

2007-2008 Annual Report
Department of Chemical Engineering
University of Rhode Island

Prepared by:

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*Department of Chemical Engineering
2007-2008 Annual Report*

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HIGHLIGHTS:

I am pleased to provide you with this summary of accomplishments in our department over the last year.

Our faculty presented seminars at a range of universities, and were strongly represented at National Meetings (AIChE, ACS, and MRS). New research grants to the department totaled \$1,717,995. Not only is this the highest amount per faculty, but it is higher (by a quite bit) in total than any other department in the College (including some that are twice as large as us). This support has come from the National Science Foundation, ACS-PRF, RIDOT, NASA, and several private companies. The university, under the leadership of Prof. Oxley in the Chemistry Department has been designated as one of the new Homeland Security Centers of Excellence, and some of our department faculty are key participants in this new program. Our faculty is serving as Associate Editors of journals, publishing in some of the best journals in their fields and supervising a strong group of graduate students. Among our graduate students, Liquan Zhang was selected for the best thesis award in the science category at URI and Jayashri Sarkar was awarded URI's Intellectual Property Award, both for 2007-08.

Our undergraduate enrollments are showing a sharp upward trend. The current number is 145, with a few more additions expected over the next few months as we get transfers from other colleges and the undecided engineers determine their majors. Of our current 48 freshmen, nearly 60% have indicated that they are interested in the Pharmaceutical engineering track, a new offering starting in Fall 2008. We believe that the addition of the Biology and Pharmaceutical Engineering tracks to our curriculum has helped both the quality of our incoming students as well as our numbers.

The department saw an unprecedented number of its undergraduates get summer internships in industry. Companies that hired include Amgen, Teknor Apex, Toray Plastics, and Millennium Pharmaceuticals as well as a wide range of smaller firms. All of the feedback we have received from these companies have been excellent, and we are indeed proud to be able to provide this high level of education to our students. All of our graduating senior class is employed.

The Department received several donations, in cash and kind from a wide range of supporters. Support from Pfizer has been critical for the AIChE Student Chapter. Amgen continues to provide support for our seminar program, allowing us to bring in a host of highly reputed individuals from other institutions to our department. This program has significantly aided the visibility of our department, while providing our graduate students and faculty the opportunity to hear about cutting edge research.

The department benefited from the support of several alumni during the past fiscal year, and we are deeply grateful for your generosity. If you did not designate a specific cause, your funds were deposited into Chemical Engineering endowment. We are building that up quickly, and will be using the funds wisely.

Professor Harry Knickle has opted to go on a 3-year phased out retirement beginning this Fall. Brenda Moyer has joined our department (part-time) to help with our graduate program.

The financial crisis all around us is beginning to affect our department operations, with reduced operating budgets and lower prospects for faculty hiring. However, our faculty and staff have risen remarkably well to this challenge, and despite everything, are maintaining the high quality of scholarship and education that we are known for.



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I wish all of you a very pleasant year ahead. Even in these challenging times, we are very excited about our progress in the department and look forward to your support. I feel energized about what is happening and I know you will when you stop by. Please come along at any time, we will be happy to show you what we have been up to.

Respectfully submitted,



Arijit Bose
Department Chair



FACULTY AND STAFF:

Department Chair:
Arijit Bose

Professors:
Stanley Barnett
Richard Brown
Otto J. Gregory
Harold Knickle
Angelo Lucia

Associate Professors:
Donald Gray
Michael L. Greenfield
Mercedes Rivero-Hudec

Assistant Professor
Geoffrey Bothun

Research Professor
Everett Crisman

Associate Research Professor:
Eugene Park

Administrative Staff:
Mary Strawderman
Brenda Moyer (1/3 time)

Technical Staff:
Robert Ansay
Robert D'Ambrosca (1/2 time)

Emeritus Professor:
Vincent Rose

Faculty and Staff Appointments, Promotions and Changes:

Brenda Moyer was hired in December, 2007 as our Graduate Secretary. We welcome Brenda to our Department and to the University.



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**Undergraduate and Graduate Student Achievements:
Department of Chemical Engineering
2006-2007 Awards**

PRESIDENT'S AWARD FOR STUDENT EXCELLENCE	<i>John P. Alper</i>
NELSON C. WHITE AWARD	<i>Michael R. Cedrone</i>
AMERICAN CHEMICAL SOCIETY (RI Section) OUTSTANDING CHEMISTRY STUDENT AWARD	<i>Matthew W. Klaas</i>
AMERICAN INSTITUTE OF CHEMISTS FOUNDATION OUTSTANDING ACHIEVEMENT AWARD Undergraduate	<i>Derek Li</i>
Graduate	<i>Jayashri Sarkar</i>
AIChE (Boston section) OUTSTANDING STUDENT AWARD (GUPPIE OF THE YEAR)	<i>Evan K. Wujcik</i>
A. RALPH THOMPSON SCHOLARSHIP AWARD	<i>Michael R. Cedrone</i>
DAVID J. CHRONLEY CREATIVITY AWARD	<i>Qian Q. Ni</i> <i>Melissa B. Williams</i>
AICHE/DONALD F. OTHMER SOPHOMORE ACADEMIC EXCELLENCE AWARD	<i>Brian E. Elias</i>
VINCENT & ESTELLE E. MURPHY SCHOLARSHIP	<i>Robert T. Ervolino</i> <i>Adam L. Hanks</i>
JERRY M. & EVELYN L. RHOADS MEMORIAL SCHOLARSHIP	<i>Derek D. Li</i> <i>James R. Lospaluto</i> <i>Bradley R. McCallum</i> <i>Qian Q. Ni</i> <i>Yasah Vezele</i>
NARRAGANSETT BAY COMMISSION SCHOLARSHIP	<i>Toloupe O. Adenodi</i>
CHARLES PAGELLA SCHOLARSHIP IN ENGINEERING	<i>Justin D. DePinto</i>
ON SEMICONDUCTOR SCHOLARSHIP	<i>Matthew W. Klaas</i>
CHEMICAL ENGINEERING FRESHMAN SCHOLARSHIP	<i>Meredith A. Matoean</i> <i>Karina Pelaez</i>



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JOSEPH L. CAMPANELLA SCHOLARSHIP

*Qian Q. Ni
Karina Pelaez*

LEONARD & ELENA LANNI FAMILY SCHOLARSHIP

Tolulope O. Adenodi

TORAY PLASTICS AMERICA SCHOLARSHIP

*John P. Alper
Rachael Browning
Amy E. Gibson
Michael Cedrone
Zachary Koehn
Sara Manteiga
Alex Pytko
Joseph L. Volsi*

R & D NOLAN LUX SCHOLARSHIP

Samuel Matus

PETER M. CARLEY MEMORIAL SCHOLARSHIP

ROSE FAMILY ENDOWMENT SCHOLARSHIP

*Qian Q. Ni
Melissa B. Williams*

Congratulations and best wishes to all of the award winners!



FACULTY ACCOMPLISHMENTS:

{tc \l3 "FACULTY PUBLICATIONS}Publications:

Dr. Stanley Barnett

- Boving, T.B., S.M.Barnett, G. Perez, W.J Blanford and J.E. McCray, Remediation with Cyclodextrin: Recovery of the Remedial Agent by Membrane Filtration, *Remediation Journal* 17, 21-36, 2007

Dr. Geoffrey D. Bothun

- Bothun, G.D., Qian, N., Ilias, S. Solvent-dependent permeability in asymmetric ceramic membranes with tortuous or non-tortuous mesopores, submitted to *J. Membrane Science*.
- Bothun, G.D. Hydrophobic silver nanoparticles trapped in dipalmitoylphosphatidylcholine bilayers: Size distribution, bilayer phase behavior, and optical properties, submitted to *J. Nanobiotechnology*.
- Bothun, G.D., Peay, K., Ilias, S. Role of tail chemistry on liquid and gas transport through organosilane modified mesoporous ceramic membranes, *J. Membrane Science*, 301 (2007) 162-170.

Dr. Arijit Bose

- Tan, G.; Ford, C.; John, V. T.; He, J.; McPherson, G. L.; Bose, A., Surfactant Solubilization and the Direct Encapsulation of Interfacially Active Phenols in Mesoporous Silicas. *Langmuir* **2008**, 24, (3), 1031-1036.
- Jha, A. K.; Lee, J.; Tripathi, A.; Bose, A., Three-Dimensional Confinement-Related Size Changes to Mixed-Surfactant Vesicles. *Langmuir* **2008**, 24, (12), 6013-6017.
- Yan, Q.; Raghuvver, M. S.; Li, H.; Singh, B.; Kim, T.; Shima, M.; Bose, A.; Ramanath, G., Rod-shaped assemblies of FePt-PtTe₂ through dynamic templating. *Advanced Materials (Weinheim, Germany)* **2007**, 19, (24), 4358-4363.
- Kayitmazer, A. B.; Bohidar, H. B.; Mattison, K. W.; Bose, A.; Sarkar, J.; Hashidzume, A.; Russo, P. S.; Jaeger, W.; Dubin, P. L., Mesophase separation and probe dynamics in protein-polyelectrolyte coacervates. *Soft Matter* **2007**, 3, (8), 1064-1076.
- Sarkar, J., V. T. John, C. Brooks, J. He, G. Ramanath, A. Bose, Surfactant-templated synthesis and catalytic properties of patterned nanoporous titania supports loaded with platinum nanoparticles, in press, *Chemistry of Materials*, (2008).
- Tan, Grace; Xu, Peng; Agarwal, Vivek; He, Jibao; Mcpherson, Gary; Bose, Arijit; John, Vijay, Cryo-Field Emission Scanning Electron Microscopy Imaging of a Rigid Surfactant Mesophase, in press, *Langmuir* (2008).

Dr. Michael L. Greenfield

- Zhang, L. and Greenfield, M.L.; "Polystyrene Single Chain Relaxation in a Model Asphalt Mixture," *Polymeric Materials Sci. and Eng. (Am. Chem. Soc.)*, 2007, 97, 888-889.
- Zhang, L. and Greenfield, M.L.; "Relaxation Time, Diffusion, and Viscosity Analysis of Model Asphalt Systems using Molecular Simulation," *J. Chem. Phys.*, 2007, 127, 194502.



- Zhang, L. and Greenfield, M.L.; “Effects of Polymer Modification on Properties and Microstructure of Model Asphalt Systems,” *Energy Fuels*, 2008, in press.

Dr. Angelo Lucia

- A. Lucia, A. Amale, and R. Taylor, Distillation Pinch Points and More, *Comput. Chem. Engng.* 32, 1350 (2008) [doi:10.1016/j.compchemeng.2007.06.019].
- R. Gattupalli and A. Lucia, Molecular Conformation of N-Alkanes Using Terrain/Funneling Methods, *J. Global Optim.* [Doi:10.1007/s10898-007-9206-5].
- A. Lucia, Multi-Scale Global Optimization Using Terrain/Funneling Methods, *Encyclopedia of Optimization*, submitted.
- A. Amale and A. Lucia, A Two-Level Design Methodology, *AIChE J.*, accepted.
- L.M. Octavio, A. Lucia and D.P. Visco, Modeling Association in the SAFT Formalism, *Ind. Eng. Chem. Res.*, submitted.
- A. Lucia, R. Gattupalli, A. Linninger and K. Kulkarni, A Barrier-Terrain Method for Global Optimization, *Ind. & Eng. Chem. Res.* 47, 2666 (2008) [Doi: 10.1021/ie071421t].
- A. Amale, A. Lucia, Non-Pinched, Minimum Energy Distillation Design, *Chem. Eng. Res. Des.* Doi: 10.1006/j.cherd2008.02.017.

Dr. Eugene Park

R. Enander, R. Gagnon, R. Hanumara, **E. Park**, T Armstrong, and D. Gute, “Environmental Health Practice: Statistically-Based Performance Measurement”, accepted for publication in the *American Journal of Public Health*, 2006.

Invited Seminars and Presentations:

Dr. Stanley M. Barnett

- Barnett, S.M., Alternate Energy, Masons (Westerly Lodge), 06-10-08

Dr. Arijit Bose

- Microstructure Evolution and Materials Synthesis in a Mixed-surfactant Mesophase, Institute of Materials Science, University of Massachusetts, Dartmouth, October (2007).
- Microstructures in Complex Fluids – Jadavpur University, February (2008).
- Microstructures in Complex Fluids – Department of Chemical Engineering, Rensselaer Polytechnic Institute, April (2008).
- Zhou, J.; Vavlekas, D.; Tan, G.; Singh, M.; Ford, C. D.; John, V. T.; McPherson, G. L.; He, J.; Bose, A. 235th ACS National Meeting, New Orleans, LA, United States, April 6-10, 2008.
- Sarkar, J.; Ramanath, G.; John, V. T.; Bose, A.; Brooks, C. J.; He, J., 234th ACS National Meeting, Boston, MA, United States, August 19-23, 2007.
- Single-Step Synthesis of Metal/Porous Support Nanocomposite Materials in Mixed Surfactant Mesophase, Jayashri Sarkar, Vijay T. John, G. Ramanath, Arijit Bose, AIChE Annual Meeting, Salt Lake City, November, 2007.



- Evolution of Soft Structures Amphiphilic Systems, ACS Colloid and Surface Science Symposium, NC State University, June, 2008.

Dr. Geoffrey D. Bothun

- Bothun, G.D. (invited) Multifunctional nanoparticle/lipid assemblies, *Chemical Engineering Seminar, URI* (April 2007).
- Bothun, G.D. (invited) Nanoscale confinement effects in native and surface functionalized inorganic membranes, *Mechanical Engineering Seminar, URI* (April 2007).
- Bothun, G.D. (invited) Biomembrane/Nanomaterial Interactions: Biocompatibility Studies & Multifunctional Assembly Design, *Interdisciplinary Research Seminar Series, URI* (January 2007).
- Bothun, G.D. (invited) A New faculty's perspective on critical professional development skills, special symposium on "Finding your catalyst - Lowering the barrier from graduate school to industry," *ACS annual fall meeting*, Boston, MA (August 2007).
- Airan, A., Bothun, G.D., Undey, C. Mathematically modeling a fermentation bioreactor, *New England Complex Fluids Workshop, URI* (June 2008).
- Gupta, A., DeLuca, R., Bothun, G.D., Ye, G., Parang, K. Investigation of Tripodal Cationic Peptides for Cellular Drug Delivery, *New England Complex Fluids Workshop, URI* (June 2008).
- Bothun, G.D., Chen, Y. Lipid-assisted formation and dispersion of aqueous nano-C₆₀, *New England Complex Fluids Workshop, URI* (June 2008).
- Bothun, G.D., DeLuca, R., Gupta, A., Ye, G., Parang, K. Domain formation in mixed zwitterionic/anionic lipid bilayers induced by synthetic tripodal cationic peptides, *ACS Colloids Symposium* (June 2008)
- Bothun, G.D., Chen, Y. Phase Behavior And Permeability Of Lipid Bilayer Membranes In The Presence Of C₆₀ Fullerene, *AICHE annual*, Salt Lake City, UT (Nov 2007).
- Bothun, G.D., Murphy, E., Ni, Q., Alper, J. Thermoporometric Investigation Of Solvent-Surface Interactions In Nanoporous Inorganic Membranes, *AICHE annual*, Salt Lake City, UT (Nov 2007).

Dr. Michael L. Greenfield

- Greenfield, M.L.; Zhang, L. "Probing Relationships between Asphalt Viscosity and Single Molecule Relaxation," Petersen Asphalt Conference, Laramie, WY, July 18, 2007.
- Zhang, L.; Greenfield, M.L. "Polystyrene Single Chain Relaxation in a Model Asphalt Mixture," American Chemical Society, Boston, MA, August 23, 2007.
- Greenfield, M.L. "Insights into Asphalt Structure and Relaxation using Molecular Simulations of Model Systems," Yale University, Dept of Chemical Engineering Seminar Series, Oct 31, 2007.
- Greenfield, M.L. "Relationships Between Single Molecules and Binder Viscosity in Model Asphalts," Rhode Island Transportation Forum, University of Rhode Island, Nov 2, 2007.
- Hobbs, M.L.; Greenfield, M.L. "Classical Simulation Of Dithiophene With Extension Of The Parameter Set To Alkyl-Substituted Dithiophene," AIChE Annual Meeting, Salt Lake City, UT, November 7, 2007.
- Zhang, L.; Greenfield, M.L. "Molecule Relaxation And Viscosity In Model Asphalt Mixture Systems," AIChE Annual Meeting, Salt Lake City, UT, November 8, 2007.



Dr. Angelo Lucia

- A New Approach to the Synthesis & Optimization of Energy Efficient Chemical Processes, with A. Amale, ICCOPT-II, August 2007.
- The Long and Short of Energy Consumption in Distillation, AIChE Annual Meeting, Salt Lake City, UT, November 2007.
- The Long and Short of Energy Consumption in Distillation, CCNY, New York, NY, February 2008.
- Distillation Boundaries in Four Component Mixtures, with M. Bellows, AIChE Annual Meeting, Salt Lake City, UT, November 2007.
- Non-Pinched Minimum Energy Solutions in Distillation, with A. Amale, R. Taylor, AIChE Annual Meeting, Salt Lake City, UT, November 2007.
- Molecular Conformation and Crystal Structure of N-Alkanes Using Multi-Scale Terrain/Funneling Optimization, with R. Gattupalli, AIChE Annual Meeting, Salt Lake City, UT, November 2007.
- Effects of Using Multiple Pure Component Parameters of Molecular-Based Equations of State on Thermodynamic Property Predictions, with D. P. Visco, S. Saravanan, AIChE Annual Meeting, Salt Lake City, UT, November 2007.
- Energy Efficient Reactive Distillation, with R. Taylor, AIChE Annual Meeting, Salt Lake City, UT, November 2007.
- Influence of Mass Transfer on Conceptual Design of Distillation Processes, with R. Taylor, AIChE Annual Meeting, Salt Lake City, UT, November 2007.
- Effective Free Energy Landscape Exploration Using Course Terrain Methods, with Y. Kevrekidis, T. Frewen, AIChE Annual Meeting, Salt Lake City, UT, November 2007.
- Modeling Association in the SAFT Formalism Using Ab Initio Quantum Chemistry, with L.M. Octavio, D. P. Visco, 23rd European Symposium on Applied Thermodynamics (ESAT 2008), Cannes, France, June 2008.

Faculty Research Areas

Dr. Stanley Barnett

Research Interests:

- Membrane Separations
- Biological Engineering
- Alternative Energy

Education Centers:

- R.I. Center for Pollution Prevention (Green Chemistry and Engineering programs)
- URI Energy Partnership

Dr. Arijit Bose

Research Interests:

- Interfacial and Colloidal Engineering; Nanostructured materials

Dr. Geoffrey D. Bothun

Research Interests:

- Bionanotechnology



- Colloidal and interfacial science
- Ceramic membrane separations
- Nanoscale fluid mechanics

Dr. Michael L. Greenfield

Research Interests:

- Polymers and polymer additives
- Molecular models and chemomechanics of asphalts
- Molecular simulation, thermodynamics, statistical mechanics
- Diffusion in polymers
- Fluid physical properties and fluid design
- Molecular tribology

Dr. Angelo Lucia

Research Interests:

- Process Modeling
- Synthesis and Simulation
- Nonlinear Analysis
- Numerical Methods

Education Center:

- Process Engineering Laboratory

Dr. Eugene Park

Research Interests:

- Pollution Prevention/Cleaner Production
- Membrane Separation

Education Center:

- R.I. Center for Pollution Prevention

Dr. Mercedes Rivero-Hudec

Research Interests:

- Aquatic Microorganisms
- Heavy Metals
- Biocorrosion and Fouling

Education Center:

- Biochemical Engineering Laboratory

Dr. Vincent Rose

Research Interests:

- Pollution Control
- Energy Management
- Water Management

Education Center:

- Innovative Energy Collaborative



Internal and External Service:

Dr. Stanley M. Barnett

- President's Council on Sustainability
- College of Engineering Undergraduate Curriculum Committee
- Chemical Engineering Undergraduate Committee
- RI AIChE - Treasurer
- AIChE Journal Reviewer
- J. Membrane Science Reviewer
- Biotechnology Progress Reviewer

Dr. Arijit Bose

- Panel reviewer, NSF MRSEC, MRI, November 2007, March 2008
- Associate Editor, IEEE Transactions in Nanotechnology
- Board of Editors, Journal of Surface Science and Technology.
- Reviewer for 16 NSF and 3 ACS-PRF proposals
- Reviewed manuscripts for Journal of Colloid and Interface Science, Langmuir, IEEE Transactions in Nanotechnology, Journal of Nanoscience and Nanotechnology.
- Member of thesis committees in Chemical Engineering, Mechanical Engineering, Chemistry and Pharmacy.
- Consulting: Cabot Corporation, Vitrimark Corporation
- URI Provost Search Committee
- URI Director of Industrial Technology Transfer Search Committee

Dr. Geoffrey D. Bothun

- COE Freshman Orientation Advisor, summer 2008
- University College Advisor, Chemical Engineering
- Strategic Planning Committee, Chemical Engineering
- AIChE Chapter Advisor
- Mentor, ChE high school summer internship program
- Organized URI/Brown University student AIChE Local Paper Contest, sponsored by the professional RI AIChE chapter (March 2007)
- Session Co-Chair, "Bridging Research and Service: The Discovery Corps Experience," ACS annual spring meeting, Chicago, IL (March 2007).
- Amgen High School Science Fair judge, Cranston, RI (March 2007)
- Scientific Advisory Board, *Regional Bioengineering and Biotechnology Conference*, University of Massachusetts Dartmouth; participants, URI, UM-D, and Brown University (Feb 2007).
- Peer-reviewer for *Biomacromolecules*, *Transactions in Nanotechnology*, *Journal of Supercritical Fluids*, *Journal of Membrane Science*, and *Chemical Engineering Research and Design*.
- Co-organizer, New England Complex Fluids workshop hosted by URI (June 2008)
- Organized CHE graduate recruitment at AIChE annual "Graduate Fair" (Nov 2007)
- Session Chair, Chemical Engineering, ASEE meeting hosted by URI (April 2007)
- COE and CHE representative, Centennial Scholar Recognition Day (March 2007)



Dr. Michael L. Greenfield

- Member of Department of Chemical Engineering Graduate Committee
- Webmaster for Department of Chemical Engineering
- COE Representative on URI Transportation Center Advisory Committee
- Presented informal two-semester long “Asphalt Rheology” course at the Rhode Island Department of Transportation
- Proposal reviewer for NSF (1 panel, 15 proposals) and Louisiana Board of Regents (1 proposal); project report reviewer for FHWA.
- Reviewer of 5 manuscripts for Industrial and Engineering Chemistry Research, Journal of Applied Polymer Science, Macromolecules, Surface Science and of 1 book proposal.
- Member of thesis committees and comprehensive exam committees in Chemical Engineering
- Informal advisor to a market researcher about uses for a new technology in the molecular simulation field.
- “Meet the University” volunteer
- Recommendation letters for 9 students

Dr. Angelo Lucia

- Editorial Board, Journal of Global Optimization
- Editorial Board, Journal of Thermodynamics
- Member of Department of Chemical Engineering Graduate Committee.
- Reviewed papers for AIChE Journal, Computers & Chemical Engineering, Industrial & Engineering Chemistry, Thermal Sciences, and Journal of Global Optimization.
- Organized high school summer internship program.
- Served on three separate NSF DataNet proposal review panels.
- External PhD thesis examiner for Mr. Mark Peters thesis, University of Witwatersrand, South Africa.

Dr. Vincent Rose

- University Ombudsman
- College of Engineering Academic Appeals Committee
- College of Engineering Diversity Committee
- Undergrad. Awards Dept. Selection Person
- Advisor, Tau Beta Pi Honor Society
- Secretary, Kingston Water District Board of Commissioners
- Vice President, Kingston Fire District Board of Wardens
- Secretary, Save the Bay Board of Directors
- Vice President, Kingston Improvement Association
- Building Manager, Department of Chemical Engineering
- Assistant Treasurer, RI Section AICHE
- Academic Standards and Calendar Committee member
- University EMS Committee member
- Life Member, ASEE



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- Registered Professional Engineer in Rhode Island
- Participated in the COE Parent Orientation
- Participated in the Meet the University Days
- Participated in the Centennial Scholar Day
- Participated in Open Day



RESEARCH FUNDING:

External Research Funds Received by Faculty:

Dr. Stanley Barnett

- Barnett, Stanley, EPA, \$40,000, USEPA Technical Assistance And Measurement
- Barnett, Stanley, EPA, \$80,000, University Of Massachusetts Participation In New England Green Chemistry Consortium
- Barnett, State of RI, \$57,500, RI DEM EPA- ERP And Statewide Assistance
- Barnett, State of RI, \$4,320, Emission Savings By The Newport/Providence- RIPTA

Dr. Arijit Bose

- Bose, Arijit, Honda, \$53,029, Honda Research Institute Highly Efficient Synthesis Of Nanocataly /Oxide composites
- Bose, Arijit, NSF, \$169,999, NSF Confinement Effects In Amphiphilic System
- Bose, Arijit, NASA, \$28,721, Directed Synthesis of Lead Selenide - Titania Core-Shell Nano wire Heterostructures for High-efficiency Low-cost Solar Cells
- Bose, Arijit, State Of RI, \$60,036, RI Dot Synthesis And Evaluation Of Self-Healing Concrete
- Bose, Arijit, NSF, \$5,000, NSF REU Supplement - Confinement Effects And Active Nanostructure Control

Dr. Geoffrey D. Bothun

- *Bothun, Geoffrey, NASA, \$30,770, Brown University Design and response of Hybrid Lipid/Nanoparticle Bilayers for RF-Controlled diffusion from liposome carriers*
- *Bothun, Geoffrey, NSF, \$35,000, University Of North Carolina Print Particle Degradation and Membrane permeability in biomimetic systems*

Dr. Everett Crisman

- US Air Force, \$172,908 Material Command IPA with Air Force Research

Dr. Angelo Lucia

- Lucia, Angelo, NSF, \$12,000, NSF REU Supplemental Funds
- Lucia, Angelo, NSF, \$114,396, NSF REU Supplemental Funds

Dr. Eugene Park

- Park, Eugene, State of RI, \$57,500, RI DEM EPA – ERP and Statewide Assistance
- Park, Eugene, EPA, \$40,000, US EPA Technical Assistance and Measurement



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DEPARTMENT BUDGET AND FOUNDATION ACCOUNTS:

Summary of Department Budget:

	2004-2005	2005-2006	2006-2007	2007-2008
Personnel	\$837,556.00	\$785,751.00	\$1,149,896.00	\$1,340,466.00
Operating	\$30,251.00	\$29,462.00	\$24,815.00	\$20,628.00
Capital/ABET	\$ 0.00	\$10,500.00	\$18,485.35	8,280.00
Travel	\$0.00	\$0.00	\$0.00	\$0.00
Faculty Development Funds	\$1,190.00	\$1,307.00	\$1,619.00	\$1,327.00
Overhead (Generated)	\$30,325.00	\$24,094.00	\$32,610.00	\$34,255.00
Release Time	\$0.00	\$0.00	\$0.00	\$0.00
TOTAL	\$ 899,322.00	\$851,114.00	\$1,031,305.00	\$1,588,956.00

Foundation Accounts:

NAME OF FOUNDATION ACCOUNT:	TOTAL ASSETS:
Department of Chemical Engineering Endowment*	\$66,394
Vin Rose Family Endowment Fund	\$38,209
Polymer Lab	\$6320
Victor J. Baxt Endowed Chair in Chemical Engineering	\$955,464
David J. Chronley Fund in Chemical Engineering	\$13,495
Joseph Estrin Endowed Graduate Seminar Series	\$24,393
Chester H. Kirk Distinguished Professorship	\$500,007
Alan Corry Endowment	\$15,948
A. Ralph Thompson Award in Chemical Engineering	\$15,588
Nystrom Family Endowment in Chemical Engineering	\$57,993
Arlene & David E. Brook Chemical Engineering Endowment	\$25,811
David Shilling Memorial Endowment in Chemical Engineering	\$23,125
Total	\$1,666,353



UNDERGRADUATE PROGRAM:

Undergraduate Enrollment

The Department undergraduate enrollment over the past five years is summarized in the following table:

Chemical Engineering	<u>2004-2005</u>	<u>2005-2006</u>	<u>2006-2007</u>	<u>2007-2008</u>	<u>2008-2009</u>
Freshman	20	22	26	36	47
Sophomores	16	13	20	26	36
Juniors	7	16	12	21	28
Seniors	12	12	18	26	34
Totals	55	63	76	109	145

Undergraduate Courses Taught:

Fall 2007

Course	Description	Instructor
ChE 212	Chemical Processes Calculations	Dr. Michael Greenfield
ChE 314	ChE Thermodynamics II	Dr. Otto Gregory
ChE 328	Industrial Plants	Dr. Vincent Rose
ChE 333	Engineering Materials	Dr. Richard Brown
ChE 345	ChE Laboratory	Dr. Donald Gray
ChE 347	Transfer Operations I	Dr. Stanley Barnett
ChE 349	Transfer Operations III	Dr. Geoffrey Bothun
ChE 351	Plant Design and Economics	Dr. Donald Gray
ChE 425	Process Dynamics and Control	Dr. Harold Knickle
ChE 491	Special Problems	Barnet, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec, Rose
ChE 492	Special Problems	Barnet, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec, Rose

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Spring 2008

Course	Description	Instructor
ChE 272	Introduction to ChE Calculations	Dr. Michael Greenfield
ChE 313	ChE Thermodynamics I	Dr. Angelo Lucia
ChE 332	Physical Metallurgy	Dr. Otto Gregory
ChE 346	Chemical Engineering Laboratory	Dr. Donald Gray, Dr. Harold Knickle
ChE 348	Transfer Operations II	Dr. Stanley Barnett
ChE 352	Plant Design and Economics	Dr. Donald Gray
ChE 464	Industrial Reaction Kinetics	Dr. Rivero-Hudec

ChE 491	Special Problems	Barnet, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec, Rose
ChE 492	Special Problems	Barnet, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec, Rose

Undergraduate Students working on research projects:

Dr. Stanley Barnett

- Samuel Matus '10
- Geof Hanson '10
- Megan R. Quiterio '09
- Melissa Williams '08
- Lee Kang '07

Student Posters

- S. Matus, Biological Fuel Cells, ACS Rhode Island Section Meeting, April 2007 ; and AIChE Rhode Island Section Meeting, March 2007
- M. Williams, Biological Fuel Cells, ACS Rhode Island Section Meeting, April 2007 ; and AIChE Rhode Island Section Meeting, March 2007

Dr. Arijit Bose

- Robert Ervolino
- Taylor Lichatz

Dr. Geoffrey D. Bothun

- Sean Marnane (senior, CHE)
- Rob DeLuca (junior, microbiology)
- Qian Ni (sophomore, CHE)

Dr. Angelo Lucia

- Taylor Lichatz



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- Bradley R. McCallum
- Gabrielle LaBove
- Gregory Passa



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ChE Dual Degree Program:
GRADUATE PROGRAM:

Graduate Enrollment and Support:

Graduate enrollment in the masters and doctoral programs is listed in the table below:

Graduate Enrollment:

	FULL-TIME	PART-TIME	INACTIVE
Masters	4	5	1
Doctoral	7	1	0
Total:	11	6	1

Graduate Support:

	2006-2007
GRADUATE TEACHING ASSISTANTS	4
RESEARCH ASSISTANTS*	7

* includes partially supported students



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Graduate Courses Taught:

Fall 2007

Courses	Description	Instructor
ChE 501	Graduate Seminar	Dr. Michael Greenfield
ChE 503	Dynamics of ChE Applications	Dr. Mercedes Rivero-Hudec
ChE 542	Advances in Interfacial Phenomena	Dr. Arijit Bose
ChE 574	Biochemical Engineering I	Dr. Stanley Barnett
ChE 591	Special Problems	Barnett, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec
ChE 592	Special Problems	Barnett, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec
ChE 599	Master's Thesis Research	Barnett, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec
ChE 691	Special Problems	Dr. Harold Knickle
ChE 600	Doctoral Dissertation	Barnett, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec

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Courses	Description	Instructor
ChE 502	Graduate Seminar	Dr. Angelo Lucia
ChE 530	Polymer Chemistry	Dr. Michael Greenfield
ChE 534	Corrosion and Corrosion Control	Dr. Richard Brown
ChE 539	Electron and Light Microscopy of Solids	Dr. Otto Gregory
ChE 541	Transport Phenomena	Dr. Arijit Bose
ChE 548	Separations for Biotechnology	Dr. Stanley Barnett
ChE 591	Special Problems	Barnett, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec
ChE 592	Special Problems	Barnett, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec
ChE 599	Master's Thesis Research	Barnett, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec
ChE 641	Transport Phenomena II	Dr. Harold Knickle
ChE 691	Special Problems	Barnett, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec
ChE 699	Doctoral Dissertation	Barnett, Bose, Bothun, Brown, Gray, Greenfield, Gregory, Knickle, Lucia, Rivero-Hudec

Graduate Student Advising:

Dr. Stanley Barnett

- Hettenbach, Kevin, PhD
- Clements, Joshua, MS
- Jorgensen, Matthew, MS
- Wenskowicz, Barry, MS

Dr. Arijit Bose

- Jha, Ashish, M.S. and Ph.D.
- Sarkar, Jayashri, M.S. and Ph.D.
- Grid Truengsatitwong, M.S.

Dr. Geoffrey D. Bothun

- Yanjing Chen, Ph.D.



Dr. Michael L. Greenfield

- Hobbs, Michael, M.S.
- Zhang, Liqun, Ph.D.

Dr. Harold Knickle

- PhD, Ke Song
- MS, Mathew Preiss

Dr. Angelo Lucia

- Amale, Amit, Ph.D.
- Gattupalli, Rajeswar, Ph.D.

Master of Science Graduates:

Dr. Arijit Bose

- Sarkar, Jayashri
- Jha, Ashish
- Grid Truengsatitwong (current)

SPECIAL DEPARTMENT ACTIVITIES_[AB1]:

Amgen Seminar Series in Chemical Engineering

In *Cherry Auditorium, Kirk Hall, 1 PM*

Fall 2007

<u>Date</u>	<u>Speaker</u>	<u>Title</u>
Sept 6	Barbara Ray Safety & Risk Management URI	Prudent Practices in the Lab & Hazardous Waste Refresher Training
Sept. 27	Professor Marc Olivier-Coppens Department of Chem Engineering RPI	Nature as a Source of Inspiration for Chemical Engineering Design
Oct 4	Professor Joan Brennecke Dept of chem & Biomolecular Eng University of Notre Dame	Carbon Dioxide Separations w Ionic Liquids
Oct 18	Professor Ravi Kane RPI	
Nov 1	Professor Brett Lucht Dept of Chemistry URI	Lithium-Ion Batteries: Mechanisms of Performance Loss & Methods to Extend Calendar Life
Nov 29	Professor Andreas Linniger Dept of Chem & Bioengineering University of Illinois at Chicago	
Dec 6	Professor Ionnis Kevrekidis Dept of Chemical Engineering Princeton University	Equation-Free Modeling & Computation for Complex/Multiscale Systems

This series at the University of Rhode Island is made possible through
the generosity of Amgen, West Greenwich, RI



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Spring 2008

Amgen Seminar Series in Chemical Engineering
Cherry Auditorium, Kirk Hall, 1 PM

<u>Date</u>	<u>Speaker</u>	<u>Title</u>
Jan 31	Professor Vijay John Dept of Chem & Biomolecular Engng Tulane University	Squishy Lipid Structures - From Nanomaterials to Vaccine Delivery
Feb 7	Professor Ray A. Adomaitis Dept of Chem & Bio Engineering University of Maryland	Intentionally Patterned & Spatially Non-Uniform Profiles in Thin Film Deposition Systems
Feb 21	Professor Albert Kausch Dept of Cell & Molecular Biology URI	Biofuels for the Future: The Role of Biotechnology for Energy Crops
Mar 6	Professor William L. Luyben Dept of Chemical Engineering Lehigh University	Design & Control of a Fully Heat Integrated Pressure Swing Azeotropic Distillation System
Mar 13	Professor Aaron Scurto Dept of Chemical Engineering University of Kansas	
April 3	Professor Geoff Bothun Department of Chemical Engineering URI	Multifunctional Nanoparticle/Lipid Self-assemblies
Apr 17	Professor J. R. Elliott Dept of Chem & Bio Engineering University of Akron	Mainstreaming Molecular Simulation in Chemical Engineering Education and Application
Apr 24	Graduate Symposium	

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