
Projects Funded

| Award Amount | PI/Sponsor/Title | Project Period |
|---------------------|---|-----------------------|
| \$883,003.00 | O.A. Basaran U.S. Dept. of Energy Fundamentals of Electric Field -Enhanced Multiphase Separations | 08/01/96-07/31/01 |
| \$26,211.00 | O.A. Basaran Purdue Research Foundation Drop Break-up in Random Pressure Fields | 05/01/99-04/30/01 |
| \$ 228,250.00 | J.M. Caruthers MSU/ AFOSR Durability Characterization of High Temperature Polymer Matrix-Carbon Fiber Composites for Future Air Force Applications | 03/15/98-02/28/01 |
| \$ 1,409,907.00 | J.M. Caruthers 21st Century - Indiana Center of Excellence: Institute for Integrated Materials- to-Product Design | 07/01/01-06/30/03 |
| \$ 296,448.00 | J.M. Caruthers Caterpillar, Inc. Application of Artificial Intelligence Methods for the Formulation of Engineering Plastics and Rubbers | 07/98-12/01 |
| \$180,179.00 | J.M. Caruthers Sandia National Labs Development and Validation of Life-Cycle Predictive Models for the Large Deformation Behavior of Polymer Solids including the effects of Chemical Degradation | 11/19/99-09/30/02 |
| \$ 50,525.00 | J.M. Caruthers Lawrence Livermore National Labs Life-Performance Including Long Term Aging of Polymer Systems with Significant Microstructure | 04/20/01-09/30/01 |
| \$ 26,042.00 | J.M. Caruthers Purdue Research Foundation A Fundamental Model of Glass Transition in Engineering Polymers | 03/01/00-02/28/02 |
| \$ 25,000.00 | D.S. Corti Purdue Research Foundation Computer-Assisted Molecular Theories of Superheated Liquids | 08/99-08/01 |

| Award Amount | PI/Sponsor/Title | Project Period |
|---------------------|---|-----------------------|
| \$ 25,000.00 | D.S. Corti American Chemical Society Molecular Theory of Deletion Forces and of the Phase Behavior of Colloidal Dispersions. | 09/01/00-08/31/02 |
| \$ 24,947.00 | W.N. Delgass Purdue Research Foundation Direct Vapor Phase Propylene Epoxidation over Gold Catalysis | 01/01/99-03/31/01 |
| \$ 272,729.00 | E.I. Franses National Science Foundation Adsorption and Surface Tension of SurfactantLipid/Protein Mixtures: Direct Probing of Surface Layers and Theoretical Modeling | 03/97-02/28/01 |
| \$ 454,145.00 | E.I. Franses Public Health Service Engineering Design of Novel Lung Surfactant Formulations | 09/98-08/01 |
| \$ 26,042.00 | E.I. Franses Purdue Research Foundation Molecular and Biophysical Design of Novel Lung Surfactant Formulation | 03/01/00-02/28/02 |
| \$ 100,000.00 | G. Lee Crane IDHM Integrated Detection of Energetic & Hazardous Materials | 08/30/00-08/30/02 |
| \$ 242,428.00 | J.A. Lauterbach National Science Foundation Study of Reaction Mechanisms and Kinetics of Heterogeneous Catalysts for Gas-Solid & Liquid-Solid Reactions by Novel High-throughput Spectroscopic Techniques | 06/01/00-05/31/03 |
| \$45,109.00 | J.A. Lauterbach Catalytica Novotech High Throughput Testing and Characterization of No Decomposition Catalysts | 11/01/00-10/31/03 |
| \$13,070.00 | J.A. Lauterbach Purdue Research Foundations Integrated Approach for Catalyst Design | 03/01/01-02/28/02 |

| Award Amount | PI/Sponsor/Title | Project Period |
|---------------------|--|-----------------------|
| \$ 313,325.00 | J.A. Lauterbach National Science Foundation In Situ Microscopy and Spectroscopy of Dynamic Behavior on Surfaces. | 04/01/98-03/31/02 |
| \$ 75,000.00 | J.F. Pekny Unilever Research Computationally Tractable Approach to Risk-based Supply Chain Management | 11/01/98-10/31/01 |
| \$ 25,746.00 | J.F. Pekny Purdue Research Foundation Computationally Tractable Approach to Risk-based Supply Chain Management | 08/16/99-08/15/01 |
| \$ 60,000.00 | N.A. Peppas Showalter Trust Showalter Distinguished Professorship in Biomedical Engineering | 11/93-06/02 |
| \$ 1,195,000.00 | N.A. Peppas National Science Foundation IGERT: Training Program on Therapeutic and and Diagnostic Devices | 08/01/99-07/31/01 |
| \$ 416,335.00 | N.A. Peppas National Institute of Health PH-Sensitive Complex Hydrogels for Protein Drug Release | 07/99-6/01 |
| \$363,636.00 | N.A. Peppas National Science Foundation Polymer/Mucin Adhesion for Targeted Therapy | 09/97-08/01 |
| \$ 25,912.00 | N.A. Peppas Purdue Research Foundation Micropatterning & Molecular Imprinting | 01/01/00-12/31/01 |
| \$12,908.00 | N.A. Peppas Purdue Research Foundation Kinetics & Modeling of Ultraviolet Polymerization | 03/01/00-07/01/01 |
| \$263,697.00 | D. Ramkrishna National Science Foundation Metabolic Engineering, Optimization and Control of Ethanol Production Inescherichia Coli | 07/01/98-06/30/01 |

| Award Amount | PI/Sponsor/Title | Project Period |
|---------------------|---|-----------------------|
| \$60,000.00 | J.L. Sinclair U.S. Department of Energy Coal Particle Flow Patterns for O ₂ -enriched Low Nox Burns | 01/01/00-08/31/02 |
| \$ 60,000.00 | J.L. Sinclair American Chemical Society LDV Measurements of Dense-Phase, Liquid-Solid Flows with Particle Collisions | 01/01/00-08/31/02 |
| \$61,710.00 | G.T. Tsao National Science Foundation Enhancement of Interfacial Mass Transfer in Gas-Liquid Contactors. | 06/14/99-11/30/01 |
| \$60,772.00 | G.T. Tsao U.S. Department of Agriculture Production of Cellulases by Repeated Extraction and Fermentation | 11/15/99-11/30/01 |
| \$13,070.00 | V. Venkatasubramanian Purdue Research Foundation A Novel Computing Environment for Systemic and Rational Design and Formulation of New Materials | 03/01/01-02/28/02 |
| \$386,311.00 | N.-H.L. Wang 21st Century - Indiana Novel Simulated Moving Bed Absorption Technologies for Biochemical Purification from Multicomponent Mixtures | 06/01/00-06/01/02 |
| \$212,421.00 | N.-H.L. Wang Abbott Laboratories Model Based Design, Optimization, and Scale-up of Simulated Moving Bed chromatography for Antibiotics Recovery and Purifications | 08/11/97-08/10/01 |
| \$ 250,245.00 | N.-H.L. Wang Lilly and Company Feasibility Studies of SMB Size Exclusion Chromotography for Insulin Purification | 05/01/99-04/30/01 |
| \$151,600.00 | N.-H.L. Wang Abbott Laboratories Devemopment of Simulated Moving Bed Technologies for the Separation of Chiral Drugs and Advanced Intermediates | 07/01/00-06/30/02 |

| Award Amount | PI/Sponsor/Title | Project Period |
|---------------------|---|-----------------------|
| \$ 87,954.00 | N.-H.L. Wang Lilly and Company Model Based Design of Preparative Chromatography for Purification of Natural Products - Pilot Study | 12/01/00-11/30/01 |
| \$13,070.00 | N.-H.L. Wang Purdue Research Foundation Novel Simulated Moving Bed Adsorption Technologies for Purification or Multicomponent Biochemical Mixtures | 12/01/00-11/30/01 |
| \$ 211,952.00 | P.C. Wankat National Science Foundation Multicomponent SMBChromatographic Separations | 07/01/99-06/30/02 |
| \$5,000.00 | P.C. Wankat Advanced Separation Technologies Research on Multicomponent SMBChromatographic Separations | 07/01/99-06/30/01 |

Thesis Projects

| Graduate Student Major Professor | Thesis Title | Degree |
|---|-------------------------|---------------|
|---|-------------------------|---------------|

Degrees Awarded August 6, 1999

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|--|--|-----|
| Farrenburg, Chad Austin <i>Wang</i> | Purification of Clarithromycin Using Simulated Moving Bed Chromatography | MS |
| Lee, Jia <i>Delgass & Tsao</i> | The Conversion of 2,3-Butanedioil to Methyl Ethyl Ketone over Zeolites | PhD |
| Pletcher, Timothy Dirk <i>Lauterbach</i> | Ellipsomicroscopy for Surface Imaging: a Novel Tool for the Investigation of Surface Phenomena | MS |
| Prosser, Alissa Jennifer <i>Franses</i> | A Survey of Equilibrium Adsorption and Tension Models for Ionic Surfactants at the Air/Water Interface | MS |
| Thompson, Alan Bruce <i>Sevick-Muraca</i> | Multi-pixel Assessment of Fluorophore Uptake and Lifetime in the Detection of Heterogeneous Tissue Volumes | MS |
| Walsh, Christopher Bodnar <i>Franses</i> | Effect of Processing Conditions on the Quality, Stability, and Permeability of Thin Organic Films | PhD |
| Yan, Jiangshan <i>Lauterbach</i> | Adsorption and UV Polymerization of Styrene and Methyl Methacrylate on Polycrystalline Platinum: Time-Resolved FT-IR and TPD Study | MS |

Degrees Awarded December 18, 1999

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|---|---|-----|
| Chan, Ho Yeung Harry <i>Delgass</i> | Interfacial Chemistry on Transition Metals in Gaseous and Electrochemical Environments as Probed by Surface-Enhanced Raman Spectroscopy | PhD |
| Chen, Shannon <i>Andres</i> | Chloropentafluoroethane Plasma Chemistry and Its Effects on the Etch Rates of Silicon Germanium and Silicon Dioxide | PhD |
| Lee, Seung-Jin <i>Caruthers</i> | Structural Relaxation in Glassy Small Molecule and Polymer Systems | PhD |
| Myrick, Sabrina Hood <i>Franses</i> | The Measurement and Interpretation of Low Dynamic Surface Tensions of Aqueous Long-Chain Alcohols | PhD |
| Richter, Steven Michael <i>Sevick-Muraca</i> | Frequency Domain Photon Migration for the Characterization of Concentrated Particulate Suspensions | PhD |
| Schertz, Derrick Paul <i>Reklaitis</i> | Scheduling Under Process Uncertainty: A Batch Serial Line Study | PhD |

| Graduate Student Major Professor | Thesis Title | Degree |
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|---------------------------------------|--|-----|
| Wilkes, Edward Dean <i>Basaran</i> | Nonlinear Dynamics of Oscillations and Breakup of Supported Drops | PhD |
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Degrees Awarded May 6, 2000

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| Blake-Powell, Cynthia M. <i>Sinclair</i> | Comparison Among Ad-Hoc Theories, Computational Fluid Dynamics Turbulence Models, and Experimental Data for Confined Jet Flow | MS |
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|--------------------------------------|--|----|
| Kuwana, Eddy <i>Sevick-Muraca</i> | Measurement and Model Assessments of Multi-exponential Decay Fluorescence Lifetime and Propagation in Scattering Media | MS |
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Course Offerings and Seminars 1999-2000

Course Offering - Fall 1999

| Class | Course Title | Instructor | Enrollment |
|--------------------------|---------------------------------------|---------------------------------------|-------------------|
| 200 | Chem. Engr. Seminar | Wankat | 131 |
| 201, 301, 401 | Co-op Seminar | Squires | 74 |
| 205 | Chem. Engr. Calculations | Sinclair | 98 |
| 211 | Chem. Engr Thermodynamics | Franses | 42 |
| 303 | Chem. Engr. Honor Seminar | Ramkrishna | 12 |
| 306 | Design of Staged Separation | Wankat | 110 |
| 348 | Chem. Reaction Engineering | Delgass | 43 |
| 377 | Momentum Transfer | Kessler | 95 |
| 378 | Heat and Mass Transfer | Greenkorn | 39 |
| 434 | Chem. Engr. Laboratory I | Muench, Eckert Kessler, Lauterbach | 92 |
| 456 | Process Dynamics & Control | Lee | 104 |
| 461 | Biomedical Engineering | Hannemann | 27 |
| 496 | Chem. Engr. Honors Lab | Houze | 9 |
| 540 | Transport Phenomena | Wang | 29 |
| 544 | Structure and Prop. of Poly. Mat. | Lackritz/Narasimhan | 14 |
| 557 | Intelligent Systems | Venkatasubramanian | 14 |
| 597A | Risk Mgmt. Proc. Develop. | Blau, Pekny | 34 |
| 597T | Biochemical Engineering | Tsao | 47 |
| 610 | Advanced Chem. Engr. Thermo | Corti | 32 |
| 620 | Transport Phenomena I | Basaran | 34 |
| 630 | Applied Math. for Chem. Engr. | Pekny | 31 |
| 632 | Linear Operator | Ramkrishna | 9 |
| 645 | Polymer Rheology | Caruthers | 7 |
| 690 | Chemical Engineering Seminar | Reklaitis | 104 |
| 697C | Biomaterial Science & Engineering | Peppas | 10 |
| Special Projects: | | | |
| 411 | Chem. Engr. Science Research Projects | | 22 |
| 412 | Chem. Engr. Design Research Projects | | 1 |

Course Offering - Spring 2000

| Class | Course Title | Instructor | Enrollment |
|--------------------------|--------------------------------------|-------------------------|-------------------|
| 201, 301 | Co-op Seminar | Squires | 58 |
| 205 | Chem. Engr. Calculations | Kessler | 56 |
| 211 | Intro. to Chem. Engr Thermo. | Franses | 87 |
| 320 | Statistical Modeling & Qual. Enhan. | Blau, Pekny | 154 |
| 348 | Chem. Reaction Engineering | Tsao | 96 |
| 377 | Momentum Transfer | Basaran | 29 |
| 378 | Heat and Mass Transfer | Houze | 108 |
| 430 | Principles of Molecular Engr. | Andres | 100 |
| 435 | Chem. Engr. Laboratory I | Muench, Eckert, Wang | 101 |
| 442 | Chemistry and Engr. of High Poly. | Caruthers | 23 |
| 450 | Design and Anal. of Proc. Systems | Venkat, Reklaitis, Tsao | 108 |
| 597C | Polymer Science Engr. Lab. | Caruthers | 7 |
| 597M | Adv. Chem E. Measurement Lab | Lauterbach | 10 |
| 611 | Adv. Topics ChE Thermo | Corti | 12 |
| 621 | Transport Phenomena II | Ramkrishna | 27 |
| 656 | Advanced Process Control | Lee | 6 |
| 658 | Biomedical Phenomena | Peppas | 7 |
| 660 | Chem. React. Engr. | Delgass | 28 |
| 685 | Educ. Methods in Engr. | Wankat, Oreovicz | 8 |
| 690 | Chem. Engr. Seminar | Reklaitis | 94 |
| Special Projects: | | | |
| 411 | Chem. Engr. Science Research Project | | 23 |
| 412 | Chem. Engr. Design Research Project | | 0 |
| 499 | Research in Chemical Engineering II | | 7 |

Seminars - Fall 1999

| Name | Title | Date |
|---|--|--------------------|
| Professor John Hudson Chemical Engineering Department University of Virginia Charlottesville, VA 22903-2442 | Spatiotemporal Pattern Formation in Electrochemical Reactions | September 23, 1999 |
| Professor Eric S.G. Shaqfeh Chemical Engineering Department Stanford University Stanford, CA 94305-5025 | To be announced | September 30, 1999 |
| Professor Rafiqul Gani Eng. Research Center, IVC-SEP Technical University of Denmark Chemical Engineering Department Lyngby, Denmark 2800 | An Integrated Approach to Synthesis, Design and Control | October 26, 1999 |
| Michael Harold Research Manager, Chemical Process Fundamentals Chemical Science & Engineering DuPont Wilmington, DE 19880 | Analysis, Synthesis, and Inter-disciplinary Teams in Chemical Engineering Research | November 18, 1999 |
| Professor Frank S. Bates Department of Chemical Engineering and Materials Science University of Minnesota Minneapolis, MN 55455 | To be announced | December 2, 1999 |
| Professor Derrick K. Rollins Chemical Engineering Department Iowa State University of Science and Technology Ames, IA 50011-2230 | A Comprehensive Approach To Dynamic Predictive Modeling | December 9, 1999 |

Seminars - Spring 2000

| Name | Title | Date |
|---|---|-------------------|
| Professor Jennifer J. Linderman University of Michigan Ann Arbor, MI | Modeling of G-Proten Coupled Receptors: Insights into Ligend Efficacy and Drug Screening | February 10, 2000 |
| Professor L. Gary Leal University of California, Santa Barbara, CA | Fluid Mechanics of Blending: Coalescence and Breakup of Drops in a Shear-Like Flow | February 24, 2000 |
| Professor N. Lawrence Ricker University of Washington Seattle, WA | Process Measurements and Control: Opportunities at the Interface | March 23, 2000 |
| Professor Sankaran Sundaresan Princeton University Princeton, NJ | Origin of Some Maso- and Macro-Scale Phenomena in Two-Phase Flows | March 30, 2000 |
| Professor Salin M. Senkan University of California Los Angeles, CA | Combinatorial Catalysis – Opportunities and Challenges | April 6, 2000 |
| Professor Robert Brown Massachusetts Institute of Tech. Cambridge, MA | Kelly Lecture | April 13-14, 2000 |