

ROBERT P. HESKETH
CURRICULUM VITA

PERSONAL DATA

DATE AND PLACE
OF BIRTH

28 September 1960
Philadelphia, PA

OFFICE ADDRESS

Chemical Engineering
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Rowan University
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DEGREES

Ph. D. Chemical Engineering, University of Delaware, May 1987

B. S. Chemical Engineering, University of Illinois, Champaign-Urbana, May 1982

ACADEMIC EXPERIENCE

2004 - Rowan University, Chair of Chemical Engineering

2000 - Rowan University, Professor of Chemical Engineering

2003 – 27 October – 31 August 2004: Bye Fellowship Robinson College, University of Cambridge

2003 - 1 January - 31 August: Acting Chair and Professor of Chemical Engineering

1996 - 2000 Rowan University, Associate Professor of Chemical Engineering

Member of College of Engineering Clinic Development Committee 1996-

Head of College of Engineering Curriculum Development Committee 1996-99

Coordinator of Freshman Engineering Clinic 1997 – 1999.

Co-coordinator of Junior/Senior Engineering Clinic 1998-2001

Coordinator of the Junior/Senior Engineering Clinic 2001-2006

1990 - 1996 University of Tulsa, Assistant Professor of Chemical Engineering

1987 -1990 Postdoctoral Research, University of Cambridge, Chemical Engineering

Funded by British Coal, Coal Research Establishment, Stoke Orchard

Engineering Tutor for Robinson College - Mathematics Tutor in the Cambridge Tutorial System¹

1982-1987 Teaching and Research Assistant at the University of Delaware. Activities included grading, lab development and supervision of distillation column and giving lectures in Equilibrium Stage Separations

¹ These supervisions are unique to the Cambridge University philosophy of education and are mandatory for all engineering students.

6/82 - 8/82 Research Assistant, Southern Illinois University, Mechanical Engineering and Energy Processes Department.

INDUSTRIAL EXPERIENCE

6/81-8/81 Engineering Assistant, Cross/Tessitore and Associates,
Environmental Engineers
6/80-8/80 Engineering Assistant, Cross/Tessitore and Associates,
Environmental Engineers

PROFESSIONAL AFFILIATIONS

American Institute of Chemical Engineers
The Combustion Institute
National Society of Professional Engineers - EIT status
American Society of Engineering Education
American Chemical Society

HONORS AND AWARDS

Chester F. Carlson 2006 Award, ASEE National Award for innovations in engineering education
Sponsored by the Xerox Corporation.
Featured Educator, Chemical Engineering Education, **37**(1) 2003.
Robert G. Quinn 2002 Award ASEE National Award, for leadership in engineering education
through the development of an innovative experiential learning program.
2001 Outstanding Teacher Award, Chemical Engineering, Rowan University
Joseph J. Martin 2001 Award for the most outstanding Chemical Engineering Division paper
presented at the 2000 ASEE Annual Meeting
Ray W. Fahien Award 1999, awarded by the Chemical Engineering Division of ASEE
Joseph J. Martin 1999 Award for the most outstanding Chemical Engineering Division paper
presented at the 1998 ASEE Annual Meeting
Best Paper Award at 1999 Spring Mid-Atlantic Section Meeting.
Dow Outstanding New Faculty Award of the American Society of Engineering Education,
Middle Atlantic Section, 1998.
Joseph J. Martin 1998 Award for the most outstanding Chemical Engineering Division paper
presented at the 1997 ASEE Annual Conference.
Who's Who Among America's Teachers 1996
DuPont Young Professor Grant, 1993 - 1996.
Professor of the Month in the College of Engineering and Applied Sciences, April 1993.
Awarded by Tau Beta Pi.
National Science Foundation Research Initiation Award 1 July 1992.
Professor of the Year in the College of Engineering and Applied Sciences in 1991. Awarded by
the University of Tulsa Mortar Board.
Professor of the Month in the College of Engineering and Applied Sciences, October 1990.
Awarded by Tau Beta Pi.

Chemical Engineering B.S. with Distinction from University of Illinois May 1982
American Consulting Engineers Council National Scholarship Award March 1980

RESEARCH AND EDUCATIONAL INTERESTS

Research and Consulting Capabilities: Reaction Engineering, Electrochemical Engineering, Supercritical Fluids, Process Engineering, and Combustion Kinetics

Reaction Engineering: Microreactors, Fluidized bed systems, Combustion systems, Catalytic reactors, and electrochemical reactors, green engineering.

Process Engineering: distillation (continuous & batch), extraction, reactive extraction, electrochemical systems, particle separations using scrubbers and cyclones, absorption, humidification, leaching, agitation and mixing of fluids, and multiphase flow operations.

Combustion Kinetics: prediction of reaction kinetics and pathways for nitrogen containing compounds

Education: Dr. Hesketh has demonstrated an enthusiasm for engineering education and has contributed to the improvement of engineering education in many ways. Robert is a highly motivated professor in both undergraduate and graduate education and has received 12 education and 2 research awards. He has made major contributions in laboratory methods that demonstrate chemical engineering practice and principles. These highly visual and effective experiments, the most notable using the vehicle of a coffeemaker, are used to introduce engineering design and science to university and pre-college students. This work has been presented at national meetings, workshops and published in journals and proceedings.

Engineering Clinic Projects

Precious Metal Separations - Johnson Matthey – Adsorption, Ion-Exchange, precipitation, electro dialysis, ultrafiltration, electroplating, liquid-liquid extraction

Multiphase Reaction Optimization — Johnson Matthey

Micromixing & Catalytic Reactors – NSF

Catalyst Recovery – Novartis

Green Engineering – Bristol-Myers Squibb, Valero

Nutraceutical Recovery & Novel Baking Technologies – Campbells Soup Co.

Wastewater Minimization – General Mills

Analysis of Control Valves – Durabla FT

Phase Transfer Catalysis – Value Recovery

Diesel Emission Reduction Technologies – NJDOT & NJDEP

PUBLICATIONS

C.S.Slater, R.P.Hesketh, D.Fichana, J.Henry, A.M.Flynn and M.Abraham, “Expanding Frontiers for Chemical Engineers in Green Engineering Education,” *Intl. J. Engineering Education*, **23**(2) pp 309-324 (2007).

- Christian H Hornung, Bart Hallmark, Robert P Hesketh and Malcolm R Mackley, "The fluid flow and heat transfer performance of thermoplastic microcapillary films," *J. Micromech. Microeng.* **16** pp434–447 (2006).
- J. Ginn, A. Toback, J. Hearne, A. J. Marchese, R. P. Hesketh, and Cliff Amundsen, "Life Cycle Analysis of Heavy Duty Diesel Vehicle Idling Alternatives," *SAE 2004 Transactions*, Vol.113-4, Journal of Fuels and Lubricants, pages 426-434.
- Toback, A., Hearne, J., Kuritz, B., Marchese, A.J., Hesketh, R. P. The Effect of Ambient Temperature and Humidity on Idling Emissions from Diesel School Buses. *SAE 2004 Transactions*, Vol.113-4, Journal of Fuels and Lubricants, pages 530-538.
- Dahm, K. D., R. P. Hesketh and M. J. Savelski, "Micromixing Experiments in the Introductory Chemical Reaction Engineering Course," *Chemical Engineering Education* 39(2) 94-99 (2005).
- S. Farrell, M.J. Savelski, and R.P. Hesketh, "Energy Balances on the Human Body: A Hands-on Exploration of Heat, Work and Power," *Chem. Eng. Educ.* **39**(1) pp 30-37 2005.
- S. Farrell, R.P. Hesketh, and M.J. Savelski, "A Respiration Experiment to Introduce Chemical Engineering Principles," *Chemical Engineering Education*, **38**(3), 2004.
- Slater, C. S. and R.P. Hesketh, "Incorporating Green Engineering into a Material and Energy Balance Course," *Chemical Engineering Education*, **38**(1), pp. 48-53, 2004.
- Hesketh, R.P., C.S. Slater, M.J.Savelski, K.Hollar and S.Farrell, "A Program to Help in Designing Courses to Integrate Green Engineering Subjects," *Intl Journal of Engineering Education*, **20**(1) pp.113-128 (2004)
- David R. Shonnard, David T. Allen, Nhan Nguyen, Sharon Weil Austin, and Robert Hesketh, "Green Engineering Education Through a US EPA/Academia Collaboration," *Environmental Science and Technology*, **37**(23) 5453-5462 (2003).
- Farrell, S., R. P. Hesketh and C. S. Slater, "Exploring the Potential of Electrodialysis," *Chemical Engineering Education* **37** (1) 2003.
- Stephanie Farrell, Robert P. Hesketh, Mariano J. Savelski, Kathryn Hollar, Kevin D. Dahm, and C. Stewart Slater, "Membrane Projects with an Industrial Focus in the Curriculum," *Chemical Engineering Education* **37** (1) 2003.
- Marchese, A. J., R. P. Ramachandran, R. P. Hesketh, and J. L. Schmalzel, "The Competitive Assessment Laboratory: Introducing Engineering Design via Consumer Product Benchmarking," *IEEE Transactions on Education*, **46**(1) 197-205 (2003).
- Pekula, N., B. Kuritz, J. Hearne, A. J. Marchese, and R. P. Hesketh, "The Effect of Ambient Temperature, Humidity, and Engine Speed on Idling Emissions from Heavy-Duty Diesel Trucks," *SAE 2003 Transactions*, Vol. 112-4, *Journal of Fuels and Lubricants*, pages 148-158.
- Dahm, K. D., R. P. Hesketh, and M. J. Savelski Is Process Simulation Used Effectively in Chemical Engineering Courses? *Chemical Engineering Education* **36**(3) 192 (2002)
- Farrell, S. and R. P. Hesketh, "An Introduction to Drug Delivery for Chemical Engineers" *Chemical Engineering Education* **36**(3) 198 (2002)

- Hesketh, R. P., C. S. Slater, S. Farrell, and M. Carney, "Fluidized Bed Polymer Coating Experiment," *Chemical Engineering Education* **36**(2) 138 (2002).
- Farrell, S., R.P. Hesketh, J.A. Newell and C.S. Slater- "Introducing Freshmen to Reverse Process Engineering And Design Through the Investigation of the Brewing Process," *International Journal of Engineering Education* **17** (6) 2001.
- Newell, J. A., S. H. Farrell, R. P. Hesketh, and C. Stewart Slater, "Introducing Emerging Technologies into the Curriculum through a Multidisciplinary Research Experience," *Chemical Engineering Education* **35**(4) 296 Fall 2001.
- Hesketh, R. P. and D. Bosak and L. Kline, "Automotive Catalytic Reaction Engineering Experiment," *Chemical Engineering Education*, **34** (3) 240 Summer 2000.
- Hesketh, R. P. and C. S. Slater, "Innovative and Economical Bench-scale Process Engineering Experiments," *International Journal of Engineering Education* **16**(4) 327 2000.
- Hesketh, R.P., Abraham, M.A. "Pollution Prevention Education in Chemical Reaction Engineering", in *Reaction Engineering in Pollution Prevention*, Martin A. Abraham and Robert P. Hesketh, eds., Elsevier Science, (2000).
- Hesketh, R. P. and C. S. Slater, "Using a Cogeneration Facility to Illustrate Engineering Practice to Lower Level Students," *Chemical Engineering Education*, **33** (4) 316 Fall 1999.
- J.L. Schmalzel, A. J. Marchese, R. P. Hesketh, "What's Brewing in the Clinic?" *Engineering Educator*, **2** (1) 6 Winter 1998.
- Kantak, M. V., K S. de Manrique, R. H. Aglave, R. P. Hesketh, "Methylamine Oxidation in Flow Reactors: Mechanism and Modeling." *Combustion and Flame*, **108**(3) 235 (1997).
- Hesketh, R.P., "Wake-Up to Engineering," *Chem Eng Educ*, **30** (3) 210 1996.
- Kantak, M. V., R. P. Hesketh, and B. G. Kelkar, "Effect of Gas and Liquid Properties on Gas-Phase Dispersion in Bubble Columns," *The Chemical Engineering Journal*, **59** 91-100 (1995).
- Sublette, K. L., R. P. Hesketh, and S. Hasan, "Microbial Oxidation of Hydrogen Sulfide in a Pilot-Scale Bubble Column," *Biotech. Progress*, **10** 611-14 (1994).
- Wankat, P. C., R. P. Hesketh, K. H. Schulz, and C. S. Slater, "Separations - What to Teach Undergraduates." *Chem. Eng. Educ.*, **28** (1) 12 (1994).
- Hesketh, R. P., and J. F. Davidson, "The effect of volatiles on the combustion of char in a fluidized bed." *Chemical Engineering Science*, **46** 3101 (1991).
- Hesketh, R. P., and J. F. Davidson, "Combustion of methane and propane in an incipiently fluidized bed." *Combustion and Flame* **85** 449 (1991).
- Hesketh, R. P., Etchells, A. W. and Russell, T. W. F., "Experimental observations of bubble breakage in turbulent flow," *Industrial and Engineering Chemistry Research* **30** 835 (1991).
- Hesketh, R. P., Etchells, A. W. and Russell, T. W. F., "Bubble breakage in pipeline flow," *Chemical Engineering Science* **46** 1 (1991).

Hesketh, R. P., Etchells, A. W. and Russell, T. W. F., "Bubble size in horizontal pipelines," *AIChE J.* **33** 663 (1987).

Hesketh, H. E., Schiffner, K. C., Hesketh, R. P. and Powell, B., "Describing and defining the catenary grid-fluidized bed mass transfer separator," *Atmospheric Environment* **19**(10) 1565 (1985).

SAE Refereed Proceedings

A. Toback, J. Hearne, S. Colligan, I. Osorio, R. P. Hesketh, and A. J. Marchese, "Experimental Evaluation of Aftertreatment Devices on Mobile School Bus Emissions from Diesel Powered School Buses," Proceedings of the SAE World Congress, SAE Paper No 2005-01-1757, 11-14 April.

J. Hearne, A. Toback, J. Akers, R. P. Hesketh, and A.J. Marchese, "Development of a New Composite School Bus Test Cycle and the Effect of Fuel Type on Mobile Emissions from Three School Buses, Proceedings of the SAE World Congress, SAE Paper No 2005-01-1616, 11-14 April.

T. Toback, J. S. Hearne, B. Kuritz, A. J. Marchese, R. P. Hesketh, "The Effect of Ambient Temperature and Humidity on Measured Idling Emissions from Diesel School Buses," Proceedings of the SAE World Congress, SAE Paper No. 2004-01-1087, 8-11 March 2004.

J. Ginn, A. Toback, J. Hearne, A. J. Marchese, R. P. Hesketh, Cliff Amundsen, "Life Cycle and Economic Analysis of Heavy Duty Diesel Vehicle Idling Alternatives," Proceedings of the SAE World Congress, SAE Paper No. 2004-01-0637, 8-11 March 2004.

B. Kuritz, J. Hearne, A. Toback, R.P. Hesketh, A.J. Marchese, Z.O. Gephardt, "Application of Experimental Design in the Steady State Particulate Exposure Levels in a 1992 International School Bus," Proceedings of the SAE World Congress, SAE Paper No. 2004-01-1088, 8-11 March 2004

N. Pekula, B. Kuritz, J. Hearne, A. J. Marchese, R. P. Hesketh, "The Effect of Ambient Temperature, Humidity, and Engine Speed on Idling Emissions from Heavy-Duty Diesel Trucks," Proceedings of the SAE World Congress, SAE Paper No. 2003-01-0290, 3-6 March 2003.

ASEE Refereed Proceedings

C. Stewart Slater, Ann Marie Flynn, Daniel Fichana, Jim Henry, Robert P. Hesketh, Expanding the Frontiers in Green Engineering," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1413, (2005).

S. Farrell, M.J. Savelski, R.P. Hesketh, and C.S. Slater, Drug Delivery Experiments for Chemical Engineers, *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1530, (2004).

S. Farrell, R.P. Hesketh, C.S. Slater, and M.J. Savelski, Industry and Academia: A synergistic Interaction that Enhances Undergraduate Education, *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1413, (2004)..

- C.S. Slater, S. Farrell, R.P. Hesketh, M.J. Savelski, The Novel Use of Green Engineering Concepts in Teaching Separations, *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1793, (2004).
- R.P. Hesketh, S. Farrell, and C.S. Slater, An Inductive Approach to Teaching Courses in Engineering, *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 2531, (2003).
- S. Farrell, R.P. Hesketh, and M.J. Savelski, "ChE Power! A Hands-on Introduction to Energy Balances on the Human Body," 2003 ASEE Annual Conference, Session 2613, (2003).
- S. Farrell, R.P. Hesketh, M.J. Savelski, and C.S. Slater, "Fundamentals, Design and Applications of Drug Delivery Systems," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1313, (2003).
- S. Farrell, R.P. Hesketh, M.J. Savelski, and C.S. Slater, "Hands-on Experiments in Pharmaceutical Drug Delivery," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1526, (2003).
- M.J. Savelski and R.P. Hesketh, "Issues Encountered with Students using Process Simulators," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 2484, (2003).
- Savelski, M., R. Hesketh, S. Farrell and C.S. Slater, "Non-Traditional Laboratory Experiments: Olive Oil Manufacturing and Testing," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1526, (2003).
- Dahm, K. D., Stephanie Farrell, Robert P. Hesketh and Mariano J. Savelski, "Realistic Reaction Engineering Experiments for the Undergraduate Curriculum" *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1526 (2003)..
- R.P. Hesketh, S. Farrell, and C.S. Slater, "SPARKING Students Interest in Electrochemical Engineering," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1313, (2003).
- Dahm, Kevin, R. P. Hesketh, and Mariano Savelski, "Micromixing Experiments in the Undergraduate Curriculum," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1613 (2002) .
- R. P. Hesketh, Stephanie Farrell, and C. Stewart Slater, "The Role of Experiments in Inductive Learning," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 3613 (2002) .
- R. P. Hesketh, C.S. Slater, Stephanie Farrell, Mariano Savelski, Kevin Dahm and R. Newland, "Real Chemical Reactions Vertically Integrated Throughout the Curriculum," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1526 (2002) .
- R. P. Hesketh, Mariano J. Savelski, C. Stewart Slater, Kathryn Hollar, and Stephanie Farrell, "A Program to Help University Professors Teach Green Engineering Subjects in their Courses," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 3251 (2002) .
- Jahan, K., Jess W. Everett, Joseph Orlins, Robert P. Hesketh, Stephanie Farrell, Linda M. Head, Kathryn Hollar, Mariano Savelski, Raúl Ordóñez and Marianne Cinaglia, "Research Experiences for Undergraduates in Pollution Prevention," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1351 (2002).
- Farrell, Stephanie, R. P. Hesketh, Mariano Savelski and C. Stewart Slater, "Integrating Drug Delivery throughout the Chemical Engineering Curriculum", *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1526 (2002) .

- Farrell, Stephanie, R. P. Hesketh, K. Hollar, Mariano Savelski, C. Stewart Slater, and R. Specht, "Don't Waste Your Breath," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1613 (2002) .
- R. P. Hesketh, Dianne Dorland, C.S. Slater, Stephanie Farrell, Mariano Savelski, Kathryn Hollar, Kevin Dahm, and James Newell "Applying Green Engineering Throughout the Curriculum," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 3651 (2001)
- Farrell, S., R. P. Hesketh, and Edward Chaloupka "Exercise in Chemical Engineering for Freshmen," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 2213 (2001).
- Hesketh, R.P., C. Stewart Slater, and Carol Rea Flynn "Engineering Experiments Utilizing an Automated Breadmaker," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 2213 (2001).
- Mariano Savelski, Kevin Dahm and R. P. Hesketh "Is Process Simulation Effectively Utilized in Chemical Engineering Courses?" *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 3513 (2001).
- James Newell, Stephanie Farrell, Robert Hesketh, C. Stewart Slater, "Introducing Emerging Technologies into the Curriculum through Multidisciplinary, Industrially-Sponsored Research ," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1413 (2001).
- C. Stewart Slater, Jahan Kauser, Stephanie Farrell, Robert P Hesketh, Kevin D Dahm, "A Project-Based Approach to Teaching Membrane Technology," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1526 (2001).
- Slater, C. S. and Hesketh, R. P., "A Hands-on Workshop on Novel Process Engineering" *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1526 (2000).
- Slater, C. S. and Hesketh, R. P., "Fluidized Bed Polymer Coating Experiment" *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 3413 (2000).
- Farrell, S., and R. P. Hesketh., "An Inductive Approach to Teaching Heat and Mass Transfer" *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 2213 (2000).
- Farrell, S., and R. P. Hesketh, "Introducing Freshmen to Drug Delivery" *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 3413 (2000).
- Slater, C. Stewart, Kauser Jahan, Stephanie Farrell, Robert P. Hesketh, Kevin D. Dahm, "Using Membrane Process Experiments in a Project-Oriented Environment," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1526 (2000).
- Hesketh, R. P. and C. S. Slater, "A Fluidized Polymer Coating," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 3413 (2000).
- Keil, Z. Otero and R. P. Hesketh, "Building Bridges: A Course to Transition Chemistry Students to Chemical Engineering," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session (2000)
- Hesketh, R. P. and C. S. Slater, "Demonstration of Chemical Engineering Principles to a Multi-disciplinary Engineering Audience," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 2513 (1997).
- Hesketh, R. P., K. Jahan, A.J. Marchese, C. S. Slater, J. L. Schmalzel, T. R. Chandrupatla, R. A. Dusseau, "Multidisciplinary Experimental Experiences in the Freshman Engineering Clinic at Rowan University," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 2326 (1997).

- Marchese, A. J., R. P. Hesketh, K. Jahan, T. R. Chandrupatla, R. A. Dusseau, C. S. Slater, J. L. Schmalzel, "Design in the Rowan University Freshman Engineering Clinic," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 3225 (1997).
- Hesketh, R. P., S. Farrell, C. S. Slater, Z. Keil, and J. Newell, "Outreach and Recruitment to Attract Students to Chemical Engineering: Fermenting Students' Interest in Engineering," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 2513 (1999).
- Hesketh, R. P. and C. S. Slater, "Catalytic Oxidation Experiment for Chemical Reaction Engineering," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 2313 (1999).
- Hesketh, R. P. and C. S. Slater, "Cost Effective Experiments in Chemical Engineering Core Courses," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1613 (1999).
- Hesketh, R. P. and C. S. Slater, "Novel Processing Workshop," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1526 (1999).
- Farrell, S., R. P. Hesketh, and C. S. Slater, "A Laboratory Project to Design and Implement a Process for the Production of Beer," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 3226 (1999).
- Jahan, K., Marchese, A. J., Hesketh, R.P., C.S. Slater, J.L., Schmalzel, T.R. Chandrupatla and R.A. Dusseau, "Engineering Measurements in the Freshman Engineering Clinic at Rowan University", *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 1326 (1998).
- Hesketh, R. P. and C. S. Slater, "Chemical Engineering Principles in a Freshman Engineering Course using a Cogeneration Facility," *Proc. Conf. Amer. Soc. Eng. Educ.*, Session 2413 (1998).

Non-Refereed Proceedings

- Jahan, K., J.W. Everett, J. Orlins, R.P. Hesketh, S. Farrell, Y. Mehta, K. Hollar, R. Polikar and M. Savelski (2003) "Pollution Prevention Experiences for Undergraduates", Proceedings of the Annual ASCE/EWRI Conference, Philadelphia, PA
- B. Kuritz, J. Hearne, A. J. Marchese, R. P. Hesketh, "Evaluation of Alternative Fuels Using Mobile Diesel Emissions Testing," Proceedings of the Topical Conference: Green Chemical Engineering:, Spring 2003 Meeting, New Orleans, March 30 - April 3, New Orleans, LA.
- Koski, M. S., S. Farrell, R. P. Hesketh, "Green Process Design via Adsorption of Precious Metals," Proceedings of the Topical Conference: Green Chemical Engineering, Spring 2003 Meeting, New Orleans, March 30 - April 3, New Orleans, LA.
- Shonnard, D. R., D. T. Allen, R. P. Hesketh, "Sustainability and Green Engineering in the Chemical Engineering Curriculum," Proceedings of the Topical Conference: Sustainability, 2002 AIChE Annual Meeting, Indianapolis, IN 3-8 November

INVITED PRESENTATIONS

- Hesketh, R. P., "Freshman Engineering and Experiential Learning," George Washington Workshop on the Future of Engineering Education, 14 April 2007.

- Hesketh, R. P., "Methods for Increasing Teaching Effectiveness," 2-day workshop for professors from the state of Maharashtra, India. University Institute of Chemical Technology, Mumbai, India 13-14 March 2006.
- Hesketh, R. P., "Workshop: Methods for Increasing Teaching Effectiveness," 1-day workshop for professors from the state of Maharashtra, India. Vishwakarma Institute of Technology, Pune, India 13-14 March 2006.
- Hesketh, R. P., "Innovations in Chemical Engineering at Rowan University", Lehigh University Chemical Engineering Seminar Series, Wednesday, 12 October 2005.
- Hesketh, R. P., "A Review of Precious Metals Separation Projects at Rowan University," PCT Process Development, Johnson Matthey Catalysts, Johnson Matthey, Royston, UK, 12 May 2004.
- Hesketh, R. P., Diesel Emissions from Heavy Duty Vehicles, ECT, Johnson Matthey Catalysts, Johnson Matthey, Royston, UK 13 May 2004.
- Hesketh, R. P., "Green engineering integrated within the engineering curriculum," Chemical Engineering, Heriot-Watt University, Edinburgh, UK, 5 May 2004.
- Hesketh, R. P., "Selective Removal of Au using Ion-Exchange Resin," Johnson Matthey Research Centre, Sonning Common, Reading, UK, 22 January 2004.
- Hesketh, R. P., "Materials Education & Research at Rowan University," Cambridge Rheology and Materials Processing Group, Department of Chemical Engineering, Cambridge University, 4 December 2003.
- Hesketh, R. P., "Innovations in Chemical Engineering Education, Plenary Lecture for the *ENBEQ 2003: – Brazilian Congress on Chemical Engineering Education*, 9 November 2003, Sao Pedro, Brazil.
- Hesketh, R. P., "Biotechnology in Chemical Engineering at Rowan University," Cambridge Bioscience Engineering Group, Department of Chemical Engineering, Cambridge University, 23 October 2003.
- Hesketh, R. P., "Inhibition of Volatiles Combustion in a Fluidized Bed," Lecture series at the Department of Chemical Engineering, University of Missouri-Rolla, 2 October, 1991.
- Hesketh, R.P., "The Inhibition of Volatiles Combustion within an Incipiently Fluidized Bed." University of Teesside, Chemical Engineering Department, United Kingdom, 26 May 1994.

ACCEPTED PRESENTATIONS

PRESENTATIONS

- David Martinez, Anthony Marchese, Krishan Bhatia and Robert Hesketh, "Measurement of Particulate Matter within School Bus Passenger Compartments Under Realistic Operating Conditions," 5th National Meeting of the United States Sections of the Combustion Institute, San Diego, March 2007

- C. Stewart Slater, Robert Hesketh, Mariano Savelski, Ann Marie Flynn, Jim Henry, Martin Abraham, "Web-based course modules to incorporate green engineering concepts into the chemical engineering curriculum," ACS 10th Green Chemistry and Engineering Conference, Washington, DC, June 26-30, 2006.
- C. Stewart Slater, Mariano J. Savelski, Robert P. Hesketh, Erin Frey "Selection and reduction of organic solvents in the pharmaceutical industry," ACS 10th Green Chemistry and Engineering Conference, Washington, DC, June 26-30, 2006.
- Current issues on water use and reuse in chemical processes," Daniel Sujo, Robert P. Hesketh, Mariano J. Savelski, C. Stewart Slater, ACS 10th Green Chemistry and Engineering Conference, Washington, DC, June 26-30, 2006.
- Daniel Fichana, Erin Frey, C. Stewart Slater, Mariano Savelski, and Robert Hesketh, "Sustainability Analysis Applied to Active Pharmaceutical Ingredient Manufacture," [255a] 2006 Spring AIChE National Meeting, Orlando FL, 23-27 April 2006.
- Kauser Jahan, Mariano Savelski, Robert P. Hesketh, "Sustainability in Engineering Education at Rowan University," [65f] 2006 Spring AIChE National Meeting, Orlando FL, 23-27 April 2006.
- Robert P. Hesketh, C. Stewart Slater, Daniel Fichana and Erin Frey, "Incorporating Life Cycle Analysis into the Curriculum," [328a] 2005 AIChE Annual Meeting, Cincinnati, OH, 30 Oct-4 November 2005.
- Colligan, Sarina A., Daniel Sujo, J. Hearne, A. Toback, J. Akers, R. P. Hesketh and A. J. Marchese, "Development of a New Composite School Bus Test Cycle and the Effect of Fuel Type on Mobile Emissions from Three School Buses," [596f] 2005 AIChE Annual Meeting, Cincinnati, OH, 30 Oct-4 November 2005.
- Michael D. Hatton Jr., Dr. Stephanie Farrell and Dr. Robert Hesketh, "Sonication and Electrodeposition of Rhodium: Effects on Plating Efficiency and Surface Morphology," [190e] 2005 AIChE Annual Meeting, Cincinnati, OH, 30 Oct-4 November 2005.
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- R.P. Hesketh, "How to Keep Freshmen Engineering Students Awake Using a Coffee Machine," Invited Presentation at the Rowan University's Second Annual Professional Conference: Celebrating Accomplishments, Rowan University, 13 May 1997.
- "Integrating Hands-on Education to Freshman Engineers at Rowan College" 1997 Zone I Meeting of the ASEE, West Point, NY, 25-26 April 1997.
- R.P. Hesketh, "Active Teaching/Learning Techniques in Chemical Engineering," Faculty Center for Excellence in Teaching and Learning, Rowan University 26 February 1997.
- R.P. Hesketh, "Reaction Pathways for Methylamine Oxidation," NJIT Chemical Engineering, Chemistry and Environmental Science Seminar Series, 17 February 1997.
- R. H. Aglave, M.V. Katak and R. P. Hesketh, "A New Technique for Detailed Mechanism Reduction," Eastern States Section of The Combustion Institute 1996 Technical Meeting, Paper 98, 9 December 1996.
- Katak, M.V., R. H. Aglave and R.P. Hesketh, "Methylamine Oxidation in a Flow Reactor: Mechanism and Modeling," Paper No. 122c, AIChE 1996 Annual Meeting, Chicago, 13 November, 1996.
- R.P. Hesketh, M. A. Abraham, J Henshaw, "Young Scholars Program: Introducing Engineering to High School Students," ASEE Midwest Section Conference, Tulsa, 10 April 1996.
- Katak, M.V., R. H. Aglave and R.P. Hesketh, "Reaction Pathways for Methylamine Oxidation," Paper No. 193i, AIChE 1995 Annual Meeting, Miami Beach, 14 November, 1995.
- Raffensperger, C., R. A. Pendergrass, and R. P. Hesketh, "The Inhibition of Propane Combustion within a Fluidized Bed" Paper No. 194r, AIChE 1995 Annual Meeting, Miami Beach, 14 November, 1995.
- Katak, M.V., R.P. Hesketh, and B. Kelkar "Estimation of Design Parameters in Bubble Columns Using Differential Pressure Fluctuations," Paper No. 59s, AIChE 1995 Annual Meeting, Miami Beach, 14 November, 1995.
- Katak, M.V., K. S. Manrique and R.P. Hesketh, "Methylamine Oxidation in a Flow Reactor," Paper No. 95PS-008, 1995 Joint Technical Meeting, Central States, Western States, Mexican National Section of the Intl. Comb. Inst. and American Flame Research Committee, San Antonio, Texas, 23 April 1995.
- Katak, M.V., L. D. Mansker and R.P. Hesketh, "Detailed Chemical Kinetic Mechanism for Methylamine Combustion," Paper No. 215q, AIChE 1994 Annual Meeting, San Francisco, 16 November, 1994.

- Kantak, M.V., L. D. Mansker and R.P. Hesketh, "Detailed Chemical Kinetic Mechanism for Methylamine Combustion," Paper No. 215q, AIChE 1994 Annual Meeting, San Francisco, 16 November, 1994.
- Manrique, K. S. and R.P. Hesketh, "Development of a Detailed Chemical Kinetic Model for Combustion of Methylamine," P3-12, The 25th International Symposium on Combustion, The Univ. of Calif. at Irvine, 3 August, 1994.
- Pendergrass II, R.A. and R.P. Hesketh, "The Effect of Particle Size and Equivalence Ratio on the Inhibition of Volatiles Combustion Within an Incipiently Fluidized Bed," P4-48, The 25th International Symposium on Combustion, The Univ. of Calif. at Irvine, 4 August, 1994.
- Hesketh, R.P., "Volatiles combustion in Fluidized Beds," DOE University Coal Research Projects Contractors Meeting, Pittsburgh PA, June 1994.
- Sublette, K. L., R. Hesketh, and S. Hasan, "Microbial Oxidation of Hydrogen Sulfide in a Pilot-Scale Bubble Column.", 1994 Gas Conditioning Conference, Oklahoma University, 1994.
- Sublette, K. L., R. Hesketh, and S. Hasan, "Microbial Oxidation of Hydrogen Sulfide in a Pilot-Scale Bubble Column.", Paper No. 44, Seventh Intl. Symp. on Anaerobic Digestion, 23 January 1994, Cape Town, South Africa.
- Sublette, K. L., R. Hesketh, and S. Hasan, "Microbial Oxidation of Hydrogen Sulfide in a Pilot-Scale Bubble Column.", IGT Symp. on Gas, Oil and Environmental Biotechnology, November 29, 1993, Colorado Springs, CO.
- Manrique, K. S. and R.P. Hesketh, "Detailed Combustion Mechanism and Modeling for Alkylamines," Paper No. 161i, AIChE 1993 Annual Meeting, St. Louis, 11 November, 1993.
- Chantravekin, P. Kantak, M.V., and R.P. Hesketh, "The Effect of Surface Area on the Inhibition of Volatiles Combustion within an Incipiently Fluidized Bed," Paper No. 59dd, AIChE 1993 Annual Meeting, St. Louis, 9 November, 1993.
- Chantravekin, P., Kantak, M.V., and R.P. Hesketh, "The Effect of Surface Area on the Inhibition of Propane Combustion within an Incipiently Fluidized Bed," 1993 Technical Meeting, Eastern States Section of The Combustion Institute, 27 October, 1993.
- Kantak, M.V. and R. P. Hesketh, "Evaluation of Laminar Flow Reactor Data for Use in Detailed Chemical Kinetic Modeling," Western States Section/The Combustion Institute 1993 Fall Meeting, 19 October, 1993, Menlo Park, CA.
- Hesketh, R.P., "Volatiles combustion in Fluidized Beds," DOE University Coal Research Projects Contractors Meeting, Pittsburgh PA, June 1993.
- Hesketh, R. P., "Inhibition of Volatiles Combustion in a Fluidized Bed," Lecture series at the Department of Chemical Engineering, Oklahoma State University, 22 October, 1992.
- Hesketh, R. P., "Inhibition of Volatiles Combustion within a Fluidized Bed," Engineers' Society of Tulsa, Inc., 20 July, 1992.

Hesketh, R. P. and J. F. Davidson, "Inhibition of Volatiles Combustion within a Fluidized Bed," AIChE Annual Meeting Paper #234f November 1991.

Hesketh, R. P. and J. F. Davidson, "The Effect of Volatiles Combustion on Char in a Fluidized Bed," AIChE Annual Meeting Poster Session #101r November 1991.

Rush, B., R. P. Hesketh and M. A. Abraham, "Retention Programs of the AIChE at The University of Tulsa," AIChE Annual Meeting Paper #220h November 1991.

Hesketh, R. P. and J. F. Davidson, "Inhibition of Volatiles combustion in a Fluidized Bed," Conference on Hazardous Waste Research, Kansas State University, Manhattan, Kansas, May 1991.

Hesketh, R. P., "Aerated Lagoons for Wastewater Treatment: Fluid Mechanics", CERT Symposium on Environmental Protection in the Energy Industry, University of Tulsa, December 1990.

Hesketh, R. P., Etchells, A. W. and Russell, T. W. F., "The rate of bubble breakage in turbulent liquid flow," AIChE Annual Meeting Paper #74c November 1989.

Hesketh, R. P., Etchells, A. W. and Russell, T. W. F., "Bubble formation in turbulent flow," AIChE Annual Meeting Paper #28d November 1986.

Hesketh, H. E., Schiffner, K. C., and Hesketh, R. P., "High efficiency-low pressure drop wet scrubber," Air Pollution Control Association Meeting paper #83.55.1, June 1983.

Books and/or Chapters

Hesketh, R.P., M. H. Gregg, C.S. Slater, "Green Engineering Education", Chapter 4 in *Sustainability Science and Engineering: Defining Principles*, M. Abraham, ed., Elsevier Science Publishers, New York, with, 2006.

D. Shonnard, A. Lindner, N. Nguyen, R. Subamatram, D. Fichana, R. Hesketh, C.S. Slater, "Green Engineering – Integration of Green Chemistry, Pollution Prevention, and Risk Based Considerations," Chapter in *Handbook of Industrial Chemistry and Biotechnology*, J. Kent, ed, Springer Publishers, 2006.

Reaction Engineering in Pollution Prevention, Martin A. Abraham and Robert P. Hesketh, eds., Elsevier Science B. V., (2000). ISBN: 0-444-50215-7

S. Farrell, R.P. Hesketh, M.J. Savelski, J.A. Newell, and C.S. Slater, "A Model for Synergistic Interaction Between Industry and Universities", in *Engineering Education and Research -- A Chronicle of Worldwide Innovations*, W. Aung (ed.) iNEER Publications, 2003, in press.

Manuals

Russell, T. W. F. and R. P. Hesketh, *Mass transfer in gas-sparged vessels*, Design Institute for Multiphase Processing, (1985).

Slater, C. S. and R. P. Hesketh, *Multidisciplinary Aspects of Novel Process Science and Engineering*, Rowan University, July 1999.

Hesketh, R. P., and C. S. Slater, *Curriculum Development for Novel Process Science and Engineering*, Rowan University, July 1999.

Hesketh, R. P., and C. S. Slater, *Laboratory Manual for Novel Process Science and Engineering Experiments*, Rowan University, July 1999.

Technical Reports

- Gouker, T, N. Deflece, B. Tyers, S. Farrell, R. P. Hesketh, Evaluation of Electro/Ion Exchange Membrane Separation Process, Final Technical Report submitted to Johnson Matthey, 5/5/99.
- Cardone, B, A Maciag, J. Russell, M. Boyle, K. Ramunuchary, and R. P. Hesketh, Liquid-Liquid Extraction of Precious Metals, Final Technical Report submitted to Johnson Matthey, 5/5/99.
- Sweeney, D., B Dericks, R. P. Hesketh, Electrochemical Separation of Metal Ions, Final Technical Report submitted to Johnson Matthey, 8/25/98.
- Hesketh, R. P., *Coal combustion, including char and volatiles, within a fluidized bed*. Biannual reports from 1987 through 1990 and 1990 Final report to British Coal Utilization Research Association
- Quarterly Technical Reports for the Department of Energy, Pittsburgh Energy Technology Center, Solicitation Number DE-PS22-92PC92520, "Volatiles combustion in Fluidized Beds." PI: Robert P. Hesketh, Starting August 1992 for 2.5 years.

PROFESSIONAL SERVICE

- Co-Chair Topical Conference titled, "Infusing Sustainability: HSE and Business Workflows," AIChE Spring Meeting, April 2006.
- Chair of the session titled, "Young Faculty Forum," 2005 AIChE Meeting
- Chair of the session titled, "Sustainability and Green Engineering," 2004 AIChE Meeting
- Chair of the session titled, "Nanotechnology - How to teach it to ChE's," in the 2002 AIChE Annual Meeting, Indianapolis, IN.
- Co-Chair of the session titled, "Incorporating Environmental Sustainability into ChE Ed," in the 2002 AIChE Annual Meeting, Indianapolis, IN.
- Chair of Group 4 Education in AIChE 2000 - 2002
- Green Engineering Program Director ASEE Chemical Engineering Division, 2000-
- Chair of the Topical Conference titled, "Chemical Engineering Education in the New Millennium," in the 2000 AIChE Annual Meeting, Los Angeles, CA.
- Co-Chair of the session titled, "Environmentally Benign Combustion Processes," in the 2000 AIChE Annual Meeting, Miami Beach, FL.
- Membership Chair of ASEE's Chemical Engineering Division. 1999-
- Chair of the session titled, "Innovations in Chemical Engineering Laboratories," in the 1999 AIChE Annual Meeting, Dallas, TX.
- Co-Chair of the session titled, "Environmentally Benign Combustion Processes," in the 1998 AIChE Annual Meeting, Miami Beach, FL.
- Chair of the session titled, "Freshman Engineering," in the 1998 AIChE Annual Meeting, Miami Beach, FL.
- Chair of the session titled, "Experiential Education" in the 1998 Annual ASEE Conference Seattle, WA.
- Chair of Group 4A Undergraduate Education in AIChE 1998 - 2000
- Vice Chair of Group 4A, Undergraduate Education in AIChE 1997-98.
- Co-Chair of Environmental Division Program of the 1997 and 1998 Annual AIChE Meetings.

- Chair of the poster session titled, "Environmental Reaction Engineering at the 1997 Annual AIChE Meeting in Los Angeles, CA.
- Chair of the Undergraduate Laboratory Session at the 1997 ASEE/AIChE Chemical Engineering Summer School, Snowbird, Utah.
- Chair of the oral and poster session titled, "Fundamental Chemical and Physical Processes in Combustion and Incineration," at the 1996 Annual AIChE Meeting in Chicago, Illinois.
- Co-chair and Chair of the oral and poster session titled, "Fundamental Chemical and Physical Processes in Combustion and Incineration," at the 1995 Annual AIChE Meeting in Miami, Florida.
- Co-chair of the oral and poster session titled, "Fundamental Chemical and Physical Processes in Combustion and Incineration," at the 1993 Annual AIChE Meeting in St. Louis, Missouri.
- American Chemical Society - National Science Funding Network 1992 -1996

Reviewer for Journals:

AIChE Journal
 Chemical Engineering Education
 Chemical Engineering Science
 Chemical Engineering Research and Design
 International Journal of Multiphase Flow
 Journal of Energy Resources Technology, Trans. ASME

Reviewer for Funding Organizations

Department of Energy: University Coal Research Program
 National Science Foundation
 Environmental Protection Agency - SBIR program

Reviewer for Book Publishers

Problem Solving in Chemical Engineering with Numerical Methods, Michael B. Cutlip and Mordechai Shacham, Prentice Hall PTR, New Jersey, 1999.
Reaction Kinetics and Reactor Design, John Butt, 2nd ed., Marcel Dekker, Inc., 2000.
Numerical Methods for Chemical Engineers with MATLAB Applications, Alkis Constantinides, and Navid Mostoufi, Prentice Hall PTR, 1999

INSTITUTIONAL SERVICE

Head of the Teaching Effectiveness Committee Spring 1992
 Chemical Engineering Curriculum Flow Sheets Fall 1992
 Member of the Faculty Study Abroad Advisory Committee 1992-1994
 Chemical Engineering Department Seminar Coordinator 1992 - 1994
 Member of University Disciplinary Committee 1992-1993.
 Chemical Engineering Class of 1996 Advisor 1992-1996
 Member of the Chemical Engineering Chair Search 1993-94
 Member of the Chemical Engineering Faculty Search 1994-95
 Chair of the Strategic Task Force on Recruitment and Retention 1995-96

Member of Academic Policies and Procedures Committee 1996-97
 Member of Computing Resource Specialist Search Committee 1996-1997
 Member of Civil Engineering Faculty Search Committee 1996-97

Recruitment of Undergraduates 1990 -
Coordinator of Freshman Engineering Clinic 1997 – 1999.
Member of Foreign Languages Requirement Study Group 1996-97
Member of College of Engineering Computer Committee 1996-97
Head of College of Engineering Curriculum Development Committee 1996-99
Member of the Rowan University Curriculum Committee 1997 -99
AIChE Student Chapter Advisor 1996-99
Member of College of Engineering Clinic Development Committee 1996-
Member of College of Engineering Laboratory Committee 1998-
Member of College of Engineering Promotion Committee 1998-
Member of Chemical Engineering Department Curriculum Development Committee 1996-
Member of Chemical Engineering Laboratory Development Committee 1996-
Member of Chemical Engineering Computer Resources Committee 1996-

RESEARCH PROPOSALS

Proposals Funded: Total External Funding of \$ 3,550,000

- 2/6/91 Oklahoma Center for the Advancement of Science and Technology, "Microbial Oxidation of H₂S in a Demonstration-Scale Bubble Column." PI: K. Sublette, co-PI: R. Hesketh, Funding Level: \$46,461 from OCAST and 30,000 from ABB Environmental Services, Inc. Duration: 12/1/91 - 11/31/92.
- 11/22/91 The University of Tulsa, Summer Faculty Development Fellowship, "The Inhibition of Gas Combustion Within a Fluidized Bed," PI: Robert P. Hesketh. Funding Level: \$4,489
- 6/1/92 National Science Foundation, Research Initiation Award, "Incineration of Fixed Nitrogen Compounds." CTS-9211905 PI: Robert P. Hesketh. Funding Level: \$96,632. Duration: 3 years.
- 9/1/92 Department of Energy, Pittsburgh Energy Technology Center, Solicitation Number DE-PS22-92PC92520, "Volatiles combustion in Fluidized Beds." PI: Robert P. Hesketh, Funding Level: \$82,613. Duration: 2.5 years.
- 2/1/93 National Science Foundation, Young Scholars Program, "An Introduction to Engineering for Early High School Students." PI: Robert P. Hesketh, Co-Pi: Martin Abraham, John Henshaw and Marc Timmerman. Funding Level: \$159,424. Duration 2 years.
- 8/30/93 DuPont Young Professor Grant., PI: Robert P. Hesketh, Funding Level: \$75,000. Duration: 3 years.
- 2/1/95 National Science Foundation, Young Scholars Program, "An Introduction to Engineering for Early High School Students." ESI-9452700 PI: Martin Abraham, Co-Pi: Robert P. Hesketh, John Henshaw and Christi Patton. Funding Level: \$179,931. Duration: 2yrs.

- 5/1/96 Callidus Technologies, "Chemical Kinetics in Combustion Systems," PI: Robert P. Hesketh, Funding level: \$4,000.
- 6/9/97 National Science Foundation, Undergraduate Faculty Enhancement Program, "A Multidisciplinary Workshop on Novel Process Science and Engineering Principles for College Faculty," PI: C. S. Slater, Co-Pi: Robert P. Hesketh. Total Funding Level: \$154,858, External Funding: \$83,948.
- 2/17/98 Process Mixing Station, Equipment Donation from Arthur W. Etchells, DuPont Engineering, Funding Level: \$20,000.
- 11/15/97 National Science Foundation, Instrumentation and Laboratory Improvement, "Multidisciplinary Membrane Process Laboratory Experiments," PI: C. S. Slater, Co-Pi: K. Jahan, Robert P. Hesketh and Zenaida Otero Keil. Funding Level: \$163,070. External (\$81,535)
- 11/15/97 National Science Foundation, Instrumentation and Laboratory Improvement, "Competitive Assessment Laboratory," PI: A. J. Marchese, Co-Pi: K Robert P. Hesketh, J. Schmalzel, K. Jahan, R. Ramachandran, J. Mariappan. Funding Level: \$111,200. External (\$55,600)
- 10/20/98 Johnson-Matthey, Evaluation of Electro/Ion Exchange Membrane Separation Process, Duration 2 semesters, Project Coordinator: Robert P. Hesketh, Co-PI's Stephanie Farrell, Robert P. Hesketh, C. Stewart Slater, Kandalam Ramanujachary, External Funding: \$50,000
- 10/20/98 Johnson-Matthey, Liquid – Liquid Extraction for Selected Metal Ions, Duration 2 semesters, Project Coordinator: Robert P. Hesketh, Co-PI's Stephanie Farrell, Robert P. Hesketh, C. Stewart Slater, Kandalam Ramanujachary, External Funding: \$17,000
- 7/1/99 National Science Foundation NSF 9950609, Course, Curriculum and Laboratory Improvement, "Field Experiences for Undergraduate Engineers," PI: J. W. Everett, K. Jahan, B. Sukumaran, R. P. Hesketh, J. Mariappan. Funding Level: \$39,854. External (\$19,927)
- 9/1/99 Johnson-Matthey, Membrane Separation Processes: 1) Evaluation of Electro/Ion Exchange Membrane Separation Process and 2) Ultrafiltration Membrane Separations, Duration 2 semesters, Project Coordinator: Robert P. Hesketh, Co-PI's Stephanie Farrell, Robert P. Hesketh, C. Stewart Slater, Kandalam Ramanujachary, External Funding: \$50,000
- 9/1/99 Tenneco Packaging, Heptane Recovery Project, Rowan Project Coordinator: Dr. Mariano J. Savelski (Co-Project Manager), Dr. John Chen (Co-Project Manager), additional project personnel Drs. Robert P. Hesketh, C. Stewart Slater. Funding: \$4,000

- 9/1/00 Johnson-Matthey, 1) Metal Ion Separation using Electrodialysis and 2) Selective Adsorption of Metal Ions, Duration 2 semesters, Project Coordinator: Robert P. Hesketh, Co-PI's Stephanie Farrell, Robert P. Hesketh, C. Stewart Slater, Kandalam Ramanujachary, External Funding: \$48,000
- 9/1/00 Campbell Soup Graver Technology Testing and Research Project, Duration 2 semesters, Project Coordinator: Stephanie Farrell, Co-PI's C. Stewart Slater, Robert P. Hesketh, Mariano Savelski, Kathryn Hollar, External Funding: \$30,000
- 04/01/01 NSF 0088501, "Real Chemical Reactions Vertically Integrated Throughout the Curriculum," PI Robert Hesketh, Co-PI's: Kevin Dahm, Mariano Savelski, Stephanie Farrell, C. S Slater External Funding \$119,714
- 4/01/01 NSF 0088878, "Non-traditional Laboratory Experiments: Olive Oil Manufacturing and Testing, PI Savelski, Farrell, Hesketh and Slater, External Funding \$ 65,286.
- 9/1/01 Johnson-Matthey, 1) Selective Adsorption of Metal Ions and 2) Ion-Exchange Systems for the Recovery of Metal Ions, Duration 2 semesters, Project Coordinator: Robert P. Hesketh, Co-PI's Stephanie Farrell, Robert P. Hesketh, C. Stewart Slater, Kandalam Ramanujachary, External Funding: \$50,000
- 9/1/01 Campbell Soup Co., Novel Baking Technology for Snack Crackers PD: Stephanie Farrell, PI's C. Stewart Slater, Robert P. Hesketh, Mariano Savelski, and Kathryn Hollar C \$40,000.00
- 10/5/01 EPA X-82768801-2, Implementing Green Engineering Education in the Chemical Engineering curriculum PI: Robert P. Hesketh, \$39,536.00
- 4/1/2002 NSF 0126902, Applied Drug Delivery throughout the Engineering Curriculum, PI: Stephanie Farrell, CO-PI: Hesketh, R. P., Savelski, M, C. S. Slater, NSF DUE-CCLI-A&I \$194,286.00
- 9/1/02 Johnson-Matthey, Separation of Metal Ions Using Adsorption Systems, Duration 2 semesters, Project Coordinator: Robert P. Hesketh, Co-PI's Stephanie Farrell, Robert P. Hesketh, C. Stewart Slater, Kandalam Ramanujachary, External Funding: \$30,000
- 1/22/2002 NJDOT, Diesel Emission Reduction Strategies for School Buses and HDDV Trucks , PI: R. P. Hesketh, Co-PI's A. J. Marchese, C. S. Slater, \$755,111.00
- 10/01/02 EPA X-83052501-0, Implementing Green Engineering Education in the Chemical Engineering curriculum PI: Robert P. Hesketh, \$125,836
- 9/1/03 Johnson-Matthey, Separation of Metal Ions Using Adsorption Systems, Project Coordinator: Robert P. Hesketh, Co-PI's Stephanie Farrell, Robert P. Hesketh, C. Stewart Slater, \$30,000.

- 9/1/04 Johnson-Matthey, Electroplating of Pt group Metals, Project Coordinator: Robert P. Hesketh, Co-PI's Stephanie Farrell, Robert P. Hesketh, C. Stewart Slater, \$30,000.
- 9/1/05 Johnson-Matthey, Crystallization Operations, Project Coordinator: Robert P. Hesketh, Co-PI's Stephanie Farrell, Robert P. Hesketh, C. Stewart Slater, \$30,000.
- 10/1/05 Pollution Prevention Program, USEPA Region 2, "Using Engineering Clinics to Advance Pollution Prevention in the Chemical Industry," PI: Stewart Slater, co-PI's Mariano Savelski and Robert P. Hesketh, \$40,000.
- 10/1/05 Conservation Challenge Grant Program, USEPA Region 2, "Green Engineering Approach to Pharmaceutical Development and Manufacturing," PI: Stewart Slater, co-PI's Mariano Savelski and Robert P. Hesketh, \$26,813.
- 9/1/05 Valero Energy Corporation, "Water Reuse Alternatives for Refineries", PI: Stewart Slater, co-PI's Mariano Savelski and Robert P. Hesketh, \$10,000.
- 9/1/05 Novartis Pharmaceuticals, Catalyst Recovery Using Adsorption in a Packed Bed, Project Coordinator: Robert P. Hesketh, PI: Brian G Lefebvre Co-PI Stephanie Farrell, Funding approved for \$30,000.
- 5/8/06 NJDEP, In-Cabin Particulate Matter Quantification and Reduction Strategies, funding approved, PI: Robert P. Hesketh, co-PI's Anthony Marchese and Krishan Bhatia, \$ 214,997.
- 6/2/07 "Workshop on Green Engineering and Sustainability in the Pharmaceutical Industry", EPA Region 3, PI: C. Stewart Slater, M. Savelski and R Hesketh, \$75,000.
- 1/3/07 Advancing P2 in Pharmaceutical Manufacturing, EPA Region 2, PI: C. Stewart Slater, M. Savelski and R Hesketh, \$132,967
- 4/12/07 NJDEP, "Evaluation of Emissions and Performance of NJ TRANSIT Diesel Locomotives with B20 Biodiesel Blends: Static and Mobile Testing," PI: Anthony Marchese, co-PI's Krishan Bhatia and Robert P. Hesketh, \$ 149,831.
- 4/15/07 NJDEP, "Emissions Measurement and Demonstration of Biodiesel/ULSD Blends in Airport Ground Support Equipment," funding approved, PI: Krishan Bhatia, co-PI's Anthony Marchese and Robert P. Hesketh, \$ 85,000.

Masters and Doctoral Committees

Chairperson or Co-Advisor

Steven Koski, "Ion-Exchange in Precious Metal Separations," M.S. in Engineering in progress

- Brian Kuritz, "Parameters Effecting the Number Concentration of Particulate Matter inside a School Bus," M. S. in Engineering in progress
- Mike Carney, "Adsorption of Precious Metals on Catalyst Support Material." M.S. in Engineering in progress.
- Megan Matricardi, "Effect of Operating Conditions on Static/Dynamic Extraction of Peanut Oil using Supercritical Carbon Dioxide," M.S. in Engineering, May 2001.
- Natalie DeFlece, "An Experiment in ElectroDialysis," M.S. in Engineering, May 2001.
- Niem Nguyen, "Dehydrogenation of Ethane to Ethylene in a Catalytic Membrane Reactor," M.S. in Engineering, May 2001.
- Milind V. Kantak, "High Temperature Methylamine Oxidation in a Flow Reactor," Ph.D. in Chemical Engineering, May 1996.
- Robert A. Pendergrass II, "Volatiles Combustion in a Fluidized Bed," Master of Science in Chemical Engineering, May 1995.
- Karla Sanchez de Manrique, "Development of a Detailed Chemical Kinetic Model for Combustion of Methylamine," Master of Science in Chemical Engineering, May 1994.
- Piras Chantravekin, "Fluidized Bed Combustion Design and Combustion Mechanism Modeling," Master of Engineering in Chemical Engineering, December 1994.

Undergraduate Research Advisor

- Lynn Tomlinson, Design of a High-Temperature Gas Sampling probe for Use in a Fluidized Bed. May 1993. Received first place award at AIChE Mid-America Regional Conference.
- Dagney Velazquez, Fluidized Bed Combustion, Summer 1994.
- Christopher Raffensperger, The Inhibition of Propane Combustion within a Fluidized Bed, May 1996.
- Numerous Engineering Clinic Projects at Rowan University