Vita – Julien Clinton Sprott

Julien Clinton Sprott Birth date: September 16, 1942, Memphis, Tennessee

Education: B.S. Physics, MIT, 1964
M.S. Physics, UW-Madison, 1966
Ph.D. Physics, UW-Madison, 1969

Experience: Laboratory Technician, MIT, Summer, 1964
Research Assistant, UW-Madison, 1964-1969
Lecturer, UW-Madison EE, 1969-1970
Project Associate, UW-Madison Physics, 1969-1970
Research Physicist, Oak Ridge National Lab, 1970-1972
Visiting Assistant Professor, UW-Madison, 1972-1973
Assistant Professor, UW-Madison, 1973-1977
Associate Professor, UW-Madison, 1977-1979
Professor, UW-Madison, 1979-2008
Professor Emeritus, UW-Madison, 2008-present

Consulting: Oak Ridge National Laboratory (Bumpy torus), 1972
McDonnell Douglas Corporation (Bumpy torus), 1977-1980
Electric Power Research Institute (Self-colliding orbits), 1978
TRW (Advanced fuel multipoles and ion cyclotron heating), 1979
Argonne National Laboratory (Tokamaks), 1979-1980
Honeywell (Plasma diagnostics), 1981
Dr. Kenneth Kensey (Levitation System), 1986
West Publishing (Physics Textbooks), 1990
Saunders College Publishing (Video production), 1991-1992
Society of Actuaries (Video production), 1992
Praxair, Inc. (Pulsed power), 2003
Chicago Museum of Science and Industry (Science Storms), 2006

Memberships: American Physical Society Fellow (Division of Plasma Physics)
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Specialty Area: Heating and confinement of plasmas, especially electron and ion cyclotron resonance heating in magnetic mirrors and toroidal devices, extraterrestrial plasmas and cosmic rays. Nonlinear dynamics and chaos.

PLP

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392. Elementary Quadratic Chaotic Flows with no Equilibria, S. Jaffari, J.C. Sprott, and S.M.R.H. Golpayegani, Physics Letters A **377**, 699 (2013).

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395. Coexistence of Point, Periodic, and Strange Attractors, J.C. Sprott, X. Wang, and G. Chen, International Journal of Bifurcation and Chaos **23**, 1350093 (2013).

396. Amplitude Control Approach for Chaotic Signals, C. Li and J.C. Sprott, Nonlinear Dynamics **73**, 1335 (2013).

397. A Gaussian Mixture Model Based Cost Function for Parameter Estimation of Chaotic Biological Signals, Y. Shekofteh, S. Jafari, J.C. Sprott, S.M.R.H. Golpayegani, and F. Almasgnj, Communications in Nonlinear Science and Numerical Simulation **20**, 469 (2015).

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400. Amplitude Control in Chaotic Systems, C. Li and J.C. Sprott, Dynamics Days poster (2013).

401. Projective Synchronization Based on Amplitude Control, C. Li and J.C. Sprott, submitted to 8th International Conference on Physics and Control (PhysCon 2017).

402. Coexistence of Three Basic Attractors: Point, Periodic and Chaotic Attractors, J.C. Sprott, X. Wang, and G. Chen, 6th Chaotic Modeling and Simulation International Conference, Istanbul, Turkey (2013).

403. Extensions in Dynamic Models of Human Happiness; Effect of Memory, S.S. Tabatabaei, M.J. Yazdanpanah, S. Jafari, and J.C. Sprott, International Journal of Happiness and Developments **1**, 344 (2014).

404. Broken Symmetry in Modified Lorenz Model, B. Kalini, I. Djellit, and J.C. Sprott, International Journal of Dynamical Systems and Differential Equations **5**, 136 (2015).

405. Finding Coexisting Attractors using Amplitude Control, C. Li and J.C. Sprott, Nonlinear Dynamics **78**, 2059 (2014).

406. Coexisting Hidden Attractors in a 4-D Simplified Lorenz System, C. Li and J.C. Sprott, International Journal of Bifurcation and Chaos **24**, 1450034 (2014).

407. Simplest Chaotic Flows with Involutional Symmetries, J.C. Sprott, International Journal of Bifurcation and Chaos **24**, 1450009 (2014).

408. Multistability in a Butterfly Flow, C. Li and J.C. Sprott, International Journal of Bifurcation and Chaos **23**, 1350199 (2013).

409. Simple Chaotic Flows with a Line Equilibrium, S. Jafari and J.C. Sprott, Chaos, Solitons & Fractals **57**, 79 (2013).

410. A Simple Chaotic Flow with a Continuously Adjustable Attractor Dimension, B. Munmuangsaen, J.C. Sprott W.J. Thio, A. Burscarino, L. Fortuna, International Journal of Bifurcation and Chaos **25**, 1530036 (2015).

411. Chaotic Flows with a Single Nonquadratic Term, C. Li and J.C. Sprott, Physics Letters A **378**, 178 (2014).

412. Comment on 'How to Obtain Extreme Multistability in Coupled Dynamical Systems, J. . Sprott and C. Li, Physical Review E **89**, 066901 (2014).

413. Cost Function Based on Gaussian Mixture Model for Parameter Estimation of a Chaotic Circuit with a Hidden Attractor, S. Lao, Y. Shekofteh, S. Jafari, and J.C. Sprott, International Journal of Bifurcation and Chaos **24**, 1450010 (2014).

414. A Chaotic Viewpoint on Noise Reduction from Respiratory Sounds, M. Molaie, S. Jafari, M.H. Moradi, J.C. Sprott, and S.M.R.H. Golpayegani, Biomedical Signal Processing and Control **10**, 245 (2014).

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417. Multistability in the Lorenz System: A Broken Butterfly, C. Li and J.C. Sprott, International Journal of Bifurcation and Chaos **24**, 1450131 (2014).

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419. A Rigorous Solution of the Chaotic Lozi Mapping, E. Zeraoulia and J.C. Sprott, submitted to International Journal of Bifurcation and Chaos.

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455. The Equivalence of Dissipation from Gibbs’ Entropy Production with Phase-Volume Loss in Ergodic Heat-Conducting Oscillators, P.K. Patra, W.G. Hoover, C.G. Hoover, and J.C. Sprott, International Journal of Bifurcation and Chaos **26**, 1650089 (2016).

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459. Chaos in a Class of Local Interaction Models, O. Gomes and J.C. Sprott, submitted to Communications in Nonlinear Science and Numerical Simulation.

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464. Sentiment-Driven Limit Cycles and Chaos, O. Gomes and J.C. Sprott, Journal of Evolutionary Economics **27**, 729 (2017).

465. Simple Chaotic 3D Flows with Surfaces of Equilibria, S. Jafari, J.C. Sprott, V.-T. Pham, C. Volos, and C. Li, Nonlinear Dynamics **86**, 1349 (2016).

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468. Categorizing Chaotic Flows from the Viewpoint of Fixed Points and Perpetual Points, F. Nazarimehr, S. Jafari, S.M.R.H. Golpayegani, and J.C. Sprott, International Journal of Bifurcation and Chaos **27**, 1750023 (2017).

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471. Detecting Hidden Chaotic Regions and Complex Dynamics in a Self-exciting Homopolar Disc Dynamo, Z. Wei, I. Moroz, J.C. Sprott, Z. Wang, and W. Zhang, International Journal of Bifurcation and Chaos **27**, 1730008 (2017).

472. Book Review "Modeling Love Dynamics by Sergio Rinaldi, Fabio Della Rossa, Fabio Dercole, Alessandra Gragnani and Pietro Landi," J.C. Sprott, Nonlinear Dynamics in Psychology and Life Sciences **20**, 568 (2016).

473. Hidden Attractors and Chaotic Bursting Oscillations in a Three-dimensional Autonomous System with a Parabolic Equilibrium, S.T. Kingni, J.C. Sprott, V.-T. Pham, and S. Jafari, submitted to Complexity.

474. Simple Chaotic Flows with a Curve of Equilibria, K. Barati, S. Jafari, J.C. Sprott, and V.-T. Pham, International Journal of Bifurcation and Chaos **26**, 1630034 (2016).

475. Are Perpetual Points Sufficient for Locating Hidden Attractors?, F. Nazarimehr, B. Saedi, S. Jafari, and J.C. Sprott, International Journal of Bifurcation and Chaos **27**, 1750037 (2017).

476. Constructing Chaotic Systems with Conditional Symmetry, C. Li, J.C. Sprott, and H. Xing, Nonlinear Dynamics **87**, 1351 (2017).

477. 3D Printing -- The Basins of Tri-Stability in the Lorenz System, A. Xiong, J.C. Sprott, J. Lyu, and X. Wang, International Journal of Bifurcation and Chaos 27, 1750128 (2017).

478. How to Bridge Attractors and Repellors, C. Li and J.C. Sprott, International Journal of Bifurcation and Chaos (in press).

479. Linear Synchronization and Circuit Implementation of Chaotic Systems with Complete Amplitude Control, C. Li, W.J. Thio, J.C. Sprott, R. Zhang, and P. Li, submitted to Chinese Physics B.

480. An Infinite 2-D Lattice of Strange Attractors, C. Li, J.C. Sprott, and Y. Mei, Nonlinear Dynamics 89, 2629-2639 (2017).

481. Towards a Complex System Understanding of Cancer: A Personal Dependent Chaotic Model Based on External Environmental Factors, F. Khatibi, S.M.R.H. Golpayeghani, S. Jafari, R. Malekzadeh, and J.C. Sprott, submitted to Complexity.

482. Megastability: Coexistence of a Countable Infinity of Nested Attractors in a Periodically-forced Oscillator with Spatially-periodic Damping, J.C. Sprott, S. Jafari, F.J.M. Khalaf, and T. Kapitaniak, European Physical Journal – Special Topics (in press).

483. A New Chaotic Oscillator with Free Control, C. Li, J.C. Sprott, A. Akgul, H.H.C. Iu, and Y. Zhao, Chaos **27**, 083101 (2017).

484. A Symmetric Pair of Hyperchaotic Attractors, C. Li, A. Akgul, J.C. Sprott, H.H.C. Iu, and W.J. Thio, submitted to IEEE Transactions on Circuits and Systems II: Express Briefs.

485. Categories of Conservative Flows, S. Jafari and J.C. Sprott, submitted.

486. A New Chaotic Model for the Glucose-Insulin Regulatory System, P. Sadeghi, S. Shabestari, S. Panahi, S. Jafari, and J.C. Sprott, submitted to International Journal of Bifurcation and Chaos.

487. Constructing Infinitely Many Attractors in a Programmable Chaotic Circuit, C. Li, W.J. Thio, J.C. Sprott, H.H.C. Iu, and Y. Xu, submitted.

488. Applied Chaos Level Test for Validation of Voice Classification Method Performances under Varying Signal Noise Conditions, B. Liu. E. Polce, J.C. Sprott, and J.J. Jiang, submitted to Journal of Speech, Language, and Hearing Research.

489. Infinite Lattice of Hyperchaotic Strange Attractors, C. Li, J.C. Sprott, T. Kapitaniak, and T. Lu, submitted to Chaos, Solitons, and Fractals.

490. A Chaotic Model of Migraine Headache Considering the Dynamical Transitions of this Cyclic Disease, A. Bayani, S. Jafari, J.C. Sprott, and B. Hatef, submitted to Nonlinear Dynamics.

491. An Infinite 3-D Quasiperiodic Lattice of Chaotic Attractors, C. Li and J.C. Sprott, submitted to Physics Letters A.

1. **Introduction to Modern Electronics**, Wiley (1981).
2. **Physics Demonstrations** software, Physics Academic Software (1989).
3. **Chaos Demonstrations** software, Physics Academic Software (1990).
4. **The Wonders of Physics Lecture Kit**, NSF (1990).
5. **Numerical Recipes, Routines and Examples in BASIC**, Cambridge University Press (1991).
6. **Chaos Data Analyzer** software, Physics Academic Software (1992).
7. **The Wonders of Physics** videos (29 hours), U. W. Physics Dept. (1986-2012).
8. **Physics Demonstrations** videos (2 hours), Saunders College Publishing (1991).
9. **Chaos**, Guest Essays in Serway, "Physics for Scientists and Engineers," 3rd ed. and in Serway & Faughn, "College Physics," 3rd ed. Saunders College Publishing (1991).
10. **Strange Attractors: Creating Patterns in Chaos**, M&T Books (1993).
11. **The Computer Artist and Art Critic**, in "Fractal Horizons: The Future Use of Fractals," C. A. Pickover, ed. St. Martin's Press (1996).
12. **The Future Project: Twenty-Second-Century Wishes, Lies, and Dreams** in "Information Imagineering: Meeting at the Interface," M. T. Wolf, P. Ensor, and M. A. Thomas, ed. American Library Association (1998).
13. **Automatic Generation of Strange Attractors** (and two other articles) in "Chaos and Fractals: A Computer Graphical Journey**,"** C. A. Pickover, ed. Elsevier (1998).
14. **Chaos and Time-Series Analysis**, Oxford University Press (2003).
15. **Images of a Complex World: The Art and Poetry of Chaos** (with Robin Chapman), World Scientific (2005).
16. **Physics Demonstrations**, University of Wisconsin Press (2006).
17. **Elegant Chaos: Algebraically Simple Chaotic Flows**, World Scientific (2010).
18. **2-D Quadratic Maps and 3-D ODE Systems: A Rigorous Approach** (with E. Zeraoulia), World Scientific (2010).
19. **Frontiers in the Study of Chaotic Dynamical Systems with Open Problems** (edited with E. Zeraoulia), World Scientific (2011).
20. **Algebraically Simple Chaotic Flows** (with S. Linz), in "Le Néant dans la Penseé Contemporaraine," N.-B. Barbe, ed. Bes Editions (2012).
21. **Robust Chaos and its Applications** (with E. Zeraoulia), World Scientific (2011).

Unpublished Invited Talks **34**

1. Microwave Heating in Toroidal Multipoles. Bull. Am. Phys. Soc. **15**, 1449 (1970).
2. Oak Ridge National Lab Information Meeting, October 1973.
3. MIT Conference on Tokamak Research, May 1974.
4. ERDA Meeting for Formulation of Near-term Plans for rf heating in Tokamaks, December 1975.
5. TRW Multipole Confinement Meeting, December 1977.
6. Princeton Conference on Tokamak Research, March 1979.
7. Princeton Conference on Tokamak Research, September 1979.
8. Princeton Workshop on Advanced Tokamak Concepts, February 1980.
9. Princeton Conference on Tokamak Research, February 1983.
10. APS, Los Angeles, on the role of Universities in the Tokamak program, November 1983.
11. Oak Ridge Small Tokamak Users meeting, February 1984.
12. University of Tokyo, RFP exchange, December 1984.
13. Electrotechnical Lab (Tsukuba, Japan), December 1984.
14. University of Nagoya (Japan), December 1984.
15. U.S./Japan RFP Workshop (Los Alamos), February 1985.
16. U.S./Japan RFP Workshop (Tsukuba, Japan), February 1986.
17. U.S./Japan RFP Workshop (Tokyo, Japan), March 1989.
18. IBM Academic Computing Conference, June 1989.
19. Demonstrating Chaos by Computer, AAPT Summer Meeting, June 1990.
20. IBM Academic Computing Conference, June 1991.
21. AAAS Annual Meeting (Chicago), February 1992.
22. Northwestern Wisconsin Education Association (Eau Claire), October 1992.
23. UW Symposium on Nonlinear Dynamics and Chaos, April 1993.
24. Cornell University Sloan Workshop, May 1993.
25. AAPT Summer Meeting, August 1993.
26. American Association for Information Sciences, October 1993.
27. APS DDP Symposium on Public Education, November 1996.

28. Society for Chaos Theory in Psychology and the Life Sciences, August 1997.
29. First National Conference on Complexity and Health Care, December 1997.
30. Wisconsin Public Power, Inc. Annual Meeting, September 1998.
31. University of Wisconsin-Whitewater, October 1998.
32. Illinois section of AAPT, October 1998.
33. Wisconsin Association of Physics Teachers, October 1999.
34. University of Wisconsin – Washington County, December 2000.
35. US-Japan Workshop on Complexity Science, March 2002.
36. International Conference on Complex Systems, Hayama Japan, March 2003.
37. APS Annual Spring Meeting, April 2003.
38. Gordon Conference on Classical and Nonlinear Mechanics, June 2004.
39. Mathematics Association of America (WI division), April 2006.
40. AAPT Conference on Computational Physics, July 2007.
41. Chaotic Modeling and Simulation International Conference, Crete, July 2008.
42. Tennessee Section of AAPT, March 2010.
43. Society for Chaos Theory in Psychology and Life Sciences, August 2014.
44. Utrecht Physics Challenge, May 2017

Colloquium and Seminar Talks (except UW) **36**

1. Oak Ridge National Lab Colloquium, March 1974.
2. McDonnell Douglas Corporation Seminar, July 1977.
3. McDonnell Douglas Corporation series of ten lectures on Plasma Physics, February-April 1978.
4. TRW Seminar, August 1978.
5. Princeton Plasma Physics Lab Colloquium, November 1978.
6. Presentation of Plasma Physics Program at DOE, November 1978.
7. Oak Ridge National Laboratory Colloquium, August 1980.
8. Honeywell Seminar, January 1981.
9. Oak Ridge National Laboratory Colloquium, November 1981.
10. Presentation of UW Plasma Physics Program at DOE, April 1982.
11. Presentation of UW Plasma Physics Program at DOE, January 1984.
12. Public lecture on Chaos at UW-Oshkosh, February 1991.
13. Lecture on Chaos at Highland Community College, April 1991.
14. Lecture on Chaos at Moorehead State University, July 1992.
15. Colloquium on Chaos at Edgewood College, November 1992.
16. College lecture on Chaos at Dickinson College, March 1994.
17. Physics colloquium on fractals at Dickinson College, March 1994.
18. Lecture on Chaos at Southwest Missouri State University, October 1995.
19. Lecture on Chaos at University of Central Oklahoma, October 1996.
20. Lecture on Chaos at Milwaukee School of Engineering, April 1997.
21. Seminar on Strange Attractors at Santa Fe Institute, June 2000.
22. Seminar on Chaotic Circuits at University of Iowa, February 2001.
23. Seminar on Chaos at Taylor University, March 2001.
24. Colloquium on Chaotic circuits at University of Augsburg, October 2001.
25. Colloquium on Fractals at Swiss Federal Research Institute, October 2001.
26. Colloquium on Chaos at North Carolina State University, January 2002.
27. Seminar on Chaotic Circuits at Duke University, January 2002.
28. Colloquium on Predator-Prey Dynamics at Swiss Federal Research Institute, April 2002.
29. Seminar on Chaotic Circuits at University of Warwick, August, 2002.
30. Seminar on Lotka-Volterra model at University of Iowa, Nov. 2003.
31. Colloquium on Strange attractors at University of North Carolina, Jan. 2004.
32. Seminar on Chaos at the Santa Fe Institute, July 2004.
33. Seminar on Chaotic Systems and Circuits at University of Illinois, September 2004.
34. Seminar on Self-Organization at Denison University, April 2005.
35. Seminar on Chaotic Systems and Circuits at Fordham University, May 2005.

36. Lecture on Fractals to Math Club at MATC, March 2007.
37. Lecture on Chaotic Systems and Circuits at S.E. University, China, April 2008.
38. Lecture on Self-Organization at S. E. University, China, April 2008.
39. Lecture on Self-Organization at Fordham University, April 2008.
40. Lecture on Self-Organization at Edgewood College, October 2008.
41. Lecture on Chaos at University of Tennessee – Martin, March 2010.
42. Lecture on Self-Organization at Mahidol University, Thailand, March 2011.
43. Lecture on Elegant Chaos at Thammasat University, Thailand, March 2011.
44. Lecture on The Wonders of Physics at South Central University, China, March 2011.
45. Lecture on Elegant Chaos at South Central University, China, March 2011.
46. Lecture on Self-Organization at Illinois State University, March 2011.
47. Lecture on Self-Organization at Lawrence University, May 2011.
48. Lecture on Self-Organization at American University in Cairo, May 2011.
49. Lecture on Elegant Chaos at American University in Cairo, May 2011.
50. Lecture on Chaos for Senior Summer School, Madison, July 2011.
51. Lecture on Fractals for Senior Summer School, Madison, July 2011.
52. Lecture on Self-Organization for Senior Summer School, Madison, August 2011.
53. Physics Colloquium on Self-Organization at Brigham Young University, November 2012.
54. Physics Colloquium on Self-Organization at Embry-Riddle Aeronautical University, October 2013.
55. Physics Colloquium on Self-Organization at Dickinson College, October 2013.
56. Physics Colloquium on Self-Organization at Howard University, October 2013.
57. Lecture on Simple Chaotic Systems and Circuits, University of Catania, July 2014.
58. Lecture on Self-Organization, University of Catania, July 2014.
59. Colloquium on Self-Organization, University of Utrecht, May 2017

Students Graduated **38**

Barter, J.D.	Ph.D. Nov 1976	"Ion Heating at the Cyclotron Resonance in Plasmas Magnetically Confined in a Toroidal Octupole Field"	TRW
Etzweiler, J.F.	Ph.D. Sep 1977	"Experimental Investigation of Plasma Resistivity and Ohmic Heating in the Octupole with Toroidal Magnetic Field"	NY Power and Light
Groebner, R.J.	Ph.D. May 1979	"Vacuum Ultraviolet Spectroscopic Study of Plasma in the Tokapole II Poloidal Divertor Experiment"	General Atomics
Strait, E.J.	Ph.D. Sep 1979	"Diverter Experiments in a Toroidal Plasma with $\vec{E}x\vec{B}$ Drift Due to an Applied Radial Electric Field"	General Atomics
Lipschultz, B.	Ph.D. Sep 1979	"Axisymmetric Instability in a Noncircular Tokamak"	MIT
Biddle, A.P.	Ph.D. Jun 1980	"Ion Heating in the Ion Cyclotron Range of Frequencies in the Wisconsin Tokapole II"	American Airlines (retired)
Holly, D.J.	Ph.D. Jan 1982	"Poloidal Ohmic Heating in a Multipole"	UW-Madison
Smith, P.K.	Ph.D. Feb 1983	"Plasma Potential in a Magnetic Mirror with Electron Cyclotron Resonance Heating"	Teledyne-Brown
Fortgang, C.M.	Ph.D. May 1983	"High Power Ion Cyclotron Resonance Heating in the Wisconsin Levitated Octupole"	Los Alamos National Lab
Witherspoon, F.D.	Ph.D. Nov 1984	"Experimental Study of the Shear Alfvén Resonance in a Tokamak"	Ultron, Inc.
Leonard, A.W.	Ph.D. Sep 1986	"The Trapping of a Gun-Injected Plasma by a Tokamak"	General Atomics
Kortbawi, D.	Ph.D. Oct 1987	"Alfvén Wave Studies on a Tokamak"	Physics International
Sarff, J.S.	Ph.D. Oct 1988	"Studies of a Poloidal Divertor Reversed Field Pinch"	UW-Madison
LaPointe, M.A.	Ph.D. Aug 1990	"Magnetic Fluctuation Measurements in the Tokapole II Tokamak"	Omega Corporation
Almagri, A.F.	Ph.D. Dec 1990	"The Effects of Magnetic Field Errors on RFP Plasmas"	UW-Madison
Watts, C.A.	Ph.D. Sep 1993	"Chaos and Simple Determinism in Reversed Field Pinch Plasmas"	University of New Mexico
Mirus, K.A.	Ph.D. Jun 1998	"Control of Nonlinear Systems Using Periodic Parametric Perturbations with Application to a Reversed Field Pinch"	Madison Area Techni College
Albers, D.J.	Ph.D. Aug 2004	"A Qualitative Numerical Study of High Dimensional Dynamical Systems"	Columbia University

	Fall	Res 990	Students Total	Spring	Res 990	Students Total	Summer
1972-73	off	0	0	EE 220	0	0	2
1973-74	922	4	4	off	3	3	7
1974-75	525	7	8	321	6	7	6
1975-76	205	5	7	525	6	8	8
1976-77	321	6	8	321	5	7	8
1977-78	244	8	8	321	8	9	9
1978-79	321	6	8	205	8	7	7
1979-80	321	8	5	205	3	5	5
1980-81	525	4	5	321	5	5	5
1981-82	321	6	7	525	5	6	5
1982-83	623	5	7	201	7	7	2
1983-84	202	5	7	525	8	9	6
1984-85	off	6	7	525	6	7	7
1985-86	205	7	7	off	7	8	6
1986-87	207	8	7	208	7	6	6
1987-88	207	6	6	208	4	5	4
1988-89	104	3	4	off	3	3	3
1989-90	103	3	3	104	3	3	3
1990-91	207	3	2	208	1	1	1
1991-92	207	1	1	208	1	1	2
1992-93	207	2	2	208	2	2	3
1993-94	207	2	4	208	1	3	1
1994-95	207/505	1	1	208	1	2	2
1995-96	103	1	3	104	1	2	2
1996-97	201	1	2	208	1	2	2

Teaching Service							**40**
1997-98	505	1	2	103	1	3	2
1998-99	207	1	3	208	1	3	2
1999-00	207	1	1	208	1	1	2
2000-01	505	2	2	Sabbatical	2	3	2
2001-02	103	1	3	104	1	2	1
2002-03	103	1	1	104	1	1	2
2003-04	103	1	4	104	1	4	1
2004-05	103	0	5	104	0	3	2
2005-06	103	0	2	104	0	1	0
2006-07	103	0	3	103	0	1	3
2007-08	104	0	2	103	0	2	1
2008-present	Retired from formal classroom teaching						

1. Radio interview on fusion, WIBA, December 1977.
2. Exhibits Coordinator, IEEE International Conference on Plasma Science, May 1980.
3. Talk on fusion to American Business Club, January 1981.
4. Article published in QST, "A Microcomputer QSO Robot", July 1981.
5. Article published in 80 Micro, "ROM Breakout", June 1982.
6. TV interview on fusion, WKOW-TV, July 1982.
7. Organizer of 1982 Small Tokamak Users Meeting, November 1982.
8. TV interview on fusion, WHA-TV, November 1982.
9. Program committee, Topical Conference on RF Heating, February 1983.
10. Article published in 80 Micro, "Letter Perfect", February 1984.
11. TV interview on lightning, WKOW-TV, May 1984.
12. Article published in 80 Micro, "The Missing Disassembler," October 1984.
13. Radio interview on physics, WORT, February 1985.
14. Talk on Plasma Physics Research at UW-Madison to the Wisconsin Association of Physics Teachers, March 1985.
15. Radio interview on physics, WORT, February 1986.
16. Radio interview on physics, WORT, February 1987.
17. Radio interview on fusion for Earth Watch Radio, February 1987.
18. Science presentation with Chemistry Department, December 1987.
19. TV interview on fusion for "The Wisconsin Magazine," WHA-TV, December 1987.
20. TV interview on "The Wonders of Physics," WMTV "PM Magazine," February 1988.
21. Talk on fusion to the UW Plato Society, March 1988.
22. MST press conference, May 1988.
23. Interview on fusion for videotape on Energy, WHA-TV, June 1988.
24. Radio interview on Physics, WFAW, February 1989.
25. Radio interview on Physics, Wisconsin Public Radio, February 1989.
26. TV interview on "The Wonders of Physics," WMTV "PM Magazine," February 1989.

27. Radio Commercial on "The Wonders of Physics" for the Badger Sports Network, August 1989.
28. Talk on Chaos to the Wisconsin Public Utility Institute Annual Meeting, November 1989.
29. Workshop leader for Physics Demonstrations software at Atlanta APS/AAPT meeting, January 1990.
30. Workshop leader for Physics Demonstrations software at Minneapolis AAPT meeting, June 1990.
31. Workshop leader for Chaos Demonstrations software at Minneapolis AAPT meeting, June 1990.
32. Workshop leader for Teaching Chaos Using Computers at San Antonio APS/ AAPT meeting, January 1991.
33. Workshop leader for Teaching Chaos Using Computers at Orlando AAPT meeting, January 1992.
34. Radio Interview on "The Wonders of Physics," WTSO Nightline, July 1992.
35. Talk on "The Wonders of Physics" at Moorehead State University, July 1992.
36. Workshop organizer for physics teachers on the use of physics demonstrations, August 1992.
37. Symposium organizer for nonlinear dynamics and chaos, April 1993.
38. Workshop leader for Physics on the Road at Boise AAPT meeting, August 1993.
39. TV interview on “The Wonders of Physics,” WISC-TV “The Talk Box,” October 1994.
40. Talk on “The Wonders of Physics,” Founders Day meeting in Manitowoc, March 1995.
41. Television interview on “The Wonders of Physics,” WMTV 15 News at 5, February 1996.
42. Radio interview on “The Wonders of Physics,” WORT, February 1996.
43. Organizer of exhibit on “The Wonders of Physics” at the University of Denver, November 1996.
44. Talk on Chaos to the Physics Club of Milwaukee, April 1997.
45. Talk on Chaos at Sigma Xi annual banquet, May 1997.
46. Radio Interview on “The Wonders of Physics,” WORT, February 1998.
47. Radio Interview on Chaos, WORT, July 1998.
48. Panel member for symposium on the play “Arcadia,” October 1998.
49. Radio interview on physics for “To the Best of Our Knowledge,” PRI, February 1999.
50. Radio interview on “The Wonders of Physics,” WORT, February 1999.
51. Honorary Judge for Deaconess Billings Clinic Science Expo, March 1999.
52. Radio interview on Time Travel, WORT, June 1999.

53. Teachers Workshop on Fusion and Astronomy, Green County (OK), February 2000.
54. Radio Interview on “The Wonders of Physics,” WFAW, February 2001.
55. Talk on Chaos for UW Plato Society, February, 2001.
56. Television Interview on “The Wonders of Physics,” WWL (New Orleans), March 2001.
57. Talk on models of love and happiness, Madison Kiwanis Club, June 2002.
58. Television interview on corked baseball bats, WKOW-TV, June 2003.
59. Television interview on gas explosions, WKOW-TV, September 2003.
60. Workshop Leader on Time-Series Analysis for Society for Chaos Theory in Psychology and Life Sciences, July 2004.
61. Book reading, Images of a Complex World, Avol’s, December 2005.
62. Public Lecture on Self-Organization at Edgewood College, March 2006.
63. Public Lecture on Self-Organization for North Shore Library in Glendale, WI, March 2006.
64. Founders’ Day dinner talk on Self-Organization in Atlanta, GA, April 2006.
65. Book reading, Images of a Complex World, WORT, May 2006.
66. Book reading, Images of a Complex World, Room of One’s Own, May 2006.
67. Physics Teacher Workshop, University of Aveiro, Portugal, July 2006.
68. Consulting editor for Odyssey Magazine, November 2007.
69. Radio Interview on physics, KVMR-FM (Nevada City, CA), January 2008.
70. Television interview on “The Wonders of Physics”, WISC-TV, February 2009.
71. Workshop Leader on Self-Organization for SCTPLS, July 2009.
72. Television Interview on walking/running in the rain, WISC-TV, September 2009.
73. Public Lecture on Self-Organization at Martin, Tennessee, March 2010.
74. Television Interview on Road Buckling, WISC-TV, May 2010.
75. Television Interview on “The Wonders of Physics”, Big-Ten Network, February 2014.
76. Newspaper Interview (Wisconsin State Journal) on Why Curveballs Curve, April 2017

Reviews

Abstract and Applied Analysis
Addison-Wesley
Advances in Dynamical Systems and Applications
Advances in Mathematical Physics
AEC/ERDA/DOE
Allyn and Bacon
American Journal of Hypertension
American Journal of Physics
Applied Mathematical Modeling
Applied Mathematics and Computation
Automatica
Basic Books
Blackwell Science
Bulletin of Calcutta Mathematical Society
Chaos: An interdisciplinary Journal of Nonlinear Science
Chinese Physics Letters
Circuits, Systems, and Signal Processing
City University of Hong Kong
Communications in Nonlinear Science and Numerical Simulations
Complexity
Computational Geosciences
Computers and Graphics
Computers in Physics
Dane County Cultural Affairs Commission
Differential Equations and Nonlinear Mechanics
Discrete Dynamics in Nature and Society
Ecological Modelling
Electric Power Research Institute
Electronic Journal of Theoretical Physics
European Physical Journal
Europhysics Letters
Fluctuation and Noise Letters
Freeman
Georgia Journal of Science
Harper Collins Publishers
IEE Proceedings on Science, Measurement & Technology
IEEE Computer Graphics and Applications
IEEE Control Systems Conference
IEEE Transactions on Circuits and Systems
IEEE Transactions on Plasma Science
Imperial College Press
In Silico Biology
Indian Journal of Pure and Applied Mathematics
International Journal for Computation and Mathematics in Electronic Engineering
International Journal of Bifurcation and Chaos
International Journal of Computer Graphics
International Journal of Circuit Theory and Applications
International Journal of Control, Automation, and Systems
International Journal of High Performance Computing Applications
International Journal of Mathematics and Mathematical Sciences
International Journal of Modern Physics C
International Journal of Nonlinear Sciences and Numerical Simulation
International Symposium on Circuits and Systems

John Hopkins University Press
John Wiley & Sons
Jones and Bartlet
Journal of Applied Physics
Journal of Circuits, Systems, and Computers
Journal of Mathematical Physics
Journal of Sound and Vibration
Journal of the Franklin Institute
Journal of Zhejiang University Science A
Lake Street Publishers
Leonardo
Mathematical and Computer Modelling
McGraw Hill
Modern Physics Letters B
Morgan Kaufmann Publishers
National Science Foundation
Nonlinear Dynamics
Nonlinear Dynamics, Psychology, and Life Sciences
Nonlinearity
Nuclear Fusion
Nuclear Technology/Fusion
Optics Letters
Oxford University Press
Philosophical Transactions of the Royal Society A
Physica A
Physica D
Physica Scripta
Physical Review
Physical Review Letters
Physics Academic Software
Physics Letters
Physics of Fluids
Physics of Plasmas
Plasma Physics
Plenum Press
Princeton University Press
Research Corporation
Review of Scientific Instruments
Saunders College Publishing
Scott Forseman and Company
SIAM Journal on Applied Mathematics
Springer
St. Martin's Press
Systems, Man, and Cybernetics
Taylor and Francis
The Physics Teacher
The Visual Computer
Turkish Journal of Electrical Engineering and Computer Science
U.S. Army
U.S. Civilian Research and Development Foundation
University of Chicago Press
VSRI Radio Science Bulletin
West Publishing
WIRES Computational Statistics
World Scientific
Worth Publishers

Zeitschrift fuer Naturforschung A

Presentations of "The Wonders of Physics" **47**

Estimated attendance in parenthesis (including overflow video audience)

1. February 15, 1984	general public	(450)
2. February 15, 1984	general public	(100)
3. February 13, 1985	general public	(450)
4. February 14, 1985	general public	(450)
5. March 19, 1985	Madison Huegel and Orchard Ridge Schools	(350)
6. June 24, 1985	College for Kids	(300)
7. June 24, 1985	Guidance & Experience in Math & Science	(100)
8. February 9, 1986	general public	(550)
9. February 11, 1986	general public	(550)
10. February 12, 1986	general public	(500)
*11. June 3, 1986	Portage Caledonia and Lewiston Schools	(250)
12. July 11, 1986	College for Kids	(350)
13. February 8, 1987	general public	(500)
14. February 11, 1987	general public	(500)
15. February 13, 1987	general public	(500)
16. February 14, 1987	general public	(500)
*17. February 15, 1987	general public	(500)
18. March 2, 1987	Kenosha Unified Schools	(100)
19. May 22, 1987	Spring Green St. John's School	(100)
20. July 10, 1987	College for Kids	(300)
21. July 10, 1987	University of Illinois Upward Bound	(50)
22. November 13, 1987	Madison high school minorities	(150)
23. January 7, 1988	Madison Gompers Elementary School	(300)
24. February 14, 1988	general public	(350)
25. February 14, 1988	general public	(350)
26. February 20, 1988	general public	(350)
27. February 20, 1988	general public	(350)

Presentations of "The Wonders of Physics"		**48**
*28. February 21, 1988	general public	(350)
29. February 21, 1988	general public	(400)
30. February 26, 1988	Junior Science Symposium	(250)
31. February 29, 1988	Kenosha Unified Schools	(100)
32. June 2, 1988	Wisconsin Dells Elementary School	(150)
33. June 24, 198	Summer Music Clinic	(350)
*34. June 24, 1988	Summer Music Clinic	(300)
35. July 7, 1988	College Access Program	(100)
36. July 8, 1988	College for Kids	(300)
37. January 12, 1989	Cherokee, Lincoln and Leopold Schools	(350)
38. February 12, 1989	general public	(350)
39. February 12, 1989	general public	(350)
40. February 18, 1989	general public	(350)
41. February 18, 1989	general public	(350)
*42. February 19, 1989	general public	(350)
43. February 19, 1989	general public	(400)
44. May 26, 1989	Spring Green St. John's School	(50)
45. July 14, 1989	College for Kids elementary	(300)
46. July 14, 1989	College for Kids middle school	(300)
47. January 10, 1990	Randall and Shorewood elementary	(350)
48. January 12, 1990	Lincoln and Randall elementary	(400)
49. February 11, 1990	general public	(400)
50. February 11, 1990	general public	(350)
51. February 17, 1990	general public	(400)
52. February 17, 1990	general public	(350)
53. February 18, 1990	general public	(400)
*54. February 18, 1990	general public	(350)
55. February 28, 1990	Junior Science Symposium	(200)

56. March 20, 1990	Brooklyn Elementary	(300)
57. March 20, 1990	Oregon Middle School	(350)
58. May 21, 1990	Talent Search (Middle School)	(300)
59. June 6, 1990	Edgewood Elementary	(100)
60. July 13, 1990	College for Kids	(300)
61. November 3, 1990	Freshmen Parents	(200)
62. November 3, 1990	Freshmen Parents	(150)
63. February 10, 1991	general public	(350)
64. February 10, 1991	general public	(350)
65. February 16, 1991	general public	(350)
66. February 16, 1991	general public	(350)
*67. February 17, 1991	general public	(350)
68. February 17, 1991	general public	(350)
69. March 16, 1991	Families and Students Together	(200)
70. July 12, 1991	College for Kids	(300)
71. July 31, 1991	Senior Guest Students	(200)
72. November 22, 1991	general public (Fairfield, CT)	(300)
73. February 16, 1992	general public	(350)
74. February 16, 1992	general public	(250)
75.February 22, 1992	general public	(350)
76. February 22, 1992	general public	(350)
*77. February 23, 1992	general public	(350)
78. February 23, 1992	general public	(350)
79. May 20, 1992	Verona Middle School	(130)
80. June 24, 1992	Alumni University	(200)
81. February 14, 1993	general public	(350)
82. February 14, 1993	general public	(350)
83. February 20, 1993	general public	(350)

Presentations of "The Wonders of Physics"		**50**
84. February 20, 1993	general public	(350)
85. February 21, 1993	general public	(300)
*86. February 21, 1993	general public	(350)
87. May 27, 1993	Academically Talented Youth	(350)
88. May 27, 1993	Academically Talented Youth	(350)
89. February 13, 1994	general public	(350)
90. February 13, 1994	general public	(350)
91. February 19, 1994	general public	(350)
92. February 19, 1994	general public	(350)
93. February 20, 1994	general public	(350)
94. February 20, 1994	general public	(350)
95. June 22, 1994	State 4-H Congress	(170)
96. July 8, 1994	College for Kids	(250)
97. September 24, 1994	Bascom Hill Society	(150)
98. February 12, 1995	general public	(350)
99. February 12, 1995	general public	(300)
100. February 18, 1995	general public	(350)
101. February 18, 1995	general public	(350)
102 February 19, 1995	general public	(350)
*103. February 19, 1995	general public	(350)
104. May 24, 1995	Academically Talented Youth	(250)
105. June 21, 1995	State 4-H Congress	(180)
106. July 17, 1995	College for Kids	(300)
107. February 11, 1996	general public	(400)
108. February 11, 1996	general public	(375)
109. February 17, 1996	general public	(350)
110. February 17, 1996	general public	(350)
111. February 18, 1996	general public	(350)

*112. February 18, 1996	general public	(350)
113. July 12, 1996	College for Kids	(300)
114. February 9, 1997	general public	(400)
115. February 9, 1997	general public	(350)
116. February 15, 1997	general public	(400)
117. February 15, 1997	general public	(350)
118. February 16, 1997	general public	(400)
*119. February 16, 1997	general public	(350)
120. June 25, 1977	Summer Science Institute	(100)
121. July 11, 1997	College for Kids	(300)
122. February 8, 1998	general public	(350)
123. February 8, 1998	general public	(350)
124. February 14, 1998	general public	(350)
125. February 14, 1998	general public	(350)
126. February 15, 1998	general public	(350)
*127. February 15, 1998	general public	(350)
128. February 14, 1999	general public	(350)
129. February 14, 1999	general public	(350)
130. February 20, 1999	general public	(350)
131. February 20, 1999	general public	(350)
132. February 21, 1999	general public	(350)
*133. February 21, 1999	general public	(350)
134. March 20, 1999	Science Fair (Billings, MT)	(500)
135. June 16, 1999	MATC Metrology Institute	(50)
136. February 13, 2000	general public	(300)
137. February 13, 2000	general public	(300)
138. February 19, 2000	general public	(350)
139. February 19, 2000	general public	(350)

140. February 20, 2000	general public	(350)
*141. February 20, 2000	general public	(350)
142. February 11, 2001	general public	(350)
143. February 11, 2001	general public	(350)
144. February 17, 2001	general public	(350)
145. February 17, 2001	general public	(350)
146. February 18, 2001	general public	(350)
*147. February 18, 2001	general public	(350)
148. March 8, 2001	Pittsburg Conference (New Orleans)	(1600)
149. November 14, 2001	general public	(175)
150. February 10, 2002	general public	(350)
151. February 10, 2002	general public	(350)
152. February 16, 2002	general public	(350)
153. February 16, 2002	general public	(350)
154. February 17, 2002	general public	(350)
*155. February 17, 2002	general public	(350)
156. February 9, 2003	general public	(350)
157. February 9, 2003	general public	(350)
158. February 15, 2003	general public	(350)
159. February 15, 2003	general public	(350)
160. February 16, 2003	general public	(350)
*161. February 16, 2003	general public	(350)
162. February 27, 2003	Junior Science Symposium	(150)
163. August 5, 2003 AAPT	AAPT (Monona Terrace)	(550)
164. February 8, 2004	general public	(350)
165. February 8, 2004	general public	(350)
166. February 14, 2004	general public	(350)
167. February 14, 2004	general public	(350)
*168. February 15, 2004	general public	(350)

169. February 15, 2004	general public	(350)
170. February 13, 2005	general public	(350)
171. February 13, 2005	general public	(350)
172. February 19, 2005	general public	(350)
173. February 19, 2005	general public	(350)
174. February 20, 2005	general public	(350)
*175. February 20, 2005	general public	(350)
176. August 13, 2005	Physics Department Alumni Celebration	(200)
177. February 11, 2006	general public	(300)
178. February 11, 2006	general public	(300)
179. February 18, 2006	general public	(300)
180. February 18, 2006	general public	(300)
*181. February 19, 2006	general public	(300)
182. February 19, 2006	general public	(300)
183. June 21, 2006	Summer Music Clinic	(250)
184. June 22, 2006	Summer Music Clinic	(250)
185. July 24, 2006	University of Aveiro (Portugal)	(400)
186. February 11, 2007	general public	(300)
187. February 11, 2007	general public	(300)
188. February 17, 2007	general public	(300)
189. February 17, 2007	general public	(300)
190. February 18, 2007	general public	(300)
*191. February 18, 2007	general public	(300)
192. May 3, 2007	Cheyenne, Wyoming	(1500)
193. February 9, 2008	General public	(300)
194. February 9, 2008	General public	(300)
195. February 10, 2008	General public	(300)
196. February 10, 2008	General public	(300)
197. February 16, 2008	General public	(300)

198. February 16, 2008	General public	(300)
199. March 8, 2008	General public	(300)
200. March 8, 2008	General public	(300)
201. March 9, 2008	General public	(300)
*202. March 9, 2008	General public	(300)
203. February 7, 2009	General public	(300)
204. February 7, 2009	General public	(300)
205. February 7, 2009	General public	(300)
206. February 8, 2009	General public	(300)
207. February 8, 2009	General public	(300)
208. February 11, 2009	General public	(400)
209. February 14, 2009	General public	(300)
210. February 14, 2009	General public	(300)
211. February 15, 2009	General public	(300)
*212. February 15, 2009	General public	(300)
213. February 7, 2010	General public	(300)
214. February 7, 2010	General public	(300)
215. February 7, 2010	General public	(300)
216. February 8, 2010	General public	(300)
217. February 8, 2010	General public	(300)
218. February 14, 2010	General public	(300)
219. February 14, 2010	General public	(300)
220. February 14, 2010	General public	(300)
221. February 15, 2010	General public	(300)
*222. February 15, 2010	General public	(300)
223. February 12, 2011	General public	(300)
224. February 12, 2011	General public	(300)
225. February 12, 2011	General public	(300)
226. February 13, 2011	General public	(300)

227. February 13, 2011	General public	(300)
228. February 19, 2011	General public	(300)
229. February 19, 2011	General public	(300)
230. February 19, 2011	General public	(300)
231. March 26, 2011	General public	(300)
*232. March 26, 2011	General public	(300)
233. May 9, 2011	Cairo, Egypt	(200)
234. May 15, 2011	Cairo, Egypt	(900)
235. May 20, 2011	National Science Olympiad	(7000)
237. September 17, 2011	Nippon TV Network (Japan)	(50)
238. February 11, 2012	General public	(300)
239. February 11, 2012	General public	(300)
240. February 11, 2012	General public	(300)
241. February 12, 2012	General public	(300)
242. February 12, 2012	General public	(300)
243. February 18, 2012	General public	(300)
244. February 18, 2012	General public	(300)
245. February 18, 2012	General public	(300)
246. February 19, 2012	General public	(300)
*247. February 19, 2012	General public	(300)
248. February 9, 2013	General public	(300)
249. February 9, 2013	General public	(300)
250. February 9, 2013	General public	(300)
251. February 10, 2013	General public	(300)
252. February 10, 2013	General public	(300)
253. February 16 2013	General public	(300)
254. February 16, 2013	General public	(300)
255. February 16, 2013	General public	(300)
256. February 17, 2013	General public	(300)

Presentations of "The Wonders of Physics"		**56**
*257. February 17, 2013	General public	(300)
258. February 8, 2014	General public	(300)
259. February 8, 2014	General public	(300)
260. February 8, 2014	General public	(300)
261. February 9, 2014	General public	(300)
262. February 9, 2014	General public	(300)
263. February 15 2014	General public	(300)
264. February 15, 2014	General public	(300)
265. February 15, 2014	General public	(300)
266. February 16, 2014	General public	(300)
*267. February 16, 2014	General public	(300)
268. February 7, 2015	General public	(300)
269. February 7, 2015	General public	(300)
270. February 7, 2015	General public	(300)
271. February 8, 2015	General public	(300)
272. February 8, 2015	General public	(300)
273. February 14 2015	General public	(300)
274. February 14, 2015	General public	(300)
275. February 14, 2015	General public	(300)
276. February 15, 2015	General public	(300)
*277. February 15, 2015	General public	(300)
278. February 13, 2016	General public	(290)
279. February 13, 2016	General public	(295)
280. February 13, 2016	General public	(275)
281. February 14, 2016	General public	(275)
282. February 14, 2016	General public	(250)
283. February 20, 2016	General public	(290)
284. February 20, 2016	General public	(265)
285. February 20, 2016	General public	(270)

Presentations of "The Wonders of Physics" **57**

286. February 21, 2016	General public	(290)
*287. February 21, 2016	General public	(265)
288. February 11, 2017	General public	(300)
289. February 11, 2017	General public	(300)
290. February 11, 2017	General public	(300)
291. February 12, 2017	General public	(300)
292. February 12, 2017	General public	(300)
293. February 18, 2017	General public	(300)
294. February 18, 2017	General public	(300)
295. February 18, 2017	General public	(300)
296. February 19, 2017	General public	(300)
*297. February 19, 2017	General public	(300)

*Available as video recording.

Committees **58**

I. National/International

1. AEC Committee to evaluate Ion Cyclotron Resonance Heating, 1973.
2. AEC Committee to evaluate the need for dedicated plasma research user facility, 1974.
3. ERDA Committee for the formulation of near-term plans for rf heating in Tokamaks, 1975.
4. ERDA Committee to review Princeton 55 MHz ICRF experiments, 1976.
5. EPRI Committee to review Fusion Energy Corporation proposal, 1978.
6. DOE Committee to review energetic electron ring proposals, 1979.
7. DOE Committee to review Princeton Spheromak program, 1980.
8. APS Division of Plasma Physics Nominating Committee, 1983.
9. DOE Committee to review MIT Alcator DCT proposal, 1983.
10. US/Japan RFP Joint Planning Committee, 1986.
11. DOE Committee to review Columbia HBT program (Chairman), 1987.
12. DOE Panel to review Texas TEXT program, 1990.
13. APS DPP Science Education Committee, 1998-2000.
14. Program Committee for International Conference on Complex Systems, 2004.

II. University

1. Plasma Coordinating Committee, 1973-present.
2. Faculty Senator, 1989-1993.
3. L&S Science and Mathematics Education Committee (Chairman), 1991-1992.
4. Council on Precollege Programs, 1993-1996.
5. L&S Committee on Outreach and Related Activities, 1994-1997.
6. Hilldale Undergraduate Awards Committee, 1994.
7. Chaos and Complex Systems Steering Committee, 1996-present.
8. Sigma Xi Board of Governors, 1997-2002.
9. Faculty Senator 2002-2008.

III. Department

1974-75	Fellowship and Assistantship
	Departmental Secretary
	Prelim Committee
1975-76	Departmental Secretary
	Civil Service (Chairman)
	Scheduling and Registration
	Mini-Research
1976-77	Departmental Secretary
	Alternate Faculty Senator
	Awards
	FAS representative
	Graduate program committee
1977-78	Alternate Faculty Senator
	Student-Staff Committee
	Awards (Chairman)
	Graduate Program (Chairman)
1978-79	TA Review
	Research Capital
	AMEP Advising

1979-80	Salaries and Promotion Space Assignment and Remodelling Research Capital (Chairman) Graduate Program-Student Staff (Chairman)
1980-81	Nominating Salaries and Promotion Space Assignment and Remodelling
1981-82	Nominating New Staff (Chairman) Space Assignment and Remodelling
1982-8	Research Capital Graduate Program (Chairman) Electronics Shop (Chairman)
1983-84	Nominating New Staff TA Review
1984-85	Nominating New Staff Admissions and Fellowships
1985-86	Nominating TA Policy Graduate Program (Chairman) Lecture Room (Chairman)
1986-87	Lecture Room
1987-88	Lecture Room Physics Club
1988-89	Outreach Programs Tours Lecture Room Introductory Courses
1989-90	Faculty Senator Public Lectures Plasma Graduate Advisor Lecture Room Introductory Courses Introductory Labs
1990-91	Faculty Senator Outreach Programs (Chairman) Plasma Graduate Advisor Introductory Courses (Chairman)
1991-92	Faculty Senator Qualifying Exam Plasma Graduate Advisor

	Lecture Room Introductory Courses (Chairman)
1992-93	Faculty Senator Lecture Room Introductory Courses (Chairman)
1993-94	Outreach Programs Public Lectures (Chairman) Introductory Courses (Chairman) Lecture Room Plasma Graduate Advisor
1994-95	Outreach Programs Public Lectures (Chairman) Lecture Room (Chairman) Introductory Courses Plasma Graduate Advisor
1995-96	Lecture Room (Chairman) Introductory Courses Physics Library Plasma Advisor
1996-97	Introductory Courses Physics Library Plasma Advisor
1997-98	Faculty Recognition Lecture Room Qualifying Exam Museum (Chairman)
1999-00	Lecture Room (Chairman) Museum (Chairman)
1999-00	Lecture Room (Chairman) Museum (Chairman)
2000-01	Public Lecture (Chairman) Museum (Chairman)
2001-02	Faculty Senator (alternate) Tours (chairman) Public Lecture (Chairman) Museum (Chairman)
2002-03	Faculty Senator Tours (Chairman) Public Lecture (Chairman) Museum (Chairman)
2003-04	Faculty Senator Museum (Chairman) Outreach Programs (Chairman) Special Lectures Lecture Room

2004-05	Faculty Senator Lecture Room (Chairman) Introductory Courses Museum (Chairman)
2005-06	Faculty Senator Special Lectures Introductory Courses Lecture Room (Chairman)
2006-07	Undergraduate Coordinator Faculty Senator Outreach & Museum Introductory Courses (Chairman)
2007-08	Faculty Senator Outreach & Museum Introductory Courses

1. Election to fellowship in the American Physical Society (1980).
2. Winner of the first annual “Computers in Physics” contest for innovative software in physics education (1990).
3. John Glover award - Dickinson College (1994). “.. In recognition of your outreach efforts in physics education.”
4. Van Hise Outreach Award for Excellence in Teaching - University of Wisconsin-Madison (1997).
5. Lifetime Achievement Award for the Long-Term Advancement of Physics and Physics Education — Wisconsin Association of Physics Teachers (1999).
6. Distinguished Lecturer in Plasma Physics (2011 – 2013).
7. Distinguished Service Award, UW Department of Physics (2013).
8. Ian Snook Prize (2014).

1. Technical Editor, Physics Academic Software, 1993 – 2011.
2. Editorial Board, Physics Academic Software, 1999 – 2011.
3. Editorial Board, International Journal of Chaos Theory and Applications, 2000.
4. International Advisory Board, Centre for Complexity Research, University of Liverpool, 2003 – present.
5. Editorial Board, Nonlinear Dynamics in Psychology and Life Sciences, 2003 – present.
6. Editorial Board, Chaotic Modeling and Simulation, 2011 – present.
7. Editorial Board, Fractal Laboratory Journal, 2011 – present.
8. Editorial Board, International Journal of Innovative Research and Development, 2012 – present.
9. Editorial Board, The SciTech, Journal of Science & Technology, 2012 – present.
10. Editorial Board, Asia Pacific Journal of Engineering, Science & Technology, 2016 – present.
11. Editorial Board, SpringerBriefs in Nonlinear Circuits, 2016 – present.

(DOE) “Reversed Field Pinch”	$1,420,000	11/1/89-10/31/90
(DOE) “Reversed Field Pinch”	$2,040,000	11/1/90-10/31/91
(DOE) “Reversed Field Pinch”	$2,100,000	11/1/91-10/31/92
(DOE) "Reversed Field Pinch"	$2,000,000	11/1/92-10/31/93
(DOE) “Reversed Field Pinch”	$1,850,000	11/1/93-10/31/94
(DOE) “Reversed Field Pinch”	$1,800,000	11/1/94-10/31/95
(DOE) “Reversed Field Pinch”	$1,600,000	11/1/95-10/31/96
(DOE) “Reversed Field Pinch”	$1,750,000	11/1/96-10/31/97
(DOE) “Reversed Field Pinch”	$2,250,000	11/1/97-10/31/98
(DOE) “Reversed Field Pinch”	$2,840,611	11/1/98-10/31/99
(DOE) “Reversed Field Pinch”	$4,659,220	11/1/99-10/31/00
(DOE) “Reversed Field Pinch”	$4,120,264	11/1/00-12/31/00
(DOE) “Reversed Field Pinch”	$4,011,000	11/1/02-11/30/02
(DOE) “Reversed Field Pinch”	$4,816,000	12/1/02–10/31/03
(DOE) “Reversed Field Pinch”	$4,815,000	11/1/03-3/31/05
(DOE) “Reversed Field Pinch”	$5,820,000	4/1/05-1/14/06
(DOE) “Reversed Field Pinch”	$5,835,000	1/15/06-1/14/07
(DOE) “Reversed Field Pinch”	$6,116,000	1/15/07-1/14/08
(NSF) “The Wonders of Physics”	$15,840	10/15/89-9/30/90
(Brittingham Fund) “The Wonders of Physics” Videotape	$5,000	1/1/90-12/31/90
(Outreach Development) “The Wonders of Physics”	$7,000	7/1/89-6/30/90
(Outreach Development) “Physics Traveling Shows”	$15,000	7/1/89-6/30/90
Hilldale Research Award (for Brian Melloon)	$1,000	7/1/93-6/30/94
(Medical Physics Foundation) “The Wonders of Physics” Videotape	$6,000	7/1/93-6/30/94
(Anonymous Fund) “The Wonders of Physics” Videotape	$7,000	7/1/94-6/30/95
Hilldale Research Award (for David Albers)	$1,000	7/1/98-6/30/99
(NSF) Center for Magnetic Self-Organization	$11,250,000	9/1/03-8/31/08

(APS) Physics on the Road	$10,000	01/01/05-12/31/05

(IBM) Gift of two IBM PS/2 series computers to develop Physics Demonstrations courseware to run under the Microsoft Windows environment, February 1988.

(Apple) Gift of two Macintosh computers as part of Project Rota to develop Physics Demonstration software for museum and lecture demonstration use, March 1990.