CURRICULUM VITAE

Ronald F. Fox

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RONALD F. FOX

CURRICULUM VITAE

FOX, Ronald F.

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Personal Data:

Born: October 1, 1943, Berkeley, California
Children: Daniel - March 14, 1974 and Lara - March 28, 1977

Educational Background:

B.A. 1964 Reed College, Portland Oregon - Physics and Mathematics
Ph.D. 1969 Rockefeller University, New York, N.Y. - Theoretical Physics
Thesis: "Contributions to the Theory of Nonequilibrium Thermodynamics"
Advisors: Mark Kac and George Uhlenbeck
Erdös # = 2 (the connection is Mark Kac).
Physics lineage:
Jozef Stefan > Ludwig Boltzmann > Paul Ehrenfest > George Uhlenbeck.> Ronald Fox

Employment History:

Postdoctoral Fellow, Miller Institute for Basic Research in Science and Department of Physics, University of California at Berkeley	1969-71
Assistant Professor of Physics, Georgia Institute of Technology	1971-74
Associate Professor of Physics, Georgia Institute of Technology	1974-79
Visitor, Department of Engineering and Applied Physics, Harvard University, Sponsored by Alfred P. Sloan Fellowship	Oct. & Nov.1975
Professor of Physics, Georgia Institute of Technology	1979-1991
Visiting Professor of Chemistry, University of California at Davis	Spring 1981
Assistant Director for Graduate Program, School of Physics, Georgia Tech	1982-84
Associate Director for Graduate Program, School of Physics, Georgia Tech	1986-1989
Faculty Associate at Argonne, Argonne National Laboratory, Argonne, Illinois	1989-1991
Regents' Professor of Physics, Georgia Institute of Technology	1991-present
Associate Chair for Graduate Program, School of Physics, Georgia Tech	1997-1999
Acting Chair, School of Physics, Georgia Tech	1999 (July 1)-2001 (January 1)
Chair, School of Physics, Georgia Tech	2001 (January 1)-2005 (June 30)
Regents Professor Emeritus	2007 (July 1)

Current Fields of Interest:

Thermal Physics. Fluctuation theories for linear and non-linear processes. Non-equilibrium statistical physics. Theoretical biodynamics. Evolution of the genetic code and the protein biosynthesis machinery. Energy transduction in organisms. The transition from order to chaos in non-linear dynamic systems. Numerical simulation of stochastic differential equations. Quantum chaos. Turbulence theory. Ion channel fluctuations in nerve membranes. Stochastic resonance. The origins of life. Quasi-adiabatic time evolution. Rectified Brownian movement. Rydberg coherent states. Generalized coherent states.

Teaching Experience:

Legend

So: Sophomore; **J**: Junior; **Se**: Senior; **G1**: 1^{rst} year graduate; **G2**: 2nd year graduate

Quarters		Enrollment
Fall, 1971	Statistical Mechanics, **G1**	19
Winter, 1972	Particle Dynamics, **So**	82
Spring, 1972	Biophysics I, **J**	16
Fall, 1972	Classical Mechanics, **J**	31
Winter, 1973	Group Theory, **G1**	9
Spring, 1973	Biophysics I, **J**	6
Fall, 1973	Statistical Mechanics, **G1**	14
Winter, 1974	Thermal Physics, **J**	29
Spring, 1974	Biophysics I, **J**	11
Winter, 1975	Statistical Mechanics, **G2**	2
Spring, 1975	Quantum Mechanics, **G1**	11
Winter, 1976	Quantum Mechanics II, **Se**	33
Spring, 1976	Classical Magnetism, **J**	22
Fall, 1976	Statistical Mechanics, **G1**	3
Winter, 1977	Thermal Physics, **J**	13
Spring, 1977	Classical Magnetism, **J**	18
Summer, 1977	Statistical Mechanics, **G2**	2
Fall, 1977	Electromagnetism, **So**	142
Winter, 1978	Electrodynamics, **G1**	11
Spring, 1978	Classical Magnetism, **J**	19
Fall, 1978	Quantum Mechanics I, **J**	13
Winter, 1979	Electrodynamics, **G1**	13
Spring, 1979	Biophysics II, **Se**	3
Spring, 1979	Biophysics Laboratory, **Se**	2
Winter, 1980	Quantum Mechanics I, **J**	22
Spring, 1980	Classical Magnetism, **J**	19
Fall, 1980	Statistical Mechanics, **G1**	5
Winter, 1981	Mechanics and Electricity, **J**	24
Fall, 1981	Thermal Physics, **J**	18
Winter, 1982	Electrodynamics, **G1**	19
Spring, 1982	Particle Dynamics, **So**	142
Fall, 1982	Statistical Mechanics, **G1**	10
Winter, 1983	Quantum Mechanics I, **J**	19
Spring, 1983	Particle Dynamics, **So**	140
Fall, 1983	General Physics II (Honors), **So**	37
Winter, 1984	Special Relativity, **Se**	9
Spring, 1984	Statistical Mechanics, **G1**	16
Fall, 1984	Statistical Mechanics, **G2**	8
Fall, 1985	Statistical Mechanics, **G2**	4
Winter, 1986	Special Relativity, **Se**	7
Spring, 1986	Thermal Physics, **J**	24

Fall, 1986	Statistical Mechanics, **G2**	8
Winter, 1987	Thermal Physics, **J**	30
Spring, 1987	Statistical Mechanics, **G1**	25
Fall, 1987	Statistical Mechanics, **G2**	15
Winter, 1988	Elementary Biophysics I, **J**	17
Spring, 1988	Statistical Physics, **G1**	23
Fall, 1988	Statistical Mechanics, **G2**	5
Fall, 1988	Elementary Biophysics, **J**	15
Winter, 1989	Electrodynamic Theory, **G2**	7
Fall, 1989	Statistical Mechanics, **G2**	6
Winter, 1990	Electrodynamic Theory, **G2**	8
Fall, 1990	Group Theory & Quantum Mech.,**G2**	12
Winter, 1991	Electromagnetic Theory, **G2**	4
Fall, 1991	General Physics I (Honors), **So**	8
Winter, 1992	General Physics II (Honors), **So**	13
Spring, 1992	General Physics III (Honors), **So**	14
Winter, 1993	General Physics III (Honors), **So**	13
Spring, 1993	Quantum Mechanics I, **J**	39
Fall, 1993	Electromagnetism I, **G1**	21
Winter, 1994	Special Relativity, **Se**	21
Spring, 1994	Electromagnetism II, **G2**	12
Fall, 1994	Electromagnetism I, **G1**	34
Winter, 1995	General Physics III (Honors), **So**	10
Spring, 1995	Electromagnetism II, **G2**	21
Summer, 1995	Survey of Physics, **G1**	17
Fall, 1995	Quantum Mechanics II, **Se**	20
Winter, 1996	Honors Physics III, **So**	21
Spring, 1996	Classical Magnetism, **J**	24
Summer, 1996	Particle Dynamics, **So**	107
Summer, 1996	Survey of Physics, **G1**	6
Fall, 1996	Electromagnetism, **So**	130
Winter, 1997	Biophysics, **Se**	16
Spring, 1997	Special Relativity, **Se**	14
Fall, 1997	Honors Physics I, **So**	10
Winter, 1998	Special Relativity, **Se**	15
Spring, 1998	Quantum Mechanics I, **J**	21
Fall, 1998	Electromagnetism I, **G1**	24
Winter, 1999	Honors Physics III, **So**	5
Spring, 1999	Electromagnetism II **G2**	12

<u>Semesters</u>

Spring, 2000	Statistical Mechanics **Se**	11
Fall, 2000	Biophysics **Se**	24
Spring, 2001	Statistical Mechanics **G2**	19
Fall, 2001	Nanobiology **Se/G2**	10
Spring, 2002	Quantum Mechanics II **G2**	26
Fall, 2002	Statistical Mechanics II **G2**	12
Spring, 2003	Quantum Mechanics II **G2**	32
Fall, 2003	Statistical Mechanics **Se**	39
Spring, 2004	Thermodynamics **J**	39
Fall, 2004	Nanobiology **Se/G2**	10
Spring, 2005	Statistical Mechanics **G2**	17
Fall, 2005	Biophysics **Se**	12
Fall, 2006	Honors Physics II, **So**	21
Spring, 2007	Origin of Life, **Se/G2**	12

Refereed Journal Publications:

1. "A Simple New Method for Calculating the Characters of the Symmetric Groups", R. F. Fox, Journal of Combinatorial Theory, 2, 186-212 (1967).

2. "Contributions to Non-Equilibrium Thermodynamics. I. Theory of Hydro-dynamical Fluctuations", R. F. Fox and G. E. Uhlenbeck, Physics of Fluids 13, 1893-1902 (1970).

3. "Contributions to Non-Equilibrium Thermodynamics. II. Fluctuation Theory for the Boltzmann Equation", R. F. Fox and G. E. Uhlenbeck, Physics of Fluids 13, 28812890 (1970).

4. "Entropy Reduction in Open Systems", R. F. Fox, Journal of Theoretical Biology 31, 43-46 (1971).

5. "Contributions to the Theory of Multiplicative Stochastic Processes", R. F. Fox, Journal of Mathematical Physics 13, 1196-1207 (1972).

6. "An 'H-Theorem' for Multiplicative Stochastic Processes", R. F. Fox, Journal of Mathematical Physics 13, 1726-1729 (1972).

7. "Physical Applications of Multiplicative Stochastic Processes", R. F. Fox, Journal of Mathematical Physics 14, 20-25 (1973).

8. "Stochastic Symmetry Breaking of Time Reversal Invariance", R. F. Fox, Journal of Mathematical Physics 14, 1187-1189 (1973).

9. "Qualms Regarding the Range of Validity of the Glansdorff-Prigogine Criterion for Stability of Non-Equilibrium States", J. Keizer and R. F. Fox, Proceedings of the National Academy of Sciences 71, 192-196 (1974).

10. "Physical Applications of Multiplicative Stochastic Processes II. Derivation of the Bloch Equations for Magnetic Relaxation", R. F. Fox, Journal of Mathematical Physics 15, 217-219 (1974).

11. "Application of Cumulant Techniques to Multiplicative Stochastic Processes", R. F. Fox, Journal of Mathematical Physics 15, 1479-1483 (1974).

12. "Multiplicative Stochastic Processes, Fokker-Planck Equations, and a Possible Dynamical Mechanism for Critical Behavior", R. F. Fox, Journal of Mathematical Physics 15, 1918-1929 (1974).

13. "A Generalized Theory of Multiplicative Stochastic Processes Using Cumulant Techniques", R. F. Fox, Journal of Mathematical Physics 16, 289-297 (1975).

14. "Physical Applications of Multiplicative Stochastic Processes III. Non-Equilibrium Entropy", R. F. Fox, Journal of Mathematical Physics 16, 1214-1218 (1975).

15. "The Thermodynamic Cuboctahedron", R. F. Fox, Journal of Chemical Education 53, 441-442 (1976).

16. "Critique of the Generalized Cumulant Expansion Method", R. F. Fox, Journal of Mathematical Physics 17, 1148-1153 (1976).

17. "Fluctuating Hydrodynamics Explanation of the Alder-Wainwright Velocity Auto- Correlation Computer Experiments", R. F. Fox, Journal of Chemical Physics 64, 5307-5308 (1976).

18. "Analysis of Nonstationary, Gaussian and Non-Gaussian, Generalized Langevin Equations Using Methods of Multiplicative Stochastic Processes", R. F. Fox, Journal of Statistical Physics 16, 259-279 (1977).

19. "A Remark on the Theory of Fluctuations far from Thermodynamic Equilibrium", R. F. Fox and M. Kac, BioSystems 8, 187-191 (1977).

20. "The Generalized Langevin Equation with Gaussian Fluctuations", R. F. Fox, Journal of Mathematical Physics 18, 2331-2335 (1977).

21. "Fluctuation Theories and Gaussian Stochastic Processes", R. F. Fox, Journal of Mathematical Physics 19, 127-130 (1978).

22. "Heat Conduction in a Spatially Random Medium", R. F. Fox and R. Barakat, Journal of Statistical Physics 18, 171-178 (1978).

23. "Hydrodynamic Fluctuation Theories", R. F. Fox, Journal of Mathematical Physics 19, 1993-1999 (1978).

24. "Fluctuation Theories for Nonlinear Hydrodynamics", R. F. Fox, Supplement 64 to Progress in Theoretical Physics, 425-435 (1978).

25. "Gaussian Stochastic Processes in Physics", R. F. Fox, Physics Reports C. 48, 179-283 (1978).

26. "Pulse Propagation in a Spatial and Temporal Random Medium", R. F. Fox and R. Barakat, Journal of Physics A 12, 353-359 (1979).

27. "Irreversible Processes at Non-equilibrium Steady States", R. F. Fox, Proceedings of the National Academy of Sciences, USA 76, 2114-2117 (1979).

28. "Master Equation Derivation of Keizer's Theory of Non-equilibrium Thermodynamics with Critical Fluctuations", R. F. Fox, Journal of Chemical Physics 70, 4660-4663 (1979).

29. "Time Ordered Operator Cumulants: Statistical Independence and Non-Commutativity", R. F. Fox, Journal of Mathematical Physics 20, 2467-2470 (1979).

30. "Maxwell $\xrightarrow[t\to\infty]{}$ Boltzmann", J. L. Davis and R. F. Fox, Journal of Statistical Physics 22, 627-645 (1980).

31. "The 'Excess Entropy' Around Nonequilibrium Steady States, $(*^2S)_{ss}$, is not a Liapunov Function", R. F. Fox, Proceedings of the National Academy of Science 77, 3763-3766 (1980).

32. "Comment on 'Inconsistency Between the Boltzmann Distribution for Relativistic Free Particles and the Planck Spectrum for Thermal Radiation in Quantum Theory'", C. H. Braden, R. F. Fox, and H. A. Gersch, Physical Review D 23, 1455-1457 (1981).

33. "Coupled Translational and Rotational Diffusion in Liquids", U. Steiger and R. F. Fox, Journal of Mathematical Physics 23, 296-314 (1982).

34. "The Ideal Gas and the Second Law of Thermodynamics", R. F. Fox, American Journal of Physics 50, 804-805 (1982).

35. "Stress-Strain Fluctuations in Non-Linear Hydrodynamics", R. F. Fox, Physica 112A, 505-513 (1982).

36. "Testing Theories of Nonequilibrium Processes with Light Scattering Techniques", R. F. Fox, Journal of Physical Chemistry 86, 2812-2818 (1982).

37. "Boson Operator Representation of Brownian Motion," U. R. Steiger and R. F. Fox, Journal of Mathematical Physics 23, 1678-1687 (1982).

38. "The Long Time Tail Conundrum in Nonequilibrium Statistical Mechanics", R. F. Fox, Physica 118A, 383-394 (1983).

39. "Correlation Time Expansion for Non-Markovian, Gaussian, Stochastic Processes", R. F. Fox, Physics Letters 94A, 281-286 (1983).

40. "Long Time Tails and Diffusion", R. F. Fox, Physical Review A27, 3216-3233 (1983).

41. "Laser with a Fluctuating Pump: Intensity Correlations", R. F. Fox, G. E. James, and R. Roy, Physical Review Letters 52, 1778-1781 (1984).

42. "Response to Comment on 'Ideal Gas and the Second Law of Thermodynamics', by G. Mandel, R. F. Fox, American Journal of Physics 52, 463 (1984).

43. "Stochastic Pump Effects in Lasers", R. F. Fox, G. E. James, and R. Roy, Physical Review A30, 2482-2492, (1984).

44. "Theoretical Analysis of Long Time Tail Observations by Light Scattering off of Polystyrene Spheres", R. F. Fox, Physical Review A30, 2590-2596, (1984).

45. "Functional Calculus Approach to Stochastic Differential Equations", R. F. Fox, Physical Review A33, 467-476 (1986).

46. "Elementary Explanation of Boundary Shadings in Chaotic Attractor Plots for the Feigenbaum Map and the Circle Map", J. Eidson, S. Flynn, C. Holm, D. Weeks and R. F. Fox, Physical Review A33, 2809-2812 (1986).

47. "Quantum Chaos and a Periodically Perturbed Eberly-Chirikov Pendulum", R. F. Fox and John Eidson, Physical Review A34, 482-492 (1986).

48. "Laser Noise Analysis By First Passage Time Techniques", R. F. Fox, Physical Review A34, 3405-3408 (1986).

49. "A Stochastic Theory of Line Shape and Relaxation", K. Faid and R. F. Fox, Physical Review A34, 4286-4302 (1986).

50. "Quantum Chaos in a Two Level System in a Semi-Classical Radiation Field", J. Eidson and R. F. Fox, Physical Review A34, 3288-3292 (1986).

51. "Uniform Convergence to an Effective Fokker-Planck Equation for Weakly Colored Noise", R. F. Fox, Physical Review A34, 4525-4527 (1986).

52. "Steady State Analysis of Strongly Colored Multiplicative Noise in a Dye Laser", R. F. Fox and Rajarshi Roy, Physical Review A35, 1838-1842 (1986).

53. "Stochastic Theory of Relaxation and Approach to Thermal Equilibrium for Phonon Reservoirs", Karim Faid and R. F. Fox, Physical Review A35, 2684-2689 (1987).

54. "Stochastic Calculus in Physics", by R. F. Fox, Journal of Statistical Physics 46, 1145-1157 (1987).

55. "Tests of Numerical Simulation Algorithms for the Kubo Oscillator", by R. F. Fox, R. Roy, and A. W. Yu, Journal of Statistical Physics 47, 477-488 (1987).

56. "Systematic Corrections to the Rotating-Wave Approximation and Quantum Chaos", by R. F. Fox and John C. Eidson, Physical Review A36, 4321-4329 (1987).

57. "Mean First Passage Times and Colored Noise", R. F. Fox, Physical Review A37, 911-917 (1988).

58. "The Absorption Line Shape for a Molecular System Stochastically Coupled to a Phonon Thermal Reservoir", K. Faid and R. F. Fox, Journal of Chemical Physics 88, 4579-4583 (1988).

59. "A Fast, Accurate, Algorithm for Numerical Simulation of Exponentially Correlated Colored Noise", R. F. Fox, I. R. Gatland, R. Roy, and G. Vemuri, Physical Review A38, 5938-5940 (1988).

60. "Numerical Simulation of Stochastic Differential Equations", R. F. Fox, Journal of Statistical Physics 54, 1353-1366 (1989).

61. "Stochastic Resonance in a Double Well", R. F. Fox, Physical Review A39, 4148-4153 (1989).

62. "Comment on: 'Bistability and Colored Noise in Nonequilibrium Systems: Theory versus Precise Numerics'", R. F. Fox, Physical Review Letters 62, 1205 (1989).

63. "Erratum: Tests of Numerical Simulation Algorithms for the Kubo Oscillator", R. F. Fox and R. Roy, Journal of Statistical Physics 58, 395-396 (1990).

64. "Effect of Molecular Fluctuations on the Description of Chaos by Macrovariable Equations", R. F. Fox and J. E. Keizer, Physical Review Letters 64, 249-251 (1990).

65. "Chaos and the Correspondence Limit in the Periodically Kicked Pendulum", R. F. Fox and B. L. Lan, Physical Review 41A, 2952-2968 (1990).

66. "Chaos, Molecular Fluctuations, and the Correspondence Limit", R. F. Fox, Physical Review 41A, 2969-2976 (1990).

67. "A Master Equation for the Logistic Map", R. F. Fox, Physical Review 42A, 1946-1953 (1990).

68. "Temperature and Field Dependence of Magnetic Relaxation in a Bi2Sr2CaCu2Ox Single Crystal", Donglu Shi, Ming Xu, A. Umezawa, and R. F. Fox, Physical Review 42B, 2062-2065 (1990).

69. "A Generalized Critical-State Model of Hard Superconductors", Ming Xu, Donglu Shi, and R. F. Fox, Physical Review 42B, 10773-10776 (1990).

70. "Quantum-Classical Correspondence and Quantum Chaos in the Periodically Kicked Pendulum", Boon Leong Lan and R. F. Fox, Physical Review 43A, 646-655 (1991).

71. "Cumulant Sum Rule for the Kardar-Parisi-Zhang (KPZ) Equation", R. F. Fox, Physical Review 43A 3143-3145 (1991).

72. "Amplification of Intrinsic Fluctuations by Chaotic Dynamics", R. F. Fox and J. Keizer, Physical Review 43A, 1709-1720 (1991).

73. "Second Order Algorithm for the Numerical Integration of Colored Noise Problems", R. F. Fox, Physical Review 43A, 2649-2654 (1991). Equation (59) correction.

74. "Generalized Coherent State Analysis of Semi-Classical Quantum Chaos for an Angular Momentum J in a Resonant Cavity", R. F. Fox, Physical Review 44A, 6193-6201 (1991).

75. "Stochastic Effects in Rayleigh-Benard Pattern Formation", T. C. Elston and R. F. Fox, Physical Review 44A, 8403-8405 (1991).

76. "Amplification of Intrinsic Noise in a Chaotic Multimode Laser System", C. Bracikowski, R. F. Fox, and Rajarshi Roy, Physical Review 45A, 403-408 (1992).

77. "Reply to 'Comments on the Amplification of Intrinsic Fluctuations by Chaotic Dynamics", J. E. Keizer and R. F. Fox, Physical Review A46, 3572-3573 (1992).

78. "On the Growth of Molecular Fluctuations for Nonstationary Systems: Hydrodynamic Fluctuations for the Lorenz Model", Joel Keizer, R. F. Fox, and John Wagner, Physics Letters A 175, 17-22 (1993).

79. "Amplification of Intrinsic Fluctuations by the Lorenz Equations", and R. F. Fox and T. C. Elston, Chaos 3, 313-323 (1993).

80. "Analytic and Numerical Study of Stochastic Resonance", R. F. Fox and Y.-N. Lu, Physical Review E48, 3390-3398 (1993).

81. "Enhanced Quantum Fluctuations in a Chaotic Single Mode Ammonia Laser", by T. C. Elston and R. F. Fox, Chaos 4, 1-13 (1994).

82. "Emergent Collective Behavior in Large Numbers of Globally Coupled Independently Stochastic Ion Channels", by R. F. Fox and Yannan Lu, Physical Review E49, 3421-3431 (1994).

83. "Chaos and Quantum-Classical Correspondence in the Kicked Pendulum", R. F. Fox and T. C. Elston, Physical Review E49, 3683-3696 (1994).

84. "Chaos and Quantum-Classical Correspondence in the Kicked Top", R. F. Fox and T. C. Elston, Physical Review E 50, 2553-2563 (1994).

85. "Unstable Evolution of Point-Wise Trajectory Solutions to Chaotic Maps", R. F. Fox, CHAOS 5, 619-633 (1995).

86. "The Origins of Life: What One Needs to Know", R. F. Fox, Zygon: Journal of Religion and Science 32, No. 3, 393-406 (1997). (An Invited Paper).

87. "Construction of the Jordan Basis for the Baker Map", R. F. Fox, Chaos 7, 254-269 (1997).

88. "Stochastic Versions of the Hodgkin-Huxley Equations", R. F. Fox, Biophysical Journal 72, 2068-2074 (1997).

89. "Quantum Steps in Hysteresis Loops", M. Thorwart, P. Reimann, P. Jung, and R. F. Fox, Physics Letters A 239, 233-238 (1998).

90. "Rectified Brownian Movement in Molecular and Cell Biology", R. F. Fox, Physical Review E 57, 2177-2203 (1998).

91. "Commentary on: 'Evolutionary Basis of Conceptual Primitives' by Larry Vandervort", R. F. Fox, New Ideas in Physhology 15 (2), 125-126 (1997).

92. "Quantifying Stochastic Resonance in Bistable Systems: Response vs. Residence Time Distribution Functions", M. H. Choi, R. F. Fox, and P. Jung, Physical Review E 57, 6335-6344 (1998).

93. "Quasi-Adiabatic Time Evolution, Avoided Level Crossings and Berrys Phase", R. F. Fox and P. Jung, Physical Review A 57, 2339-2346 (1998).

94. "Entropy Evolution for the Baker Map", R. F. Fox, Chaos 8, 462-465 (1998).

95. "Quantum Hysteresis and Resonant Tunneling in Bistable Systems", M. Thorwart, P. Reimann, P. Jung, and R. F. Fox, Chemical Physics 235, 61-80 (1998).

96. "Generalized Coherent States", R. F. Fox, Physical Review A 59, 3241-3255 (1999).

97. "Generalized Coherent States and Quantum-Classical Correspondence", R. F. Fox and M. H. Choi, Physical Review A 61, 032107 (2000), 11 pages.

98. "Rectified Brownian Motion and Kinesin Motion Along Microtubules", R. F. Fox and M. H. Choi, Physical Review E 63, 051901 (2001), 12 pages.

99. "Generalized Coherent States for Systems with Degenerate Energy Spectra", R. F. Fox and M. H. Choi, Physical Review A 64, 042104 (2001), 6 pages.

100. "Evolution of Escape Processes with Time Varying Load", M. H. Choi and R. F. Fox, Physical Review E 66, 031103 (2002), 6 pages.

101. "Quasiadiabatic Analysis for Ionization of a particle in a Perturbed $\delta(x)$ Potential", M.H. Choi and R.F. Fox, Physical Review E 66, 046124 (2002), 5 pages.

102. "Semiclassical Analysis of Long Wavelength, Multiphoton Processes: The Periodically Driven Harmonic Oscillator", R.F. Fox and L.V. Vela-Arevalo, Physical Review A 66, 053402 (2002), 10 pages. This paper has been selected by the Editor of and appears in Virtual Journal of Ultrafast Science-November 2002, Volume 1, Issue 6.

103. "Using nonequilibrium measurements to determine macromolecule free energy differences." (Invited commentary), R.F. Fox, Proceedings of the National Academy of Sciences USA 100, 12537-12538 (2003).

104. "A Minnow, an E. Coli and Ubiquinone: The Story of Rectified Brownian Motion" (Invited paper) Proceedings of the Nanotech 2004 Conference, Boston, Massachusetts March 7-11, (2004).

105. "Semiclassical Analysis of Long Wavelength, Multiphoton Processes: The Rydberg Atom", Luz V. Vela-Arevalo and R. F. Fox, Physical Review A 69, 063409 (2004), 13 pages. This paper has been selected by the Editor of and appears in Virtual Journal of Ultrafast Science-July 2004, Volume 3, Issue 7.

106. " Coherent states of the driven Rydberg atom: Quantum-classical correspondence of periodically driven systems", Luz V. Vela-Arevalo and R. F. Fox, Physical Review A 71, 063403 (2005), 12 pages. This paper has been selected by the Editor of and appears in Virtual Journal of Ultrafast Science-July 2005, Volume 4, Issue 7.

107. "Coherent State Analysis of the Quantum Bouncing Ball", William Mather and R.F. Fox, Physical Review A, 73 032109 (2006), 9 pages.

108. "Kinesin's Biased Stepping Mechanism: Amplification of Neck Linker Zippering", William Mather and R.F. Fox, Biophysical Journal, 91 2416-2426 (2006).

109. "Universal Turning Point Behavior for Gaussian-Klauder States and an Application for Maximally Eccentric Rydberg Atoms", William H. Mather and Ronald F. Fox, Physical Review A, 74 044101 (2006), 4 pages.

110. "An exact value for Avogadro's number: untangling this constant from *Le Gran K* could provide a new definition of the gram", R.F. Fox and T. P. Hill, American Scientist, 95 104-107 (March 2007).

Refereed Book Chapters:

1. "A Non-Equilibrium Thermodynamical Analysis of the Origin of Life", R. F. Fox, Chapter in *Molecular Evolution: Prebiological and Biological*, Eds. by D. L. Rohlfing and A. I. Oparin, (Plenum Press, 1972).

2. "The Uroboros", R. F. Fox, Chapter in *Molecular Evolution and Protobiology*, Edited by K. Matsuno et al. (Plenum, New York, 1984), pp. 413-420.

3. "Lasers with Fluctuating Pumps: Comparison of Theory and Experiment", R. Roy, R. F. Fox and G. E. James, Chapter in *Lasers and Applications*, Edited by H. D. Bist and J. S. Goela, Tata McGraw-Hill, (1984).

4. "The Origin of Irreversibility in Quantum Statistical Mechanics", R. F. Fox, Chapter in *Probability, Statistical Mechanics, and Number Theory*, edited by G. C. Rota, Advances in Mathematics Supplemental Studies, Vol. 9, 125-145 (1986).

5. "Stochastic Processes in Quantum Mechanical Settings", R. F. Fox, Chapter in *Noise in Nonlinear Dynamical Systems, Volume II: Theory of Noise Induced Processes in Special Applications*, Edited by F. Moss and P. V. E. McClintock, Cambridge University Press, Chapter 1, pp. 1-23 (1989).

6. "Quantum Chaos in Two-Level Quantum Systems", R. F. Fox, Chapter in *The Uniquity of Chaos*, Edited by S. Krasner, American Association for the Advancement of Science, Washington, D. C., pp. 105-114 (1990).

7. "Testing Approximate Theories of Colored Noise", R. F. Fox, Chapter in *Noise and Chaos in Nonlinear Dynamical Systems*, edited by F. Moss, L. Lugiato, and W. Schleich, (Cambridge University Press, New York, 1990), pp. 207-227.

8. "Generalized Coherent State Analysis of Semi-Classical Quantum Chaos", R. F. Fox, Chapter in *Coherent States, Past, Present and Future*, edited by D. H. Feng, J. R. Klauder and M. R. Strayer (World Scientific, New Jersey, 1994), pp. 159-168.

9. "Amplification of Intrinsic Fluctuations by Chaotic Dynamics", in *International Workshop on Statistical Physics*, edited by Zhan-ru Yang, Gang Hu and E-jiang Ding, (The Beijing Normal University Press, Beijing, P. R. China, 1993), pp. 147-157.

10. "H. Theorem; Phase Space; Statistical Mechanics", three sections of *Macmillan Encyclopedia of Physics*, (Macmillan Pub., New York, 1996).

11. "Non-equilibrium Thermodynamics", *Encyclopedia of Chemical Physics and Physical Chemistry*, edited by J. H. Moore and N. D. Spencer, (Institute of Physics Publishing, Bristol, 2001), Volume I: Fundamentals, pp. 597-616.

12. "Origin of Life and Energy", *Encyclopedia of Energy*, *Volume 4*, pp. 781-792, edited by Cutler Cleveland, Elsevier Inc. (2004).

13. "Discovery's Ecstasy, Friendship's Reward," pp. 147-157 in *Thinking Reed: Centennial Essays by Graduates of Reed College*, ed. Roger Porter and Robert Reynolds (Portland, OR: Reed College, 2011).

Books:

1. Ph.D. Thesis: "Contributions to the Theory of Nonequilibrium Thermodynamics", Rockefeller University, 1969.

2. *Biological Energy Transduction: The Uroboros*, R. F. Fox (Wiley-Interscience, New York, 1982).

3. *Energy and the Evolution of Life*, R. F. Fox, (W. H. Freeman and Co., New York, 1988).

4. *Rectified Brownian Motion*, an E-book by R.F. Fox at http://www.fefox.com/fefoxArticles.html

Book Reviews (Each review was solicited):

1. *Equilibrium and Nonequilibrium Statistical Mechanics* by R. Balescu (John Wiley and Sons, New York, l975) and *Statistical Physics* by A. Isihara (Academic Press, New York, 1971). Reviewed in Transport Theory, 6, 77, (1977).

2. *Fundamental Problems in Statistical Mechanics IV*. Edited by E. G. D. Cohen, W. Friszdon, and A. Palczewski. (Polish Academy of Sciences, Warsaw, (1978). Reviewed in Science, 205, 1124, (1979).

3. *Instabilities, Bifurcations, and Fluctuations in Chemical Systems*, Edited by L. E. Reichl and W. C. Schieve (University of Texas Press, Austin, Texas, 1982). Reviewed in Journal of Statistical Physics 32, July (1983).

4. *Biophysics*, W. Hoppe, W. Lohmann, H. Markl, and H. Ziegler, editors, (Springer-Verlag, Berlin, 1983), and *Problems of Biological Physics*, by L. Blummenfeld, (Springer-Verlag, New York, 1981). Reviewed in IEEE Engineering in medicine and biology magazine, 1985.

5. *Quantum-Mechanical Tunnelling in Biological Systems*, by D. Devault, 2nd Ed. (Cambridge University Press, Cambridge, 1984). Reviewed in Quarterly Review of Biology, Vol. 60, 563 (1985).

6. *Structure and Motion: Membranes, Nucleic Acids and Proteins*, Edited by E. Clementi, G. Corongiu, M. H. Sarma, and R. H. Sarma, Reviewed in Trends in Biochemical Sciences 11, 119 (1986).

7. *Statistical Physics II*, R. Kubo, N. Hashitsume, and M. Toda, (Springer-Verlag, Tokyo, 1985). Reviewed in Mathematical Reviews, 1986.

8. *Nonequilibrium Statistical Thermodynamics*, B. H. Lavenda, (John Wiley and Sons, New York, 1985). Reviewed in Mathematical Reviews (1988).

9. *Statistical Thermodynamics of Nonequilibrium Processes*, J. E. Keizer, (Springer-Verlag, New York, 1987). Reviewed in Foundations of Physics 19, 629 (1989).

10. *Genetic Takeover: And the Mineral Origins of Life*, A. G. Cairns-Smith, (Cambridge University Press, Cambridge, 1987). Reviewed in American Scientist, p. 588, November (1989).

11. *Mathematics and the Unexpected*, Ivar Ekeland (University of Chicago Press, Chicago, 1988). Reviewed in American Journal of Physics 57, 479 (1989).

12. *Chaotic Dynamics*, G. L. Baker and J. P. Gollub (Cambridge University Press, New York, 1990). Reviewed in Physics Today, July, 1990, p. 67.

13. *Information and the Origin of Life*, B.-0. Kuppers (The MIT Press, Cambridge, Massa., 1990). Reviewed in Bulletin of Mathematical Biology.

14. *Weak Chaos and Quasi-Regular Patterns*, G. M. Zaslawski, R. Z. Sagdeev, D. A. Usikov and A. A. Chernikov (Cambridge University Press, New York, 1991). Reviewed in Americal Journal of Physics, 1992.

15. *Time's Arrow: The Origins of Thermodynamic Behavior*, M. Mackey (Springer-Verlag, New York, 1992). Reviewed in Physics Today, July 1992.

16. *The Origins of Order*, Stuart Kauffman (Oxford University Press, New York, 1993). Reviewed in Biophysical Journal; December, 1993.

17. *Stochastic Dynamical Systems, Concepts, Numerical Methods, Data Analysis*, Josef Honerkamp (Albert-Ludwig-Universitat, Freiburg VCH: New York, 1993). Reviewed in Journal of the American Chemical Society 116, 11629 (1994).

18. *Nonlinear Dynamics and Chaos: With Applications to Physics, Biology, Chemistry and Engineering*, Steven H. Strogatz (Addison-Wesley, Reading, Mass. 1994). Reviewed in Physics Today, March, 1995, pg. 93.

19. *Fluctuations and Order: The New Synthesis*, edited by M. Millonas (Springer-Verlag, New York, 1996). Reviewed in Physics Today, February, 1997, pg. 69.

20. *Classical Electrodynamics, Third Edition*, John David Jackson (John Wiley and Sons, New York, 1999). Reviewed in American Journal of Physics 67, 841 (1999).

Letters/Articles:

"Einstein's Faith", Sunday New York Times, Editorial page, April 18, 1993.
"Joel E. Keizer", Obituary, Davis Enterprise, Davis, California, May 23, 1999.
"Life Puts Random Motions to Work", The World & I, Vol. 16, No. 10, October, 2001, pp. 136-143.
"Fowl Tales", REED MAGAZINE, End Note, August, 2004.

Research Grants and Fellowships:

NSF, Theoretical Physics,	6/1/73 - 11/30/75	14,200
NSF, Theoretical Physics,	11/30/75 - 11/30/76	6,200
Alfred P. Sloan, Fellowship,	9/16/74 - 9/15/78	20,000
NSF, Theoretical Physics,	8/15/77 - 1/31/80	20,900
NSF, Travel Grant,	7/9/78 - 7/15/78	1,400
NSF, Theoretical Physics,	1/15/80 - 6/30/82	26,760
NSF, Theoretical Physics,	1/15/81 - 6/30/83	16,000
NSF, Theoretical Physics,	7/15/83 - 12/31/84	18,000
John Simon Guggenheim Fellowship	1/1/85 - 6/30/85	15,000
NSF, Theoretical Physics,	7/15/84 - 12/31/85	18,500
Georgia Tech Foundation Inc.	1/1/85 - 6/30-85	16,420
NSF, Theoretical Physics,	7/15/85 - 12/31/86	20,177
NSF, Theoretical Physics,	7/15/86 - 12/31/89	63,000
NSF, Supplement,	7/15/87 - 12/31/88	5,000
NSF, Theoretical Physics,	7/1/88 - 12/31/89	26,042
NSF, Theoretical Physics,	7/15/89 - 12/31/92	108,600
ONR, Physics Division, and AFOSR, Mathematics Division,	32/1/90 - 9/30/92	168,400
Pittsburgh Supercomputing Center	8/22/89 - 9/1/91	15 service units
ONR, Cray Supercomputer	10/1/90 - 9/30/91	7,000
NSF, Theoretical Physics	7/15/92 - 12/31/94	100,098
Emory/Georgia Tech Biomedical Technology Research Center Seed Grant	7/1/93 - 6/30/94	14,000
NSF, Theoretical Physics	7/15/94 - 12/31/95	53,600
NSF, Theoretical Physics	8/1/96 - 7/31/99	90,000
Georgia Tech Foundation, Inc.	3/1/97 - 6/30/98	5,000
NSF, Theoretical Physics	5/15/99 - 12/31/03	135,000

Meetings, Symposia, Colloquia, and Short Courses:

1. "Statistical Mechanics of Biological Systems", Southeastern Section, American Physical Society, Birmingham, Alabama, November 18, 1972.

2. "A Model of Primitive Molecular Genetics: The Uroboros", Rockefeller University Colloquium, March 28, 1973.

3. "A Model of Primitive Molecular Genetics", at Symposium in memory of Charles Yegian held by the Department of Molecular, Cellular, and Developmental Biology, University of Colorado, Boulder, Colorado, February 7-9, 1974.

4. "Maxwell $\xrightarrow[t\to\infty]{}$ Boltzmann", American Physical Society Meeting, Dec. 5, 1974, Atlanta, Georgia.

5. "Stochastic Methods and the Approach to Equilibrium", Conference on Recent Developments in Kinetic Theories, Virginia Polytechnic Institute, Blacksburg, Virginia, June 2, 1976, (Invited Talk).

6. "Non-linear Hydrodynamic Fluctuations", APS Meeting, Miami Beach, Nov. 2l, 1977.

7. "The Physics-Biology Interface: Energy Transduction in Cells", Society of Physics Students Luncheon Address, APS Meeting, Miami Beach, Nov. 21, 1977.

8. "Fluctuation Theories for Nonlinear Hydrodynamics", Oji Seminar on Nonlinear Non-equilibrium Statistical Mechanics, Kyoto, Japan, July 13, 1978, (Invited Lecture).

9. "Biological Energy Transduction", Department of Molecular, Cellular, and Developmental Biology, University of Colorado, Boulder, Colorado, March 31, 1980.

10. "A Physicist looks at the Origin of Life", Department of Physics and Astronomy, University of Virginia, Charlottsville, Virginia, April 21-25, 1980. (A series of talks in the Cosmology program).

11. "The Long Time Tail Conundrum in Nonequilibrium Statistical Mechanics", National Bureau of Standards Meeting on Nonlinear Fluid Behavior, Boulder, Colorado, June 7-11, 1982.

12. "Long Time Tails and Diffusion", Conference on Statistical Mechanics, University of California at Davis, March 27-30, 1984.

13. "Fluctuations in Classical, Quantum, and Biological Systems", Advanced Summer School in Physics, Five invited lectures at CIEN, Mexico City (Institute for Advanced Study), July 30 - Aug. 10, 1984.

14. "Can Quantum Systems Exhibit Intrinsic Noise?", Oscillations and Dynamics Instabilities in Chemical Systems, Gordon Research Conference, Plymouth, N.H., July 22-26, 1985.

15. "Quantum Chaos and a Periodically Perturbed Eberly-Chirikov Pendulum", Mark Kac Memorial Symposium, Rockefeller University, New York, November 4, 1985.

16. "Quantum Chaos and a Periodically Perturbed Eberly-Chirikov Pendulum", Topical Conference on Chaos in Physical Systems, APS/AAPT Meeting, January 30, 1986, Atlanta, Georgia.

17. "Quantum Chaos and a Periodically Perturbed Eberly-Chirikov Pendulum", Project in Nonlinear Science, UCLA, Los Angeles, California, March 14, 1986.

18. "The Role of Energy in Evolution", Center for Nonlinear Studies, Los Alamos, New Mexico, July 14, 1986.

19. "Chaos in a Quantum System", Third International Meeting on Epistemology, Topic: The Concept of Probability, Delphi, Greece, October 12-16, 1987.

20. "Energy Transport Across Membranes", Short course for the high school science department, The Westminster Schools, Atlanta, Ga., Nov. 9, 1987.

21. "Numerical Simulations of Stochastic Differential Equations", Conference on External Noise, Center for Nonlinear Studies, Los Alamos National Labs., Los Alamos, New Mexico, March 29-31, 1988.

22. "Quantum Chaos in Two Level Quantum Systems", Chaos Symposium, AAAS Annual Meeting, San Francisco, California, January 14-19, 1989, Invited talk.

23. "Quantum Chaos", Department of Applied Mathematics Colloquium, University of California, Davis, California, January 18, 1989.

24. "Energy and the Evolution of Life", Department of Physics Colloquium, University of Illinois, Urbana, Illinois, January 26, 1989.

25. "Testing Approximate Theories of Colored Noise", Conference on Noise and Chaos in Nonlinear Dynamical Systems, Turin, Italy, March 7-11, 1989, Invited talk.

26. "Quantum Chaos", Physics Colloquium, Clarkson College, Potsdam, New York, April 7, 1989.

27. "Stochastic Processes in Physics", Invited lecture in the special memorial symposium for George Uhlenbeck, American Physical Society Meeting, Baltimore, Maryland, May 3, 1989.

28. "Chaos, Molecular Fluctuations, and the Correspondence Limit", Physics Colloquium, Georgia Tech, October 18, 1989; Probability Seminar, School of Mathematics, Georgia Tech, October 19, 1989; Nonlinear Dynamics Seminar, Center for Nonlinear Dynamics, Georgia Tech, November 13, 1989; Physics Colloquium, Physics Department, Emory University, November 16, 1989; Atlanta, Georgia.

29. "The Effect of Chaos on the Description of Turbulent Dynamics", Physics Department, Johns Hopkins University, Baltimore, Maryland, January 25, 1990.

30. "Synthesizing Artificial Life", Artificial Life II Conference, Santa Fe Institute, Santa Fe, New Mexico, February 5-9, 1990.

31. "Chaos, Molecular Fluctuations, and the Correspondence Limit", 2nd Southeast Dynamical Systems Conference, Mobile, Alabama, February 23-24, 1990.

32. "Chaos, Molecular Fluctuations, and the Correspondence Limit", Project in Nonlinear Science, UCLA, Los Angeles, California, April 20, 1990.

33. "Intrinsic Molecular Fluctuations and Chaotic Dynamics", Pedagogical Symposium on Chaos and Nonlinearity in Chemistry, American Chemical Society Meeting, Boston, Massachusetts, April 23, 1990.

34. "Intrinsic Fluctuations and Chaotic Dynamics", Applied Mathematics and Institute of Theoretical Dynamics, University of California at Davis, May 2, 1990.

35. "Amplification of Intrinsic Fluctuations by Chaotic Dynamics", Gordon Research Conference: Fractals, Plymouth, New Hampshire, August 6-10, 1990.

36. "Amplification of Intrinsic Fluctuations by Chaotic Dynamics", Physics Colloquium, Louisiana State University, Baton Rouge, Louisiana, September 20, 1990.

37. "Amplification of Intrinsic Fluctuations by Chaotic Dynamics", Applied Mathematics Seminar, Georgia Tech, October 30, 1990; Nuclear Engineering Seminar, Georgia Tech, November 15, 1990.

38. "Amplification of Intrinsic Noise by Chaotic Dynamics", Center for Complexity, April 25, 1991; "Synthesis of Artificial Life", Program in Mathematical Biology, April 26, 1991, University of Arizona, Tucson, Arizona.

39. "Chaos Invalidates Determination", Panel on "Paradoxes of Probability", at the Tenth Annual Meeting of the Society for Scientific Exploration, University of Virginia, Charlottesville, Virginia, May 23-25, 1991.

40. "Energy and the Evolution of Life", Biology Seminar, Morehouse College, Atlanta, Georgia, Sept. 17, 1991.

41. "Some Open Problems in Chaotic Dynamics", Mathematics Colloquium, School of Mathematics, Georgia Tech, Atlanta, Georgia, December 5, 1991.

42. "Energy and the Evolution of Life", Sci Trek Scholars lecture series, Sci Trek, Atlanta, Georgia, Feb. 18, 1992.

43. "The Interplay of Scientific Knowledge and Rhetoric", Panel at the 1992 Meeting of the Society of Literature and Science, Atlanta, Georgia, Oct. 8, 1992.

44. "Amplification of Intrinsic Fluctuations by Chaotic Dynamics", International Workshop on Statistical Physics, Beijing Normal University, Beijing P. R. China, October 18-25, 1992.

45. "Order out of Chaos", Adult Education Program, Trinity Presbyterian Church, Atlanta, Georgia, November 1, 1992.

46. "Perspectives on the 'RNA-World' View", Departments of Anatomy and Cell Biology, Emory University, Atlanta, Georgia, November 9, 1992.

47. "Chance and Necessity", Adult Education Program, Trinity Presbyterian Church, Atlanta, Georgia, January 17, 1993.

48. "Stochastic Resonance Redux", Mathematical Physics Seminar, School of Mathematics, Georgia Tech, May 25, 1993.

49. "Generalized Coherent States and Semiclassical Quantum Chaos", International Symposium on: Coherent States, Past, Present and Future, Oak Ridge National Laboratory, Oak Ridge, Tennessee, June 14-17, 1993.

50. "Amplification of Fluctuations by Chaotic Dynamics", Workshop on Fluctuations and Order: The New Synthesis, Center for Nonlinear Studies, Los Alamos National Laboratory, Los Alamos, New Mexico, September 9-12, 1993.

51. "Chaos and Quantum-Classical Correspondence for the Kicked Pendulum", 1st Pan-American Workshop on Quantum Chaos, Cocoyoc, Mexico, January 5-7, 1994.

52. "Chaos and Quantum-Classical Correspondence in the Kicked Pendulum", Physics Colloquium, Georgia Tech, Atlanta, Georgia, January 26, 1994.

53. "Chaos and Quantum-Classical Correspondence", Mathematical Physics Seminar, School of Mathematics, Georgia Tech, Atlanta, Georgia, June 2, 1994.

54. "Stochastic Resonance Redux", Conference on Fluctuations in Physics and Biology: Stochastic Resonance, Signal Processing and Related Phenomena, Isle of Elba, Italy, June 5-10, 1994.

55. "Chaos and Quantum-Classical Correspondence in the Kicked Pendulum and in the Kicked Top", 4th Drexel Symposium on Quantum Nonintegrability: Quantum Classical Correspondence, Drexel University, Philadelphia, Pennsylvania, September 8-11, 1994.

56. "Chaos, Amplification of Intrinsic Fluctuations, and Quantum-Classical Correspondence", Statistical Physics Seminar, Institute of Physical Science and Technology, University of Maryland, College, Park, Maryland, September 20, 1994.

57. "Ito versus Stratonovich in Stochastic Calculus", Probability Seminar, School of Mathematics, Georgia Tech, Atlanta, Georgia, October 6, 1994.

58. "Chaos, Amplification of Intrinsic Fluctuations, and Quantum-Classical Correspondence", Statistical Physics Seminar, University of Texas, Austin, Texas, October 20, 1994.

59. "A Second Order Algorithm for the Numerical Integration of Stochastic Ordinary Differential Equations", Numerical Analysis Seminar, School of Mathematics, Georgia Tech, Atlanta, Georgia, November 18, 1994.

60. "Chaos and Quantum-Classical Correspondence", Workshop on Nonlinear Dynamics in Science and Engineering, Georgia Tech, Atlanta, Georgia, November 30-December 2, 1994.

61. "Noise Simulation Algorithms", Algorithms for Computer Simulations of N-body Problems Workshop, Center for Nonlinear Studies, Los Alamos National Laboratory, Los Alamos, New Mexico, January 11-13, 1995.

62. "Coherence in Quantum-Classical Correspondence", Mini Colloquium on Wavelets and Quantum Mechanics, Center for Theoretical Studies of Physical Systems, Clark Atlanta University, Atlanta, Georgia, January 25-27, 1995.

63. "Quantum Chaos", 1995 NSBP (National Society of Black Physicists) Conference, Atlanta, Georgia, April 12-15, 1995.

64. "A Physicist Looks at the Origins of Life", Northside Seniors Group (PALS), July 24, 1995, Atlanta, Georgia.

65. "Chaotic Maps", Physics Colloquium, Georgia Tech, October 11, 1995.

66. "Quantum Chaos and the Rotating Wave Approximation", Conference on Dynamical Numerical Analysis, Georgia Tech, Dec. 14-16, 1995, Atlanta, Georgia.

67. "The Lyapunov Exponent: A Quantum Signature of Classical Chaos", Sante Fe Institute Colloquium, May 16, 1996, Sante Fe, New Mexico.

68. "Energy and the Evolution of Life", Adult Education Program, Trinity Presbyterian Church, May 19, 1996, Atlanta, Georgia.

69. “Rectified Brownian Movement in Molecular and Cell Biology”, Institute for Theoretical Dynamics, University of California at Davis, May 27, 1997.

70. “Rectified Brownian Movement in Molecular and Cell Biology”, Probability and Statistics Seminar, School of Mathematics, Georgia Tech, Atlanta, Georgia, November 20, 1997.

71. “Quasi-Adiabatic Time Evolution, Avoided Level Crossings, and Berry’s Phase”, AMO Seminar, School of Physics, Georgia Tech, Atlanta, Georgia, November 21, 1997.

72. “Rydberg Coherent States”, AMO Seminar, School of Physics, Georgia Tech, Atlanta, GA, December 12, 1997.

73. “Rydberg Coherent States and Kepler’s Third Law”, AMO Seminar, School of Physics, Georgia Tech, Atlanta, GA, February 13, 1998.

74. “Chance and Necessity”, I and II, Adult Education Program, Trinity Presbyterian Church, Atlanta, GA, February 15, 22, 1998.

75. "Rydberg Coherent States and Kepler's Third Law", Physics Colloquium, School of Physics, Georgia Tech, Atlanta, GA, March 4, 1998.

76. "Quasiadiabatic Time Evolution, Avoided Level Crossings and Berry's Phase", contributed talk with P. Jung, APS Meeting, Los Angeles, California, March 18, 1998.

77. "Quantifying Stochastic Resonance", contributed talk with Mee Choi and P. Jung, APS Meeting, Los Angeles, California, March 18, 1998.

78. "Quantum Steps in Hysteresis Loops", contributed talk with M. Thorwart, P. Reimann, and P. Jung, APS Meeting, Los Angeles, California, March 19, 1998.

79. "Rydberg Atom Coherent States", Physics Colloquium, Georgia State University, Atlanta, GA, October 13, 1998.

80. "Rectified Brownian Movement in Molecular and Cell Biology", Chemical Engineering Colloquium, Georgia Tech, Atlanta, GA, November 2, 1998.

81. "Generalized Coherent States", Institute for Theoretical Dynamics, University of California at Davis, March 16, 1999.

82. "Nonequilibrium Statistical Thermodynamics", Nonlinear Dynamics in Biology and Chemistry Conference, University of California, Davis, California, September 3-4, 1999.

83. Banquet Address, Nonlinear Dynamics in Biology and Chemistry Conference, University of California, Davis, California, September 3, 1999.

84. "Quantum Chaos and the Correspondence Principle", Physics Colloquium, Ohio University, Athens, Ohio, November 12, 1999.

85. "Quantum Chaos and the Correspondence Principle", Knowlton Lectureship, Reed College, Portland, Oregon, November 17, 1999.

86. "A Physicist's Thoughts on the Origin of Life", Knowlton Lectureship, Reed College, Portland, Oregon, November 17, 1999.

87. "Generalized Coherent States and Quantum-Classical Correspondence", Ilya Prigogine Center for Studies in Statistical Mechanics and Complex Systems, Department of Physics, University of Texas, Austin, Texas, February 22, 2000.

88. "Chaos, Fluctuations and Quantum-Classical Correspondence", Faculty of Mathematics, University of Waterloo, Waterloo, Ontario, Canada, August 14, 2000.

89. "Rectified Brownian Motion and the Motion of Kinesin Along Microtubules", Rockefeller University Centennial Alumni Symposium. Also chair of the symposium on theoretical biology. New York, New York, May 4, 2001 (invited talk).

90. "Rectified Brownian Motion and the Motion of Kinesin Along Microtubules", Nanobiology 2001 Conference, Emory University, Atlanta, Georgia, October 26, 2001 (invited talk).

91. "Rectified Brownian Motion and the Motion of Kinesin along Microtubules", Department of Physics Colloquium, Emory University, Atlanta, Georgia, February 8, 2002.

92. "The Lyapunov Exponent is a Quantum Signature of Classical Chaos", Colloquium, School of Natural Sciences and Mathematics, University of Alabama, Birmingham, Alabama, March 1, 2002.

93. "Conceptual Issues to be Confronted by Experimental Approaches to the Origin of Life", Suddath Symposium, Gergia Tech, April 19-21, 2002 (invited talk).

94. Butcher Forum on Genomics and Proteomics, University of Colorado, November 1, 2002. Invited panel member.

95. "Rectified Brownian Motion in Cell Biology", Stochastics Seminar, School of Mathematics, Georgia Tech, April 10, 2003.

96. "'Momentary' state analysis of multiphoton processes", 89th Statistical Mechanics Conference, Rutgers University, May 18-20, 2003. (Invited talk).

97. "A Minnow, an E. Coli and ubiquinone: The story of rectified Brownian movement", Nonequilibrium methods for complex materials symposium, SERMACS, Atlanta, Georgia, November 17, 2003 (invited speaker).

98. "A Minnow, an E. Coli and ubiquinone: The story of rectified Brownian movement", Modeling Randomness and Diffusion Effects Session, Nanotechnology conference, Boston Massachusetts, March 7-11, 2004 (invited talk).

99. "Rectified Brownian motion", Proteomics Workshop IV: Molecular Machines, Institute for Pure and Applied Mathematics, UCLA, Los Angeles, California, May 24-28, 2004 (invited talk).

100. "Nanobiology: The Interplay Between Biology and Naoscience", SESAPS, Oak Ridge, Tennessee, November 12, 2004 (invited speaker).

101. "Rectified Brownian Motion in Sub-Cellular Biology", Colloquium, Department of Chemistry, New York University, March 25, 2005.

102. "EINSTEIN Centenary Commemoration of Einstein's *Annus Mirabilis* 1905. Georgia Tech Public Lecture, October 27, 2005

103. "Centenary Commemoration of Einstein's Annus Mirabilis", Bolch Science Talk, Westminster Schools, Atlanta, Georgia, January 10, 2006.

104. "Rectified Brownian Motion in Sub-Cellular Biology", Physics Colloquium, Florida State University, Tallahassee, Florida, February 16, 2006.

105. "Rectified Brownian Motion in Sub-Cellular Biology", Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing, China, March 10, 2006.

106. "A Physicist's Perspective on the Origins of Life", Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing, China, March 14, 2006.

107. "Rectified Brownian Motion in Sub-Cellular Biology", Beijing Normal University, Beijing, China, March 16, 2006.

108. "A Physicist's Perspective on the Origins of Life", Beijing Normal University, Beijing, China, March 17, 2006.

109. "EINSTEIN: Centenary Commemoration of Einstein's *Annus Mirabilis*, 1905", Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing, China, March 21, 2006.

110. "Rectified Brownian Motion in Sub-Cellular Biology", Institute of Physics, Chinese Academy of Sciences, Beijing, China, March 22, 2006.

111. "Rectified Brownian Motion in Sub-Cellular Biology", Center of Theoretical Biology, Peking University Beijing, China, March 28, 2006.

112. "Rectified Brownian Motion in Sub-Cellular Biology", Tsinghua University, Beijing, China, April 5, 2006.

113. "Rectified Brownian Motion in Sub-Cellular Biology", Department of Physics , Suzhou University, Suzhou, China, April 10, 2006.

114. "Rectified Brownian Motion in Sub-Cellular Biology", College of Sciences, Southern Yangtze University, Wuxi, China, April 12, 2006.

115. "Rectified Brownian Motion in Sub-Cellular Biology", Department of Physics, Zhejiang University, Hangzhou, China, April 13, 2006.

116. "Rectified Brownian Motion in Sub-Cellular Biology", Fermi National Accelerator Lab, Batavi, Illinois, November 8, 2006.

117. "Rectified Brownian Motion in Subcellular Biology", Department of Physics, Cal Poly, San Luis Obispo, California, May 10, 2007.

Service on Committees - Georgia Tech:

Faculty Advisory Committee, School of Physics	1975-1986
Priorities Committee, School of Physics	1976
Chairman of New Director Search Committee, School of Physics	1977-1978
Colloquium Chairman, School of Physics	1978-1982
Self-Study Committee for the Institute addressing Financial Resources	1982-1983
Graduate Committee, School of Physics	1982-1989
Graduate Committee Chairman, School of Physics	1986-1989
Chairman of New Faculty Search Committee	1984-1986
Dean's Advisory Committee	1985-1988
Dean's Advisory Committee Recording Secretary	1986-1987
Dean's Advisory Committee Chairman	1987-1988
New Faculty Search Committee	1986-1989
Promotion, Tenure and Reappointment Committee, School of Physics	1989-1990
Promotion, Tenure and Reappointment Committee Chairman, School of Physics	1990-1991
Vice President's Promotion, Tenure, and Reappointment Committee	1990-1991
Faculty Status and Grievance Committee, Elected Member	1991-1994
Faculty Status and Grievance Committee, Vice Chairman	1992-1993
Faculty Status and Grievance Committee, Chairman	1993-1994
Dean of the College of Science Search Committee, Executive Subcommittee	1992-1993
Governance Committee (Executive Board Subcommittee)	1993-1994
Elected Representative: General Faculty Assembly and Academic Senate	1994-1996
Executive Board Vice Chairman	1994-1996
Executive Board Liaison to the Faculty Status and Grievance Committee	1994-1996
Student Athletic Complex (SAC) Board	1994-1997
School of Physics Graduate Program Review Committee, Chair	1995
President's Intercollegiate and Recreational Facility Study Group	1995-1996
Committee to Develop Process for Evaluating Deans	1995-1996
President's Strategic Planning Task Force	1996
Georgia Tech Honorary Degree Committee	1996
Promotion, Tenure, and Reappointment Committee, School of Physics	1997-1999
Chair, Post-Tenure Review (M.R.F., U.L., E. T., H. V., E. P.)	1998
Robinson Chair Search Committee	1998
Chair, Post-Tenure Review (I. G.)	1999
College of Science Regents' Professor Nominating Committee	1999-2000
Institute Regents' Professor Selection Committee	2000-2003
Biophysics Search Committee (Chair), CoS	2002-2003
Honors College Committee	2005-2006

Honors, Awards or Recognitions:

Phi Beta Kappa, Reed College	1964
Woodrow Wilson Fellowship	1964
National Science Foundation Graduate Student Fellowship	1964-65
Rockefeller University Graduate Student Fellowship	1965-69
Sigma Xi, Rockefeller University, Associate Member	1966
Sigma Xi, Rockefeller University, Full Member	1967-
Miller Institute for Basic Research in Science Fellowship, Univ. of Calif. at Berkeley (Physics Department)	1969-71
Georgia Tech Sigma Xi Faculty Research Award	1973
Alfred P. Sloan Fellowship	1974-78
Board of Reviewers for Mathematical Reviews	1975-91
Phi Kappa Phi Honorary Society, Georgia Tech	1984
John Simon Guggenheim Fellowship	1985
Editorial Board, Journal of Statistical Physics	1985-1988
Sigma Xi Ph.D. Dissertation Award (K. Faid)	1987
Regents' Professor	1991
Fellow, American Physical Society	1991
W. Roane Beard Outstanding Teacher Award	1992
Sigma Xi Sustained Research Award	1997
Editorial Advisory Board, Journal of Non-Equilibrium Thermodynamics	1999-
Knowlton Lecturer, Reed College, Portland, Oregon, November 17	1999
National Science Foundation Awardee , Theoretical Physics Division	1973-2003
Bolch Science Talk, The Westminster Schools, Atlanta, Georgia, January 10	2006
Inaugural Weird Science Award #2 http://whyfiles.org/siegfried/story35/	2006
Regents' Professor Emeritus	2007
APS Outstanding Referee	2009

Membership in Professional and Honor Societies:

Sigma Xi, Rockefeller University Chapter
American Physical Society
New York Academy of Science

Undergarduate Research Student

Anna Pavlova, January-September, 2006

Graduate Students Supervised:

Joel L. Davis, Ph.D., Georgia Tech, June, 1976
"Maxwell $\xrightarrow[t\to\infty]{}$ Boltzmann".

Ulrich R. Steiger, Ph.D., Georgia Tech, June, 1981.
"Analysis of Coupled Translational and Rotational Diffusion using Operator Calculus".

Barry J. Cown, Ph.D., Georgia Tech, September, 1982.
"Stochastic Near-Field Theory and Techniques for Wideband Electro-magnetic Emitters at In-Band and Out-Of-Band Frequencies".

Byron L. Burel, Ph.D., Georgia Tech, June, 1983.
"Fluctuations in a Nonequilibrium Steady State: Light Scattering from a Thermal Gradient".

Karim Faid, Ph.D., Georgia Tech, December, 1986.
"Stochastic Theory of Relaxation and Collisional Broadening of Spectral Line Shapes".

John C. Eidson, Ph.D., Georgia Tech, May, 1987.
"Chaotic Dynamics of Two-Level Atoms Interacting with a Radiation Field".

Dongwan An, Ph.D., Georgia Tech, June, 1990.
"The Operator Cumulant Approach to the Quantum Theory of Reservoir Effects".

Rebecca L. Honeycutt, Ph.D., Georgia Tech, September, 1990.
"Higher Order Algorithms for the Numerical Integration of Stochastic Differential Equations".

Boon L. Lan, Ph.D., Georgia Tech, September, 1990.
"Quantum-Classical Correspondence and Quantum Chaos in the Periodically Kicked Pendulum".

Ming Xu, Ph.D., Georgia Tech, June, 1991.
"Critical Current Density and Time-Dependent Magnetization of The High Transition Temperature Superconductors".

Timothy C. Elston, Ph.D., Georgia Tech, December, 1993.
"The Effects on Intrinsic Fluctuations of Chaotic Dynamics".

Mee Hyang Choi, Ph.D., Georgia Tech, December 1997.
"Residence Time Distribution as a Measure for Stochastic Resonance in a Bistable System".

William Mather, Ph. D. Georgia Tech, August, 2007
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Postdoctoral Fellows Supervised:

C. K. Lai	1974-1976	
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Citations

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