CURRICULUM VITAE

William David Sudderth

August 31, 2023

I Biographical Data

A Personal:

Date/Place of Birth: April 29, 1940, Dallas, Texas
Citizenship: U.S.

B Education:

University of California, Berkeley, Ph.D., 1967
University of California, Berkeley, M.A., 1965
Yale University, B.S., 1963

C Positions Held:

Professor Emeritus, School of Statistics, University of Minnesota (2012–)
Professor, School of Statistics, University of Minnesota (1977–2012)
Visiting Professor, Cowles Foundation for Research in Economics, Yale University (Spring 1997, Spring 2001, Spring 2004, Spring 2007)
Visiting Professor, Department of Statistics and Cowles Foundation for Research in Economics, Yale University (Fall 1994)
Visiting Professor, Department of Statistics, University of California, Berkeley (Spring 1993)
Visiting Professor, Department of Mathematics and Computer Science, University of Miami (Spring 1986)
Visiting Professor, Department of Statistics, University of Michigan (1977)
Associate Professor, Department of Theoretical Statistics, University of Minnesota (1971–77)
Assistant Professor, Department of Theoretical Statistics, University of Minnesota (1969–71)
Assistant Professor, Department of Mathematics, Morehouse College, (A Woodrow Wilson Foundation teaching intern)(1968–69)

Acting Assistant Professor, Department of Statistics, University of California, Berkeley (1967–68)

D Consulting (on legal matters of a statistical nature):

1. Consultant to the Special Masters in the Rajender Decree from 1982 to 1984.
2. Consultant to the Special Master in the U.S.F. & G. Decree from 1983 to 1989.
3. Consultant to the North Carolina Legal Defense from 1983 to 1984.
4. Consultant to law firm of Mohrem and Manahan from 1984 to 1985.

II Professional Honors and Recognitions

A Societies:

Member of the American Mathematical Society, the Institute of Mathematical Statistics, and the Game Theory Society

B Honors:

Elected Fellow of the Institute of Mathematical Statistics (1979) and Member of the International Statistical Institute (1989)

C Activities:

Associate Editor for the *Annals of Statistics*, 1980–83
Participant in the Visiting Lecturer Program in Statistics 1978–79
Probability and Statistics Editor for the
Proceedings of the the American Mathematical Society, 1987–1990
Associate Editor for *Mathematics of Operations Research*, 1993–97
Editorial Board, *International Journal of Game Theory*, 2001–03
Editorial Board, *Annals of the International Society of Dynamic Games*, 2001–04

III Teaching

A Courses taught at the University of Minnesota:

In the School of Statistics:
Decision of Theory

Probability and Statistics (elementary)
Theory of Statistics (intermediate)
Mathematical Statistics
Large Sample Theory
Introduction to Stochastic Processes with Applications
Various special topics courses including Markov Decision Theory and Stochastic Control

In the School of Mathematics:

Linear Algebra
Ordinary Differential Equations
Introduction to Stochastic Processes
Theory of Probability
Measure Theory and Probability

In the Summer Honors College:

Probability and Statistics in Games and Sports

B Ph.D. Students:

Robert Chen (1974). Thesis entitled "On finitely additive almost sure convergence."
Stuart Klugman (1975). "Optimal strategies for modified -red-and-black casinos."
Pintip Chaiyakarn (1987). "Controlling a discrete-time process to a goal quickly or slowly."
Lakshmi Nilakantan (1993). "Continuous time stochastic games."
Nathan Richard Wetzel (1993). "Coherent inferences for multivariate data models."
Piercesare Secchi (1995). "Problems in two-person, zero-sum stochastic games."
Grant Runyan (1998). "Superfair red-and-black."
Maurizio Tiso (1999). "Nonparametric model selection: an approach based on density estimation."
Laura Pontiggia (2004). "Topics in Stochastic Games."
Barbara Bennie (2006). "Strategic Market Games with Cyclic Production."
Christopher Cook (2006). "A Game Theoretic Approach to Options Markets."

C Honors:

Selected Best Statistics Professor by the Student Board of the Institute of Technology at the University of Minnesota, 1989.

IV Adminstration and Committees

Honors representative 1971–75, 1982–83, 2008–
CLA Assembly 1977–1979, 1990–92
Director of Graduate Studies 1982–84
School of Statistics Self-Survey Report Committee Chair 1984
Physical Science Policy and Review Committee 1988–1990
CLA Promotion and Tenure Committee 1988–1990
Chair, Department of Theoretical Statistics 1989–1992
Director of Undergraduate Studies 2008 – 2012
CLA Scholastic Appeals Committee 2008 – 2012
IT Curriculum Committee 2008 – 2012
Academic Standards and Student Affairs Committee 2008 – 2012

V Scholarship

A Papers:

1. "Another formulation of the inventory problem," *Journal of Operations Research*, *13*, pp. 504–507, May–June 1965.

2. "On the existence of good stationary strategies," *Transactions of the American Mathematical Society*, *135*, pp. 399–414, January, 1969.

3. "On measurable, non-leavable gambling houses with a goal," *Annals of Math. Stat.*, *40*, pp. 66–71, February, 1969.

4. "A note on thrifty strategies and martingales in a finitely additive setting," *Annals of Math. Stat.*, *40*, pp. 2211–2215, December, 1969.

5. "On measurable gambling problems," *Annals of Math. Stat.*, *42*, pp. 260–269, February, 1971.

6. "A gambling theorem and optimal stopping theory," *Annals of Math. Stat.*, *42*, pp. 1697–1705, October, 1971.

7. "A 'Fatou equation' for randomly stopped variables," *Annals of Math. Stat.*, *42*, pp. 2143–2146, December, 1971.

8. "On the Dubins and Savage characterization of optimal strategies," *Annals of Math. Stat.*, *43*, pp. 498–507, April, 1972.

9. "On a theorem of de Finetti, oddsmaking, and game theory," (with David Heath), *Annals of Math. Stat.*, *43*, pp. 2072–2077, December, 1972.

10. "Subfair Red-and-Black with a limit," (with David Heath and William Pruitt), *Proc. of Amer. Math. Soc.*, *35*, pp. 555–560, October, 1972.

11. "Red-and-Black with unknown win probability," (with Donald Berry and David Heath), *Annals of Statistics*, *2*, pp. 602–608, May, 1974.

12. "Continuous-time gambling problems," (with David Heath), *Adv. in App. Prob.*, *6*, pp. 651–665, December, 1974.

13. "An example in which stationary strategies are inadequate," (with Lester Dubins), *Annals of Probability*, *3*, pp. 722–725, August, 1975.

14. "Some finitely additive probability," (with Roger Purves), *Annals of Probability*, *4*, pp. 259–276, April, 1976.

15. "De Finetti's theorem on exchangeable variables," (with David Heath), *The American Statistician*, *30*, pp. 188–190, November, 1976.

16. "Generalized Kolmogorov inequalities for martingales," (with David Gilat), *Z. f. Wahrscheinlichkeitstheorie*, *36*, pp. 67–73, 1976.

17. "Persistently ε-optimal strategies," (with Lester Dubins), *Mathematics of Operations Research*, *2*, pp. 125–134, May, 1977.

18. "Timid play when large bets are profitable," (with David Gilat), *Annals of Probability*, *5*, pp. 573–576, August, 1977.

19. "On countably additive gambling and optimal stopping theory," (with Lester Dubins), *Z. f. Wahrscheinlichkeitstheorie*, *41*, pp. 59–72, 1977.

20. "On finitely additive priors, coherence, and extended admissibility," (with David Heath), *Annals of Statistics*, *6*, pp. 333–345, March 1978.

21. "Diffuse models for sampling and predictive inference," (with David Lane), *Annals of Statistics*, *6*, pp. 1318-1336, September 1978.

22. "On stationary strategies for absolutely continuous houses," (with Lester Dubins), *Annals of Probability*, *7*, pp. 461–476, June, 1979.

23. "A strong law for some generalized urn processes," (with Bruce Hill and David Lane), *Annals of Probability*, *8*, pp. 214–226, April, 1980.

24. "Countably additive gambling with a general expected reward," *Z. f. Wahrscheinlichkeitstheorie*, *54*, pp. 221–225, 1980.

25. "Finitely additive priors, coherence, and the marginalization paradox," *Journal of the Royal Statistical Society*, *42*, no. 3, pp. 339–341, 1980.

26. "Incidence and prevalence as used in the analysis of nosocomial infection," (with Frank Rhame), *American Journal of Epidemiology*, *113*, no.1, pp. 1–11, January, 1981.

27. "On nearly strategic measures," (with Thomas Armstrong), *Pacific Journal of Mathematics*, *94*, no. 2, pp. 251–257, 1981.

28. "Dynamic Programming," *Encyclopedia of Statistical Sciences*, *v.2*, pp. 428–433, Wiley, New York, 1982.

29. "Singularity with respect to strategic measures," (with Karel Prikry), *Illinois Journal of Mathematics*, *43*, pp. 139–153, no. 2, 1982.

30. "How to stay in a set or König's Lemma for random paths," (with Roger Purves), *Israel Journal of Mathematics*, *43*, pp. 139–153, no. 2, 1982.

31. "Coherent and continuous inference," (with David Lane), *Annals of Statistics*, *11*, pp. 114–120, March 1983.

32. "Gambling problems with a limit inferior payoff," *Mathematics of Operations Research*, *8*, pp. 287–297, May 1983.

33. " Finitely additive zero-one laws," (with Roger Purves), *Sankhya, Series A*, *45*, pp. 32–37, 1983.

34. "Coherent predictive inference," (with David Lane), *Sankhya, Series A*, *46*, pp. 166–185, 1984.

35. "Continuous-time Red-and-Black: How to control a diffusion to a goal," (with Victor Pestien), *Mathematics of Operations Research*, *10*, pp. 599–611, November 1985.

36. "Coherent predictions are strategic," (with David Lane), *Annals of Statistics*, *13*, pp. 1244–1248, September 1985.

37. "The expected value of an everywhere stopped martingale," (with S. Ramakrishnan), *Annals of Probability*, *14*, pp. 1075–1079, July 1986.

38. "Stationary policies and Markov policies in Borel dynamic programming," (with Manfred Schäl), *Probability Theory and Related Fields*, *74*, pp. 91–111, 1987.

39. "Minimizing or maximizing the expected time to reach zero," (with D. Heath, S. Orey, and V. Pestien), *SIAM Journal on Control and Optimization*, *25*, pp. 195–205, January 1987.

40. "Exchangeable urn processes," (with B. Hill and D. Lane), *Annals of Probability*, *15*, pp. 1586–1592, October 1987.

41. "Reaching zero rapidly," (with S. Orey and V. Pestien), *SIAM Journal on Control and Optimization*, *25*, pp. 1253–1265, September 1987.

42. "Gambling theory and stochastic control," (with V. Pestien), *Proceedings of the 26th IEEE Conference on Decision and Control*, pp. 1970–1972, December 1987.

43. "Continuous-time casino problems," (with V. Pestien), *Mathematics of Operations Research*, *13*, pp. 364–376, May 1988.

44. " A sequence of coin toss variables for which the strong law fails," (with S. Ramakrishnan), *American Mathematical Monthly*, *95*, pp. 939–941, December 1988.

45. "Locally coherent rates of exchange," (with Thomas Armstrong), *Annals of Statistics*, *17*, pp. 1394–1408, September 1989.

46. "Coherent inference from improper priors and from finitely additive priors," (with D. Heath), *Annals of Statistics*, *17*, pp. 907–919, June 1989.

47. "Controlling a process to a goal in finite time," (with A. Weerasinghe), *Mathematics of Operations Research*, *14*, pp. 400–409, August 1989.

48. "Measurable, nonleavable gambling problems," (with L. Dubins, A. Maitra and R. Purves), *Israel Journal of Mathematics*, *67*, pp. 257–271, 1989.

49. "Leavable gambling problems with unbounded utilities," (with A. Maitra and R. Purves), *Transactions of American Mathematical Society*, *320*, pp. 543–567, August 1990.

50. "A Borel measurable version of König's Lemma for random paths," (with A. Maitra and R. Purves), *Annals of Probability*, *19*, pp. 423–451, January 1991.

51. "Using fuel to control a process to a goal," (with A. Weerasinghe), *Stochastics and Stochastics Reports*, *34*, pp. 169–186, 1991.

52. "A capacitability theorem in finitely additive gambling," (with A. Maitra and R. Purves), *Rendiconti di Matematica e delle sue applicazioni*, *11*, pp. 819–842, October-December 1991.

53. "Polya trees and random distributions," (with R. D. Mauldin and S. C. Williams), *Annals of Statistics*, *20*, pp. 1203–1221, September 1992.

54. "A capacitability theorem in measurable gambling theory," (with A. Maitra and R. Purves), *Transactions of American Mathematical Society, 333*, pp. 221–250, September 1992.

55. "An operator solution of stochastic games," (with A. Maitra), *Israel Journal of Mathematics, 78*, pp. 33–49, 1992.

56. "A bang-bang strategy for a finite fuel stochastic control problem," (with A. Weerasinghe), *Advances in Applied Probability, 24*, pp. 589–603, 1992.

57. "The optimal reward operator in negative dynamic programming," (with A. Maitra), *Mathematics of Operations Research, 17*, pp. 921–931, November 1992.

58. "Approximation theorems for gambling problems and stochastic games," (with A. Maitra and R. Purves), *Game Theory and Economic Applications: Lecture Notes in Economics and Mathematical Systems, 389*, pp.114–131, Springer-Verlag, Berlin, 1992.

59. "Borel stochastic games with lim sup payoff," (with A. Maitra), *Annals of Probability, 21*, pp. 861–885, April 1993.

60. "Finitely additive and measurable stochastic games," (with A. Maitra), *International Journal of Game Theory, 22*, pp. 201-223, 1993.

61. "Prediction in a multivariate normal setting: coherence and incoherence," (with M. L. Eaton), *Sankhya, Series A,55*, pp. 481–493, 1993.

62. "Coherent inference and prediction in statistics," *Logic, Methodology, and Philosophy of Science IX*, editors D. Prawitz, B. Skyrms, and D. Westerståhl, pp. 833–844, Elsevier Science, 1994.

63. "Construction of stationary Markov equilibria in a strategic market game," (with I. Karatzas and M. Shubik), *Mathematics of Operations Research, 19*, pp. 975–1006, November 1994.

64. "Stochastic games and operators," (with A. Maitra), *Topics in Contemporary Probability and its Applications*, editor J. L. Snell, pp. 291–319, CRC Press, 1995.

65. "The Big Match on the integers," (with B. Fristedt and S. Lapic), *Annals of the International Society of Dynamic Games*, editor G. J. Olsder, pp. 95–107, Birkhäuser, Boston, 1995.

66. "The formal posterior of a standard flat prior in MANOVA is incoherent," (with M. L. Eaton), *Journal of the Italian Statistical Society, 2*, pp. 251–270, 1995.

67. "The gambler and the stopper," (with A. Maitra), *Statistics, Probability,and Game Theory, Papers in Honor of David Blackwell*, IMS Lecture Notes - Monograph *Series 30*, editors T. S. Ferguson, L. S. Shapley, and J. B. MacQueen, pp. 191–208, 1996.

68. "A strategic market game with secured lending," (with I. Karatzas and M. Shubik), *Journal of Mathematical Economics*, *28*, pp. 207–247, 1997.

69. "Geometric convergence of algorithms in gambling theory," (with S. Ramakrishnan), *Mathematics of Operations Research*, *23*, pp. 568–575, 1998.

70. "Finitely additive stochastic games with Borel measurable payoffs," (with A. Maitra), *International Journal of Game Theory*, *27*, pp. 257–267, 1998.

71. "A new predictive distribution for normal multivariate linear models," (with Morris Eaton), *Sankhya, Series A*, *60*, pp. 363–382, 1998.

72. "Control and stopping of a diffusion process on an interval," (with Ioannis Karatzas), *Annals of Applied Probability*, *9*, pp. 188–196, 1999.

73. "An introduction to gambling theory and its applications to stochastic games," (with A. Maitra), *Stochastic and Differential Games: Theory and Numerical Methods*, editors M. Bardi, T. E. S. Raghavan and T. Parthasarathy, pp. 251–269, Birkhäuser, Boston, 1999.

74. "Consistency and strong inconsistency of group invariant predictive inferences," (with M. L. Eaton), *Bernoulli*, *5*, pp. 833-854, October 1999.

75. "Saturations of gambling houses," (with A. Maitra), *Séminaire de Probabilités XXXIV*, Lecture Notes in Mathematics, 1729, pp. 218-238, Springer-Verlag, Berlin, 2000.

76. "A strategic market game with active bankruptcy," (with J. Geanakoplos, I. Karatzas, and M. Shubik), *Journal of Mathematical Economics*, *34*, pp.359–396, 2000.

77. "Randomized strategies and terminal distributions," (with A. Maitra), *Game Theory, Optimal Stopping, Probability and Statistics, Papers in honor of Thomas S. Ferguson*, IMS Lecture Notes - Monograph Series 35, pp. 39-52, 2000.

78. “Persistently good strategies for nonleavable stochastic games with finite state space,” (with Piercesare Secchi), *Annals of the International Society of Dynamic Games*,*6*, pp. 119-127, 2001.

79. “Best invariant predictive distributions,”(with M.L. Eaton), *Algebraic Methods in Statistics and Probability*, AMS Contemporary Mathematics Series 287, pp. 49-62, 2001.

80. “Dynamic strategic market games: a survey with examples,” (with Ioannis Karatzas and Martin Shubik), *Rivista Internazionale di Scienze Economiche e Commerciali*, *XLVIII*, pp.291-330, 2001.

81. “The controller-and-stopper game for a linear diffusion,” (with I. Karatzas), *Annals of Probability*, *29*, pp.1111-1127, 2001.

82. “Invariant gambling problems and Markov decision processes,” (with A. Maitra and L. Dubins), *Handbook of Markov Decision Processes: Methods and Applications*, International Series in Operations Research and Management Science, 40, pp. 409-428, 2002.

83. “Group invariant inference and right Haar Measure,” (with M. L. Eaton), *Journal of Statistical Planning and Inference*, *103*, pp. 87-99, 2002.

84. “Stay-in-a-set games,”(with P. Secchi), *International Journal of Game Theory*, *30*, pp. 479-490, May 2002.

85. ”N-person stochastic games with upper semi-continuous payoffs,” (with P. Secchi), *International Journal of Game Theory*, *30*, pp. 491-502, May 2002.

86. “The balayage order defined by a gambling house,” (with A. Maitra), *Sankhya, Series A*, *64*, pp. 852-867, 2002.

87. “A stochastic overlapping generations economy with inheritance,” (with I. Karatzas and M. Shubik), *Journal of Economics*, *77*, pp. 207-240, 2002.

88. ”Stochastic games with $\limsup$ payoff,” (with A. Maitra), *Stochastic Games and Applications*, A. Neyman and S. Sorin(editors), NATO Science Series C, Mathematical and Physical Sciences, vol. 570, Kluwer Academic Press, Chapter 23, pp. 357-366, 2003.

89. ”Stochastic games with Borel payoffs,” (with A. Maitra), *Stochastic Games and Applications*, A. Neyman and S. Sorin(editors), NATO Science Series C, Mathematical and Physical Sciences, vol. 570, Kluwer Academic Press, Chapter 24, pp. 367-373, 2003.

90. "Borel stay-in-a-set games," (with A. Maitra), *International Journal of Game Theory*, *32*, pp. 97-108, 2003.

91. "The preservation of continuity and Lipschitz continuity by optimal reward operators," (with Rida Laraki), *Mathematics of Operations Research*, *29*, pp. 672-685, 2004.

92. "Properties of right Haar predictive inference," (with M. Eaton), *Sankhya*, *66*, pp. 487-512, 2004.

93. "Information and the existence of stationary Markov equilibrium," (with I. Karatzas and M. Shubik), *Annals of the International Society of Dynamic Games*, *7*, pp. 3-20, 2005.

94. "A simple two-person stochastic game with money,"(with P. Secchi), *Annals of the International Society of Dynamic Games*, *7*, pp. 39-66, 2005.

95. "The inflationary bias of real uncertainty and the harmonic Fisher equation," (with I. Karatzas, M. Shubik, and J. Geanakoplos), *Economic Theory*, *28*, pp. 481-512, 2006.

96. "Stochastic games of control and stopping for a linear diffusion,"(with I. Karatzas), *Random Walks, Sequential Analysis, and Related Topics: A Festschrift in Honor of Yuan-Shih Chow*, C.A. Hsiung, Z. Ying, and C-H. Zhang eds, World Scientific, Singapore, pp.100-117, 2006.

97. "Production, interest, and saving in deterministic economies with additive endowments," (with I. Karatzas and M. Shubik), *Economic Theory*, *29*, pp. 528-548, 2006.

98. "Subgame perfect equilibria for stochastic games," (with A. Maitra), *Mathematics of Operations Research*, *32*, pp. 711-722, 2007.

99. "De Finetti coherence and logical consistency," (with J. Dickey and M. Eaton), *Notre Dame Journal of Formal Logic*, *50*, pp. 133-139, 2009.

100. "Two characterizations of optimality in dynamic programming," (with I. Karatzas), *Applied Mathematics and Optimization*, *61*, pp. 421-434, 2010.

101. "Big Vee:The story of a function, an algorithm, and three mathematical worlds," (with R. Purves), *Sankhya, Series A*, *72*, pp. 37-63, 2010.

102. "Invariance of posterior distributions under reparametrization," (with M. Eaton), *Sankhya, Series A*, *72*, pp. 101-118, 2010.

103. “Perfect information games with upper semicontinuous payoffs,” (with Roger Purves), *Mathematics of Operations Research*, *36*, pp. 468-473, 2011.

104. “Financial control of a competitive economy without randomness,” (with I. Karatzas and M. Shubik), *Journal of Public Economic Theory*, *13*, pp. 503-537, 2011.

105. “Invariance, model matching, and probability matching,” (with M. Eaton) *Sankhya, Series A*, *74*, pp. 170-193, 2012.

106. “Two-person zero-sum stochastic games with semicontinuous payoff,” (with R. Laraki and A. Maitra), *Dynamic Games and Applications*, *3*, pp. 162-171, 2013.

107. “Asymptotic behavior of a stochastic interest rate,” (with J. Geanakoplos and O. Zeitouni), *Sankhya, Series A*, *76*, pp. 150-157, 2014.

108. “Inflationary equilibrium in a stochastic economy,” (with J. Geanakoplos, I. Karatzas and M. Shubik), *Journal of Mathematical Economics*, *52*, pp. 1-11, 2014.

109. “Random walks and the number theoretic density,” *Statistical Methods and Applications, 23*, pp. 477-482, 2014.

110. “From general equilibrium to Schumpeter,” (with Martin Shubik), *Journal of Economic Dynamics and Control, 61*, pp. 269-282, 2015.

111. “Finitely additive dynamic programming,” *Mathematics of Operations Research, 41*, pp. 92-108, 2016.

112. “Measurability of the value of a parametrized game,” (with K. Prikry) *International Journal of Game Theory 3*, pp. 675-683, 2016.

113. “Breaking the circular flow: a dynamic programming approach to Schumpeter,” (with Martin Shubik), *Trends in Mathematical Economics*, A. A. Pinto, E. A. Gamba, A. N. Yannacopoulos, and C. Herves-Beloso, eds, Springer, pp. 1-35, 2016.

114. “A Continuity Question of Dubins and Savage,” (with R. Laraki), *Journal of Applied Probability*, pp. 462-473, 2017.

115. “Simplifying optimal strategies in limsup amd liminf stochastic games,” (with J. Flesch and A. Predtetchinski), *Discrete Applied Mathematics 251* pp. 40-56, 2018 .

116. "Characterization and simplification of optimal strategies in positive stochastic games," (with J. Flesch and A. Predtetchinski), *Journal of Applied Probability 55* pp. 462-473, 2018.

117. "Positive Zero-Sum stochastic games with countable state and action spaces," (with J. Flesch and A. Predtetchinski), *Applied Mathematics and Optimization 82*, pp. 499-516, 2020.

118. "Optimal Markov Strategies," *Decisions in Economics and Finance 43*, pp. 43-54, 2020.

119. "Stop-or-go games," (with J. Flesch and A. Predtetchinski), *International Journal of Game Theory 50*, pp. 559-579, 2021.

120. "Superfair stochastic games," (with J. Flesch and A. Predtetchinski), *Applied Mathematics and Optimization* (to appear).

B Books:

Discrete Gambling and Stochastic Games (with A. Maitra). Springer-Verlag, New York, 1996.

Co-editor with David Gilat of How to Gamble If You Must: Inequalities for Stochastic Processes by Lester E. Dubins and Leonard J. Savage, Dover Publications, New York, 2014.

C Book Reviews and Comments:

Great Expectations: The Theory of Optimal Stopping by Y. S. Chow, H. Robbins, and D. Siegmund, in *Mathematical Reviews*, 1973.

Stochastic Processes by J. Medhi in *Journal of the American Statistical Association*, December 1983.

Optimization Over Time by P. Whittle in *The American Scientist*, January-February 1985.

Bayes Theory by J. A. Hartigan in *Bulletin of the American Mathematical Society*, April 1985.

Comments on "The axioms of subjective probability" by Peter C. Fishburn, *Statistical Science*, August 1986.

Comments on "Avoiding foregone conclusions: geometric and foundational analysis of paradoxes of finite additivity," by Michael Goldstein, *Journal of Statistical Planning and Inference*, 34 pp. 93-95 2001.

D Invited Addresses:

Annual Meeting of the Institute of Mathematical Statistics held at University of Alberta, August 1974.

Regional Meeting of the Institute of Mathematical Statistics held at University of Kentucky, March 1978.

Seventeenth NBER-NSF Seminar on Bayesian Inference in Econometrics held at University of Michigan, November 1978.

Conference in honor of C. R. Rao held at the Indian Statistical Institute in Delhi, India, December 1980.

Institute for Applied Mathematics at the University of Bonn, West Germany, July 1981 and 1982, June 1986.

Annual meeting of the Operations Research Society of America/Institute of Management Science held at Atlanta, Georgia, November 1985.

Department of Mathematics at the University of Strasbourg, France, January 1986.

Oberwolfach meeting on Gambling Theory and Optimal Stopping held at Oberwolfach, West Germany, June 1986.

International Workshop on Bayesian Analysis held at Stresa, Italy, September 1986.

Deterministic and Stochastic Control Workshop, Mathematical Sciences Institute, Cornell University, April 1987.

26th IEEE Conference on Decision and Control, Los Angeles, California, December 1987.

Meeting of the American Mathematical Society, Atlanta, Georgia, January 1988.

Conference on Probability and Utility in Statistical Inference held at Erice, Sicily, February 1989.

International Congress on Logic, Methodology, and Philosophy of Science held at Uppsala, Sweden, August 1991.

Applied Probability Day, Columbia University, April 1992.

International Conference on Game Theory at Stony Brook, New York, July 1992.

Workshop in Honor of Professor Y. S. Chow, Columbia University, April 1993.

The Sixth International Symposium on Dynamic Games and Applications held at St. Jovite, Québec, Canada, July 1994.

Applied Probability Conference, Atlanta, Georgia, June 1995.

Workshop on "New Directions in Decision Processes," Atlanta, Georgia, February 1996.

INFORMS Applied Probability Meeting, Boston, June 1997.

NBER Conference on General Equilibrium and Economic Theory. New Haven, May 1997.

American Math. Society regional meeting. Atlanta, October 1997.

INFORMS national meeting. Seattle, October 1998.

NATO Advanced Study Institute on Stochastic Games. Stony Brook, New York, July 1999.

Benesfest: A Day of Stochastic Control, Columbia University, May 2000.

Workshop on Stochastic Control and Optimization, Politecnico di Milano, Milan, Italy, November 2000.

12th International Conference on Game Theory, Stony Brook, New York, July 2001.

3rd International Bayesian Nonparametrics Summit, Ann Arbor, Michigan, July 2001.

14th International Conference on Game Theory, Stony Brook, New York, July 2003.

15th International Conference on Game Theory, Stony Brook, New York, July 2004.

Workshop on "Jeux Dynamiques, Jeux Differentiels," Roscoff, France, June 2005.

17th International Conference on Game Theory, Stony Brook, New York, July 2006.

Four lectures on stochastic dynamic programming at Columbia University, New York, May 2007.

Annual meeting of the Florida chapter of the American Statistical Association, February 2009.

INFORMS Applied Probability Conference, Cornell, July 2009.

Institut Henri Poincare, Paris, May 2011.

David Blackwell Memorial Conference at Howard University, Washington D.C., April 2012.

Probability, Control, and Finance: a Conference in Honor of Ioannis Karatzas, Columbia University, New York, June 2012.

23rd International Conference on Game Theory, Stony Brook, New York, July 2012.

Conference on Mathematical Aspects of Game Theory and Applications, Roscoff, France, July 2014.

6th Workshop on Stochastic Methods in Game Theory, Erice, Sicily, May 2017.

Conference on The Mathematics of Subjective Probability, Milan, Italy, September 2018.

E Research Grants:

Supported by a grant from the Air Force Office of Scientific Research (AF-AFOSR)(for the summer of 1967) for research in probability theory.

Co-investigator for National Science Foundation Grants GP-9556 (1969-1970), GP-24183 (1970–1971) and DMS-8911548 (1989–) for research in probability theory and statistics.

Principle investigator for the following National Science Foundation Grants for research in probability theory and statistics:

NSF GP-39316	1973–1975
MPS75-06173	1975–1976
MCS76-03940	1976–1977
MCS77-28424	1978–1981
MCS81-00789	1981–1984
DMS-8421208	1985–1988
DMS-8801085	1988–1992
DMS-9123358	1992–1995
DMS-9423009	1995–1997
DMS-9703285	1997–2001

Professional Development Grants from University of Minnesota Retirees Association, 2014-2015 and 2017-2018.