samson A. Jenekhe, Ph.D., Minnesota • Polymer Science & Engineering; Optoelectronic/Photonic Materials
Shaoyi Jiang, Ph.D., Cornell • Interfacial Phenomena and Nanotechnology
René M. Overney, Ph.D., Basel, Switzerland • Nanoscale Surface Science and Polymer Physics
Daniel T. Schwartz, Ph.D., California (Davis) • Electrochemical Engineering; Electrolytic Thin-Film Science
James C. Seferis, Ph.D., Delaware • Polymeric Composites; Manufacturing and Teaming
Eric M. Stuve, Ph.D., Stanford • Electrochemical Surface Science; Fuel Cell Electrocatalysis

Biochemical Engineering and Bioengineering

François Baneyx, Ph.D., Texas (Austin) • Biotechnology; Protein Technology; Biochemical Engineering
David G. Castner, Ph.D., California (Berkeley) • Biomaterial and Biomolecule Surface Analysis, Self-Assembled Monolayers
Thomas A. Horbett (Joint), Ph.D., Washington • Biomaterials; Peptide Drug Delivery
Mary E. Lidstrom, Ph.D., Wisconsin • Environmental Biotechnology; Molecular Bioengineering
Buddy D. Ratner (Joint), Ph.D., Brooklyn Polytechnic • Biomaterials; Polymers; Surface Characterization

Information and Process Technology

Bruce A. Finlayson, Ph.D., Minnesota • Mathematical Modeling
Bradley R. Holt, Ph.D., Wisconsin • Process Design and Control
N. Lawrence Ricker, Ph.D., California (Berkeley) • Process Control and Optimization

Graduate Programs in

Chemical Engineering

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

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

Facilities

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

Financial Assistance

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

Student Life

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

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Faculty

Su Ha, Ph.D. Illinois, electrochemical engineering, portable fuel cells, catalysts in fuel cells

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

James Lee, Ph.D Kentucky, bioprocessing, mixing

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

Reid Miller, Ph.D. University of California–Berkeley, thermodynamics

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

William Thomson, Ph.D. Idaho, materials, kinetics, catalysis

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

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

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ChEBE, 509-335-4332

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

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B. Khomami ► Rheology, Polymer and Composite Materials Processing
P. A. Ramachandran ► Chemical Reaction Engineering, Boundary Element Methods
R. Sureshkumar ► Complex Fluids Dynamics, Interfacial Nanostructures, Multiscale Modeling and Simulations
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For Information Contact

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Graduate Certificate in Polymer Engineering

Sandro R.P. da Rocha, Ph.D., UT Austin, 2000
Nanostructured materials from self-assembled amphiphiles in conventional and compressible media ◆ Drug delivery and sensing devices ◆ Molecular modeling and computer simulations

Esin Gulari, Ph.D., Caltech, 1973
Thermodynamics and transport properties of polymer solutions and melts ◆ Processing of polymers with supercritical fluids ◆ Light scattering based particle and drop sizing techniques

Yinlun Huang, Ph.D., Kansas State, 1992
Pollution prevention and waste minimization ◆ Process design and synthesis

Rangaramanujam Kannan, Ph.D., Caltech, 1994 — Dynamics of polymeric systems and interfaces ◆ Rheo-optical spectroscopy and scattering techniques

Ralph Kummler, Ph.D., John Hopkins, 1966 — Modeling of combined sewer overflows and sediments ◆ Chemical kinetics ◆ Computer simulation

Joseph F. Louvar, Ph.D., Wayne State, 1983 — Process design and safety ◆ Risk analysis

Charles Manke, Chair, Ph.D., California, Berkeley, 1983 — Polymer processing and rheology ◆ Molecular dynamics and kinetic theory of polymeric liquids

Guang-Zhao Mao, Ph.D., Minnesota, 1994 — Optoelectronic properties of thin films and crystals ◆ Self-assembly of polymers and surfactants ◆ Colloidal stability of waterborne paints ◆ Real time imaging of surface phenomena at the molecular level

Howard Matthew, Ph.D., Wayne State, 1992 — Tissue engineering and biomaterials ◆ Artificial organ substitutes

Simon Ng, Ph.D., Michigan, 1985 — Heterogeneous catalysis ◆ Spectroscopic and thermal analysis of material surfaces

Jeffrey Potoff, Ph.D., Cornell, 1999 — Molecular simulation ◆ Phase behavior ◆ Complex systems

Susil Putatunda, Ph.D., IIT Bombay, 1983 — Effects of microstructure on fatigue ◆ Fracture toughness ◆ Creep in metals and alloys

Erhard Rothe, Ph.D., Michigan, 1959 — Applications of high-powered UV lasers ◆ Machining of electronic chips ◆ Diagnostics of internal combustion

Steven Salley, Ph.D., Detroit, 1976 — Biochemical/medical engineering ◆ Design of artificial organs ◆ Immobilized enzyme reactors

Gina Shreve, Ph.D., Michigan, 1991 — Environmental and biochemical applications ◆ Microbially mediated biotransformations

Contact:

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Faculty

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Biotechnology, interfacial phenomena, colloid chemistry, soft materials, nanotechnology

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Kinetics and catalysis, surface chemistry, energy from renewable resources

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Fluid mechanics, complex fluids, applied and computational mathematics

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Process modeling and optimization, supply chain optimization, new product development, systems biology, scheduling

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Thermodynamics, kinetics and catalysis, surface science, computational chemistry, electronic materials, fuel cells

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Biomedical engineering, protein-protein interactions, targeted drug delivery

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Polymers, directed assembly, nanofabrication, cell-substrate interactions

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Anthony G. Dixon • *Ph.D., Edinburgh*

Nikolaos K. Kazantzis • *Ph.D., Michigan*

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Susan Zhou • *Ph.D., U.C. Irvine*

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Merrill W. Beckstead *(Utah)* • propellant combustion, modeling
Thomas H. Fletcher *(BYU)* • pyrolysis and combustion
Hugh B. Hales *(MIT)* • reservoir simulation
John H. Harb *(Illinois)* • coal combustion, electrochemical engineering
William C. Hecker *(UC Berkeley)* • kinetics and catalysis
Randy S. Lewis *(MIT)* • bioprocessing and biomaterials
John L. Oscarson *(Michigan)* • calorimetry and thermodynamics
William G. Pitt *(Wisconsin)* • materials science
Richard L. Rowley *(Michigan State)* • thermophysical properties
Kenneth A. Solen *(Wisconsin)* • biomedical engineering
Ronald E. Terry *(BYU)* • engineering education, reservoir engineering
Dean R. Wheeler *(UC Berkeley)* • electrochemical engineering, computer simulation and modeling
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Bacterial adhesions to surfaces

For further information, contact

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Williams E. Collins, Associate Professor • PhD, University of Wisconsin-Madison
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James W. Mitchell, Packard Professor of Material Science • PhD, Iowa State University, Ames
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John P. Tharakan, Professor • PhD, University of California, San Diego
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For further information, contact

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Howard University, 2300 6th Street NW, LKD 1009, Washington, DC 20059
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- **T. C. HO** *(Ph.D., Kansas State University)*
- **J. R. HOPPER** *(Ph.D., Louisiana State University)*
- **K. Y. LI** *(Ph.D., Mississippi State University)*
- **SIDNEY LIN** *(Ph.D., University of Houston)*
- **H. H. LOU** *(Ph.D., Wayne State University)*
- **R. TADMOR** *(Ph.D., Weizmann Institute of Science)*
- **Q. XU** *(Ph.D., Tsing Hua University)*
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Joseph H. Holles; Assistant Professor • PhD, University of Virginia, 2000

Chemical process safety
Daniel A. Crowl; Professor • PhD, Illinois, 1975;
Herbert Henry Dow Chair of Chemical Process Safety

Demixing-polymerization, polymer materials
Gerard T. Caneba; Associate Professor • PhD, California-Berkeley, 1985

Environmental and biochemical engineering
David R. Shonnard; Associate Professor • PhD, California-Davis, 1991

Environmental reaction engineering
Jason M. Keith; Assistant Professor • PhD, University of Notre Dame, 2000

Environmental thermodynamics
Tony N. Rogers; Associate Professor • PhD, Michigan Tech, 1994

Extractive metallurgy, waste management, particle separations
Carl C. Nesbitt; Associate Professor • PhD, University of Nevada-Reno, 1990

Materials Utilization
John F. Sandell; Associate Professor • PhD, Michigan Tech, 1995

Particulate processing, size reductions, solid waste
S. Komar Kawatra; Professor • PhD, University of Queensland, 1974

Polymers, composites
Julia A. King; Associate Professor • PhD, Wyoming, 1989

Polymer rheology, flow instabilities, complex fluids
Faith A. Morrison; Associate Professor • PhD, Massachusetts-Amherst, 1988

Process and plant design
Bruce A. Barna: Professor • PhD, New Mexico State, 1985

Process control, energy systems
Nam K. Kim; Associate Professor • PhD, Montana State, 1982

Process control, neural networks, fuzzy logic control
Tomas B. Co: Associate Professor • PhD, Massachusetts-Amherst, 1988

Reactor design, thermodynamics, materials
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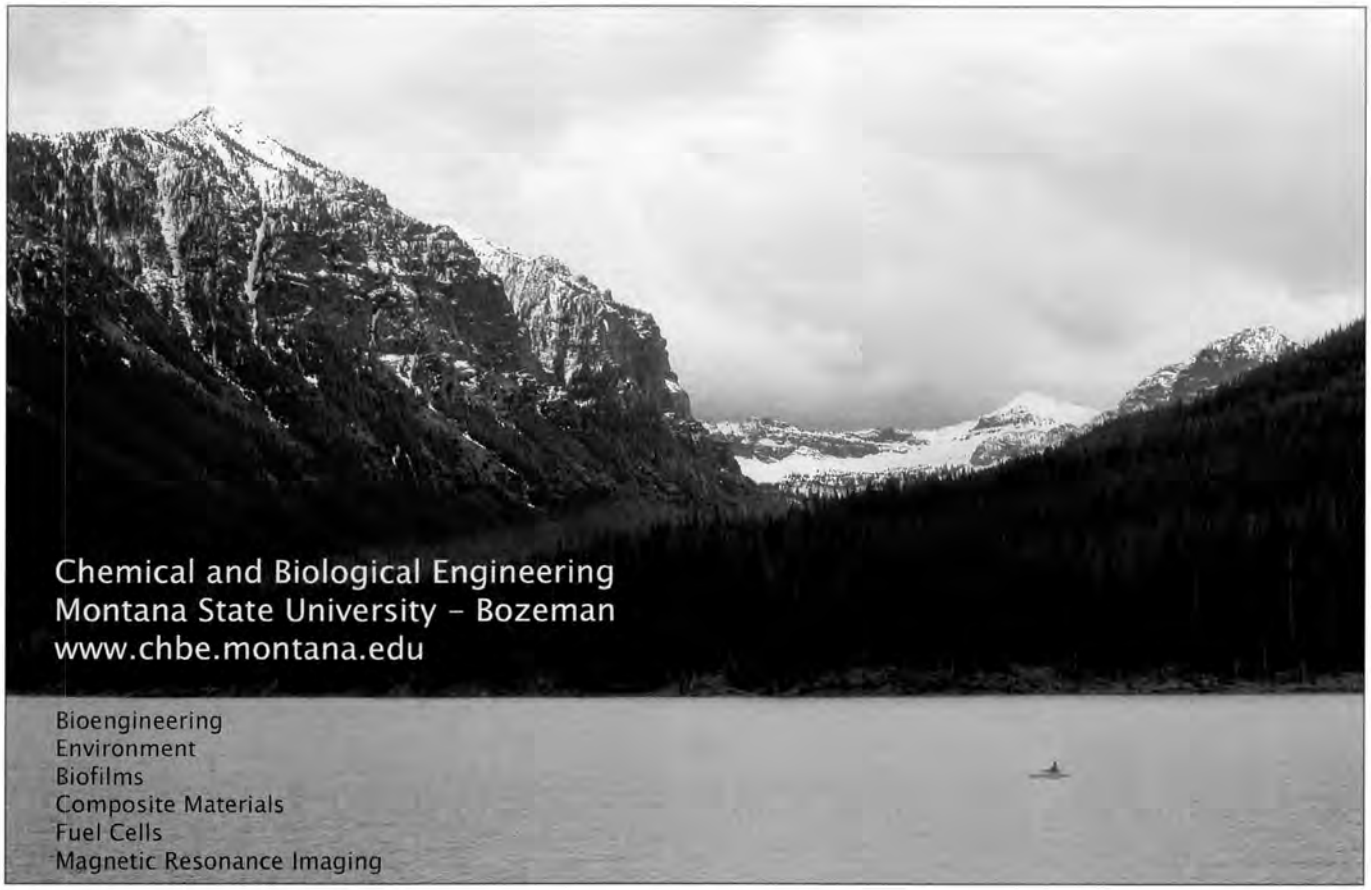

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