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Catalysis, Reaction Engineering, Environmentally Benign Synthesis

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Faculty

G.C. April, Ph.D. (Louisiana State)
D. W. Arnold, Ph.D. (Purdue)
C. S. Brazel, Ph.D. (Purdue)
E. S. Carlson, Ph.D. (Wyoming)
P. E. Clark, Ph.D. (Oklahoma State)
W. C. Clements, Jr., Ph.D. (Vanderbilt)
W. S. Epling, Ph.D. (Florida)
R. A. Griffin, Ph.D. (Utah State)
D. T. Johnson, Ph.D. (Florida)
P. W. Johnson, Ph.D. (New Mexico Tech.)
T. M. Klein, Ph.D. (NC State)
A. M. Lane, Ph.D. (Massachusetts)
M. D. McKinley, Ph.D. (Florida)
R. G. Reddy, Ph.D. (Utah)
L. Y. Sadler III, Ph.D. (Alabama)
V. N. Schrodt, Ph.D. (Penn. State)
J. M. Wiest, Ph.D. (Wisconsin)

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

CHEMICAL & MATERIALS ENGINEERING

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FACULTY & RESEARCH AREAS

Ramón L. Cerro - Ph.D. (UC-Davis)
Professor and Chair
Capillary hydrodynamics, multiphase flows, enhanced heat transfer surfaces.
(256) 890-7313, rlc@che.uah.edu

Chien P. Chen - Ph.D. (Michigan State)
Professor
Multiphase flows, spray combustion, turbulence modeling, numerical methods in fluids and heat transfer.
(256) 890-6194, cchen@che.uah.edu

Krishnan K. Chittur - Ph.D. (Rice)
Professor
Protein Adsorption to Biomaterials, FTR/ATR at solid-liquid interfaces, biosensing.
(256) 890-6850, kchittur@che.uah.edu

Douglas G. Hayes - Ph.D. (Michigan)
Assistant Professor
Enzyme reactions in nonaqueous media, separations involving biomolecules, lipids and surfactants, surfactant-based collidal aggregates.
(256) 890-6874, dhayes@che.uah.edu

James E. Smith Jr. - Ph.D. (South Carolina)
Professor
Kinetics and catalysis, powdered materials processing, combustion diagnostics and fluids visualization using optical methods.
(256) 890-6439, jesmith@che.uah.edu

Jeffrey J. Weimer - Ph.D. (MIT)
Associate Professor, *Joint Appointment in Chemistry*
Adhesion, biomaterials surface properties, thin film growth, surface spectroscopies, scanning probe microscopies.
(256) 890-6954, jjweimer@matsci.uah.edu

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For further information, contact

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Department of Chemical and Materials Engineering
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e-mail: chemical.engineering@ualberta.ca
web: www.ualberta.ca/chemeng

CHEMICAL ENGINEERING FACULTY

P. CHOI, Ph.D. (University of Waterloo)
Statistical Mechanics of Polymers • Polymer Solutions and Blends

K. T. CHUANG, Ph.D. (University of Alberta)
Mass Transfer • Catalysis • Separation Processes • Pollution Control

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Computational Fluid Dynamics • Transport Phenomena • Pulp and Paper

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Transport Phenomena • Distillation • Computational Fluid Dynamics

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AI • Intelligent Control • Process Control

S. L. SHAH, Ph.D. (University of Alberta)
Computer Process Control • System Identification • Adaptive Control

S. E. WANKE, Ph.D. (University of California, Davis) CHAIR
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M. C. WILLIAMS, Ph.D. (University of Wisconsin)
Rheology • Polymer Characterization • Polymer Processing

Z. XU, Ph.D. (Virginia Polytechnic Institute and State University)
Surface Science & Engineering • Mineral Processing • Waste Management

CHEMICAL AND ENVIRONMENTAL ENGINEERING

at

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FACULTY / RESEARCH INTERESTS

ROBERT ARNOLD, Professor (Caltech)
Microbiological Hazardous Waste Treatment, Metals Speciation and Toxicity

PAUL BLOWERS, Assistant Professor (Illinois, Urbana-Champaign)
Chemical Kinetics, Catalysis, Surface Phenomena

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

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

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

ROBERTO GUZMAN, Associate Professor (North Carolina State)
Protein Separation, Affinity Methods

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

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

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

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

JERKER PORATH, Research Professor (Uppsala)
Separation Science

EDUARDO SAEZ, Associate Professor (UC, Davis)
Rheology, Polymer Flows, Multiphase Reactors

FARHANG SHADMAN, Professor (Berkeley)
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Chairman,
Graduate Study Committee
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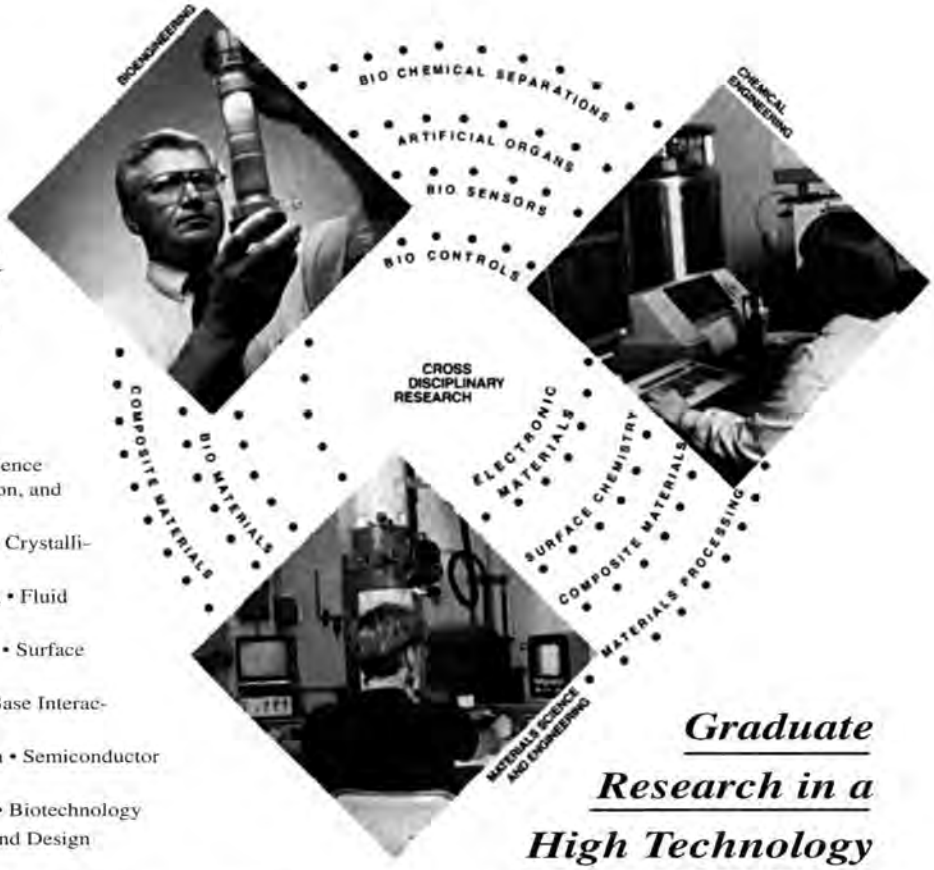

Graduate Research in a High Technology Environment

Chemical Engineering

Beaudoin, Stephen P., Ph.D., North Carolina State University • Transport Phenomena and Surface Science concering Pollution Prevention, Waste Minimization, and Pollution Remediation

Beckman, James R., Ph.D., University of Arizona • Crystallization and Solar Cooling

Berman, Neil S., Ph.D., University of Texas, Austin • Fluid Dynamics and Air Pollution

Burrows, Veronica A., Ph.D., Princeton University • Surface Science, Semiconductor Processing

Garcia, Antonio A., Ph.D., U.C., Berkeley • Acid-Base Interactions, Biochemical Separation, Colloid Chemistry

Raupp, Gregory B., Ph.D., University of Wisconsin • Semiconductor Materials Processing, Surface Science, Catalysis

Razatos, Anna, Ph.D., University of Texas, Austin • Biotechnology

Rivera, Daniel, Ph.D., Cal Tech • Process Control and Design

Sater, Vernon E., Ph.D., Illinois Institute of Tech

Torrest, Robert S., Ph.D., University of Minnesota • Multiphase Flow, Filtration, Flow in Porous Media, Pollution Control

Bioengineering

Guilbeau, Eric J., Ph.D., Louisiana Tech University • Biosensors, Physiological Systems, Biomaterials

He, Jiping, Ph.D., University of Maryland • Biomechanics, Robotics, Computational Neuroscience, Optimal Control, System Dynamics and Control

Kipke, Daryl R., Ph.D., University of Michigan • Computation Neuroscience • Machine Vision, Speech Recognition, Robotics • Neural Networks

Massia, Stephen, Ph.D., University of Texas • Bio materials • Molecular and Cellular Engineering

Panitch, Alyssa, Ph.D., University of Massachusetts • Tissue Engineering

Pizziconi, Vincent B., Ph.D. Arizona State University• Artificial Organs, Biomaterials, Bioseparations

Sweeney, James D., Ph.D., Case-Western Reserve University• Rehab Engineering, Applied Neural Control

Towe, Bruce C., Ph.D., Pennsylvania State University• Bioelectric Phenomena, Biosensors, Biomedical Imaging

Yamaguchi, Gary T., Ph.D., Stanford University • Biomechanics, Rehab Engineering, Computer-Aided Surgery

Materials Science & Engineering

Adams, James, Ph.D., University of Wisconsin, Madison • Atomistic Simulation of Metallic Surfaces • Grain Boundaries • Automobile Catalysts • Polymer-Metal Adhesion

Alford, Terry L., Ph.D., Cornell University • Electronic Materials • Physical Metallurgy • Electronic Thin Films • Surface/Thin Film

Dey, Sandwip K., Ph.D., NYSC of Ceramics, Alfred University • Ceramics, Sol-Gel Processing

Krause, Stephen L., Ph.D., University of Michigan • Ordered Polymers, Electronic Materials, Electron X-ray Diffraction, Electron Microscopy

Mahajan, Subhash, Ph.D., University of Michigan • Semiconductor Defects, Structural Materials Deformation

Mayer, James, Ph.D., Purdue University •Thin Film Processing • Ion Bean Modification of Materials

For more details regarding the graduate degree programs in the Department of Chemical, Bio, and Materials Engineering, please call (480) 965-3313 or write to: Dr. Eric Guilbeau, Chair of the Graduate Committee, Department of Chemical, Bio, and Materials Engineering, Arizona State University, Tempe, Arizona 85287-6006.

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Chemical Engineering

Faculty

Robert P. Chambers — *University of California, Berkeley*
Harry T. Cullinan — *Carnegie Mellon University*
Christine W. Curtis — *Florida State University*
Steve R. Duke — *University of Illinois*
Mahmoud El-Halwagi — *University of California, Los Angeles*
James A. Guin — *University of Texas, Austin*
Ram B. Gupta — *University of Texas, Austin*
Gopal A. Krishnagopalan — *University of Maine*
Jay H. Lee — *California Institute of Technology*
Y. Y. Lee — *Iowa State University*
Glennon Maples — *Oklahoma State University*
Ronald D. Neuman — *The Institute of Paper Chemistry*
Stephen A. Perusich — *University of Illinois*
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Christopher B. Roberts — *University of Notre Dame*
A. R. Tarrer — *Purdue University*
Bruce J. Tatarchuk — *University of Wisconsin*

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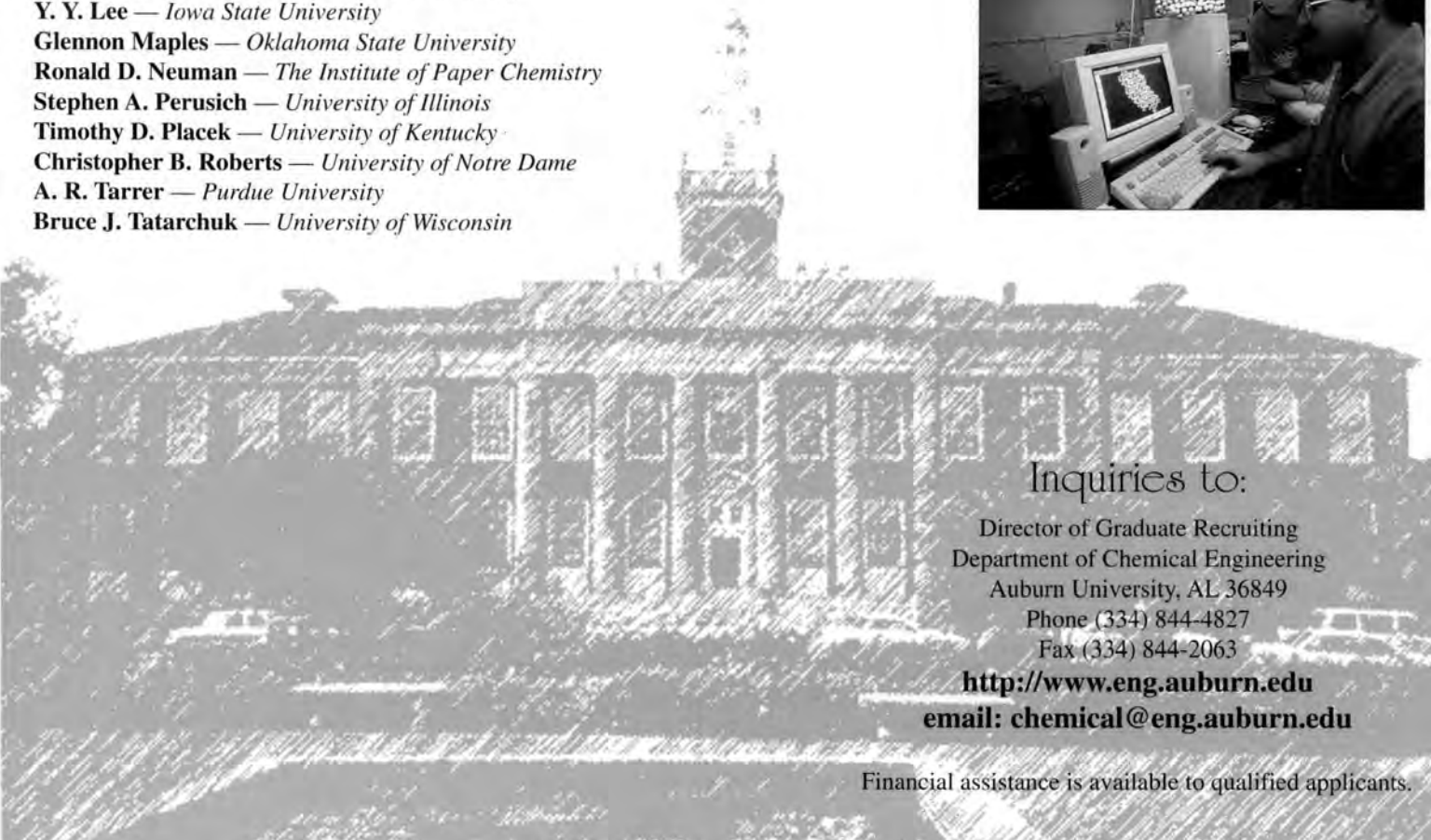
• Catalysis and Reaction Engineering
• Computer Aided Process Synthesis, Optimization and Design
• Environmental Chemical Engineering
• Pollution Prevention • Recycling
• Materials • Polymers • Surface Science
• Colloid and Interfacial Phenomena
• Thermodynamics • Supercritical Fluids
• Separation • Electrochemical Engineering
• Fluid Dynamics and Transport Phenomena
• Fuels and Energy



Inquiries to:

Director of Graduate Recruiting
Department of Chemical Engineering
Auburn University, AL 36849
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http://www.eng.auburn.edu
email: chemical@eng.auburn.edu

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J. Azaiez *(Stanford)*
H. Baheri *(Saskatchewan)*
L. A. Behie *(Western Ontario)*
C. Bellehumeur *(McMaster)*
P. R. Bishnoi *(Alberta)*
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- **Process Development**
- **Reaction Engineering/Kinetics**
- **Thermodynamics**
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• For Additional Information Write •

Dr. A. K. Mehrotra • Chair, Graduate Studies Committee
Department of Chemical and Petroleum Engineering
University of Calgary • Calgary, Alberta, Canada T2N 1N4
E-mail: gradstud@ench.ucalgary.ca

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Fluid Mechanics
Kinetics and Catalysis
Polymer Science and Technology
Process Design and Development
Separation Processes
Surface and Colloid Science
Thermodynamics

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Faculty

David E. Block, Assistant Professor • Ph.D., University of Minnesota, 1992 • *Industrial fermentation, biochemical processes in pharmaceutical industry*

Roger B. Boulton, Professor • Ph.D., University of Melbourne, 1976 • *Fermentation and reaction kinetics, crystallization*

Stephanie R. Dungan, Associate Professor • Ph.D., Massachusetts Institute of Technology, 1992 • *Micelle transport, colloid and interfacial science in food processing*

Bruce C. Gates, Professor • Ph.D., University of Washington, Seattle, 1966 • *Catalysis, solid superacid catalysis, zeolite catalysts, bimetallic catalysis, catalysis by metal clusters*

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 and processing of nanostructured materials*

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 • *Protein production in plant cell cultures, bioremediation*

Marjorie L. Longo, Assistant 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*

Benjamin J. McCoy, Professor • Ph.D., University of Minnesota, 1967 • *Supercritical extraction, pollutant transport*

Karen A. McDonald, Professor • Ph.D., University of Maryland, College Park, 1985 • *Plant cell culture bioprocessing algal cell cultures*

Amiya K. Mukherjee, Professor • D.Phil., University of Oxford, 1962 • *Superplasticity of intermetallic alloys and ceramics, high temperature creep deformation*

Zuhair A. Munir, Professor • Ph.D., University of California, Berkeley, 1963 • *Combustion synthesis, multilayer combustion systems, functionally gradient materials*

Alexandra Navrotsky, Professor • Ph.D., University of Chicago, 1967 • *Thermodynamics and solid state chemistry; high temperature calorimetry*

Ahmet N. Palazoglu, Professor • Ph.D., Rensselaer Polytechnic Institute, 1984 • *Process control and process design of environmentally benign processes*

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

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

Subhash H. Risbud, Professor and Chair • 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 • *Biomolecular process engineering and recombinant bioprocess technology*

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, Langmuir Blodgett films, colloid and surface science*

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

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Professor Jeffery C. Gibeling
Department of Chemical Engineering & Materials Science
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- Biochemical Engineering
- Aerosol Science and Technology
- Air Pollution Control and Environmental Engineering

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A. R. Wazzan

PROGRAMS

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, Molecular Engineering of Materials, and Process Systems Engineering.

Fellowships are available for outstanding applicants in both M.S. and Ph.D. degree programs. A fellowship includes a waiver of tuition and fees plus a stipend.

Located five miles from the Pacific Coast, UCLA's attractive 417-acre campus extends from Bel Air to Westwood Village. Students have access to the highly regarded science programs and to a variety of experiences in theatre, music, art, and sports on campus.

CONTACT

Admissions Officer • Chemical Engineering Department
5531 Boelter Hall • UCLA • Los Angeles, CA 90095-1592
(310) 825-9063

University of California, Riverside
Department of Chemical and Environmental Engineering

The Graduate Program in Chemical and Environmental Engineering offers training leading to the degrees of Master of Science and Doctor of Philosophy. All applicants are required to submit scores from the general aptitude Graduate Record Examination (GRE).

For more information
and application materials, write:

Graduate Advisor
Department of Chemical and
Environmental Engineering
University of California
Riverside CA 92521

Visit us at our website:
http://www.engr.ucr.edu/chemical

The Marlan and Rosemary Bourns College of

Engineering

Faculty

Wilfred Chen (Cal Tech) *Environmental Biotechnology, Microbial Engineering, Biocatalysis*

Marc Deshusses (ETH, Zurich) *Environmental Biotechnology, Bioremediation, Modeling*

Mark R. Matsumoto, Chair (UC Davis) *Water and Wastewater Treatment, Soil Remediation*

Ashok Mulchandani (McGill) *Biosensors, Environmental Biotechnology*

Joseph M. Norbeck (Nebraska) *Advanced Vehicle Technology, Air Pollution, Renewable Fuels*

Akula Venkatram (Purdue) *Micrometeorology, Air Pollution Modeling*

Anders O. Wistrom (UC Davis) *Particulate and Colloidal Systems, Wastewater Treatment*

Yushan Yan (CalTech) *Advanced Materials, Zeolite Thin Films, Catalysis*

The 1,200-acre Riverside campus of the University of California is conveniently located 50 miles east of Los Angeles within driving distance to most of the major cultural and recreational offerings in Southern California. In addition, it is virtually equidistant from the desert, the mountains, and the ocean.

UNIVERSITY OF CALIFORNIA

SANTA BARBARA

FACULTY AND RESEARCH INTERESTS

ERAY S. AYDIL Ph.D. *(University of Houston)* • Microelectronics and Plasma Processing.

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

BRADLEY F. CHMELKA Ph.D. *(U.C. Berkeley)* • Inorganic-Organic Hybrid Materials, Zeolites and Molecular Sieves, Polymeric Solids, Liquid Crystals, Solid-State NMR.

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

JACOB ISRAELACHVILI Ph.D. *(Cambridge)* **(Vice-Chair)** • Surface and Interfacial Phenomena, Adhesion, Colloidal Systems, Surface Forces, Biomolecular Interactions, Friction.

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

FRED F. LANGE Ph.D. *(Penn State)* • Powder Processing of Composite Ceramics, Liquid Precursors for Ceramics, Superconducting Oxides.

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.

DIMITRIOS MAROUDAS Ph.D. *(M.I.T.)* • Theoretical and Computational Materials Science, Microstructure Evolution in Electronic and Structural Materials.

ERIC McFARLAND Ph.D. *(M.I.T.)* M.D. *(Harvard)* • Biomedical Engineering, NMR and Neutron Imaging, Transport Phenomena in Complex Liquids, Radiation Interactions.

DUNCAN A. MELLICHAMP Ph.D. *(Purdue)* • Computer Control, Process Dynamics, Real-Time Computing.

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

DAVID J. PINE Ph.D. *(Cornell)* • Polymer, Surfactant, and Colloidal Physics, Multiple Light Scattering, Photonic Crystals, Macroporous Materials.

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

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

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

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

W. HENRY WEINBERG Ph.D. *(U.C. Berkeley)* • Surface Chemistry, Heterogeneous Catalysis, Electronic Materials, Materials Discovery using Combinatorial Chemistry

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

PROGRAMS AND FINANCIAL SUPPORT

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

THE UNIVERSITY

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

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Julia A. Kornfield
John H. Seinfeld
David A. Tirrell
Nicholas W. Tschoegl (Emeritus)
Zhen-Gang Wang

RESEARCH INTERESTS

Aerosol Science
Applied Mathematics
Atmospheric Chemistry and Physics
Biocatalysis and Bioreactor Engineering
Biomaterials
Bioseparations
Catalysis
Chemical Vapor Deposition
Combustion
Colloid Physics
Fluid Mechanics
Materials Processing
Microelectronics Processing
Microstructured Fluids
Polymer Science
Protein Engineering
Statistical Mechanics

For further information, write

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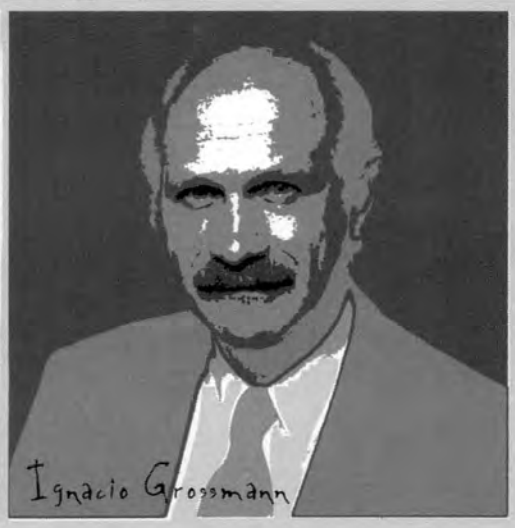

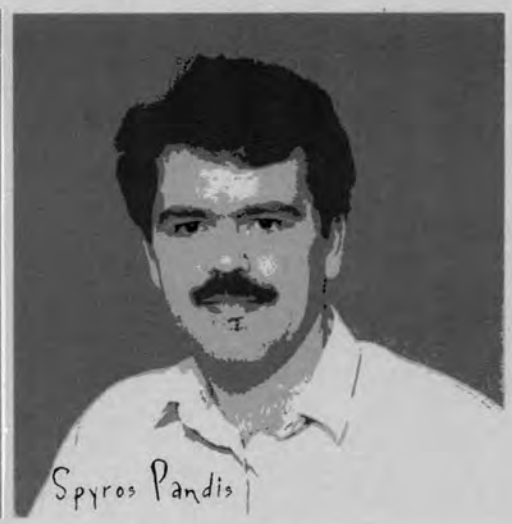

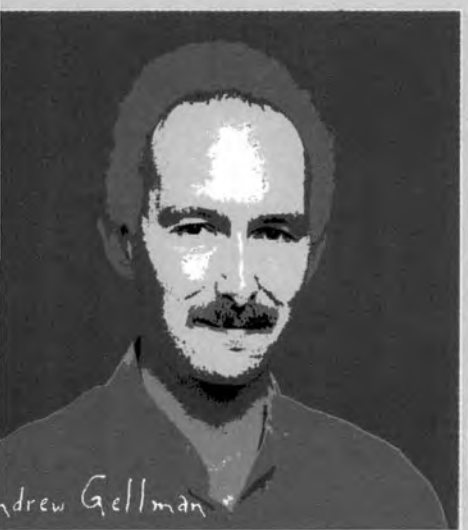

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Donald Feke
Nelson Gardner
Howard Greene
Uziel Landau
Chung-Chiun Liu
J. Adin Mann
Philip Morrison
Syed Qutubuddin
Robert Savinell

Students in the Department of Chemical Engineering are involved in state-of-the-art research. Here, two students make adjustments to a component of a prototype fuel cell

Research Opportunities

- Low Pressure Growth of Diamonds
- Process Control
- Colloidal Phenomena and Microemulsions
- Electrochemical Engineering
- Biomedical Sensors
- Synthesis of Electronic Material
- Polymers and Interfacial Phenomena
- Fuel Cells
- Catalysis and Reactor Design
- Separation Processes
- Interfacial Transport and Liquid Crystals
- In Situ Diagnostics

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

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

or see our home page at

http://cheme.cwru.edu

CWRU

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Faculty

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Joel Fried
Rakesh Govind
David Greenberg
Vadim Guliants
Daniel Hershey
Sun-Tak Hwang
Robert Jenkins
Yuen-Koh Kao
Soon-Jai Khang
Y. S. Lin
Neville Pinto
Sotiris Pratsinis
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 of Chemical Engineering
PO Box 210171
University of Cincinnati
Cincinnati, Ohio 45221-0171
e-mail: char@alpha.che.uc.edu

The faculty and students in the Department of Chemical Engineering are engaged in a diverse range of exciting research topics. A limited number of assistantships and tuition scholarships are available to highly qualified applicants to the MS and PhD degree programs.

☐ **Biotechnology (Bioseparations)**
Novel bioseparation techniques, chromatography, affinity separations, biodegradation of toxic wastes, controlled drug delivery, two-phase flow, suspension rheology.

☐ **Chemical Reaction Engineering and Heterogeneous Catalysis**
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☐ **Coal Research**
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☐ **Material Synthesis**
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☐ **Membrane Separations**
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☐ **Particle Technology**
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☐ **Polymers**
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☐ **Process Synthesis**
Computer-aided design methodologies, design for waste minimization, design for dynamic stability, separation system synthesis.

Graduate Study In CHEMICAL ENGINEERING AT CLEMSON UNIVERSITY

Special opportunities:

Students can participate in the department's M.S. Industrial Residency Program, which combines on-campus course work with practical work assignments in industry. Students can conduct their thesis research under joint faculty and industrial supervision.

Much of the research in polymers and composites is conducted in the Center for Advanced Engineering Fibers and Films, which is funded by the National Science Foundation and industrial partners.

Clemson is a land-grant institution with an enrollment of more than 16,500 students including 3,800 graduate students. The 1,400-acre main campus is located in the foothills of the Blue Ridge Mountains, on the shores of Lake Hartwell, midway between Atlanta, Ga., and Charlotte, N.C.

The Faculty

Charles H. Barron Jr. (D.Sc., University of Virginia)
David A. Bruce (Ph.D., Georgia Institute of Technology)
Dan D. Edie (Ph.D., University of Virginia)
Charles H. Gooding (Ph.D., North Carolina State University)
James M. Haile (Ph.D., University of Florida)
Graham M. Harrison (Ph.D., University of California, Santa Barbara)
Douglas E. Hirt (Ph.D., Princeton University)
Scott M. Husson (Ph.D., University of California, Berkeley)
S. Michael Kilbey II (Ph.D., University of Minnesota)
Stephen S. Melsheimer (Ph.D., Tulane University)
Amod A. Ogale (Ph.D., University of Delaware)
Richard W. Rice (Ph.D., Yale University)
Mark C. Thies (Ph.D., University of Delaware)

Research Areas

Bioseparations
Catalysis
Engineering Fibers & Films
Interfacial Engineering
Membrane Separations
Molecular Dynamics
Polymers & Composites
Rheology
Supercritical Fluids
Water Remediation

Programs lead to the M.S. and Ph.D. degrees

For more information, contact: Graduate Coordinator, Department of Chemical Engineering, Clemson University, Box 340909, Clemson, SC 29634-0909, Telephone 864/656-3055, Email address: *che@ces.clemson.edu*
Visit our Web site at *www.ces.clemson.edu*

CLEMSON UNIVERSITY

Cleveland State University

Graduate Studies in Chemical and Applied Biomedical Engineering

Engineering Degrees

M. Sc. **Chemical Engineering**
D. Eng. **Applied Biomedical Engineering**
D. Eng. **Chemical Engineering**

CSU Faculty

A. Annapragada (University of Michigan)
J.M. Belovich (University of Michigan)
G. Chatzimavroudis (Georgia Institute of Technology)
G.A. Coulman (Case Western Reserve University)
R.P. Elliott (Illinois Institute of Technology)
J.E. Gatica (State University of New York at Buffalo)
B. Ghorashi (Ohio State University)
D.B. Shah (Michigan State University)
O. Talu (Arizona State University)
S.N. Tewari (Purdue University)
S. Ungarala (Michigan Technological University)

CCF Collaborating Faculty

J. Frederick Cornhill (University of Oxford, U.K.)
A. Courtney (Harvard University/Harvard MIT)
B. Davis (Pennsylvania State University)
M. Grabiner (University of Illinois)
G. Lockwood (University of Toronto, Canada)
C. McDevitt (University of London, U.K.)
W. Smith (Cleveland State University)
A. van den Bogert (University of Utrecht, The Netherlands)
I. Vesely (University of Western Ontario, Canada)

Fenn College has more than 75 years of experience in providing outstanding engineering education.

Graduate Studies in Chemical and Applied Biomedical Engineering at Cleveland State University's (CSU's) Fenn College of Engineering offers a wealth of opportunity in a stimulating environment.

Research opportunities are available in collaboration with the Biomedical Engineering Department of the renowned Cleveland Clinic Foundation (CCF), Cleveland's Advanced Manufacturing Center, local and national industry, and Federal agencies, to name a few. Assistantships and Tuition Fee Waivers are available on a competitive basis for qualified students.

Cleveland State University has 18,000 students enrolled in its academic programs. It is located in the center of the city of Cleveland, with many outstanding cultural and recreational opportunities nearby.

RESEARCH AREAS

Adsorption Processes
Agile Manufacturing
Artificial Heart Valves
Biomechanics
Bioreactor Design
Bioseparations
Blood Flow
Computational Fluid Dynamics and Combustion
Drug Delivery Systems
Environmental Pollution Control
Materials Synthesis and Processing
Medical Imaging
MEMS Technology
Orthopedic Devices
Process Modeling and Control
Reaction Engineering
Surface Phenomena and Mass Transfer
Thermodynamics and Fluid Phase Equilibrium
Tissue Engineering
Tribology
Ventricular Assist Devices
Zeolites: Synthesis, Adsorption, and Diffusion

For more information, write to:

Graduate Program Coordinator • Department of Chemical Engineering
Cleveland State University • Cleveland, OH 44115

Telephone: 216-687-2569
E-mail: chemabe@csvax.egr.csuohio.edu

http://www.csuohio.edu/chemical_engineering/

Assistantships and Tuition/Fee Waivers are available on a competitive basis for qualified students.

University of Colorado at Boulder

The Boulder campus has a controlled enrollment of 20,000 undergraduates and 5,000 graduate students. The beautiful 600-acre campus has over 160 buildings of rough-cut sandstone with red-tile roofs. The excellent educational opportunities and beautiful location attract outstanding students from every part of the United States and 75 countries.

The University of Colorado has its main campus located in Boulder, an attractive community of 90,000 people located at the base of the Rocky Mountains. Boulder has over 300 days of sunshine per year, with relatively mild and dry seasons. The city is an active and innovative town that provides a rich array of recreational and cultural activities.

Department of Chemical Engineering Faculty and Research Interests

Kristi S. Anseth
Polymers, Biomaterials

Victor H. Barocas
Biomechanics, Biomedical Eng., Fluid Mechanics

Christopher N. Bowman
Polymers, Membrane Materials

David E. Clough
Process Control, Applied Statistics

Robert H. Davis
Fluid Mechanics, Biotechnology, Membranes

John L. Falconer
Catalysis, Zeolite Membranes

R. Igor Gamow
Biophysics, High Altitude Physiology, Human Performance

Christine M. Hrenya
Fluid Mechanics, Fluidization, Granular Systems

Dkinakar S. Kompala
Bioprocess Engineering, Animal Cell Cultures

William B. Krantz
Membranes, Geophysics, Global Climate Change

Richard D. Noble
Membranes, Separations

W. Fred Ramirez
Process Control, Biotechnology

Theodore W. Randolph
Biotechnology, Supercritical Fluids

Robert L. Sani
Transport Phenomena, Applied Mathematics

Paul W. Todd
Biotechnology, Bioseparations, Low Gravity

Alan W. Weimer
Ceramic Materials, Reaction Engineering

Graduate students may participate in the interdisciplinary Biotechnology Training Program and the interdisciplinary NSF Industry/University Cooperative Research Center for Membrane, Applied Science and Technology

For information and application
Graduate Admissions Committee • Department of Chemical Engineering
University of Colorado • Boulder, CO 80309-0424
Phone (303) 492-7471 • Fax (303) 492-4341 • E-mail • chemeng@spot.colorado.edu
www.http//spot.colorado.edu/~chemeng/Home.html

COLORADO SCHOOL OF MINES

THE FACULTY AND THEIR RESEARCH

R. M. BALDWIN, Professor and Head; Ph.D., Colorado School of Mines. *Fuels science and catalysis, zeolites, computational chemistry.*

A. L. BUNGE, Professor; Ph.D., University of California, Berkeley. *Absorption of chemicals in skin, pharmacokinetic modeling, risk assessment.*

J.R. DORGAN, Associate Professor; Ph.D., University of California, Berkeley. *Polymer science and engineering, biomaterials, molecular simulations.*

J. F. ELY, Professor; Ph.D., Indiana University. *Molecular thermodynamics and transport properties of fluids, parallel computation.*

J. H. GARY, Professor Emeritus; Ph.D., University of Florida. *Petroleum refinery processing operations.*

J.O. GOLDEN, Professor Emeritus; Ph.D., Iowa State University. *Hazardous waste processing, fluidization engineering, incineration.*

M.S. GRABOSKI, Research Professor; Ph.D., Pennsylvania State University. *Fuels synthesis and evaluation, engine technology, alternate fuels*

A. J. KIDNAY, Professor Emeritus; D.Sc., Colorado School of Mines. *Thermodynamic properties of gases and liquids, vapor-liquid equilibria.*

D.W.M. MARR, Assistant Professor; Ph.D., Stanford. *Interfacial statistical mechanics, complex fluids.*

R.L. McCORMICK, Research Assistant Professor; Ph.D., Wyoming. *Catalysis in fuel synthesis, fuel cells, low emissions fuels for internal combustion engines, ion conducting solid catalysts and electrolytes, reactor design and fluidization.*

J.T. McKINNON, Associate Professor; Ph.D., Massachusetts Institute of Technology. *Effects of microgravity, high temperature gas phase chemical kinetics, combustion, hazardous waste destruction.*

R. L. MILLER, Professor; Ph.D., Colorado School of Mines. *Interdisciplinary curriculum development, innovative pedagogies, measures of intellectual development, psychological theories of learning, multiphase fluid mechanics*

M. S. SELIM, Professor; Ph.D., Iowa State University. *Heat and mass transfer, sedimentation and diffusion of colloidal suspensions, ink jet printing, synthesis of nano-size magnetic particles for color toner and laserjet printing applications, modeling of cracking furnaces and simulation of ethylene plants.*

E. D. SLOAN, JR., Weaver Distinguished Professor; Ph.D. Clemson University. *Natural gas hydrates, phase equilibria, education methods research.*

J. D. WAY, Associate Professor; Ph.D. University of Colorado. *Novel separation processes, membrane science and technology, membrane reactors, ceramic and metal membranes.*

C. A. WOLDEN, Assistant Professor, Ph.D., Massachusetts Institute of Technology. *Electronic materials processing, gas-solid reaction dynamics.*

D. T. WU, Assistant Professor; Ph.D. University of California, Berkeley. *Polymers, powders, theory and simulation of complex fluids and materials, phase equilibria, controlled self-assembly.*

V. F. YESAVAGE, Professor; Ph.D., University of Michigan. *Vapor liquid equilibrium, equations of state for highly non-ideal systems, process simulation, environmental engineering, gas-liquid reactions.*

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Colorado State University

CSU is located in Fort Collins, a pleasant community of 100,000 people with the spirit of the West, the vitality of a growing metropolitan area, and the friendliness of a small town. Fort Collins is located about 65 miles north of Denver and is adjacent to the foothills of the Rocky Mountains. The climate is excellent, with 300 sunny days per year, mild temperatures, and low humidity. Opportunities for hiking, biking, camping, boating, fishing, and skiing abound in the immediate and nearby areas. The campus is within easy walking or biking distance of the town's shopping areas and its Center for the Performing Arts.

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

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- Biofuels
- Catalysis
- Chemical Thermodynamics
- Chemical Vapor Deposition
- Computational Fluid Dynamics
- Environmental Biotechnology
- Environmental Engineering
- Polymeric Materials
- Solar Cooling Systems
- Semiconductor Processing
- Thin Films
- Water Quality Monitoring

FINANCIAL AID AVAILABLE

Teaching and research assistantships paying a monthly stipend plus tuition reimbursement.

For applications and further information, write

Department of Chemical and Bioresource Engineering
Colorado State University
Fort Collins, CO 80523-1370

FACULTY

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

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

M. Nazmul Karim, Ph.D.
University of Manchester

Terry G. Lenz, Ph.D.
Iowa State University

James C. Linden, Ph.D.
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Jim C. Loftis, Ph.D.
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Carol M. McConica, Ph.D.
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UNIVERSITY OF CONNECTICUT

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M.S. and Ph.D. Programs for Scientists and Engineers

FACULTY RESEARCH AREAS

Luke E.K. Achenie, Ph.D., Carnegie Mellon University
Modeling and Optimization, Molecular Design, Artificial Intelligence

Thomas F. Anderson, Ph.D., University of California, Berkeley
Modeling of Separation Processes, Fluid-Phase Equilibria

James P. Bell, Sc.D., Massachusetts Institute of Technology
Structure-Property Relations in Polymers and Composites, Adhesion

Carroll O. Bennett, Professor Emeritus, Ph.D., Yale University
Catalysis, Chemical Reaction Engineering

Douglas J. Cooper, Ph.D., University of Colorado
Process Modelinbg, Monitoring and Control

Robert W. Coughlin, Ph.D., Cornell University
Biotechnology, Biochemical and Environmental Engineering, Catalysis, Kinetics, Separations, Surface Science

Michael B. Cutlip, Ph.D., University of Colorado
Kinetics and Catalysis, Electrochemical Reaction Engineering, Numerical Methods

Anthony T. DiBenedetto, University Professor Emeritus, Ph.D., Univ. of Wisconsin
Composite Materials, Mechanical Properties of Polymers

Can Erkey, Ph.D., Texas A&M University
Supercritical Fluids, Environmental Engineering, Multicomponent Diffusion and Mass Transfer

James M. Fenton, Ph.D., University of Illinois, Urbana-Champaign
Electrochemical and Environmental Engineering, Mass Transfer Processes, Electronic Materials, Energy Systems

Suzanne (Schadel) Fenton, Ph.D., University of Illinois
Computational Fluid Dynamics, Turbulence, Two-Phase Flow

Robert J. Fisher, Ph.D., University of Delaware
Biochemical/Biomedical Engineering and Environmental Biotechnology

Joseph J. Helble, Ph.D., Massachusetts Institute of Technology
Air Pollution, Aerosol Science, Nanoscale Materials Synthesis and Characterization, Combustion

G. Michael Howard, Professor Emeritus, Ph.D., University of Connecticut
Process Systems Analysis and Modeling, Process Safety, Engineering Education

Herbert E. Klei, Professor Emeritus, Ph.D., University of Connecticut
Biochemical Engineering, Environmental Engineering

Jeffrey T. Koberstein, Ph.D., University of Massachusetts
Polymer Blends/Compatibilization, Polymer Morphology, Polymer Surface and Interfaces

H. Russell Kunz, Ph.D., Rensselaer Polytechnic Institute
Fuel Cells, Electrochemical Energy Systems

Patrick T. Mather, Ph.D., University of California, Santa Barbara
Polymers: Microstructure and Rheology, Liquid Crystallinity, Inorganic-Organic Hybrids

Montgomery T. Shaw, Ph.D., Princeton University
Polymer Rheology and Processing, Polymer-solution Thermodynamics

Donald W. Sundstrom, Professor Emeritus, Ph.D., University of Michigan
Environmental Engineering, Hazardous Wastes, Biochemical Engineering

Robert A. Weiss, Ph.D., University of Massachusetts
Polymer Structure-Property Relationships, Ion-Containing and Liquid Crystal Polymers, Polymer Blends

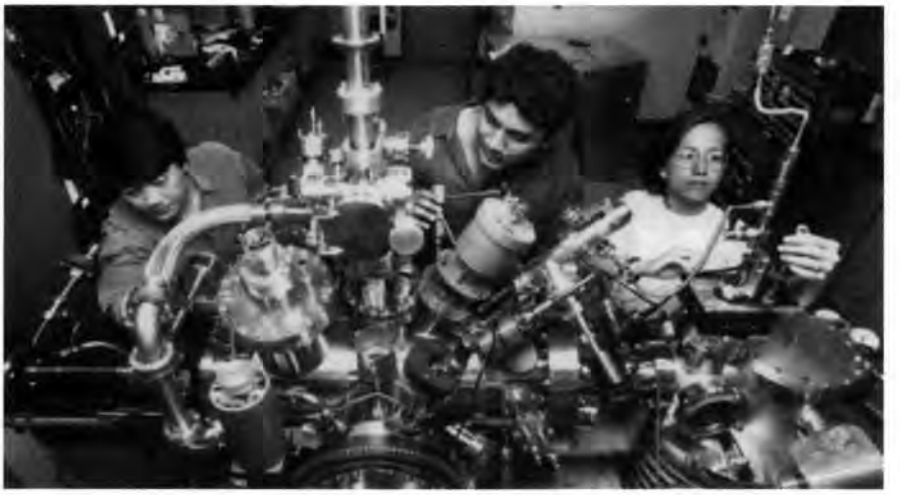
Thomas K. Wood, Ph.D., North Carolina State University
Microbiological Engineering, Bioremediation with Genetically-Engineered Bacteria, Enzymatic Green Chemistry, Biochemical Engineering, Biocorrosion

FOR MORE INFORMATION

Graduate Admission,
191 Auditorium Road, U-3222
University of Connecticut
Storrs, CT 06269-3222
Tel. (860) 486-4020

CORNELL
UNIVERSITY

Chemical 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 Supercomputing Facility, and the Materials Science Center.

Degrees granted include Master of Engineering, Master of Science, and Doctor of Philosophy. All Ph.D. students are fully funded with tuition coverage and attractive stipends.

Distinguished Faculty

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Paulette Clancy
Claude Cohen
T. Michael Duncan
James R. Engstrom
Fernando A. Escobedo
Emmanuel P. Giannelis
Peter Harriott
Donald L. Koch
Kelvin H. Lee
Leonard W. Lion
Christopher K. Ober
William L. Olbricht
Ferdinand Rodriguez
W. Mark Saltzman
Michael L. Shuler[†,‡]
Paul H. Steen

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

Research Areas

- Advanced Materials Processing
- Biochemical and Biomedical Engineering
- Fluid Dynamics, Stability, and Rheology
- Molecular Thermodynamics and Computer Simulation
- Polymer Science and Engineering
- Reaction Engineering: Surface Science, Kinetics, and Reactor Design

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

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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) ▶ Microbial polymer synthesis, metabolic engineering, fermentation technology

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

Francis Kennedy (RPI) ▶ Tribology, surface mechanics

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

Christopher E. Naimie (Dartmouth) ▶ Environmental fluid dynamics, modeling coastal ocean/estuarine systems

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

Jeffrey A. Proehl (U. Washington) ▶ Numerical ocean modeling: flow stability, magnetohydrodynamics

Paul E. Queneau (Delft) ▶ Mineral engineering, extractive metallurgy, process design

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

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

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Graham Wallis (Cambridge) ▶ Two-phase flow, thermodynamics, transport phenomena, energy

Charles E. Wyman (Princeton) ▶ Biomass pretreatment & hydrolysis, cellulase synthesis & kinetics, process design & evaluation

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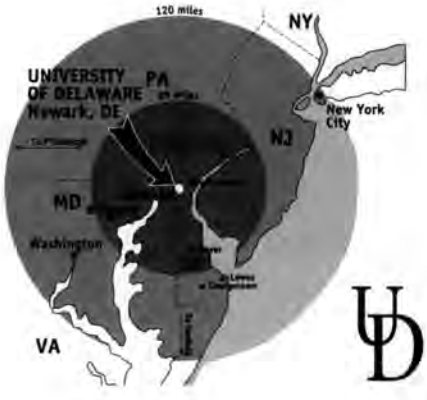

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Ramesh C. Chawla, Professor • PhD, Wayne State University
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David C. Venerus; *polymer rheology and processing, transport phenomena in polymeric systems*
Darsh T. Wasan; *thin liquid films; interfacial rheology; foams, emulsion and dispersion, environmental technologies*

Research Faculty and Lecturers

Javad Abbasian ◆ V.M. Balasubramaniam ◆ Richard Beissinger ◆ Gulnur Birol
Inanc Birol ◆ Michael Caracotsios ◆ Ellis Fields ◆ Ted Knowlton
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FACULTY

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

Audrey Butler
U. of Iowa 1989
Chemical precipitation processes

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

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

Robert Linhardt
Johns Hopkins 1979
Biopolymers and pharmaceutical applications

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

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

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

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Chris Baldwin, Ph.D.
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D. Kalika; University of California, Berkeley
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- superacid catalysts

Jules Thibault
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- bioreactor engineering
- neural network modelling

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Université Laval
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Hugo S. Caram (University of Minnesota) ■ gas-solid and gas-liquid systems • optical techniques • reaction engineering
Marvin Charles (Polytechnic Institute of Brooklyn) ■ bioprocess design • cGMP R&D
Manoj K. Chaudhury (SUNY-Buffalo) ■ adhesion • thin films • surface chemistry
John C. Chen (University of Michigan) ■ two-phase vapor-liquid flow • fluidization • radiative heat transfer • environmental technology
Mohamed S. El-Aasser (McGill University) ■ polymer colloids and films • emulsion copolymerization • polymer synthesis and characterization
Christos Georgakis (University of Minnesota) ■ batch control • model predictive control • identification • statistical process control
James T. Hsu (Northwestern University) ■ separation processes • adsorption and catalysis in zeolites
Andrew J. Klein (North Carolina State University) ■ emulsion polymerization • colloidal and surface effects in polymerization
Mayuresh Kothare (California Institute of Technology) ■ constrained control • model predictive control • optimization • industrial control
William L. Luyben (University of Delaware) ■ process design and control • distillation
Janice A. Phillips (University of Pennsylvania) ■ biochemical engineering • instrumentation/control of bioreactors • mammalian cell culture
Maria M. Santore (Princeton University) ■ polymers adsorption processes and blend stability
William E. Schiesser (Princeton University) ■ numerical algorithms and software in chemical engineering
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
Leslie H. Sperling (Duke University) ■ mechanical and morphological properties of polymers • interpenetrating polymer networks
Fred P. Stein (University of Michigan) ■ thermodynamic properties of mixtures
Harvey G. Stenger, Jr. (Massachusetts Institute of Technology) ■ reactor engineering
Israel E. Wachs (Stanford University) ■ materials characterization • surface chemistry • heterogeneous catalysis • environmental catalysis
Leonard A. Wenzel, Emeritus (University of Michigan) ■ thermodynamics • cryogenics and mixed-gas adsorption

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Dr. Maria M. Santore, Chairman • Graduate Admissions Committee
Department of Chemical Engineering • Lehigh University • 111 Research Drive • Iacocca Hall • Bethlehem, PA 18015
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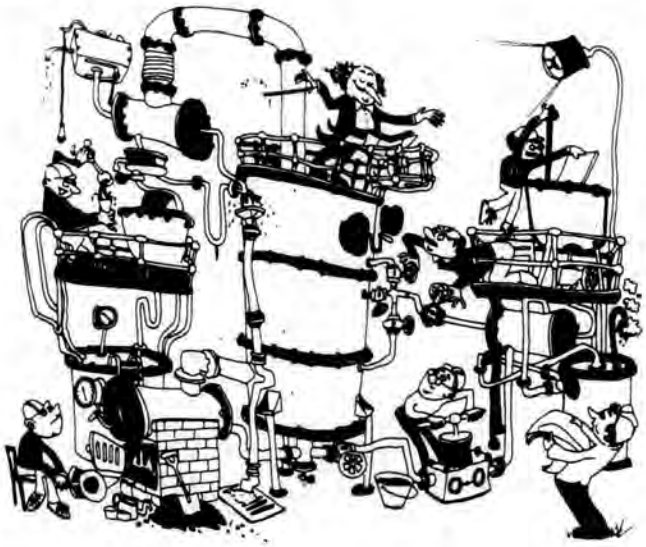

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A.B. CORRIPIO (Ph.D., Louisiana State University)
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F.C. KNOPF (Ph.D., Purdue University)
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Fluid Mechanics, Rheology, Coating Processes, Particle Motion Modeling

ALBERT CO Ph.D. (Wisconsin)
Polymeric Fluid Dynamics, Rheology, Transport Phenomena, Numerical Methods

JOSEPH M. GENCO Ph.D. (Ohio State)
Process Engineering, Pulp and Paper Technology, Wood Delignification

AMYL GHANEM Ph.D. (Cornell)
Biochemical Engineering, Toxicology

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Process Control, Numerical Methods, Instrumentation and Real Time Computer Applications

MARQUITA K HILL Ph.D. (U.C. Davis)
Environmental Science, Waste Management Technology

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FOR FURTHER INFORMATION CONTACT:

Graduate Program Coordinator
Department of Chemical and Biochemical Engineering
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Mikhail A. Anisimov (Moscow) • *Critical phenomena and phase transitions in fluids and fluid mixtures*

Timothy A. Barbari (Texas-Austin) • *Membrane science, polymer science, separation processes*

William E. Bentley (Colorado-Boulder) • *Biochemical engineering, metabolic engineering, applications of molecular biology*

Richard V. Calabrese (Massachusetts) • *Multiphase flow, turbulence and mixing*

Kyu Yong Choi (Wisconsin) • *Polymer reaction engineering*

Sheryl H. Ehrman (UCLA) • *Aerosol science and engineering*

James W. Gentry (Texas-Austin) • *Aerosol science and engineering*

Sandra C. Greer (Chicago) • *Physical chemistry, polymer science*

Michael T. Harris (Tennessee) • *Nanoparticle technology*

Peter Kofinas (MIT) • *Polymer science and engineering*

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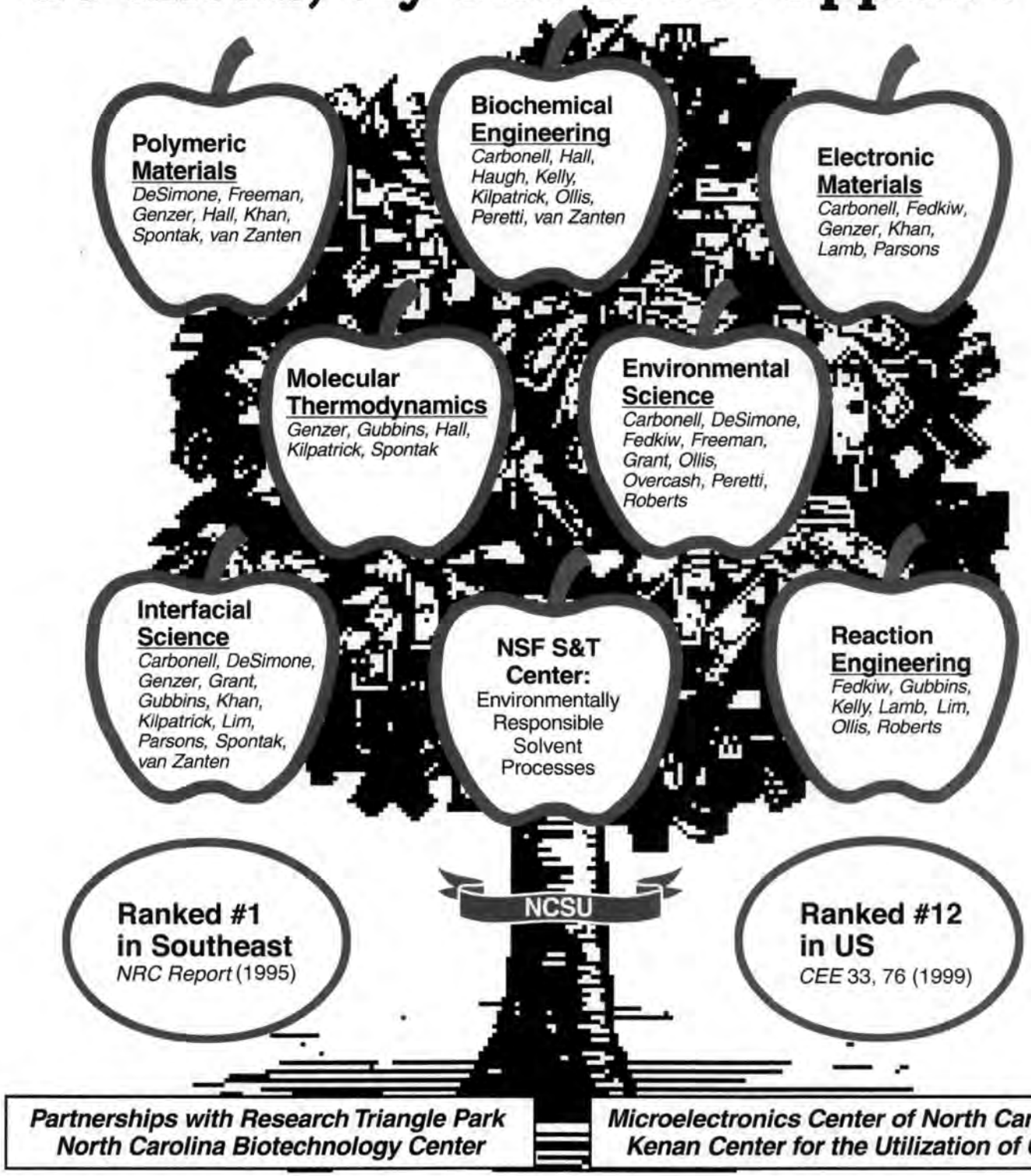

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Catalysis, treatment technologies, environmental chemistry

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

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

Lyle F. Mockros, Ph.D., Berkeley, 1962
Biomedical engineering, fluid mechanics in biological systems

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

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

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

Bruce E. Rittmann, Ph.D., Stanford, 1979
In situ bioremediation, biofilms

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

Melody A. Swartz, Ph.D., M.I.T., 1998
Biomedical transport phenomena

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

For information and application to the graduate program, write

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

Phone: (847) 491-7398
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Chemical Engineering at

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FACULTY

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- A.E. Miller
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- W. C. Strieder
- A. Varma
- E. E. Wolf

RESEARCH AREAS

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Catalysis and Reaction Engineering
Combustion Synthesis
Environmentally Conscious Process Design
Enzyme Encapsulation
Gas-Liquid Flows
Inorganic Membranes
Molecular Modeling
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www site: http://www.nd.edu/~chegdept/

Graduate Study in Chemical Engineering at

The Ohio State University

FACULTY

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  Process Systems Engineering
- **Robert S. Brodkey,** *Wisconsin*
  Image Processing and Analysis, Fluid Mechanics
- **Jeffrey J. Chalmers,** *Cornell*
  Bioengineering, Cell Culture, Immunomagnetic Cell Separation
- **Kenneth R. Cox,** *Illinois-Urbana*
  Statistical Mechanics, Molecular Thermodynamics, Applied Computational Chemistry
- **James F. Davis,** *Northwestern*
  Knowledge-Based Systems, Decision Support, Data Interpretation
- **Liang-Shih Fan,** *West Virginia*
  Fluidization, Multiphase Flow, Particulate Reaction Engineering, Particle Technology
- **Martin Feinberg,** *Princeton*
  Complex Chemical Systems
- **Morton H. Friedman,** *Michigan*
  Biomedical Engineering, Hydrodynamic Effects in Vascular Disease
- **Kurt W. Koelling,** *Princeton*
  Rheology of Complex Fluids, Polymer Processing, Biocompatible Polymers
- **Isamu Kusaka,** *Caltech*
  Nucleation
- **L. James Lee,** *Minnesota*
  Composite and Polymer Processing, Polymer Characterization, Micro-Fabrication
- **Umit S. Ozkan,** *Iowa State*
  Heterogeneous Catalysis
- **James F. Rathman,** *Oklahoma*
  Colloids, Interfaces, Molecular Self-Assembly
- **David L. Tomasko,** *Illinois-Urbana*
  Supercritical Fluid Thermodynamics, Separations, Materials Processing
- **Shang-Tian Yang,** *Purdue*
  Biotechnology, Fermentation, Cell Culture, Tissue Engineering
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E-mail address: che-grad@che.eng.ohio-state.edu

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Chemical Engineering

Graduate Programs

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Research Areas

Multiphase Flow and Associated Corrosion
Coal Conversion Technology and Desulfurization
Aerosol Science and Technology
Process Control
Separations
Energy and Environmental Engineering
Thin Film Materials
Chemical Reaction Engineering
Wastewater Treatment
Bioreactor Analysis
Downstream Processing of Proteins
Biomedical Engineering

Financial Aid

Financial support includes teaching and grant-related associateships and fellowships ranging from $10,000 to $15,000 per twelve months. In addition, students are granted a full tuition scholarship for both the regular and summer academic terms. Stocker Fellowships are available to especially well-qualified students.

The Faculty

Calvin H. Baloun, P.E., Emeritus *(Ph.D., Cincinnati, 1962)*
W. J. Russell Chen *(Ph.D., Syracuse, 1974)*
Nicholas Dinos, Emeritus *(Ph.D., Lehigh, 1967)*
Douglas J. Goetz *(Ph.D., Cornell, 1995)*
Madan Gopal *(Ph.D., Ohio, 1994)*
Tingyue Gu *(Ph.D., Purdue, 1990)*
Daniel A. Gulino *(Ph.D., Illinois, 1983)*
W. Paul Jepson *(Ph.D., Heriot-Watt, 1980)*
Michael E. Prudich, Chair *(Ph.D., West Virginia, 1979)*
Darin Ridgway, P.E. *(Ph.D., Florida State, 1990)*
Kendree J. Sampson *(Ph.D., Purdue, 1981)*
Ben J. Stuart *(Ph.D., Rutgers, 1995)*
Valerie L. Young *(Ph.D., Virginia Tech., 1992)*

For More Information Contact:

Director of Graduate Studies
Department of Chemical Engineering, 172 Stocker Center • Ohio University, Athens OH 45701-2979
E-mail: chedept@bobcat.ent.ohiou.edu • Visit our website at: http://www.ent.ohiou.edu/che

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School of Chemical Engineering
and Materials Science
The University of Oklahoma
100 E. Boyd, Room T-335
Norman, OK 73019-0628
Phone: (405) 325-5811
Fax: (405) 325-5813
E-Mail: chegrad@ou.edu

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Faculty and Research Interests

- **Miguel J. Bagajewicz**, Associate Professor ● *process plant simulation and data reconciliation ● design of heat/mass-exchange networks for waste minimization applications ● mathematical background, algorithm development and process design applications of optimization theory ● high temperature fuel-gas cleaning reactors ● modeling of fluid-solid diffusion-reaction problems*
- **Billy L. Crynes**, Professor ● *modeling of hydrocarbon pyrolysis ● surface effects during pyrolysis of hydrocarbons*
- **Brian P. Grady**, Assistant Professor ● *multiphase and block copolymers ● ion-containing polymers ● x-ray, neutron and light scattering ● biodegradable and bioabsorbable polymers ● orientation and orientation mechanisms in polymers*
- **Roger G. Harrison, Jr.**, Associate Professor ● *production of proteins and peptides using recombinant DNA technology ● separation and purification of biochemicals ● enzyme reactors ● protein engineering ● drug delivery systems ● applications of biotechnology to waste treatment*
- **Jeffrey H. Harwell**, Conoco/DuPont Professor ● *tertiary oil recovery ● unconventional low energy separation processes ● mass transfer ● dynamics of multicomponent mass transfer processes ● surface phenomena ● adsorption kinetics*
- **Lloyd L. Lee**, C. M. Sliepcevich Professor ● *thermodynamics ● molecular transport theory ● statistical mechanics ● structured liquids ● Monte Carlo and molecular dynamics studies ● conformal solution theory ● natural gas properties ● polar fluids, ionic solutions, and molten salts ● surface adsorption ● turbulent flow*
- **Lance L. Lobban**, Associate Professor and Director ● *catalytic reaction rate mechanisms and modeling ● partial oxidation of hydrocarbons ● fuel cells*
- **Richard G. Mallinson**, Associate Professor ● *chemical reaction engineering ● polymerization ● synthetic and alternative fuels*
- **Mathias U. Nollert**, Assistant Professor ● *biomedical engineering ● cellular metabolism and transport ● fluid transport and mechanics*
- **Edgar A. O'Rear, III**, Professor ● *catalysis ● surface chemistry and physics ● kinetics ● blood trauma associated with medical devices ● biorheology ● organic chemistry ● coal technology*
- **Dimitrios V. Papavassiliou**, Assistant Professor ● *modeling of transport processes ● novel computational methods applied to turbulent trasport of mass and heat, reactive flows, and flows in porous media ● integrated process simulations ● transport phenomena in biological systems ● small scale transport*
- **Daniel E. Resasco**, Associate Professor ● *heterogeneous catalysis, reaction engineering and kinetics ● design of catalysts for pollutant abatement ● transport and adsorption in porous materials ● physical chemistry of surfaces ● characterization of ceramic supports*
- **Melissa M. Rieger**, Assistant Professor ● *electrochemical phenomena and electrochemical engineering ● alternative energy sources ● material systems and electrochemical processes in microelectronic processing ● optoelectronic integration into silicon electronics ● electrochemical behavior of polymeric materials ● photochemical etching of silicon carbide ● porous silicon luminescence*
- **John F. Scamehorn**, Asahi Glass Chair ● *surface and colloid science ● tertiary oil recovery ● detergency ● membrane separations ● adsorption ● pollution control ● polymers ● plastics deinking*
- **Robert L. Shambaugh**, Professor ● *polymerization chemistry ● polymer processing technology ● fiber spinning, texturing and extrusion ● wastewater engineering ● physicochemical treatment ● ozonation ● gas-liquid reactions*

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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)
R. Russell Rhinehart (Ph.D., North Carolina State University)
Robert L. Robinson, Jr. (Ph.D., Oklahoma State University)
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
Air Pollution
Artificial Intelligence
Biochemical Processes
Corrosion
Design
Environmental Engineering
Fluid Flow
Gas Processing
Hazardous Wastes
Ion Exchange
Kinetics
Mass Transfer
Modeling
Phase Equilibria
Polymers
Process Control
Process Simulation
Thermodynamics

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For more information contact
Dr. Robert L. Robinson
School of Chemical Engineering
Oklahoma State University
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- **C. Chang**
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- **A. H. Hassan**
  High Pressure Transport Processes, Pharmaceuticals
- **G. N. Jovanovic**
  Fine Particle Processing, Transport Phenomena
- **S. Kimura**
  Reaction Engineering, High-Temperature Materials
- **M. D. Koretsky**
  Electronic Materials Processing
- **K. L. Levien**
  Process Optimization and Control
- **J. McGuire**
  Protein Adsorption, Biofilm Development
- **C. McConica**
  Gas Solid Kinetics, Semiconductor Processing
- **W. E. Rochefort**
  Rheological, Thermal, and Molecular Characterization of Polymers, Polymer Processing, Biomaterials
- **G. L. Rorrer**
  Biochemical Reaction Engineering

Competitive research and teaching assistantships are available.

For further information, write:

Chemical Engineering Department
Oregon State University
103 Gleeson Hall
Corvallis, Oregon 97331-2702
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or e-mail us at mail@che.orst.edu

PENN STATE

Chemical Engineering

Aziz Ben-Jebria *(Univ. of Paris)*—Respiratory Transport, Inhalation Toxicology

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

Alfred Carlson *(Wisconsin)*—Biotechnology, Bioseparations

Lance Collins *(Penn)*—Turbulent Flow, Combustion

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

Ronald P. Danner *(Lehigh)*—Applied Thermodynamics, Adsorption Phenomena

Thomas E. Daubert *(Penn State)*—Applied Thermodynamics

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

David A. Edwards *(Illinois Institute of Tech.)*—Transport Phenomena, Drug Delivery

Kristen Fichthorn *(Michigan)*—Statistical Mechanics, Surface Science, Catalysis

Costas D. Maranas *(Princeton)*—Computational Chemistry, Design and Control, Optimization Theory

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

John R. McWhirter *(Penn State)*—Gas-Liquid Mass Transfer, Microencapsulation

R. Nagarajan *(SUNY at Buffalo)*—Colloid and Polymer Science

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

Jonathan Phillips *(Wisconsin)*—Heterogeneous Catalysis, Surface Science

John M. Tarbell *(Delaware)*—Cardiovascular Fluid Mechanics and Mass Transfer, Turbulent Reacting Flows

James S. Ultman *(Delaware)*—Physiological Transport Processes, Environmental Health

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

Darrell Velegol *(Carnegie Mellon)*—Colloidal Systems, Colloidal Particle Interactions

James S. Vrentas *(Delaware)*—Transport Phenomena, Applied Mathematics, Polymer Science

Individuals with a B.S. degree in chemistry or other related areas are encouraged to apply.

For more information, contact:

Chairperson
Graduate Admissions Committee
Department of Chemical Engineering
The Pennsylvania State University
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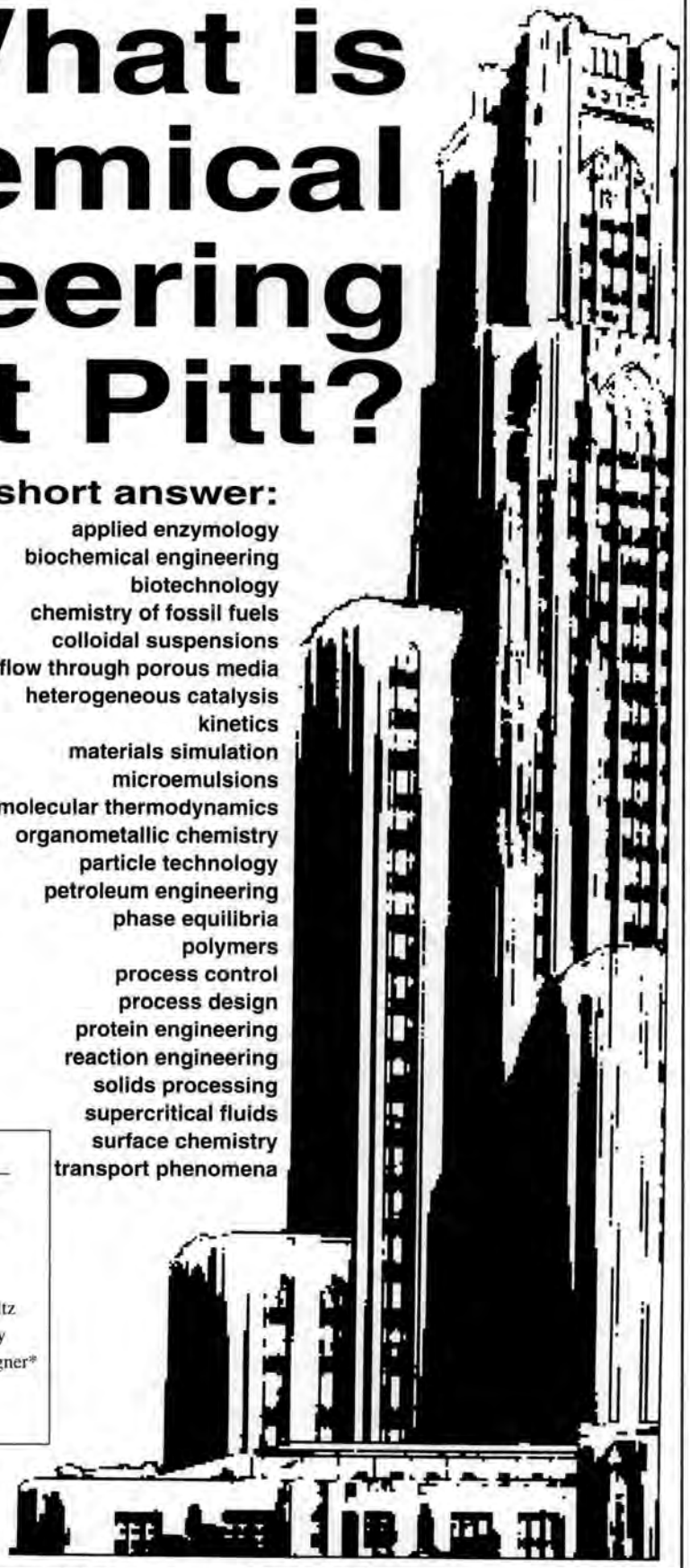

A short answer:

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process design
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solids processing
supercritical fluids
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transport phenomena

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Mohammad M. Ataai	Dan Farcasiu	Badie I. Morsi
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Harvey S. Borovetz*	Gerald D. Holder	Alan J. Russell
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A.S. Myerson • *crystallization, mass transfer*

E.M. Pearce • *polymer synthesis and degradation*

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N.A. Peppas
D. Ramkrishna
G.V. Reklaitis
E.M. Sevick-Muraca
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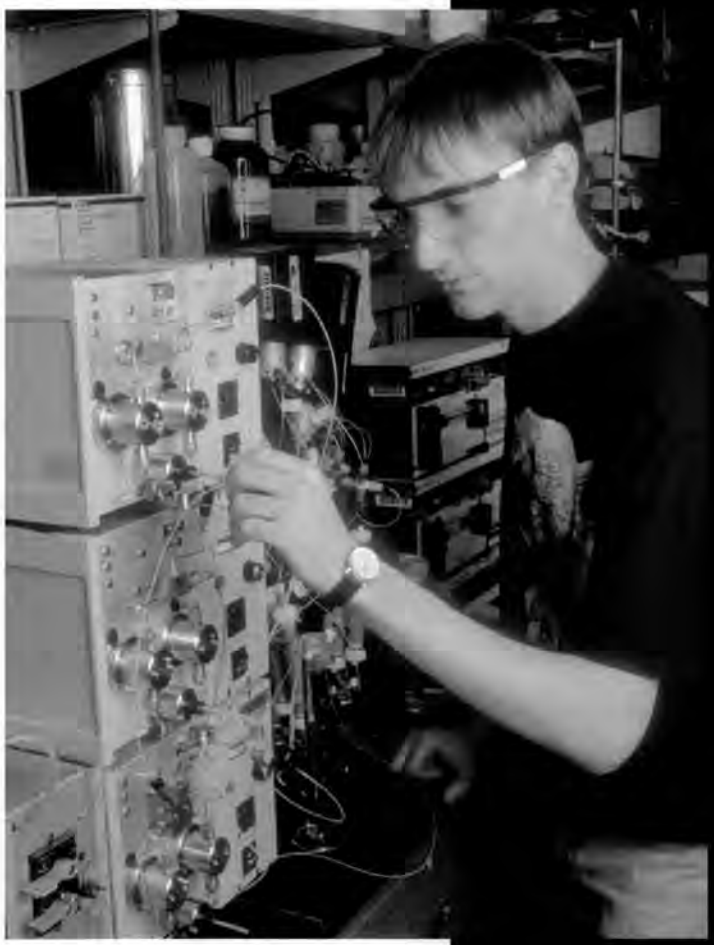
G.T. Tsao
V. Venkatasubramanian
N.H.L. Wang
P.C. Wankat



Research Areas

Applied Mathematics
Artificial Intelligence
Biochemical Engineering
Biomedical Engineering
Catalysis and Reaction Engineering
Colloids and Interfacial Engineering
Process Dynamics and Control
Environmental Science
Fluid Mechanics
Fluid Particle Systems
Materials and Microelectronics Processing
Parallel Computing and Combinatorics
Polymer Science and Engineering
Separation Processes
Surface Science and Engineering
Thermodynamics and Statistical Mechanics
Transport Phenomena

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For More Information

Graduate Studies
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Web Address:
http://www.che.purdue.edu

Chemical Engineering at

Rensselaer Polytechnic Institute

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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
Associate Department Chair
Thermodynamics; equations of state; phase equilibria

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

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

B. Wayne Bequette, bequeb@rpi.edu
Process modeling, control, design, and optimization

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

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

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

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

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

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

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

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

Charles Muckenfuss, Professor Emeritus

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

Hendrick C. Van Ness, Institute Professor Emeritus

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

Graduate Study in Chemical Engineering at

Rice University

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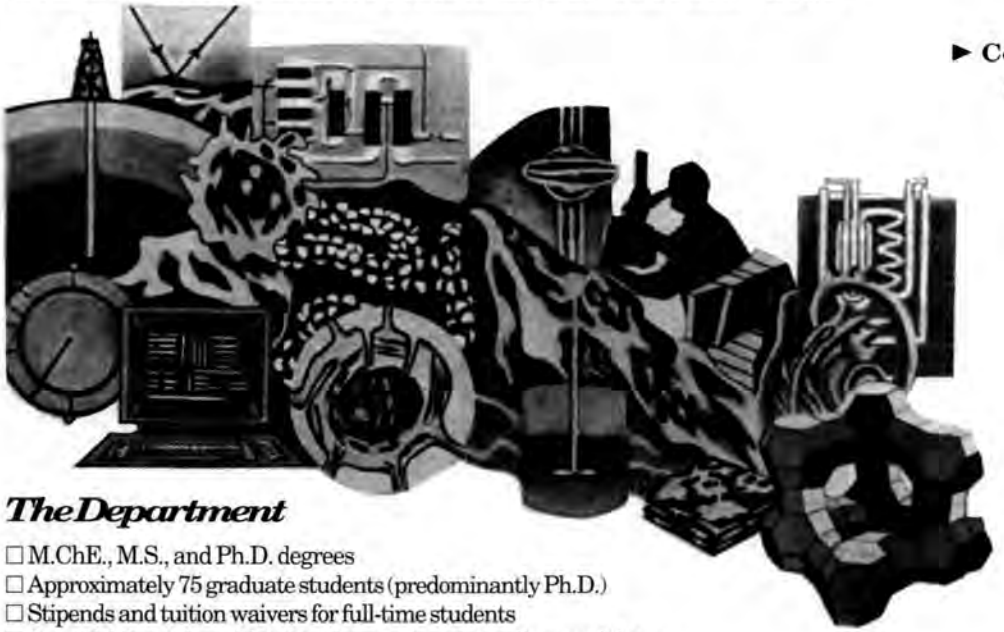

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Chair, Graduate Committee
Department of Chemical Engineering, MS-362
Rice University
6100 S. Main St.
Houston, TX 77005-1892

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Research Interests

- Applied Mathematics
- Biochemical Engineering
- Biomedical Engineering
- Equilibrium Thermodynamic Properties
- Fluid Mechanics
- Interfacial Phenomena
- Kinetics and Catalysis
- Polymer Science
- Process Control
- Reaction Engineering
- Rheology
- Statistical Mechanics
- Tissue Engineering
- Transport in Porous Media
- Transport Processes
- Transport Properties

Faculty

► **William W. Akers*** *(Michigan, 1950)*

► **Constantine D. Armeniades** *(Case Western Reserve, 1969)*

► **Walter Chapman** *(Cornell, 1988)*

► **Sam H. Davis, Jr.** *(MIT, 1957)*

► **Derek C. Dyson** *(London, 1966)*

► **Jacqueline Goveas** *(Princeton, 1996)*

► **J. David Hellums*** *(Michigan, 1961)*

► **Joe W. Hightower** *(Johns Hopkins, 1963)*

► **George J. Hirasaki** *(Rice, 1967)*

► **Riki Kobayashi*** *(Michigan, 1951)*

► **Larry V. McIntire** *(Princeton, 1970)*

► **Antonios G. Mikos** *(Purdue, 1988)*

► **Clarence A. Miller** *(Minnesota, 1969)*

► **Matteo Pasquali** *(Minnesota, 1999)*

► **Mark A. Robert** *(Swiss Fed. Inst. of Tech., 1980)*

► **Ka-Yiu San** *(CalTech, 1984)*

► **Kyriacos Zygourakis** *(Minnesota, 1981)*

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Polymer Science and Engineering • Organic Materials for Optics and Photonics • Device Science

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

R. H. HEIST, Ph.D. 1972, Purdue
Nucleation • Aerosols • Ultrafine Particles

S. A. JENEKHE, Ph.D. 1985, Minnesota
Polymer Science and Engineering • Materials Chemistry • Optoelectronic and Photonic Materials and Devices

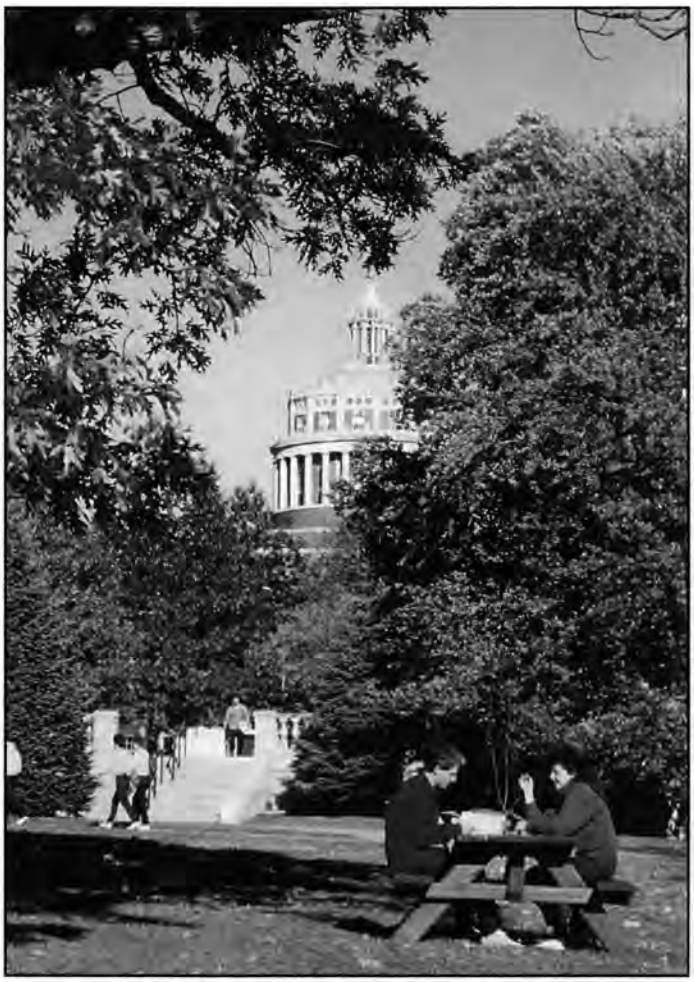
J. JORNE, Ph.D. 1972, California (Berkeley)
Electrochemical Engineering • Microelectronics Processing • Theoretical Biology

R. H. NOTTER, Ph.D. 1969, Washington (Seattle) M.D. 1980, Rochester
Biomedical Engineering • Lung Surfactant • Molecular Biophysics

H. J. PALMER, Ph.D. 1971, Washington (Seattle)
Interfacial Phenomena • Phase Transfer Reactions • Mass Transfer • Bioengineering

S. V. SOTIRCHOS, Ph.D. 1982, Houston
Reaction Engineering • Transport and Reaction in Porous Media • Processing of Ceramic Materials and Composites

J. H. D. WU, Ph.D. 1987, M.I.T.
Biochemical Engineering • Fermentation • Biocatalysis • Bone Marrow Tissue Engineering • Genetic and Protein Engineering



For further information and application, write

Graduate Admissions • Department of Chemical Engineering
University of Rochester • Rochester, New York 14627

Phone: (716) 275-4042 • Fax: (716) 273-1348
e-mail: gradadm@che.rochester.edu

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Faculty

- **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; University of Pennsylvania, 1984 • *Statistical thermodynamics, microscopic structures of fluids and particle systems, interfacial phenomena*
- **Alkis Constantinides,** Professor and Chair; D.E.Sc., Columbia University, 1970 • *Biochemical engineering, optimization and control of fermentation processes, applied numerical analysis, artificial intelligence*
- **Peter Couchman,** Professor; Ph.D., University of Virginia, 1976 • *Thermodynamics, transition, and equation of state behavior of single and multicomponent systems, particularly polymers; surface phenomena*
- **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,** Assistant 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,** Assistant Professor; 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,** Assistant Professor; Ph.D., Graz, 1995 • *Reaction and environmental engineering, reactive flows, numerical analysis of large dynamical systems*
- **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*
- **David S. Kosson,** Professor and Graduate Director; Ph.D., Rutgers University, 1986 • *Hazardous waste management, in-situ and on-site remediation, leaching, contaminant fate and transport in wastes, soils, and groundwater*
- **Prabhas V. Moghe,** Assistant Professor; Ph.D., University of Minnesota, 1993 • *Tissue engineering: skin, liver cell-biomaterials interactions, biodegradable polymers in medicine, cardiovascular materials*
- **Fernando Muzzio,** Associate Professor; Ph.D., University of Massachusetts, 1991 • *Transport phenomena, mixing, chaotic flows, powder technology*
- **Balaji Narasimhan,** Assistant Professor; Ph.D., Purdue University, 1996 • *Transport phenomena in polymers, dynamics of entangled polymers, magnetic resonance imaging, controlled drug delivery*
- **Brian A. Newman,** Professor; Ph.D., Bristol, 1966 • *Structure and morphology of electroactive polymers; X-ray diffraction studies of polymers; high-pressure polymer physics*
- **Henrik Pedersen,** Professor; Ph.D., Yale University, 1978 • *Biochemical engineering, immobilized enzymes, plant cell biotechnology, fiber-optic sensors*
- **Carlos B. Rosas,** Visiting Professor and Administrative Director, Pharmaceutical Engineering Program; M.E., Stevens Institute of Technology, 1968 • *Fine chemicals, pharmaceuticals, and biologicals*
- **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*
- **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,** Visiting 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:

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Environmental Engineering
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Singapore 117576
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E-mail: chehead@nus.edu.sg
http://www.eng.nus.edu.sg/ChemEng/

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- Catalytic Materials
- Ultra Thin Films
- Sensors, Electrochemical Devices

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- Process Control, Modeling and Optimization
- Reaction Engineering
- Thermodynamics

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- Environmental Chemistry
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- Biological Treatment

Academic Programs

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J.H. Gibbons, Pittsburgh
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M.A. Matthews, Texas A&M
T. Papathanasiou, McGill
H.J. Ploehn, Princeton
B.N. Popov, Illinois
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C.T. Williams, Purdue

► *Research Areas*

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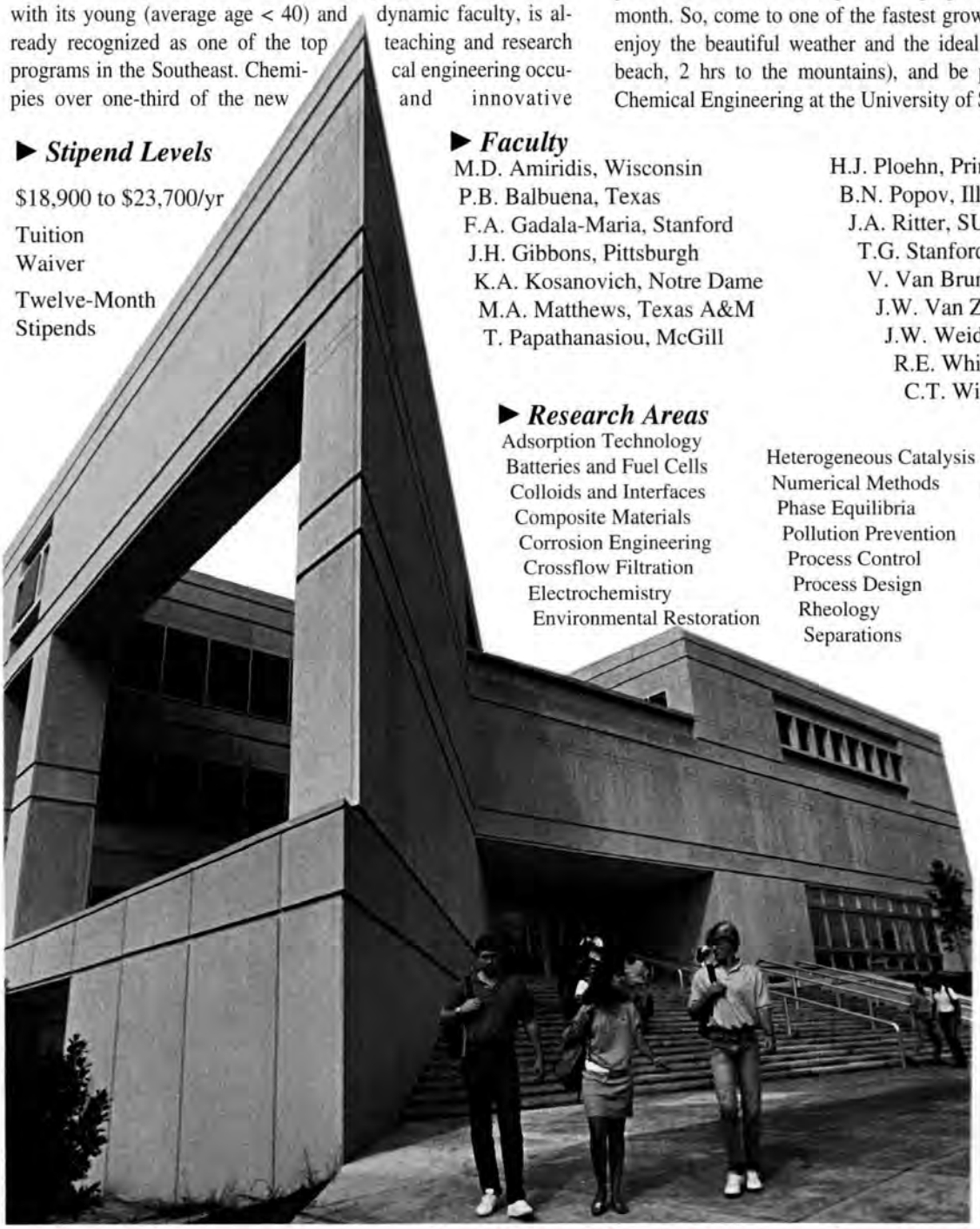

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Swearingen Engineering Center

University of South Carolina

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S. Kovenklioglu (PhD, Stevens Institute of Technology)
A Lawal (PhD, McGill University)
M. Mackay (PhD, University of Illinois)
H. Silla, (PhD, Stevens Institute of Technology)
F. Yang (PhD, University of Pittsburgh)

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201-216-5234

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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 17,000 undergraduates, 7,500 graduate and professional students, and a faculty of 1,600. 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)
Separations and Transport, Environmental

Peter T. Cummings (Ph.D., Melbourne, 1980)
Molecular Thermodynamics, Design, Environmental

George C. Frazier (D.Eng., Johns Hopkins, 1962)
Bioprocessing, Kinetics

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

John W. Prados (Ph.D., Tennessee, 1957)
Safety and Risk Assessment

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

Frederick E. Weber (Ph.D., Minnesota, 1982)
Computer-Aided Design, Radiation Chemistry

The Next Step

For additional information contact:

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Knoxville, TN 37996-2200
Phone: (423) 974-2421
E-mail: *cheinfo@utk.edu*
World Wide Web: *http://www.che.utk.edu*

Adjunct and Part-Time Faculty from Oak Ridge National Laboratory

Charles H. Byers (Ph.D., Berkeley): *Separations and Transport*
Hank D. Cochran (Ph.D., M.I.T.): *Thermodynamics, Statistical Mechanics*
Brian H. Davison (Ph.D., Caltech): *Biochemical Engineering*
Jack S. Watson (Ph.D., Tennessee): *Separations and Transport, Nuclear Fusion*

UNIVERSITY OF TEXAS AT AUSTIN

The University of Texas at Austin's Department of Chemical Engineering is a cutting-edge, well-funded program. The Department has been among the top five in the U.S. in sponsored research and Ph.D. degrees granted for the last five years. Both the M.S. and the Ph.D. degrees are offered, with nearly all students pursuing the Ph.D. Fellowships and research assistantships are provided, including tuition and fees.

FACULTY AND RESEARCH

David Allen *(Caltech)* • environmental modeling, reaction engineering
Joel W. Barlow *(University of Wisconsin)* • polymer blends, properties, processing
Roger T. Bonnecaze *(Caltech)* • suspension rheology, transport phenomena, electrical impedance tomography
Thomas F. Edgar *(Princeton University)* • process modeling, control, optimization
John G. Ekerdt *(University of California, Berkeley)* • electronic materials chemistry, surface science
Bruce Eldridge *(University of Texas)* • separations research
George Georgiou *(Cornell University)* • microbial, protein biotechnology
Peter Green *(Cornell University)* • materials science • polymer melts
Adam Heller *(Hebrew University)* • electrochemical biosensing, environmental photoelectrochemistry
Keith P. Johnston *(University of Illinois)* • polymer and surface thermodynamics, supercritical fluid science
Brian A. Korgel *(University of California, LA)* • complex fluids, nanostructured materials
William J. Koros *(University of Texas)* • membrane and structure-permeability relationships for polymers
Douglas R. Lloyd *(University of Waterloo)* • polymeric membrane formation, liquid separations
C. Buddie Mullins *(Caltech)* • surface science, molecular beams, semiconductor thin-film growth
Donald R. Paul *(University of Wisconsin)* • polymer blends, membranes, barrier materials
Joseph Qin *(University of Maryland)* • process modeling and control
Gary T. Rochelle *(University of California, Berkeley)* • air pollution control, reactive mass transfer
Isaac C. Sanchez *(University of Delaware)* • statistical thermodynamics of polymer liquids and solutions
Christine Schmidt *(University of Illinois)* • cell and tissue engineering
Mukul M. Sharma *(University of Southern California)* • surface and colloid chemistry
J. Michael White *(University of Illinois)* • chemical reactions on surfaces
C. Grant Willson *(University of California, Berkeley)* • polymer synthesis, photochemical processing

Inquiries should be sent to

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Texas A&M University • College Station, Texas 77843-3122

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R.G. Anthony, Head • Ph.D., University of Texas, 1966
C.D. Holland Professor
Catalysis, reaction engineering ion exchange

A. Akgerman, Associate Head • Ph.D., University of Virginia, 1971
Chevron II Professor
Reaction engineering, waste treatment

L.A. Archer, Ph.D. • Stanford University, 1993
Polymers, rheology

J.T. Baldwin, Ph.D. • Texas A&M University, 1968
Process Design

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

J.A. Bullin, Ph.D. • University of Houston, 1972
Gas sweetening, asphalt characterizations

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

R.R. Davison, Ph.D. • Texas A&M University, 1962
Asphalt characterization

L.D. Durbin, Ph.D. • Rice University, 1961
Process control

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

D.M. Ford, Ph.D. • University of Pennsylvania, 1996
Molecular modeling/transport

G. Froment, Ph.D. • University of Gent, Belgium, 1957
Reaction Engineering

C.J. Glover, Ph.D. • Rice University, 1974
Polymer solutions

T.A. Good, Ph.D. • University of Wisconsin-Madison, 1996
Biomedical Engineering, Cellular Engineering

K.R. Hall, Ph.D. • University of Oklahoma, 1967
Director of TRC
Thermodynamics

D.T. Hanson, Ph.D. • University of Minnesota, 1968
Biochemical engineering

C.D. Holland, Ph.D. • Texas A&M University, 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
Biochemical engineering

N.K. Kazantzis, Ph.D. • University of Michigan, 1997
Process Control

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

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

M.V. Pishko, Ph.D. • University of Texas at Austin, 1992
Biomedical Engineering, Biomaterials

J.C. Slattery, Ph.D. • University of Wisconsin, 1959
Jack E. and Sarah Brown Chair
Interfacial transport phenomena, multiphase transport phenomena

A.T. Watson, Ph.D. • California Institute of Technology, 1979
Porous media, math modeling

The University of Toledo

Chemical & Environmental Engineering

Faculty

Martin A. Abraham, Professor
Ph.D., University of Delaware
Environmental Reaction Engineering, Supercritical Fluids, Catalytic Processes

Maria R. Coleman, Associate Professor
Ph.D., University of Texas at Austin
Membrane Separations, Bioseparations

Kenneth J. DeWitt, Professor
Ph.D., Northwestern University
Transport Phenomena, Mathematical Modeling & Numerical Methods

John P. Dismukes, Professor
Ph.D., University of Illinois
Materials Processing, Management of Technological Innovation

Saleh Jabarin, Professor
Ph.D., University of Massachusetts
Physical Properties of Polymers, Polymer Orientation & Crystallization

Steven E. LeBlanc, Professor
Ph.D., University of Michigan
Environmental, Educational Computing Applications

G. Glenn Lipscomb, Associate Professor
Ph.D., University of California at Berkeley
Membrane Separations, Polymer Science & Engineering

Arunan Nadarajah, Associate Professor
Ph.D., University of Florida
Transport Phenomena, Protein Crystallization

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

Constance A. Schall, Assistant 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, Enzyme Kinetics, Membrane Transport

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Toledo, OH 43606-3390

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Web: http://www.che.utoledo.edu

Tulane University

Department of Chemical Engineering

Faculty and Research Areas

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

Richard D. Gonzalez • *Synthesis and Characterization of Supported Metal Catalysts • Fundamental Studies in Reactor Design • In-situ Spectroscopic Methods • Reactions in Organized Media*

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

Daniel J. Lacks • *Molecular Simulation • Thermodynamics of Condensed Phases • Dynamical Processes in Solids • Physical Properties of Polymer Materials • Density Functional Theory*

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

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

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

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

Peter N. Pintauro • *Electrochemical Engineering • Membrane Separations • Electro-organic Synthesis • Environmental Remediation*

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Graduate Advisor
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Tulane University • New Orleans, LA 70118
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The Faculty

T. Ariman • Particulate science and technology, multiphase separation processes

L.P. Ford • Kinetics of dry etching of metals, surface science

K.D. Luks • Thermodynamics, phase equilibria

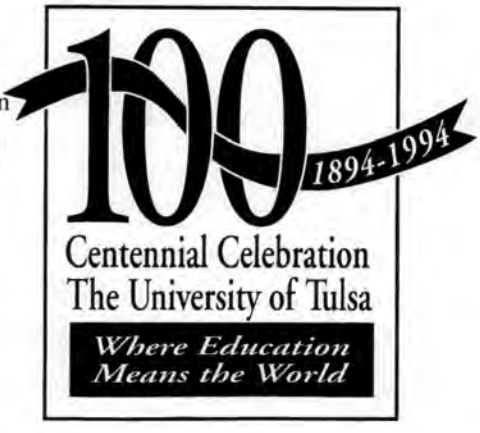
F.S. Manning • Industrial pollution control, surface processing of petroleum

C.L. Patton • Thermodynamics, applied mathematics

C.M. Sheppard • Refining reaction processes, process design, process hazard reduction

K.L. Sublette • Bioremediation, biological waste treatment, ecological risk assessment

K.D. Wisecarver • Multiphase reactors, multiphase flows



Further Information
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Frank M. Bowman *(Ph.D., California Institute of Technology)*
Air pollution; atmospheric chemistry mechanisms; gas-aerosol transport; modeling complex chemical reaction systems.

Kenneth A. Debelak *(Ph.D., 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.

Tomlinson Fort *(Ph.D., University of Tennessee)*
Capillarity; insoluble monolayers/L-B films; adsorption from the gas phase and from solution; contact angles and wetting; polymer interfaces; spreading on liquid surfaces; fine particle/powder technology; modeling/flow of fluids in porous media; tribology.

G. Kane Jennings *(Ph.D., Massachusetts Institute of Technology)*
Surface modification; experimental molecular engineering; corrosion inhibition; microelectronics processing.

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.

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 considerations, kinetics, and effects of substrate topography on chemical vapor deposition, sputter deposition and etch processes).

John A. Roth *(Ph.D., University of Louisville)*
Chemical reactor design; industrial waste water treatment; sorption processes; chemical oxidation for waste treatment; hazardous waste management; electrochemistry.

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.

Robert D. Tanner *(Ph.D., Case Western Reserve University)*
In situ bubble fractionation of excreted proteins from growing baker's yeast; selective protein recovery from a semi-solid air fluidized bed fermentation process; bubble and foam fractionation of proteins.

University of Virginia

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Founder, University of Virginia

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Department of Chemical Engineering
Thornton Hall
University of Virginia
Charlottesville, VA 22903-2442

Phone (804) 924-7778
E-mail: cheadmis@virginia.edu

Website:
http://www.che.virginia.edu

- **Giorgio Carta,** *Ph.D.*
University of Delaware
Adsorption, ion exchange, biocatalysis, environmentally benign processing

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

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

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

- **John L. Gainer,** *Ph.D.*
University of Delaware
Biochemical engineering, biomedical applications, environmentally benign solvents

- **Andrew C. Hillier,** *Ph.D.*
University of Minnesota
Interfacial engineering, electrochemistry, scanning probe microscopy

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

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

- **Matthew Neurock,** *Ph.D.*
University of Delaware
Molecular modeling, computational heterogeneous catalysis, kinetics of complex reaction systems

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

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

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Donald G. Baird, The Harry C. Wyatt Professor
Ph.D., University of Wisconsin
Polymer Processing and non-Newtonian Fluid Mechanics

William L. Conger, Professor
Ph.D., University of Pennsylvania
Department Administration

David F. Cox, Associate Professor
Ph.D., University of Florida
Catalysis, Ultrahigh Vacuum Surface Science

Richey M. Davis, Associate Professor
Ph.D., Princeton University
Physical Chemistry and Rheology of Colloids and Polymer Solutions

Kimberly E. Forsten, Assistant Professor
Ph.D., University of Illinois
Computational Bioengineering and Tissue Engineering

Aaron S. Goldstein, Assistant Professor
Ph.D., Carnegie Mellon University
Tissue Engineering, Interfacial Phenomena in Bioengineering

Erdogan Kiran, Department Head comes Jan. 1, 2000
Ph.D., Princeton University
Supercritical Fluids, High Pressure Polymer Processes

Y.A. Liu, The Frank C. Vilbrandt Professor
Ph.D., Princeton University
Artificial Intelligence and Green Engineering Design

Eva Marand, Assistant Professor
Ph.D., University of Massachusetts
Transport through Polymer Membranes, Polymer Spectroscopy

S. Ted Oyama, Professor
Ph.D., Stanford University
Heterogeneous Catalysis and New Materials

Len Peters, Professor
Vice Provost/Research & Dean/Graduate School
Ph.D., University of Pittsburgh
Atmospheric Transport

Peter R. Rony, Professor
Ph.D., University of California, Berkeley
Instrumentation

Ravi Saraf, Associate Professor
Ph.D., University of Massachusetts
Microelectronics

Joseph T. Sullivan, The Joseph H. Collie Professor
Ph.D., University of Minnesota
Marketing and Chemical Distribution

Kevin E. Van Cott, Assistant Professor
Ph.D., Virginia Tech
Tissue Remodeling, Biomaterials

William H. Velander
The W. Martin Johnson Professor
Ph.D., Pennsylvania State University
Transgenic Livestock Bioreactors & Immunopurification of Therapeutics, Biosensors

Garth L. Wilkes, The Fred W. Bull Professor
Ph.D., University of Massachusetts
Structure-Property Behavior of Polymeric Materials

For further information, contact the

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E-mail: grad.admissions@cheme.washington.edu
Web Page: http://weber.u.washington.edu/~chemeng/

Chemical Engineering Faculty • Research Areas

Materials

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
J.W. Rogers, Jr., Ph.D., Texas (Austin)	•	Surface Science; Thin-Film Deposition
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	•	Catalytic and Electrochemical Surface Science

Biochemical Engineering and Bioengineering

Albert L. Babb, Ph.D., Illinois	•	Biomedical Engineering; Hemodialysis
François Baneyx, Ph.D., Texas (Austin)	•	Biotechnology; Protein Technology; Biochemical Engineering
Michael W. Chang (Adjunct), Ph.D., Washington; M.D., Texas	•	Rehabilitation Medicine
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

Environmental Technology

E. James Davis, Ph.D., Washington	•	Colloid Science; Aerosol Chemistry and Physics; Electrokinetics
Barbara Krieger-Brockett, Ph.D., Wayne State	•	Reaction Engineering

Computers and Process Control

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

Transport Phenomena and Physics

René M. Overney, Ph.D., Basel, Switzerland	•	Nanoscale Surface Science and Polymer Physics

Graduate Programs in Chemical Engineering

Washington State University

Master's and doctoral programs in WSU's Department of Chemical Engineering are closely aligned with industry and government interests that often lead to professional opportunities. Our emphases in bioengineering, environmental restoration, and hydrocarbon processing involve you in such projects as biotreatment of hazardous contamination, diagnostic medical devices, and converting natural gas to useful products. Our Center for Multiphase Environmental Research provides interdisciplinary opportunities to solve complex problems at the interface of air, water, and earth.

Biking and rock-climbing are just two of the many outdoor recreations in Eastern Washington, rich in mountains, fields, rivers, lakes, and forests.

Facilities

Facilities include the new 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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About WSU

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

Faculty

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

R. Mahalingam, Ph.D. Newcastle-Upon-Tyne, England, hazardous wastes, materials, transport phenomena

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

Brent Peyton, Ph.D. Montana State, bioavailability, extremophilic bioprocessing, heavy metal flux in biofilms and porous materials

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

Contacts

Department of Chemical Engineering

Richard Zollars, ChemE Chair, 509-335-4332

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

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Departmental Website: www.che.wsu.edu

WSU Graduate School

Phone: 509-335-1446

Email: gradsch@wsu.edu

Website: www.gradsch@wsu.edu

Prof. Reid Miller and students hold a seminar typical of the small teacher-student ratio in WSU's ChemE Department.

Graduate Study in Chemical Engineering at

Washington University

Master's and Doctoral Programs

M. Al-Dahhan ► Chemical Reaction Engineering, Multiphase Reactors, Mass Transfer, Process Engineering
M. P. Dudukovic ► Chemical Reaction Engineering
J. T. Gleaves ► Heterogeneous Catalysis, Surface Science, Microstructured Materials
B. Joseph ► Process Control, Process Optimization, Expert Systems
J. L. Kardos ► Composite Materials and Polymer Engineering
B. Khomami ► Rheology, Polymer and Composite Materials Processing
P. A. Ramachandran ► Chemical Reaction Engineering, Boundary Element Methods
R. Sureshkumar ► Applications of transport processes involving complex polymeric and celloidal fluids
C. Thies ► Biochemical Engineering, Microencapsulation
J. Turner ► Environmental Reaction Engineering, Air Quality Policy and Analysis, Air Pollution Control

For Information Contact

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Washington University
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E-mail: chedept@wuche3.wustl.edu
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M.S. and Ph.D. in Materials Science and Engineering

Graduate Certificate in Polymer Engineering

M.S. and Graduate Certificate in Hazardous Waste Management

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

Charles Manke, 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 ◆ Polymer kinetics ◆ Spectroscopic and thermal analysis of material surfaces

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

Paul VanTassel, Ph.D., Minnesota, 1993 — Shape selective catalysis ◆ Protein adsorption and bioseparations

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Yinlun Huang, Associate Professor; Graduate Advisor, Chemical Engineering • yhuang@cheml.eng.wayne.edu

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Interfacial phenomena, colloid chemistry, soft materials

◪ ***Juan de Pablo***
Molecular thermodynamics, statistical mechanics, polymer physics

◪ ***James A. Dumesic*** *(Chairman)*
Kinetics and catalysis, surface chemistry

◪ ***Michael D. Graham***
Fluid mechanics, complex fluids, applied and computational mathematics

◪ ***Charles G. Hill, Jr.***
Immobilized enzyme technology, photocatalysis, kinetics and catalysis, composite wood products, membrane separations

◪ ***Daniel J. Klingenberg***
Colloid science, complex fluids, suspension rheology

◪ ***Thomas F. Kuech***
Semiconductor and advanced materials processing, solid-state and electronic materials, nanostructured materials

◪ ***Manos Mavrikakis***
Kinetics and catalysis, surface science, computational chemistry, electronic materials

◪ ***Regina M. Murphy***
Biomedical engineering, protein-protein interactions, targeted drug delivery

◪ ***Paul F. Nealey***
Polymers, thin films, nanolithography, cell-substrate interactions

◪ ***Sean Palecek***
Cellular engineering, biopolymers, biochemical reaction kinetics

◪ ***James B. Rawlings***
Process modeling, dynamics and control, particle technology, crystallization

◪ ***W. Harmon Ray***
Reaction engineering, polymerization processes, process dynamics and control

◪ ***Thatcher W. Root***
Surface chemistry, catalysis, solid-state NMR, MRI, and protein chromatography

◪ ***Ross E. Swaney***
Process design, synthesis, modeling, and optimization

◪ ***John Yin***
Applied virology, molecular process engineering bio-informatics

Graduate Studies in Chemical Engineering

Areas of Research

Advanced Materials
- Inorganic Membranes
- Molecular Sieve Zeolites
- Nanostructured Materials
- Diamond Thin Films and Coatings
- Art and Historical Materials

Biochemical Engineering
- Bioreactor Analysis
- Bioseparations

Catalysis and Reaction Engineering
- Adsorption and Transport in Porous Media
- Heterogeneous and Homogeneous Catalysis
- Surface Science of Catalysis
- Supported Molten Metal Catalysis
- Zeolite Catalysis
- Computational Fluid Dynamics
- Catalytic Microkinetics

Environmental Engineering
- Neutron Scattering from Aerosols
- Nucleation and Phase Transitions
- Environmental Catalysis
- Waste Reduction Technology
- Fuel Cells
- Renewable Fuels and Chemicals

Faculty

William M. Clark • *Ph.D., Rice*

Ravindra Datta • *Ph.D., U.C. Santa Barbara*

David DiBiasio • *Ph.D., Purdue*

Anthony G. Dixon • *Ph.D., Edinburgh*

Yi Hua Ma • *Sc.D., MIT*

William R. Moser • *Ph.D., MIT*

Fabio H. Ribeiro • *Ph.D., Stanford University*

Karen M. McNamara • *Ph.D., MIT*

Robert W. Thompson • *Ph.D., Iowa State*

Barbara E. Wyslouzil • *Ph.D., Caltech*

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For further information contact:

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Worcester Polytechnic Institute • 100 Institute Road
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P. K. Agarwal	*coal combustion/gasification • fluidization • image analysis*
D. A. Bell	*recycling processes • surface science • explosives*
C. Y. Cha	*solid waste utilization • microwave induced reactions • gas clean-up*
H. A. Deans	*enhanced oil recovery • carbon dioxide flooding*
P. C. Gilcrease	*biodegradation • explosives remediation • solids grinding • slurry reactors*
H. G. Harris	*unconventional gas production • enhanced oil recovery*
H. W. Haynes	*catalysis • reaction kinetics • synthetic fuels • applied thermodynamics • trona solution mining*
N. R. Morrow	*oil recovery • surface chemistry • wettability • low permeability media • multi-phase flow*
M. P. Sharma	*two phase flow • air pollution • thermal EOR • drilling and production • industrial ecology*
B. F. Towler	*reservoir simulation and modeling • phase behavior • enhanced oil recovery*
D. L. Whitman	*enhanced oil recovery • microcomputers • economics*

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For more information contact

Dr. Pradeep Agarwal, Coordinator for Graduate Studies • Chemical & Petroleum Engineering Department
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YALE

Department of Chemical Engineering

Eric Altman, *Ph.D. Pennsylvania*

Menachem Elimelech,
Ph.D. Johns Hopkins

Roger L. Ely, *Ph.D. Oregon State*

Marshall Grant, *Ph.D. Princeton*

Gary L. Haller, *Ph.D. Northwestern*

Csaba G. Horváth, *Ph.D. Frankfurt*

Michael Loewenberg, *Ph.D. Cal Tech*

Lisa D. Pfefferle, *Ph.D. Pennsylvania*

Daniel E. Rosner, *Ph.D. Princeton*

John Y. Walz, *Ph.D. Carnegie Mellonn*

Adjunct Professors

- **F. Peter Boer**
- **Donald M. Crothers**
- **William S. Hancock**
- **Joseph J. Pignatello**
- **James R. Wallis**
- **L. Lee Wikstrom**

Joint Appointments

- **Thomas Graedel** (School of Forestry & Environmental Studies)
- **Kurt Zilm**

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Interfacial and Colloidal Phenomena

Membrane Separations

Materials Synthesis and Processing

Multiphase Transport Phenomena

Separation Science and Technology

Surface Science

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Graduate Studies in Chemical Engineering

M.S. and Ph.D. Degree Programs

Faculty and Research Interests

Calvin H. Bartholomew *(Stanford)* • kinetics and catalysis
Merrill W. Beckstead *(Utah)* • propellant combustion, modeling
Thomas H. Fletcher *(BYU)* • coal pyrolysis and combustion
Hugh B. Hales *(MIT)* • reservoir engineering
John H. Harb *(Illinois)* • coal combustion, electrochemical engineering
William C. Hecker *(UC Berkeley)* • kinetics and catalysis
Paul O. Hedman *(BYU)* • energy, combustion, chemical propulsion
John L. Oscarson *(Michigan)* • calorimetry and thermodynamics
William G. Pitt *(Wisconsin)* • materials science
Richard L. Rowley *(Michigan State)* • thermophysical properties
L. Douglas Smoot *(Washington)* • fossil energy and combustion
Kenneth A. Solen *(Wisconsin)* • biomedical engineering
Ronald E. Terry *(BYU)* • engineering education, reservoir engineering
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University of British Columbia

Vancouver, Canada

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The Department operates joint research programs at the M.A.Sc. and Ph.D. levels with the UBC Biotechnology Laboratory and the Pulp and Paper Research Institute of Canada (PAPRICAN) in areas of common interest. An interdisciplinary M.Eng degree in Pulp and Paper Engineering is also offered by the Department in collaboration with PAPRICAN.

Application forms can be obtained from
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Process analysis, multimedia courseware design

D.P. Cavanagh (PhD, Northwestern)
Interfacial dynamics, multiphase flows, surfactants at interfaces, biofluid dynamics

J. Csernica (PhD, M.I.T.)
Diffusion in polymers, polymer surface modification

W.E. King (PhD, Pennsylvania)
Laser-tissue interactions, transport in tumors

J.E. Maneval (PhD, U.C. Davis)
NMR methods, membrane and novel separations

J.M. Pommersheim (PhD, Pittsburgh)
Transport phenomena, corrosion, modeling

M.J. Prince (PhD, U.C. Berkeley)
Biochemical systems, environmental barriers

W.J. Snyder (PhD, Penn State)
Polymer degradation, kinetics, drag reduction

J.D. Stolk (PhD, Texas)
Metal/ceramic composites, nanoscale alloys

M.A.S. Vigeant (PhD, Virginia)
Bacterial adhesions to surfaces

For further information, contact

Dr. Jeffrey Csernica • Chemical Engineering Department • Bucknell University • Lewisburg, PA 17837
Phone 570-577-1114 • csernica@bucknell.edu • http://www.bucknell.edu

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Graduate Programs in Chemical Engineering and Applied Chemistry

Faculty and Research Areas

B. BERNE ◆ *Statistical Mechanics, Theoretical Chemistry*
L.E. BRUS ◆ *Nanocrystals*
H.Y. CHEH ◆ *Electrochemical Engineering*
C.J. DURNING ◆ *Polymer Physical Chemistry*
G. FLYNN ◆ *Physical Chemistry*
C.C. GRYTE ◆ *Polymer Science, Separation Processes, Pharmaceutical Engineering*
E.F. LEONARD ◆ *Biomedical Engineering, Transport Phenomena*
R. LEVICKY ◆ *Physical Polymer Science*
A.E. MCDERMOTT ◆ *Biophysical Chemistry*
B. O'SHAUGHNESSY ◆ *Polymer Physics*
J.L. SPENCER ◆ *Applied Mathematics, Chemical Reactor Engineering*
J. THOMAS ◆ *Biomolecular Engineering*
N. TURRO ◆ *Supramolecular Photochemistry, Interface Chemistry, Polymer Chemistry*
A.C. WEST ◆ *Electrochemical Engineering, Mathematical Modeling*

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For Further Information, Write
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Graduate Committee
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