Invited Addresses at Meetings, Colloquia, Seminars, etc. (not complete):

1. "A mathematical model of the humoral immune response," Marquette University, MaSt Dept. Colloquium, October 1978.
2. "A model of complement activation by antigen-antibody complexes," Fall conference on Differential and Integral Equations, Oklahoma State University, Stillwater, OK, October 1979.
3. "A Mathematical Model Simulating Disease Treatment: SLE," IEEE Conference on Decision and Control, San Diego, CA. (IEEE Control System Society), January 3, 1979, 30 minutes.
4. "A Mathematical Model of the Humoral Immune Response to a Growing Antigen," Lefschetz Center for Dynamical Systems Seminar, Department of Applied Mathematics, Brown Univ., Providence, RI, March 1979, 1 hour.
5. "Applications of Secondary School Mathematics in Biology," at Marquette University for the 1979 Spring Meetings of the Milwaukee Area Math. Council, May 1979, 45 minutes.
6. "A Mathematical Model Simulating Disease Treatment: SLE," Univ. of Iowa, Mathematics Dept. Colloquium, Iowa City, IA, March 6, 1980, 1 hour.
7. "Control and activation of the complement system," Theoretical Aspects of Molecular Biology: Mathematical Biology, Southern Illinois University, Carbondale, IL, May 1980, 45 minutes.
8. "A model of the role of natural killer cells in immune surveillance," Lefschetz Center of Dynamical Systems seminar, Brown University, October 1980, 1 hour.
9. "Natural killer cells, Marquette University," MSCS Dept. Colloquium, October1981, 1 hour.
10. "Interaction of antitumor cells: competition and interference," International Conference in Population Biology, Edmonton, Alberta, Canada, June 1982, 30 minutes.
11. "Mathematical models in Biology: Muscle physiology," Luther College, Decorah, IA, October 1982, 50 minutes.
12. "Natural killer cells - an application of control theory," Univ. of Wisconsin-Milwaukee, October 1982, 50 minutes.
13. "Stochastic models of tumor growth and elimination," Los Alamos National Laboratory, New Mexico, July 1984, 60 minutes.
14. "Omega-limits in a multi-parameter model of the immune response," A.M.S. Meeting, Chicago, IL, March 1985, 20 minutes.
15. "Nonlinearities in the Mathematical Description of the Cell- Mediated Aspect of the Immune Response," AMS National Meeting, New Orleans, LA, January 1986, 20 minutes.
16. "Large periodic solutions in a model of antibody response," Emory University, Atlanta, GA, April 1986, 60 minutes.
17. "Kinetics of killing *Listeria monocytogenes* by macrophages," University of Iowa, April 1987, 60 minutes.
18. "AIDS: Background and the dynamics of the decline of immunocompetence, Workshop on Theoretical Immunology," Santa Fe, NM, June 1987, 30 minutes.
19. "AIDS: Dynamics of the decline of immunocompetence," Combined Midwest-S.E. Differential Equations Conference, Vanderbilt University, Nashville, TN, October 1987, 25 minutes.
20. "Population Dynamics of T Cells and HIV," Santa Fe Institute Workshop on Modeling the Interaction of HIV with the Immune System, October 1988, 45 minutes.
21. "Mathematical Descriptions of HIV Infection and AIDS Progression," Center for Dynamical Systems and Nonlinear Studies, Georgia Tech. Univ., Atlanta, GA, November 1989, 60 minutes.
22. "Modeling early stages of HIV infection," AMS special session on mathematical biology, Albuquerque, NM, April 1990, 25 minutes.

23. “A stochastic model of PCR and its use in measuring the frequency of HIV-infected cells,” Div. of Theoretical Biology and Biophysics, Los Alamos National Laboratory, NM, October 1990, 60 minutes.
24. “Stochastic models of AIDS immunology,” Dept. of Mathematics, University of New Mexico, Albuquerque, NM, October 1990, 60 minutes.
25. “Stochastic & Deterministic Models I & II,” Dept. of Mathematics, University of New Mexico, Albuquerque, NM, October 1990, 60 minutes each.
26. “Mathematical models of HIV infection of cells of the immune system,” Santa Fe Institute, Santa Fe, NM, November 1990, 75 minutes.
27. “Modeling the interaction of HIV with the immune system,” Center for Nonlinear Studies, Los Alamos National Laboratory, NM, November 1990, 60 minutes.
28. “Making PCR quantitative,” Dept. of Mathematics, University of New Mexico, Albuquerque, NM, December 1990, 60 minutes.
29. “Stochastic models of AIDS immunology,” School of Statistics, University of Minnesota, February 1991, 60 minutes.
30. “Mathematical models of AIDS immunology,” MAA-Wisc. Section, Oshkosh, WI, April 1991, 50 minutes.
31. “Models of AIDS immunology,” UW-Platteville, October 1991, 60 minutes.
32. “Basic Concepts of Chaos,” MU Dept. of Mechanical and Industrial Engineering, November 1991, 60 minutes.
33. “Modeling PCR,” Mu Alpha Theta, Marquette University H.S., February 1992, 45 minutes.
34. “Mathematics in Medicine,” Mu Alpha Theta, Rufus King H.S., Milwaukee, June 1992, 60 minutes.
35. “Using Maple in Calculus,” Wisconsin Math Council Summer Meeting, Waukesha, June 1992, 45 minutes.
36. “T Cell Population Dynamics,” Modeling in Immunology Workshop, University of California, Berkeley, CA, June 1992, 75 minutes.
37. “Mathematics in Science,” HHMI Seminar in Contemp. Science and Curriculum Development, Milwaukee, June 1993, 1 day.
38. “Mathematical Modeling Workshop,” PRIME (Math Ed) Workshop, Oshkosh, WI, October 1993, 3 hours.
39. “Mathematical Modeling Workshop,” PRIME (Math Ed) Workshop, Menomonee, WI, October 1993, 3 hours.
40. “Dynamics of T Cell Depletion in AIDS,” Michigan State University, Campus Theory Seminar, E. Lansing, MI, October 1993, 1 hour.
41. “Mathematical Modeling Workshop,” PRIME (Math Ed) Workshop, Milwaukee, November 1993, 3 hours.
42. “Modeling the Early Stages of HIV Infection,” Oberwolfach, Germany, Conference on Mathematical Models in Biology, November 1993, 60 minutes.
43. “Maple and the TI-85 in Calculus,” Dept. of Physics, Marquette University, December 1993, 60 minutes.
44. “What's New in Freshman Calculus: Using Maple and the TI-85 to Teach Calculus Concepts,” Dept. of Elec. & Comp. Eng., Marquette University, April 1994, 60 minutes.
45. “Mathematics in Medicine,” Mu Alpha Theta, Oconomowoc H.S., April 1994, 50 minutes.
46. “Stochastic modeling of the immunology of HIV infection,” University of Wisconsin-Milwaukee, October 1994, 60 minutes.

47. “The interactive classroom,” St. Viator H.S., Arlington Heights, IL, November 1994, 60 minutes.
48. “A stochastic model of the generation of diversity in HIV infection,” AMS Annual Meeting, San Francisco, CA, January 1995, 25 minutes.
49. “The role of diversity in HIV infection,” Viral and Rickettsial Disease Laboratory, State of California, Berkeley, CA, January 1995, 75 minutes.
50. “Markov chain methods in the analysis of heart rate variability,” Nonlinear Dynamics and Time Series, Fields Institute, Montreal, Canada, July 1995, 20 minutes.
51. “A model of diversity in HIV infection,” Workshop on HIV Pathogenesis, Berkeley, CA, July 1995, 50 minutes.
52. “Simulation of HIV diversity,” International Symposium on Clinical Immunology, San Francisco, CA, July 1995, 15 minutes.
53. “Markov chain methods in heart rate variability,” Marquette Electronics, Inc., Milwaukee, WI, August 1995, 60 minutes.
54. “The role of HIV diversity in drug resistance,” National Cancer Institute - Laboratory of Mathematical Biology, Bethesda, MD, October 1995, 60 minutes.
55. “Marquette Electronic Outreach: A 3-year distance learning experiment,” Marquette University, January 1996, 50 minutes.
56. “Markov chain methods in HRV,” American Statistical Association - Milwaukee Chapter, February 1996, 20 minutes.
57. “The significance of co-factors in the pathogenesis of AIDS,” (with R. Root-Bernstein), AIDS and Alternative Medicine: Current State of the Science, Bastyr University, Seattle, WA, April 1996, 75 minutes.
58. “Chaos theory,” Theology 145: Religion and Science, Marquette University, April 1996, 20 minutes.
59. “A model of the role of cofactors in the initiation and development of AIDS,” G.J. Butler Memorial Conference, U. of Alberta, June 1996, 30 minutes.
60. “Markov chain methods in HRV,” Department of Biostatistics, Medical College of Wisconsin, January 1997, 60 minutes.
61. “A model of the role of stimulatory cofactors in the initiation of an HIV infection,” Department of MSCS, Marquette University, 60 minutes.
62. “Chaos and Complexity,” HOPR 196: Relating Theology and the Natural Sciences, Marquette University, October 1998, 60 minutes.
63. “A model for the role of infective cofactors in AIDS,” Workshop on Dynamics and Control AIDS, Institute for Mathematics and its Applications, University of Minnesota, November 1998, 60 minutes.
64. “Modeling engraftment following peripheral stem cell transplantation,” Department of Biomedical Engineering, Marquette University, September 1999, 60 minutes.
65. “The kinetics of engraftment following peripheral stem cell transplantation,” Medical College of Wisconsin-Bone Marrow Transplant Program Seminar, February 2000, 60 minutes.
66. “Development of the T cell repertoire,” Blood Research Institute, Milwaukee, WI, March 2000, 60 minutes.
67. “Love in the age of AIDS,” Pi Mu Epsilon, Marquette University, April, 2000, 30 minutes.
68. “Markov chain methods in the analysis of heart rate variability,” IMACS 2000, Milwaukee, WI, May 2000, 30 minutes.
69. “Introductory Biological Sequence Analysis through Spreadsheets,” ICTCM 2000, Atlanta, GA, 30 minutes, November 2000.

70. “Stochastic models of the early stages of HIV,” SIAM Life Sciences Conference, Boston, MA, March 2002, 25 minutes.
71. “Detecting autocatalytic dynamics in data modeled by a compartmental model,” Jaquez Memorial Conf., University of Michigan Medical School, Ann Arbor, MI, October 2001, 45 minutes.
72. Spatial dependence of fluorescence in the microarray, 4th Butler Memorial Conference, University of Alberta, Edmonton, Alberta, CA, June 2003, 30 minutes.
73. “Solving problems: perchance to dream,” ICTMA 11, Milwaukee, WI, July 2003, 60 minutes plenary address.
74. “Teaching stochastic modeling workshop,” ICTMA 11, Milwaukee, WI, July 2003, 2 hours.
75. “Dance of early HIV infection,” SIAM Life Sciences, Portland OR, July 2004, 15 minutes.
76. “Modeling of Human Interactions,” Chaos and Life Sciences Conference, Milwaukee, WI, July 2004, 4 hour workshop.
77. “The registration process error-free – can we freeze the heat?” Atrial Fibrillation and Ventricular Arrhythmia Management, St. Luke’s Hospital, Milwaukee, September 2005, 15 minutes.
78. “An applied mathematician in the lab: a case study,” Center for Functional and Environmental Genomics Fall Symposium, Great Lakes Water Institute, keynote address, (also UWM Biology Colloquium) September 2005, 60 minutes.
79. “Understanding data complexity through models & computation, ISL July 2006, Milwaukee, WI. 1 hour
80. “Biocalculus: Reflecting the needs of the students,” Joint SIAM Life Sciences/Society of Mathematical Biology, July 2006, North Carolina State University, Raleigh, NC. 20 minutes
81. “Empirical Markov chains as models of dynamic processes,” Society for Chaos Theory, Virginia Commonwealth University, July 2008, Richmond, VA. 30 minutes
82. “A Poisson-like model of sub-clinical signs from the neurological examination of healthy aging subjects,” SIAM CSE Conference (Miami), March 2009. 15 minutes.
83. “Markov Chains,” GasDay Lab, Dept. of EECE, Marquette U., March 2009. 75 minutes.
84. “Simulation,” MSCS Computational Thinking Workshop, June 2009. 75 minutes.
85. “Markov chains as models of dynamic processes” (Featured pre-meeting workshop), SCTPLS 2009 annual conference (Milwaukee), July 2009. 4 hours.
86. “Bifurcation in Markov chains – using Markov chains to identify bifurcations in time series, Dept EECE Colloquium, Marquette University (Milwaukee), April, 2010. 60 minutes
87. “A model of thyroid cancer initiation and growth in autoimmune thyroiditis,” First North American Meeting on Industrial and Applied Mathematics, Huatulco, Oaxaca, Mexico, Dec. 2010. 25 minutes.
88. “Markov Chains,” The 21st Annual International Society for Chaos Theory on Psychology and Life Sciences (SCTPLS) Conference, Chapman University, Orange, California, August 2011. 60 minute Workshop.
89. “Cost of failure to treat autoimmune thyroiditis in thyroid cancer initiation and growth,” The 21st Annual International Society for Chaos Theory on Psychology and Life Sciences (SCTPLS) Conference, Chapman University, Orange, California, August 2011. 30 minutes
90. “Mathematical description of the creative process,” 5th International Nonlinear Science Conference (Barcelona) March 2012. 30 minutes
91. “Models of life and the life of models,” Center for Devices and Radiological Health, US FDA, Silver Spring, MD, April 2012. 60 minutes.
92. “Modeling aspects of the immune response: Dealing with complexity,” Center for Drug Evaluation and Research, US FDA, Silver Spring, MD, June 2012. 75 minutes + 75 minute roundtable discussion.

93. “Markov chains: using MC and HMM to describe and explore time series dynamics,” SCTPLS 2013, Portland, OR, July 2013, 1 hour workshop.
94. “Computational Sciences at the FDA,” Department of MSCS, Marquette University, September 2013, 60 minutes
95. “Dreaming and creativity in mathematics,” Virginia Commonwealth University, Richmond, VA, April 2014. 60 minutes
96. “Models of life and the life of models,” Computational Sciences Symposium, Marquette University, April 2015. 30 minutes
97. “Models of life and the life of models,” GasDay Lab Seminar, Marquette University, May 2015. 60 minutes
98. “Nonlinear models and analysis,” 25th Annual International Conference of SCTPLS pre-meeting workshop. 6 hours (with Mark Shelhamer), July 2015
99. “VVUQ: Aspects to consider when using mathematical models to made decisions”, GasDay Seminar, Marquette University, November 2016, 60 minutes.
100. “Identifying the third dimension hidden in 2D fluoroscopy – a story of APN Health, LLC,” Joint MU/MCW/UWM Biomedical Engineering Seminar Series October 2017, 60 minutes.