

ARVIND VARMA

R. Games Slayter Distinguished Professor
School of Chemical Engineering
Purdue University
West Lafayette, IN 47907-2100

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A. Personal Information

Date of Birth: October 13, 1947
Place of Birth: Firozabad, U.P., India - U.S. Naturalized Citizen
Marital Status: Married, two children

B. Education

B.S. (Chem. Eng.), Panjab University, India	1966
M.S. (Chem. Eng.), University of New Brunswick, Canada	1968
Ph.D. (Chem. Eng.), University of Minnesota	1972

C. Professional Experience

Assistant Professor, University of Minnesota	1972-73
Senior Research Engineer, Union Carbide Corporation	1973-75
Dept. of Chemical Engineering, Univ. of Notre Dame	
Assistant Professor	1975-77
Associate Professor	1977-80
Professor	1980-88
Chairman	1982 - 88
Arthur J. Schmitt Professor	1988-2003
Director (<i>founding</i>), Center for Molecularly Engineered Materials	2000-2003
School of Chemical Engineering, Purdue University	
R. Games Slayter Distinguished Professor	1/2004-present
Head, School of Chemical Engineering	1/2004-8/2012
Jay & Cynthia Ihlenfeld Head of Chemical Engineering	9/2012-7/2016

Visiting Appointments:

Visiting Professor, University of Wisconsin-Madison	Fall 1981
Chevron Visiting Professor, California Institute of Technology	Spring 1982
Visiting Professor, Indian Institute of Technology - Kanpur	Spring 1989
Visiting Chair Professor, University of Cagliari, Italy	Summer 1989, July 1992
Visiting Fellow, Princeton University	Spring 1996
Piercy Distinguished Visiting Professor, University of Minnesota	Fall 2001
G.P. Kane Visiting Professor, UICT-Mumbai	January 2007
Golden Jubilee Visiting Fellow, UICT-Mumbai	March 2008
B.D. Tilak Visiting Fellow, ICT-Mumbai	March 2012
Visiting Scholar, University of California – Santa Barbara	1/2017 – 3/2017
Visiting Professor, ETH-Zurich	4/2017 – 6/2017

D. Fellowships, Honors and Recognitions

NSF US-India Exchange Visitor	April 1982
Fellow, American Institute of Chemists	1987
Indo-American Fellowship, Fulbright Scholar Award	1988-89
College of Engineering Outstanding Teacher of the Year Award	1991
Special Presidential Award, Univ. of Notre Dame	1992
R.H. Wilhelm Award, American Institute of Chemical Engineers	1993
Burns Graduate School Award, Univ. of Notre Dame	1997
Ernest W. Thiele Award, AIChE (Chicago section)	1998
Chemical Engineering Lectureship Award, ASEE	2000
Research Achievement Award (<i>Inaugural</i>), Univ. of Notre Dame	2001
Honorary Fellow (<i>Inaugural batch</i>), Indian Institute of Chem. Engrs	2001
Technology and Innovation Award, <i>Industry Week</i>	2005
Honoree, 60 th Birthday sessions - I & II, AIChE Annual Meeting	2007
Distinguished Chemical Engineering Alumnus (<i>Inaugural batch of 3</i>), 2008 Panjab University	
Distinguished University Alumnus, Panjab University	2008
Fellow, AIChE	2008
Honoree, Festschrift issue, I&EC Research (Volume 47, No. 23)	2008
Elected Foreign Member, Academy of Engineering, Mexico	2010
Fellow, American Association for the Advancement of Science	2011
Fellow, Industrial & Engineering Chemistry Division, American Chemical Society	2011
Leadership Award, College of Engineering, Purdue University	2011
Warren K. Lewis Award, AIChE	2013
Sigma Xi Faculty Research Award (Purdue Chapter)	2015
Arden L. Bement Jr. Award for Pure or Applied Science or Engineering, Purdue University	2016
Purdue Innovators Hall of Fame	2017
<i>Special Lectureships:</i>	
Plenary Lecture, ISCRE-12, Torino, Italy	1992
Warren McCabe Lecture, North Carolina State University	1992
UOP Invitational Lecture	1994
G. C. A. Schuit Lecture, University of Delaware	1994
Robb Distinguished Lecture, Penn State University	1997
Kuloor Lecture, Indian Institute of Science – Bangalore	1999
Amundson Lectures, University of Guadalajara, Mexico	2001
Piercy Lecture, University of Minnesota	2001
Perkin Elmer Chemcon Distinguished Lecture, Chennai, India (<i>Inaugural Speaker</i>)	2001
Paul C. Wilber Lecture, Rice University	2002
Research Highlight Series Lecture, NSF	2002
ConocoPhillips Lecture, Oklahoma State University	2003
Johansen-Crosby Lecture, Michigan State University	2004
G.P. Kane Lectures, UICT-Mumbai	2007
Golden Jubilee Lecture, UICT-Mumbai	2008
CNR Rao Distinguished Lecture, Chemcon,	2008

Chandigarh, India

Distinguished Chemical Engineering Lecture, Univ. of Utah	2009
Distinguished Engrg Lecture, Univ. of Western Ontario	2010
Induction Lecture, Academy of Engineering, Mexico	2010
Lindsay Lecture, Texas A&M University	2012
B.D. Tilak Lecture, ICT-Mumbai	2012
125 th Anniversary Lecture, Academy of Engineering, Mexico	2013
ChE Academy Lecture, Missouri Univ of Science & Tech	2015
Lyman Handy Lecture, University of Southern California	2017
Dow/Jean B. Cropley Lecture, West Virginia University	2017

Listed in:

American Men and Women of Science, Who's Who in the World,
Who's Who in America, and other biographical listings.

E. Principal Research Interests

Chemical and Catalytic Reaction Engineering, New Energy Sources, Synthesis of
Advanced Materials
Author of over 300 research publications in these areas.

F. Professional Society Memberships

American Institute of Chemical Engineers (AIChE) - Fellow
American Chemical Society (ACS)
American Society for Engineering Education (ASEE)
American Association for the Advancement of Science (AAAS) - Fellow
Sigma Xi

G. Books

Mathematical Methods in Chemical Engineering, A. Varma and M. Morbidelli,
690 + xvi pages, Oxford University Press, New York, 1997.
Parametric Sensitivity in Chemical Systems, A. Varma, M. Morbidelli and H. Wu,
342 + xvi pages, Cambridge University Press, Cambridge, U.K., 1999; paperback
2005.
Catalyst Design: Optimal Distribution of Catalyst in Pellets, Reactors and Membranes,
M. Morbidelli, A. Gavriilidis and A. Varma, 227 + xii pages, Cambridge University
Press, Cambridge, U.K., 2001; paperback 2005.

Edited Books

*The Mathematical Understanding of Chemical Engineering Systems: Selected Papers of
N. R. Amundson, R. Aris and A. Varma (Editors)*, Pergamon Press, 829 pages, 1980.
Chemical Reaction and Reactor Engineering, J. J. Carberry and A. Varma (Editors),
Marcel Dekker, 1069 pages, 1987.

H. Editorships

Series Editor (<i>founding</i>), <i>Cambridge Series in Chemical Engineering</i> Cambridge University Press	1996 – present
Member of Editorial Board, <i>Catalysis Reviews - Science and Engineering</i> <i>International Journal of</i> <i>Self-Propagating High-Temperature Synthesis</i> <i>International Journal of Petroleum Science and Technology</i> <i>Industrial & Engineering Chemistry Research</i>	1976-1986 1992 – 2006 2005-2013 2012-14
<i>Changing Issues in Chemical Engineering</i> A. G. Fredrickson, G. R. Gavalas, W. H. Ray and A. Varma (Editors) Special Issue of <i>Chemical Engineering Science</i> (Vol. 44, No. 9) in honor of Rutherford Aris, Pergamon Press, 334 pages.	1989
<i>ISCRE-18: From Molecular to Product and Process Engineering</i> A. Varma, B. Subramanian and K. VandenBussche (Editors) Special Issue of <i>Chemical Engineering Science</i> (Vol. 59, No. 22-23; 1033 pages)	2004
<i>Doraiswami Ramkrishna Festschrift</i> A. Varma and G.D. Yadav (Editors), <i>Industrial & Engineering</i> <i>Chemistry Research</i> , <u>54</u> (42), pages 10135-10552.	2015

I. Professional Activities

AICHE

Member, National Program Committee on Kinetics, Catalysis and Reaction Engineering (Area 1b)	1978-95
Director (<i>founding</i>), Catalysis and Reaction Engineering Division	1995-98
Member, AIChE Awards Committee	1994-99
Program Evaluator for Chemical Engineering Accreditation, AIChE/ABET	1988-98
Member, AIChE Awards Solicitation Committee	2009-11
Member, Program Steering Committee, AIChE Midwest Regional Conference	Jan 2013
Member, International Committee	2012 – 15
Member, Fellows Council	2014-16
Member, Industry-Academia Alignment Task Force	2014-16
Trustee, AIChE Foundation	2014-present

ISCRE

Member, ISCRE Board of Directors	2001 -13
Member, Scientific Committee, ISCRE-15, Newport Beach, CA	Sept. 1998
Member, Scientific Committee, ISCRE-17, Hong Kong, China	Sept. 2002

Chair, ISCRE-18, Chicago, IL		2004
Member, Scientific Committee, ISCRE-19, Potsdam/Berlin, Germany	Sept.	2006
Chair, Amundson Award Committee		2006
Member, Scientific Committee, ISCRE-20, Kyoto, Japan	Sept.	2008
Chair, Amundson Award Committee		2009-10
Member, Organizing Committee, ISCRE-21, Philadelphia, PA	Aug.	2010
Member, Scientific Committee, ISCRE-22, Maastricht, the Netherlands	Sept.	2012
Member, Scientific Committee, ISCRE-23, Bangkok, Thailand	Sept.	2014
Member, Scientific Committee, ISCRE-25, Florence, Italy	May	2018

Other Committee Memberships

Member, Examination Board for Chemical Engineering and Applied Mathematics, National Council of Engineering Examiners		1976-79
Departmental Representative, CACHE (National Committee on Computer Aids for Chemical Engineering Education)		1976-80
Member, CACHE Task Force on Large-Scale Systems		1978-80
Member, CACHE Task Force on Personal Computers		1979-81
Member, National Program Committee, I & EC Division, American Chemical Society		1983-85
Member, Engineering Research Equipment Review Panel, NSF	March	1990
Member, SBIR Proposal Evaluation Panel, NSF	Sept.	1993
Member, Career Award Proposal Evaluation Panel, NSF	Jan.	1996
Member, Microgravity Combustion Peer Review Panel, NASA	June	2000
Member, Chemical Engineering Division Award Committee, ASEE		2001-03
Member, Career Award Proposal Evaluation Panel, NSF	Nov.	2001
Diversity Award Committee, Council for Chemical Research Member - 2006, 2007; Chair - 2008		2006-08
Member, GCEP Proposal Review Panel, Stanford University	May	2008
Member, GCEP Proposal Review Panel, Stanford University	April	2010
Chair, Awards Committee, I&EC Division, ACS		2012- 16
Engineering Research Council Awards Cmte, ASEE Member - 2012, Chair - 2013-16		2012- 16
Member, Isadore T. Davis Award Committee, ASEE		2012-14
Member, Advisory Committee, Department of Chemical and Biological Engineering, University of Colorado-Boulder		2012-present
Member, Board of Judges for 2013 Kirkpatrick Award, <i>Chemical Engineering</i> magazine		2013
Member, Board of Judges for 2015 Kirkpatrick Award, <i>Chemical Engineering</i> magazine		2015

Session Chair at Conferences

Chairman, Sessions on Advances in Modeling and Analysis

of Chemical Engineering Systems, AIChE Annual Meeting, San Francisco, CA	Nov. 1979
Chairman, Session on Fixed-Bed Reactors, ACS National Meeting, Las Vegas, NV	Aug. 1980
Chairman, Sessions on Chemical and Catalytic Reactor Modeling, AIChE Annual Meeting, Chicago, IL	Nov. 1980
Co-Chairman, Session on New Methods in Mathematical Modeling and Analysis, AIChE Annual Meeting, New Orleans, LA	Nov. 1981
Chairman, Session on Mixing and Polymerization, Seventh International Symposium on Chemical Reaction Engineering, Boston, MA	Oct. 1982
Chairman, Session on Chemical and Catalytic Reactor Modeling, AIChE Annual Meeting, Los Angeles, CA	Nov. 1982
Chair or Vice-Chair, Session on Chemical Reactor Stability and Dynamics, AIChE Annual Meeting, San Francisco (1984), Chicago (1985), Miami (1986), New York (1987), Washington, DC (1988), Chicago (1990), Los Angeles (1991), Miami (1992)	
Chairman, Chemical Engineering Courses Group, NSF Indo-US Seminar on Chemical Engineering Education: Curricula for the Future, Bangalore, India	Jan. 1988
Chairman, Session on Reactor Modeling, Scale - up and Control, Twelfth International Symposium on Chemical Reaction Engineering, Torino, Italy	June 1992
Chair, Murphree Award Symposium, ACS National Meeting, Denver, CO	April 1993
Co-Chair, Session on Synthesis of New Materials, International Symposium on Chemical Reaction Engineering-13, Baltimore, MD	Sept. 1994
Chair, Session on Future Directions in Chemical Reaction Engineering, AIChE Annual Meeting, San Francisco, CA	Nov. 1994
Chair, Session on Reactor Operation with Flow Reversal, 2nd International Conference on Unsteady-State Processes in Catalysis, St. Louis, MO	Sept. 1995
Chair, Session on SHS Methods: New Variations and New Problems, 3rd International Symposium on Self-Propagating High-Temperature Synthesis, Wuhan, China	Oct. 1995
Co-Chair, Session on Catalyst Design, AIChE Annual Meeting, Miami Beach, FL	Nov. 1995
Chair, Session on Future Directions in Reaction Engineering Research: Papers in Honor of Rutherford Aris, AIChE Annual Meeting, Chicago, IL	Nov. 1996
Chair, Session on Fundamentals of SHS, 4th International Symposium on Self-Propagating High-Temperature Synthesis, Toledo, Spain	Oct. 1997
Chair, Session on "Dynamic Processes on Catalyst Surfaces," Third International Conference on Unsteady State	July 1998

Processes in Catalysis, St. Petersburg, Russia	
Chair, Session on “Catalytic Reactors,” International Symposium on Chemical Reaction Engineering-15, Newport Beach, CA	Sep. 1998
Chair, Session on Future Directions in Reaction Engineering Research, AIChE Annual Meeting, Miami Beach, FL	Nov. 1998
Chair, Session on Combustion Mechanisms, 5 th International Symposium on Self-Propagating High-Temperature Synthesis, Moscow, Russia	Aug. 1999
Chair, Round Table on SHS in Chemical Engineering, 5 th International Symposium on Self-Propagating High-Temperature Synthesis, Moscow, Russia	Aug. 1999
Chair, Session on Membrane Reactors, AIChE Annual Meeting, Dallas, TX	Nov. 1999
Chair, Sessions on Inorganic Membranes for Reaction and Separation, North American Membrane Society Meeting, Boulder, CO	May 2000
Chair, Session on Metallic Membranes, International Conference on Inorganic Membranes, Montpellier, France	June 2000
Chair, Session on Conversion Enhancement, International Conference on Catalysis in Membrane Reactors, Zaragoza, Spain	July 2000
Chair, Session on Reactor Dynamics and Control, International Symposium on Chemical Reaction Engineering-16, Cracow, Poland	Sep. 2000
Chair, Session on Future Directions in Reaction Engineering Research, AIChE Annual Meeting, Los Angeles, CA	Nov. 2000
Chair, Plenary Session, International Symposium on Chemical Reaction Engineering-17, Hong Kong	Aug. 2002
Chair, Session on Future Directions in Reaction Engineering Research, AIChE Annual Meeting, Indianapolis, IN	Nov. 2002
Chair, Session on Novel Reactors and Process Developments, International Symposium on Chemical Reaction Engineering-19, Potsdam/Berlin	Sep. 2006
Chair, Sessions (2) in honor of Neal Amundson’s 90 th Birthday, AIChE Annual Meeting, San Francisco, CA	Nov. 2006
Chair, Sessions (2) in honor of Wilhelm Award Recipient, AIChE Annual Meeting, San Francisco, CA	Nov. 2006
Chair, Session on Materials Processing, International Symposium on Chemical Reaction Engineering-20, Kyoto, Japan	Sep. 2008
Chair, Plenary Session – 1, International Symposium on Chemical Reaction Engineering-21, Philadelphia, PA	June 2010
Chair, Session in honor of Roger Schmitz’ 75 th Birthday, AIChE Annual Meeting, Salt Lake City, UT	Nov. 2010
Chair, Session on Reaction Path Analysis & Reaction Kinetics, International Symposium on Chemical Reaction Engineering-22, Maastricht, The Netherlands	Sep. 2012

Chair, Panel Discussion on “The Next Steps,” U.S.-India Symposium on Energy, Environment and Sustainability, AIChE Annual Meeting, Pittsburgh, PA	Oct. 2012
Chair, Panel Discussion on “The Next Steps,” U.S.-India Symposium on Energy, Environment and Sustainability, Chemcon 2013, Mumbai, India	Dec. 2013
Chair, Panel Discussion on Future Education of Chemical Engineers, 8th Sino-US Joint Conference of Chemical Engineering, Shanghai, China	Oct. 2015
Chair, Session on “Trends and Challenges in Chemical Engineering Research,” World Congress of Chemical Engineering, Barcelona, Spain	Oct. 2017

Other Conference Related Activities

Invited Reporter for Reactors, First International Conference on Foundations of Computer-Aided Process Design, Henniker, NH	July 1980
Academic Co-Reporter, Workshop on Catalysis, Council for Chemical Research Meeting, Houston, TX	Sept. 1982
Plenary Lecturer, International Chemical Reaction Engineering Conference, Pune, India	Jan. 1984
Invited Lecture, International Chemical Reaction Engineering Conference-2, Pune, India	April 1987
Plenary Lecturer, International Conference on Advances in Chemical Engineering, Kanpur, India	Jan. 1989
Member, Program and Publication Committee, Second International Symposium on Self-Propagating High Temperature Synthesis, Honolulu, HI	Nov. 1993
Member of Organizing Committee, 2nd International Conference on Unsteady-State Processes in Catalysis, St. Louis, MO	Sept. 1995
Member, Program and Publication Committee, Third International Symposium on Self-Propagating High-Temperature Synthesis, Wuhan, China	Oct. 1995
Invited Lecture, International Conference on Advances in Chemical Engineering, Madras, India	Dec. 1996
Member, International Advisory Committee, Fourth International Symposium on Self-Propagating High-Temperature Synthesis, Toledo, Spain	Oct. 1997
Member of Organizing Committee, 3rd International Conference on Unsteady-State Processes in Catalysis, St. Petersburg, Russia	July 1999
Member, International Advisory Committee, Fifth International Symposium on Self-Propagating High-Temperature Synthesis, Moscow, Russia	Aug. 1999
Member, International Advisory Committee, Sixth International Symposium on Self-Propagating	

High-Temperature Synthesis, Haifa, Israel	Oct. 2001
Member, Scientific Committee, International Conference on Catalysis in Membrane Reactors, Dalian, China	June 2002
Member of Organizing Committee, 4th International Conference on Unsteady-State Processes in Catalysis, Montreal, Canada	Oct. 2003
Member of Organizing Committee, 5th International Conference on Unsteady-State Processes in Catalysis, Osaka, Japan	Nov. 2006
Chair, International Advisory Board, Energy Center Hydrogen Initiative Symposium – 2, Purdue University	April 2007
Organizer, US-India Chemical Engineering Conference and Workshop on Energy and Sustainability, Chandigarh, India	Dec. 2008
Member, Scientific Advisory Committee, Sino-US Conference of Chemical Engineering, Beijing, China	Oct. 2009
Member, International Advisory Committee, 9th World Congress of Chemical Engineering, Seoul, Korea	Aug. 2013
Member, International Advisory Committee, International Symposium on Self-Propagating High-Temperature Synthesis - 13, South Padre Island, TX	Oct. 2013
Co-Organizer, Indo-US Chemical Engineering Conference on Energy, Environment and Sustainability, Mumbai, India	Dec. 2013
Member, International Advisory Committee, Chemcon-2013, Mumbai, India	Dec. 2013
Member, Advisory Committee, Chemcon-2014, Chandigarh, India	Dec. 2014

Consulting

Ford Motor Company	1978 - 83
Olin Chemicals	1990 - 91
Union Carbide Corporation	1990 - 98
International Specialty Products (Member of Science Advisory Board)	1992 - 97
B/E Aerospace	1999- 2002
Alexza Corporation	2006-2007
Heritage Research Group	2008
Kleiner Perkins Caufield & Byers	2008
Sriya Green Materials	2009-2010
BASF	2013-14
Air Liquide – Member, Science Advisory Board	2015-present

J. Doctoral Dissertations Directed

Completed

1. * C. J. Pereira, "Modeling of the Catalytic Converter for Automotive Exhaust Gas,
"University of Notre Dame, August 1978; 209 + xii pages.

- 2.* A. L. DeVera, "Some Problems Concerning Transport in Random Heterogeneous Media and Chemically Reacting Systems," University of Notre Dame, January 1979; 339 + xii pages.
3. S. C. Paspek, "Experimental and Theoretical Investigation of Ethylene Oxidation in a Fixed-Bed Reactor," University of Notre Dame, August 1979; 135 + ix pages.
4. J. B. Wang, "Problems Involving Diffusion and Reaction in Porous Catalyst Pellets, and the Modeling of Catalytic Converter for Automotive Exhaust System," University of Notre Dame, February 1980; 125 + ix pages.
5. D. T.-J. Huang, "Steady State and Dynamic Behavior of Gas-Liquid Reactors," University of Notre Dame, June 1980; 173 + xii pages.
- 6.* V. Ravichandran, "Characterization, Sintering and Transient Reaction Kinetics for Model Three-Way Catalysts," University of Notre Dame, September 1981; 89 + vii pages.
7. N. Jothi, "Reaction Kinetics for Carbon Monoxide Oxidation on a Commercial Three-Way Catalyst," University of Notre Dame, October 1982; 151 + viii pages.
8. A. Shaikh, "Studies on the Steady State Behavior of Gas-Liquid Reactors," University of Notre Dame, December 1983; 172 + xii pages.
9. B. Subramaniam, "Reactions of CO, NO, O₂ and H₂O on Pt/ γ -Al₂O₃ and Commercial Three-Way Catalysts," University of Notre Dame, February 1984, 190 + ix pages.
10. S. Dhalewadikar, "Ethylene Oxidation on Supported Platinum Catalyst in a Non-Adiabatic Fixed-Bed Reactor: Experiments and Model," University of Notre Dame, July 1984, 200 + ix pages.
11. M. Kosanovich, "Reactions of Propylene, Nitric Oxide, and Oxygen on Platinum/ γ -Al₂O₃, Iridium/ γ -Al₂O₃ and Platinum-Iridium/BaO-Al₂O₃ Catalysts," University of Notre Dame, August 1986, 290 + xviii pages.
12. R. Chemburkar, "Optimal Catalyst Activity Profiles in Pellets: Single Pellet Theory and Experiments," University of Notre Dame, December 1986, 104 + x pages.
13. M. Morbidelli, "Parametric Sensitivity and Runaway in Chemically Reacting Systems," University of Notre Dame, April 1987, 248 + xi pages.
14. R. Herrera, "Effect of Gold in the Oxidation of Ethylene over α -Alumina Supported Silver-Gold Catalysts," University of Notre Dame, July 1987, 203 + xiv pages.
15. C. Lee, "Theoretical and Experimental Studies of Fixed-Bed Reactors with Non-Uniformly Active Catalyst Pellets," University of Notre Dame, September 1987, 157 + xi pages.
16. E. Bauman, "Parametric Sensitivity in Non-Adiabatic Catalytic Fixed-Bed Reactors: Theory and Experiments," University of Notre Dame, September 1988, 148 + x pages.
17. D. Price, "Preparation of Pt/ γ -Al₂O₃ Pellets with an Internal Step-Distribution of Catalyst: Experiments and Theory," University of Notre Dame, October 1988, 141 + x pages.
18. R. Pigeon, "Chemical Reaction Engineering Considerations in the Synthesis of Silicon Nitride," University of Notre Dame, March 1992, 235 + xv pages.
19. J. -P. Lebrat, "Mechanistic and Processing Studies Related to Combustion Synthesis of Advanced Materials," University of Notre Dame, December 1992, 118 + xiii pages.
20. A. Gavriilidis, "Optimal Distribution of Silver Catalyst in Pellets for Epoxidation of Ethylene," University of Notre Dame, July 1993, 218 + xvi pages.
- 21.* D. Chatzopoulos, "Experimental and Modeling Studies on Membrane-Aerated Granular Activated Carbon-Sequencing Batch Biofilm Reactors," University of Notre Dame, September 1994, 309 + xxiii pages.

- 22.* U. Stafford, "Photocatalytic Oxidation of a Model Halogenated Aromatic Compound: A Mechanistic Study," University of Notre Dame, October 1994, 223 + xvii pages.
23. C. Kachelmyer, "Mechanistic and Product Structure Formation Studies in the Combustion Synthesis of Advanced Materials," University of Notre Dame, April 1996, 151 + xv pages.
- 24.* M. Maalmi, "Reaction-Bonded Silicon Nitride Synthesis: Modeling, Analysis and Experiments," University of Notre Dame, August 1996, 200 + xix pages.
- 25.* R. Wu, "Enhancing Performance of Three-Phase Packed-Bed Catalytic Reactors by Pulsing-Flow Regime: Modeling and Experimental Study," University of Notre Dame, June 1997, 183 + xiii pages.
26. J. Szegner, "Effects of Nonuniform Catalyst Distribution on Inorganic Membrane Reactor Performance: Experiments and Theory," University of Notre Dame, June 1997, 206 + xix pages.
27. S. Hwang, "Microstructure of Wave Propagation during Combustion Synthesis of Advanced Materials: Experiments and Theory," University of Notre Dame, November 1997, 158 + x pages.
28. A. Pelekh, "Combustion Synthesis of Advanced Materials: Studies of the Influence of Gravity and Reaction Kinetics," University of Notre Dame, June 1999, 115 + ix pages.
29. R. Souleimanova, "Palladium-Composite Membranes: Synthesis, Characteristics and Properties," University of Notre Dame, September 2000, 115 + ix pages.
30. L. Thiers, "Mechanistic Studies Involving Kinetics of Rapid High-Temperature Reactions for Materials Synthesis," University of Notre Dame, April 2002, 116 + xv pages.
- 31.* B. Wilhite, "Pulsing-Flow Regime in Trickle-Bed Reactors: Hydrodynamics and Reactor Design," University of Notre Dame, September 2002, 140 + xiii pages.
32. C. Lau, "The Effects of Gravity on Combustion Synthesis of Advanced Materials," University of Notre Dame, October 2002, 151 + xiv pages.
33. V. Diakov, "Methanol Oxidative Dehydrogenation in a Catalytic Packed-Bed Membrane Reactor: Experiments and Model," University of Notre Dame, October 2002, 89 + xi pages.
- 34.* R. Huang, "Flow Patterns and their Influence on Trickle-Bed Reactors: Experiments and Theory," University of Notre Dame, October 2002, 92 + xv pages.
35. K. Deshpande, "Nanoscale Advanced Materials Using Aqueous Combustion Synthesis," University of Notre Dame, January 2005, 97 + xi pages.
36. C. Norfolk, "Processing of Mesocarbon Microbeads to High-Performance Materials for Friction Applications," University of Notre Dame, March 2005, 96 + xvi pages.
37. P. Erri, "Solution Combustion Synthesis for Catalytic and Power Generation Applications," Purdue University, March 2007, 111 + xiv pages.
38. T. Andrzejak, "Experimental Studies on the Ignition of Single Ni/Al, Fe/Al, and Ti Particles," Purdue University, September 2007, 146 + xvi pages.
39. M. Diwan, "Hydrogen Generation for Fuel Cell Applications," Purdue University, August 2009, 111 + xviii pages.
40. W. Hu, "Catalytic Oxidation of Glycerol to High-Value Chemical Dihydroxyacetone Over Pt-Bi/C Catalyst," Purdue University, May 2011, 89 + xix pages.
41. A. Al-Kukhun, "Hydrogen Generation for Fuel Cell Vehicle Applications," Purdue University, May 2012, 198 + xviii pages.
42. R. Ghose, "Oxidative Coupling of Methane using Catalysts Synthesized by Solution Combustion Method," Purdue University, September 2013, 123 + xix pages.

43. D. Gao, "Catalytic Hydrodeoxygenation of Guaiacol over Noble Metal Catalysts," Purdue University, September 2014, 109 + xvi pages.
- 44.* Y. Xiao, "Heterogeneous Catalysis for Biodiesel Production and Utilization of its Byproduct Crude Glycerol by Selective Oxidation," Southeast University (China), November 2014, 137 + xii pages.
45. G. Honda, "The Hydrodynamics of Trickle Bed Reactors," Purdue University, August 2015, 102 + xi pages.
46. S. B. Lee, "Multiphase Reaction Studies in Stirred Tank and Fixed Bed Reactors," Purdue University, December 2015, 198 + xxv pages.

In Progress

Ryan Adams, joined Fall 2014
 Wooram Kang, joined Fall 2014
 Johnny Zhuchen, joined Fall 2016

Note: * indicates joint supervision.

K. Invited Lectures (Graduate Research Seminars)

<i>Institution</i>	<i>Date</i>
1. University of Michigan, Ann Arbor, MI	October 1978
2. Ford Motor Company, Dearborn, MI	March 1979
3. Northwestern University, Evanston, IL	April 1979
4. University of Minnesota, Minneapolis, MN	May 1979
5. Purdue University, West Lafayette, IN	September 1979
6. Illinois Institute of Technology, Chicago, IL	October 1979
7. Universidad Autonoma Metropolitana-Iztapalapa, Mexico City	January 1980
8. University of Houston, Houston, TX	February 1980
9. University of Florida, Gainesville, FL	May 1980
- Also a series of ten special lectures in stability theory and applications to reactor design	October 1980
10. Iowa State University, Ames, IA	February 1981
11. University of Illinois, Urbana, IL	September 1981
12. University of Wisconsin, Madison, WI	October 1981
13. University of California, Davis, CA	January 1982
14. University of California, Berkeley, CA	February 1982
15. University of California, Santa Barbara, CA	February 1982
16. University of California, San Diego, CA	February 1982
17. Stanford University, Stanford, CA	March 1982
18. National Chemical Laboratory, Pune, India	April 1982
19. University of Bombay, Bombay, India	April 1982
20. Regional Research Laboratory, Hyderabad, India	April 1982
21. Indian Institute of Science, Bangalore, India	April 1982
22. Engineers India Limited, Delhi, India	April 1982
23. Politecnico di Milano, Milano, Italy	May 1982
24. California Institute of Technology, Pasadena, CA	May 1982
25. University of Southern California, Los Angeles, CA	May 1982

26.	Carnegie-Mellon University, Pittsburgh, PA	November	1982
27.	University of Virginia, Charlottesville, VA	October	1983
28.	Indian Institute of Technology, Kanpur, India	January	1984
29.	Miles Laboratories, Elkhart, IN	August	1984
30.	University of Rochester, Rochester, NY	December	1985
31.	Penn State University, University Park, PA	March	1986
32.	Exxon Research and Engineering, Florham Park, NJ	August	1986
33.	University of Texas, Austin, TX	November	1986
34.	Indian Institute of Technology, Kanpur, India	April	1987
35.	University of Virginia, Charlottesville, VA	September	1987
36.	Wayne State University, Detroit, MI	October	1987
37.	University of Pennsylvania, Philadelphia, PA	February	1988
38.	Union Carbide Corporation, South Charleston, WV	May	1988
39.	Allied Signal Research Center, Des Plaines, IL	May	1988
40.	University of Tübingen, Tübingen, West Germany	September	1988
41.	Indian Institute of Technology, Kanpur, India	April	1989
42.	Harcourt Butler Technological Institute, Kanpur, India	April	1989
43.	Indian Institute of Technology, Bombay, India	May	1989
44.	Indian Petrochemicals Corporation, Baroda, India	May	1989
45.	University of Bombay, Bombay, India	May	1989
46.	National Chemical Laboratory, Pune, India	May	1989
47.	Università di Cagliari, Cagliari, Italy	June	1989
48.	Università di Roma, Rome, Italy	June	1989
49.	Università di Pisa, Pisa, Italy	June	1989
50.	Università di Bologna, Bologna, Italy	June	1989
51.	Università di Padova, Padova, Italy	June	1989
52.	Politecnico di Milano, Milan, Italy	June	1989
53.	Olin Chemicals, Charleston, TN	February	1990
54.	University of California, Davis, CA	February	1990
55.	Union Carbide Corporation, South Charleston, WV	April	1990
56.	Argonne National Laboratory, Argonne, IL	July	1990
57.	Texaco Research Center, Beacon, NY	October	1990
58.	Washington University, St. Louis, MO	March	1991
59.	Shell Development Company, Houston, TX	June	1991
60.	Union Carbide Corporation, South Charleston, WV	July	1991
61.	University of Wisconsin, Madison, WI	January	1992
62.	International Specialty Products, Wayne, NJ	June	1992
63.	Università di Cagliari, Cagliari, Italy	July	1992
64.	Reilly Industries, Indianapolis, IN	January	1993
65.	Northwestern University, Evanston, IL (Depts. of Chem. Engg. & Appl. Math.)	February	1993
66.	McGill University, Montreal, Canada	March	1993
67.	Monsanto Company, St. Louis, MO	March	1993
68.	EPA Research Laboratory, Cincinnati, OH	May	1993
69.	University of Southern Mississippi, Hattiesburg, MS (Dept. of Chemistry and Biochemistry)	October	1993
70.	Arco Chemical Company, Newtown Square, PA	December	1993
71.	University of Kansas, Lawrence, KS	October	1994
72.	Chevron Research & Technology Company, Richmond CA	December	1994

73.	University of Naples, Naples, Italy	February	1995
74.	University of Akron, Akron, OH	March	1995
75.	Alfred University, Alfred, NY (School of Ceramic Engineering & Sciences)	April	1995
76.	Princeton University, Princeton, NJ (Dept. of Mechanical & Aerospace Engg.)	February	1996
77.	Exxon Research & Engineering Company, Annandale, NJ	March	1996
78.	Iowa State University, Ames, IA	March	1996
79.	Princeton University, Princeton, NJ	April	1996
80.	University of Minnesota, Minneapolis, MN	April	1996
81.	Lummus Company, Bloomfield, NJ	April	1996
82.	City College of the City University of New York, New York, NY	April	1996
83.	University of Houston, Houston, TX	April	1996
84.	Engelhard Corporation, Iselin, NJ	May	1996
85.	Union Carbide Corporation, South Charleston, WV	August	1996
86.	Du Pont Central Research, Wilmington, DE	October	1996
87.	Institute of Catalysis, Madrid, Spain	October	1997
88.	ETH - Zurich, Switzerland	March	1998
89.	Universita di Cagliari, Cagliari, Italy	July	1998
90.	Hong Kong Univ. of Science & Technology, Hong Kong	June	1999
91.	National University of Singapore, Singapore	June	1999
92.	Indian Institute of Technology, Delhi, India	June	1999
93.	Eindhoven University of Technology, The Netherlands	August	1999
94.	Rutgers University, Piscataway, NJ	October	1999
95.	Cornell University, Ithaca, NY	January	2000
96.	DSM Research, Geleen, The Netherlands	March	2000
97.	CPE-Lyon, Lyon, France	June	2000
98.	University of Texas, Austin, TX (Institute for Advanced Technology)	November	2000
99.	University of Delaware, Newark, DE	December	2000
100.	Shell Chemicals Company, Houston, TX	January	2001
101.	University of California, Berkeley, CA	February	2001
102.	Worcester Polytechnic Institute, Worcester, MA	March	2001
103.	University of Minnesota, Minneapolis, MN	September	2001
104.	North Carolina State University, Raleigh, NC	October	2001
105.	University of Michigan, Ann Arbor, MI	October	2001
106.	Lehigh University, Bethlehem, PA	April	2002
107.	General Motors R&D Center, Warren, MI	February	2003
108.	University of Arizona, Tucson, AZ	March	2003
109.	ExxonMobil Research & Engineering Co., Annandale, NJ	March	2003
110.	Purdue University, West Lafayette, IN	May	2003
111.	University of California, Los Angeles, CA	February	2005
112.	CPE-Lyon, Lyon, France	June	2005
113.	Politecnico di Milano, Milano, Italy	June	2005
114.	Drexel University, Philadelphia, PA	May	2006
115.	Rose-Hulman Inst of Technology, Terre Haute, IN	October	2006
116.	Purdue University, School of Mechanical Engineering	December	2006
117.	Univ. Institute of Chemical Technology (UICT), Mumbai	January	2007

118.	Texas Tech University, Lubbock, TX	March	2007
119.	University of Houston, Houston, TX	March	2007
120.	University of Pittsburgh, Pittsburgh, PA	September	2007
121.	Carnegie-Mellon University, Pittsburgh, PA	September	2007
122.	Reliance Industries Ltd, Mumbai, India	March	2008
123.	New Jersey Institute of Technology, Newark, NJ	March	2008
124.	Indian Institute of Technology – Bombay, Mumbai, India	January	2009
125.	Tata Chemicals Innovation Center, Pune, India	January	2009
126.	MATRIC, Inc, South Charleston, WV	August	2009
127.	University of Texas, Austin, TX	September	2009
128.	Lamar University, Beaumont, TX	April	2010
129.	Columbia University, New York, NY	October	2010
130.	Georgia Institute of Technology, Atlanta, GA	December	2010
131.	Vanderbilt University, Nashville, TN	February	2011
132.	Tsinghua University, Beijing, China	October	2011
133.	Universidad de los Andes, Bogota, Colombia	November	2011
134.	Illinois Institute of Technology, Chicago, IL	January	2012
135.	Texas A&M University, College Station, TX	February	2012
136.	Cornell University, Ithaca, NY	April	2012
137.	ExxonMobil Research & Engineering Co., Annandale, NJ	January	2013
138.	The Dow Chemical Company, Freeport, TX	July	2013
139.	Korea Institute of Science & Technology, Seoul, Korea	August	2013
140.	Korea University (50 th anniversary symposium), Seoul, Korea	August	2013
141.	Kazan National Research Technical Univ., Kazan, Russia	September	2013
142.	National Chemical Laboratory, Pune, India	January	2014
143.	Northwestern University, Evanston, IL	March	2014
144.	UOP, Des Plaines, IL	March	2014
145.	The Dow Chemical Company, Midland, MI	June	2014
146.	East China University of Science and Technology, Shanghai	October	2015
147.	University of California, Los Angeles, CA	March	2017
148.	University of California, Santa Barbara, CA	March	2017

L. **Papers Presented at Conferences** - over 320 in all, at various professional society meetings (separate list available).

M. **Selected List of Services to the University**

I. PURDUE UNIVERSITY

Member, College of Engineering Leadership Team	2004-present
Member, Engineering Area Promotions Committee	2004-present
Member, College of Engineering Research Advisory Committee	2004-05
Member, Head Search Committee, Dept. of Chemistry	2004
Member, Director Search Committee, Birck Nanotechnology Center	2005-06
College of Engineering Financial Affairs Team	
Member	2005-08
Chair	2006-08
Chair, Internal Assessment Committee to review the College of Engineering Graduate Programs	2005-06
Member, Engineering Dean Search Committee	2006

Member, Distinguished Professor Committee, College of Science	March 2006
Member, Distinguished Professor Committee, College of Engrg	Oct 2006
Chair, International Advisory Board, Energy Center Hydrogen Symposium – 2	2007
Member, H. C. Brown Award Committee, Energy Center Hydrogen Symposium – 3	2009
Purdue Engineering Strategic Plan, ELT Co-Champion, Team 2 – The Research Enterprise	2009
Member, CoE Heads' On-Boarding program Mentoring; Research Enterprise and SPS Services	2009
Chair, Distinguished Professor Committee, College of Engineering College of Engineering ELT Committees	Sep 2009
Member, ELT Task Force on Ways to Encourage Ph.D. Graduates to Seek Faculty Careers	Oct 2008
Member, ELT Strategic Topic: Growth of Research	Nov 2008
Member, ELT <i>ad hoc</i> Cmte for Tracking Faculty Awards	Jan 2010
Member, ELT <i>ad hoc</i> Cmte on Committees	July 2010
Lead, ELT <i>ad hoc</i> Cmte for Ethics/Academic Honor Code	July 2010
Member, CoE Budget Contingency Planning Team	Fall 2010, Fall 2011
Chair, Civil Engineering Head Search Committee	2011-12
Member, Distinguished Professor Committee, College of Engrg	Spring 2013
Member, Planning Team, Purdue-Lilly Tech Day (2)	2014
Chair, Distinguished Professor Committee, College of Engrg	Fall 2014
Member, Planning Team, Sumitomo Chemical – Purdue University Grand Challenge Workshop	January 2015
Member, Distinguished Professor Committee, College of Engrg	Spring 2015
Member, Faculty Awards and Recognition Committee, Purdue U.	2015-present

II. UNIVERSITY OF NOTRE DAME

a. *University*

Faculty Senate	1978-81
Committee on Admissions, Sigma Xi	1978-83
Committee on Research & Sponsored Programs	1980-83, 1989-92, 1992-95
Committee on Final Examinations Policy (Ad Hoc)	1983-84
Committee to Select the Grace-Rupley Chairholder in Chemistry (Ad Hoc)	1986-88
Graduate Council	1987-90, 1995-98
Chairman, Internal Review Team, Dept. of Physics Review of Graduate Program	1988
Committee on Doctoral Student Teaching (Ad Hoc)	1989-90
Budget Priorities Committee	1989-90
Committee for Policy on Racial Harassment (Ad Hoc)	1990
Chairman, Task Force on Research Systems	1990
Member of Internal Review Team, Kellogg Institute for International Studies and Institute for International Peace Studies	1991
Academic Council	1991-94
Member of Executive Committee (1991-92, 1992-93, 1993-94)	
Member, Task Force on Cultural Diversity	1991-92

Member, Provost Review Committee	1992
Member, Search Committee for Director, Institute for International Peace Studies	1992
Academic and Faculty Affairs Committee of the Board of Trustees	1994-97
Member, Burns Award Committee	1998
Member, Task Force on Strategic Directions in Science and Engineering	1999
Director (founding), Center for Molecularly Engineered Materials	2000-03
Member, Research Achievement Award Committee	2002, 2003
b. <i>College</i>	
Systems Matrix Group	1975-81
Engineering Computer Committee	1975-81
Applied Mathematics Committee	1977-81
Executive Committee	1982-88
College Council	1982-88, 1990-93
Committee for Evaluation of Chaired Professorship Candidates	1984, 87
Member, Dean Search Committee	1987
Member of Executive Committee, Center for Bioengineering and Pollution Control	1988-96
Organizer of Sesquicentennial Year Symposium: Frontiers of Engineering Research	Spring 1992
Committee to Select Teacher of the Year (Chair - 1994)	1993, 1994
Member of Executive Committee, Center for Catalysis and Reaction Engineering	1993-99
Co-Chair, Committee on the Role of Materials Science and Engineering in the College of Engineering	1995-96
Coordinator, Center for Materials Research	1997-98
Co-Chair, Session on Critical Technologies of the 21 st Century, Advisory Council Meeting	Sep. 1998
Chair, Committee on Materials Technologies	1998-99
c. <i>Department</i>	
Committee for Appointments and Promotions (elected)	1977-2003
Graduate Recruiting	1977-79, 1982-86 1989-91, 1995-96
Standards	1975-79
Graduate and Undergraduate Curriculum	1975-79
Director of Graduate Studies	1977-79, 1982-86
Graduate Studies and Research	1980-86
Chairman Search Committee	1981-82
Dept. Chairman	1982-88
Honors and Awards	1996-2003

LIST OF PUBLICATIONS**Arvind Varma**

1. "Spontaneous Ignition of High Voidage Cellulosic Fuels," A. Varma and F. R. Steward, *Journal of Fire and Flammability*, 1, 154-165 (1970).
2. "Global Asymptotic Stability in Distributed Parameter Systems - Comparison Function Approach," A. Varma and N. R. Amundson, *Chemical Engineering Science*, 27, 907-918 (1972).
3. "Some Problems Concerning the Non-Adiabatic Tubular Reactor - Qualitative Behavior, A Priori Bounds, Preliminary Uniqueness and Stability Considerations," A. Varma and N. R. Amundson, *Canadian Journal of Chemical Engineering*, 50, 470-485 (1972).
4. "Maximal and Minimal Solutions, Effectiveness Factors for Chemical Reaction in Porous Catalysts," A. Varma and N. R. Amundson, *Chemical Engineering Science*, 28, 91-104 (1973).
5. "Some Observations on Uniqueness and Multiplicity of Steady States in Non-Adiabatic Chemically Reacting Systems," A. Varma and N. R. Amundson, *Canadian Journal of Chemical Engineering*, 51, 206-226 (1973).
6. "Local Stability of Tubular Reactors," A. Varma and N. R. Amundson, *AIChE Journal*, 19, 395-398 (1973).
7. "The Non-Adiabatic Tubular Reactor Stability Considerations," A. Varma and N. R. Amundson, *Canadian Journal of Chemical Engineering*, 51, 459-467 (1973).
8. "Some Remarks Concerning Reversible Chemical Reactions in Porous Catalysts," A. Varma, *Chemical Engineering Science*, 29, 1340-1343 (1974).
9. "Some General Considerations of Reversible Chemical Reactions in Batch and Tubular Reactors," A. Varma and N. R. Amundson, *Canadian Journal of Chemical Engineering*, 52, 580-590 (1974).
10. "Computational Methods for the Tubular Chemical Reactor," A. Varma, C. Georgakis, N. R. Amundson and R. Aris, *Computer Methods in Applied Mechanics and Engineering*, 8, 319-330 (1976).
11. "Stirred Pots and Empty Tubes," A. Varma and R. Aris, Chapter 2 in *Chemical Reactor Theory - A Review*, L. Lapidus and N. R. Amundson (Editors), pgs 79-155, Prentice-Hall (1977).
12. "Bounds on the Concentration and Temperature in a Tubular Reactor," A. Varma, *Canadian Journal of Chemical Engineering*, 55, 629-632 (1977).
13. "Effectiveness Factors for the Case of Mildly Concentration-Dependent Diffusion Coefficients," C. J. Pereira and A. Varma, *Chemical Engineering Science*, 33, 396-399 (1978).
14. "Some Comments on the Upward Spiral," A. Varma, *AIChE Journal*, 24, 158-159 (1978).
15. "Catalytic Effectiveness and Yield: The Case Involving Finite External and Internal Area," P. Varghese, A. Varma and J. J. Carberry, *Industrial and Engineering Chemistry Fundamentals*, 17, 195-199 (1978).
16. "Effectiveness Factors for Pellets with Step-Distribution of Catalyst," J. B. Wang and A. Varma, *Chemical Engineering Science*, 33, 1549-1552 (1978).

17. "Uniqueness Criteria of the Steady State in Automotive Catalysis," C. J. Pereira and A. Varma, *Chemical Engineering Science*, 33, 1645-1657 (1978).
18. "Yield Optimization in Complex Reaction Networks," A. L. DeVera and A. Varma, *Modeling and Simulation*, 9, 1425-1431 (1978).
19. "Uniqueness Criteria for First Order Catalytic Reactions with External Transport Limitations," C. J. Pereira, J. J. Carberry and A. Varma, *Chemical Engineering Science*, 34, 249-255 (1979).
20. "Substrate-Inhibited Enzyme Reaction in a Tubular Reactor with Axial Dispersion," A. L. DeVera and A. Varma, *Chemical Engineering Science*, 34, 275-278 (1979).
21. "Catalytic Reactions in Transport-Line Reactors," P. Varghese and A. Varma, *Chemical Engineering Science*, 34, 337-343 (1979).
22. "Yield Optimization for the Van de Vusse Reaction," A. L. DeVera and A. Varma, *Chemical Engineering Journal*, 17, 163-167 (1979).
23. "Stability of the Steady States and Transient Behavior for a Non-Isothermal Bimolecular Langmuir-Hinshelwood Reaction," C. J. Pereira and A. Varma, *Chemical Engineering Science*, 34, 1187-1193 (1979).
24. "Dynamics of Selectivity Reactions in Isothermal CSTRs," A. Varma and A. L. DeVera, *Chemical Engineering Science*, 34, 1377-1386 (1979).
25. "Mathematical Methods in Chemical Engineering," A. Varma, *Chemical Engineering Education*, 13, 184-188 (1979).
26. "A Justification of the Internal Isothermal Model for Gas-Solid Catalytic Reactions," C. J. Pereira, J. B. Wang and A. Varma, *AIChE Journal*, 25, 1036-1043 (1979).
27. "An Experimental and Theoretical Investigation of Ethylene Oxidation on Supported Platinum in an Adiabatic Fixed-Bed Reactor," S. C. Paspek and A. Varma, *Chemical Engineering Science*, 35, 33-40 (1980).
28. "On Shape Normalization for Non-Uniformly Active Catalyst Pellets," J. B. Wang and A. Varma, *Chemical Engineering Science*, 35, 613-617 (1980).
29. "Utilization of the Recycle Reactor in Determining Kinetics of Gas-Solid Catalytic Reactions," S. C. Paspek, A. Varma and J. J. Carberry, *Chemical Engineering Education*, 14, 78-82 (1980).
30. "Yield Optimization in a Tube-Wall Reactor," D. T.-J. Huang and A. Varma, *American Chemical Society Symposium Series*, 124, 469-480 (1980).
31. *The Mathematical Understanding of Chemical Engineering Systems: Selected Papers of N. R. Amundson*, R. Aris and A. Varma (Editors), Pergamon Press, 829 pgs (1980).
32. "On the Number and Stability of Steady States of a Sequence of CSTRs," A. Varma, *Industrial and Engineering Chemistry Fundamentals*, 19, 316-319 (1980).
33. "Optimal Bulk Phase Composition for an Isothermal Second Order Reaction in a Catalyst Slab -- Elliptic Integral Method," A. L. DeVera and A. Varma, *Industrial and Engineering Chemistry Fundamentals*, 19, 320-322 (1980).
34. "On the Reference Time in the Multiplicity Analysis for CSTRs," D. T.-J. Huang and A. Varma, *Chemical Engineering Science*, 35, 1806-1809 (1980).
35. "Gas Absorption with Consecutive Second-Order Reactions," D. T.-J. Huang, J. J. Carberry and A. Varma, *AIChE Journal*, 26, 832-839 (1980).
36. "Diffusion-Reaction of CO, NO and O₂ in Automotive Exhaust Catalysts," J. W. Kress, N. C. Otto, M. Bettman, J. B. Wang and A. Varma, *AIChE Symposium Series*, 76 (201), 202-211 (1980).

37. "Steady State and Dynamic Behavior of Fast Gas-Liquid Reactions in Non-Adiabatic CSTRs" D. T.-J. Huang and A. Varma, *Chemical Engineering Journal*, 21, 47-57 (1981).
38. "Steady State Multiplicity of a Non-Adiabatic Bubble Column with Fast Reactions," D. T.-J. Huang and A. Varma, *AIChE Journal*, 27, 111-120 (1981).
39. "Steady State Uniqueness and Multiplicity of Non-Adiabatic Gas-Liquid CSTRs; Part I: The Second-Order Reaction Model," D. T.-J. Huang and A. Varma, *AIChE Journal*, 27, 481-489 (1981).
40. "Steady State Uniqueness and Multiplicity of Non-Adiabatic Gas-Liquid CSTRs; Part II: Discrimination Among Rival Reaction Models," D. T.-J. Huang and A. Varma, *AIChE Journal*, 27, 489-495 (1981).
41. "Explicit Multiplicity Criteria for First-Order Catalytic Reactions with External Transport Limitations," M. Morbidelli and A. Varma, *Chemical Engineering Science*, 36, 1211-1218 (1981).
42. "Catalytic Converters for Automotive Exhausts," A. Varma, *Perspectives in Computing*, 1 (2), 22-27 (1981).
43. "Packed-Bed Reactors: An Overview," A. Varma, *ACS Symp. Series*, 168, 279-286 (1981).
44. "Simultaneous Reactions of CO, NO and O₂ in a Tubular Reactor," N. Jothi and A. Varma, *AIChE Journal*, 27, 848-851 (1981).
45. "Chaos in a Continuous Stirred Tank Reactor with Two Consecutive First-Order Reactions," C. Kahlert, O. E. Rossler and A. Varma, *Springer Series in Chemical Physics*, 18, 355-365 (1981).
46. "Some Historical Notes on the Use of Mathematics in Chemical Engineering," A. Varma, in *A Century of Chemical Engineering*, Plenum Press, 353-387 (1982).
47. "Optimal Catalyst Activity Profiles in Pellets, I. The Case of Negligible External Mass Transfer Resistance," M. Morbidelli, A. Servida and A. Varma, *Ind. Eng. Chem. Fundamentals*, 21, 278-284 (1982).
48. "Optimal Catalyst Activity Profiles in Pellets, II. The Case Involving External Mass Transfer Resistance," M. Morbidelli and A. Varma, *Ind. Eng. Chem. Fundamentals*, 21, 284-289 (1982).
49. "Parametric Sensitivity and Runaway in Tubular Reactors," M. Morbidelli and A. Varma, *AIChE Journal*, 28, 705-713 (1982).
50. "Simultaneous Reactions of CO, NO, O₂ and NH₃ on Pt/ γ -Al₂O₃ Catalyst in a Tubular Reactor," B. Subramaniam and A. Varma, *Chemical Engineering Communications*, 20, 81-91 (1983).
51. "Isothermal Diffusion-Reaction in a Catalyst Slab with Bimolecular Langmuir-Hinshelwood Kinetics: Connections with Negative First-Order Kinetics," M. Morbidelli and A. Varma, *Chemical Engineering Science*, 38, 289-296 (1983).
52. "On Shape Normalization for Non-Uniformly Active Catalyst Pellets-II," M. Morbidelli and A. Varma, *Chemical Engineering Science*, 38, 297-305 (1983).
53. "Complex Dynamic Behavior in the Case of CO-NO-O₂-H₂O Reaction System on Pt/ γ -Al₂O₃ Catalyst," B. Subramaniam and A. Varma, *Chemical Engineering Communications*, 21, 221-233 (1983).
54. "Modeling of Gas-Liquid CSTRs," A. A. Shaikh and A. Varma, *ACS Symp. Series*, 237, 95-106 (1984).

55. "Reactions of CO, NO, O₂ and H₂O on Three-Way and Pt/ γ -Al₂O₃ Catalysts," B. Subramaniam and A. Varma, in *Frontiers in Chemical Reaction Engineering*, Wiley Eastern, pgs. 231-240 (1984).
56. "Gas Absorption with Chemical Reaction: The Case Involving a Volatile Liquid Reactant," A. A. Shaikh and A. Varma, *Chemical Engineering Science*, 39, 1639-1641 (1984).
57. "On Steady-State Uniqueness and Multiplicity in Gas-Liquid CSTRs with Fast Reactions," A. A. Shaikh and A. Varma, *Chemical Engineering Journal*, 29, 59-65 (1984).
58. "Consecutive Bimolecular Reactions of General Order in Gas-Liquid Reactors," M. Morbidelli, A. Servida, S. Carra and A. Varma in *Recent Advances in the Engineering Analysis of Chemically Reacting Systems*, Wiley Eastern, pgs. 336-362 (1984).
59. "Optimal Distribution of Immobilized Enzyme in a Pellet for a Substrate-Inhibited Reaction," M. Morbidelli, A. Servida and A. Varma, *Biotechnology and Bioengineering*, 26, 1508-1510 (1984).
60. "Optimal Catalyst Activity Profiles in Pellets, 3. The Nonisothermal Case with Negligible External Transport Limitations," M. Morbidelli, A. Servida, S. Carra and A. Varma, *Ind. Eng. Chem. Fundamentals*, 24, 116-119 (1985).
61. "Approximate Solutions of Nonlinear Boundary Value Problems," A. Varma and W. Strieder, *IMA Journal of Applied Mathematics*, 34, 165-171 (1985).
62. "On Parametric Sensitivity and Runaway Criteria of Pseudohomogeneous Tubular Reactors," M. Morbidelli and A. Varma, *Chemical Engineering Science*, 40, 2165-2168 (1985).
63. "Reaction Kinetics on a Commercial Three-Way Catalyst: CO-NO-O₂-H₂O System," B. Subramaniam and A. Varma, *Ind. Eng. Chem. Prod. Res. Dev.*, 24, 512-516 (1985).
64. "Parametric Sensitivity in Fixed-Bed Catalytic Reactors: The Role of Interparticle Transfer Resistances," M. Morbidelli and A. Varma, *AIChE Journal*, 32, 297-306 (1986).
65. "Optimal Catalyst Activity Profiles in Pellets," A. Varma, Chapter in *Reacting Flows: Combustion and Chemical Reactors*, Part 2, *Lectures in Applied Mathematics*, 24, 41-62 (1986).
66. "Parametric Sensitivity and Runaway in Fixed-Bed Catalytic Reactors," M. Morbidelli and A. Varma, *Chemical Engineering Science*, 41, 1063-1071 (1986).
67. "Parametric Sensitivity of a CSTR," R. Chemburkar, M. Morbidelli and A. Varma, *Chemical Engineering Science*, 41, 1647-1654 (1986).
68. "Complex Dynamic Behavior during Ethylene Oxidation on Supported Silver Catalyst," S. V. Dhalewadikar, E. N. Martinez and A. Varma, *Chemical Engineering Science*, 41, 1743-1746 (1986).
69. "Optimal Catalyst Activity Profiles in Pellets, 4. Analytical Evaluation of the Isothermal Fixed-Bed Reactor," M. Morbidelli, A. Servida and A. Varma, *Ind. Eng. Chem. Fundamentals*, 25, 307-313 (1986).
70. "Optimal Catalyst Activity Profiles in Pellets, 5. Optimization of the Isothermal Fixed-Bed Reactor," M. Morbidelli, A. Servida, S. Carra and A. Varma, *Ind. Eng. Chem. Fundamentals*, 25, 313-321 (1986).
71. "Optimal Catalyst Activity Profiles in Pellets," A. Varma, M. Morbidelli, R. Chemburkar and C. K. Lee, in *Proc. World Congress III of Chemical Engineering*, Tokyo, Japan, 4, 370-373 (1986).

72. "Reactor Steady State Multiplicity and Stability," M. Morbidelli, A. Varma and R. Aris, Chapter 15, in *Chemical Reaction and Reactor Engineering*, J. J. Carberry and A. Varma (Editors), pgs 973-1054, Marcel-Dekker (1987).
73. "Optimal Catalyst Activity Profiles in Pellets, 6. Optimization of the Isothermal Fixed-Bed Reactor with Multiple Zones," C. K. Lee, M. Morbidelli and A. Varma, *Ind. Eng. Chem. Research*, 26, 167-170 (1987).
74. "Parametric Sensitivity and Runaway in Chemical Reactors," M. Morbidelli and A. Varma, *Sadhana*, 10, 133-148 (1987).
75. "Optimal Catalyst Activity Profiles in Pellets," A. Varma, in *Recent Trends in Chemical Reaction Engineering*, Wiley Eastern, 1, 43-60 (1987).
76. "Dynamics of Consecutive Reactions in a CSTR--A Case Study," R. Chemburkar, O. Rossler and A. Varma, *Chemical Engineering Science*, 42, 1507-1509 (1987).
77. "Steady State Multiplicity Behavior of an Isothermal Axial Dispersion Fixed-Bed Reactor with Nonuniformly Active Catalyst," C. K. Lee, M. Morbidelli and A. Varma, *Chemical Engineering Science*, 42, 1595-1608 (1987).
78. "Steady State Multiplicity Behavior of an Adiabatic Plug-Flow Reactor with Nonuniformly Active Catalyst," C. K. Lee and A. Varma, *Chem. Eng. Communications*, 58, 287-309 (1987).
79. "Parametric Sensitivity in Tubular Polymerization Reactors," M. Tjahjadi, S. K. Gupta, M. Morbidelli and A. Varma, *Chemical Engineering Science*, 42, 2385-2394 (1987).
80. "Optimal Catalyst Activity Profiles in Pellets, 7. The Case of Arbitrary Reaction Kinetics with Finite External Heat and Mass Transport Resistances," R. M. Chemburkar, M. Morbidelli and A. Varma, *Chemical Engineering Science*, 42, 2621-2632 (1987).
81. "Parametric Sensitivity in Fixed-Bed Catalytic Reactors: Inter and Intraparticle Resistances," M. Morbidelli and A. Varma, *AIChE Journal*, 33, 1949-1958 (1987).
82. "A Generalized Criterion for Parametric Sensitivity: Application to Thermal Explosion Theory," M. Morbidelli and A. Varma, *Chemical Engineering Science*, 43, 91-102 (1988).
83. "Approximate Solutions for Nonlinear Diffusion-Reaction Equations from the Maximum Principle," M. C. Regalbutto, W. C. Strieder and A. Varma, *Chemical Engineering Science*, 43, 513-518 (1988).
84. "A Simulation Analysis of Gas-Liquid Reactions in Isothermal CSTRs," A. A. Shaikh and A. Varma, *Hungarian J. Ind. Chem.*, 16, 121-140 (1988).
85. "An Isothermal Fixed-Bed Reactor with Nonuniformly Active Catalysts: Experiments and Theory," C. K. Lee and A. Varma, *Chemical Engineering Science*, 43, 1995-2000 (1988).
86. "On Steady State Multiplicity in Bubble Column Reactors," A. A. Shaikh and A. Varma, *Chemical Engineering Journal*, 39, 191-195 (1988).
87. "Effective Diffusivity Measurement through an Adsorbing Porous Solid," D. M. Price and A. Varma, *AIChE Symp. Series*, 84, (266), 88-96 (1988).
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 42. Shafirovich, E., and Varma, A., "Metal-CO₂ Propulsion for Mars Missions: Current Status and Opportunities," *43rd AIAA/ASME/SAE/ASEE Joint Propulsion Conference*, July 8-11, 2007, Cincinnati, OH, AIAA Paper 2007-5126.
 43. Andrzejak, T.A., Shafirovich, E., and Varma, A., "Ignition of Aluminum Particles Coated by Nickel or Iron: Studies under Normal and Reduced Gravity Conditions," *43rd AIAA/ASME/SAE/ASEE Joint Propulsion Conference*, July 8-11, 2007, Cincinnati, OH, AIAA Paper 2007-5646.
 44. "Arvind Varma: Educator, Researcher and Leader," M. Morbidelli and B. Subramaniam, *Arvind Varma Festschrift, Industrial & Engineering Chemistry Research*, 47, 8957-8959 (2008).
 45. "Purdue's Doraiswami Ramkrishna – A Population of One," P. Wankat and A. Varma, *Chemical Engineering Education*, 45 (1), 8-14 (2011).
 46. "Neal Amundson: ChE Educator, Researcher and Leader *Par Excellence*," A. Varma and D. Luss, *Chemical Engineering Progress*, 107 (4), 51 (2011).
 47. "Neal R. Amundson, 1916-2011," D. Luss and A. Varma, *Memorial Tributes – National Academy of Engineering*, 15, 21-23 (2011).

48. "Preface: Doraiswami Ramkrishna—Dedicated to the Application and Teaching of Mathematics in Chemical Engineering," *Industrial & Engineering Chemistry Research*, 54, 10135–10137 (2015).

Intellectual Property

1. "Synthesis of Orthopaedic Implant Materials," A. Varma, A.S. Mukasyan and B. Li, U.S. Patent 6,896,846, issued May 24, 2005.
2. "Method for Releasing Hydrogen from Ammonia Borane," A. Varma, M. Diwan, E. Shafirovich, H.-T. Hwang and A. Al-Kukhun, US Patent 8,377,416, issued February 19, 2013.
3. "High and Rapid Hydrogen Release from Thermolysis of Ammonia Borane near PEM Fuel Cell Operating Temperature," A. Varma, H.T. Hwang and A. Al-Kukhun, US Patent 9,493,349, issued November 15, 2016.
4. "High and Rapid Hydrogen Release from Thermolysis of Ammonia Borane at PEM Fuel Cell Temperature Using Boric Acid as Additive," H.T. Hwang and A. Varma, Invention Disclosure, filed on November 9, 2011.
5. "Method to Prevent Reprocessing of Ammonium Nitrate Based Compounds into Element of Explosives," H.T. Hwang and A. Varma, Invention Disclosure, filed on January 20, 2012.
6. "Hydrogen Release from Magnesium Borohydride with Additives," A. Al-Kukhun, H.T. Hwang and A. Varma, Invention Disclosure, filed on March 30, 2012.
7. "Oxidative Coupling of Methane using Catalysts Synthesized by Solution Combustion Method," R. Ghose, H.T. Hwang and A. Varma, Provisional Patent Application No. 61/684,942, filed on August 20, 2012.
8. "A Universal Method for Crude Glycerol Purification from Different Feedstock in Biodiesel Production," Y. Xiao and A. Varma, Invention Disclosure, filed on June 17, 2013.
9. "Catalytic Deoxygenation of Bio-Oils Using Methane," A. Varma and Y. Xiao, Provisional Patent Application No. 62/199,268 filed on July 31, 2015.

Papers Presented at Conferences

1. "Some Experimental and Theoretical Considerations in the Catalytic Oxidation of Ethylene," AIChE Annual Meeting, Chicago, IL, December 1976.
2. "Uniqueness Criteria and Stability of the Steady States in Automotive Catalysis," Fifth North American Meeting of the Catalysis Society, Pittsburgh, PA, April 1977.
3. "Reactor Design for Complex Reactions: A Case Study," First International Conference on Mathematical Modeling, St. Louis, MO, August 1977.
4. "Some Modeling Aspects in Automotive Catalysis," AIChE Annual Meeting, New York, NY, November 1977.
5. "Yield Optimization in Complex Reaction Networks," Ninth Annual Pittsburgh Conference on Modeling and Simulation, Pittsburgh, PA, April 1978.
6. "Some Modeling and Simulation Aspects in Automotive Catalysis," 1978 Summer Computer Simulation Conference, Newport Beach, CA, July 1978.
7. "A Justification of the Internal Isothermal Model for Gas-Solid Catalytic Reactions," Sixth North American Meeting of the Catalysis Society, Chicago, IL, March 1979.
- * 8. "Chemical and Catalytic Reactor Models - A Survey," Second International Conference on Mathematical Modeling, St. Louis, MO, July 1979.
9. "Yield Optimization in a Tube-Wall Reactor," ACS National Meeting, Washington, D.C., September 1979.
10. "Connections of the Bimolecular Langmuir-Hinshelwood with Negative First-Order Kinetics," ACS National Meeting, Washington, D.C., September 1979.
11. "On Various Normalizations for Diffusion-Reaction in Catalyst Pellets," AIChE Annual Meeting, San Francisco, CA, November 1979.
12. "Diffusion-Reaction of CO, NO and O₂ in Automotive Exhaust Catalysts," AIChE Annual Meeting, San Francisco, CA, November 1979.
13. "An Experimental and Theoretical Investigation of Ethylene Oxidation on Supported Platinum in an Adiabatic Fixed-Bed Reactor," ISCRE-6, Nice, France, March 1980.
- * 14. "A History of the Use of Mathematics in Chemical Engineering," ACS National Meeting, Las Vegas, NV, August 1980.
- * 15. "Fixed-Bed Reactors: A Review," ACS National Meeting, Las Vegas, NV, August 1980.
16. "Multiplicity Criteria for Gas-Liquid Stirred Tank and Bubble Column Reactors," AIChE Annual Meeting, Chicago, IL, November 1980.
17. "Parametric Sensitivity and Runaway in Tubular Reactors," AIChE Annual Meeting, Chicago, IL, November 1980.
18. "Reaction Kinetics on Three-Way Catalysts for Automotive Exhausts," Seventh North American Meeting of the Catalysis Society, Boston, MA, October 1981.
19. "Influence of Ceria on Platinum Catalysts," AIChE Annual Meeting, New Orleans, LA, November 1981.
20. "Optimal Catalyst Activity Profiles in Pellets," AIChE Annual Meeting, New Orleans, LA, November 1981.
- * 21. "Ernest W. Thiele and Diffusion-Reaction in Catalyst Pellets," ACS National Meeting, Las Vegas, NV, March 1982.
22. "Modeling of Gas-Liquid CSTRs," AIChE Annual Meeting, Los Angeles, CA, November 1982.
23. "Complex Dynamic Behavior in the Case of the CO-NO-O₂-H₂O Reaction System on Pt/ γ -Al₂O₃ Catalyst in a Tubular Reactor," AIChE Annual Meeting, Los Angeles, CA, November 1982. NATO Workshop on Chemical Instabilities, Austin, TX, March

1983. Eighth North American Meeting of the Catalysis Society, Philadelphia, PA, May 1983.
24. "Reactions of CO, NO, O₂ and H₂O on Three-Way and Pt/ γ -Al₂O₃ Catalysts," AIChE 1983.
 - * 25. International Chemical Reaction Engineering Conference, Pune, India, January 1984.
 26. "Optimal Catalyst Activity Profiles in Pellets: Analytical Evaluation of the Isothermal Fixed-Bed Reactor," AIChE Annual Meeting, Washington, D.C., November 1983.
 27. "Optimal Catalyst Pellet Design for an Isothermal Bimolecular Langmuir-Hinshelwood Reaction in a Fixed-Bed Reactor," ACS National Meeting, Philadelphia, PA, August 1984.
 28. "Ethylene Oxidation on Supported Platinum in a Nonadiabatic Fixed-Bed Reactor: Experiments and Model," AIChE Annual Meeting, San Francisco, CA, November 1984.
 29. "Optimal Catalyst Activity Profiles in Pellets," Ninth North American Meeting of the Catalysis Society, Houston, TX, March 1985.
 31. "Reactions of C₃H₆, NO, O₂ and H₂O over a Platinum Catalyst," Ninth North American Meeting of the Catalysis Society, Houston, TX, March 1985.
 32. "Oscillatory Behavior in the C₃H₆-NO-O₂-H₂O System over a Platinum Catalyst," ACS National Meeting, Miami Beach, FL, April 1985.
 32. "Approximate Solutions for Nonlinear Reaction - Diffusion from Maximum Principle," SIAM Spring Meeting, Pittsburgh, PA, June 1985.
 - * 33. "Optimal Catalyst Activity Profiles in Pellets," AMS - SIAM Summer Seminar Lecture, Cornell University, Ithaca, NY, June 1985.
 34. "Parametric Sensitivity and Runaway in Fixed-Bed Catalytic Reactors," ACS National Meeting, Chicago, IL, September 1985.
 - * 35. "Diffusion-Reaction in Nonuniformly Active Catalyst Pellets," Symposium held in honor of 90th Birthday of Dr. E. W. Thiele, AIChE Meeting, Chicago, IL, November 1985.
 36. "Parametric Sensitivity in Fixed-Bed Catalytic Reactors," AIChE Annual Meeting, Chicago, IL, November 1985.
 37. "Ethylene Oxidation on Supported Silver and Silver-Gold Catalysts," AIChE Annual Meeting, Chicago, IL, November 1985.
 38. "Approximate Solutions of Nonlinear Boundary Value Problems," AIChE Annual Meeting, Chicago, IL, November 1985.
 39. "Optimal Catalyst Activity Profiles in Pellets: Theory and Experiments," AIChE Annual Meeting, Chicago, IL, November 1985.
 40. "Parametric Sensitivity and Runaway in Fixed-Bed Catalytic Reactors," ISCRE 9, Philadelphia, PA, May 1986.
 41. "Optimal Catalyst Activity Profiles in Pellets," World Congress III of Chemical Engineering, Tokyo, Japan, September 1986.
 42. "Modeling of Fixed-Bed Reactors with Non-Uniformly Active Catalyst Pellets," AIChE Annual Meeting, Miami Beach, FL, November 1986.
 43. "Parametric Sensitivity in Chain Polymerization Reactors," AIChE Annual Meeting, Miami Beach, FL, November 1986.
 - * 44. "Optimal Catalyst Activity Profiles in Pellets," International Chemical Reaction Engineering Conference - 2, Pune, India, April 1987.
 45. "Parametric Sensitivity and Runaway in Fixed-Bed Catalytic Reactors: Effects of Radial Heat and Mass Dispersion," AIChE Annual Meeting, New York, NY, November 1987.
 46. "Preparation of Pt/ γ -Al₂O₃ Pellets with Internal Step-Distribution of Catalyst: Experiments and Theory," AIChE Annual Meeting, New York, NY, November 1987.

47. "An Isothermal Fixed-Bed Reactor with Nonuniformly Active Catalysts: Experiments and Theory," ISCRE 10, Basel, Switzerland, August 1988.
48. "An Isothermal Fixed-Bed Reactor with Nonuniformly Active Catalysts," AIChE Annual Meeting, Washington, D.C., November 1988.
49. "Upper and Lower Bounding Solutions for Nonlinear Diffusion-Reaction Equations," AIChE Annual Meeting, Washington, D.C., November 1988.
50. "Self-Propagating Solid-Solid Noncatalytic Reactions in Finite Pellets," AIChE Annual Meeting, Washington, D.C., November 1988.
- * 51. "Parametric Sensitivity and Runaway in Chemical Reactors," International Conference on Advances in Chemical Engineering, Kanpur, India, January 1989.
52. "Optimal Catalyst Activity Profiles in Pellets: General Nonisothermal Reacting Systems with Arbitrary Kinetics," AIChE Annual Meeting, San Francisco, CA, November 1989.
53. "Parametric Sensitivity and Runaway in Catalytic Reactors: Experiments and Theory," ISCRE 11, Toronto, Canada, July 1990.
54. "A Microcomputer Automated Reactor for Synthesis of ^{13}C Labeled Monosaccharides," ACS National Meeting, Washington, D.C., August 1990.
Note: This paper received the 1990 Outstanding Student Paper Award from the American Chemical Society - Carbohydrate Division.
55. "An Automated Reactor for the Synthesis of Stable Isotopically Enriched Monosaccharides," AIChE Annual Meeting, Chicago, IL, November 1990.
56. "The Influence of Silicate Melts in the Synthesis of Reaction-Bonded Silicon Nitride," AIChE Annual Meeting, Chicago, IL, November 1990.
57. "Combustion Synthesis of TiC and Intermetallic Compounds," AIChE Annual Meeting, Chicago, IL, November 1990.
58. "Optimal Catalyst Activity Profiles in Pellets: The Case of Catalyst Surface Area Varying with Catalyst Loading," AIChE Annual Meeting, Chicago, IL, November 1990.
59. "Combustion Synthesis of Intermetallic and Composite Materials," TMS Annual Meeting, New Orleans, LA, February 1991.
60. "Combustion Synthesis of the $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ Superconductor," Sintering '91, Vancouver, Canada, July 1991.
- * 61. "Self-Propagating Reactions in Finite Pellets: Theory and Experiments," 1st International Symposium on Self-Propagating High-Temperature Synthesis, Alma-Ata, USSR, September 1991.
- * 62. "Optimal Catalyst Activity Profiles in Pellets," First Exxon Frontiers of Science Workshop on Catalysis and Catalytic Processes, Exxon Research & Engineering Company, Annandale, NJ, November 1991.
63. "Optimal Catalyst Activity Profiles in Pellets: An Experimental Study of Ethylene Epoxidation," AIChE Annual Meeting, Los Angeles, CA, November 1991.
64. "Self-Propagating High-Temperature Synthesis of Ceramic Superconductors," AIChE Annual Meeting, Los Angeles, CA, November 1991.
65. "Combustion Synthesis of Advanced Materials," AIChE Annual Meeting, Los Angeles, CA, November 1991.
66. "The Effects of Semiconductor Properties Upon Photocatalytic Rates for Organic Contaminant Degradation," AIChE Annual Meeting, Los Angeles, CA, November 1991.
67. "Optimal Catalyst Activity Profiles in Pellets," ACS National Meeting, San Francisco, CA, April 1992.
- * 68. "Combustion Synthesis of Advanced Materials," Plenary Lecture, ISCRE 12, Torino, Italy, June 1992.

69. "Chemical Reaction Engineering Considerations in the Synthesis of Silicon Nitride," ISCRE 12, Torino, Italy, June 1992.
70. "Optimal Distribution of Silver Catalyst for Epoxidation of Ethylene," ACS National Meeting, Washington, D.C., August 1992.
71. "Mechanistic Studies of Combustion Synthesis," AIChE Annual Meeting, Miami Beach, FL, November 1992.
72. "Instabilities During the Combustion Synthesis of Nickel Aluminides," AIChE Annual Meeting, Miami Beach, FL, November 1992.
73. "Optimal Distribution of Silver Catalyst in Pellets for Epoxidation of Ethylene," AIChE Annual Meeting, Miami Beach, FL, November 1992.
74. "Adsorption and Desorption Studies in the Aqueous Phase for the Toluene/Activated Carbon System," AIChE Annual Meeting, Miami Beach, FL, November 1992.
75. "Combustion Synthesis of Advanced Materials," ACS Meeting, Denver, CO, April 1993.
76. "Optimal Distribution of Silver Catalyst in Pellets for Epoxidation of Ethylene," 13th North American Meeting of The Catalysis Society, Pittsburgh, PA, May 1993.
77. "Optimal Distribution of Catalyst in Pellets," US-Japan-China Symposium on Heterogeneous Catalysis, Beijing, China, June 1993.
78. "Combustion Synthesis of Intermetallic Aluminides: Processing and Mechanistic Studies," National Heat Transfer Conference, Atlanta, GA, August 1993.
79. "Some New Considerations Involving Gas-Solid Reactions Following the Sharp Interface Model," AIChE Annual Meeting, St. Louis, MO, November 1993.
80. "Experimental and Modeling Studies on the Aqueous-Phase Adsorption and Desorption of Toluene in Activated Carbon Fixed Beds," AIChE Annual Meeting, St. Louis, MO, November 1993.
81. "Combustion Synthesis of Intermetallic Aluminides: Mechanistic and Processing Studies," AIChE Annual Meeting, St. Louis, MO, November 1993.
82. "A New Expression for the Velocity of a Combustion Front During SHS," AIChE Annual Meeting, St. Louis, MO, November 1993.
- * 83. "Combustion Synthesis of Intermetallic Aluminides," Second International Symposium on Self-Propagating High Temperature Synthesis, Honolulu, HI, November 1993.
84. "Microstructural Aspects of SHS in the Ti-Si and Ti-Al Systems," Second International Symposium on Self-Propagating High Temperature Synthesis, Honolulu, HI, November 1993.
85. "Mechanistic and Processing Studies in Combustion Synthesis of Niobium Aluminide Matrix Composites," Materials Research Society Meeting, San Francisco, CA, April 1994.
86. "On the Velocity of the Combustion Front during Self-Propagating High Temperature Synthesis," Eighth World Ceramics Congress & Forum on New Materials, Florence, Italy, June 1994.
87. "Nonuniform Catalyst Distribution for Catalytic Membrane Reactors," Third International Conference on Inorganic Membranes, Worcester, MA, July 1994.
88. "A Comparison Between Uniform and Nonuniform Catalyst Distribution for Inorganic Membrane Reactors," International Symposium on Synthetic Membranes in Science and Industry, Tübingen, Germany, August 1994.
89. "Microstructure of Gasless Combustion Waves," Zeldovich Memorial-International Conference on Combustion, Moscow, Russia, September 1994.
90. "On the Performance of Inorganic Membrane Reactors with Nonuniform Catalyst Distribution," First International Workshop on Catalytic Membranes, Lyon, France, September 1994.

91. "Novel Preparation Techniques for Supported Thin Metallic Membranes and Inorganic Ceramic Membranes," First International Workshop on Catalytic Membranes, Lyon, France, September 1994.
92. "Mechanism of Structure Formation during Combustion Synthesis of Materials," ISCRE 13, Baltimore, MD, September 1994.
93. "Nonuniform Catalyst Distribution for Catalytic Membrane Reactors," ISCRE 13, Baltimore, MD, September 1994.
94. "Modeling and Analysis of the Reaction-Bonded Silicon Nitride Synthesis," AIChE Annual Meeting, San Francisco, CA, November 1994.
95. "Mechanistic Investigation of Structure Formation during Combustion Synthesis using a Particle-Foil Experiment," AIChE Annual Meeting, San Francisco, CA, November 1994.
96. "A Novel Preparation Technique for Supported Thin Metallic Membranes for Gas Separation and Reaction," AIChE Annual Meeting, San Francisco, CA, November 1994.
97. "The Effect of Gravity on the Combustion Synthesis of Ni-Al and Ni₃Al-TiB₂ Composites from Elements," Third International Microgravity Combustion Workshop, NASA Lewis Research Center, Cleveland, OH, April 1995.
98. "Effects of 1, 2 Dichloroethane Addition on the Optimal Silver Catalyst Distribution in Pellets for Epoxidation of Ethylene," 14th North American Meeting of The Catalysis Society, Snowbird, UT, June 1995.
99. "Experimental Study of Gasless Combustion Wave Microstructure," International Pyrotechnic Conference, Moscow, Russia, September 1995.
100. "Influence of Pulsing Frequency on Performance of Three-Phase Packed-Bed Reactors," 2nd International Conference on Unsteady-State Processes in Catalysis, St. Louis, MO, September 1995.
- * 101. "Mechanistic Studies in the Combustion Synthesis of Aluminides and Silicides," 3rd International Symposium on Self-Propagating High-Temperature Synthesis, Wuhan, China, October 1995.
102. "The Influence of Experimental Parameters on the Effective Kinetics of SHS Processes," 3rd International Symposium on Self-Propagating High-Temperature Synthesis, Wuhan, China, October 1995.
103. "Experimental Study of Gasless Combustion Wave Microstructure," 3rd International Symposium on Self-Propagating High-Temperature Synthesis, Wuhan, China, October 1995.
104. "The Effect of Gravity on the Combustion Synthesis of Intermetallic Matrix-Ceramic Composites," 3rd International Symposium on Self-Propagating High-Temperature Synthesis, Wuhan, China, October 1995.
105. "Effect of Catalyst Activity Distribution on Inorganic Membrane Reactor Performance," AIChE Annual Meeting, Miami, FL, November 1995.
106. "An Experimental and Theoretical Study of Combustion Wave Microstructure," AIChE Annual Meeting, Miami, FL, November 1995.
107. "Modeling and Analysis of the Reaction-Bonded Silicon Nitride Synthesis," AIChE Annual Meeting, Miami, FL, November 1995.
108. "Enhancement of Three-Phase Packed-Bed Reactor Performance by Tuning the Pulsing Frequency in Pulse-Flow Regime," AIChE Annual Meeting, Miami, FL, November 1995.
109. "Investigation of Phase Transformations and Ordering during Combustion Synthesis," Materials Research Society Fall Meeting, Boston, MA, November 1995.

110. "Metal Composite Membranes: Synthesis, Characterization and Reaction Studies," 11th International Congress on Catalysis, Baltimore, MD, July 1996.
- * 111. "Metal Composite Membranes: Synthesis, Characterization and Reaction Studies," 5th World Congress in Chemical Engineering, San Diego, CA, July 1996.
112. "Microporous Ceramic Membranes: Synthesis, Characterization and Reaction Studies," 5th World Congress in Chemical Engineering, San Diego, CA, July 1996
- * 113. "Mechanistic Studies in Combustion Synthesis of Advanced Materials," 5th World Congress in Chemical Engineering, San Diego, CA, July 1996.
114. "Synthesis of Reaction-Bonded Silicon Nitride: Experiments and Theory," 5th World Congress in Chemical Engineering, San Diego, CA, July 1996.
115. "Membrane Synthesis and Catalyst Distribution Studies for Ethane Dehydrogenation in Microporous Alumina Membrane Reactors," Fourth International Conference on Inorganic Membranes, Gatlinburg, TN, July 1996.
116. "Microporous Ceramic Membranes for Dehydrogenation and Oxidation Reactions," AIChE Annual Meeting, Chicago, IL, November 1996.
117. "Mechanisms of Structure Formation and Wave Microstructure during Combustion Synthesis," AIChE Annual Meeting, Chicago, IL, November 1996.
118. "The Effects of Gravity on Combustion and Structure Formation during Combustion Synthesis in Gasless Systems," Fourth International Microgravity Combustion Workshop, Cleveland, OH, May 1997.
- * 119. "Combustion Wave Microstructure in Heterogeneous Reaction Systems: Experiments and Theory," 4th International Symposium on Self-Propagating High-Temperature Synthesis, Toledo, Spain, October 1997.
120. "The Effects of Gravity on Combustion and Structure Formation in Heterogeneous Systems," 4th International Symposium on Self-Propagating High-Temperature Synthesis, Toledo, Spain, October 1997.
121. "Ethane Dehydrogenation and Ethylene Epoxidation Reactions in a Membrane Reactor," Asia-Pacific Congress on Catalysis, Kyongju, Korea, November 1997.
122. "The Role of Gravity on the Mechanism of Combustion Synthesis of Advanced Materials," AIChE Annual Meeting, Los Angeles, CA, November 1997.
123. "Enhancing Performance of Three-Phase Packed-Bed Catalytic Reactors by Pulsing-Flow Regime," AIChE Annual Meeting, Los Angeles, CA, November 1997.
124. "Supported Pd and Pd-Ag Alloy Membranes: Relationships Between Plating Kinetics, Film Microstructure and Membrane Permeation," AIChE Annual Meeting, Los Angeles, CA, November 1997.
125. "Effect of Pulsing on Reaction Outcome in a Gas-Liquid Catalytic Packed-Bed Reactor," 2nd International Symposium on Catalysis in Multiphase Reactors, Toulouse, France, March 1998.
126. "Enhancing Performance of Three-Phase Packed-Bed Catalytic Reactors by Pulsing-Flow Regime," Third International Conference on Unsteady State Processes in Catalysis, St. Petersburg, Russia, July 1998.
127. "Mechanisms of Reaction Wave Propagation during Combustion Synthesis of Advanced Materials," ISCRE 15, Newport Beach, CA, September 1998.
128. "Study of Structure Formation during Electroless Plating of Metal-Composite Membranes," ISCRE 15, Newport Beach, CA, September 1998.
- * 129. "Dynamics of Structure Formation during Electroless Plating of Metal-Ceramic Composite Membranes," First Annual Users' Meeting, Burleigh Instruments, Baltimore, MD, November 1998.
130. "Complex Behavior of Self-Propagating Reaction Waves during Combustion Synthesis

- of Advanced Materials," AIChE Annual Meeting, Miami Beach, November 1998.
131. "Ethylene Epoxidation in a Catalytic Packed-Bed Membrane Reactor," AIChE Annual Meeting, Miami Beach, November 1998.
 132. "Kinetics of Rapid High-Temperature Reactions in Gas-Solid Systems," AIChE Annual Meeting, Miami Beach, November 1998.
 133. "Dynamics of Structure Formation during Electroless Plating of Metal-Ceramic Composite Membranes," AIChE Annual Meeting, Miami Beach, November 1998.
 - * 134. "Ethylene Epoxidation in a Catalytic Packed-Bed Membrane Reactor," Industrial Chemistry Award Symposium, ACS National Meeting, Anaheim, CA, March 1999.
 135. "The Effects of Gravity on Combustion and Structure Formation during Synthesis of Advanced Materials," Fifth International Microgravity Combustion Workshop, Cleveland, OH, May 1999.
 - * 136. "Combustion Synthesis of Advanced Materials," Plenary Lecture, Asia-Pacific Chemical Reaction Engineering Symposium, Hong Kong, June 1999.
 - * 137. "Complex Behavior of Self-Propagating Reaction Waves in Heterogeneous Media," Fifth International Symposium on Self-Propagating High-Temperature Synthesis, Moscow, Russia, August 1999.
 138. "Macroscopic Mechanisms of Pulsating Combustion in Gasless Systems," Fifth International Symposium on Self-Propagating High-Temperature Synthesis, Moscow, Russia, August 1999.
 139. "Influence of Heating Rate on Kinetics of Rapid High-Temperature Reactions," Fifth International Symposium on Self-Propagating High-Temperature Synthesis, Moscow, Russia, August 1999.
 140. "Ethylene Epoxidation in a Catalytic Packed-Bed Membrane Reactor: Experiments and Model," AIChE Annual Meeting, Dallas, TX, November 1999.
 141. "Dense Palladium Composite Membranes: Synthesis, Characterization and Permeation Properties," AIChE Annual Meeting, Dallas, TX, November 1999.
 142. "Oscillation Combustion Modes in Gasless Reaction Systems," AIChE Annual Meeting, Dallas, TX, November 1999.
 143. "Influence of Heating Dynamics on Kinetics of Rapid High-Temperature Reactions," AIChE Annual Meeting, Dallas, TX, November 1999.
 144. "Ethylene Epoxidation in a Catalytic Packed-Bed Membrane Reactor," Membrane Conference on Technology/Planning, Newton, MA, December 1999.
 145. "Palladium Composite Membranes: Synthesis, Characterization and Hydrogen Permeation Studies," North American Membrane Society Annual Meeting, Boulder, CO, May 2000.
 146. "Methanol Oxidative Dehydrogenation in a Catalytic Packed-Bed Membrane Reactor," North American Membrane Society Annual Meeting, Boulder, CO, May 2000.
 - * 147. "Combustion Synthesis of Advanced Materials," Chemical Engineering Lectureship Award Lecture, ASEE Annual Meeting, St. Louis, MO, June 2000.
 148. "Pd Composite Membranes Prepared by Electroless Plating and Osmosis: Synthesis, Characterization, and H₂ Permeation Studies," Sixth International Conference on Inorganic Membranes, Montpellier, France, June 2000.
 149. "Perovskite Membranes Prepared by Combustion Technique: Synthesis, Characterization and O₂ Permeation Studies," Sixth International Conference on Inorganic Membranes, Montpellier, France, June 2000.
 150. "Methanol Partial Oxidation in a Catalytic Packed-Bed Membrane Reactor," Fourth International Conference on Catalysis in Membrane Reactors, Zaragoza, Spain, July 2000.

151. "Microstructural Mechanism of Combustion in Heterogeneous Reaction Media," Twenty-eighth International Symposium on Combustion, Edinburgh, Scotland, August 2000.
152. "Ethylene Epoxidation in a Catalytic Packed-Bed Membrane Reactor: Experiments and Model," ISCRE 16, Cracow, Poland, September 2000.
153. "Dynamics of Self-Propagating Reactions in Heterogeneous Media: Experiments and Model," ISCRE 16, Cracow, Poland, September 2000.
154. "Perovskite Membranes Prepared by Combustion Synthesis: Synthesis and Characterization," AIChE Annual Meeting, Los Angeles, CA, November 2000.
155. "Kinetics of Phase Formation during Combustion Synthesis of Advanced Materials," AIChE Annual Meeting, Los Angeles, CA, November 2000.
156. "Methanol Oxidative Dehydrogenation in a Catalytic Packed-Bed Membrane Reactor: Selectivity to Formaldehyde and Membrane Effect on Reactor Stability," AIChE Annual Meeting, Los Angeles, CA, November 2000.
157. "Combustion Synthesis of NiAl-TiB₂ Composites," AIChE Annual Meeting, Los Angeles, CA, November 2000.
158. "Properties of Perovskite Materials Prepared by Aqueous Combustion Synthesis for Fuel Cell Applications," NASCRE-1, Houston, TX, January 2001.
159. "Methanol Oxidative Dehydrogenation in a Catalytic Packed-Bed Membrane Reactor: Experiments and Model," NASCRE-1, Houston, TX, January 2001.
160. "Combustion of Levitated Clad Al/Ni Particles," Joint US Sections Meeting of the Combustion Institute, Oakland, CA, March 2001.
161. "Membranes for Solid Oxide Fuel Cells by Aqueous Combustion Synthesis," North American Membrane Society Annual Meeting, Lexington, KY, May 2001.
162. "Mechanistic Studies of Combustion and Structure Formation during Synthesis of Advanced Materials," Sixth International Microgravity Combustion Workshop, Cleveland, OH, May 2001.
163. "Methanol Oxidative Dehydrogenation in a Catalytic Packed-Bed Membrane Reactor: Experiments and Model," 2nd International Symposium on Multifunctional Reactors, Nuremberg, Germany, June 2001.
164. "Mechanistic Studies of Combustion and Structure Formation during Synthesis of Advanced Materials: Effects of Gravity," Gordon Research Conference on Gravitational Effects in Physicochemical Systems, New London, NH, July 2001.
165. "Novel Synthesis Route for Perovskite Membranes," ACS National Meeting, Chicago, IL, August 2001.
166. "Reactant Distribution by Inert Membrane Enhances Packed-Bed Reactor Stability," AIChE Annual Meeting, Reno, NV, November 2001.
167. "Measurements of Local, Transient, Fluid-Solid Heat Transfer in a Cocurrent Gas-Liquid- Flow Packed-Bed," AIChE Annual Meeting, Reno, NV, November 2001.
168. "Phenylacetylene Hydrogenation over Pt/Al₂O₃ Catalyst: Kinetics, Modeling and Reactor Performance," AIChE Annual Meeting, Reno, NV, November 2001.
169. "Combustion Synthesis of Orthopedic Implant Materials," AIChE Annual Meeting, Reno, NV, November 2001.
- * 170. "Combustion Synthesis of Advanced Materials," Perkin Elmer Chemcon Distinguished Lecture, Indian Institute of Chemical Engineers Meeting, Chennai, India, December 2001.
- * 171. "Mechanistic Studies of Combustion and Structure Formation during Synthesis of Advanced Materials," 40th AIAA Aerospace Sciences Meeting, Reno, NV, January 2002.

172. "Combustion of Low-Exothermic Condensed Systems for Oxygen Generation," Meeting of the Central States Section, Combustion Institute, Knoxville, TN, April 2002.
173. "Novel Technique for Synthesis of Dense CoCrMo Implant Materials," 28th Annual Society for Biomaterials Meeting, Tampa, FL, April 2002.
174. "Methanol Oxidative Dehydrogenation in a Packed-Bed Membrane Reactor: Yield Optimization Experiments and Model," ISCRE-17, Hong Kong, China, August 2002.
175. "Phenylacetylene Hydrogenation in a Three-Phase Catalytic Packed-Bed Reactor: Experiments and Model," ISCRE-17, Hong Kong, China, August 2002.
176. "Sintering Mechanisms in Mesocarbon Microbeads for Use as High-Performance Composite Friction Materials," AIChE Annual Meeting, Indianapolis, IN, November 2002.
177. "Single and Multi-Wall Carbon Nanotubes by Floating Catalyst Method: Synthesis and Properties," AIChE Annual Meeting, Indianapolis, IN, November 2002.
178. "Methanol Oxidative Dehydrogenation in a Packed-Bed Membrane Reactor: Yield Optimization Experiments and Model," AIChE Annual Meeting, Indianapolis, IN, November 2002.
179. "Novel Membrane Trickle-bed Reactor for Pharmaceuticals and Fine Chemicals," AIChE Annual Meeting, Indianapolis, IN, November 2002.
180. "Yield and Productivity Enhancement in a Packed-Bed Membrane Reactor: A Case Study," MRS Fall Meeting, Boston, MA, December 2002.
- * 181. "Combustion Synthesis of Bio-Alloys: Phase Separation Mechanism," 41st AIAA Aerospace Sciences Meeting, Reno, NV, January 2003.
182. "Combustion of Complex Metal Particles," Third Joint U.S. Sections Meeting of the Combustion Institute, Chicago, IL, March 2003.
183. "Mechanistic Studies of Combustion and Structure Formation during Combustion Synthesis of Advanced Materials: Phase Separation Mechanism for Bio-Alloys," 7th International Workshop on Microgravity Combustion and Chemically Reacting Systems, Cleveland, OH, June 2003.
184. "Rapid Reaction Wave Propagation in Porous Media," 7th International Symposium on SHS, Krakow, Poland, July 2003.
185. "Influence of Heating Rate on Kinetics of Rapid High-Temperature Reactions in Condensed Heterogeneous Systems," 7th International Symposium on SHS, Krakow, Poland, July 2003.
186. "Packed-Bed Reactor Performance Enhancement by Membrane Distributed Feed: The Case of Methanol Oxidative Dehydrogenation," ISMR-3, Bath, U.K., August 2003.
187. "Effects of Induced-Pulsing Flow on Trickle-Bed Reactor Performance," USPC-4, Montreal, Canada, October 2003.
188. "Novel Preparation of Perovskite Catalysts," AIChE Annual Meeting, San Francisco, CA, November 2003.
189. "Novel Synthesis of Nanoscale Iron Oxides," AIChE Annual Meeting, San Francisco, CA, November 2003.
190. "Nanostructured Carbon-Based Composites for Advanced Friction Applications," AIChE Annual Meeting, San Francisco, CA, November 2003.
- * 191. "Combustion Synthesis of Nanomaterials: Mechanism, Characterization and Properties," MRS Fall Meeting, Boston, MA, December 2003.
192. "Microstructural Correlations between Reaction Medium and Combustion Wave Propagation in Heterogeneous Systems," A.S. Mukasyan, A.S. Rogachev, M. Mercedes and A. Varma, ISCRE-18, Chicago, IL, June 2004.

193. "Nickel-Coated Aluminum Particles: A Promising Fuel for Mars Missions," Strategic Research to Enable NASA's Exploration Missions Conference and Workshop, Cleveland, OH, June 2004.
- * 194. "Future Directions in Chemical Engineering Education: A New Path to Glory," Industrial Biotechnology Congress, Mayaguez, PR, September 2004.
195. "High Throughput Analysis of Perovskite Catalysts for Reforming of Heavy Hydrocarbons," AIChE Annual Meeting, Austin, TX, November 2004.
196. "Combinatorial Approach to Catalyst Improvement for Direct Methanol Fuel Cells," AIChE Annual Meeting, Austin, TX, November 2004.
197. "In-situ Reinforcement Formation in Mesocarbon Microbeads," AIChE Annual Meeting, Austin, TX, November 2004.
- * 198. "Future Directions in Chemical Engineering Education: A New Path to Glory," First Joint AIChE-IChE Meeting, Mumbai, India, December 2004.
199. "Combustion of Condensed Systems for Oxygen and Hydrogen Generation," Joint Meeting of the US Sections of the Combustion Institute, Philadelphia, PA, March 2005.
200. "Hydrogen Generation via Combustion of Metal Borohydride/Aluminum/Water Mixtures," ACS National Meeting, Washington, DC, August 2005.
201. "Numerical Modeling of Combustion Stability in Emergency Oxygen Generators," AIChE Annual Meeting, Cincinnati, OH, November 2005.
202. "Studies on Combustion of Single Ni-Coated Al Particles in Normal and Reduced Gravity," AIChE Annual Meeting, Cincinnati, OH, November 2005.
203. "Novel Chemical Mixtures for Hydrogen Generation by Combustion," AIChE Annual Meeting, Cincinnati, OH, November 2005.
204. "Studies on Ignition and Combustion Mechanisms of Single Ni-Coated Al Particles," 44th AIAA Aerospace Sciences Meeting, Reno, NV, January 2006.
205. "Novel Chemical Mixtures for Hydrogen Generation by Combustion," 44th AIAA Aerospace Sciences Meeting, Reno, NV, January 2006.
- * 206. "Combustion-Based Methods to Generate Hydrogen for Fuel Cells," NSF Workshop on *Research Frontiers for Combustion in the Hydrogen Economy*, Arlington, VA, March 2006.
207. "Combustion-Based Methods to Generate Hydrogen for Fuel Cells," First Annual Energy Center Hydrogen Initiative Symposium, West Lafayette, IN, April 2006.
208. "Purdue Hydrogen Technology Program," 2006 DOE Hydrogen Program Merit Review and Peer Evaluation Meeting, Arlington, VA, May 2006.
209. "Ignition and Combustion Mechanisms of Nickel-Coated Aluminum Particles," 2006 Technical Meeting of the Central States Section of the Combustion Institute, Cleveland, OH, May 2006.
210. "Solution Combustion Synthesized Oxygen Carriers for Chemical Looping Combustion," ISCRE-19, Potsdam/Berlin, Germany, September 2006.
211. "Hydrogen Generation by Combustion," ISCRE-19, Potsdam/Berlin, Germany, September 2006.
- * 212. "Hydrogen Generation by Combustion for Portable Fuel Cell Applications," 2006 Hydrogen Production & Storage Forum, Vancouver, BC, Canada, September 2006.
213. "Ignition Mechanisms of Metal-Coated Aluminum Particles," AIChE Annual Meeting, San Francisco, CA, November 2006.
214. "Doped Oxygen Carriers for Inherent CO₂ Capture Using Chemical Looping Combustion," AIChE Annual Meeting, San Francisco, CA, November 2006.

215. "Novel Chemical Mixtures to Generate Hydrogen for Portable Fuel Cells," AIChE Annual Meeting, San Francisco, CA, November 2006.
216. "Combustion-Assisted Hydrolysis of Sodium Borohydride for Hydrogen Generation," MRS Fall Meeting, Boston, MA, November, 2006.
217. "Spinel Supported Oxygen Carriers for Inherent CO₂ Separation during Power Generation," CAMURE-6 and ISMR-5 Symposia, National Chemical Laboratory, Pune, India, January 2007.
- * 218. "Evolving Trends in Chemical Engineering Education and the Energy Challenge," CAMURE-6 and ISMR-5 Symposia, National Chemical Laboratory, Pune, India, January 2007.
219. "Development of Oxygen Carriers for Inherent CO₂ Capture," NASCRE-2, Houston, TX, February 2007.
220. "Novel Chemical Mixtures to Generate Hydrogen for Fuel Cells," NASCRE-2, Houston, TX, February 2007.
221. "Combustion of Single Titanium and Coated Aluminum Particles," 5th US Combustion Meeting, San Diego, CA, March 2007.
222. "Combustion of Borohydride/Metal/Water Mixtures for Hydrogen Generation," 5th US Combustion Meeting, San Diego, CA, March 2007.
223. "Purdue Hydrogen Technology Program," DOE Hydrogen Program Annual Merit Review, Arlington, VA, May 2007.
224. "Metal-CO₂ Propulsion for Mars Missions: Current Status and Opportunities," 43rd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Cincinnati, OH, July 2007.
225. "Ignition of Aluminum Particles Coated by Nickel or Iron: Studies under Normal and Reduced Gravity Conditions," 43rd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Cincinnati, OH, July 2007.
- * 226. "Hydrogen Generation for Portable Fuel Cells by Using Novel Chemical Mixtures," 234th ACS National Meeting, Boston, MA, August 2007.
227. "Transition Metal / Alloy Foams By Combustion Technique," AIChE Annual Meeting, Salt Lake City, UT, November 2007.
228. "Modeling of Combustion Wave Propagation in Heterogeneous Mixtures for Hydrogen Generation," AIChE Annual Meeting, Salt Lake City, UT, November 2007.
229. "Heterogeneous Mixtures of Boron Compounds with Metals and Water for Hydrogen Generation," AIChE Annual Meeting, Salt Lake City, UT, November 2007.
230. "Catalytic Conversion of Glycerol to High-Value Chemicals", Biofuels Symposium, Discovery Park Energy Center, Purdue University, West Lafayette, IN, May 2008.
231. "Increasing Productivity of Bioethanol. A Model-Driven Approach to Process Optimization and Strain Improvement" Biofuels Symposium, Discovery Park Energy Center, Purdue University, West Lafayette, IN, May 2008.
232. "Purdue Hydrogen Systems Laboratory," 2008 DOE Hydrogen Program Merit Review and Peer Evaluation Meeting, Arlington, VA, June 2008.
233. "Catalytic Conversion of Glycerol to High-Value Chemicals", ACS Green Chemistry Summer School, Colorado School of Mines, Golden, CO, July 2008.
234. "New Methods for Hydrogen Generation from Boron Compounds and Water," 32nd International Symposium on Combustion, Montreal, Canada, August 2008.
235. "More Ethanol in Recombinant Yeast from Modeling: Towards Pathway Modifications Using Hybrid Cybernetic Models," Metabolic Engineering VII. Health and Sustainability, Puerto Vallarta, Mexico, September 2008.
236. "Hydrogen Generation from Boron Compounds Using Metal/Water Reactions: Experiments and Model," ISCRE-20 Meeting, Kyoto, Japan, September 2008.

237. "Catalytic Oxidation of Glycerol to High-Value Chemicals", AIChE Annual Meeting, Philadelphia, PA, November 2008.
238. "Identification of Potential Target Pathways of Recombinant Yeast for Increasing Bioethanol Productivity: In Silico Analysis Using Cybernetic Models," AIChE Annual Meeting, Philadelphia, PA, November 2008.
239. "Optimization of Batch and Continuous Fermenters for Increasing Bioethanol Productivity Using Hybrid Cybernetic Models," AIChE Annual Meeting, Philadelphia, PA, November 2008.
240. "Hydrothermolysis of Ammonia Borane: A Novel Method to Generate Hydrogen for Fuel Cells," AIChE Annual Meeting, Philadelphia, PA, November 2008.
- * 241. "New Methods for Hydrogen Generation from Boron Compounds and Water," Prof. R. Aris Memorial session, AIChE Annual Meeting, Philadelphia, PA, November 2008.
- * 242. "Experimental and Modeling Studies on Combustion Wave Propagation in Metal/Water Mixtures for Hydrogen Generation," Session in honor of Prof. D. Ramkrishna's 70th birthday, AIChE Annual Meeting, Philadelphia, PA, November 2008.
- * 243. "New Methods for Hydrogen Generation from Boron Compounds and Water," CNR Rao Distinguished Lecture, Chemcon 2008, Chandigarh, India, December 2008.
244. "Purdue Hydrogen Systems Laboratory," 2009 DOE Hydrogen Program, Annual Merit Review and Peer Evaluation Meeting, Arlington, VA, May 2009.
245. "Catalytic Oxidation of Glycerol to High-Value Chemical Dihydroxyacetone," North American Meeting of the Catalysis Society, San Francisco, CA, June 2009.
- * 246. "Evolving Trends in Chemical Engineering Education," 8th World Congress of Chemical Engineering, Montreal, Canada, August 2009.
247. "New Methods for Hydrogen Generation from Boron Compounds and Water," 8th World Congress of Chemical Engineering, Montreal, Canada, August 2009.
- * 248. "New Methods to Generate Hydrogen from Boron Compounds and Water," The 5th Sino-US Conference of Chemical Engineering, Beijing, China, October 2009.
249. "Selective Oxidation of Glycerol to High-Value Chemical Dihydroxyactone Over PtBi/C Catalyst," AIChE Annual Meeting, Nashville, TN, November 2009.
250. "High Hydrogen Yield Ammonia Borane Hydrothermolysis for Fuel Cell Based Vehicles," AIChE Annual Meeting, Nashville, TN, November 2009.
251. "Kinetics of Glycerol Selective Oxidation Over Pt-Bi/C Catalyst," AIChE Annual Meeting, Nashville, TN, November 2009.
252. "Method to Release Hydrogen from Ammonia Borane for Portable Fuel Cell Applications," AIChE Annual Meeting, Nashville, TN, November 2009.
253. "Hydrogen Generation from Noncatalytic Hydrothermolysis of Ammonia Borane for Vehicle Applications," NHA Hydrogen Conference & Expo, Long Beach, CA, May 2010.
254. "Purdue Hydrogen Systems Laboratory," 2010 DOE Hydrogen Program, Annual Merit Review and Peer Evaluation Meeting, Washington, DC, June 2010.
255. "Hydrogen for Vehicle Applications from Ammonia Borane: Hydrogen Yield, Thermal Characteristics, and Ammonia Formation," ISCRE-21 Meeting, Philadelphia, PA, June 2010.
256. "Catalytic Oxidation of Glycerol to Dihydroxyacetone," ISCRE-21 Meeting, Philadelphia, PA, June 2010.
- * 257. "Roger Schmitz: The Quintessential Academic," Session in honor of Prof. R. Schmitz' 75th birthday, AIChE Annual Meeting, Salt Lake City, UT, November 2010.
258. "Hydrogen Generation From Thermolysis of Neat Ammonia Borane for On-Board Vehicle Applications," AIChE Annual Meeting, Salt Lake City, UT, November 2010.

259. "Ammonia Borane Dehydrogenation Always Generates Ammonia, How Much and How to Remove It?" AIChE Annual Meeting, Salt Lake City, UT, November 2010.
260. "Kinetic Study of Glycerol Oxidation over Pt-Bi/C catalyst," AIChE Annual Meeting, Salt Lake City, UT, November 2010.
261. "New Methods to Generate Hydrogen from Boron Compounds and Water for Fuel Cell Applications," 8th Tactical Power Sources Summit, Washington, DC, January 2011.
- * 262. "Neal R. Amundson: His Chief Contributions to the Development of Chemical Reaction Engineering," University of Houston, Houston, TX, March 2011.
263. "Purdue Hydrogen Systems Laboratory," 2011 DOE Hydrogen Program, Annual Merit Review and Peer Evaluation Meeting, Washington, DC, May 2011.
264. "Kinetic Study of Glycerol Oxidation Network over Pt-Bi/C Catalyst," North American Meeting of the Catalysis Society, Detroit, MI, June 2011.
265. "High and Rapid Hydrogen Release from Thermolysis of Ammonia Borane near PEM Fuel Cell Operating Temperatures," AIChE Annual Meeting, Minneapolis, MN, October 2011.
266. "The Attractiveness of Ammonia Borane to Generate Hydrogen for PEM Fuel Cell Vehicles," AIChE Annual Meeting, Minneapolis, MN, October 2011.
267. "Molecular Reaction Pathways of Ammonia Borane Dehydrogenation: Experimental and DFT Elucidations," AIChE Annual Meeting, Minneapolis, MN, October 2011.
- * 268. "Hydrogen Generation from Ammonia Borane for PEM Fuel Cell Applications," AIChE Annual Meeting, Minneapolis, MN, October 2011.
269. "Trickle-Bed Reactor Studies for Selective Oxidation of Glycerol to Dihydroxyacetone Over Pt-Bi/C Catalyst," AIChE Annual Meeting, Minneapolis, MN, October 2011.
270. "Oxidative Coupling of Methane Using Novel Catalytic Materials," AIChE Annual Meeting, Minneapolis, MN, October 2011.
- * 271. "Solution Combustion Synthesis of Advanced Materials: Principles and Applications," Gordon Research Conference on Energetic Materials, West Dover, VT, June 2012.
272. "Solution Combustion Synthesized Catalytic Materials for Oxidative Coupling of Methane," ACS National Meeting, Philadelphia, PA, August 2012.
273. "Hydrogen Generation from Ammonia Borane for Fuel Cell Vehicle Applications," ISCRE-22 Meeting, Maastricht, The Netherlands, September 2012.
274. "Catalytic Hydrodeoxygenation of Guaiacol," AIChE Annual Meeting, Pittsburgh, PA, October 2012.
- * 275. "New Methods to Generate Hydrogen from Boron-Compounds for Vehicle Applications," AIChE Annual Meeting, Pittsburgh, PA, October 2012.
276. "Improved Hydrogen Release from Magnesium Borohydride with Additive," AIChE Annual Meeting, Pittsburgh, PA, October 2012.
277. "Catalytic Effect of Boric Acid On Thermal Dehydrogenation of Ammonia Borane," AIChE Annual Meeting, Pittsburgh, PA, October 2012.
278. "Solution Combustion Synthesized Catalytic Materials for Oxidative Coupling of Methane," AIChE Annual Meeting, Pittsburgh, PA, October 2012.
279. "Pressure Drop and Hydrodynamics of Trickle-Bed Reactors with Particle Size Distributions," AIChE Annual Meeting, Pittsburgh, PA, October 2012.
- * 280. "Glycerol Selective Oxidation: A Reaction Engineering Study," AIChE Annual Meeting, Pittsburgh, PA, October 2012.
281. "Pechmann Condensation of Resorcinol with Ethyl Acetoacetate Over a Novel Highly Superacidic Sulfated Zirconia," AIChE Annual Meeting, Pittsburgh, PA, October 2012.
- * 282. "Solution Combustion Synthesis of Advanced Materials: Principles and Applications," AIChE Annual Meeting, Pittsburgh, PA, October 2012.

283. "The Effect of Particle Size Distribution on Trickle-Bed Reactor Hydrodynamics," NASCRE-3, Houston, TX, March 2013.
284. "Catalytic Hydrodeoxygenation of Guaiacol," NASCRE-3, Houston, TX, March 2013.
285. "Solution Combustion Synthesized Catalytic Materials for Oxidative Coupling of Methane," North American Catalysis Society Meeting, Louisville, KY, June 2013.
- * 286. "New Methods to Generate Hydrogen from Boron-compounds for Vehicle Applications," 9th World Congress of Chemical Engineering (WCCE-9), Seoul, Korea, August 2013.
- * 287. "Solution Combustion Synthesis of Advanced Materials: Principles and Applications," 9th World Congress of Chemical Engineering (WCCE-9), Seoul, Korea, August 2013.
288. "Solution Combustion Synthesized Catalytic Materials for Oxidative Coupling of Methane," ACS Annual Meeting, Indianapolis, IN, September 2013.
289. "Experimental and Simulation Study of Crude Glycerol Purification from Different Feed Stocks in Biodiesel Production," ACS Annual Meeting, Indianapolis, IN, September 2013.
290. "Catalytic Hydrodeoxygenation of Guaiacol," ACS Annual Meeting, Indianapolis, IN, September 2013.
- * 291. "Solution Combustion Synthesis of Advanced Materials: Principles and Applications," AIChE Annual Meeting, San Francisco, CA, November 2013.
292. "Biphasic Aldol Condensation of N-butyraldehyde: Kinetic Study Using Stirred Cell," AIChE Annual Meeting, San Francisco, CA, November 2013.
293. "Hydrodynamics of Trickle-Bed Reactors with Particle Size Distributions," AIChE Annual Meeting, San Francisco, CA, November 2013.
294. "A Universal Procedure for Crude Glycerol Purification from Different Feedstock in Biodiesel Production: Experimental and Simulation Study," AIChE Annual Meeting, San Francisco, CA, November 2013.
- * 295. "Selected Topics Related to Energy and Chemicals," US-India Symposium on Energy, Environment and Sustainability, Chemcon 2013, Mumbai, India, December 2013.
295. "Catalytic Hydrodeoxygenation of Guaiacol," ISCRE-23 Meeting, Bangkok, Thailand, September 2014.
297. "Flow Regime Transition in Trickle Bed Reactors," AIChE Annual Meeting, Atlanta, GA, November 2014.
298. "Conversion of Guaiacol on Noble Metal Catalysts," AIChE Annual Meeting, Atlanta, GA, November 2014.
299. "Biphasic Stirred Tank Reactor for n-Butyraldehyde Aldol Condensation: Experiments and Models", AIChE Annual Meeting, Atlanta, GA, November 2014.
300. "Effect of Flow Regime on Trickle-Bed Reactor Performance", AIChE Annual Meeting, Atlanta, GA, November 2014.
301. "Kinetic Study of Catalytic Hydrogenolysis for Pharmaceutical Applications", AIChE Annual Meeting, Atlanta, GA, November 2014.
302. "Glycerol Selective Oxidation to 1,3-Dihydroxyacetone via Bimetallic Platinum-Bismuth Catalysts: An Experimental and Theoretical Study," AIChE Midwest Regional Conference, Chicago, IL, March 2015.
303. "Kinetic Study of Catalytic Hydrogenolysis for Pharmaceutical Applications," North American Catalysis Society Meeting, Pittsburgh, PA, June 2015.
304. "Multiphase Reaction Studies in Stirred Tank and Trickle-Bed Reactors," ACS Annual Meeting, Boston, MA, August 2015.
305. "Kinetic Study of Pd-Catalyzed Hydrogenation of N-Benzyl-4-Fluoroaniline," ACS Annual Meeting, Boston, MA, August 2015.

306. "Bubbly and Pulsing Flow Regime Transitions in Trickle-Bed Reactors," ESCRE 2015, Fürstfeldbruck, Germany, October 2015.
- * 307. "Selected Topics Related to Energy and Chemicals," Keynote Lecture, The 8th Sino-US Conference of Chemical Engineering, Beijing, China, October 2015.
308. "Acetophenone Hydrogenation on Rh/Al₂O₃ Catalyst: Intrinsic Reaction Kinetics and Effects of Internal Diffusion," AIChE Annual Meeting, Salt Lake City, UT, November 2015.
309. "Acetophenone Hydrogenation on Rh/ Al₂O₃ Catalyst: Flow Regime Effect and Modeling of a Trickle Bed Reactor," AIChE Annual Meeting, Salt Lake City, UT, November 2015.
310. "The Transition to the Bubbly Flow Regime in Trickle Bed Reactors," AIChE Annual Meeting, Salt Lake City, UT, November 2015.
311. "Kinetic Study of Pd-Catalyzed Hydrogenation of N-Benzyl-4-Fluoroaniline," AIChE Annual Meeting, Salt Lake City, UT, November 2015.
312. "An Experimental and Theoretical Study of Glycerol Selective Oxidation to 1,3-Dihydroxyacetone Via Bimetallic Platinum-Bismuth Catalysts," AIChE Annual Meeting, Salt Lake City, UT, November 2015.
313. "Catalytic Deoxygenation of Guaiacol Using Methane," AIChE Annual Meeting, Salt Lake City, UT, November 2015.
- * 314. "Acetophenone Hydrogenation over Rh/Al₂O₃ Catalyst: Intrinsic Kinetics, Pore Diffusion and Trickle-Bed Reactor Studies," AIChE Annual Meeting, Salt Lake City, UT, November 2015.
315. "The Hydrodynamics of Trickle-Bed Reactors," ISCRE-24 Meeting, Minneapolis, MN, June 2016.
316. "Insight into Pt-Bi Bimetallic Catalysts for Tuning Selectivity and Improving Stability," ISCRE-24 Meeting, Minneapolis, MN, June 2016.
317. "Guaiacol Deoxygenation Using Methane over Pt-Bi Catalysts: Reaction Pathways and Kinetics," AIChE Annual Meeting, San Francisco, CA, November 2016.
318. "Glycerol to Hydrocarbon Fuels Via Bifunctional Catalysts," AIChE Annual Meeting, San Francisco, CA, November 2016.
319. "Solution Combustion Synthesis for High Performance ZnCo₂O₄ Anode in Lithium-Ion Batteries," AIChE Annual Meeting, San Francisco, CA, November 2016.
320. "Controllable Solution Combustion Synthesis of Nanoscale α/β -Bi₂O₃ and Its Catalytic Application," AIChE Annual Meeting, San Francisco, CA, November 2016.
321. "Hydrogen Generation from Hydrous Hydrazine over Nickel-Doped Ceria Catalysts Prepared By Solution Combustion Synthesis," AIChE Annual Meeting, San Francisco, CA, November 2016.
322. "Anode Performance and Safety Evaluation of Potassium-Ion Batteries," AIChE Annual Meeting, San Francisco, CA, November 2016.