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Personal: **September 5, 2014**

Place of Birth: Trichur, Kerala, India
Date of Birth: 29 October 1938.
Marital Status: Married; Two Sons.
Citizenship: U.S.

Educational Background:
B. (Chem) Eng., University of Bombay, 1960.
Ph.D. in Chemical Engineering, University of Minnesota, 1965.
Ph.D. Thesis: "Models for the Dynamics of Microbial Growth," University of Minnesota, 1965.

Academic Experience:
Instructor, 1964-65, University of Minnesota.
Assistant Professor, 1965-67, University of Minnesota.
Assistant Professor, 1967-72, Indian Institute of Technology, Kanpur.
Associate Professor, 1972-75, Indian Institute of Technology, Kanpur.
Professor, 1975-77, Indian Institute of Technology, Kanpur (on leave).
Visiting Associate Professor, 1974-75, University of Wisconsin.
Visiting Professor, 1975-76, University of Minnesota.
Professor, 1976-94, Purdue University.
H.C. Peffer Distinguished Professor, 1994-, Purdue University

Honors & Professional Memberships:
Member of the American Institute of Chemical Engineers
Member of the American Chemical Society
University Grants Commission Visiting Professor, 1982-83, Indian Institute of Science, Bangalore
Dr. G.P. Kane Professor, 3/83-4/83, Bombay University
1987 AIChE Alpha Chi Sigma Award in Chemical Engineering
George T. Piercy Distinguished Visiting Professor, University of Minnesota 9/16-12/15, 1988
Harry Creighton Peffer Distinguished Professor, Purdue University, July 1994
'UDCT DIAMOND' Award; Bombay University, Department of Chemical Technology, August 4, 1994
Melchor Visiting Professor, University of Notre Dame, Fall 1994
Fellow of the American Institute for Medical and Biological Engineering, January 1, 1996
Distinguished Lecturer, The State University of New Jersey, Rutgers, Piscataway, NJ, April 16, 1998
1998 AIChE R. H. Wilhelm Award in Chemical Reaction Engineering
1999 Dow-Professor Sharma Distinguished Fellow in Chemical Engineering at Bombay University.
2001 Senior Humboldt Award to visit the Max Planck Institute, Magdeburg, Germany.
2001 Fulbright Award to visit Germany (declined).
Honorary Fellow of the Indian Institute of Chemical Engineers, December 2001.
Kvaerner Powergas, N. R. Kamath Memorial Lecturer at Chemcon 2001, Chennai, India, December 19, 2001.
Honorary Doctor of Science, University of Minnesota, Fall 2004.
Fredrickson Lecture, University of Minnesota, September 10, 2004.
2004 AIChE Thomas Baron Award in Fluid-Particle Systems.
Purdue Research Excellence Award, April 2005.
Jewel of Ruia Award (Outstanding Alumnus Award from Undergraduate Alma Mater), December 2006.
V. V. Mariwala Visiting Professorship, Bombay University, December 2007.
Fellow of the American Institute of Chemical Engineers, January 2008.
Member, US National Academy of Engineering, February 2009.
Mumbai Institute of Technology Platinum Award, May 2009.
M. M. Sharma Distinguished Professor, Institute of Technology, U of Mumbai, January 1-May 2010.
Purdue College of Engineering Mentoring Award, March 2010.
Foreign Fellow, Indian National Academy of Engineering, September 2011.
College of Science, Team Award, March 2012.
Sigma Xi Faculty Research Award (Purdue Chapter), March 2013.

RESEARCH PUBLICATIONS

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5 Ramkrishna, D., A.G. Fredrickson and H.M. Tsuchiya, "On Relationships Between Various Distribution Functions in Balanced Unicellular Growth," *Bull, Math. Biophys.,* **30**, 319-323, 1968.

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8 Subramanian, G., D. Ramkrishna, A.G. Fredrickson and H.M. Tsuchiya, "On the Mass Distribution Model for Microbial Cell Populations," *Bull. Math. Biophys.,* **32**, 521-537, 1970.

9 Ramkrishna, D., "Solution of Population Balance Equations," *Chem. Eng. Sci.,* **26**, 1134-1136, 1971.

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12 Shah, B.H. and D. Ramkrishna, "A Population Balance Model for Mass Transfer in Lean Liquid-Liquid Dispersions," *Chem. Eng. Sci.,* **28**, 389-399, 1973.

13 Ramkrishna, D. and N.R. Amundson, "Self-Adjoint Operators from Selected Nonsymmetric Matrices; Application to Kinetics and Rectification," *Chem. Eng. Sci.,* **28**, 601-605, 1973.

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17 Rao, N.J., J.D. Borwanker and D. Ramkrishna, "Numerical Solution of Ito Integral Equations," *S.I.A.M.J. on Control,* **12**, 124-139, 1974.

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23 Singh, P.N. and D. Ramkrishna, "Transient Solution of the Brownian Coagulation Equation by Problem-Specific Polynomials," *J. Colloid & Interface Sci.,* **53**, 214-223, 1975.

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77 Sweet, I.R., Gustafson, S. and D. Ramkrishna, "Population Balance Modeling of Bubbling Fluidized Bed Reactors - I. Well-Stirred Dense Phase," *Chem. Eng. Sci.,* **42**, 341-351, 1987.

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PAPERS PRESENTED AT CONFERENCES

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2 Shah, B.H. and D. Ramkrishna, "A Population Balance Model for Mass Transfer in Lean Liquid-Liquid Dispersion," Paper presented at the Indian Institute of Chemical Engineers, Kanpur, India, 1972.

3 Ramkrishna, D. and R .K. Bajpai, "A Coalescence-Redispersion Model for Dropsize Distributions in an Agitated Vessel," Paper presented at the Indian Institute of Chemical Engineers, Coimbatore, India, 1973.

4 Ramkrishna, D., B.H. Shah, "Analysis of Agglomerating Populations," Paper presented at the AIChE Meeting, Los Angeles, CA, 1975.

5 Ramkrishna, D., "Statistical Foundations of Segregated Models of Cell Populations," Paper presented at the AIChE Meeting, New York, NY, 1977.

6 Ramkrishna, D., "Normal Operators in Chemical Engineering," Paper presented at the Second International Conference on Mathematical Modeling, St. Louis, MO, July 1979.

7 Narsimhan, G., D. Ramkrishna, and J.P. Gupta, "Analysis of Dropsize Distributions in Stirred Liquid-Liquid Dispersions", Paper No. 11f. presented at the 87th National Meeting of the American Institute of Chemical Engineers, Boston, MA, August 19-22, 1979.

8 Ramkrishna, D., "Age Distribution Models for Cell Populations with Correlation between Lifespans of Siblings," Paper presented at the American Chemical Society, 178th National Meeting, Washington, DC, September 10-13, 1979.

9 Papoutsakis, E., D. Ramkrishna and H.C. Lim, "On the Graetz Problem at Low Peclet Numbers," Paper presented in the Symposium on *Fundamental Research in Heat and Mass Transfer*, at the 72nd Annual Meeting of the AIChE, November 25-59, 1979.

10 Ramkrishna, D., "On Nonselfadjoint Problems in Chemical Engineering," Paper presented at the 72nd Annual Meeting of the AIChE, November 25-29, 1979.

11 Hibbard, J.L. and D. Ramkrishna, "Analysis of Phase Transfer Catalytic Reactions in Liquid-Liquid Systems," Paper presented at the 72nd Annual Meeting of the AIChE, November 25-29, 1979.

12 Sampson, K.J. and D. Ramkrishna, "An Investigation of Particle Size Correlations and the Effect of Crowding in Brownian Coagulation," Paper presented at the 72nd Annual Meeting of the AIChE, November 25-29, 1979.

13 Ramkrishna, D., "The Precise Connection Between Monte Carlo Simulation of Particulate Systems and Population Balances," Paper No. 39e, 88th National Meeting of the AIChE, Philadelphia, PA., June 8-12, 1980.

14 Papoutsakis, E., D. Ramkrishna, and H.C. Lim, "On the Solution of Conjugated Graetz Problems," *Paper No. 16e*, 73rd Annual Meeting of the AIChE, Chicago, IL, November 16-20, 1980.

15 Dhurjati, P., D. Ramkrishna, M.C. Flickinger and G.T. Tsao, "Cell Growth in Multiple Substrate Systems. Model of Microbes as Optimal Strategists," Paper No. 105a, 73rd Annual Meeting of the AIChE, Chicago, IL, November 16-20, 1980.

16 Ramkrishna, D. and S.J. Parulekar, "Boundary Value Problems on Axially Dispersed Systems. Solution via a New Integral Transform," 2nd World Congress of Chemical Engineering, IX Interamerican Congress of Chemical Engineering, Montreal, Canada, October 4-9, 1981 (Session 8.10).

17 Dhurjati, P., D. Ramkrishna, M.C. Flickinger and G.T. Tsao, "Cybernetic Modeling of Microbial Growth in Multiple Substrate Systems," 2nd World Congress of Chemical Engineering, IX Interamerican Congress of Chemical Engineering, Montreal, Canada, October 4-9, 1981 (Session 16.5).

18 Narsimhan, G. and D. Ramkrishna, "Breakage Functions for Droplets in Agitated Liquid-Liquid Dispersions," 74th Annual Meeting of the AIChE, New Orleans, LA, Paper No. 601, November 8-12, 1981. Also presented at the Engineering Foundation Conference on Mixing, Henniker, NH, August, 1981.

19 Parulekar, S.J. and D. Ramkrishna, "Spectral Analysis of Axial Dispersion Models," Paper No. 21f, 75th Annual Meeting of the AIChE, Los Angeles, CA, 1982.

20 Dhurjati, P., D. Ramkrishna, M.C. Flickinger and G.T. Tsao, "A Computer-assisted Experimental Investigation of the Growth of *Klebsiella pneumoniae in Multiple Substrate Systems*," Paper No. 88b, 75th Annual Meeting of the AIChE, Los Angeles, CA, 1982.

21 Kompala, D.S., D. Ramkrishna and G.T. Tsao, "Continuous Culture Studies of Bacterial Growth on Varying Feed Strategies of Multiple Substrate Media," Paper No. 50d, Diamond Jubilee Meeting of AIChE, Washington, DC, 1982.

22 Kompala, D.S., D. Ramkrishna, N.B. Jansen and G.T. Tsao, "Modeling of Continuous Culture Dynamics of Bacteria Grown on Mixed Substrates," Paper No. 72, MBT division, ACS Annual Meeting, Washington, DC, 1983.

23 Parulekar, S.J. and D. Ramkrishna, "Integral Transforms for Reaction and Transport in Infinite Heterogeneous Media," Paper presented at a Conference on Integral Methods in Science and Engineering at the University of Texas at Arlington, TX, March 18-21, 1985.

24 Ramkrishna, D., D.S. Kompala, B.G. Turner, N.B. Jansen and G.T. Tsao, "Microbial Growth in Multiple Substrate Media in Batch and Continuous Cultures," Paper presented at the ACS meeting, (MBT Division), Washington, DC, September 8-13, 1985.

25 Ramkrishna, D., S. Gustafson, and I.R. Sweet, "Simulation of Bubble Populations in Fluidized Beds. Effect on Chemical Reaction Conversion," 1985 Summer Computer Simulation Conference, Chicago, IL, July 22-24, 1985.

26 Muralidhar, R. and D. Ramkrishna, "An Inverse Problem in Agglomeration Kinetics," Poster session, Engineering Foundation Mixing Conference," Henniker, NH, August 1985.

27 Ramkrishna, D., P.K. Das and R. Kumar, "Drop Coalescence in Liquid-Liquid Dispersions," Paper presented at the Engineering Foundation Mixing Conference, Henniker, NH, August 1985.

28 Ramkrishna, D., B.G. Turner and N.B. Jansen, "Bacterial Growth in Continuous Cultures with Mixed Substrate Feeds. Experiments versus Cybernetic Models," Paper No. 76j, AIChE Annual Meeting, Miami, FL, November 2-7, 1986.

29 Ramkrishna, D. and Pedro Arce, "Self-Adjoint Operators in Interacting Solid-Fluid Systems," Paper No. 106d, AIChE Annual Meeting, Miami, FL, November 2-7, 1986.

30 Ramkrishna, D. and R. Muralidhar, "Coalescence Probability of Liquid Drops in Stirred Liquid-Liquid Dispersions," Paper No. 28a, AIChE Annual Meeting, Miami, FL, November 2-7, 1986.

31 Muralidhar, R. and D. Ramkrishna, "Simulation of Bubble Populations in Fluidized Bed Reactors - Effect on Chemical Reaction Conversion," Paper No. 41p (Poster Session), AIChE Annual Meeting, Miami, FL, November 2-7, 1986.

32 Muralidhar, R., T. Tobin and D. Ramkrishna, "Coalescence in Liquid-Liquid Dispersion," Paper presented at the Engineering Foundation Mixing Conference, Henniker, NH, August 2-7, 1987.

33 Muralidhar, R., T. Tobin and D. Ramkrishna, "Droplet Coalescence in Turbulent Liquid-Liquid Dispersions," Paper No. 78f, AIChE Annual Meeting, New York, NY, November 16-20, 1987.

34 Straight, J., D. Ramkrishna, S.J. Parulekar and N.B. Jansen, "Bacterial Growth on Lactose. Experiments versus Cybernetic Models," Paper No. 158, AIChE Annual Meeting, New York, NY, November 16-20, 1987.

35 Muralidhar, R. and D. Ramkrishna, "Coalescence Phenomena in Stirred Liquid-Liquid Dispersions," VI European Conference on Mixing, Pavia, Italy, May 24-26, 1988.

36 Alexander, M. and D. Ramkrishna, "Cybernetic Modeling of Bacterial Metabolite Production," paper presented at the 196th National ACS Meeting, Los Angeles, CA, September 25-30, 1988.

37 Baloo, S. and D. Ramkrishna, "Transient Phenomena in Bacterial Continuous Cultures," paper presented at the 196th National ACS Meeting, Los Angeles, CA, September 25-30, 1988.

38 Tobin, T., R. Muralidhar and D. Ramkrishna, "Experimental Determination of Coalescence Frequencies in Stirred Liquid-Liquid Dispersions," Paper 165B, AIChE Annual Meeting, Washington, DC, November 27-December 2, 1988.

39 Muralidhar, R., H.A. Wright and D. Ramkrishna, "Inverse Problems in Agglomeration Kinetics," Symposium on Process Modeling. Theory and Fundamentals, ACS National Meeting, Dallas, TX, April 10-15, 1989.

40 Tobin, T., H. Wright, R. Muralidhar and D. Ramkrishna, "Analysis of Transient Drop Size Distributions in Dilute Agitated Liquid-Liquid Systems." Paper presented at the Engineering Foundation Mixing Conference, Potosi, MO, August 6-11, 1989.

41 Baloo, S. and D. Ramkrishna, "Modeling Metabolic Regulation in Continuous Bacterial Cultures," A.C.S. Annual Meeting, Miami Beach, FL, September 10-15, 1989.

42 Arce, P. and D. Ramkrishna, "Pattern Formation in Catalytic Reactors," Paper No. 127b, AIChE Annual Meeting, San Francisco, CA, November 5-10, 1989.

43 Muralidhar, R. and D. Ramkrishna, "Rate Processes in Fractal Media," Paper No. 20d, AIChE Annual Meeting, San Francisco, CA, November 5-10, 1989.

44 Tobin, T., H.A. Wright, R. Muralidhar, and D. Ramkrishna, "An Experimental Study of Size Dependence of Coalescence Frequencies in Stirred Liquid-Liquid Dispersions," Paper No. 74b, AIChE Annual Meeting, San Francisco, CA, November 5-10, 1989.

45 Alexander, M.L. and D. Ramkrishna, "Cybernetic Modeling of Bacterial Metabolite Production in Continuous Culture," Paper No. 43c, AIChE Annual Meeting, San Francisco, CA, November 5-10, 1989.

46 Straight, J.V. and D. Ramkrishna, "Regulation of Complex Growth Dynamics: Substitutable and Complementary Processes," A.C.S. Annual Meeting, Washington, DC, August 26-31, 1990.

47 Straight, J.V. and D. Ramkrishna, "Regulation of Complex Growth Dynamics. Substitute and Complementary Processes," Paper No. 101b, AIChE Annual Meeting, Chicago, IL, November 11-16, 1990.

48 Muralidhar, R., D. Ramkrishna, D. Jacobs, and H. Nakanishi, "Diffusion in Fractal Media," Paper No. 178g, AIChE Annual Meeting, Chicago, IL, November 11-16, 1990.

49 Ramkrishna, D., P. Arce, and J.K. Thurber, "Pattern Formation in Catalytic Reactors," Paper No. 202a, AIChE Annual Meeting, Chicago, IL, November 11-16, 1990.

50 Ramkrishna, D., D. Muralidhar, and H.A. Wright, Aggregation Frequencies of Fractal Aggregates," Paper No. 213f, AIChE Annual Meeting, Chicago, IL, November 11-16, 1990.

51 Alexander, M.L. and D. Ramkrishna, "Iron-Regulated Bacterial Siderophore Production," Paper No. 48e, AIChE Annual Meeting, Chicago, IL, November 11-16, 1990.

52 Wright, H. and D. Ramkrishna, "The Effect of Dispersed Phase Concentration on Coalescence of Droplets in a Stirred Liquid-Liquid Dispersion," Paper No. 155i, AIChE Annual Meeting, Chicago, IL, November 11-16, 1990.

53 Tobin, T., H. Wright, R. Muralidhar, and D. Ramkrishna, "Factors Affecting Drop Coalescence: Towards Control of Agitated Dispersions," Mixing XIII, Engineering Foundation conference, Banff, Canada, June 10-15, 1991.

54 Tobin, T., R. Muralidhar, and D. Ramkrishna, "An Investigation of Electrical Effects on Coalescence," Paper No. 120e, AIChE Annual Meeting, Los Angeles, CA, November 17-22, 1991.

55 Sathyagal, A.N., G. Narsimhan, and D. Ramkrishna, "Determination of Breakage Functions from Dynamic Drop Size Distributions. An Inverse Problem Approach," Paper No. 120g, AIChE Annual Meeting, Los Angeles, CA, November 17-22, 1991.

56 Ramkrishna, D. and R. Muralidhar, "Diffusion in Fractal Porous Media and an Age Dependent Diffusion Equation," Paper No. 142a, AIChE Annual Meeting, Los Angeles, CA, November 17-22, 1991.

57 Muralidhar, R., D. Ramkrishna, K. Mahalingam, and N. Otsuka, "Monte Carlo Simulation of Crystal Growth via Molecular Beam Epitaxy (MBE)," Paper No. 151f, AIChE Annual Meeting, Los Angeles, CA, November 17-22, 1991.

58 Tobin, T. and D. Ramkrishna, "Modelling Turbulent Drop Coalescence in the Presence of a Surface Charge," Paper No. 96, 66th Colloid and Surface Science Symposium, West Virginia University, Morgantown, WV, June 14-17, 1992.

59 Trinh, S., J.K. Thurber, and D. Ramkrishna, "Patterns in Heterogeneous Reactors," Paper No. 66d, AIChE Annual Meeting, Miami Beach, FL, November 2-6, 1992.

60 Arce, P. and D. Ramkrishna, "Pattern Formation in Catalytic Reactors: Bifurcation of Particle vs Bifurcation of Assemblage," Paper No. 67f, AIChE Annual Meeting, Miami Beach, FL, November 2-6, 1992.

61 Muralidhar, R. and D. Ramkrishna, "Why Fractals?," Paper No. 143d, AIChE Annual Meeting, Miami Beach, FL, November 2-6, 1992.

62 Narang, A., A.E. Konopka, and D. Ramkrishna, "Modeling of Bacterial Growth in Mixed Substrate Environments. Non-Diauxic Growth," Paper No. 148a, AIChE Annual Meeting, 1992, Miami Beach, FL, November 2-6, 1992.

63 Liu, Lee-Yin, J. Hawley, D. Ramkrishna, and H.S. Lackritz, "The Rotational Brownian Motion of NLO Chromophores and Electric Field Effects in Polymer Films," Paper presented at the American Physical Society, Seattle, WA, March 15-19, 1993.

64 Sathyagal, A., H. Wright, G. Narsimhan, and D. Ramkrishna, "Inverse Problems for Determination of Drop Breakage and Coalescence Functions," Paper presented at the Engineering Foundation Conference on Inverse Problems, Palm Coast, FL, June 13-18, 1993. Published in "Inverse Problems in Engineering: Theory and Practice," ASME publication Edited by N. Zabaras, K. A. Woodbury and M. Raynaud, 299-305, 1993.

65 Tobin, T. and D. Ramkrishna, "Modelling the Effect of Drop Charge on Coalescence in Agitated Liquid-Liquid Dispersions," Paper presented at the Mixing XIV Engineering Foundation Conference, Santa Barbara, CA, June 20-25, 1993.

66 Manjunath, S., K.S. Gandhi, R. Kumar, and D. Ramkrishna, "Precipitation in Small Systems. Stochastic Analysis," Paper presented at the American Fine Particle Society, Chicago, IL, August 22-26, 1993; also Paper No. 138c, AIChE Annual Meeting, 1993, St. Louis, MO, November 7-12, 1993.

67 Trinh, S. and D. Ramkrishna, "Pattern Formation in Catalytic Packed Bed Reactors," Paper No. 136a, AIChE Annual Meeting, 1993, St. Louis, MO, November 7-12, 1993.

68 Ramkrishna, D., "Self-Similar Theory of Microbial Populations for Interpretation of Cytometric Data," Paper No. 111g, AIChE Annual Meeting, 1993, St. Louis, MO, November 7-12, 1993.

69 Sathyagal, A., Narsimhan, G., and D. Ramkrishna, "Application of Self-Similarity in Drop Breakage," Paper No. 139d, AIChE Annual Meeting, 1993, St. Louis, MO, November 7-12, 1993.

70 Narang, A., A.E. Konopka, and D. Ramkrishna, "Sequential and Simultaneous Growth Patterns in Mixed Substrate Cultures," Paper No. 37g, AIChE Annual Meeting, 1994, San Francisco, CA, November 14-19, 1994.

71 Ramkrishna, D. and K.E. Yasuada, "Maximizing Selectivity of Liquid-Liquid Reaction Systems: Control of the Dispersion Process," Paper No. 92c, AIChE Annual Meeting, 1994, San Francisco, CA, November 14-19, 1994.

72 Kumar, S., G. Narsimhan, and D. Ramkrishna, "Prediction of Shelf-Life of Food Emulsions: An Inverse Problem Approach," Paper 98f, AIChE Annual Meeting, 1994, San Francisco, CA, November 14-19, 1994.

73 Yiu, L.Y., D. Ramkrishna, and H.S. Lackritz, "The Rotational Brownian Motion of Chromophores and Electric Field Effects in Polymer Films for Second Order Nonlinear Optics," Paper No. 198f, AIChE Annual Meeting, 1994, San Francisco, CA, November 14-19, 1994.

74 Ramakrishna, R., A.E. Konopka, and D. Ramkrishna, "Bacterial Metabolism of Naphthalene. Effect of Cometabolites," Paper No. 216b, AIChE Annual Meeting, 1994, San Francisco, CA, November 14-19, 1994.

75 Trinh, S. and D. Ramkrishna, "Pattern Formation in a Packed Bed Catalytic Reactor," Paper No. 239h, AIChE Annual Meeting, 1994, San Francisco, CA, November 14-19, 1994.

76 Kumar, S., T.G. Tobin, A. Sathyagal, and D. Ramkrishna, "On the Solution of Population Balance Equations by Discretization," Paper No. 240l, AIChE Annual Meeting, 1994, San Francisco, CA, November 14-19, 1994.

77 Sathyagal, A., D. Ramkrishna, and G. Narsimhan, "Droplet Breakage in Stirred Dispersions. Breakage Functions from Experimental Drop Size Distributions," Biennual North American Mixing Conference, Banff, Canada, June 10-23, 1995.

78 Ramkrishna, D., and S. Trinh, "Unsteady Spatio-Temporal Patterns in Catalytic Reactors," 2nd International Conference on Unsteady State Processes in Catalysis, St. Louis, MO, September 10-14, 1995.

79 Pirog, T., S. Kumar, G. Narsimhan and D. Ramkrishna, "A New Procedure for Hindered Creaming Velocity Determination for Polydisperse Dispersions," Paper No. 103g, AIChE Annual Meeting, 1995, Miami Beach, FL, November 12-17, 1995.

80 Kumar, S. and D. Ramkrishna, "A General Discretization Technique for Solving Population Balance Equations Involving Bivariate Distributions," Paper No. 139c, AIChE Annual Meeting, 1995, Miami Beach, FL, November 12-17, 1995.

81 Starry, A., J. Caruthers and D. Ramkrishna, "Nonlinear Fluctuating Hydrodynamics of a Viscoelastic Fluid," Paper No. 169a, AIChE Annual Meeting, 1995, Miami Beach, FL, November 12-17, 1995.

82 Trinh, S. and D. Ramkrishna, "Pattern Formation in Packed Bed Catalytic Reactors," Paper No. 170g, AIChE Annual Meeting, 1995, Miami Beach, FL, November 12-17, 1995.

83 Ramakrishna, R., A. Konopka and D. Ramkrishna, "Cybernetic Modeling of Microbial Growth on Mixed Substrates. Application to Bioremediation Strategies," Paper No. 218e, AIChE Annual Meeting, 1995, Miami Beach, FL, November 12-17, 1995.

84 Varner, J., A. Narang, R. Ramakrishna and D. Ramkrishna, "Microbial Uptake of Mixed Substrates. Dissection of Cybernetic Models by Nonlinear Analysis," V World Conference, San Diego, CA, July 17, 1996.

85 Varner, J. and D. Ramkrishna, "Application of Cybernetic Models to Metabolic Engineering. Investigation of Storage Pathways," Engineering Foundation Conference on Metabolic Engineering and Recombinant DNA Technology, Danvers, MA, October 7-11, 1996.

86 Varner, J. and D. Ramkrishna, "Bifurcation Analysis of Cybernetic Models: Application to Model Synthesis," Paper No. 36g, AIChE Annual Meeting, 1996, Chicago, IL, November 11-15, 1996.

87 Pirog, T., S. Kumar, G. Narsimhan and D. Ramkrishna, "Hindered Creaming Velocities in Polydisperse Food Emulsions," Paper No. 44b, AIChE Annual Meeting, 1996, Chicago, IL, November 11-15, 1996.

88 Krishnaswami, S., D. Ramkrishna and J. M. Caruthers, "Stochastic Bridge Simulation of Polymer Conformation in an External Field. A Statistical Mechanically Exact Method, Paper No. 216f, AIChE Annual Meeting, 1996, Chicago, IL, November 11-15, 1996.

89 Pirog, T., S. Kumar, G. Narsimhan and D. Ramkrishna, "Hindered Creaming Velocities in Polydisperse Emulsions. Experimental Results," Paper No. 90j, A.I.Ch.E. Annual Meeting, 1997, Los Angeles, November 16-21, 1997.

90 Kumar, S. and D. Ramkrishna, "Discretization Methods for Solution of Population Balance Equations of Processes with Aggregation, Nucleation and Growth," Paper No. 132e, A.I.Ch.E. Annual Meeting, 1997, Los Angeles, November 16-21, 1997.

91 Ramkrishna, D., S. Manjunath, K. S. Gandhi and R. Kumar, "Modeling of Precipitation in Small Systems," Paper No. 196b, A.I.Ch.E. Annual Meeting, 1997, Los Angeles, November 16-21, 1997.

92 Schell, J. and D. Ramkrishna, "On Self-Similarity of Microbial Populations," Paper No. 234f, A.I.Ch.E. Annual Meeting, 1997, Los Angeles, November 16-21, 1997.

93 Parker, R., F. Doyle and D. Ramkrishna, "Nonlinear Adaptive Horizon-based Predictive Control of a Bioreactor using a State Space Laguerre Model," Paper No. 235h, A.I.Ch.E. Annual Meeting, 1997, Los Angeles, November 16-21, 1997.

94 Varner, J. and D. Ramkrishna, "The Cybernetic Framework and Metabolic Engineering. Investigation of Amino Acid Production in *Corynbacterium lactofermentum* ATCC 21799," Paper No. 240f, A.I.Ch.E. Annual Meeting, 1997, Los Angeles, November 16-21, 1997.

95 Gandhi, K. S., R. Kumar and D. Ramkrishna, "Precipitation in Reverse Micelles," Invited Paper to the 70th Birthday Celebration of The Contributions of L. K. Doraiswamy, Paper No. 274d, A.I.Ch.E. Annual Meeting, 1997, Los Angeles, November 16-21, 1997.

96 M. J. Guardia, A. Europa, A. Gambhir, D. Ramkrishna and W.-S. Hu, "Alteration of Cell Metabolism and Existence of Multiple Steady States in Mammalian Cell Culture," Biochemical Engineering X, Kananaskis, Alberta, Canada, May 1997.

97 Cote, A. S., W. N. Delgass and D. Ramkrishna, "Investigation of Spatially Patterned Catalytic Reactors," 15th International Symposium on Chemical Reaction Engineering, Newport Beacj, California, September 13-16, 1998.

98 Cote, A. S., D. Ramkrishna and W. Nicholas Delgass, "Spatially Patterned Catalytic Reactors. Potential Industrial Applications," Paper No. 312b, A.I.Ch.E. Annual Meeting, 1998, Miami Beach, November 15-20, 1998.

99 Ramkrishna, D., "The Packed Bed Reactor. A Modeler's Delight," Invited talk; Paper No. 302d, A.I.Ch.E. Annual Meeting, 1998, Miami Beach, November 15-20, 1998.

100 Mahoney, A. W., D. Ramkrishna and F. J. Doyle, "Growth and Nucleation Rates from Dynamic Particle Size Distributions," Paper No. 230b, A.I.Ch.E. Annual Meeting, 1998, Miami Beach, November 15-20, 1998.

101 Ramkrishna, D. and T. W. Pirog, "Simulation of the Creaming of Food Emulsions," Paper No. 245e, A.I.Ch.E. Annual Meeting, 1998, Miami Beach, November 15-20, 1998. (Scheduled paper could not be presented).

102 Guardia, M. J., A. Europa, A. Gambhir, D. Ramkrishna and Wei-Shou Hu, "Cybernetic Model for Mammalian Cell Cultures," Paper No. 266f, A.I.Ch.E. Annual Meeting, 1998, Miami Beach, November 15-20, 1998.

103 Varner, J. D., D. Ramkrishna and J. E. Bailey, "A Cybernetic Investigation of Glucose Catabolism in Escherichia Coli: Prediction of Network Response to Amplification of Key Glycolytic Enzymes," Paper No. 268k, A.I.Ch.E. Annual Meeting, 1998, Miami Beach, November 15-20, 1998.

104 Varner, J. D. and D. Ramkrishna, "Steady State Multiplicty and History Dependence in Cybernetic Systems," Paper No. 251c, A.I.Ch.E. Annual Meeting, 1998, Miami Beach, November 15-20, 1998.

105 Ramkrishna, D. "Problems in Chemical Reaction Engineering. An Analyst's Perspective." Banquet talk at the Catalysis & Reaction Engineering Division Dinner," A.I.Ch.E. Annual Meeting, 1998, Miami Beach, November 15-20, 1998.

106 Cote, A., W. N. Delgass, and D. Ramkrishna, "Enhancement of Selective Conversion in Spatially Patterned Reactors," International Symposium on *Reaction Kinetics and the Develop,ent of Catalytic Processes*. Belgium, April 19-21, 1999.

107 Mahoney, A. W., D. Ramkrishna and F. J. Doyle, "Data-Driven Modeling of Particulate Growth and Nucleation," Paper No. 83g, A.I.Ch.E., Annual Meeting 1999, Dallas, October 31-November 5, 1999.

108 Cote, A. S., W. N. Delgass and D. Ramkrishna, "Spatially Patterned Catalytic Reactors," Paper No. 288a, A.I.Ch.E., Annual Meeting 1999, Dallas, October 31-November 5, 1999.

109 Mahoney, A. W., D. Ramkrishna and F. J. Doyle, "An Efficient Finite Element Technique for Precipitation Dynamics," Paper No. 144f, A.I.Ch.E., Annual Meeting 1999, Dallas, October 31-November 5, 1999.

110 Ramkrishna, D., "Solution of Inverse Problems in Population Balances," Engineering Foundation Conference on "Population Balance Modeling of Particulate Systems," in Kona, Hawaii, January 23-28, 1999.

111 Mahoney, A. W., D. Ramkrishna and F. J. Doyle, "An Inverse Problem Strategy for Identification of Nucleation and Growth," Engineering Foundation Conference on "Population Balance Modeling of Particulate Systems," in Kona, Hawaii, January 23-28, 2000.

112 Cote, A., W. N. Delgass and D. Ramkrishna, "Spatially Patterned Catalytic Reactors. Feasibility Issues," 16th International Symposium on Chemical Reaction Engineering, Cracow, Poland, September 11-14, 2000.

113 Mahoney, A. W., and D. Ramkrishna, "Inverse Problem Modeling of Agglomeration," Paper No.17d, A.I.Ch.E. Annual Meeting 2000, Los Angeles, November 12-17, 2000.

114 Doshi, P., D. Ramkrishna and O. A. Basaran, " Nonlinear Dynamics and Break-up of Oscillating Liquid Bridges," Paper No. 130c, A.I.Ch.E. Annual Meeting 2000, Los Angeles, November 12-17, 2000.

115 Lee, Kangwook, A. J. Mahoney, Jay H. Lee and D. Ramkrishna, Paper No. 234e, A.I.Ch.E. Annual Meeting 2000, Los Angeles, November 12-17, 2000.

116 Mahoney, A. J., D. Ramkrishna and F. Doyle, "Observation of Particulate Systems," Paper No. 259f, A.I.Ch.E. Annual Meeting 2000, Los Angeles, November 12-17, 2000.

117 Kaisare, N. S., A. Namjoshi, J. H. Lee and D. Ramkrishna, "Control of Mammalian Cell Reactor using a Cybernetic Model," Paper No. 264b, A.I.Ch.E. Annual Meeting 2000, Los Angeles, November 12-17, 2000.

118 Lele, T. P., J. Lauterbach and D. Ramkrishna, " A Rational Mathematical Framework for Modeling Physico-Chemical Phenomena on Catalysts. Application to CO Oxidation on Pt(100)," Paper No. 269I, A.I.Ch.E. Annual Meeting 2000, Los Angeles, November 12-17, 2000.

119 Namjoshi, A., Wei-Shou Hu and D. Ramkrishna, "Cybernetic Modeling of Hybridoma Cells," Paper No. 271b, A.I.Ch.E. Annual Meeting 2000, Los Angeles, November 12-17, 2000.

120 Song, Hyun-Seob and D. Ramkrishna, Sinh Trinh and H. A. Wright, "Nonlinear Analysis of Fischer-Tropsch Reactor Models," Paper No. 344b, A.I.Ch.E. Annual Meeting 2000, Los Angeles, November 12-17, 2000.

121 Song, Hyun-Seob and D. Ramkrishna, Sinh Trinh, R. L. Espinoza and H. A. Wright, "Nonlinear Analysis of Fischer-Tropsch Slurry Bubble Column Reactors," 6th World Congress of Chemical Engineering, Melbourne 2001, September 23-26, 2001.

122 Namjoshi, A., Wei-Shou Hu and D. Ramkrishna, "Modeling of Hybridoma Cells: The Cybernetic Approach to Multiplicity," Paper No. 283a, A.I.Ch.E. Annual Meeting 2001, Reno, November 4-9, 2001.

123 Namjoshi, A. and D. Ramkrishna, "Multiplicity and Stability Analysis of Cybernetic Models:Growth on Substitutable Substrates," Paper No. 296a, A.I.Ch.E. Annual Meeting 2001, Reno, November 4-9, 2001.

124 Mahoney, A. W. and D. Ramkrishna, "Sequential and Simultaneous Inverse Problem Modeling of Precipitation," Paper No. 297g, A.I.Ch.E. Annual Meeting 2001, Reno, November 4-9, 2001.

125 Song, Hyun-Seob, D. Ramkrishna, Sinh, Trinh, and H. Wright, "Impact of Feedback Controllers on the Multiplicity Behavor of Fischer-Tropsch Stirred Tank Slurry Reactors," Paper No. 357d, A.I.Ch.E. Annual Meeting 2001, Reno, November 4-9, 2001.

126 Doshi, P. D. Ramkrishna, and O. A. Basaran, "Two-fluid Drop Breakup and Interface Rupture," Paper No. 87f, A.I.Ch.E. Annual Meeting 2002, Indianapolis, November 4-9, 2002.

127 Young, Jamey, D. Ramkrishna, J. A. Morgan, and A. E. Konopka, "The Cybernetic Approach to Metabolic Engineering:Preliminary Modeling Investigation of Escherichia Coli," Paper No.314i, A.I.Ch.E. Annual Meeting 2002, Indianapolis, November 4-9, 2002.

128 Qin, Qiang, D. Ramkrishna, Sinh Trinh and Rafael Espinoza, "On Increasing Productivity of FT Reactors. The Effect of Water Removal," Paper No. 366c, A.I.Ch.E. Annual Meeting 2002, Indianapolis, November 4-9, 2002.

129 Hamilton, Rob, Jennifer Curtis, and D. Ramkrishna, "Beyond Log-Normal Distributions. A New Spectral Methodfor Solving Population Balance Equations," Paper No. 141b, A.I.Ch.E. Annual Meeting 2002, Indianapolis, November 4-9, 2002.

130 Namjoshi, A., A. Kienle and D. Ramkrishna, "Steady state multiplicity in bioreactors: bifurcation analysis of cybernetic models," Paper presented at ISCRE 17, Hong Kong, China, August 25-28, 2002.

131 Hamilton, Rob, Jennifer Curtis, and D. Ramkrishna, "Investigation of Particle Attrition in Pneumatic Conveying via Population Balances," Paper No.30f, A.I.Ch.E. Annual Meeting 2003, San Francisco, November 16-21, 2003.

132 Sherer, Eric, D. Ramkrishna, Ann Rundell, Robert Hanneman, "Towards a Rational Design of Hemopoietic Cancer Treatment," Paper No. 137b, A.I.Ch.E. Annual Meeting 2003, San Francisco, November 16-21, 2003.

133 Young, J. D., J. Morgan, A. E. Konopka and D. Ramkrishna, "A Systematic Treatment of (Local and Global) Cybernetic Variables in Models of Metabolism," Paper No. 464b, A.I.Ch.E. Annual Meeting 2003, San Francisco, November 16-21, 2003.

134 Young, J. D., J. Morgan, A. E. Konopka and D. Ramkrishna, "Rational Design of Recombinant Organisms by the Cybernetic Modeling Approach," Paper No. 213g, A.I.Ch.E. Annual Meeting 2003, San Francisco, November 16-21, 2003.

135 Qin, Qiang, D. Ramkrishna, Rafael Espinoza and Sinh Trinh, "On the Deactivation of Cobalt Catalysts in Fischer-Tropsch Synthesis. The Influence of Dispersion State," Paper No.bg, A.I.Ch..E. Annual Meeting 2003, San Francisco, November 16-21, 2003.

136 Hamilton, R., J. J. S. Curtis and D. Ramkrishna, "Investigation of Particle Attrition in Pneumatic Conveying," Paper presented at the Second International Conference in Population Balance Modeling, Valencia, Spain, May 5-7, 2004.

137 Nere, Nandkishor and D. Ramkrishna, "Solution of Population Balance Equation with Pure Aggregation in a Turbulent Flow Field," Paper presented at the Second International Conference in Population Balance Modeling, Valencia, Spain, May 5-7, 2004.

138 Qin Qiang, Doraiswami Ramkrishna, Rafael Espinoza "Towards More Effective Reactor Configurations for FTS. Issues of Selectivity, Catalyst Life and Safety," Paper presented at ISCRE 18, Chicago, June 6-9, 2004.

139 Hamilton, R. J., J. S. Curtis and D. Ramkrishna, "Self-Similarity of Particle Size Distribution from Pneumatic Conveying Attrition," Paper No, 270b, A.I.Ch.E. Annual Meeting 2004, Austin Texas, November 7-12.

140 Hamilton, R. J., D. Ramkrishna, and J. S. Curtis, "Flow Characteristics and Particle Size Distribution in Pneumatic Conveying with Particle Attrition," Paper No. 280e, A.I.Ch.E. Annual Meeting 2004, Austin Texas, November 7-12.

141 Young, J. D., J. A. Morgan and D. Ramkrishna, "Cybernetic Model-Based Optimization for Recombinant Strain Design," Paper No. 457q, A.I.Ch.E. Annual Meeting 2004, Austin Texas, November 7-12.

142 Sherer, E., R. Hannemann, A. E. Rundell, and D. Ramkrishna, "Kinetic Effects of Camptothecin on Leukemia Cells," Paper No, 507g, A.I.Ch.E. Annual Meeting 2004, Austin Texas, November 7-12.

143 Young, J. D. and D. Ramkrishna, "Evolution of Cybernetic Models," First US India Conference, 2004, Mumbai, India, December 28-30.

144 Nere, Nandkishor and D. Ramkrishna, "Size Distribution of Non-Spherical Particles from Chord Length Measurements: How to Account for Orientation Bias due to Flow," Paper #115g, A.I.Ch.E. Annual Meeting, 2005, Cincinnati, October 31-November 4, 2005.

145 Hamilton, R. A., D. Ramkrishna and J. S. Curtis, "Particle Attrition during Dense and Dilute Phase Pneumatic Conveying," Paper #84e, A.I.Ch.E. Annual Meeting, 2005, Cincinnati, October 31-November 4, 2005.

146 Sherer, E., D. Ramkrishna, R. E. Hannemann and A. E. Rundell, "Customized Leukemia Therapy using an Age-Structured Population Balance," Paper 317b, A.I.Ch.E. Annual Meeting, 2005, Cincinnati, October 31-November 4, 2005.

147 Sherer, E., D. Ramkrishna, R. E. Hannemann and A. E. Rundell, "Evaluation of Leukemia Patient Non-Compliance During Maintenance Chemotherapy. A Population Balance Model of RBC Maturation," Paper 432a, A.I.Ch.E. Annual Meeting, 2005, Cincinnati, October 31-November 4, 2005.

148 Young, J. D. and D. Ramkrishna, "Discovery and Analysis of Biological Control Laws," Paper #379b, A.I.Ch.E. Annual Meeting, 2005, Cincinnati, October 31-November 4, 2005.

149 Young, J. D. and D. Ramkrishna, "Cybernetic Modeling Approach for Analysis and Redesign of Biochemical Pathways," Paper #479b, A.I.Ch.E. Annual Meeting, 2005, Cincinnati, October 31-November 4, 2005.

150 Young, J. D. and D. Ramkrishna, "Elementary Modes and Cybernetic Mechanisms: A Systems Level Approach for Modeling Biological Regulation," Paper #504a, A.I.Ch.E. Annual Meeting, 2005, Cincinnati, October 31-November 4, 2005.

151 Kim, Jin Il and D. Ramkrishna, "A Hybrid Model for Metabolic Networks: Cybernetic Approach with Elementary Mode Analysis," Paper #504b, A.I.Ch.E. Annual Meeting, 2005, Cincinnati, October 31-November 4, 2005.

152 Young, J. D. and D. Ramkrishna, "Maximizing the productivity of elementary flux modes as a surrogate description of metabolic regulation in cybernetic models," Chemcon 2005, New Delhi, December 17,2005.

153 Ramkrishna, D. and J. D. Young, "Cybernetic Models of Metabolism. A Dynamic Framework for Metabolic Engineering," ISCRE 19, Potsdam, Germany, September 4, 2006.

154 Nere, N. K. and D. Ramkrishna, "Simulation of Drop Breakage in a Turbulent Pipe Flow with Computational Fluid Dynamics and Population Balances via Operator Methods," (Invited talk by D. Ramkrishna: Special Session honoring Larry Tavlarides) Paper # 26b, Session in Honor of Larry Tavlarides on his 65th Birthday: Invited talk, A.I.Ch.E. Annual Meeting, San Francisco, November 12-17, 2006.

155 Mehra, S., K. Jayapal, S. Charanya, M. Castro, D. Ramkrishna and Wei-Shou Hu, "Unveiling the Regulation of Secondary Metabolism in Streptomyces, Paper #295b, A.I.Ch.E. Annual Meeting, San Francisco, November 12-17, 2006.

156 Sherer, E., R. E. Hannemann, A. E. Rundell and D. Ramkrishna, "Evaluation of Leukemia Chemotherapy using Stochastic Equations of Population Balance Models," Paper #442i, A.I.Ch.E. Annual Meeting, San Francisco, November 12-17, 2006.

157 Young, J. D., Jin Il Kim, D. Ramkrishna and J. D. Varner, Poster on "On Modeling Metabolism," in Session on Computational Systems Biology, First International Conference on Biomolecular Engineering, San Diego, January 14-18, 2007.

158 Nopens, I., N. K. Nere, P. A. Vanrolleghem and D. Ramkrishna, "Solving the Inverse Problem for Aggregation in Activated Sludge Flocculation," Third International Conference on Population Balance Modeling, Quebec City, Canada, September 19-21, 2007.

159 Borchert, C., N. K. Nere, A. Voigt, K. Sundmacher and D. Ramkrishna, "On the Prediction of Crystal Shape Distribution through Multidimensional Population Balances," Third International Conference on Population Balance Modeling, Quebec City, Canada, September 19-21, 2007.

160 Sherer, E., R. Hannemann, A. E. Rundell, and D. Ramkrishna, "Application of Population Balance Product Densities to Sterilization Processes," Third International Conference on Population Balance Modeling, Quebec City, Canada, September 19-21, 2007.

161 Sherer, E., R. E. Hannemann, A. E. Rundell and D. Ramkrishna, "A Sturctured Model of RBC Differentiation for Predicting 6MP Efficacy in Childhood ALL," Paper #36b, A.I.Ch.E. Annual Meeting, Salt Lake City, November 4-9, 2007.

162 Song, H-S., Jin-Il Kim, J. D. Varner, J. A. Morgan and D. Ramkrishna, "Dynamic Simulation of Fermentation Systems by Recombinant S. Cerevisiae Using a Hybrid Cybernetic Model," Paper #132d, A.I.Ch.E. Annual Meeting, Salt Lake City, November 4-9, 2007.

163 Song-H-S. and D. Ramkrishna, "Reduction of the EFM Set, Using Yield-Vector Analysis for Metabolic Models," Paper #242c, A.I.Ch.E. Annual Meeting, Salt Lake City, November 4-9, 2007.

164 Borchert, C., N. K. Nere, A. Voigt, K. Sundmacher and D. Ramkrishna, "Prediction of Crystal Shape and Size Distributions Using Multidimensional Population Balances," Paper #225a, A.I.Ch.E. Annual Meeting, Salt Lake City, November 4-9, 2007.

165 Nopens, I., N. K. Nere, P. Vanrolleghem and D. Ramkrishna, "Formulation of Effective Mechanistic Aggregation Kernels for the Flocculation Process with Concurrent Mechanisms Using Inverse Problem Solution," Paper #542c, A.I.Ch.E. Annual Meeting, Salt Lake City, November 4-9, 2007.

166 Nere, N. K., R. Pinal, D. Ramkrishna, and Ram Narayan, "On the Sameness Criteria for the Particle Size Distributions," Paper #, A.I.Ch.E. Annual Meeting, Salt Lake City, November 4-9, 2007.

167 Akkisetty, P. K., M. Lasinski, N. K. Nere, V. Venkatasubramanian, G. V. Reklaitis, D. Ramkrishna, W. Bell and G. Blau, "Computationally Efficient Hybrid Method for the Inversion of Chord Lenfth Distributions to Particle Size Distributions," Paper #391g, A.I.Ch.E. Annual Meeting, Salt Lake City, November 4-9, 2007.

168 Caruthers, J. M., D. Ramkrishna, F. Ribeiro, W. N. Delgass, Y. Zvinevich, D. S. Corti, and R. Chhabra, "A Chemical Engineering Fundamentals Laboratory," Paper #229b, A.I.Ch.E. Annual Meeting, Salt Lake City, November 4-9, 2007.

169 Kim, Jin Il and Doraiswami Ramkrishna, "A Hybrid Model of *E coli* and Multiple Steady States," Paper presented at ISCRE 20, Kyoto, Japan, September 7-10, 2008.

170 Song, Hyun-Seob, J. A. Morgan, N. W. Y. Ho, A. Varma and D. Ramkrishna, "Optimization of Batch and Continuous Fermenters for Increasing Bioethanol Productivity using Hybrid Cybernetic Models," Paper #677b, November 20, 2008, AIChE Annual Meeting, Philadelphia, November 16-21, 2008.

171 Sherer, E., R. E. Hannemann, A. E. Rundell and D. Ramkrishna, "Approximation of Actual Number Densities of Age-Structured Cell Division Models using Stochastic Equations of Population Balance," Paper #652b, November 20, 2008, AIChE Annual Meeting, Philadelphia, November 16-21, 2008.

172 Borchert, C., Nandkishor Nere, Andreas Voigt, K. Sundmacher and D. Ramkrishna, "Modeling the Manipulation of Crystal Morphology Distributions," Paper #27b, November 17, 2008, AIChE Annual Meeting, Philadelphia, November 16-21, 2008.

173 Song, Hyun-Seob, J. A. Morgan, N. W. Y. Ho, A. Varma and D. Ramkrishna, "Identification of Potential Target Pathways for Increasing Bioethanol Productivity: In Silico Analysis using Cybernetic Models," Paper #197a, November 18, 2008, AIChE Annual Meeting, Philadelphia, November 16-21, 2008.

174 Young, J. D., K. L. Henne, J. A. Morgan, A. E. Konopka and D. Ramkrishna, "A Novel Control-Theoretic Approach for Modeling Metabolic Networks and Inferring Pathway Regulation," Paper #300a, November 18, 2008, AIChE Annual Meeting, Philadelphia, November 16-21, 2008.

175 Nere, Nandkishor, Ryan McCann, Kenneth Morris and Doraiswami Ramkrishna, "On the Modeling of Milling in the Pharmaceutical Industry," Paper #712b, November 20, 2008, AIChE Annual Meeting, Philadelphia, November 16-21, 2008.

176 Akkisetty, P. K., Nandkishor Nere, Ryan McCann, Kenneth Morris, Doraiswami Ramkrishna, Gintaras V. Reklaitis and V. Venkatasubramanian, "Milling of Roller Compacted API with Excipients: Model Identification and Verification," Paer #402d, November 19, 2008, AIChE Annual Meeting, Philadelphia, November 16-21, 2008.

177 Noble, S., E. Sherer, D. Ramkrishna and A. Rundell, "Achieving targeted granulocyte differentiation through the use of interpolation and optimization techniques," Proceedings of the American Control Conference, 2571-2572, 2008.

178 Song Hyun-Seob and Doraiswami Ramkrishna, "Robustness of Metabolic Networks: Some Fresh Insights," Paper #47c, AIChE Annual Meeting, Nashville, November 8-13, 2009.

179 Franz, Andre, Hyun-Seob Song, Achim Kienle and Doraiswami Ramkrishna, "Modeling of PHB Synthesis and Degradation in Microorganisms Using the Hybrid Cybernetic Approach," Paper #182e, AIChE Annual Meeting, Nashville, November 8-13, 2009.

180 Chakraborty, J. and Doraiswami Ramkrishna, "Markov Chain Modeling of Milling Processes," Paper #299b, AIChE Annual Meeting, Nashville, November 8-13, 2009.

181 Song, Hyun-Seob and Doraiswami Ramkrishna, "Network-Based Prediction of Metabolic Fluxes Using the Cybernetic Control Principle," Paper #418c, AIChE Annual Meeting, Nashville, November 8-13, 2009.

182 Hur Won, Hyun-Seob Song and Doraiswami Ramkrishna, "Cybernetic Modeling of the Metabolic Homeostasis of the Liver," Paper 489o (Poster), AIChE Annual Meeting, Nashville, November 8-13, 2009.

183 Song, Hyun-Seob and Doraiswami Ramkrishna, "Steady State and Hopf Bifurcations in Bioreactors with Mixed Feeds," Paper #689a, AIChE Annual Meeting, Nashville, November 8-13, 2009.

184 Ramkrishna, D., S. Ramalingam and O. Basaran, "Small Oscillations of a Drop Pinned at an Azimuth," Paper presented at the American Physical Society, Minneapolis, MN., November 24, 2009.

185 Borchert C, D. Ramkrishna and Sundmacher K, "Model Based Prediction of Crystal Shape Distributions," 19th European Symposium on Computer Aided Process Engineering, JUN 14-17, 2009 Cracow, Poland.

186 Chakraborty, J., Meenesh R. Singh, and Doraiswami Ramkrishna, "Morphological population balance modeling of faceted crystals with large number of faces: the division of internal coordinate space into dynamic and invariant coordinates," 4th International Conference on Population Balance Modeling, September 15-17, 2010, Berlin, Germany.

187 Shu, Che-Chi, Doraiswami Ramkrishna, Anushree Chatterjee and Wei-Shou Hu, "On modeling transfer of drug resistance with population balances," 4th International Conference on Population Balance Modeling, September 15-17, 2010, Berlin, Germany.

188 Chatterjee, Anushree, C. M. Johnson, Che-Chi Shu, Yannis Kaznesis, Doraiswami Ramkrishna, Gary M. Dunny and Wei-Shou Hu, "A Bistable Switch Controls Drug Resistance in *Enterococcus faecalis* via Antisense RNA, Transcriptional Interference: An In-Silico and In-Vivo Approach," Paper #105e, AIChE Annual Meeting, Salt Lake City, Utah, November 7-12, 2010.

189 Singh, Meenesh R., Jayanta Chakraborty, and Doraiswami Ramkrishna, "Population Balance Modeling of Morphology Distributions of Asymmetric Crystals," Paper # 141g, AIChE Annual Meeting, Salt Lake City, Utah, November 7-12, 2010.

190 Geng, Jun, Hyun-Seob Song, Doraiswami Ramkrishna, and Jinqi Yuan,"Cofermentation of Mixed Sugars to Bioethanol with Single and Multiple Yeast Strains: Model Development," Paper #378ea, AIChE Annual Meeting, Salt Lake City, Utah, November 7-12, 2010.

191 Song, Hyun-Seob and Doraiswami Ramkrishna, "Dynamic Behavior of Knockout Strains Predicted from Limited Data on Wild-Type," Paper #441f, AIChE Annual Meeting, Salt Lake City, Utah, November 7-12, 2010.

192 Shu, Che-Chi, Doraiswami Ramkrishna, Anushree Chatterjee, Wei-Shou Hu, "Modeling Drug Resistance, a Quorum Sensing System, with Population Balance," Paper #651a, AIChE Annual Meeting, Salt Lake City, Utah, November 7-12, 2010.

193 Singh, Meenesh, R., Jayanta Chakraborty, Doraiswami Ramkrishna, Stephan X. M. Boerichter, Christian Borchert, and Kai Sundmacher, "Morphological Measurements of Faceted Crystals Using Image Analysis," Paper #668c, AIChE Annual Meeting, Salt Lake City, Utah, November 7-12, 2010.

194 Sowbna, P. R., G. D. Yadav, and Doraiswami Ramkrishna, "Modeling of Mandelic Acid from Benzaldehyde by Phase Transfer Catalysis," Paper #730g, AIChE Annual Meeting, Salt Lake City, Utah, November 7-12, 2010.

195 Meenesh R. Singh, Christian Borchert, Kai Sundmacher, Doraiswami Ramkrishna, "Modeling of Morphology Transformations in Crystalline Materials: A Generalized Framework," Paper #20c, AIChE Annual Meeting, Minneapolis, Minnesota, October 16-21, 2011.

196 Adler, Philipp, Hyun-Seob Song, Marzena Wiewiora, Doraiswami Ramkrishna and Benno Kunz, "Modeling of Lactic Acid Production from Lignocellulosic Residues Using a Hybrid Cybernetic Approach," Paper #192r, AIChE Annual Meeting, Minneapolis, Minnesota, October 16-21, 2011.

197 Shu, Che-Chi, Doraiswami Ramkrishna, Anushree Chatterjee and Wei-Shou Hu, "How Conjugation Contributes to Antibiotic Resistance of Biofilm-From an Aspect of Population Balance with Stochastic Intracellular Gene Regulation," Paper #313a, AIChE Annual Meeting, Minneapolis, Minnesota, October 16-21, 2011.

198 Song, Hyun-Seob, Jun Geng, Doraiswami Ramkrishna, Grigoriy Pincuk, Alex S. Beliaev, and Allan Konopka, "Comprehensive Network-Based Dynamic Metabolic Model for *Shewenella oneidensis*," Paper #314g, AIChE Annual Meeting, Minneapolis, Minnesota, October 16-21, 2011.

199 Song Hyun-Seob and Doraiswami Ramkrishna, "Towards Genome-Scale Dynamic Modeling of Cellular Metabolism. The Cybernetic Approach," Paper #534c, AIChE Annual Meeting, Minneapolis, Minnesota, October 16-21, 2011.

200 Meenesh R. Singh, Stephen Boerrigter, Christian Boorchert, Kai Sundmacher and Doraiswami Ramkrishna, "Experimental Investigation of Crystal Shape Evolution During Growth and Dissolution," Paper #548d, AIChE Annual Meeting, Minneapolis, Minnesota, October 16-21, 2011.

201 Chatterjee, Anushree, Che-Chi Shu, Yannis Kaznessis, Doraiswami Ramkrishna, Gary M. Dunny and Wei-Shou Hu, "The Antibiotic Resistance Game: The Genetic Regulation of Antibiotics Resistance Transfer in *Enterococcus faecalis*, Paper #653b, AIChE Annual Meeting, Minneapolis, Minnesota, October 16-21, 2011.

202 Meenesh R. Singh and Doraiswami Ramkrishna, "The Morphological Population Balance Model (M-PBM) Generator: Application to Additive Controlled Crystallization of KAP," Paper #23f, AIChE Annual Meeting, Pittsburgh, Pennsylvania, October 28-November 2, 2012.

203 Song, Hyun-Seob, Noam Goldberg, Ashutosh Mahajan, Sven Leyffer and Doraiswami Ramkrishna, Linear Programming-Based Algorithm for Computing Metabolic Pathways from Genome-Scale Networks, Paper #430f, AIChE Annual Meeting, Pittsburgh, Pennsylvania, October 28-November 2, 2012.

204 Meenesh R. Singh and Doraiswami Ramkrishna, "On Predicting Nuclei Shape Distribution," Paper #514e, AIChE Annual Meeting, Pittsburgh, Pennsylvania, October 28-November 2, 2012.

205 Jayachandran Devaraj and Doraiswami Ramkrishna "Modeling Hematopoiesis. Clinical Application of Population Balance Models," Paper #596at, AIChE Annual Meeting, Pittsburgh, Pennsylvania, October 28-November 2, 2012.

206 Jayachandran Devaraj, Ann E. Rundell, Robert E. Hannemann and Doraiswami Ramkrishna "Model-Based Individualized Treatment for Acute Lymphoblastic Leukemia," Paper #596au, AIChE Annual Meeting, Pittsburgh, Pennsylvania, October 28-November 2, 2012.

207 Parks, Conor, Meenesh Singh and Doraiswami Ramkrishna, "A kinetic Approach towards Polymorph Prediction. Identifying Nucleation Kernels Specific to a Polymorph," Population Balance Modeling Conference, Bangalore, India, September 13, 2013.

208 Devaraj, Jayachandran and Doraiswami Ramkrishna, "Predicting Clinical Responses for Chemotherapeutics: Population Balance Modeling for Personalized Treatment," Bangalore, India, September 14, 2013.

209 Devaraj, Jayachandran, Jose Miguel Lainez and Doraiswami Ramkrishna, "Tailoring Treatment for Individual Patients: Bayesian Modeling and Control of Chemotherapeutics," Paper #259h, AIChE Annual Meeting, San Francisco, California, November 3-8, 2013.

210 Singh, Meenesh R., Conor Parks, Hsien-Hsin Tung, Shailendra Bordawekar and Doraiswami Ramkrishna, "Polymorph Prediction: A Kinetic Approach," Paper #451c, AIChE Annual Meeting, San Francisco, California, November 3-8, 2013.

211 DeVilbiss, Frank, Hyun-Seob Song and Doraiswami Ramkrishna, "Developing and Information-Theoretic Framework for Model Selection in Systems Biology," Paper #490d, AIChE Annual Meeting, San Francisco, California, November 3-8, 2013.

212 Singh, Meenesh R., Hsien-Hsin Tung, Shailendra Bordawekar and Doraiswami Ramkrishna, "Morphology Control Through Cycles of Particle Breakage, Dissolution and Growth," Paper #536d, AIChE Annual Meeting, San Francisco, California, November 3-8, 2013.

213 Devaraj, Jayachandran, Jodi Skiles, Jamie Renbarger and Doraiswami Ramkrishna, "Early Prediction of Chemotherapy-Induced Toxicity: A Pharmacogenomics-Based Approach for Personalized Treatment," Paper #584ag, AIChE Annual Meeting, San Francisco, California, November 3-8, 2013.

214 Devaraj Jayachandran, Tuhina Ghanty and Doraiswami Ramkrishna, "Model-Based Decision Support Tool for Personalized Treatment of Cancer," Paper #684p, AIChE Annual Meeting, San Francisco, California, November 3-8, 2013.

215 Singh, Meenesh R. and Doraiswami Ramkrishna, "Predicting Dispersions in Crystallization Process," Paper #694g, AIChE Annual Meeting, San Francisco, California, November 3-8, 2013.

INVITED LECTURES

1 Regional Research Laboratory, Hyderabad, India, 1968 (June). *6 Lectures* on The Application of Probability Theory.

2 Symposium on "Industrial Fermentations with Special Reference to Indigenous Raw Materials and Needs of the Country", in Regional Engineering College, Jammu and Kashmir, India. Presented a talk on "The Role of Kinetic Analysis in Fermentation" in March, 1970.

3 Department of Chemical Engineering, Indian Institute of Technology, Delhi, India, December, 1971. *Lecture* on "Statistical Modeling of Cell Populations."

4 Department of Chemical Engineering, Princeton University, Princeton, NJ, February 1972. *Lecture* on "Solution of Population Balance Equations by MWR."

5 Department of Chemical Engineering, California Institute of Technology, Pasadena, CA, March 1972. *Lecture* on "Population Balance Modeling of Lean Liquid-Liquid Dispersions."

6 Department of Chemical Engineering, University of Minnesota, Minneapolis, MN, March 1972. *Lecture* on "Population Balance Modeling of Lean Liquid-Liquid Dispersions." *Lecture* on Stochastic Differential Equation.

7 Department of Chemical Engineering, University of Maine, Orono, ME, March 1972. *Lecture* on "Population Balance Modeling of Lean Liquid-Liquid Dispersions."

8 Department of Chemical Engineering, Indian Institute of Technology, Madras, India, June 1974. *3 Lectures* on "Generalized Analysis of Particulate Systems."

9 Department of Chemical Engineering, University of Wisconsin, Madison, WI, September 1975. *Lecture* on "Generalized Analysis of Particulate Systems."

10 Department of Chemical Engineering, Illinois Institute of Technology, Chicago, IL, March, 1975. *Lecture* on "Generalized Analysis of Particulate Systems."

11 Department of Chemical Engineering, State University of New York at Buffalo, NY, Fall, 1975. *Lecture* on "Generalized Analysis of Particulate Systems."

12 Department of Electrical Engineering, University of Minnesota, Minneapolis, MN, Spring, 1976. *Lecture* on "Stochastic Simulation of Stirred Tank Reactors."

13 Department of Chemical Engineering, Indian Institute Technology, Delhi, India, December 1973. *4 Lectures* on "Biochemical Engineering Kinetics."

14 Engineering Foundation Conference, Rindge, NH, August, 1976. *Invited Talk* "On the Mathematical Analysis of Particulate Systems: Small and Large Populations."

15 Department of Chemical Engineering, University of Minnesota, Minneapolis, MN, (i) a series of *4 Lectures* on "Generalized Treatment of Population Balances" in a Fluidization Seminar, (ii) a series of *5 Lectures* on "Stochastic Differential Equations," and (iii) a series of *5 Lectures* on "Biological Population Modeling."

16 Math Research Center, University of Wisconsin, Madison, WI, 1975. *Lecture* on "Some Non-self Adjoint Sturm-Liouville Problems."

17 Technical Microbiology Department, MBU, CSAV, Prague, Czechoslovakia, August 1974. *Lecture* on "Statistical Models of Cell Populations,".

18 Department of Chemical Engineering, University of Minnesota, January 1977. *Lecture* on "Stochastic Models of Algal Photosynthesis in Turbulent Flows" in the Amundson Seminar Series.

19 Department of Chemical Engineering, University of Notre Dame, Notre Dame, IN, March, 1977. *Lecture* on "What are Population Balances? Do we need them?"

20 Engineering Foundation Mixing Conference, Rindge, NH, August 1977. *Invited Talk* On the Transitional Breakage Probability of Droplets in Agitated Lean Liquid-Liquid Dispersions."

21 Department of Chemical Engineering, University of Delaware, Newark, DE, September 19, 1977. *Lecture* on "A Generalized Treatment of Particulate Processes."

22 Department of Chemical Engineering, University of Florida, Gainesville, FL, October 7, 1977. *Lecture* on "The Prospects of Population Balances."

23 Department of Chemical Engineering, Case-Western Reserve University, Cleveland, OH, October 28, 1977. *Lecture* on "A Generalized Treatment of Particulate Systems."

24 Department of Chemical Engineering, Northwestern University, Evanston, IL, November 7, 1977. *Lecture* on "A Generalized Treatment of Particulate Systems."

25 Department of Chemical Engineering, Michigan State University, East Lansing, MI, February 1, 1979. *Lecture* on "Prospects of Population Balances."

26 Department of Chemical Engineering, University of Wisconsin, Madison, WI, March 14, 1979. *Lecture* on "Prospects of Population Balances."

27 Department of Chemical Engineering, Princeton University, Princeton, NJ, April 4, 1979. *Lecture* on "Linear Operator Theory in Chemical Engineering."

28 Engineering Foundation Conference, Henniker, NH, August, 1979. August, 1979. *Invited Talk*: "Drop Breakage in Liquid-Liquid Dispersions."

29 Department of Chemical Engineering, Columbia University, New York, NY, October 24, 1979. *Lecture* on "What are Population Balances? Do We Need Them?"

30 Department of Chemical Engineering, University of Massachusetts, Amherst, MA, March 7, 1980. *Lecture* on "Linear Operator Theory in Chemical Engineering."

31 Department of Chemical Engineering, Washington University, St. Louis, MO, March 24, 1980. *Lecture* on "Prospects of Population Balances."

32 As US-INDIA Exchange Visitor sponsored by the National Science Foundation presented lectures at the following institutions in India between June 13, 1980 and August, 1980.

Indian Institutes of Technology at Bombay and Kanpur
Bombay University Department of Chemical Technology
National Chemical Laboratory, Pune
Indian Institute of Science, Bangalore
Regional Research Laboratory, Hyderabad
Engineers India Limited, New Delhi

33 Department of Chemical Engineering, Rice University, Houston, TX, October 16, 1980: *Lecture* on "Prospects of Population Balances."

34 Planta Piloto de Ingenieria Quimica (PLAPIQUI), Bahia Blanca, Argentina, as an invitee of the Nation Research Council (BID-CONICET) of Argentina; spent one month teaching a graduate course on "Linear Operator Methods in Chemical Engineering", and as a research consultant to the faculty at PLAPIQUI, from June 22, 1981 to July 22, 1981.

35 Mathematics Research Center, University of Wisconsin, Madison, WI, December 8, 1981. *Lecture* on "Some Symmetrizable Non-self-adjoint Operators in Chemical Engineering Problems."

36 American Chemical Society, Industrial and Engineering Chemistry Division, 1982 Winter Symposium on "Foundations of Biochemical Engineering: Kinetics and Thermodynamics in Biological Systems," January 17-20, 1982 at Boulder, CO, *Lecture* on "A Cybernetic Perspective of Microbial Growth."

37 "Holiday and Science on the Rhine." Summer school on Residence Time Distribution Theory in Chemical Engineering at the Physics Center of the German Physical Society, D-5340 Bad Honnef, West Germany, August 15-25, 1982. Presented *two invited lectures* on "Axial Dispersion Models from the Viewpoint of Spectral Theory."

38 Presented an *invited lecture* on "Multicomponent Diffusion and Reaction" in the Alpha Chi Sigma Award Symposium in honor of Professor Warren E. Stewart, Los Angeles, CA, November, 1982, AIChE Annual Meeting.

39 Department of Chemical Engineering, University of Rochester, Rochester, NY, November 11, 1982. *Lecture* on "Linear Operator Theory in Chemical Engineering."

40 Department of Chemical Engineering, Indian Institute of Science, Bangalore, India. Presented the 1982 KULOOR MEMORIAL LECTURES. *Three lectures*.

41 Department of Chemical Engineering, I.I.T. Kanpur, India, February 4, 1983. *Lecture* on "A Spectral Theoretic View of Axial Dispersion Models."

42 Department of Chemical Engineering, Pennsylvania State University, University Park, PA, October 25, 1983. *Lecture* on "Axial Dispersion Models. How does one do without Danckwerts Boundary Conditions?"

43 Department of Mathematics, Indiana University Purdue University, Indianapolis, IN, December 2, 1983. *Lecture* on "Some Symmetrizable Non-self-adjoint Operators in Chemical Engineering Problems."

44 International Chemical Reaction Engineering Conference, National Chemical Laboratory, Pune, India, January 8-11, 1984. Invited plenary *lecture* on "Cybernetic Modelling of Microbial Populations. Growth on Mixed Substrates."

45 Department of Chemical Engineering, University of Florida, Gainsville, FL. September 7, 1984. *Lecture* on "Axial Dispersion Models. How does one do without Danckwerts Boundary Conditions?"

46 Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA, October 26, 1984. *Lecture* on "Population Balances. Do We Need Them?"

47 Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, April 4, 1985. *Lecture* on "Cybernetic Models of Microbial Populations," in commemoration of Henry M. Tsuchiya at the Opening Ceremony of the Tsuchiya Laboratory of Biochemical Engineering in Amundson Hall.

48 Department of Chemical Engineering, University of Notre Dame, Notre Dame, IN, September 10, 1985. *Lecture* on "Are Microbes Optimal Strategists?"

49 Department of Mathematics, Purdue University, West Lafayette, IN, October 1985. *Lecture* on "Some Nonlinear Problems in Chemical Reaction Engineering."

50 Department of Chemical Engineering, University of Houston, TX, January 10, 1986. Neal R. Amundson 70th Birthday *lecture* on "The Descendents of the Fourier Transform."

51 Department of Chemical Engineering, Indian Institute of Technology, Madras, India, July 28, 1986. *Lecture* on "Are Microbes Optimal Strategists?"

52 Indian Institute of Technology, Kanpur, August 6, 1986. *Institute Lecture* (public) on "Are Microorganisms Smart?" Department of Chemical Engineering, (I.I.T. Kanpur, India). *Lecture* on "The Descendents of the Fourier Transform."

53 Center for Mathematics, Indian Institute of Science-Tata Institute of Fundamental Research Cooperative program, Bangalore, India, July 16, 1986. *Lecture* on "Some Symmetrizable Nonself-adjoint Boundary Value Problems in Chemical Engineering."

54 Department of Chemical Engineering, Indian Institute of Science, Bangalore, India, July 29, 1986. *Lecture* on "The Descendents of the Fourier Transform."

55 Department of Chemical Technology, Bombay University, India, August 11, 1986. *Lecture* on "Are Microbes Optimal Strategists?"

56 Department of Chemical Engineering and Mathematics, Indian Institute of Technology, Bombay, India, August 13, 1986. Two *lectures*: "The Descendents of the Fourier Transform" and "Are Microbes Optimal Strategists?"

57 Department of Chemical Engineering, University of Michigan, Ann Arbor, MI, October 23, 1986. *Lecture* on "Are Microbes Optimal Strategists?"

58 Applied Mathematics Center, Department of Mathematics, Purdue University, West Lafayette, IN, October 29, 1986. Lecture on "Some Inverse Problems in Particulate Systems."

59 International Chemical Reaction Engineering Conference, National Chemical Laboratory, Pune, India, April 22-24, 1987. Invited *lecture* on "How Effective are Effectiveness Factors in Transient Reactor Analysis?"

60 Department of Chemical Engineering, University of Colorado, Boulder, CO, September 17, 1987. *Lecture* on "Linear Operator Methods in Chemical Engineering."

61 Department of Chemical Engineering, Illinois Institute of Technology, Chicago, IL, February 24, 1988. *Lecture* on "Analysis of Rate Processes in Liquid-Liquid Dispersions. A Population Balance Approach."

62 Department of Chemical Engineering, University of Wisconsin, Madison, WI, April 13, 1988. *Lecture* on "Modeling of Metabolic Regulation in Microbial Systems. A Cybernetic Approach."

63 Department of Chemistry, University of Alabama, Huntsville, AL and NASA, June 2, 1988. *Lecture* on "Population Balances. The Rational Approach to Analysis of Dispersed Phase Systems."

64 Alpha Chi Sigma Award Symposium, AIChE Meeting, Washington, DC, November 27-December 2, 1988. *Lecture* on "Applied Mathematics. Opportunities for Chemical Engineers."

65 Institute for Advanced Studies in Biological Process Technology, University of Minnesota, St. Paul, MN, December 6, 1988. *Lecture* on "Cybernetic Modeling of Metabolic Regulation."

66 Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN.
October 18, 1988. *Lecture* on "Inverse Problems in Agglomerating Particulate Systems."
Fall Quarter, 1988. Series of lectures on "Cybernetic Models of Microbial Systems."

67 Wisconsin Center, University of Wisconsin, Madison, WI, February 10, 1989, at the Academic Festival to celebrate the 65th birthday of Professor R.B. Bird. *Lecture* on "Operators in the Service of Chemical Reactors."

68 Department of Chemical Engineering, University of Houston, Houston, TX, February 17, 1989. *Lecture* on "Inverse Problems in Agglomerating Particulate Systems."

69 Savannah River Laboratory, Westinghouse Savannah River Company, Aiken, SC, June 19, 1989. *Lecture* on "Rate Processes in Liquid-Liquid Dispersions. Engineering Issues and Analysis."

70 Second National Symposium on Modeling and Simulation in Chemical Engineering, Indian Institute of Science, Bangalore, India, July 6-8, 1989. *Plenary Lecture* on "Applied Mathematics. Opportunities for Chemical Engineers".

71 As U.N.D.P. expert under the TOKTEN (Transfer of knowledge through expatriate nationals) program (7/2/89 - 8/14/89) gave lectures at:
Bombay University, Department of Chemical Technology
Indian Institute of Technology at Bombay and Delhi
National Chemical Laboratory at Pune
Hindustan Lever Research Center, Bombay

72 Department of Chemical Engineering, Syracuse University, Syracuse, NY, October 30, 1989. *Lecture* on "Are Empty Tubular Reactors Really Empty?"

73 Department of Chemical Engineering, Clarkson College of Technology, Potsdam, NY, October 31, 1989. *Lecture* on "Inverse Problems in Agglomerating Particulate Systems."

74 Department of Chemical Engineering, University of Maryland, College Park, MD, November 28, 1989. *Lecture* on "Linear Operator Methods in Chemical Engineering."

75 Department of Chemical Engineering, Indian Institute of Science, Bangalore, India, July 20, 1990. *Lecture* on "Can Pseudohomogeneous Reaction Models be Valid?"

76 Center for Applied Mathematics, Indian Institute of Science-TIFR Program, Bangalore, India, July 19, 1990. *Lecture* on "Anomalous Diffusion."

77 Department of Chemical Engineering, Indian Institute of Technology at Bombay, India, August 3, 1990. *Lecture* on "Inverse Problems in Agglomerating Particulate Systems."

78 Department of Chemical Engineering, Indian Institute of Technology at Delhi, India, August 7-8, 1990. *Lectures* on "Anomalous Diffusion" and "Inverse Problems in Agglomerating Particulate Systems."

79 School of Physics, Purdue University, West Lafayette, IN, February 12, 1991. *Lecture* on, "Fractals. What is in it for Chemical Engineers?"

80 Department of Chemical Engineering, Tulane University, New Orleans, LA, March 1, 1991. *Lecture* on, "Modeling of Metabolic Regulation in Microbial Systems. A Cybernetic Approach."

81 Department of Chemical Engineering, University of Illinois, Urbana-Champaign, IL, March 19, 1991. *Lecture* on "Inverse Problems of Aggregation Processes."

82 Department of Chemical Engineering, University of Missouri at Rolla, MO, April 22, 1991. *Lecture* on "Inverse Problems of Aggregation Processes."

83 7th International Conference on Partitioning in Aqueous Two-Phase Systems, June 6, 1991. *Invited Talk* on "Analysis of Transport in Dispersed Phase Systems. An Inverse Problem Methodology."

84 Jawaharlal Nehru Center for Advanced Scientific Research, Co-organizer of a Workshop on "Interfacial Phenomena in Liquid-Liquid Dispersions," June 24-27, 1991 at Bangalore, India. Delivered *four lectures* entitled "The Framework of Population Balance"; "Simulation of Dispersion Processes"; "Modeling of Breakage and Coalescence Processes"; and "Inverse Problems for Breakage and Coalescence Processes."

85 *Lecture* on "Diffusion in Fractal Media" at
(i) Department of Chemical Engineering, Indian Institute of Technology at Bombay.
(ii) Department of Chemical Engineering, Bombay University.
(iii) National Chemical Laboratory at Pune.

86 Department of Chemical Engineering, University of Illinois, Chicago, IL, October 4, 1991. *Lecture* on "Inverse Problems of Aggregation Processes."

87 Department of Chemical Engineering, Iowa State University, Ames, IA, March 26, 1992. *Lecture* on "Inverse Problems of Aggregation Processes."

88 Department of Chemical Engineering, Rensselaer Polytechnic Institute, Troy, NY, April 20, 1992. *Lecture* on "Linear Operator Theory in Chemical Engineering."

89 Department of Chemical Engineering, Princeton University, Princeton, NJ, April 22, 1992. *Lecture* on "Inverse Problems of Aggregation Processes."

90 American Fine Particle Society, Las Vegas, NV, July 14, 1992. *Invited talk* on "Analysis of Diffusion in Fractal Media," Session on Pore Diffusion, Membrane Transport and Dispersion Processes I.

91 U.S.-India Exchange Visitor (sponsored by the National Science Foundation) to the Indian Institute of Science, Bangalore, and Indian Institute of Technology, Bombay - May-June 1993.

92 Ninth International Biotechnology Symposium and Exposition, "Harnessing Biotechnology for the 21st Century," Crystal City, VA, August 16-21, 1992. *Invited talk* on "Modeling of Microbial Processes -- The Status of the Cybernetic Approach," J. Straight, A. Narang, and D. Ramkrishna (Speaker).

93 International Society for Analytical Cytology (ISACXVI), Colorado Springs, CO, March 21-26, 1993. *Invited Plenary Lecture* on "Towards a Self-Similar Theory of Microbial Populations."

94 Department of Chemical Engineering, FAMU/FSU, Tallahassee, FL, April 2, 1993. *Lecture* on "Modeling of Metabolic Regulation in Microbial Systems. A Cybernetic Approach."

95 Department of Chemical Engineering, University of Louisville, Louisville, KY, April 16, 1993. *Lecture* on "Modeling of Metabolic Regulation in Microbial Systems. A Cybernetic Approach."

96 Center for Cellular and Molecular Biology, Hyderabad, India, June 25, 1993. *Lecture* on "Modeling of Metabolic Regulation in Microbial Systems. A Cybernetic Approach."

97 Department of Chemical Engineering, Indian Institute of Science, Bangalore, July 14, 1993. *Lecture* on "Modeling of Metabolic Regulation in Microbial Systems. A Cybernetic Approach."

98 Chemcon 93: joint meeting of A.I.Ch.E and I.I.Ch.E (Indian Institute of Chemical Engineers) December 16-18, 1993, Bombay. Distinguished speaker. *Lecture* on "Maximizing Selectivity in Liquid-Liquid Reaction Systems. Control of the Dispersion Process." (Paper with Ken Yasuda).

99 Bombay University Department of Chemical Technology, December 27, 1993. Rajadhyaksha Distinguished Memorial *Lecture* on "The Oddities of Bioreactors."

100 Institute for Advanced Studies in Bioprocessing Technology, St. Paul, MN, May 1994. *Lecture* on "A Self-Similar Theory of Microbial Population Growth."

101 Indian Institute of Chemical Technology, Hyderabad, India, August 9-11, 1994. *Plenary Lecture* on "Inverse Problems in Population Balances" in Conference on Advances in Chemical Engineering.

102 Department of Chemical Engineering, Indian Institute of Science, Bangalore, India, August 3, 1994. *Lecture* on "A Self-Similar Theory of Microbial Population Growth."

103 Department of Chemical Engineering, University of Notre Dame, December 1994. *Three lectures* on Population Balances.

104 Biochemical Engineering IX, Engineering Foundation Conference in Davos, Switzerland, May 21-26, 1995. *Invited Talk* on "Strategies for Enhancement of Bioremediation from Cybernetic Modeling of Mixed Substrate Utilization," in the session on "The Role of Physiology for Process Enhancement," May 23, 1995.

105 Department of Chemical Engineering, Indian Institute of Science, Bangalore, July 1995. *Three lectures* on population balances.

106 Department of Chemical Engineering, Zhejiang University, December 4-9, 1995. *Four lectures* on "Modeling of Microbiol Processes," as World Bank sponsored visitor of P.R. China.

107 Laboratory of Bioreactor Engineering, East China University, December 11, 12, 1995. Two lectures on "Modeling of Microbial Processes."

108 Chemcon 95: Joint-meeting A.I.Ch.E. and I.I.Ch.E. (Indian Institute of Chemical Engineers), December 27-29, 1995. *Plenary lecture* on "The Packed Bed Reactor. A Modeler's Delight."

109 Department of Chemical Engineering, Indian Institute of Science, Bangalore, June 5, 1996. *Lecture* on "The Packed Bed Reactor. A Modeler's Delight."

110 Department of Chemical Engineering, Iowa State University, September 19, 1996. *Lecture* on "The Packed Bed Reactor. A Modeler's Delight."

111 Department of Statistics, Purdue University Probability Seminar Series, September 26, 1996. *Lecture* on "Stochastic Bridge Processes and Polymer Conformations."

112 International Conference on Advances in Chemical Engineering, Indian Institute of Technology, Madras, December 13, 1996. *Lecture* on "The Status of Cybernetic Modeling of Microbial Processes."

113 Second Joint U.S. China Chemical Engineering Conference, May 19-22, 1997, Beijing, China. *Keynote Lecture* on "Cybernetic Modeling and Metabolic Engineering." (Lecture delivered by Professor G. T. Tsao in view of inability to attend the conference).

114 Department of Chemical Engineering, North Carolina A & T University, Greensboro, North Carolina, October 10, 1997. *Lecture* on "The Destabilization of Stored Emulsions."

115 Indian Institute of Chemical Engineers, Golden Jubilee Celebrations, December 15-18, 1997, New Delhi, India. *Plenary* Lecture XIII on "Destabilization of Stored Emulsions."

116 Department of Chemical Engineering, University of California at Los Angeles, CA, March 6, 1998. *Lecture* on "Destabilization of Stored Emulsions."

117 Department of Chemical Engineering, The State University of New Jersey, Rutgers, Piscataway, NJ, April 16, 1998, *Lecture* (as part of Collaboratus VIII, Eighth Annual Merck-sponsored Distinguished Lecture Series) on "The Status of Cybernetic Modeling of Microbial Processes."

118 Conference on "Analysis of microbial cells at the single-cell level," March 25-27, 1999 in Villa Olmo, at Como, Italy. *Lecture* on "On Corpuscular Models of Cell Populations. The Population Balance Approach."

119 Department of Chemical & Bioresource Engineering, Colorado State University, Fort Collins, Colorado, April 16, 1999. *Lecture* on "Modeling of Metabolic Regulation. The Cybernetic Approach."

120 Department of Civil Engineering, Purdue University, West Lafayette, Indiana, April 27, 1999. *Lecture* on "Modeling of Metabolic Regulation. The Cybernetic Approach."

121 Chemical Engineering Division, Bombay University Department of Chemical Technology, July 8-22, 1999. Gave six lectures on Population Balances as Dow-Professor Sharma Distinguished Fellow. Also presented a *popular lecture* on "Modern Trends in Chemical Reaction Engineering," on August 2, 1999.

122 Department of Chemical Engineering, Indian Institute of Technology, Bombay, July 30, 1999. *Lecture* on "Destabilization of Stored Emulsions."

123 "Modeling, Simulation and Design in Process Engineering," Sonderforschungsbereich (**SFB**) 412 'Computer Aided Modeling and Simulation for Analysis, Synthesis and Operation in Process Engineering' of the University of Stuttgart, Germany, October 11-12, 1999. Lead *Lecture* on "Population Balance Modeling of Dispersed Phase Systems," Tuesday, October 12, 1999.

124 McKnight Seminar Series sponsored by the Departments of Mathematics, Chemical Engineering and Bioprocess Technological Institute of the University of Minnesota. *Lecture* on "Stochastic Modeling of Populations & Applications," April 4, 2000.

125 Mahoney, A. W. and D. Ramkrishna, "Determination of Nucleation and Particle Growth Rates from Particle Size Distributions-An Inverse Problem Approach," Invited Paper presented at the 1st Symposium on Particulate Processes Max-Planck Institute for Dynamics of Complex Technical Systems in Magdeburg, Germany, October 11-12, 2000.

126 Department of Chemical Engineering, Northwestern University, Evanston, Illinois, November 30, 2000. *Lecture* on "Modeling of Biological Systems. The Cybernetic Approach to the Issue of Metabolic Regulation."

127 Department of Mathematics and Chemical Engineering, University of Houston. *4 lectures on* "Population Balances," as part of a course on Aerosols, January 22-26, 2001.

128 Invited Keynote speaker at the Conference on Dynamics of Chemical Process Systems (DyCops 6), Cheju Islands, Korea, June 4-6, 2001. *Lecture* on: "On Modeling of Bioreactors for Control."

129 Invited *Plenary Speaker* at the Workshop on Modeling and Computation in Chemical Engineering and Biotechnology (MCEB 2001), Hohenwart Forum, Germany; Black Forest, October 1-4, 2001. *Lecture* "On Cybernetic Modeling of Biological Processes."

130 Max-Planck Institute, Magdeburg, Germany. *Lecture* on: "Problems in Chemical Reaction Engineering. An Analyst's Perspective," October 24, 2001.

131 Invited Speaker at the Symposium on Liquid-Liquid Mixing at the A.I.Ch.E. Meeting , 2001, Reno Nevada (Paper No. 224c). *Lecture* on: "Identification of Particle Behavior from Measurements of Population Distributions. The Inverse Problem Approach."

132 Institute for Systems Theory in Engineering, University of Stuttgart, Germany: *Lecture* on: "Inverse Problems in Population Balances," November 13, 2001.

133 Department of Theoretical Biophysics, University of Humboldt, Berlin, Germany. *Lecture* on: "On Cybernetic Modeling of Biological Processes," November 15, 2001.

134 Research Institute of Chemical Engineering and High-Temperature Chemical Processes, Patras, Greece. *Lecture* on: "Cybernetic modeling of Biological Processes," November 21, 2001.

135 Department of Chemical Engineering, University of Patras, Greece. *Lecture* on: "Inverse Problems in Population Balances," November 21, 2001.

136 Department of Chemical Engineering, National Technical University, Athens, Greece. *Lecture* on: "On Cybernetic Modeling of Biological Processes," November 22, 2001.

137 Department of Chemical Engineering, University of Thessaloniki, Greece. "Inverse Problems in Population Balances," November 23, 2001.

138 Invited Special Lecturer at Chemcon 2001: Joint AIChE and IIChE Meeting in Chennai, India. The *N. R. Kamath Memorial Lecture* on: "Is Abstraction Antithetical to Practicality?" December 19, 2001.

139 Department of Chemical Engineering, State University of New York at Buffalo. *Lecture* on: "Modeling of Biological Systems. The Cybernetic Approach to the Issue of Metabolic Regulation," April 3, 2002.

140 Scientific Symposium commemorating Official Inauguration of the Max Planck Institute at Magdeburg, Germany. *Lecture* on:" Population Balances. Challenges Not as Well-Known," May 24, 2002.

141 Conference on Analysis of Microbial cells at the Single Cell Level, Technical University of Denmark, Lyngby, Denmark.. *Lecture* on: "The Potential of Apoptotic Studies in Single Cells for Cancer Treatment," June 1-4, 2002.

142 Cast Plenary Lecture, "On Modeling Biochemical Reaction Systems. The Cybernetic Route," Paper No. 240d, A.I.Ch.E. Annual Meeting 2002, Indianapolis, November 4-9, 2002.

143 Department of Chemical Engineering, City College of the City University of New York. *Lecture* on "A Cybernetic Approach to Analysis of Metabolic Regulation in Large Pathways. An Evolving Framework for Bioinformatics," March 1, 2004.

144 Department of Chemical Engineering, Rice University. *Lecture* on "A Cybernetic Approach to Analysis of Metabolic Regulation in Large Pathways. An Evolving Framework for Bioinformatics," March 11, 2004.

145 Invited Keynote Talk on: "Population Balances: Future Prospects," Second International Conference on Population Balance Modeling, Valencia, Spain, May 7-9, 2004.

146 Fredrickson Lecture: "Blotting out the Bad Bugs. Fredrickson's Models for Killing Cell Populations, and their Descendants," Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, Minn., September 10, 2004.

147 Department of Chemical Engineering, Pennsylvania State University. *Lecture* on "A Cybernetic Approach to Analysis of Metabolic Regulation in Large Pathways. An Evolving Framework for Bioinformatics," September 30, 2004.

148 Thomas Baron Award Lecture: "Population Balances. Future Prospects," A.I.Ch.E. Annual Meeting, Austin, Texas, November 10, 2004, 6 PM.

149 Department of Chemical Engineering, University of California at Los Angeles. *Lecture* on "On Modeling Metabolic Systems. The Cybernetic Approach," March 11, 2005.

150 Department of Chemical Engineering, Washington University at St. Louis. *Lecture* on "On Modeling Metabolic Systems. The Cybernetic Approach," April 25, 2005.

151 Indiana University Biocomplexity Workshop: *Lecture* on "On Modeling Metabolic Systems. The Cybernetic Approach," May 9-12:, 2005.

152 Amrita Institute of Medical Sciences, Cochin. *Lecture* on "The Potential of Mathematical Models in Cancer Treatment," June 30, 2006.

153 Department of Chemical Engineering, Indian Institute of Technology, Chennai. *Lecture* on "On Modeling Metabolic Systems. The Cybernetic Approach," July 10, 2006.

154 Department of Chemical Engineering, Indian Institute of Technology, Mumbai, *Lecture* on "On Modeling Metabolic Systems. The Cybernetic Approach," July 14, 2006.

155 Ramkrishna, D., "On Amundson's Legacy," Paper # 136b, Session in Honor of Neal R. Amundson's 90th Birthday: Invited talk, A.I.Ch.E. Annual Meeting, San Francisco, November 12-17, 2006.

156 Computer Research Institute (CRI) CS&E/CLS SEMINAR SERIES, *Lecture* on "On Modeling Metabolic Systems," November 29, 2006.

157 Department of Chemical Engineering, Indian Institute of Technology, Mumbai. *Lecture* on "Modeling of Cancer Chemotherapy. Potential Benefits," August 2, 2007.

158 Department of Chemical Engineering, Tennessee Tech University, Cookeville, TN. *Lecture* on "On Modeling Metabolic Systems. The Cybernetic Approach," October 4, 2007.

159 Arvind Varma Symposium: AIChE Meeting, Salt Lake City, Utah: *Invited Talk on* "Steady State Multiplicity in Biological Reactors," (31a) November 5, 2007, A.I.Ch.E. Annual Meeting, Salt Lake City, November 4-9, 2007.

160 L. K. Doraiswamy Symposium: *Invited Talk on:* "On Bubble Size Distributions in the Heterogeneous Regime," (238d) November 6, 2007, A.I.Ch.E. Annual Meeting, Salt Lake City, November 4-9, 2007.

161 Dave C. Swalm School of Chemical Engineering, Mississippi State University, Mississippi State, MS. *Lecture* on "On Modeling Metabolic Systems. The Cybernetic Approach," November 27, 2007.

162 Ramnarain Ruia College, Mumbai: "The Road Ahead," Talk to MSc. Students about opportunities ahead, December 20, 2007.

163 Chemical Engineering Division, MUICT, Bombay. *Lecture* on "On Modeling Metabolic Systems. The Cybernetic Approach," December 20, 2007.

164 Reliance Company, Chembur, Mumbai. *Lecture* on "On Modeling Metabolic Systems. The Cybernetic Approach," December 26, 2007.

165 Symposium on Information and Control Hierarchies: Foundations, Computation and Applications: Invited Talk: "On Modeling Metabolic Systems. The Cybernetic Route," Max-Planck-Institut für Dynamik Komplexer Technischer Systeme, May 22-23, 2008.

166 National Chemical Laboratory, Pune, India. "On Modeling Metabolic Systems. The Cybernetic Route," June 26, 2008.

167 University of Ghent, Ghent, Belgium, "On Hybrid Cybernetic Models of Metabolic Systems," July 2, 2008.

168 Invited Talk in Symposium Honoring Ted Davis: "On the Computation of Spectra of Spatially Varying Convective-Diffusion Operators," Ansgar Bohmann, Nandkishor Nere, **Doraiswami Ramkrishna**, Achim Kienle, Paper #564a, November 19, 2008, AIChE Annual Meeting, Philadelphia, November 16-21, 2008.

169 Invited Talk in Memory of Rutherford Aris, "Monod's Growth Kinetics. Is there a Rationale for it?" Paper #295b, November 18, 2008, AIChE Annual Meeting, Philadelphia, November 16-21, 2008.

170 Invited Talk in Session on Applied Mathematics in Chemical Engineering: Past 100 Years and the Future: "Dynamic Models of Biological Systems. A Hotbed for Nonlinear Analysis," Paper #154e, November 17, 2008, AIChE Annual Meeting, Philadelphia, November 16-21, 2008.

171 Brystol Myers Squibb, New Jersey, "On Modeling Metabolic Systems. The Cybernetic Route," February 6, 2009.

172 Pacific Northwest National Laboratories, Pasco, Washington, "On Modeling Metabolic Systems. The Cybernetic Route," March 5, 2009.

173 Department of Chemical Engineering, University of California at Berkeley, CA. *Lecture* on "On Dynamic Modeling of Metabolism," September 30, 2009.

174 Department of Chemical Engineering, University of California at Santa Barbara, CA. *Lecture* on "On Dynamic Modeling of Metabolism," October 13, 2009.

175 Joint Bioenergy Institute, Emeryville, California. *Lecture* on "On Dynamic Modeling of Metabolism," October 22, 2009.

176 Song, Hyun-Seob and Doraiswami Ramkrishna, "The Metabolic Modeling Landscape," (Invited Session) Paper #316a, AIChE Annual Meeting, Nashville, November 8-13, 2009.

177 Department of Chemical Engineering, Cornell University, Ithaca, NY. *Lecture* on "On Dynamic Modeling of Metabolism," November 23, 2009.

178 Department of Chemical Engineering, Indian Institute of Technology, Kanpur. *Lecture* on "On Dynamic Modeling of Metabolism, Thursday, February 11, 2010.

179 Department of Chemical Engineering, Indian Institute of Technology, Mumbai. *Lecture* on "The Metabolic Modeling Landscape," March 25, 2010.

180 National Chemical Laboratory, Pune. *Lecture* on "The Metabolic Modeling Landscape," May 4, 2010.

181 Session in Honor of Roger Schmitz, "Nonlinear Phenomena in Metabolic Systems," Paper #154b, AIChE Annual Meeting, Salt Lake City, Utah, November 7-12, 2010.

182 Session in Honor of Arvind Varma. "Reaction Engineering Concepts in Metabolic Modeling" ACS annual Meeting, Anaheim, CA, March, 28, 2011.

183 AIChE (Invited) webinar, "The Cybernetic Approach to Metabolic Modeling," April 12, 2011.

184 Invited Talk: "The Cybernetic Approach to Metabolic Modeling," Session 16, Society for Industrial Microbiology, Annual Meeting: New Orleans, July 26, 2011.

185 Keynote Talk: ISIC (International Symposium on Industrial Crystallization) 18, Zurich: Meenesh Singh, **Doraiswami Ramkrishna**, Hsien-Hsin Tung, Nandkishor Nere and Shailendra Bordawekar, "Towards Control of Crystal Shape. Crystallization and Dissolution," September 15, 2011.

186 Session in Honor of Professor Santosh K. Gupta: "Population Balance Modeling of Particles with Random Behavior. Application to Gene Regulatory Processes," Paper #381a, AIChE Annual Meeting, Minneapolis, Minnesota, October 16-21, 2011. (Co-author: Che-Chi Shu).

187 Invited Session: Paradigms in Systems Biology, "Dynamic Modeling of Metabolism. The Cybernetic Approach," Paper #42b, AIChE Annual Meeting, Pittsburgh, Pennsylvania, October 28-November 2, 2012.

188 Department of Chemical and Biological Engineering, University of Wisconsin, Madison, WI. *Lecture* on "Dynamic Modeling of Metabolism. The Cybernetic Approach," November 27, 2012.

189 Department of Chemical and Biological Engineering, Iowa State University, L. K. DORAISWAMY *Lecture* on "Dynamic Modeling of Metabolic Systems. The Cybernetic Approach," March 14, 2013.

190 Department of Bioengineering, University of California at San Diego, *Lecture* on "On Dynamic Modeling of Metabolism. The Cybernetic Approach," Monday, June 3, 2013.

191 Department of Chemical Engineering, University of California at Irvine, *Lecture* on "On dynamic Modeling of Metabolism. The Cybernetic Approach," Wednesday, June 5, 2013.

192 National Chemical Laboratory, Pune, India, L. K. DORAISWAMY *Lecture* on "Dynamic Modeling of Metabolic Systems. The Cybernetic Approach," September 16, 2013.

193 Purdue University Sigma Xi Faculty Research Award *Lecture*, "Metabolic Complexity. Is there Music Behind it?" October 22, 2013.

194 Department of Chemical Engineering, Ohio State University, Columbus, Ohio, *Lecture* on "Dynamic Modeling of Metabolism. The Cybernetic Approach," October 24, 2013.

195 PD2M Plenary Session: AIChE Annual Meeting, San Francisco, California, November 4, 2013: Invited talk: "Towards Personalized Therapy: Biomolecular Complexities Beyond Gene Expression" paper #39a, November 3-8, 2013.

196 Department of Chemical Engineering, Rice University. *Lecture* on "Metabolic Complexity. Is there Music Behind it?" March 13, 2014.

197 Department of Chemical Engineering, University of Houston, *Lecture* on "Metabolic Complexity. Is there Music Behind it?" March 14, 2014.

198 NSF-CSoI Workshop, National Academy of Engineering and Science, Irvine, *Talk* on "On Modeling Biological Systems. Quest for Goal-Directedness," August 4, 2014.

PHD STUDENTS IN ACADEME

1 N. J. Rao*, (PhD. 1972), Professor and Director, Center for Electronics Design Technology, Indian Institute of Science, Bangalore, India).
2 P. N. Singh, (PhD. 1974), Retired as Dean of Engineering, Karnataka, Regional Engineering College, Surathkal, India.
3 R. K. Bajpai, (PhD. 1975), Chaired Professor of Chemical Engineering, University of Louisiana at Lafayette, Louisiana.
4 G. Narsimhan, (PhD. 1979), Professor of Agricultural Engineering, Purdue University, West Lafayette, Indiana.
5 E. Papoutsakis,* (PhD. 1979), Distinguished Professor of Chemical Engineering, University of Delaware, Wilmington, Delaware.
6 K. J. Sampson, (PhD. 1982), Associate Dean and Associate Professor of Chemical Engineering, University of Ohio, Athens, Ohio.
7 P. S. Dhurjati, (PhD. 1982), Professor of Chemical Engineering, University of Delaware, Newark, Delaware.
8 S. J. Parulekar, (PhD. 1983), Professor of Chemical Engineering, I.I.T. Chicago, Illinois.
9 D. S. Kompala (PhD. 1984), Associate Professor of Chemical Engineering, University of Colorado, Boulder, Colorado.
10 P. Arce (PhD. 1990), Professor & Head of Chemical Engineering, Tennessee Tech. University, Cookeville, Tennessee.
11 A. Narang (PhD. 1994), Associate Professor of Chemical Engineering, Indian Institute of Technology, Delhi,
12 J. D. Varner, (PhD, 1997), Associate Professor, Department of Chemical Engineering, Cornell University, Ithaca, New York.
13 Tanmay Lele,* (PhD, 2002), Assistant Professor, Department of Chemical Engineering, University of Florida, Gainsville, Florida.
14 Jamey Young (PhD, 2005), Assistant Professor, Vanderbilt University, Chemical and Biomolecular Engineering Department Nashville, Tennessee.
15 Eric Sherer,* (PhD, 2007), Assistant Professor, Department of Chemical Engineering, Lousiana Tech University, Ruston, Louisiana.
16 Che-Chi Shu (PhD, 2012), Assistant Professor, Department of Chemical Engineering, Taipei University of Technology, Taiwan.

(*) jointly with another colleague.

CONSULTING ACTIVITY

Consultant to General Mills, Inc. Minneapolis, Minnesota, Pillsbury Co., Minneapolis, MN and to American Oil Company, Naperville, IL, and Ciba-Corning, MA.

General Mills:

Developed modeling and design of:
(i) the continuous equipment (C-Gun) for puffing breakfast cereal pellets.
(ii) dryers for the drying of cereal pellets the motive of energy savings in large scale drying operations.

Member of Technology Advisory Board, October 2005.

Member Advisory Council to Pacific Northwest National Laboratory, Richland, WA on Microbial Community Initiative (for three years, 2010-1013).

Pillsbury Company:

Continuing activity on modeling of dough-sheeting operations with the objective of evolving design methodology for sheet rollers. Also presently concerned with food colloids in the improvement of shelf-life.

Amoco:

Modeling novel reactor-applications for their reactors.

Ciba-Corning:

Estimating accuracy of instruments using photomultiplier tubes.

Abbot Laboratories:

On problems in crystallization.

Eli Lilly:

Consultant on DOE project on: "Development of Novel Crystallizer Design and Process Optimization Tools for Solution Crystallization." June 15, 2001 to June 14, 2004.

OTHER PROFESSIONAL ACTIVITIES

First Chairman of Area 10D on Applied Mathematics of CAST Division of the American Institute of Chemical Engineers (from 1987 to 1991).

Chaired several session in the annual meetings of the A.I.Ch.E. on applied mathematics covering a range of topics but in particular the application of stochastic methods, population balances and analysis oriented sessions in nonlinear mathematics

Editorial Board:

1. Latin American Journal of Chemical Engineering.
2. International Journal of Applied Engineering Research.
3. The World Journal of Chemical Engineering.
4. Current Opinion in Chemical Engineering. (http://www.elsevier.com/journals/current-opinion-in-chemical-engineering/2211-3398/editorial-board).
5. Processes. (http://www.mdpi.com/journal/processes/editors)

Conference Organization:

1. **Co-organizer (with Pr**ofessor P. B. Deshpande) **of Conference on** "Chemical Engineerng Education. Curricula for the Future." Indo-U.S. Seminar held at the *Indian Institute of Science*, Bangalore, India. January 1-4, 1988.
2. First US-India Conference Chair (sponsored jointly by AIChE and IIChE): December 28-30, 2004, in Bombay, India.

Guest Editorships:

1. *Chemical Engineering Communications*: Special Issue in honor of Neal R. Amundson on his 75th birthday, 1989.
2. *Journal of Biotechnology:* Special issue on "Modeling in Biochemical Engineering," and in honor of Arnold G. Fredrickson, (jointly with Friedrich Srienc), 1999.
3. *Processes:* "Dynamic Approaches to Metabolic Modeling and Metabolic Engineering", 2014.