

**Harry L. Swinney**

*Sid Richardson Foundation Regents Chair*

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**Education:**

B.S. with Honors (physics), Rhodes College, 1961

Ph.D. (physics), Johns Hopkins University, 1968; “The Spectrum of Light Scattered by Carbon Dioxide in the Critical Region”

Advisor: Herman Z. Cummins

**Experience:**

1990-	Sid Richardson Foundation Regents Chair in Physics	University of Texas at Austin
1984-90	Trull Centennial Professor	University of Texas at Austin
1983(fall)	Visiting Scientist	Centre de Recherche Paul Pascal (Bordeaux)
1978-84	Professor	University of Texas at Austin
1978	Professor	City College of CUNY
1973-77	Associate Professor	City College of CUNY
1971-73	Assistant Professor	New York University
1970-71	Visiting Assistant Professor	Johns Hopkins University
1968-70	Research Associate	Johns Hopkins University

**Honors:**

2013	Boltzmann Medal of the International Union of Pure and Applied Physics, awarded at Statphys25 (Seoul) “for his ingenious and challenging experiments, which have had a large impact on many areas of statistical physics”
2013	Distinguished Alumnus Award, Rhodes College
2012	Celebration of accomplishments of H. Swinney, J. Reppy (Cornell) and J. Sengers (U. Maryland) at the 108th Statistical Mechanics Conference
2012	Lewis Fry Richardson Medal of the European Geosciences Union, “For his pioneering experiments on deterministic chaos and highly original models of geophysical flows”
2010	Award of Doctoral Degree “Honoris Causa”, University of Buenos Aires
2009	Fellow, Society of Industrial and Applied Mathematics
2008	Doctor Philosophiae Honoris Causa, The Hebrew University of Jerusalem
2007	Jürgen Moser Award of the Society of Industrial and Applied Mathematics
2002	Honorary Doctor of Science degree, Rhodes College
2001	Honorable Visitor, National Science Council of the Republic of China

1999 Fellow, American Association for the Advancement of Science  
 1997 Career Research Excellence Award, UT-Austin  
 1995 American Physical Society Fluid Dynamics Prize  
 1992 Member, National Academy of Sciences  
 1991 Fellow, American Academy of Arts and Sciences  
 1984 Inducted into Johns Hopkins Society of Scholars  
 1983-84 John Simon Guggenheim Foundation Fellowship  
 1977 Fellow, American Physical Society  
 1967 National Space Club Fellowship  
 1967 National Science Foundation Fellowship  
 1960 Phi Beta Kappa

**Named and special lectures:**

2015 Reed College, Divisional Speaker, Mathematics and Natural Sciences  
 2015 University of Southern California, Laufer Lecture  
 2014 Distinguished Lecturer, Centro Internacional de Ciencias, Cuernavaca  
 2013 Boltzmann Award Lecture, StatPhys25, Seoul  
 2011 President's Forum Lecturer, Shanghai Jiao Tong University  
 2008 Edward L. Reiss Memorial Lectures (2 lectures), Northwestern University  
 2007 Jürgen Moser Lecture, Dynamical Systems Meeting of the Society  
     of Industrial and Applied Mathematics  
 2007 Tenneco Public Lecture, University of Houston  
 2006 Rhodes College Public Lecture, sponsored by the Society of Physics Students  
     and the Department of Physics of Rhodes College, Memphis, TN  
 2004 Primakov Lecture, University of Pennsylvania  
 2004 Distinguished Lecturer, Haverford College  
 2003 Complex Systems Distinguished Lecturer, University of Alaska at Anchorage  
 2002 The 2002 Kovasznay Distinguished Lecture, University of Houston  
 2002 Fritz London Memorial Lecture, Duke University  
 2002 400th Year of Otto-von-Guericke Lecture, Otto-von-Guericke University  
 1999 Shih-I Pai Lecture, University of Maryland  
 1999 4th Annual Joseph Morgan Lecture, Texas Christian University  
 1999 Dean's Podium Lecture, Ben-Gurion University, College of Sciences  
 1999 Joe Ford Memorial Lecture, Georgia Institute of Technology  
 1998 Distinguished Lecturer, Los Alamos National Laboratory, Center  
     for Nonlinear Science  
 1998 Distinguished Lecturer, University of New Mexico  
 1994 Interdisciplinary Distinguished Lecturer, University of Washington  
 1992 Birkett Williams Lecturer, Ouachita Baptist University  
 1992 Eastman Lecture, Portland Division, Optical Society of America  
 1991 Mark Kac Lectures, Los Alamos National Laboratory  
 1989 Distinguished Lecturer, Haverford College  
 1987 Inaugural Lecture, Institute for Theoretical Science and Engineering,  
     University of Houston  
 1987 Peyton Nalle Rhodes Lecturer, Rhodes College  
 1987 Halliburton Distinguished Lecturer, Texas Tech University  
 1984 Hudnall Lecture, University of Chicago  
 1982 Morris Loeb Lecturer, Harvard University  
 1976 Distinguished Guest Lecturer, NASA Langley Research Center

## Recent Professional Activities:

### *University Service:*

Director, The Center for Nonlinear Dynamics, University of Texas, 1985-  
College of Natural Sciences, Promotion and Tenure Committee, 2013; 2014  
UT Energy Week Organizing Committee, 2014-15  
Co-organizer, Physics Department Annual Open House, 2010, 2011, 2012, 2013, 2014, 2015  
Physics Research Support Committee, 2012-14  
Physics Undergraduate Affairs Committee, 2009-13  
Dean Search Committee, College of Natural Sciences, UT-Austin, 2011-12  
Faculty Recruitment Committee, Physics Department, The University of Texas at Austin, 2007-2011  
UT-Peking University Physics Dual PhD Degree Program Committee, 2010-13 (attended MOU signing  
at Peking University, 2010 Beijing)  
Harrington Graduate Student Fellowship Committee, 2000-2009  
Physics Department Budget Council Advisory Committee, 1999-2002, 2003-2006  
Organizing Committee, Harrington Symposium on Abrupt Climate Change,  
University of Texas, April 15, 2005  
Committee to Review Dean of College of Natural Sciences, 1999-2000  
Provost Search Committee, University of Texas at Austin, 1997-1998  
Consultative Committee for Vice President for Research, 1994  
Chair Search Committee, Computational and Applied Mathematics Program, 1993-1997  
University Consortium for Atmospheric Research (UCAR) Committee, 1991-1993  
Physics Department Budget Council Advisory Committee, 1986-1992

### *Service Outside of the University:*

UT Physics Liaison to Travis High School (Ty Davidson, Principal), Austin Independent School District, 2101-1  
Co-organizer, Texas Spin-Up Conference, Astin, May 4-6, 2012, sponsored by NSF,  
to enhance undergraduate physics education in Texas  
Chair, External Review Committee for the Institute of Physical Science and Technology,  
University of Maryland, 2009-10  
Co-founder and Director, annual international schools Hands-On Research on Complex Systems, 2008-2016,  
handsonresearch.org. About 60 young career scientists (ages 25-35) from developing countries are accepted  
Cameroon (2010), and Shanghai (2012). The annual schools in 2013, 2014, and 2015 and subsequent annual  
Headquarters, Trieste. See 3 minute long video:  
<http://chaos.utexas.edu/wp-uploads/2013/11/Hands-On-Promo-640x360>  
Member, Editorial Board, *Proceedings of the National Academy of Sciences*, 2008-2011  
Member, Lewis Fry Richardson Award Committee of the European Geophysical Union, 2013, 2014, 2015, 2016  
External Advisory Committee, University of Chicago Materials Research Center, 2009  
Organizing Committee, American Physical Society Division of Fluid Dynamics Annual Meeting,  
San Antonio, November 23-25, 2008  
Jürgen Moser Lecture Award Committee, 2008-09  
Executive Board, The Academy of Medicine, Engineering, and Science of Texas, 2006-2009  
O'Donnell Award Committee, The Academy of Medicine, Engineering, and Science Texas, 2007-2011  
American Physical Society  
Texas Section: Vice-Chair, 2010-2011; Chair-Elect, 2011-2012; Chair, 2012-2013;  
Past Chair, 2013-2014; and various TSAPS committees  
Physical Review E Editor Selection Committee, 2012  
APS Executive Board, 2005-2006

Committee on Committees (Chair 2006), 2005-2007  
 Division Councillor, Fluid Dynamics, 2003-2006  
 Committee on International Scientific Affairs (Vice-Chair 2003-2004), 2002-2004  
 Task Force on Africa, 2002-2005  
 Executive Board, 1993-1994  
 Membership Committee, 1993-1995 (Chairman-1995)  
 Councillor-at-Large, 1991-1994  
 Otto Laporte Award Committee, 1988-89 (Chairman, 1989)  
 Fluid Dynamics Prize Committee, 1986, 1996  
 Member of the Executive Committee, Division of Fluid Dynamics, 1983-1986  
 Advisory Board, Society for Industrial and Applied Mathematics Activity Group on Dynamical Systems, 2008-2011  
 O'Donnell Award Committee, The Academy of Medicine, Engineering, and Science Texas, 2007-2011  
 J. D. Crawford Prize Committee, Society of Industrial and Applied Mathematics (SIAM), 2007-2010  
 Committee on Invited Talks, SIAM Dynamical Systems Conference, 2009  
 Society for Industrial and Applied Mathematics, Dynamical Systems Group: Jurgen Moser Award Committee, 2008-09  
 National Academy of Sciences Liason (for Applied Physics) to the National Research Council, 2005-2008  
 Organizing Committee, *Southern Workshop on Granular Materials*, Vina del Mar, Chile, Sept. 13-16, 2006  
 Co-Organizer, 9th Tamura Symposium, *Frontiers in Dynamics: Physical and Biological Systems*, Tokyo, May 22-24, 2006  
 Editorial Board, Proceedings of the National Academy of Sciences, 2002-2011  
 National Advisory Board, Research Resource for Complex Physiologic Signals, 2000-2005  
 Editorial Board, Nonlinear Science Series, Cambridge University Press, 1988-2004  
 Member, SIAM J. D. Crawford Prize Committee, 2000-2001  
 Electorate Nominating Committee, Section on Physics (B), American Association for the Advancement of Science, 2000-2003; Chair 2003  
 Member, Nominating Committee, National Academy of Sciences, 2000  
 Advisory Board, SIAM Activity Group on Dynamical Systems, 1999-2001  
 Divisional Editor (Fluid Dynamics), Physical Review Letters, 1999-2001  
 International Advisory Committee of the VII Latin American Workshop on Nonlinear Phenomena Cocoyoc, Mexico, 2001  
 International Advisory Committee for 21st IUPAP International Conference on Statistical Physics Cancun, July 2001  
 Member, Los Alamos National Laboratory Center for Nonlinear Studies, Program Review Committee, 1998  
 Member, Advisory Board, Society of Amateur Scientists, 1997-1999  
 Associate Editor, *Physics of Fluids*, 1990-1992  
 Editorial Board, *Chaos, An Interdisciplinary Journal of Nonlinear Science* (AIP), 1991-1995  
 Editor, *Physica D-Nonlinear Dynamics* (North-Holland), 1982-1986  
 Vice-Chairman, Society for Industrial and Applied Mathematics Activity Group on Dynamical Systems, 1990 - 1991  
 Member, Advisory Board for the Warwick Nonlinear Systems Laboratory, 1986-1989  
 Member, Science Board of the Santa Fe Institute, 1987-1996  
 Member, Editorial Board of the Santa Fe Institute, 1991-1997  
 Member, External Advisory Board, Center for Interdisciplinary Complex Systems, University of Arizona, 1987-1989  
 Co-Organizer, Conference "Developments in Experimental Pattern Formation," Newton Institute, Cambridge University, August 8-12, 2005  
 Co-organizer, US-Japan Conference on *Turbulence and Plasmas*, Austin, 7-11 December 1987

Co-organizer, *Dynamics Days*, Houston, 5-8 January 1988 and 4-7 January 1989;  
Austin, 3-6 January 1990; Houston, 6-9 January 1991; Austin, 8-11 January 1992;  
Houston, 4-7 January 1995; Houston, 3-6 January, 1996 (principal organizer of the  
Austin meetings)  
Co-organizer, Workshop on *Computation of Nonlinear Flows and Instabilities*, Austin,  
24-25 March 1989  
Co-organizer, *Waves and Patterns in Chemical and Biological Excitable Media*,  
Pushchino, USSR, May 1990

## Research:

In the period 1965-74 Swinney conducted laser light scattering experiments on fluids near the critical point. Measurements with his PhD advisor H.Z. Cummins and others on carbon dioxide, xenon, and sulfur hexafluoride demonstrated that the exponent characterizing the decay rate of the order parameter is the same for different systems. This universality is now well understood from mode-mode coupling and renormalization group theory.

At New York University (1971-73) Swinney began light scattering studies of the conformation and structure of filamentous viruses. A transient electric birefringence technique developed for those experiments became widely used. In 1973 Swinney moved to City College and in 1974 he and Jerry P. Gollub began to study transitions in fluid flow between concentric cylinders (the Couette-Taylor system). They sought evidence for Lev Landau's picture for the transition to turbulence: Landau predicated (1944) that with increasing Reynolds number, fluids would exhibit a sequence of well-defined transitions, each adding a new characteristic incommensurate frequency to the dynamics. However, in the Couette-Taylor experiments it was found that the flow became nonperiodic after just two dynamical instabilities. Thus the Landau picture of the transition to turbulence was incorrect.

After Swinney moved to the University of Texas in 1978, he and his collaborators conducted experiments on instabilities in fluid and chemical systems, which demonstrated that the strange attractors discussed by theorists occur in laboratory systems. The strange attractors were characterized by their fractal dimension, Lyapunov exponents, and Mutual Information, and different routes to chaos were observed and characterized. Experiments on homogeneous (well-stirred) chemical systems yielded one-dimensional maps, and, beyond a period doubling cascade leading to chaos, the Metropolis, Stein, and Stein (MSS) universal symbolic sequence.

In the mid-1980s Swinney and collaborators (particularly Patrick de Kepper from Bordeaux) began a quest to observe the spontaneous formation of a stationary chemical pattern of the type that had been predicted by Alan Turing in 1952 but never observed. Two different designs of chemical reactors were designed and patented for these studies. In 1991 Ouyang and Swinney made a definitive observation and characterization of Turing patterns, which were found to spontaneously arise in chemical reaction-diffusion systems at a well-defined transition. This led to more than a decade of studies by the UT group (and by many others) of bifurcations and patterns in chemical reaction-diffusion systems.

Studies begun in Swinney's group in the late 1980s and continuing to the present examine and characterize the formation of fractal patterns in electrodeposition, viscous fingering, torn plastic sheets, growing leaves, and bacterial colonies.

Experiments begun in 1993 on vertically oscillated granular layers revealed the emergence of patterns (stripes, squares, hexagons, spirals) above a critical acceleration amplitude. Insight into the dynamics of both oscillating layers and supersonic flows in granular media was developed through molecular dynamics and continuum dynamics numerical simulations, which provided new insights and guided the laboratory experiments. A localized oscillating non-propagating structure was discovered by Swinney's grad student Paul Umbanhowar to occur in oscillating granular layers. These localized quasi-particles, dubbed oscillons,

were found to form lattices and other structures. Subsequently oscillons have been found to occur in the Swift-Hohenberg model and in various other models and physical systems.

Research by Swinney and his collaborators, particularly Philip Marcus at Berkeley, have provided insight into planetary flows, including the Great Red Spot of Jupiter and blocking phenomena in atmospheric flows. Also, the laboratory experiments and mathematical models mimicking the oceans and the atmosphere have revealed barriers to transport that can be viewed as invariant surfaces (KAM tori) in Hamiltonian dynamical systems. Particles in rapidly rotating flows containing currents and vortices were found to move on long trajectories (“flights”) before being trapped for a period of time in a vortex; surprisingly, the mean square step length was divergent, i.e., the flight length probability distribution function was a Lévy distribution (this was the first direct laboratory observation of Lévy flights).

In the period 2008-13 Swinney, postdoc A. Be’er, and Professors E.L. Florin (physics) and S. Payne (biology) conducted experiments on growing bacterial colonies and showed that competition between nearby bacterial colonies can lead to the secretion of a toxin. The toxin was found to be a previously unknown protein, which was named Slf, for Sibling Lethal Factor. The Slf kills bacteria located near the leading edge of a neighboring colony. The observations suggest that antibiotics such as Slf may be secreted by other bacteria, since the protein Slf discovered in this work is encoded by a gene that is in the Pham family, and members of this family occur in many bacteria and even in some yeasts. Also, studies tracking individual bacteria revealed that the rms of the number of bacteria in a volume was not proportional to the mean number in the volume, as would be the case for a system in equilibrium, but rather varied as the mean number to the three-fourths power. Further, the cooperative behavior of bacteria in clusters was exhibit the same correlations as starlings in flocks.

Currently Swinney’s group is conducting experiments and numerical simulations on internal gravity waves in stratified fluids, such as the ocean and atmosphere. This research has revealed conditions in which intense resonant internal waves are generated by tidal flow over ocean topography; such strong currents provide a plausible explanation for why the ocean bottom in the region beyond the Continental Shelf slopes at an angle that is only about 3 degrees. Other recent work by the group has revealed that there are many locations in the deep oceans where internal gravity waves become nonpropagating (evanescent) below a turning depth. Presently Swinney’s group is examining the contribution of internal gravity waves in the oceans to the oceans’ energy budget, which is highly uncertain because of the complex nonlinear dynamics of the conversion process. This energy plays a significant but poorly understood role in sustaining ocean currents, which play an important role in determining climate.

### **Publications:**

1. “Critical opalescence: the Rayleigh linewidth,” H. Z. Cummins and H. L. Swinney, *J. Chem. Phys.* **45**, 4438 (1966).
2. “Brillouin scattering in carbon dioxide in the critical region,” R. W. Gammon, H. L. Swinney, and H. Z. Cummins, *Phys. Rev. Lett.* **19**, 1467 (1967).
3. “Anisotropy in lattice vibrations of zinc oxide,” E. C. Heltemes and H. L. Swinney, *J. Appl. Phys.* **38**, 2387 (1967).
4. “Thermal diffusivity of CO<sub>2</sub> in the critical region,” H. L. Swinney and H. Z. Cummins, *Phys. Rev.* **171**, 152 (1968).
5. “Dispersion of the velocity of sound in xenon in the critical region,” H. Z. Cummins and H. L. Swinney, *Phys. Rev. Lett.* **25**, 1165 (1970).
6. “Light beating spectroscopy,” H. Z. Cummins and H. L. Swinney, *Progress in Optics*, Vol. 8, edited by E. Wolf (North Holland, Amsterdam, 1970), p. 133.

7. "Rayleigh linewidth in xenon near the critical point," D. L. Henry, H. L. Swinney, and H. Z. Cummins, *Phys. Rev. Lett.* **25**, 1170-1173 (1970).
8. "Rayleigh linewidth of SF<sub>6</sub> near the critical point," T. K. Lim, H. L. Swinney, K. H. Langley, and T. Kachnowski, *Phys. Rev. Lett.* **27**, 1776 (1971).
9. "Rayleigh linewidth in xenon near the critical point," H. L. Swinney, D. L. Henry, and H. Z. Cummins, *J. Phys. (Paris)* **33**, C1-81 (1972).
10. "Collisional excitation of carbon monoxide by H<sub>2</sub>," A. Compaan, W. D. Langer, D. Eden, and H. L. Swinney, *Astrophysical Journal*, **185**, 105 (1973).
11. "Spectral linewidth of light quasielastically scattered from xenon along the coexistence curve near the critical point," T. K. Lim, H. L. Swinney, I. W. Smith, and G. B. Benedek, *Opt. Commun.* **7**, 18 (1973).
12. "Dynamics of fluids near the critical point: decay rate of order parameter fluctuations," H. L. Swinney and D. L. Henry, *Phys. Rev. A* **8**, 2586 (1973).
13. "Dynamics of fluids near the critical point: light scattering investigations," H. Z. Cummins and H. L. Swinney, in *Anharmonic-Lattices, Structural Transitions, and Melting*, edited by T. Riste (Noordhoff, Leiden, 1974), p. 325.
14. "Optical heterodyne studies of brillouin scattering in xenon near the critical point," D. Eden and H. L. Swinney, *Opt. Commun.* **10**, 191 (1974).
15. "Hydrodynamic properties and molecular weight of bacteriophage fd DNA," J. Newman, H. L. Swinney, S. Berkowitz, and L. A. Day, *Biochemistry* **13**, 4832 (1974).
16. "Critical phenomena," H. L. Swinney, in *Photon Correlation and Light-beating Spectroscopy*, edited by H. Z. Cummins and E. R. Pike (Plenum, New York, 1974), p. 331.
17. "Onset of turbulence in a rotating fluid," J. P. Gollub and H. L. Swinney, *Phys. Rev. Lett.* **35**, 927 (1975).
18. "Depolarized light scattering due to double scattering," L. A. Reith and H. L. Swinney, *Phys. Rev. A* **12**, 1094 (1975).
19. "Length and dipole moment of TMV by laser signal averaging transient electric birefringence," J. Newman and H. L. Swinney, *Biopolymers* **15**, 301 (1976).
20. "Absolute cross section measurements by a ratio technique," L. A. Reith and H. L. Swinney, *Opt. Commun.* **17**, 111 (1976).
21. "Experimental test of the dynamic droplet model," D. Wonica, H. L. Swinney, and H. Z. Cummins, *Phys. Rev. Lett.* **37**, 66 (1976).
22. "Laser doppler study of the onset of turbulent convection at low Prandtl number," J. P. Gollub, S. L. Hulbert, G. M. Dolny, and H. L. Swinney, in *Photon Correlation Spectroscopy and Velocimetry*, edited by E. R. Pike and H. Z. Cummins (Plenum, New York, 1977), p. 425.
23. "Transition to turbulence in fluid flows," H. L. Swinney, J. P. Gollub, and R. Fenstermacher, in *Synergetics, a Workshop*, edited by H. Haken (Springer, Berlin and New York, 1977), p. 60.
24. "Hydrodynamic properties and structure of fd virus," J. Newman, H. L. Swinney, and L. A. Day, *J. Molecular Biology* **116**, 593 (1977).

25. "Confocal interferometer light scattering sample cell," R. A. Weingarten and H. L. Swinney, *Appl. Opt.* **17**, 3028 (1978).
26. "The transition to turbulence," H. L. Swinney and J. P. Gollub, *Phys. Today* **31**, No. 8, 41 (1978).
27. "Hydrodynamic instabilities and the transition to turbulence," H. L. Swinney, *Prog. Theor. Phys. Suppl.* **64**, 164 (1978).
28. "Dynamical instabilities and the transition to chaotic Taylor vortex flow," P. R. Fenstermacher, H. L. Swinney, and J. P. Gollub, *J. Fluid Mech.* **94**, 103-129 (1979).
29. "Bifurcations to periodic, quasiperiodic, and chaotic regimes in rotating and convecting fluids," P. R. Fenstermacher, H. L. Swinney, S. V. Benson, and J. P. Gollub, *Ann. N. Y. Acad. Sci.* **316**, 652 (1979).
30. "Visual observation of the second characteristic mode in a quasiperiodic flow," M. Gorman and H. L. Swinney, *Phys. Rev. Lett.* **43**, 1871 (1979).
31. "Transition to turbulence in Couette-Taylor flow," H. L. Swinney, in *Light Scattering in Solids*, edited by J. L. Birman, H. Z. Cummins, and K. K. Rebane (Plenum, New York, 1979), p. 15.
32. "Dimensions of Xf virus from its rotational and translational diffusion coefficients," F. C. Chen, G. Koopmans, R. L. Wiseman, L. A. Day, and H. L. Swinney, *Biochemistry* **19**, 1373 (1980).
33. "Modulation patterns, multiple frequencies, and other phenomena in circular Couette flow," M. Gorman, L. A. Reith, and H. L. Swinney, *Ann. N. Y. Acad. Sci.* **357**, 10 (1980).
34. "Instabilities and transition in the flow between concentric rotating cylinders," R. C. Di Prima and H. L. Swinney, in *Hydrodynamic Instabilities and the Transition to Turbulence*, edited by H. L. Swinney and J. P. Gollub (Springer, 1981), pp. 139-180.
35. "Space-time symmetry in doubly periodic circular Couette flow," M. Gorman and H. L. Swinney, *Nonlinear Phenomena at Instabilities and Phase Transitions*, edited by T. Riste (Plenum, New York, 1981), p. 295.
36. "Recent results on instabilities and turbulence in Couette flow," M. Gorman and H. L. Swinney, *Physica* **106A**, 123-127 (1981).
37. "Doubly periodic circular Couette flow: Experiments compared with predictions from dynamics and symmetry," M. Gorman, H. L. Swinney, and D. Rand, *Phys. Rev. Lett.* **46**, 992-995 (1981).
38. *Hydrodynamic Instabilities and the Transition to Turbulence*, edited by H. L. Swinney and J. P. Gollub (Springer; Berlin, Heidelberg, New York, 1981, 1st Ed.; 1985, 2nd Ed.), Topics in Applied Physics Volume 45. Chapter 1: "Introduction," H. L. Swinney and J. P. Gollub, pp. 1-6.
39. "Experimental studies of noise in a chemical reaction and in a fluid flow," H. L. Swinney, J.-C. Roux, and G. P. King, in *Noise in Physical Systems*, edited by P. H. E. Meijer, R. D. Mountain, and R. J. Soulen (National Bureau of Standards Special Publication No. 614, U.S. Government Printing Office, 1981), p. 283.
40. "Topology of chaos in a chemical reaction," J.-C. Roux and H. L. Swinney, in *Nonlinear Phenomena in Chemical Dynamics*, edited by A. Pacault and C. Vidal (Springer-Verlag, Berlin, Heidelberg, New York, 1981), p. 38.
41. "Alternating periodic and chaotic regimes in a chemical reaction: Experiment and theory," J. Turner, J.-C. Roux, W. D. McCormick, and H. L. Swinney, *Phys. Lett.* **85A**, 9-12 (1981).



42. "Spatial and temporal characteristics of modulated waves in circular Couette flow," M. Gorman and H. L. Swinney, *J. Fluid Mech.* **117**, 123-142 (1982).
43. "Experimental observations of complex dynamics in a chemical reaction," J.-C. Roux, J. S. Turner, W. D. McCormick, and H. L. Swinney, in *Nonlinear Problems: Present and Future*, edited by A. R. Bishop (North-Holland, Amsterdam, 1982), p. 409-422.
44. "Superposition of traveling waves in the circular Couette system," R. S. Shaw, C. D. Andereck, L. A. Reith, and H. L. Swinney, *Phys. Rev. Lett.* **48**, 1172-1175 (1982).
45. "One-dimensional dynamics in a multicomponent chemical reaction," R. H. Simoyi, A. Wolf, and H. L. Swinney, *Phys. Rev. Lett.* **49**, 245-248 (1982).
46. "Modulated wavy vortex flow in laboratory and rotating reference frames," J. B. Swift, M. Gorman, and H. L. Swinney, *Phys. Lett.* **87A**, 457 (1982).
47. "New flows in a circular Couette system with co-rotating cylinders," C. D. Andereck, R. Dickman, and H. L. Swinney, *Phys. Fluids* **26**, 1395-1401 (1983).
48. "Low-dimensional chaos in a hydrodynamic system," A. Brandstater, J. Swift, H. L. Swinney, A. Wolf, J. D. Farmer, E. Jen, and J. P. Crutchfield, *Phys. Rev. Lett.* **51**, 1442-1445 (1983).
49. "Limits of stability and irregular flow patterns in wavy vortex flow," G. P. King and H. L. Swinney, *Phys. Rev. A* **27**, 1240-1243 (1983).
50. "Observation of a strange attractor," J.-C. Roux, R. H. Simoyi, and H. L. Swinney, *Physica* **8D**, 257-266 (1983).
51. "Observations of order and chaos in nonlinear systems," H. L. Swinney, *Physica* **7D**, 3-15 (1983).
52. "Testing nonlinear dynamics," N. B. Abraham, J. P. Gollub, and H. L. Swinney, *Physica* **11D**, 252-264 (1984).
53. "A strange attractor in a Couette-Taylor experiment," A. Brandstater, J. Swift, H. L. Swinney, and A. Wolf, in *Turbulence and Chaotic Phenomena in Fluids*, edited by T. Tatsumi (North-Holland, Amsterdam, 1984), pp. 179-184.
54. "Distinguishing low-dimensional chaos from random noise in a hydrodynamic experiment," A. Brandstater and H. L. Swinney, in *Fluctuations and Sensitivity in Nonequilibrium Systems*, edited by W. Horsthemke and D. Kondepudi (Springer, Heidelberg, 1984), pp. 166-171.
55. "Wave speeds in wavy vortex flow," G. P. King, Y. Li, W. Lee, P. S. Marcus, and H. L. Swinney, *J. Fluid Mech.* **141**, 365-390 (1984).
56. "Geometry and dynamics in experiments on chaotic systems," H. L. Swinney, in *Fluids and Plasmas: Geometry and Dynamics*, edited by J. E. Marsden (American Math. Soc. Series in Contemporary Mathematics, Vol. **28**, 1984), pp. 349-355.
57. "Instabilities and chaos in a chemical reaction," H. L. Swinney, in *Chaos and Statistical Mechanics*, edited by Y. Kuramoto (Springer, Berlin, 1984), pp. 244-248.
58. "Chemical chaos," H. L. Swinney and J.-C. Roux, in *Nonequilibrium Dynamics in Chemical Systems*, edited by C. Vidal and A. Pacault (Springer, Berlin, 1984), pp. 124-140.
59. "A complex transition sequence in the Belousov-Zhabotinskii reaction," J. Maselko and H. L. Swinney, *Physica Scripta* **T9**, 35-39 (1985).

60. "Non-propagating oscillatory modes in Couette-Taylor flow," L. H. Zhang and H. L. Swinney, *Phys. Rev. A* **31**, 1006-1009 (1985).
61. "Determining Lyapunov exponents from a time series," A. Wolf, J. B. Swift, H. L. Swinney, and J. A. Vastano, *Physica* **16D**, 285-317 (1985).
62. "Observations of complex dynamics and chaos," H. L. Swinney, in *Fundamental Problems in Statistical Mechanics VI*, edited by E. G. D. Cohen (North-Holland, Amsterdam, 1985), pp. 253-276.
63. Comment on "Renormalization, unstable manifolds, and the fractal structure of mode locking," H. L. Swinney and J. Maselko, *Phys. Rev. Lett.* **55**, 2366 (1985).
64. "Flow regimes in a circular Couette system with independently rotating cylinders," C. D. Andereck, S. S. Liu, and H. L. Swinney, *J. Fluid Mech.* **164**, 155-183 (1986).
65. "Characterizing turbulent channel flow," A. Brandstater, H. L. Swinney, and G. T. Chapman, in *Entropies and Dimensions*, edited by G. Mayer-Kress (Springer, New York, 1986), pp. 150-158.
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### Books Edited:

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2. H. L. Swinney, G. Aris, and D. Aronson, *Patterns and Dynamics in Reactive Media*, IMA Volumes in Mathematics and its Applications, Vol. 37, (Springer-Verlag, 1991).
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### Patents:

1. Z. Noszticzius, W. Horsthemke, W. D. McCormick, H. L. Swinney, and W. Y. Tam, U.S. Patent Number 4,968,484, "Annular gel reactor for chemical pattern formation", granted Nov. 6, 1990.
2. W. Y. Tam, W. Horsthemke, W. D. McCormick, and H. L. Swinney, U.S. Patent Number 4,832,914, "Two-dimensional uniformly fed unstirred chemical reactor," granted May 23, 1989.

### Invited Talks:

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| 1/11/68  | National Bureau of Standards (Maryland), Statistical Physics Seminar |
| 5/20/68  | American Institute of Chemical Engineers Annual Meeting, Tampa       |
| 11/25/68 | Temple University, Physics Department Seminar                        |
| 3/6/69   | University of Maryland, Institute for Molecular Physics Seminar      |
| 11/19/69 | University of Chicago, Chemical Physics Seminar                      |
| 12/15/69 | University of Arizona, Optical Sciences Colloquium                   |
| 12/18/69 | New York University, Physics Department Colloquium                   |
| 1/22/70  | Rice University, Chemical Engineering Colloquium                     |
| 3/17/70  | University of Maryland, Institute for Molecular Physics Seminar      |
| 7/2/70   | National Bureau of Standards (Colorado), Cryogenics Division Seminar |
| 12/1/70  | American Institute of Chemical Engineers (Chicago), Annual Meeting   |

3/18/71 Catholic University of America, Physics Department Colloquium  
 4/1/71 Clark College, Physics Colloquium  
 5/1/71 University of Missouri, Symposium on Critical Phenomena  
 7/15/71 International Colloquium on Light Scattering in Fluids, Paris  
 12/1/71 Yeshiva University, Statistical Mechanics Meeting  
 3/30/72 American Physical Society Meeting, Atlantic City  
 7/24-26/73 NATO Advanced Study Institute, Capri, Italy (lecture series)  
 10/11/73 Optical Society of America Annual Meeting, Rochester  
 4/3/74 M.I.T., Conference on the Spectrum of Light Scattered by Biological Molecules  
 12/16/74 European Physical Society Conference-Light Scattering Studies of Motion in  
     Molecular Systems, Verbier, Switzerland  
 11/17/75 Rockefeller University, Statistical Physics Seminar  
 12/3/75 Bell Laboratories Seminar  
 12/9/75 Yeshiva University, Statistical Mechanics Meeting  
 1/8/76 New York University, Physics Department Colloquium  
 2/2/76 American Physical Society Meeting, New York  
 2/18/76 McMaster University, Physics Department Colloquium  
 2/26/76 Johns Hopkins University, Physics Department Colloquium  
 3/5/76 Yale University, Department of Engineering and Applied Science Seminar  
 3/29/76 Temple University, Physics Department Colloquium  
 6/22/76 NASA Langley Research Center, Distinguished Guest Lecturer  
 6/25/76 Brookhaven National Laboratory, Solid State Seminar  
 7/19/76 Gordon Conference on Dynamical Instabilities and Fluctuations in Classical and  
     Quantum Systems  
 10/18/76 Michigan State University, Solid State Seminar  
 11/5/76 Johns Hopkins University, Applied Physics Laboratory Colloquium  
 11/9/76 Rutgers University, Solid State Seminar  
 1/12/77 University of Minnesota, Physics Department Colloquium  
 1/13/77 Argonne National Laboratory, Solid State Physics Seminar  
 2/22/77 University of Maryland, Physics Department Colloquium  
 4/5/77 University of Texas at Austin, Physics Department Colloquium  
 5/2/77 International Workshop on Synergetics, Bavaria, Germany  
 6/8/77 Fourth Rochester Conference on Coherence and Quantum Optics  
 7/18/77 Regional Conference on Nonlinear Hydrodynamic Stability, Troy, New York  
 10/31-11/4/77 Conference on Bifurcation Theory and Applications in Scientific Disciplines,  
     New York City  
 12/21/77 College of Staten Island, City University of New York, Department of Physics,  
     Engineering Science, Astronomy, and Geology Colloquium  
 1/17/78 Ohio State University, Physics Department Colloquium  
 1/26/78 Syracuse University, Physics Department Colloquium  
 3/9/78 Wesleyan University, Physics Department Colloquium  
 7/3/78 University of Tokyo, Physics Department Seminar  
 7/4/78 University of Tokyo, Institute of Space and Aeronautical Sciences Aerodynamics Seminar  
 7/6/78 Kyushu University, Department of Physics Seminar  
 7/10/78 Nonlinear Nonequilibrium Statistical Mechanics Conference, Kyoto, Japan  
 10/25/78 Georgia Institute of Technology, Physics Department Colloquium  
 1/12/79 Xerox Palo Alto Research Center, Seminar  
 2/14/79 Rice University, Departments of Physics and Electrical Engineering Joint Colloquium  
 3/4/79 Third InterAmerican Undergraduate Conference on Theoretical Physics, Austin  
 3/28/79 Taylor Vortex Flow Working Party, Leeds, England



5/21/79 Second USA-USSR Light Scattering Symposium, New York City  
 10/2/79 University of Houston, Physics Department Colloquium  
 11/12/79 University of Texas at El Paso, Physics Department Colloquium  
 12/17/79 International Conference on Nonlinear Dynamics, New York City  
 1/22/80 University of Chicago, Joint Colloquium of the Physics Department  
 and The James Franck Institute  
 2/19/80 University of California, Santa Barbara, Physics Department Colloquium  
 3/12/80 Workshop on Instabilities, Bifurcations, and Fluctuations in Chemical Systems,  
 Austin  
 3/30/80 Kansas State University, Physics Department Colloquium  
 8/17-23/80 International Conference on Thermodynamics and Statistical Mechanics  
 (StatPhys 14), Edmonton, Canada  
 3/81 American Physical Society Meeting, Phoenix  
 3/81 International Conference on Nonlinear Problems: Present and Future, Los Alamos  
 4/81 Sixth International Symposium on Noise in Physical Systems, Washington, D.C.  
 6/22-7/3/81 Workshop on Nonequilibrium Phenomena, Institute for Theoretical Physics,  
 Santa Barbara  
 10/2/81 Exxon Production Research Company Seminar, Houston  
 10/15/81 University of Illinois, Nonlinear Dynamics Seminar  
 10/15/81 University of Illinois, Physics Department Colloquium  
 11/11/81 University of Houston, Mathematics Department Colloquium  
 11/23/81 American Physical Society Division of Fluid Dynamics Annual Meeting,  
 Panel on Fluid Defects, Monterey  
 11/25/81 Institute for Theoretical Physics, Santa Barbara  
 2/22-3/6/82 Harvard University, Morris Loeb Lectures  
 3/5/82 Dartmouth College, Physics Department Colloquium  
 3/9/82 Union College, Physics Department Seminar  
 3/16/82 Bell Laboratories Seminar, Murray Hill  
 5/82 Conference on Order in Chaos, Los Alamos  
 7/82 Workshop on Chaos and Nonlinear Physics, Aspen  
 7/19-23/82 Gordon Conference on Superfluidity and Instability Phenomena  
 7/26-30/82 Gordon Conference on Oscillations and Dynamics Instabilities in Chemical Systems  
 9/25/82 Texas Christian University, Physics Department Colloquium  
 10/7/82 University of Maryland, Applied Dynamics and Condensed Matter Joint Seminar  
 10/7/82 Greater Washington Area, Solid State Physics Colloquium  
 11/82 American Physical Society Division of Plasma Physics Annual Meeting, New Orleans  
 12/13-17/82 U.S.-Japan Workshop on Statistical Physics and Chaos in Fusion, Austin  
 2/10/83 Princeton University, Department of Physics Colloquium  
 2/25/83 University of Arizona, Nonlinear Science Lecture  
 3/30/83 University of Texas at Arlington, Physics Department Colloquium  
 5/25/83 Exxon Corporate Research Laboratories, Seminar, Linden, NJ  
 5/26-31/83 American Association for the Advancement of Science Annual Meeting, Detroit  
 6/6-9/83 NATO Advanced Research Workshop on Testing Nonlinear Dynamics,  
 Haverford, Pennsylvania  
 6/13-15/83 Sixtieth Anniversary Taylor Vortex Flow Meeting, Eugene, Oregon  
 7/17-23/83 American Mathematical Society Conference on Fluids and Plasmas, Boulder  
 8/19/83 Universidad Nacional Autonoma de Mexico, Physics Department Seminar  
 8/22-27/83 Mexican Physical Society School in Statistical Physics, Oaxtapec, Mexico  
 (4 lecture course)  
 9/5-10/83 International Union for Theoretical and Applied Mechanics Symposium on

Turbulence and Chaotic Phenomena in Fluids, Kyoto, Japan

- 9/12-15/83 Chaos and Statistical Mechanics Summer School, Kyoto, Japan  
 11/3 & 11/10/83 Centre de Recherche Paul Pascal, two seminars, Bordeaux  
 12/20/83 Observatoire de Nice, Seminar, Nice, France  
 1/3/84 Royal Radar and Signal Establishment, Seminar, Malvern, England  
 2/1/84 Turbulence Conference, Mathematical Sciences Research Institute, Berkeley  
 2/29/84 University of Texas, Astronomy Department Seminar  
 3/26-30/84 American Physical Society Meeting, Detroit  
 4/23/84 University of Arizona, Physics Department Colloquium  
 5/3/84 University of California San Diego, Physics Department Colloquium  
 5/4/84 California Institute of Technology, Department of Aeronautics Seminar  
 6/11-16/84 Nobel Symposium "The Physics of Chaos and Related Problems," Graftavallen, Sweden  
 6/18-29/84 Fundamental Problems in Statistical Mechanics VI, (3 lecture course), Trondheim, Norway  
 6/26/84 University of Kiel, Applied Physics Seminar  
 9/3-7/84 International Colloquium on Nonequilibrium Dynamics in Chemical Systems, Bordeaux  
 10/16/84 North Texas State University, Physics Department Colloquium  
 10/25/84 Conference on Chaos and its Applications, Boston University  
 11/5/84 University of California San Diego, Lecture Series on Nonlinear Science  
 3/25/85 Stanford Linear Accelerator Laboratory, Colloquium  
 3/27/85 NASA-Ames Research Center, Seminar  
 3/28/85 Lawrence Livermore National Laboratory, Seminar  
 4/2/85 Ohio State University, Physics Department Colloquium  
 4/3/85 University of Michigan, Physics Department Colloquium  
 5/15/85 IBM Laboratory, Colloquium, Yorktown, NY  
 5/17/85 University of Toronto, Chemistry Department Seminar and Colloquium  
 6/25-26/85 BP Venture Research Conference, London  
 9/10-16/85 Conference on Dimensions and Entropies in Chaotic Systems,  
 Albuquerque  
 10/8-10/85 Symposium on Energy Engineering Sciences, Pennsylvania State University  
 10/26/85 Conference on Advances in Science Teaching, San Marcos, Texas  
 11/24-26/85 American Physical Society Division of Fluid Dynamics Annual Meeting, Tucson  
 1/28-30/86 American Physical Society Winter Meeting, Atlanta  
 3/31-4/1/86 American Physical Society Annual March Meeting, Las Vegas  
 5/12/86 New York University, Economics Department Colloquium  
 5/13/86 Cornell University, Condensed Matter Physics Seminar  
 6/23/86 9th Canadian Symposium on Theoretical Chemistry, Toronto, Ontario  
 8/28-9/6/86 Conference on Physics and Structure of Complexity, Trieste, Italy  
 12/14-19/86 Conference on Chaos and Related Phenomena, Jerusalem, Israel  
 12/29/86 Ben Gurion University, Physics Department Seminar  
 2/26/87 Inaugural Lecture, Institute for Theoretical Science and Engineering,  
 University of Houston  
 3/25-27/87 Fifth Taylor-Vortex Flow Working Party, Tempe  
 3/27-28/87 Conference on Nonlinear Sciences, Santa Barbara  
 6/15-19/87 Nonlinear Evolution and Chaotic Phenomena,  
 NATO Advanced Study Institute, Sicily (2 lecture course)  
 6/23-24/87 Venture Research Conference, London  
 7/3/87 Centre de Recherche Paul Pascal (Bordeaux), Seminar  
 9/21-22/87 Stanford Industrial Affiliates Symposium, Stanford University  
 10/2/87 Schlumberger, Seminar, Austin  
 10/9-10/87 J.H. Taylor Symposium, Rhodes College, Memphis

10/21-23/87 Dynamic Patterns in Complex Systems, Bahia Mar, Florida  
 12/14-15/87 Ed Lorenz Symposium, M.I.T.  
 2/24/88 Duke University, Physics Department Colloquium  
 4/13/88 Jason Day of Chaos, La Jolla  
 4/20/88 American Physical Society Meeting, Baltimore  
 4/21/88 Clarkson University, Physics Colloquium  
 5/4-5/88 Department of Energy Symposium on Energy Engineering Sciences, Argonne  
 5/12/88 Statistical Mechanics Meeting, Rutgers University  
 5/16-20/88 Advances in Fluid Turbulence, Los Alamos  
 7/26-8/5/88 Enrico Fermi International School of Physics, Nonlinear Topics in Ocean  
     Physics, Varenna, Italy (3 lecture course)  
 9/15/88 Texas A&M University, Physics Department Colloquium  
 9/22/88 Rice University, Chemical Engineering Seminar  
 12/2/88 American Society of Mechanical Engineering Annual Meeting, Chicago  
 12/19-20/88 Conference on Physics of Fully Developed Turbulence, Princeton  
 1/13/89 NASA Ames Research Center, Seminar  
 1/16/89 American Association for the Advancement of Science, Annual Meeting, San Francisco  
 2/6-7/89 ONR Nonlinear Oceanography Workshop, Washington  
 2/16/89 University of New Orleans, Physics Department Colloquium  
 3/3/89 Conference on Chaos, Rhodes College  
 4/12/89 Fermi Lab, Colloquium  
 4/13/89 University of Illinois, Condensed Matter Seminar  
 4/14/89 University of Illinois, Physics Department Colloquium  
 5/1-15/89 Spring School on Experimental Studies of Chaotic Phenomena in Nonlinear  
     Systems, (5 lecture course), Tianjin, China  
 5/16/89 Institute of Applied Physics and Computational Mathematics Seminar,  
     Beijing, China  
 5/17/89 Department of Mechanics Seminar, Beijing, China  
 5/19/89 Beijing University, Department of Mechanics Seminar  
 5/26/89 Northwestern University, Jaitong University and Institute of Metallurgy and  
     Engineering Construction Joint Seminar, Xian, China  
 6/27-28/89 BP Venture Research Conference, London  
 7/24-28/89 AIP-NAS Soviet-American Conference on Chaos, Woods Hole  
 8/22-25/89 Conference on Dynamics of Exotic Phenomena in Chemistry, Hajduszoboszlo, Hungary  
 10/16-20/89 Workshop on Patterns and Dynamics in Reactive Media, Institute for  
     Mathematics and Its Applications, University of Minnesota  
 11/1/89 Southern Methodist University, Nonlinear Science Colloquium  
 11/2/89 East Texas State University, Physics Department Colloquium  
 11/9/89 Texas Instruments, Central Research Laboratories Colloquium  
 11/9/89 Electrochemical Society Meeting, Dallas  
 11/10/89 University of North Texas, Chemistry Department Colloquium  
 11/10/89 University of North Texas, Physics Department Colloquium  
 11/17-18/89 Conference on Nonlinear Structures in Physical Systems, San Jose  
 1/16/90 National Chemical Laboratory for Industry, Seminar, Tsukuba, Japan  
 1/17/90 Physics of Chaos Symposium, Tsukuba, Japan  
 2/20/90 Tuesday Club, Austin  
 3/3/90 Science Academy Research Symposium, LBJ High School, Austin  
 3/12-14/90 NATO Advanced Research Workshop on Self Organization, Emerging  
     Properties and Learning, Austin  
 3/20-21/90 Interdisciplinary Symposium on Applications on Nonlinear Studies, University of Michigan

4/23/90 Dedication of the Bloomberg Center for Physics and Astronomy, Johns Hopkins University  
 5/28-6/1/90 Waves and Patterns in Chemical and Biological Excitable Media, Pushchino, USSR  
 6/25-27/90 Venture Research Conference, London  
 7/12-13/90 Silliman University, (8 hours of lectures), Dumaguete City, Philippines  
 8/20-24/90 IUTAM Symposium on Fluid Mechanics of Stirring and Mixing, San Diego  
 8/27-31/90 12th International Symposium on Nonlinear Acoustics, Austin  
 9/14-15/90 Arizona State University, Mathematics Department Colloquium  
 10/3-4/90 NASA-Goddard Space Flight Center Advances in Computational Science  
     Seminar Series  
 12/5/90 University of Texas at Arlington, Physics Department Colloquium  
 2/7-8/91 American Institute of Physics Visiting Lecturer, Lawrence University  
 5/3/91 Mathematical Sciences Research Institute Seminar, University of California, Berkeley  
 5/12-15/91 9th Symposium on Energy Engineering Sciences, Argonne National Laboratory  
 5/22-24/91 NATO Advanced Workshop, Ohio State University  
 5/29-31/91 Office of Naval Research Symposium, Washington, D. C.  
 7/1-5/91 Gordon Conference on Oscillations and Dynamic Instabilities in Chemical  
     Systems, Salve Regina College, Newport  
 7/8-12/91 Soviet-American Conference on Chaos, Woods Hole  
 8/11-24/91 IUGG/IAPSO Non-Linear Dynamics & Predictability of Critical Geophysical  
     Phenomena, Vienna, Austria  
 9/20/91 University of Houston, Institute for Theoretical Science and Engineering Seminar  
 10/1-3/91 1st Experimental Chaos Conference, Washington, D. C.  
 10/23/91 Rice University, Physics Department Colloquium  
 11/14/91 Round Rock Astronomical Society Seminar, Round Rock  
 11/21-22/91 American Institute of Physics Visiting Lecturer, University of San Diego  
 11/24-26/91 American Physical Society Fluid Dynamics Meeting, Scottsdale  
 12/2-5/91 NATO ARW on Nonequilibrium Chemical Dynamics, Brussels, Belgium  
 2/13/92 Emory University, Physics Department Colloquium  
 2/19/92 University of Arizona, Physics Department Colloquium  
 4/27/92 Princeton University, Molecular Biology Department Seminar  
 5/14-17/92 Santa Fe Institute Time Series Analysis Workshop, Santa Fe  
 7/27-31/92 Research Workshop on Spatially Nonequilibrium Systems, University of  
     California, Santa Barbara  
 8/3-8/92 Adriatico Research Conference on Synergetics in Condensed Matter Physics,  
     Trieste, Italy  
 9/9-10/92 Workshop on Visualization and Statistical Analysis in Hard-Turbulence,  
     University of Minnesota  
 10/15-19/92 SIAM Conference on Applications of Dynamical Systems, Snowbird  
 1/5-9/93 Dynamics Days 1993, Tempe  
 2/12/93 University of Southern Mississippi, Department of Chemistry and Biochemistry Seminar  
 2/19/93 University of Southern California, Department of Aerospace Engineering Seminar  
 2/20-23/93 9th Annual University of California Conference on Nonlinear Science, UCLA  
 6/14-16/93 NASA Microgravity Fluids Meeting, Cleveland  
 9/27/93 University of Texas, Department of Chemical Engineering Seminar  
 10/21/93 California Institute of Technology, Physics Colloquium  
 1/3-9/94 Dynamics Days 1994, Duke University  
 5/3/94 University of Texas Mathematics Department, Dynamical Systems Seminar  
 8/7-12/94 Gordon Conference on Oscillations and Dynamical Systems, Newport  
 4/6-7/95 University of Toronto, Physics-Math Colloquium and Nonlinear Dynamics Seminar  
 5/15-17/95 DOE Symposium on Energy Engineering Science, Argonne

8/8-10/95 9th Couette-Taylor Workshop, Boulder  
 11/18-21/95 American Physical Society Fluid Dynamics Meeting, Irvine (Prize Awarded)  
 1/18-20/96 Workshop on Advances in Dynamical Chaos, New York University  
 6/13-15/96 3rd Microgravity Fluids Conference, Cleveland  
 8/13-14/96 UNAM Nonlinear Science Seminar, Mexico City  
     UNAM Physics Department Colloquium, Mexico City  
 10/20-23/96 Society of Engineering Science Annual Technical Meeting, Arizona State University  
 10/31-11/2/96 250th Anniversary Conference on Critical Problems in Physics, Princeton University  
 11/24-26/96 American Physical Society Division of Fluid Dynamics Meeting, Syracuse University  
 12/13/96 IBM Almaden, San Jose  
 2/19/97 University of Texas, Department of Physics Colloquium  
 2/25/97 University of Chicago, The James Franck Institute Colloquium  
 3/27/97 Ben Gurion University, Department of Physics Colloquium  
 4/3/97 Frontiers in Condensed Matter Physics Conference Plenary Talk, Tel Aviv  
 4/11/97 World Presidents Organization Meeting, Austin  
 4/12/97 Southwestern Dynamical Systems Meeting, Denton  
 6/30/97 G.I. Taylor Symposium, Northwestern University, Chicago  
 9/12/97 Natural Sciences Foundation Advisory Council, University of Texas, Austin  
 11/11-15/97 5th Chemical Congress of North America, Cancun  
 11/25/97 University of California, Berkeley, Physical Chemistry Seminar  
 2/3/98 University of Houston, Department of Physics Seminar  
 3/20/98 Annual Spring Meeting, Texas Sections of the AAPT and APS,  
     University of the Incarnate Word, San Antonio  
 3/26/98 Interdisciplinary Lecture Series 'Facing the Uncertain,' University of Texas, Austin  
 4/14/98 Trinity University, Department of Physics Colloquium, San Antonio  
 4/29/98 Georgia Institute of Technology, Joe Ford Memorial Lecture  
 5/11-15/98 Workshop on Pattern Formation and Nonlocal Effects, Institute for Mathematics  
     and Its Applications, University of Minnesota, Minneapolis  
 6/17/98 IUTAM/IUGG Symposium "Developments in Geophysical Turbulence," Boulder  
 7/22/98 Workshop on Transport and Mixing in Fluids: the Dynamical Systems Approach,  
     Woods Hole, MA  
 8/7/98 NATO Advanced Study Institute "Dynamics: Models and Kinetic Methods for  
     Nonequilibrium Many Body Systems," Leiden, The Netherlands  
 9/7/98 Cornell University, Department of Physics Colloquium  
 11/4/98 Northwestern University, Department of Physics Colloquium  
 11/19/98 College of Charleston, NC, American Physical Society Centennial Speaker  
 2/18/99 Arizona State University, College of Engineering and Applied Sciences Colloquium  
 2/19/99 University of Arizona, Program in Applied Mathematics Colloquium  
 3/20-26/99 American Physical Society Centennial Meeting, Atlanta  
 4/16-18/99 15th Annual University of California Conference in Nonlinear Science  
 4/23/99 Georgetown University, Department of Physics Colloquium  
 4/28/99 City College of New York, Department of Physics Colloquium  
 4/29-30/99 New York University, Department of Physics Colloquium  
 5/6/99 Ecole Normale Supérieure, Department of Environmental  
     Sciences and Energy Research, Colloquium, Paris  
 5/10/99 Weizmann Institute, Department of Physics Colloquium  
 5/12/99 Ben-Gurion University, Dean's Podium Lecture, College of Sciences  
 5/13/99 Ben-Gurion University, Physics Department Colloquium  
 5/19-22/99 NATO Advanced Research Workshop "Applications of Statistical Mechanics," Budapest  
 7/5/99 POSTECH, Physics Colloquium, Pohang, Korea

7/6/99 Korean Institute of Advanced Studies, Physics Seminar, Seoul  
 7/7-10/99 International Workshop on Stochastic Dynamics and Pattern Formation,  
 2 talks (introductory tutorial lecture and research talk), Seoul  
 7/16/99 Dynamics Days Asia-Pacific Conference, Hong Kong  
 12/13-17/99 8th International Workshop on Instabilities and Nonequilibrium  
 Structures, Santiago, Chile (2 talks)  
 1/4-7/00 XXIX Winter Meeting on Statistical Physics, Cuernavaca  
 1/31/00 University of Texas at Austin, Department of Mathematics Colloquium  
 2/7-9/00 Conference on Physics of Hydrodynamic Turbulence, Institute for Theoretical Physics,  
 University of California, Santa Barbara  
 2/10/00 University of California, San Diego, Department of Physics Colloquium  
 3/27/00 University of Texas Center for Computational Visualization  
 Graphics and Visualization Seminar, Austin  
 4/7-8/00 DOE Basic Energy Sciences workshop on the Complex  
 Interactions in Granular Materials, Argonne National Laboratory  
 4/26-28/00 NASA Ames Research Center, Lecture  
 6/12-13/00 San Francisco State University, Department of Physics Colloquium  
 6/29-7/4/00 Conference on “Bifurcations, Symmetry, and Patterns,”  
 University of Porto, Portugal  
 9/28/00 Los Alamos National Laboratory, Physics/Theory Colloquium  
 1/4/01 Central University (Taiwan), Physics Department Colloquium  
 1/5/01 National Taiwan University (Taida), Physics Department Colloquium  
 1/9/01 National Center for Theoretical Sciences (Taiwan) and  
 Tsinghua University Physics Department, Joint Colloquium  
 1/10/01 Academia Sinica Institute of Physics and Institute of Astronomy  
 and Astrophysics Joint Colloquium  
 1/11/01 Academia Sinica Institute of Earth Sciences and Institute of  
 Astronomy and Astrophysics Joint Colloquium  
 1/30/01 LAMP (Learning Activities for Mature People) lecture, Austin  
 2/27/01 Texas A&M University, Physics Department, Seminar  
 5/31/01 University of Sao Paulo, Physics Colloquium  
 6/7-12/01 Brazilian National Institute of Space Research (INPE),  
 Sao Jose dos Campos, (3 lectures)  
 6/8/01 Federal University of Rio de Janeiro (UFRJ), Metallurgy and  
 Engineering Materials Department, Seminar  
 6/11/01 Brazilian Center of Physics Research (CBPF), Rio de Janeiro, seminar  
 6/13/01 Brazilian Center for Weather Forecast and Climate Studies  
 (CPTEC), Cachoeira Paulista, Seminar  
 7/8/01 VII Latin American Workshop on Nonlinear Phenomena, Cocoyoc, Mexico  
 7/15/01 IUPAP 21st International Conference on Statistical Physics (StatPhys21), Cancun  
 9/7/01 2001 International Couette-Taylor Workshop, Northwestern University, Keynote Speaker  
 10/11/01 University of Texas at Dallas, Physics Colloquium  
 10/17/01 Lakeway Men’s Breakfast Club, Lakeway, Texas  
 11/2/01 University of Arizona, Arizona Applied Math Fest  
 1/7/02 University of Maryland at College Park, Dynamics Days 2002  
 4/2/02 Duke University, Fritz London Memorial Lecture  
 4/11/02 University of Houston, the 2002 Kovasznay Distinguished Lecture  
 5/7/02 Workshop on Scientific Issues in Multiphase Flows, Champaign, Illinois  
 5/27/02 Otto-von-Guericke University, Nonlinear and Complex Systems seminar  
 5/28/02 Otto-von-Guericke University, 400th Year of Otto-von-Guericke Lecture

5/30/02 Max-Planck Institute for the Physics of Complex Systems (Dresden), seminar  
 6/3/02 Leipzig University, Physics Department Colloquium  
 6/5/02 International Symposium on Engineering of Chemical Complexity, Berlin  
 7/11/02 50th Anniversary Meeting of the Society for Industrial and Applied Mathematics,  
 Philadelphia  
 10/21/02 Workshop on Dynamics and Its Application, Beirut, Lebanon  
 11/6/02 Workshop on Anomalous Distributions, Nonlinear Dynamics and Nonextensivity,  
 Santa Fe, New Mexico  
 2/13/03 University of Chicago, Physics Department Colloquium  
 2/14/03 University of Chicago, James Franck Institute, seminar  
 2/20/03 Oklahoma State University, Physics Department Colloquium  
 3/3/03 American Physical Society Annual Meeting, Austin, invited talk  
 5/8/03 University of Alaska at Anchorage, Complex Systems Distinguished Lecturer  
 (evening public lecture)  
 5/9/03 University of Alaska at Anchorage, Complex Systems Seminar  
 5/18/03 Statistical Mechanics Conference, Rutgers University  
 6/27/03 Workshop on Unifying Concepts in Granular Media and Glasses, Capri, Italy  
 7/1-4/03 Enrico Fermi School *Physics of Complex Systems*, Varenna, Italy,  
 Course on "Patterns and shock waves in granular media" (4 lectures)  
 9/26/03 Northwestern University, seminar at the Engineering School  
 10/03/03 The Institute of Applied Mathematics (IAM) and the Pacific Institute of Mathematical  
 Sciences (PIMS) at the University of British Columbia, Distinguished Colloquium  
 11/07/03 University of Texas at Austin, Siemens Westinghouse Competition Seminar  
 11/8/03 Guest Speaker, Siemens Westinghouse Science and Technology Competition Awards  
 Banquet, Austin  
 11/18/03 Mathematics in Science Seminar, University of Texas at Austin, TX, Invited Talk  
 12/6/03 Southern Workshop on Granular Materials at the Center for Advanced Interdisciplinary  
 Research in Materials (CIMAT), Universidad de Santiago, Chile  
 2/3/04 University of California at Santa Barbara, Seminar at the Department of Mechanical and  
 Environmental Engineering  
 4/13/04 University of Pennsylvania, Primakov Lecture  
 4/15/04 Haverford College, Distinguished Lecture  
 4/30/04 APS Annual Meeting, Plenary Lecture, Denver  
 5/23/04 SIAM Conference on Mathematical Aspects of Materials Science, Los Angeles, CA  
 6/4/04 8th Experimental Chaos Conference, Florence Italy  
 6/17/04 International Summer School at the Institute for Advanced Studies, Zanjan, Iran  
 8/15/04 21st International Congress of Theoretical and Applied Mechanics, Warsaw, Poland  
 9/8/04 University of Toledo and Bowling Green State University, Joint Physics Colloquium  
 9/24/04 City College of New York, Levich Institute, seminar  
 9/29/04 New Jersey Institute of Technology, Department of Mathematical  
 Sciences and Mechanical Engineering, Joint Colloquium  
 10/01/04 6th Workshop on Nonlinear Dynamics and Chaos, Courant  
 Institute of Mathematical Sciences, New York University  
 10/23/04 American Mathematical Society Meeting, Special Session on Stability Issues in Fluid Dynamics,  
 Northwestern University  
 11/2/04 University of Texas at Austin, Astronomy Colloquium  
 11/08/04 Annual Meeting of the American Institute of Chemical Engineering, Session on Fundamental  
 Research in Fluid Mechanics, Austin  
 12/3/04 Symposium on "Time, Irreversibility and Self-Organization" at the International Solvay  
 Institutes for Physics and Chemistry Symposium, Brussels, Belgium

12/09/04 Ecole Polytechnique (Paris) LadHyX, Fluid Dynamics Seminar  
 12/19/04 92nd Statistical Mechanics Conference, Rutgers University  
 1/10/05 University of Florida, Chemical Engineering Colloquium  
 1/13/05 American Meteorological Society Annual Meeting, Ed Lorenz Symposium, San Diego  
 3/01/05 University of California, Berkeley, Physical Chemistry Seminar  
 3/23/05 American Physical Society Annual Meeting, Symposium on Granular Media, Los Angeles  
 6/26/05 Gordon Research Conference on Nonlinear Science  
 6/30/05 Statistical Physics Days, Keynote Lectures (2), Istanbul  
 8/12/05 Workshop "Developments in Experimental Pattern Formation," Isaac Newton Institute for  
 Mathematical Sciences Cambridge University, Cambridge  
 9/23/05 Massachusetts Institute of Technology, Department of Mechanical Engineering, seminar  
 1/12/06 Workshop on Turbulence and Coherent Structures in Fluids, Plasmas, and Granular Flows,  
 Australian National University, banquet talk, "Legacy of G. I. Taylor."  
 1/16-20/06 19th International Summer School on Turbulence and Coherent Structures in Fluids,  
 Plasmas, and Granular Flows, Canberra, Australia (5 lecture course on pattern formation)  
 3/1/06 University of Texas at Austin, Odyssey Lecture  
 3/13/06 Universidad de Guanajuato (Mexico), Colloquium in the series North American Lectures in  
 Chemical Engineering and Science  
 3/15/06 Universidad Autonoma de San Luis Potosi (Mexico), Colloquium in the series North American  
 Lectures in Chemical Engineering and Science  
 3/16/06 Universidad Nacional Autonoma de Mexico (UNAM), FENOMECA 10th Anniversary  
 Colloquium  
 3/30/06 Rhodes College, Public Lecture, sponsored by the Society of Physics Students and the  
 Department of Physics of Rhodes College, Memphis, TN  
 3/31/06 University of Mississippi, Keynote Lecturer, Society of Physics Students Zonal Meeting  
 5/4/06 Los Alamos National Laboratory, Physics/Theory Colloquium  
 5/24/06 9th Tamura Symposium, "Frontiers in Dynamics: Physical and Biological Systems,"  
 Tokyo, Japan  
 5/26/06 University of Tokyo, Japan, Physics Department Colloquium,  
 10/13/06 Workshop on Emergence in Physical, Biological, and Social Systems, Institute for Complex  
 Adaptive Matter, University of Michigan  
 10/25/06 University of Texas at Arlington, Physics Department Colloquium  
 11/3/06 Emory University, Physics Department Colloquium  
 11/16/06 International Marangoni Conference, University of Florida, Gainesville  
 11/19/06 59th Annual Meeting of the APS Division of Fluid Dynamics, Tampa, Florida  
 3/26/07 Carnegie Institution of Washington, Colloquium  
 3/27/07 Carnegie Institution of Washington, Seminar  
 3/28/07 Indiana University, Physics Department Colloquium  
 4/6/07 École Supérieure de Physique et de Chimie Industrielles (ESPCI, Paris), Seminar  
 6/2/07 Symposium of the Miller Institute for Basic Research in Science, University of California,  
 Berkeley  
 9/18/07 Conference on Nonlinear Dynamics and Chaos: Advances and Perspectives, Aberdeen, Scotland  
 12/16/07 Conference on Statistical Mechanics, Rutgers University  
 1/3/08 National Conference on Nonlinear Systems and Dynamics, Ahmedabad, India  
 1/6/08 Hands-on Research in Complex Systems School, Gandhinagar, India  
 2/29/08 University of Colorado, Boulder, Applied Mathematics Colloquium  
 3/1/08 Society of Industrial and Applied Mathematics, Front Range Applied Mathematics  
 Student Conference, the Plenary Lecture  
 3/29/08 University of Texas at Austin, Saturday Physics Workshop for high school  
 teachers and students



5/6-7/08 Northwestern University, Edward L. Reiss Memorial Lectures (2)  
 5/7/08 Conference on Symmetries and Properties of Condensed Matter Systems, City of New York  
 6/3/08 Hebrew University of Jerusalem, Physics Department Colloquium  
 6/4/08 Birzeit University (Palestine), Colloquium of the Departments of Physics, Mathematics,  
 and Biology  
 7/22/08 Conference "25 Years of Nonlinear Dynamics", Amelia Island, Florida  
 10/15/08 Workshop on Pattern Formation and Development in Colonial Organisms, Ohio State University  
 10/18/08 Meeting of the Texas Section of the American Physical Society, University of Texas at El Paso  
 11/24/08 Annual Meeting of the American Physical Society Division of Fluid Dynamics, San Antonio, TX  
 12/16/08 Symposium in Celebration of Distinguished Professor Herman Z. Cummin's 75th Birthday,  
 City College of New York  
 2/25/09 Georgia Tech University, Physics Department Colloquium  
 3/24/09 Trinity University, Physics Department Colloquium  
 4/7/09 University of Chicago, James Franck Institute Colloquium  
 6/1/09 International Conference on Complexity in Physics, Ecole Normale Supérieure de Lyon, France  
 6/26/09 Emergence in Chemical Systems Conference, University of Alaska  
 7/26/09 Hands-On Research School, lecture and 2-week course on fluid instabilities, Sao Paulo, Brazil  
 12/13/09 102nd Statistical Mechanics Conference, Rutgers University, New Brunswick, New Jersey  
 1/5/10 Dynamic Days 2010 Conference, Northwest University Institute on Complex Systems,  
 Chicago, IL  
 1/13/10 Woods Hole Oceanographic Institute, Seminar  
 2/12/10 Arizona State University, Physics Department Colloquium  
 03/15-17/10 Invited lecture series Physical and Biological Dynamics in the 21st Century,  
 University of Buenos Aires, Argentina (3 talks)  
 4/8/10 Banff International Research Station for Mathematical Innovation and Discovery Conference  
 on Internal Waves, Banff, Canada  
 6/29-7-3/10 Enrico Fermi School on Complex Systems, Varenna sul Lago di Como, Italy (3 talks)  
 6/25/10 New Trends on Growth and Form Conference, Agay, France  
 1/15/10 Symposium in Honor of Herman Z. Cummins, New York City  
 3/30/11 Notre Dame University, Physics Department Colloquium  
 5/4/11 University of Massachusetts-Amherst, Physics Department Colloquium  
 5/20/11 Nonlinear Dynamics and Fluid Instabilities in the 21st Century, Haverford College  
 6/6/11 Shanghai Jiao Tong University, University President's Forum  
 6/8/11 Shanghai Jiao Tong University, Department of Physics (talk-on Hands-On Research Schools)  
 6/13/11 Peking University, International Centre for Quantum Materials Seminar  
 6/14/11 Peking University, Center for Theoretical Biology Seminar  
 7/10/11 Keynote Address, Workshop: "Hands-on Experiments, Scientific Discovery Games  
 and Citizen Science Learning through Research for All", Paris  
 7/14/11 Abdus Salam International Centre for Theoretical Physics, Monthly Colloquium,  
 Trieste, Italy  
 10/21/11 Rhodes College (Memphis), Physics Seminar  
 1/4/12 Dynamics Days 2012, Baltimore  
 4/24/12 European Geosciences Union Annual Meeting, Lewis Fry Richardson Medal Lecture, Vienna  
 4/27/12 Eotvos Lorand University, Budapest, Physics Colloquium  
 5/17/12 Experimental Physics Conference, Public Lecture, University of Michigan  
 6/18 & 29/12 Hands-On Research in Complex Systems School, Shanghai, Lecture on Emergence  
 of Spatial Patterns and lecture on Competing Bacterial Colonies  
 9/6/12 Texas Tech University, Physics Department Colloquium  
 10/3/12 International Conference on Nonequilibrium Collective Dynamics, Potsdam, Germany  
 11/8/12 Texas A&M University-Commerce, Physics Department Colloquium

2/15/13	University of New Mexico, Physics Department Colloquium
2/28/13	University of Pennsylvania, Department of Mechanical Engineering and Applied Mechanics, Seminar
3/6/13	Baylor University, Physics Department Colloquium
3/13/13	Woods Hole Oceanographic Institute, Meeting on Integrated Ocean Dynamics and Acoustics
4/6/13	University of Washington (St. Louis), Physics Department Colloquium
4/30/13	Duke University, Nonlinear Dynamics Seminar
6/4/13	Ocean Turbulence Conference, Santa Fe, NM
7/1-7/12/13	Hands-On Research School in Complex Systems, International Centre for Theoretical Physics, Trieste Italy, Opening Talk on July 1st and Closing Talk on July 12th
7/8/13	Tribute to Marshall Rosenbluth, talk at the ICTP Annual Prize Ceremony
7/21/13	Korea Institute for Advanced Study, Public Lecture (Seoul, Korea)
7/24/13	Boltzmann Award Lecture, Statphys25–International Conference on Statistical Physics (Seoul)
6/30/14	Opening lecture at the Hands-On Research in Complex Systems School, Trieste, Italy
6/10/14	Conference on Nonlinear Effects in Internal Waves, Cornell University
7/20/14	Gordon Research Seminar on Granular and Granular-Fluid Flow, Easton, Mass.
9/24/14	Texas A&M University, Mechanical Engineering Seminar
12/2/14	Centro Internacional de Ciencias, Cuernavaca, Mexico, Distinguished Invited Lecture
2/24/15	Reed College, Spring Divisional Speaker, Mathematics and Natural Sciences
2/25/15	Reed College, Physics Seminar
3/26/15	University of Southern California, Laufer Lecture
4/24/15	Johns Hopkins University, Center for Environmental and Applied Fluid Mechanics, Seminar
4/28/15	Rockefeller University, Center for Studies in Physics and Biology, Seminar
5/25/15	Topics in Applied Dynamical Systems Conference, Columbus Ohio
6/19/15	Universitat de Barcelona, Department of Physical Chemistry, Seminar
6/22/15	8th International Conference on Engineering of Chemical Complexity, Munich, Plenary Lecture
6/28/15	Hands-On Research in Complex Systems School, ICTP, Trieste, Italy, Opening Lecture
6/29/15	Hands-On Research in Complex Systems School, ICTP, Trieste, Italy, Lecture on Professional Deve

**Grants** (H. L. Swinney, Principal Investigator):

Agency: Office of Naval Research (through Woods Hole Oceanographic Institute)  
 Title: “Coastal Ocean Modeling of Nonlinear Internal-Wave Physical and Acoustic Effects”  
 Period: 6/1/11-5/31/16  
 Amount: \$750,000

Swinney has had other grants awarded by NSF, DOE, ONR, British Petroleum, IBM, the Trull Foundation, NASA, NATO, United States-Israel Binational Foundation, Nigeria LNG, American Chemical Society Petroleum Research Fund, The Robert A. Welch Foundation, Exxon Education Foundation, and the Texas Advanced Technology Program.

**Ph.D. Students:**

T. K. Lim, Johns Hopkins University, 1973  
 “The Rayleigh Linewidth of Simple Fluids near the Critical Point”

Jay Newman, New York University, 1975

- “Dynamic Light Scattering and Birefringence Studies of fd Virus and Its DNA”  
Dennis Wonica, City College of CUNY, 1979  
“Brillouin Scattering in Xenon Near the Critical Point”
- Randy Fenstermacher, City College of CUNY, 1979  
“Laser Doppler Velocimetry Study of the Onset of Chaos in Taylor Vortex Flow”
- Leslie Reith, The University of Texas, 1981  
“Transition to Turbulence in a Circular Couette System”
- Gregory P. King, The University of Texas, 1983  
“Limits of Stability and Irregular Flow Patterns in Wavy Vortex Flow”
- Anke Brandstater, Christian Albrechts Universität (Kiel), 1984  
“Low Dimensional Chaos in a Hydrodynamic System”
- Donald Allen Hirst, The University of Texas at Austin, 1987  
“The Aspect Ratio Dependence of the Attractor Dimension in Taylor-Couette Flow”
- Andrew McLeod Fraser, The University of Texas at Austin, 1988  
“Information and Entropy in Strange Attractors”
- John Vastano, The University of Texas at Austin, 1988  
“Bifurcations in Spatiotemporal Systems”
- Peter McCarty, University of Texas at Austin, 1989  
(Principal Advisor Werner Horthemke: Co-advisor Harry Swinney)  
“Modelling of spatially extended open chemical systems”
- Steven D. Meyers, The University of Texas at Austin, 1990  
“Laboratory Experiments on Coherent Structures in Quasi-geostrophic Flows”
- W. Stuart Edwards, The University of Texas at Austin, 1991  
“New Stability Analyses for the Couette-Taylor Problem”
- Michael F. Schatz, The University of Texas at Austin, 1991  
“Transition in Plane Channel Flow with Spatially Periodic Perturbations”
- Daniel P. Lathrop, The University of Texas at Austin, 1992  
“Turbulent Drag and Transport in High Reynolds Number Couette-Taylor Flow”
- Kyoung J. Lee, The University of Texas at Austin, 1994  
“Nonequilibrium Chemical Patterns and their Bifurcations”
- Steven P. Gross, The University of Texas at Austin, 1995  
(Co-advisors: Michael Marder and Harry Swinney)  
“Dynamics of Fast Fracture”
- John M. Huth, The University of Texas at Austin, 1995

- “Dynamics and Convective Transport in Electrochemical Deposition”
- Gregory S. Lewis, The University of Texas at Austin, 1996  
“Velocity Fluctuations, Wall Shear Stress and the Transition in Torque Scaling at  $R=13,000$  in Turbulent Couette-Taylor Flow”
- Paul B. Umbanhowar, The University of Texas at Austin, 1996  
“Pattern Formation in Vertically Vibrated Granular Materials”
- Stephen Van Hook, The University of Texas at Austin, 1996  
“Long-Wavelength Instability in Surface-Tension-Driven Bénard Convection”
- Eric R. Weeks, The University of Texas at Austin, 1997  
“Experimental Studies of Anomalous Diffusion, Blocking Phenomena, and Two-Dimensional Turbulence”
- Jens Hauch, The University of Texas at Austin, 1999  
(Principal Advisor, Michael Marder; Co-advisor, Harry Swinney)  
“Dynamic Fracture in Brittle Materials”
- John Burgess, The University of Texas at Austin, 1999  
(Principal Advisor, Harry Swinney; Co-advisor, W. D. McCormick)  
“Thin Film Instabilities: Rayleigh-Taylor with Thermocapillarities and Kolmogorov Flow in a Soap Film”
- Charles Baroud, The University of Texas at Austin, 2001  
“Transitions from three-to two-dimensional turbulence in a rotating system”
- Daniel I. Goldman, The University of Texas at Austin, 2002  
“Pattern formation and fluidization in vibrated granular layers, and grain dynamics and jamming in a water fluidized bed”
- Douglas S. Martin, The University of Texas at Austin, 2003  
(Principal Advisor, Josef Käs, Co-Advisor, Harry Swinney)  
“Speed and Propagation of Diffusive Signals in Spatially Inhomogeneous Membranes”
- Martin B. Forstner, The University of Texas at Austin, 2003  
(Principal Advisor, Josef Käs, Co-Advisor, Harry Swinney)  
“Motion of Nano-Objects in Langmuir Monolayers”
- Mitchell G. Moore, The University of Texas at Austin, 2003  
“Unsteady Growth and Relaxation of Viscous Fingers”
- Erin C. Rericha, The University of Texas at Austin, 2004  
“Shocks in Rapid Granular Flows”
- Sunghwan Jung, The University of Texas at Austin, 2005  
“Statistics of Turbulence in a Rapidly Rotating System”
- Jori Elan Ruppert-Felsot, The University of Texas at Austin, 2005

“Coherent Structures and Two-Dimensionalization in Rotating Turbulent Flow”

Andrew T. Lee, The University of Texas at Austin, 2005  
“Dynamics of a Single Sphere Sedimenting in a Fluid”

Matthew Thrasher, The University of Texas at Austin, 2007  
“Geometry and Dynamics of Fluid-Fluid Interfaces”

Benjamin King, The University of Texas at Austin, 2010  
“Laboratory and Numerical Studies of Internal Wave Generation and Propagation in the Ocean”

Bruce E. Rodenborn, The University of Texas at Austin, 2011  
“The Fluid Dynamics of Flagellar Swimming by Microorganisms and  
Harmonic Generation by Reflecting Internal, Ocean-like Waves”

**Masters Degree Students:**

Gordon Skinner, The University of Texas at Austin, 1989  
“Studies of Spiral Wave Dynamics in the Belousov-Zhabotinskii Reagent”

William Holloway, The University of Texas at Austin, 1991  
“Experimental Studies of Steady-State and Rossby Wave Flow in Planetary Jets”

Fred Hamill, The University of Texas at Austin, 1995  
“Turbulent Bursting in the Couette-Taylor System”

Ade Lee, The University of Texas at Austin, 1995  
“Pattern Formation in a Parametrically Forced Chemical System”

Andreas Breu, The University of Texas at Austin, 1997  
“Onset of Fluidization in a Water Fluidized Bed”

Richard Metzler, The University of Texas at Austin, 1997  
“Diffusing-Wave Spectroscopy in a Liquid-Fluidized Bed”

Matthias Bertram, The University of Texas at Austin, 1999  
“A Numerical Study of Resonant Pattern Formation in the Brusselator Reaction-Diffusion Model”

Reza Kharrazian, The University of Texas at Austin, 2000  
“Resonant patterns in the FitzHugh-Nagumo model with oscillatory and excitable dynamics”

Thomas Weber, The University of Texas at Austin, 2000  
“2D and 3D turbulence in a rotating tank with a vertically oscillating grid”

Bernward Mann, The University of Texas at Austin, 2001  
“Spatial Phase-Transitions in Bacterial Growth”

Xaver Sailer, The University of Texas at Austin, 2001  
“Simulation of Resonant Pattern Formation with the FitzHugh-Nagumo Model”

- Karl Martinez, The University of Texas at Austin, 2001  
“Resonant pattern formation in excitable chemical media”
- Beth Christine Lewis, The University of Texas at Austin, 2001  
“Spirals and oscillons in vertically oscillated granular material”
- Florian Merkt, The University of Texas at Austin, 2003  
“Localized structures in a vertically vibrated aqueous solution of cornstarch”
- Patrick Heil, The University of Texas at Austin, 2003  
“Surface shock waves on fluidized granular material”
- Sabrina Nagel, The University of Texas at Austin, 2004  
“Height fluctuations in a two-dimensional air fluidized bed”
- Stephan Ulrich, The University of Texas at Austin, 2004  
“Collective Behavior in Size Segregation of Granular Materials”
- Matthew Thrasher, The University of Texas at Austin, 2005  
“A Liquid Stream Bouncing on a Moving Liquid Bath”
- Stacy Sidle, The University of Texas at Austin, 2006  
“Investigating a Granular Length Scale Using the Central Limit Theorem”
- Luis Salinas, The University of Texas at Austin, 2007  
“Determination of the Static Force Distribution on a Sphere Resting in a Wedge”
- Alexander Buck, The University of Texas at Austin, 2007  
“The effective granular temperature based on the fluctuation-dissipation theorem”
- Daniel Kiefer, The University of Texas at Austin, 2007  
“Nonlinear Interaction of Internal Wave Beams Upon Reflection at a Sloping Boundary”
- Leen Alawieh, The University of Texas at Austin, 2009  
“Dynamical Heterogeneity in a Fluidized Bed”
- Guenther Ebert, The University of Texas at Austin, 2010  
“The Efficiency of Turbulent Mixing in Stratified Fluids”
- Matthew Drake, The University of Texas at Austin, 2012  
“Internal Wave Generation in the Presence of Turning Depths  
‘ Laboratory Models of the Deep Ocean”
- Amadeus K. Dettner, The University of Texas at Austin, 2012  
“Internal gravity waves generated by tidal flow over topography”

**Postdoctoral Research Associates:**

- Don Eden, 1971-73  
Richard Weingarten, 1973-76

Michael Gorman, 1977-80  
C. David Andereck, 1980-84  
Reuben Simoyi, 1981-83  
Jerzy Maselko, 1983-86  
Joel Sommeria, 1985-87  
Wing Yim Tam, 1985-88  
Laurette Tuckerman, 1985-88  
Eric Kostelich, 1985-89  
Randall Tagg, 1985-1990  
Girish Kshirsagar, 1988-89  
Jay Fineberg, 1988-1992  
R. Dennis Vigil, 1990-1993  
Thomas R. Solomon, 1990-93  
Francisco Melo, 1992-94  
Dror Haim, 1994-95  
Michael Schatz, 1991-1996  
Jeffrey Urbach, 1993-1996  
Qi Ouyang, 1987-1996  
Valery Petrov, 1995-1998  
Stephen Van Hook, 1996-98  
Brendan Plapp, 1997-99  
Anne Juel, 1998-1999  
Mark D. Shattuck, 1996-2000  
Anna Lin, 1997-2001  
Julien Aubert 2001-2002  
Eran Sharon, 2000 - 2003  
Nick Peffley, 2000 - 2002  
Daniel Goldman, 2002 - 2003  
Olivier Praud, 2002 - 2004  
Matthias Schroeter, 2003 - 2007  
Hepeng Zhang, 2004 - 2011)  
Avraham Be'er, 2007 - 2011  
Matthew Paoletti, 2010 - 2013  
Likun Zhang, 2012-  
Michael Allshouse, 2013-

**Visitors (1 or more years):**

Jean-Claude Roux, 1980-81 (Centre de Recherche Paul Pascal, Bordeaux)  
Li-Hua Zhang, 1981-82 (Academia Sinica, Beijing)  
Shu-Sheng Liu, 1981-82 (Tianjin University)  
Francoise Argoul, 1987-90 (Ecole Normale)  
Alain Arneodo, 1987-90 (Superiere Lyon)  
Robert Behringer, 1989-90 (Duke University)  
Zoltan Noszticzius, 1989-92 (Technical University of Budapest)  
Alexei Predtechensky, 1991-1995 (Novobirsk University, Siberia)  
Ge Li, 1995-97 (Tsinghua University, Beijing)

Yudong Tian, 1995-1996 (UCLA)

Jean-Pierre Delville, 1996-1997 (CNRS, Bordeaux)

John deBruyn, 1997-98 (Memorial University of Newfoundland)

Andreas Engel, 1998-1999 (Institut für Theoretische Physik, Magdeberg)

Stephen Morris, 2000-2001 (University of Toronto)

Eduardo Ramos, 2001-2002 (National University of Mexico, Cuernavaca)

Jiajung Zhao, 2014- (National University of Singapore)